Appendix L
Aquatic ecology technical reports

Hydrobiology

AQUATIC ECOLOGY

BRISBANE | PERTH | SINGAPORE | PAPUA NEW GUINEA

BORUMBA PUMPED HYDRO PROJECT



B22017

—

DECEMBER 2022

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EXECUTIVE SUMMARY

This report describes the results of the preliminary aquatic ecological baseline study and impact assessment completed by Hydrobiology for the proposed Borumba Pumped Hydro Project (BPHP). The project will comprise an upper and lower reservoir, dam and intake structures, underground power generation, switch yard, transmission lines, and access roads to the power house and dam site.

The broad objectives of the baseline study were to provide a summary of the existing aquatic values of the Study Area to direct future seasonal surveys and investigations associated with the environmental impact statement (EIS). The riverine and lacustrine habitats that were investigated included:

- Sites within and upstream of Lake Borumba. This included areas within the proposed full storage level (FSL);
- Sites within and downstream of the proposed upper reservoir;
- Sites downstream of Borumba dam along Yabba Creek;
- Tributaries of Yabba Creek downstream of Borumba dam; and
- Sites within Mary River, including upstream and downstream of the confluence with Yabba Creek.

This investigation was able to draw on existing data from previous studies in the Study Area and further downstream along Mary River; however, there was little information available upstream of Lake Borumba along Yabba and Kingaham Creek and in the proposed upper reservoir. The field study involved sampling of fish, aquatic reptiles, platypus, macrocrustaceans (freshwater prawns and yabbies), macroinvertebrates, microcrustaceans, microalgae and the assessment of in-stream and riparian habitat.

Natural geomorphology with superimposed habitat modification dictates the nature and extent of aquatic habitats within the Study Area. The Study Area can be broadly grouped into the following habitat types, including:

1. Upper Reservoir (steep confined valley) – Single channel, low sinuosity. Macrohabitat features include run, rapid, cascade and pool (largely shallow). Substrate was dominated by bedrock, boulder and cobble complexes, though in the upper reaches sand deposits were also noted;
2. Creeks upstream of Lake Borumba (partly confined valley) - Largely single channel with occasional backwater. Sinuous valley alignment. Macrohabitat features include run, rapid, riffle, pool (deep and shallow) and macrophytes. Substrate was dominated by cobble, pebbles and gravel complexes;
3. Lake Borumba - Lacustrine habitat including both shallow (less frequent) and deep open waters. Macrophytes occur along fringing shallow extents. Substrates are largely fine (dominated by silts), though larger substrates are evident adjacent to cliff faces; and
4. Downstream of Lake Borumba including Yabba Creek and Mary River (partly confined valley with flood pockets, though Mary River becoming less confined downstream of the Yabba Creek confluence) - Largely single channel though highly variable channel width, frequent backwaters. Macrohabitats include run, riffle, pool (shallow and deep). Absence of macrophytes due to recent scouring from flood flows. Substrates in these reaches were more varied than other areas and were representative of local impacts. Overall pebbles and gravel substrates dominated composition followed by sand and cobbles.

The aquatic community and habitat condition of the Study Area can be summarised as follows:

- The Study Area has a diverse community of aquatic fauna that shares a range of species with the Upper Mary River catchment and to a lesser extent the Lower Mary River catchment;
- The Study Area (excluding the proposed Upper Reservoir), features multiple conservation significant species, including lungfish, Mary River cod, white-throated snapping turtle, Mary River turtle and platypus. These species are considered threatened under the National *Environment Protection and Biodiversity Conservation Act 1999* and/or the State *Nature Conservation Act 1992*;
- Riverine habitats used by aquatic fauna of Yabba Creek, Kingaham Creek and Mary River include riffles, runs, pools (shallow and deep), stream edges and shallow margins, macrophytes, woody debris and tree roots. While these habitats are favoured by particular suites of species, many fish and macroinvertebrates show flexible habitat requirements;
- Riverine habitats used by the aquatic fauna of the upper reservoir are not considered specific. However, the presence of specialist crayfish species (i.e., Conondale crayfish) require confirmation;
- A number of non-native species occur in the Study Area, including those introduced into Australia and translocated native (though not native to the study area) species that have been deliberately or incidentally stocked. Abundances and biomass of species that were introduce into Australia are considered low in the Study Area including areas where they could proliferate (i.e., Lake Borumba). For those species which are native to Australia though not within the Study Area, abundance and biomass are high in Lake Borumba. It is not anticipated that these species (including tilapia) will outcompete native species as a result of the BPHP; and
- The aquatic fauna of the Study Area has been subject to a number of current and historic impacts, of which the most locally significant is water resource development (i.e. Borumba dam). This includes habitat change (lentic to lotic systems) and barriers to fish movement. Those unrelated to water resource development are associated with agricultural land uses and include land clearing in general, significant loss of riparian vegetation, increase in nutrients and sedimentation, cattle access to streams and introduction of feral animals, while other issues include aquatic weed infestations, historic fishing pressure on Mary River cod and harvesting of Mary River turtles eggs for the pet trade (now stopped; this has been noted for Mary River and not Yabba Creek).

The impacts of greatest significance to aquatic habitat and fauna would be during the operational phase of the proposed project and are associated with:

- The conversion of a lotic to a lentic system (for predicted extents beyond the current FSL of Lake Borumba) will reduce macrohabitat diversity and suitability for key species in the projected FSL of the Lower Reservoir. This represents a residual impact and cannot be mitigated.
- Lotic environments of the Upper Reservoir will also be converted to lentic systems. This represents a residual impact and cannot be mitigated.
- Operation of the pumped hydro:
  - Predicted rapid water level fluctuations in the lower reservoir will limit macrophyte establishment and thus spawning habitat for lungfish and also access to large woody debris in shallower nearshore areas which are important for several species.
  - the operational requirements of the Upper Reservoir will see the depth recede regularly and, in some instances, the Upper Reservoir could be emptied almost completely, limiting the ability of the area to support a functional ecosystem. This is unlikely to change and will represent a residual impact on the biota in this area.
- Flow regime changes downstream – is likely to be limited once the storage fills.
- Improved fish and turtle passage through provision of specific infrastructure (none exists now).
- Improved quality water released downstream through replacement of the current bottom release with a multi-level offtake (though depending on water quality impacts of the water transfer associated with the hydro scheme).

Based on the significant residual impact (SRI) assessment there are potential residual impacts to both State and National Matters of Environmental Significance, including:

- Threatened species listed under the EPBC Act including white-throated snapping turtle, Mary River turtle and Australian lungfish;
- Protected wildlife habitat for the special least concern species listed under the NC Act including platypus;
- Wetlands of high ecological significance (HES); and
- Waterways providing fish passage.

The identified SRI impacts will likely require offsetting. Relevant to State matters, offsets can come in the form of a financial settlement or other agreed method, while National matters typically require land-based offset.

Further studies will be undertaken to support the EIS and the assessment of impacts, potential mitigation strategies and need for offsets will be re-assessed at that time.

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1. INTRODUCTION

1.1 PROJECT DESCRIPTION

In June 2021, Powerlink Queensland (PQ) was engaged by the Queensland Government to prepare a detailed analytical report (DAR) and front-end engineering design (FEED) for the Borumba Pumped Hydro Project (BPHP) proposed to be based at the existing Lake Borumba. The primary objective of the BPHP is to provide long duration, high capacity dispatchable energy to the Queensland grid which can be used to increase system stability and reliability of supply.

In September 2022, the project was transferred from PQ to Queensland Hydro (QH). Queensland Hydro is responsible for the design, delivery, operation and maintenance of Queensland's long duration pumped hydro energy storage assets.

The purpose of the DAR is to assess the commercial, technical, and environmental feasibility of the project to a standard consistent with the *Queensland Government Business Case Development Framework (2021)*. The DAR will be completed in early-2023 and will be provided to the Queensland Government for review.

A number of technical reports will provide input to the DAR.

The project proposal assessed in the technical reports is based on a preliminary Reference Design which will be further developed as part of the DAR/FEED process. As such, the assessments are preliminary and will be updated when further information becomes available.

The project is located within the Gympie and Somerset Regional Council local government areas, some 13 km south west of Imbil, 48 km south west of Gympie, and 180 km north west of Brisbane.

Built across Yabba Creek, the existing Borumba Dam was constructed in 1963, and was upgraded to increase flood storage in 1997. It forms Lake Borumba and is owned and operated by Seqwater. Stored water is currently used within Mary Valley Water Supply Scheme for drinking water and for irrigation purposes. Lake Borumba is a popular recreation area including for camping, fishing and water sports (including power boating).

Borumba Dam is at 31.1 km AMTD (Adopted Middle Thread Distance) on Yabba Creek and Yabba Creek joins Mary River 226.7 km AMTD from the mouth of the river (and 167.4 km upstream of the tidal barrage).

The key components of the current design for BPHP comprise (Figure 1-1).:

- New Borumba Dam and (lower) reservoir (Lake Borumba):
  - Raising the full supply level of Lake Borumba through the construction of a new dam wall immediately downstream of the existing dam wall.
  - Partial demolition of existing Borumba Dam.
  - Installation of fish and turtle passage and transfer devices.
- New upper dams and reservoir:
  - Installation of a main dam wall, saddle dam and minor saddle dams to form an upper reservoir.
- Underground works to support power generation:
  - Water transfer (headrace and tailrace) tunnels (from 260 m to 2,400 m long) to transfer water between the upper and lower reservoirs (each comprising of 2 x 10.5 m internal diameter tunnels).
  - Underground power station and pump turbines.
  - Access to the surface would be via a 1,520 m long, 10.4 m wide main access tunnel (MAT), and a 1,480 m long, 8.5 m wide emergency, cable and ventilation tunnel (ECVT). The portals would be located near the switchyard.
- Electrical switchyard (approximately 5 Ha in area).
- Transmission lines: two sets of transmission lines to connect the switchyard to substations at Tarong and Woolooga substations (being assessed separately by PQ).
- Ancillary infrastructure (both temporary and permanent) including quarry sites and other resource extraction areas, access roads and bridges, maintenance buildings, construction camps with associated water and wastewater treatment plants, spoil dumps and laydown areas.

Key elements of the dams and the associated reservoirs are identified in Table 1-1, along with a comparison with the existing Borumba Dam and Lake Borumba. It should be noted that the design is still under development, and some features may be subject to change based on development of the FEED.

Table 1-1 Key statistics of existing and proposed water storage infrastructure

	Existing Borumba Dam and Lake Borumba	New Borumba Dam and lower reservoir	New upper dams and reservoir
Full Supply Level (m Australian Height Datum - AHD)	135	155	492
Dam wall height (m)	43	69.2	102 (main dam)

	Existing Borumba Dam and Lake Borumba	New Borumba Dam and lower reservoir	New upper dams and reservoir
Max depth at FSL (m)	30	50	96
Surface area at FSL (Ha)	482	1,241	308
Capacity at FSL (GL)	46.1	260	73.1

The new Borumba Dam would be constructed approximately 300 m downstream from the present dam. The existing Borumba Dam is to remain in place but requires partial demolition after the construction of the new dam to allow greater water flow downstream.

The new Borumba Dam would be ungated with a crest level (set at a height yet to be fixed) above FSL to provide a level of flood surcharge across the spillway. Specifications for dam outlet works are still under development, however these would incorporate sufficient capacity to provide for water delivery, environmental flows and emergency drawdown. A multi-level offtake would be used and would replace the current single level offtake. The dam would also allow for safe fish and turtle passage and transfer which the current dam does not. An assessment is underway to determine the most suitable transfer and passage devices.

The new upper reservoir would be constructed on an un-named tributary which enters Lake Borumba. The storage would require a number of saddle dams in addition to the main dam. The main dam would be designed to only overtop in the event of accidental overfilling during water transfer from the lower storage. It is not planned to have outlet works or fish transfer devices. Its sole purpose would be to support the generation of electricity. As such it would not be accessible to the public.

The water transfer intake structures would be located below the waterline of the upper and lower reservoirs at a sufficient depth to avoid air entrainment and vortex formation. The intakes would be screened by trash racks, and diffuser sections would be provided to avoid high jet velocities and minimise the entrainment of fauna and sediment.

The scheme would operate in two cycles:

- A **generation cycle** during which water is released from the upper reservoir to the lower reservoir, thereby generating electricity by powering the turbines in the underground power station cavern; and
- A **pumping cycle** during which the turbines would be used on a reverse cycle to pump water from the lower reservoir to the upper reservoir to replenish storage.

The process uses little water as it is essentially a recirculating system.

The upper storage is generally kept full so that it can quickly enter the generation cycle on demand. The length of each cycle would be determined by the electricity demand at the time, but the system would have the capacity to generate for up to 24 hours and produce 2000 megawatts (MW) of electricity.

The water level in the upper storage could vary by up to 47 m in a single operational cycle. The water level variation within Lake Borumba would be significantly less because of its much larger volume but could be many metres in a single cycle and would vary with the level of water in storage.

Raising Borumba Dam will meet the necessary flood capacity handling requirements, which it currently does not.

The lower reservoir will retain its current water supply and environmental flow capabilities. Integrated management would be required to balance demand for hydropower generation with downstream water demand and environmental flows.

Despite the changes to operability of Lake Borumba, the project is being designed with the intent of maintaining existing recreational values.

The project would take several years to construct and would employ a large on-site workforce. Detailed estimates will be developed as planning progresses.

1.2 LOCATION

The proposed BPHP is within the region of Lake Borumba, the water storage area of Borumba Dam, a rock filled embankment dam situated across Yabba Creek, in South-East Queensland (Figure 1-1). Borumba Dam was constructed in 1963 and is owned by Seqwater. The dam is at 31.1 km AMTD (Adopted Middle Thread Distance) on Yabba Creek and Yabba Creek joins Mary River 226.7 km AMTD from the mouth of the river (and 167.4 km upstream of the barrage).

The "Local Study Area" for this component of work was equivalent to the Yabba Creek sub-catchment as shown in Schedule 3 of the Water Plan (Mary Basin) 2006 (Queensland Government, 2006). The "Broader Study Area' included the Upper Mary River drainage sub-basin prior to Gympie as defined in DES (2013b).

The field survey encapsulated the freshwater aquatic habitats (riverine, lacustrine and palustrine waterbodies) upstream and downstream of Lake Borumba, along with an adjacent tributary. These included:

- Tributaries upstream of Lake Borumba (Kingaham Creek, Yabba Creek, and Borumba Creek);
- Lake Borumba (existing and proposed raised);
- Proposed Upper reservoir and its catchment;
- Yabba Creek downstream of Lake Borumba;
- Mary River (downstream to Traveston crossing road, Amamoor and upstream to Moy Pocket); and
- Bella Creek, an adjacent stream which will not be impacted by dam related works.

1.3 SCOPE AND OBJECTIVES

The purpose of this assessment is to describe, using existing data supplemented by new field survey, the existing aquatic ecological values of the Study Area to satisfy the "Aquatic Flora and Fauna" section of the DAR Environment chapter.

The assessment will also provide a preliminary analysis of potential impacts and likely offset requirements and will contribute to the suite of baseline studies for a potential future statutory environmental impact statement (EIS).

To address this requirement, Hydrobiology was commissioned to undertake a three-stage assessment process which included:

- Stage 1 – Desktop assessment (literature review and gap analysis) of the aquatic ecosystem values within the Study Area;
- Stage 2 – A single field survey to confirm the desktop findings and fill gaps; and
- Stage 3 – A preliminary impact and mitigation assessment.

This report presents the findings of the initial desktop assessment, aquatic ecology field assessment and the subsequent impact and mitigation assessment. This will be updated in detail through the EIS process.

This report only assesses water quality as a habitat variable. A more detailed assessment of water and sediment quality values in their own right is documented by Hydrobiology in a separate report.

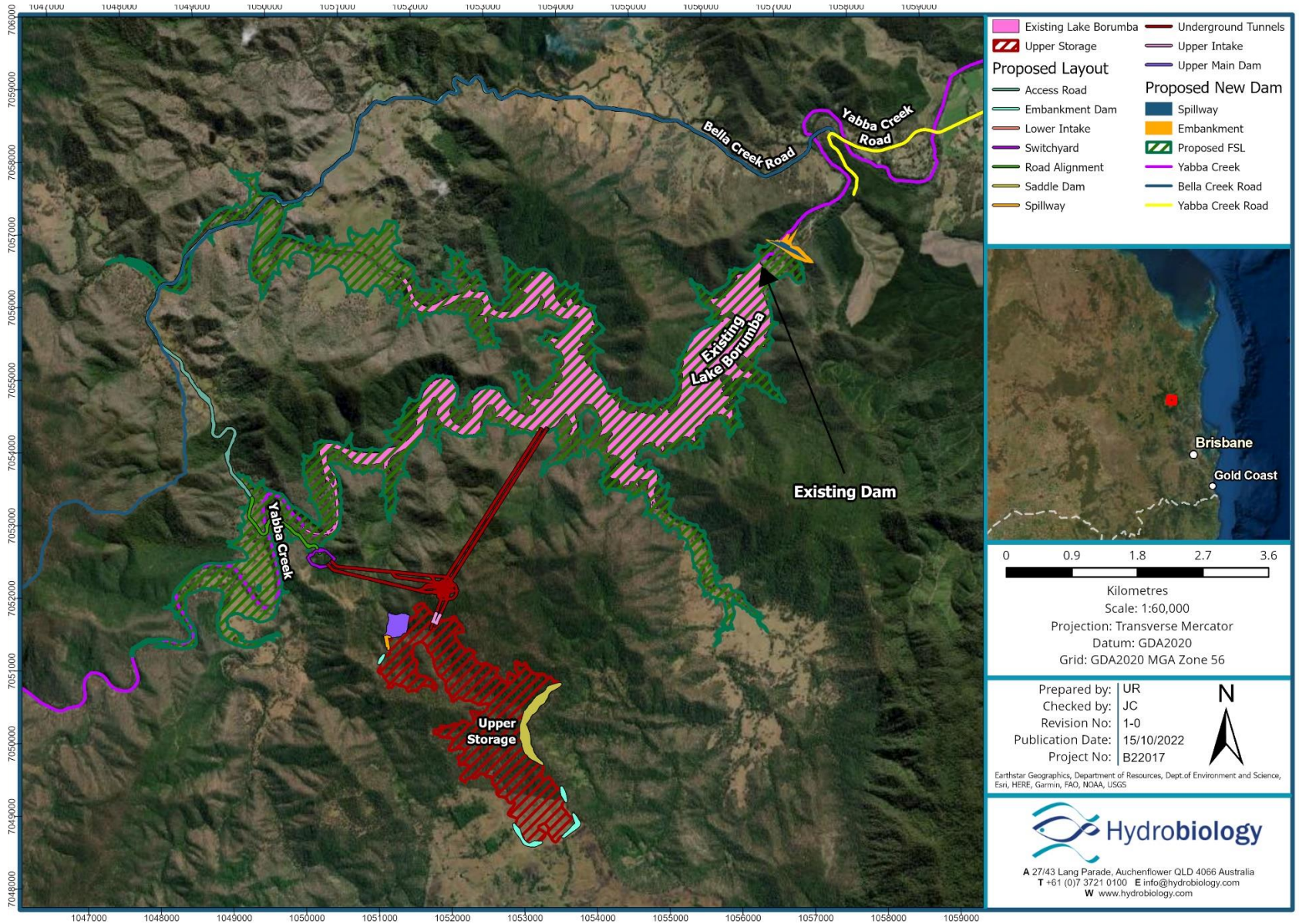


Figure 1-1 Proposed BPHP and its associated infrastructure

2. REGULATORY ENVIRONMENT

2.1 ENVIRONMENTAL VALUES

Commonwealth and State legislation relevant to the Study Area and surrounds are detailed in Table 2-1. They have been used to identify environmental values of relevance to aquatic ecology in the Study Area. Legislation relating to aquatic matters is discussed below.

2.1.1 COMMONWEALTH *ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999 (EPBC ACT)*

The EPBC Act provides the legal framework for the protection and management of Australia's unique plants, animals, habitats and places. These include heritage sites, marine areas and some wetlands. The Act also protects listed threatened and migratory species. The protected matters are collectively defined as Matters of National Environmental Significance (MNES).

The 9 MNES are:

- World heritage areas;
- National heritage places;
- Wetlands of international importance (listed under the Ramsar Convention);
- Listed threatened species and ecological communities;
- Listed migratory species (protected under international agreements);

- Commonwealth marine areas;
- Great Barrier Reef Marine Park;
- Nuclear actions (including uranium mines); and
- Water resources (that relate to coal seam gas development and large coal mining development).

The Act also protects the environment when actions are taken:

- On Commonwealth land or impact upon Commonwealth land;
- By an Australian Government agency anywhere in the world; and
- That impact Commonwealth heritage places overseas.

For the purposes of this report it is assumed that the MNES of listed threatened species and ecological communities is relevant. Other MNES may be relevant to other reports.

The EPBC provides protection for threatened species and ecological communities by:

- Identifying and listing of species and ecological communities as threatened;
- Developing conservation advice and recovery plans for listed species and ecological communities;
- Developing a register of critical habitat;
- Recognising key threatening processes;
- Where appropriate, reducing the impacts of these processes through threat abatement plans and non-statutory threat abatement advice; and by
- Requiring approval for certain actions or activities that will, or are likely to, have a significant impact on an MNES or other protected matter.

Listed threatened species relevant to the Study Area are detailed in the below table (Table 2-1).

2.1.2 EPBC ACT ENVIRONMENTAL OFFSET POLICY 2012

This policy outlines the Australian Government's approach to the use of environmental offsets ('offsets') under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

Offsets are defined as measures that compensate for the residual adverse impacts of an action on the environment. Where appropriate, offsets are considered during the assessment phase of an environmental impact assessment under the EPBC Act.

In identifying whether an activity will, or is likely to have, a significant residual impact, an administering agency may refer to:

- The Commonwealth Significant Impact Guidelines for what constitutes a significant residual impact on MNES (DoE, 2013).

Typically, environmental offsets delivered under the EPBC Act are required to be proponent driven, land-based offsets (known as direct offsets). Direct offsets of 90 percent are required. The policy is accompanied by the Offsets assessment guide (the guide). The guide has been developed in order to give effect to the requirements of the policy, utilising a balance sheet approach to estimate impacts and offsets for threatened species and ecological communities. The policy and guide provide a decision support framework in order to normalise the judgements associated with determination of proposed offsets for a given impact. The overarching test of both the policy and the guide is that suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the proposed action.

2.1.3 *ENVIRONMENTAL PROTECTION ACT 1994* (EP ACT)

The EP Act provides the legislative framework for ecologically sustainable development in Queensland. Its purpose is to protect Queensland's environment while allowing for development that improves the total quality of life, now and in the future, in a way that maintains the ecological processes on which life depends.

Section 319 of the EP Act defines the General Environmental Duty and states that a person must not carry out any activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm. Section 320 of the EP Act also includes a duty to notify, where a person is required to give notice where serious or material environmental harm is caused or there is a risk of such harm, and that harm is not authorised.

The mechanisms of the EP Act include to achieve its objectives include the General Environmental Duty, regulation of contaminated land, licencing of Environmentally Relevant Activities (ERAs) as outlined under Schedule 2 of the EP Regulation and issuing the Environmental Protection Policies (EPPs) and Regulations under the Act.

2.1.4 *ENVIRONMENTAL PROTECTION (WATER AND WETLAND BIODIVERSITY) POLICY 2019* (EPP (WWB)

The EPP (WWB provides for the achievement of the objectives of the EP Act in relation to Queensland waters. Environmental values for Queensland waters include the protection of aquatic ecosystems. The components of aquatic ecosystems to be protected are generally specified under the EPP (WWB) for a given waterway if water quality objectives have been listed under Schedule 1 of the EPP (WWB).

2.1.5 *NATURE CONSERVATION ACT 1992* (NC ACT)

The purpose of the NC Act is the conservation of nature while allowing for the involvement of indigenous people in the management of protected areas in which they have an interest under Aboriginal tradition or Island custom. The NC Act provides the framework for the declaration and management of protected areas, and the protection of wildlife listed under the Nature Conservation Regulation (Plants) 2020 and Nature Conservation Regulation (Animals) 2020.

The NC Act, section 71 describes the classes of wildlife to which the Act applies as:

protected wildlife, that is:

- Extinct wildlife;
- Extinct in the wild wildlife;
- Critically endangered wildlife;
- Endangered wildlife;
- Vulnerable wildlife;
- Near threatened wildlife;
- Least concern wildlife;
- International wildlife; and
- Prohibited wildlife.

2.1.6 NATURE CONSERVATION REGULATION (PLANTS) 2020 AND NATURE CONSERVATION REGULATION (ANIMALS) 2020

These NC Regulations prescribes the status of particular species in accordance with the categories set out in the Act. Listed threatened species relevant to the Study Area are detailed in the below table. It also discusses special least concern animals which are defined as:

- echidna (*Tachyglossus aculeatus*);
- platypus (*Ornithorhynchus anatinus*) – relevant to this study; and
- least concern birds.

It is an offence to 'take' protected wildlife without a license, permit or other authority (section 320), where take is defined in the NC Act. It is also an offence for a person, without a reasonable excuse, to tamper with an animal breeding place that is being used by a protected animal to incubate or rear the animal's offspring.

2.1.7 *FISHERIES ACT 1994*

The *Fisheries Act 1994* provides for the management and protection of fisheries resources, including regulating development that might impact declared fish habitat areas and fish passage. It regulates the taking and possession of specific fishes, removal of marine vegetation, the control of development in areas of fish habitat and listed noxious fish species.

The Fisheries Act establishes a risk hierarchy for waterway barrier works across Queensland and guides the design and assessment process for the implementation of new and altered waterway crossings. Development potentially impacting fish passage is either:

- Accepted development, where the design of infrastructure strictly conforms to the Department of Agriculture and Fisheries' (DAF) Accepted Development Requirements for Operational Work that is Constructing or Raising a Waterway Barrier Works (2017); or
- Assessable development, where the proposed development requires assessment by DAF and the design of the development is required to demonstrate compliance with the State Development Assessment Provisions (SDAP State code 18).

The Queensland Waterways for Waterway Barrier Works spatial data layer assists in the determination of whether the site of proposed waterway barrier works requires assessment and approval under the Act. Waterways have been colour coded to show the risk of adverse impact from in-stream barriers on fish movement and whether waterway barrier works can potentially proceed under the accepted development code or whether the works will require a development approval. Culverts, bridges, dams and other temporary or permanent waterway barrier works that cannot comply with accepted development requirements will result in waterway barrier works designs requiring approval from the DAF.

2.1.8 *ENVIRONMENTAL OFFSETS ACT 2014* (EO ACT) QUEENSLAND

The EO Act provides for environmental offsets to counterbalance significant residual impacts of activities on matters of state or local environmental significance (MSES, and MLES respectively) and establishes a framework in relation to environmental offsets. The EO Act defines a significant residual impact in Section 8 as an adverse impact, whether direct or indirect, of a prescribed activity on all or part of a prescribed environmental matter that:

- Remains, or will or is likely to remain, (whether temporarily or permanently) despite on-site mitigation measures for the prescribed activity; and
- Is, or will or is likely to be, significant.

In identifying whether an activity will, or is likely to have, a significant residual impact, an administering agency may refer to:

- The State guideline that provides guidance on what constitutes a significant residual impact for MSES (DES, 2014).

For State matters not gazetted under the EPBC Act and where a Project is deemed to have a SRI on MSES or MLES, an environmental offset is required in accordance with the Queensland *Environmental Offsets Act 2014* (EO Act). Environmental offsets under the EO Act can take various forms, including financial settlement offsets, proponent driven offsets or a combination of the two.

2.1.9 QUEENSLAND WATER ACT 2000

The Queensland Water Act 2000 provides for the sustainable management of water resources in Queensland, including requiring permits for works within watercourses and providing for the sustainable allocation of water for environmental purposes (i.e. environmental flows to protect ecological functions in rivers). Many of these functions are documented in Water Plans for a catchment, which include ecological outcomes and obligations for water licence holders or water scheme operators. For example, in relation to the Project, the Water Plan (Mary Basin) 2006 details how the water in the plan area is to be allocated and sustainably managed. They also include obligations on the infrastructure owner to undertaken monitoring to assess the performance of implemented management measures. This includes environmental matters such as threatened species.

2.1.10 BIOSECURITY ACT 2014

The purpose of the *Biosecurity Act 2014* (Qld) (Biosecurity Act) is to provide a framework for minimising and managing biosecurity risks in Queensland, ensure the safety of agricultural inputs, align responses to biosecurity events to national and international obligations, and manage risks associated with:

- Emerging, endemic and exotic pests and diseases that impact the built, social and natural environment;
- The transfer of diseases from animals to humans and vice versa; and
- Biological, chemical, and physical contaminants in carriers.

The Biosecurity Act establishes a General Biosecurity Obligation that requires all people in Queensland to be responsible for managing biosecurity risks that are under their control and that they know about or should reasonably be expected to know about. It also defines prohibited and restricted biosecurity matters and places. Prohibited matters are listed in Schedule 1 of the Biosecurity Act, and restricted matters are listed in Schedule 2.

Under the General Biosecurity Obligation, individuals and organisations who undertake activities that present a biosecurity risk must:

- Take all reasonable and practical measures to prevent or minimise the risk;
- Prevent or minimise the adverse effects on a biosecurity consideration;
- Minimise the likelihood of causing a biosecurity event, and limit the consequences of a biosecurity event; and
- Not do or omit to do something if it is known, or ought to reasonably be known, that this may exacerbate adverse effects.

Aquatic pests that are restricted biosecurity matters listed in Schedule 2 of the Act include:

- Various pathogens;
- Fish, including but not limited to eastern Gambusia (*Gambusia holbrooki*), carp (*Cyprinus carpio*) and tilapia (*Oreochromis mossambicus*);
- Aquatic plants, including but not limited to salvinia (*Salvinia molesta*), water hyacinth (*Eichhornia crassipes*), and cabomba (*Cabomba caroliniana*); and

- Other plants that are common weeds of riparian areas.

2.1.11 *BIOSECURITY REGULATION 2016* (QLD)

The *Biosecurity Regulation 2016* (Qld) prescribes the ways in which the General Biosecurity Obligation can be met to prevent or minimise a biosecurity risk, including measures to prevent or control the spread of biosecurity matter and maximum acceptable levels of contaminants in carriers.

2.1.12 WEEDS OF NATIONAL SIGNIFICANCE

Weeds of National Significance (WoNS) is a list of the most problematic plant species in Australia as determined by the federal government. Under the National Weeds Strategy, 32 introduced plants were identified as WoNS. Relevant to this investigation, those WoNS, include:

- salvinia (*Salvinia molesta);*
- cabomba (*Cabomba caroliniana*);
- hymenachne (*Hymenachne amplexicaulis*); and
- water hyacinth (*Eichhornia crassipes*).

2.1.13 LOCAL ENVIRONMENTAL SIGNIFICANCE

The study area is located in the Gympie Region Council (GRC). The Gympie Regional Council Planning Scheme 2013 includes elements on environmental management and conservation. The Study area, largely Borumba Dam and upstream areas of Yabba and Kingaham Creeks are located in the Environmental Management and Conservation Zone Code. The purpose of the zone is to provide for areas identified as supporting significant biological diversity and ecological integrity.

Environmental overlays are also mapped over the study area including Waterway Buffers and Conservation Significant Areas.

GRC Planning Scheme is yet to detail an environmental offset provision, though it is part of their environmental strategy for 2018-2023.

Table 2-1 Legislation relevant to aquatic ecology and the Project

Legislation	Environmental value	Notes
Matters of National Environmental Significance		
Environment Protection and Biodiversity Conservation Act 1999	National heritage places	No national heritage places are located within 50 km of the Study Area
	World heritage properties	No world heritage places are located within 50 km of the Study Area
	Wetlands of international significance	There are no Ramsar wetlands located within the Study Area, the closest Ramsar wetland is the Great Sandy Strait, which is located approximately 150 km downstream of Borumba Dam.
	Great Barrier Reef Marine Park	Mary River discharges 100 km south of the boundary of the Great Barrier Reef Marine Park. The Burnett-Mary is however regarded as a reef catchment (Queensland Government, 2018)
	Commonwealth marine waters	The Study Area and its surrounds are not located near any Commonwealth marine waters.
	Listed Threatened Species and Ecological Communities	Threatened species or species habitat are known within the Study Area. This includes white-throated snapping turtle, Mary River cod, Mary River turtle, and Australian lungfish. These species are discussed further in Section 4.1.11.
	Listed Migratory Communities	No listed aquatic migratory species are present within the Study Area. Migratory birds are not assessed in this aquatic ecology scope.
	A water resource, in relation to coal seam gas development and large coal mining development	Not relevant
Matters of State Environmental Significance from Schedule 2 of the Environmental Offset Regulation 2014		
Environmental Protection Act 1994	A wetland in a wetland protection area (WPA)	A single WPA wetland is situated along Mary River approximately 3 km upstream of the confluence with Yabba Creek (Figure 2-2), as it is upstream of the confluence it will not be affected by the Project.
	A wetland of high ecological significance (HES) shown on the map of Queensland wetland environmental values	There are HES wetlands mapped within the Study Area. These are HES wetlands attributing to Mary River itself, several tributaries of Yabba Creek, sections of Yabba Creek, and a single section of Kingaham and Sandy Creek (Figure 2-2).
	A wetland or watercourse in high ecological value (HEV) waters	There are no mapped HEV wetlands present within the Study Area. (Figure 2-2).
Regional Planning Interests Act 2014	A designated precinct in a strategic environmental area	The Study Area and surrounds do not traverse any mapped strategic environmental areas.
Nature Conservation Act 1992	A habitat for an animal that is critically endangered wildlife, endangered wildlife or vulnerable wildlife or a special least concern animal	Protected species or species habitat are known within the Study Area and its surrounds (Sections 4.1.10 and 4.1.11)
	A protected area	Protected areas are known to occur within the Study Area with sections of Conondale National Park (NP) being flooded by the Proposed FSL of Borumba Dam and subsequently becoming aquatic habitat (Figure 2-3). However, the current values will be discussed in the accompanying terrestrial ecology report.
Fisheries Act 1994	An area declared under the *Fisheries Act 1994* to be a fish habitat area	There are no fish habitat areas within the Study Area.

Legislation	Environmental value	Notes
	Any part of a waterway providing for passage of fish only if the construction, installation or modification of waterway barrier works carried out under an authority will limit the passage of fish along the waterway.	Waterways of major, high, moderate, and low levels providing for passage of fish are present within the Study Area (Figure 2-1), it is expected that the works carried out by the Project will limit the passage of fish along several waterways.
Other Relevant Legislation		
Environmental Protection (Water and Wetland Biodiversity) Policy 2019	The policy lists the EVs and WQOs for Queensland waters. These are a part of the legislation and therefore considered by planners and managers when making decisions about waters and/or water quality.	The policy has listed environmental values and water quality objectives for the Mary River Basin which do not include listings for biota. The environmental values and water quality objectives relevant to water quality are discussed in a separate water and sediment quality report. Relevant to this report we specifically discuss aquatic ecosystem values.
Environmental Offsets Act 2014	Aquatic MNES and MSES listed in Section 8 of the EO Act Environmental Offsets Regulation 2014, Schedule 2	There are aquatic MNES and MSES present with relevance to the Project including waterway barrier works. Potential offset requirements are discussed in Section 6.
Biosecurity Act 2014	Aquatic pest fauna and flora	Invasive aquatic flora and fauna are known to occur within the Study Area and surrounds (Sections 4.1.10 and 4.1.11, respectively).
Water Act 2000 **Water Plan Mary Basin 2006**	Flow regime: For Mary River, upstream of Mary River barrage pondage	13 (b)(i) Minimise changes to the low flow regime of the river
	Flow regime: For Mary River, upstream of Mary River barrage pondage	13 (b)(ii) Minimise changes to the hydraulic habitat requirements of species such as Mary River cod, Mary River turtle and lungfish
	Flow regime: For the Mary River Basin	11 (g) To support natural ecosystems by minimising changes to natural flow regimes

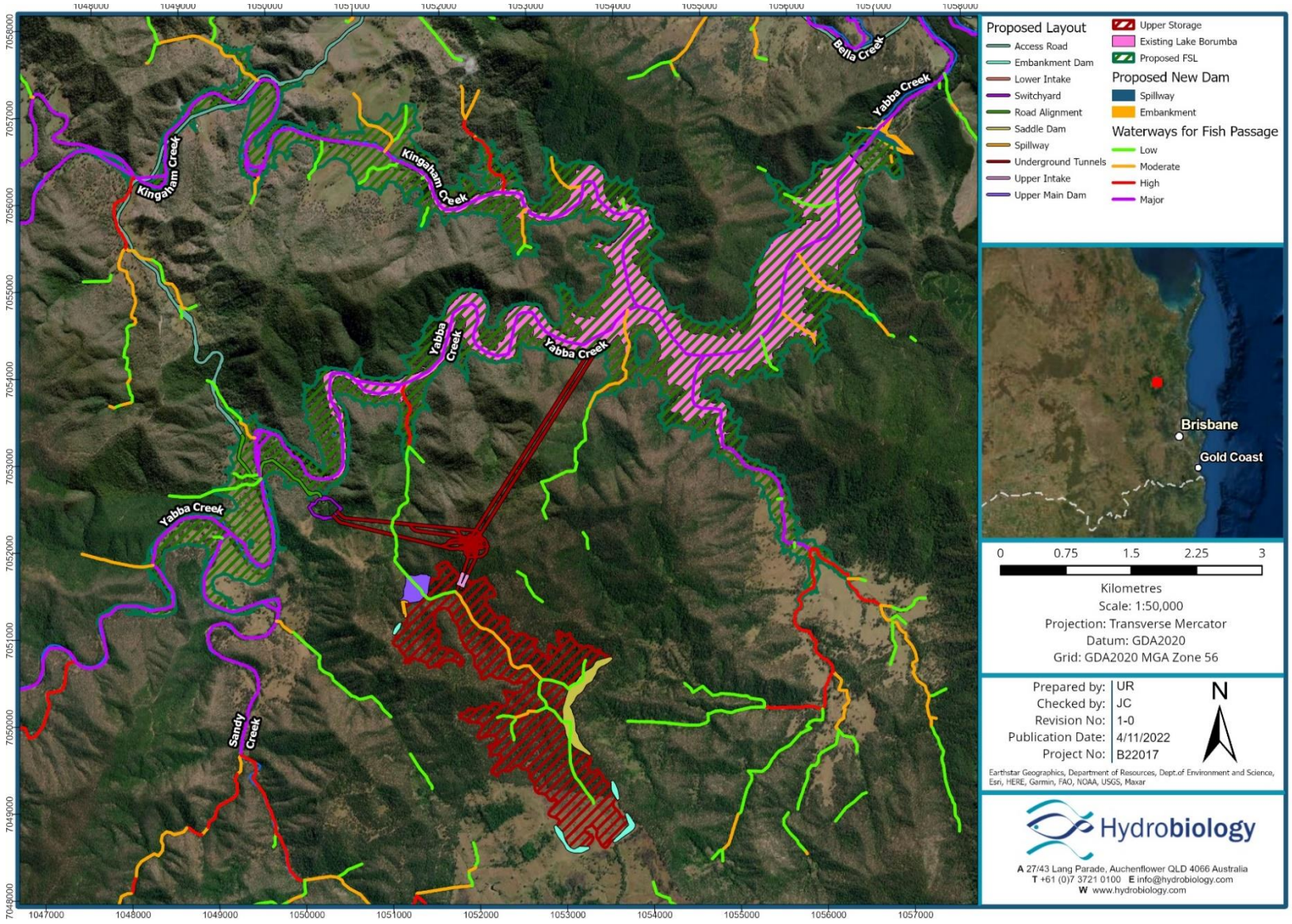


Figure 2-1 Waterways providing for fish passage within and surrounding the Study Area

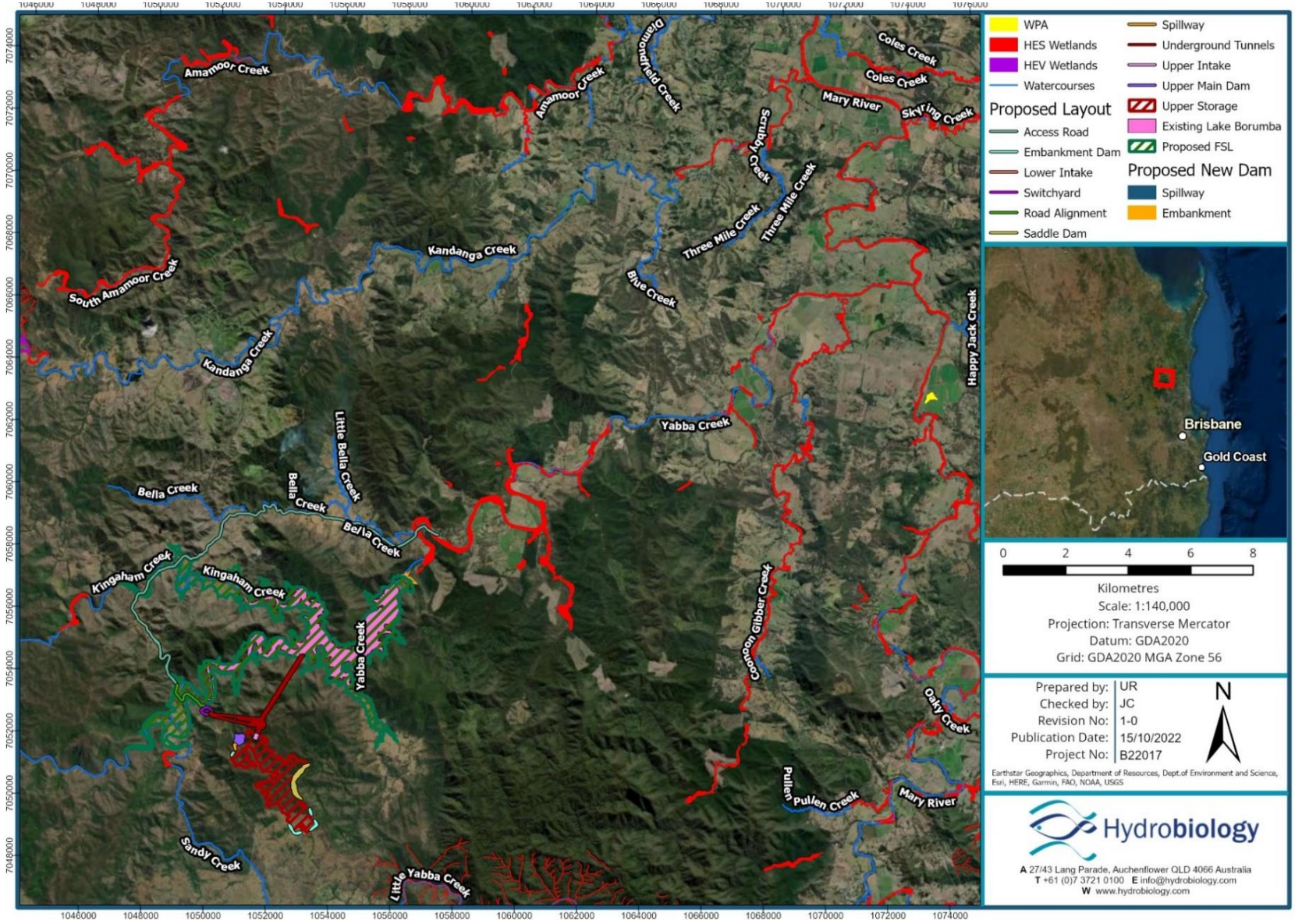


Figure 2-2 HES, HEV, and WPA wetlands within and surrounding the Study Area

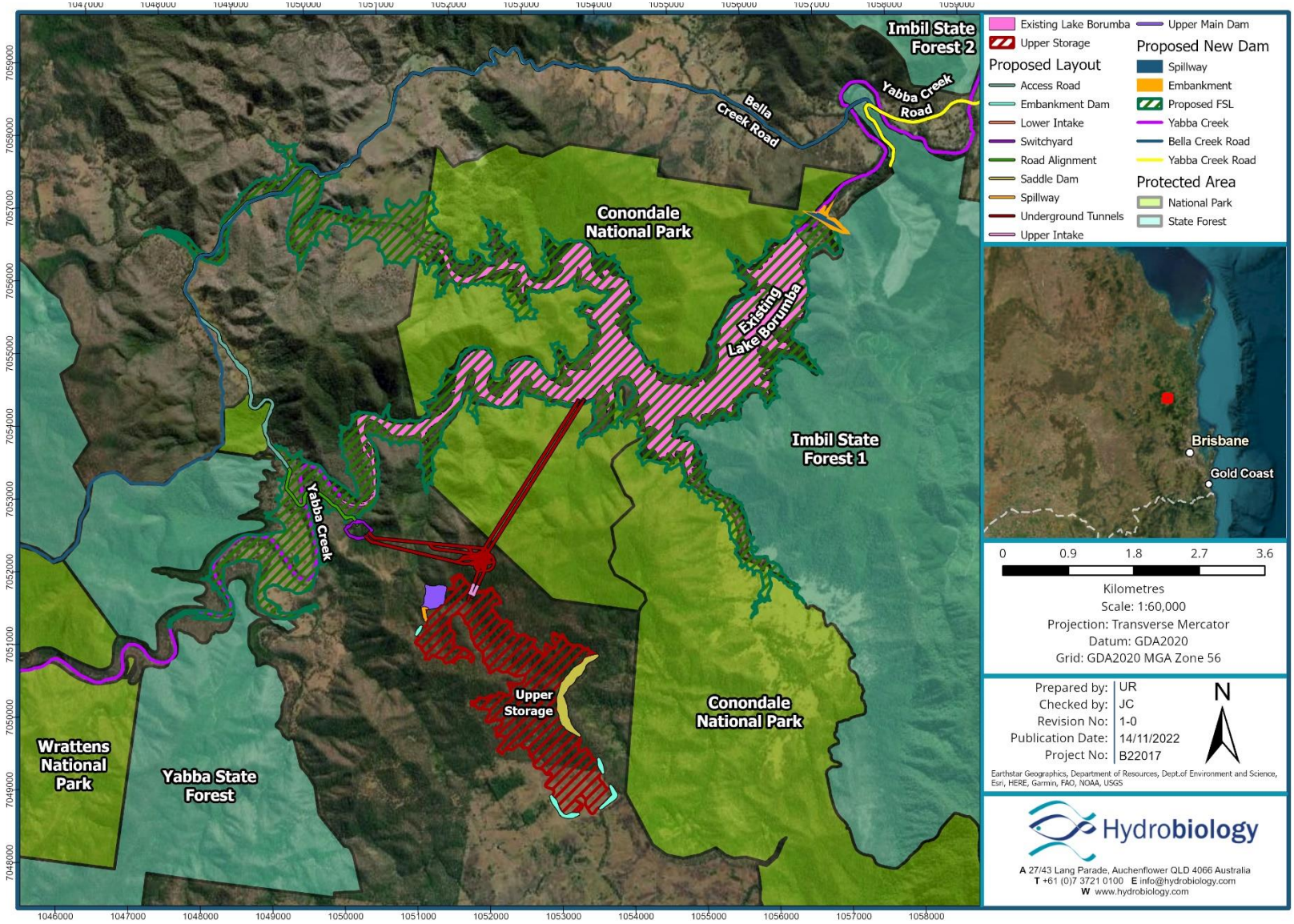


Figure 2-3 Protected areas of the Study Area bordering the Project infrastructure.

3. METHODOLOGY

3.1 DESKTOP ASSESSMENT

The aquatic ecological values were initially identified through review of regulatory instruments, which have identified the likely relevant MNES, MSES, MLES and biosecurity risks. In this section the mapping and databases associated with those relevant values is further investigated. The following were reviewed:

- SPRAT database;
- Wildlife online database;
- Atlas of living Australia database;
- Recovery plan for the various listed threatened species;
- Schedule 1 of EPP (WWB); and
- Resources such as the EPBC Act Protected Matters Search Tool, the Queensland Matters of State Environmental Significance Search Tool, were used to identify conservation significant species that occur or could occur in the Study Area from both the State and Federal government datasets.

Most of the available literature/data are associated with:

- Recovery plans/programs for threatened aquatic species and their habitats;
- Published scientific papers;
- Consultants' reports;
- Overview studies to support the Draft 2006 Mary River Water Resource Plan;
- Aerial photographs of the Study Area;

- Aquatic and riparian habitat surveys that were initially scoped to prioritise rehabilitation efforts;
- The Traveston Crossing Dam EIS and associated materials, which included lower Yabba Creek;
- River health monitoring programs, which include historical datasets for macroinvertebrates and water quality; and
- Compliance monitoring (largely water quality) and investigation datasets/reports including fish kill events at Lake Borumba.

The main focus of the literature review and gaps analysis was on data collected within the reaches likely to be affected directly by the proposed BPHP and specifically that of the aquatic ecological values within the Study Area.

In addition to online literature searches, consultation was undertaken with stakeholders including Mary River Catchment Coordinating Committee (MRCCC), Seqwater and Dr Col Limpus of the Threatened Species Unit at the Department of Environment and Science (DES). MRCCC is the primary catchment management authority for Mary River basin, while Dr Col Limpus is a subject matter expert concerning threatened turtles in Mary River Basin.

Information for the broader Mary River catchment and other impounded catchments in South East Queensland was also sought and referred to where appropriate.

Two classification schemes have been adapted from SKM (2007) to assess the quality and/or value of the existing information. These have both been applied as part of this study and the rating / coding systems for each are presented in Table 3-1 and Table 3-2.

Table 3-1 Data quality / value categories

Category	Description
1. Raw data (no interpretation)	1a. Data in basic original instrument format with no validation
	1b. Data extracted and archived in usable form following basic validation
2. Primary data source (Field-based observation study, non-experimental approach)	2a. Collection of field data undertaken to specifically describe onsite conditions (current-day).
	2b. Collection of field data undertaken to specifically describe onsite conditions (historical).
	2c. Collection of field data undertaken to describe conditions/values at broad spatial scales (e.g. whole of catchment), but also considered on-site conditions/values.
	2d. Collection of field data undertaken elsewhere outside the Study Area, but findings relevant to Study Area
3. Primary data source (Empirical, experimental approach used for impact definition)	3a. Direct measurements of impact under investigation undertaken within Study Area.
	3b. Direct measurements of impact under investigation undertaken elsewhere, but relevant to Study Area.

Category	Description
4. Primary data (Numerical modelling)	4a. Soundly established, but with limited or no validation
	4b. Validated as regionally sound
	4c. Validated against local Study Area data
5. Secondary data source (Review/synthesis of primary data sources)	5a. Considers Study Area.
	5b. Considers case studies undertaken elsewhere, but relevant to Study Area

Table 3-2 Data quality/quantity review definitions

Code	Description
1	Limited sampling effort in time (e.g. does not consider inter-annual or seasonal variations).
2	Limited sampling effort in space (e.g. inadequate replication at different spatial scales, or mismatch in spatial scale with issue under investigation).
3	Potential / likely inaccuracies in collected data (e.g. due to methods of data collection, reporting, etc.
4	Data/information not current (e.g. major changes in environmental conditions since survey undertaken) and the impact consensus has changed
5	Data current, robust sampling design (adequate replication in time and space), data likely to be accurate.

Table 3-3 Analysis of key literature sources utilised.

Key Literature	Reliability and Relevance to Study	Notes
Aquatic Habitat		
SKM, (2007) – Traveston Crossing Dam EIS	Data Quality/Value (Table 3-1) = 3a Data Quality/Quantity (Table 3-2) = 5	The aquatic component of the EIS was conducted by Hydrobiology. Surveys were undertaken in both Mary River and the lower extent of Yabba Creek with one located shortly after the confluence with Coonoon Gibber Ck, another directly upstream of Imbil Weir and another on both sides of Imbil Weir. Habitat mapping was undertaken via the following: • Aerial imagery analysis; • Helicopter flyover to "ground truth" imagery; • Habitat mapping via canoe to identify threatened species habitat; and • land based site inspections of Instream habitat features and matters relating to riverine geomorphology. This differed to the methods implemented in the current survey which incorporate the following: • Detailed threatened species likelihood of occurrence assessment; • Systematic habitat and condition assessments under the Australian River Assessment System: AusRivAS Physical Assessment Protocol and AusRivAS protocols for Queensland streams; • Side-scan sonar survey within Lake Borumba; and • Drone captured imagery. Surveying was also undertaken during the millennium drought which presented a different sampling environment in contrast to the present survey which was conducted following flooding.
DES, (2020) – Aquatic Conservation Assessment	Data Quality/Value (Table 3-1) = 1b Data Quality/Quantity (Table 3-2) = 3	The Aquatic Biodiversity Assessment and Mapping Method (AquaBAMM) is a comprehensive method that identifies relative wetland conservation values. Mapping outputs generated from expert opinion and workshops.

Key Literature	Reliability and Relevance to Study	Notes
		A variety of ecosystem criteria are used to form scores of aquatic habitats. With the following eight criteria being defined within AquaBAMM, including: • Naturalness – Aquatic; • Naturalness – Catchment; • Diversity and Richness; • Threatened Species and Ecosystems; • Priority Species and Ecosystems; • Special Features; • Connectivity; and • Representativeness. The method also weights the same scores to form the Back on Track Species Framework, which ranks conservation significant species prioritisation.
Stockwell, (2001) Mary River and Tributaries Rehabilitation Plan	Data Quality/Value (Table 3-1) = 2b Data Quality/Quantity (Table 3-2) = 4	Study conducted riparian reach assessments on Yabba Creek downstream of Borumba Dam and within Mary River. The data rank reaches of the aforementioned rivers in terms of riparian quality. The study also undertook reach rehabilitation prioritisation within Yabba Creek upstream of and including Lake Borumba. This mapping defined rehabilitation prioritisation rankings of each reach using measures developed in multiple sources of literature. These were undertaken via the use of a range of quantitative and semi-quantitative data from previous surveys with ground truthing undertaken where necessary.
Aquatic Flora		
SKM, (2007) – Traveston Crossing Dam EIS	Data Quality/Value (Table 3-1) = 3a Data Quality/Quantity (Table 3-2) = 5	The assessment of macrophytes was undertaken by rapid habitat mapping with two observers on a canoe traversing each reach. Site based quantitative surveys were undertaken at each site in which the following data were recorded:

Key Literature	Reliability and Relevance to Study	Notes
		• The presence/absence of all native and exotic aquatic macrophytes; • Total area covered by aquatic macrophytes at each site; • Total area covered by submerged, emergent and floating aquatic vegetation at each site; • % bed cover of any of the listed rare and threatened aquatic macrophyte species; • % bed cover of all noxious aquatic weeds; • % bed cover of all species with cover exceeding 10% of the area of each site (defined as the area of the channel); and • Characteristics of the site e.g. depth, substrate and morphology. The site based quantitative surveys were undertaken using the same methods used in the present survey. Surveys were undertaken at sites previously mentioned.
Mackay et al, (2003) - Spatial variation in the distribution and abundance of submersed macrophytes in an Australian subtropical river	Data Quality/Value (Table 3-1) = 2c Data Quality/Quantity (Table 3-2) = 2	A single site on Yabba Creek was sampled upstream of Imbil, with several others throughout the upper sub-basin. Macrophyte sampling was undertaken through 20-30 quadrats being implemented at each site measuring submersed macrophyte abundance as percentage cover of individual taxa per quadrat). This differs from the method undertaken in the current survey which used visual estimates of percent coverage. The study was also undertaken during the millennium drought in which hydrological and aquatic habitat conditions differed distinctly to that of the present survey's post flood conditions.
DES, (2013) – Wetland Info Database for the Upper Mary River Sub-basin	Data Quality/Value (Table 3-1) = 1b Data Quality/Quantity (Table 3-2) = 3	Database of macrophytes known to occur in the Upper Mary River sub-basin. Data are sourced from information submitted to the DES WildNet database. Data can be unreliable due to the nature of the database in which records are often submitted from a variety of independent sources with limited vetting and verification.
Macroinvertebrates		

Key Literature	Reliability and Relevance to Study	Notes
SKM, (2007) – Traveston Crossing Dam EIS	Data Quality/Value (Table 3-1) = 3a Data Quality/Quantity (Table 3-2) = 5	A comprehensive study of macroinvertebrates over two seasons within the Upper Mary River catchment. The methods implemented were as follows: • A standard macroinvertebrate net was used to sample edge habitat and bed/riffle habitat; • A surber sampler was used in edge habitats adjacent to deep pools; • Benthic fauna of deep pools and weirs were sampled using van Veen grab; and • Bait traps were used for larger crustaceans. The methods are similar to that of the present survey, however the latest survey used methods based upon DNRM (2001) AusRivAS protocols for Queensland streams and DES (2018) Monitoring and sampling manual. This contrasts to Quantitative sampling and semi-quantitative techniques used within the SKM (2007) survey. Surber samplers and baited box traps were not implemented in the current survey. The study was also undertaken during the millennium drought which differed to the present survey's conditions. Surveys were undertaken at sites previously mentioned The study offers investigations into the macroinvertebrates of the Study Area with comparisons of communities to other studies in similar catchments.
Connolly, (2003) – Appendix G: Aquatic Macroinvertebrates Mary Basin Draft Water Resource Plan: Environmental Conditions Report	Data Quality/Value (Table 3-1) = 5b Data Quality/Quantity (Table 3-2) = 4	Study was undertaken by a scientific panel comprising members of the Mary Basin Water Resource Plan Technical Advisory Panel. The study drew on baseline information compiled in the course of the WRP environmental investigations and was undertaken primarily as a desktop investigation. Unfortunately, the methodology was not provided in the appendix and as such cannot be discussed.
Macrocrustaceans		
Coughran et al., (2010) - *Tenuibranchiurus glypticus*, IUCN	Data Quality/Value (Table 3-1) = 5b	IUCN Redlist overview of the endangered *Tenuibranchiurus glypticus*. Provides an overview of the threats and basic ecology

Key Literature	Reliability and Relevance to Study	Notes
	Data Quality/Quantity (Table 3-2) = 5	and biology of a species with little literature from several subject matter experts in crustaceans.
Dawkins et al., (2010) Distribution and population genetics of the threatened freshwater crayfish genus *Tenuibranchiurus*	Data Quality/Value (Table 3-1) = 2d Data Quality/Quantity (Table 3-2) = 5	Investigation into the distribution of the species by a variety of subject matter experts. The study was undertaken throughout swamps outside of Mary River catchment.
Smith et al., (1998) Habitat Changes, Growth and Abundance of Juvenile Giant Spiny Crayfish, *Euastacus hystricosus* (Decapoda: Parastacidae), in the Conondale Ranges, South-east Queensland	Data Quality/Value (Table 3-1) = 3b Data Quality/Quantity (Table 3-2) = 1	Study occurring within Conondale National Park, south of the Study Area and adjacent to the Upper Catchment and Lake Borumba. The study characterised the habitat and relative abundance of the endangered *Euastacus hystricosus* within the Conondale ranges.
DES, (2013) – Wetland Info Database for the Upper Mary River Sub-catchment	Data Quality/Value (Table 3-1) = 1b Data Quality/Quantity (Table 3-2) = 3	Database of macrocrustaceans known to occur in the Upper Mary River sub-basin. Data are sourced from information submitted to the DES WildNet database. Data can be unreliable due to the nature of the database in which records are often submitted from a variety of independent sources with limited vetting and verification.
SKM, (2007) - Traveston Crossing Dam EIS	Data Quality/Value (Table 3-1) = 3a Data Quality/Quantity (Table 3-2) = 5	Related to the Traveston Crossing Dam EIS in Mary River. The aquatic component of the EIS was conducted by Hydrobiology. Surveys were undertaken at sites previously mentioned.
Fish (excluding EVNT)		
Allen, (1989) – Freshwater Fishes of Australia	Data Quality/Value (Table 3-1) = 5b Data Quality/Quantity (Table 3-2) = 4	The resource is a field guide to freshwater fishes of Australia offering a variety of information on species within Mary River Catchment.
DES, (2013) – Wetland Info Database for the Upper Mary River Sub-catchment	Data Quality/Value (Table 3-1) = 1b Data Quality/Quantity (Table 3-2) = 3	Database of fish known to occur in the Upper Mary River sub-basin. Data are sourced from information submitted to the DES WildNet database.

Key Literature	Reliability and Relevance to Study	Notes
		Data can be unreliable due to the nature of the database in which records are often submitted from a variety of independent sources with limited vetting and verification.
SKM, (2007) – Traveston Crossing Dam EIS	Data Quality/Value (Table 3-1) = 3a Data Quality/Quantity (Table 3-2) = 5	Related to the Traveston Crossing Dam EIS in Mary River. The aquatic component of the EIS was conducted by Hydrobiology. Fish sampling was based on a range of standard quantitative sampling methods, including: • Boat mounted electrofishing; • Backpack electrofishing; • Standard bait traps ; • Gill netting; • Seine netting; and • Fyke netting. The fish sampling also included non-standard sampling techniques: • Dip netting; • Scissor netting; and • Visual observations. The survey included a number of methods not implemented in the current survey. As described earlier, the survey was also undertaken during very dissimilar climate conditions. Surveys were undertaken at sites previously mentioned.
Kelly et al., (2004) Borumba Dam Remedial Works And Successful Relocation Of Fish And Turtles	Data Quality/Value (Table 3-1) = 2b Data Quality/Quantity (Table 3-2) = 2	A study documenting the species recorded in the spillway pool below Borumba Dam wall. The report documents several species of fish including both Mary River Cod and Lungfish below the dam wall, providing insights to what may be travelling upstream before being impeded by the dam wall and what may be traveling down the spillway.
Queensland freshwater fish stocking records (2009 to 2018) in Borumba Dam https://www.data.qld.gov.au/dataset/queensland-freshwater-fish-stocking-records	N/A	Queensland fish stocking records for Borumba Dam are provided until 2018 which indicates that Borumba Dam has been stocked by the Lake Borumba Fish Stocking Association. With Australian

Key Literature	Reliability and Relevance to Study	Notes
		bass, golden perch, Mary River cod and silver perch for both conservation and angling purposes.
Pusey et al., (2004) – Freshwater Fishes of North-Eastern Australia	Data Quality/Value (Table 3-1) = 5b Data Quality/Quantity (Table 3-2) = 4	Very well-known and established resource on freshwater fish of North-Eastern Australia. Provides an overview with some in depth detail on the ecology, systematics, and biogeography of fish present in the region. Including Mary River cod and lungfish. Information is outdated in some cases but still relevant.
Mary River Cod		
Simpson & Jackson, (1996) – Mary River Cod Research and Recovery Plan	Data Quality/Value (Table 3-1) = 5a Data Quality/Quantity (Table 3-2) = 4	Review and investigation of Mary River cod, listing habitat requirements and distribution of the species. The plan also details objectives and threats to Mary River cod including detailing conservation-based recommendations. Plan is outdated with updated research available. however, the listing advice for cod was updated in late 2016 and added little to this.
Simpson and Mapleston, (2002) -Movements and Habitat Use by the Endangered Australian Freshwater Mary River cod.	Data Quality/Value (Table 3-1) = 2c Data Quality/Quantity (Table 3-2) =2	The study was conducted on Mary River cod within Mary River, Tinana–Coondoo Creek and Six Mile Creek. Telemetry systems were used to track the movements and home range of the cod. In addition to classifying the instream habitats within the home range of the cod and then noting the habitat type utilised by them during tracking. The study can be used to determine cod home ranges and movement while also defining habitat usage.
Stocking of Mary River cod.	N/A	Mary River cod has been stocked within Lake Borumba from 1992 with an additional 1000 individuals being added in 2017/2018 bringing the total number to 5000 individuals stocked. A number of programs exist for the stocking of Mary River cod. Known hatcheries for Mary River cod include: • Lake Borumba Fish Stocking Association which maintains the overarching goal of "Stocking Borumba Dam with Australian

Key Literature	Reliability and Relevance to Study	Notes
		Native fish and to help bring Mary River Cod off the endangered species list"; • The Hanwood Fish Hatchery which has a history of stocking dams, rivers, and weirs in Queensland; and • The Gerry Cook Fish Hatchery which maintains a Mary River cod breeding and restocking program. However, the hatchery was closed as of February 2019 for the Lake Macdonald Dam Improvement Program (DIP). Discussions are reportedly underway for a reduced version of the breeding program to operate. Mary River cod captive breeding program has released fingerlings (from the Gerry Cook Fish Hatchery under direction from the Mary River Catchment Coordinating Committee) in approximately 85-90% of the species former range for conservation purposes, reportedly releasing over 500,000 fingerlings (MRCCC, 2018). The species has also been stocked for conservation purposes in the Stanley, Logan-Albert, Coomera, and Brisbane rivers including stocking for angling opportunities in Hinze, Maroon, Moogerah, Sommerset, Wivenhoe, Wyaralong, Ewen Maddock dams and Lake Samsonvale and Dwyer (Fisheries Queensland, 2020).
Pusey et al., (2004) – Freshwater Fishes of North-Eastern Australia	Data Quality/Value (Table 3-1) = 5b Data Quality/Quantity (Table 3-2) = 4	Discussed above.
Kennard, (2003) – Appendix H: Freshwater Fish, Mary Basin Draft Water Resource Plan: Environmental Conditions Report	Data Quality/Value (Table 3-1) = 5a Data Quality/Quantity (Table 3-2) = 2	Technical Advisory Panel report as noted above.
Simpson, (1994) – An investigation into the habitat preferences and population status of the endangered Mary River Cod (*Maccullochella peelii mariensis*) in Mary River systems, south-eastern Queensland	Data Quality/Value (Table 3-1) = 2c Data Quality/Quantity (Table 3-2) = 1	An investigation into the status of Mary River cod. Stream habitat data was collected across nearly 75 sites with habitat assemblages sampled at 52 of the sites. Study concluded that cod were extinct or nearly extinct throughout the catchment. Much of the habitat information in the study is superseded by Simpson and Mapleston (2002), with the study also having a limited temporal sampling effort.

Key Literature	Reliability and Relevance to Study	Notes
Dunlop, (2016) – Ecology of larval freshwater fish in Mary River system with a focus on the nationally threatened Mary River cod	Data Quality/Value (Table 3-1) = 2d Data Quality/Quantity (Table 3-2) = 2	An honours thesis undertaken within Mary River on larval freshwater fish. Located Cod larvae within the systems of Six Mile, Tinana, and Obi Obi Creeks , which indicated that spawning was occurring. It is not obvious if survey efforts occurred in the Study Area.
Fisheries Queensland, (2020) – Policy for fish stocking in Queensland	Data Quality/Value (Table 3-1) = 5b Data Quality/Quantity (Table 3-2) = 5	Details the stocking locations of Mary River cod and several other species. Restocking in areas within the species' current and former natural range (uncertain if it includes the Study Area). Mary River cod have also been stocked for conservation purposes into the Brisbane, Stanley, Logan-Albert and Coomera rivers, and to allow angling opportunities in the Hinze, Maroon, Moogerah, Wivenhoe, Somerset, Cressbrook, Wyaralong, and Ewen Maddock dams and lakes Dwyer and Samsonvale
Pickersgill, (1998) – Conserving and Rehabilitating Mary River cod Habitat: Mapping and Extension. Final Report (July 97 – July 98). Report to the World Wildlife Fund for Nature. Brisbane.	Data Quality/Value (Table 3-1) = 2c Data Quality/Quantity (Table 3-2) = 3	Mapping included the Study Area, having mapped Yabba Creek from the confluence to upstream of Borumba dam. Mapping was undertaken by volunteers through the use of a simple approach which included canoe or on foot surveys to determine simple features along a watercourse. Landholders were also invited to take part in surveys to disseminate cod habitat information. The age, data collected and the method by which it was undertaken adds little value to more recent surveys.
Australian Lungfish		
Kemp, (1981) Rearing of embryos and larvae of the Australian lungfish, *Neoceratodus forsteri*, under laboratory conditions	Data Quality/Value (Table 3-1) = 3b Data Quality/Quantity (Table 3-2) = 5	Defined suitable foods, conditions, etc. The conditions detailed offer insight into lungfish larvae at early stages.
Kind, (2002) Movement patterns and habitat use in the Queensland lungfish *Neoceratodus forsteri*	Data Quality/Value (Table 3-1) = 2d Data Quality/Quantity (Table 3-2) = 5	Report which focuses mainly on movements and habitat preferences of the Australian lungfish. Correlating the movements to instream habitat usage including habitats within the Study Area.

Key Literature	Reliability and Relevance to Study	Notes
Kemp, (2014) – Abnormal development in embryos and hatchlings of the Australian Lungfish, *Neoceratodus forsteri*, from two reservoirs in south-east Queensland	Data Quality/Value (Table 3-1) = 3b Data Quality/Quantity (Table 3-2) = 2	Lungfish eggs were collected from Lake Wivenhoe and Samsonvale and reared under lab conditions to assess for abnormal development or other anomalies in hatchlings and embryos from those reservoirs.
Arthington, (2009) – Australian lungfish, *Neoceratodus forsteri*, threatened by a new dam	Data Quality/Value (Table 3-1) =5b Data Quality/Quantity (Table 3-2) = 3	Report details the potential effects of the proposed Traveston Crossing Dam on the Australian lungfish. Several points such as habitat and feeding have since been disproven by the DAF (2016) – Lungfish and aquatic ecosystem monitoring., however many issues such as spawning still apply or have not been investigated. Other issues such as the presence of harmful exotics have not been observed in Lake Borumba.
Kemp, (1986) – The biology of the Australian Lungfish, *Neoceratodus forsteri*	Data Quality/Value (Table 3-1) = 5b Data Quality/Quantity (Table 3-2) = 4	Literature review on the biology of the Australian lungfish, includes many relevant unpublished sources on the ecology of the species though is very dated.
Australian Government, (2016) – Mary River Threatened Species Recovery Plan	Data Quality/Value (Table 3-1) = 5a Data Quality/Quantity (Table 3-2) =5	Review and investigation of the Australian lungfish, listing habitat requirements and distribution of the species. The plan also details objectives and threats to the species including detailing conservation-based recommendations. It is one of the most recent reviews of Australian lungfish literature. This recovery plan is yet to be adopted under the EPBC Act; however the Species Profile and Threats Database detailed by the DCCEEW requires that this recovery plan is used to assist regulatory considerations.
Brooks & Kind, (2002) – Ecology and demography of the Queensland lungfish (*Neoceratodus forsteri*) in the Burnett River, Queensland with reference to the impacts of Walla Weir and future water infrastructure development	Data Quality/Value (Table 3-1) = 3b Data Quality/Quantity (Table 3-2) = 5	Ecological study of the Australian Lungfish within the Burnett. The study is based upon impacts from the Walla Weir. Monitoring in this system was continued and reported by DAF (2016).
DAF, (2016) – Lungfish and aquatic ecosystem monitoring	Data Quality/Value (Table 3-1) = 3b Data Quality/Quantity (Table 3-2) = 5	The report provides 10 years of monitoring data in Paradise Dam and the Burnett River, producing directly relevant and recent

Key Literature	Reliability and Relevance to Study	Notes
		information on populations, movement, spawning habitat, the effects of dams on distribution, effectiveness of fishways for lungfish. The report underwent multiple independent reviews sponsored by the federal government and is considered to be reliable.
Turtles (excluding EVNT)		
DES, (2013) – Wetland Info Database for the Upper Mary River Sub-catchment	Data Quality/Value (Table 3-1) = 1b Data Quality/Quantity (Table 3-2) = 3	As discussed above
SKM, (2007) – Traveston Crossing Dam EIS	Data Quality/Value (Table 3-1) = 3a Data Quality/Quantity (Table 3-2) = 5	Related to the Traveston Crossing Dam EIS in Mary River. The aquatic component of the EIS was conducted by Hydrobiology. The Study included turtle survey methods of the following: • Baited cathedral traps; and • Observational snorkelling. While not specifically targeting turtles, various fish methods referred to above also incidentally captured turtles such as fyke nets. This is similar to the methods implemented in the latest survey with the exception of snorkelling which will be implemented in future surveys. Sites noted previously were surveyed.
Kelly et al., (2004) Borumba Dam Remedial Works And Successful Relocation Of Fish And Turtles	Data Quality/Value (Table 3-1) = 2b Data Quality/Quantity (Table 3-2) = 2	A study documenting the species recorded in the spillway pool below Borumba Dam wall. The report documents several species of turtle; however, it fails to provide abundance numbers or detail taxa recorded with the exception of describing *E. albagula and E. macrurus.* The study provides insights to what may be travelling upstream before being impeded by the dam wall and what may be traveling down the spillway.
Turtle Hatcheries	N/A	Existing turtle hatcheries operate for Mary River turtle, these appear to be operated by the Tiaro and District Landcare Inc.

Key Literature	Reliability and Relevance to Study	Notes
White-Throated Snapping Turtle		
Limpus et al., (2011) - The Biology and Management Strategies for Freshwater Turtles in the Fitzroy Catchment, with particular emphasis on *Elseya albagula* and *Rheodytes leukops*	Data Quality/Value (Table 3-1) = 5b Data Quality/Quantity (Table 3-2) = 4	The report provides relevant information on the nesting and movement of the species including commentary on impoundments . Dr Col Limpus of the Threatened Species Unit at the Department of Environment and Science (DES) is considered a subject matter expert on the species.
Hamann et al., (2007) - Management plan for the conservation of *Elseya* sp. [Burnett River] in the Burnett River Catchment	Data Quality/Value (Table 3-1) = 5b Data Quality/Quantity (Table 3-2) = 4	Comprehensive management plan for the white-throated snapping turtle in the Burnett River. Now technically superseded by the national recovery plan. Still remains a critical resource.
Schaffer et al., (2015) - Muddy waters: the influence of high suspended sediment concentration on the diving behaviour of a bimodally respiring freshwater turtle from north-eastern Australia	Data Quality/Value (Table 3-1) = 2d Data Quality/Quantity (Table 3-2) = 2	Provides information on links between habitat conditions and water quality in relation to the bimodally respiring *E. irwini.* While it is not *E. albagula,* the information provided can be used to infer some habitat requirements and the effects of increased turbidity on *E. albagula.*
Limpus, (2008) - Freshwater Turtles in Mary River: Review of biological data for turtles in Mary River, with emphasis on *Elusor macrurus* and *Elseya albagula*	Data Quality/Value (Table 3-1) = 5a Data Quality/Quantity (Table 3-2) = 4	Study collating and defining a range of information on turtles within Mary River Catchment. Predominately based on *Elusor macrurus* and *Elseya albagula.* The study offers ample discussion relating to impoundments and the turtles. Directly relevant to the proposed BPHP. The study makes several inferred and generalised claims relevant to the Study Area of the proposed BPHP which are unsupported by evidence. Many other statements are ambiguous with conclusions which relate to specific commentary on nesting and distribution being inconsistent with the information provided in graphics and maps. Some data has become superseded and that several of the conclusions made relating to impoundments also state the requirement for further research.
Collett, (2017) Understanding the environmental conditions that dictate the abundance and distribution of two	Data Quality/Value (Table 3-1) = 3a Data Quality/Quantity (Table 3-2) = 5	Study on the white-throated snapping turtle in Mary River, includes several records of the species used within this report.

Key Literature	Reliability and Relevance to Study	Notes
threatened freshwater turtles of South-East Queensland		
Connell, (2018) Freshwater turtle assemblages within the Mary River (Queensland Australia), with a focus on the population of the endangered *Elusor macrurus*	Data Quality/Value (Table 3-1) = 3b Data Quality/Quantity (Table 3-2) = 5	PhD thesis - Despite the focus of this study on the Mary River turtle, bycatch included white-throated snapping turtles. Analyses were also presented for this species. There is a single survey site within the Study area. The study provides a rigorous assessment on distribution by size class across the Mary River.
C, Limpus, personal communication, (2022)	N/A	Consultation with and Dr Col Limpus of the Threatened Species Unit at the Department of Environment and Science (DES). Providing updates on past literature regarding impoundments and turtles.
Commonwealth of Australia, (2020) - *National Recovery Plan for the White-throated Snapping Turtle* (Elseya albagula)	Data Quality/Value (Table 3-1) = 5b Data Quality/Quantity (Table 3-2) = 3	The official recovery plan for the species. The technical data in the core reference documents does not support many of the views put forward regarding impacts or threats associated with water resource development. The content of the plan is at times contradictory with comments regarding impacts of water infrastructure drawn from older data and then contradicted by later data.
Mary River Turtle		
Connell, (2018) Freshwater turtle assemblages within the Mary River (Queensland Australia), with a focus on the population of the endangered *Elusor macrurus*	Data Quality/Value (Table 3-1) = 3b Data Quality/Quantity (Table 3-2) = 5	As per the above.
Limpus, (2008) - Freshwater Turtles in Mary River: Review of biological data for turtles in Mary River, with emphasis on *Elusor macrurus* and *Elseya albagula*	Data Quality/Value (Table 3-1) = 5a Data Quality/Quantity (Table 3-2) = 4	See commentary in white-throated snapping turtle section.

Key Literature	Reliability and Relevance to Study	Notes
Collett, (2017) Understanding the environmental conditions that dictate the abundance and distribution of two threatened freshwater turtles of South-East Queensland	Data Quality/Value (Table 3-1) = 3a Data Quality/Quantity (Table 3-2) = 5	As above
Flakus, (2002) - The ecology of Mary River turtle, *Elusor macrurus*. M.Sc. thesis	Data Quality/Value (Table 3-1) = 2c Data Quality/Quantity (Table 3-2) = 4	A Master's thesis on Mary River turtle, while it is dated, it is still a key resource on the ecology relating to the species. However, some conclusions made have since been advanced or contradicted.
Australian Government, (2016) - Mary River Threatened Species Recovery Plan	Data Quality/Value (Table 3-1) = 5a Data Quality/Quantity (Table 3-2) =5	Acts a multi species recovery plan developed by Mary River Catchment Committee. The plan is not an official recovery plan under the EPBC act and has not been adopted by any government-based authority. Due to this the plan has only been used for Mary River turtle as the species currently lacks a recovery plan and in cases where other reputable sources of information are missing. The report presents few instances of new data, generally only building upon existing information which included a review and investigation of the Mary River turtle, listing habitat requirements and distribution of the species. The plan also details objectives and threats to the species including detailing conservation-based recommendations. It is one of the most recent reviews of Mary River turtle literature.
van Kampen et al., (2003) - Increasing the survivorship of Mary river turtle: Tiaro District of Southeast Queensland	Data Quality/Value (Table 3-1) = 3b Data Quality/Quantity (Table 3-2) = 2	Detailed assessment of Mary River turtle nesting in Mary River downstream of Myrtle Creek (downstream of the Study Area, near Antigua). Details predation of nests which is a major issue attributing to the decline of the species and investigates methods of increasing nest survivorship.
Platypus		

Key Literature	Reliability and Relevance to Study	Notes
Bino et al., (2019) - The platypus: evolutionary history, biology, and an uncertain future	Data Quality/Value (Table 3-1) = 5b Data Quality/Quantity (Table 3-2) = 5	Literature review on the platypus including biology and ecology. The report also outlines threats and conservation directions. Provides various information of platypus ecology which has been used in this report.
Grant, (2015) - Family Ornithorhynchidae (platypus) Handbook of the mammals of the world: marsupials and monotremes	Data Quality/Value (Table 3-1) = 5b Data Quality/Quantity (Table 3-2) = 5	Literature review on the platypus including biology and ecology. Provides various information of platypus ecology which has been used in this report.
Furlan et al., (2013) - Dispersal patterns and population structuring among platypuses, *Ornithorhynchus anatinus*, throughout south-eastern Australia	Data Quality/Value (Table 3-1) = 2d Data Quality/Quantity (Table 3-2) = 5	This study collected organic samples of platypus from a total of 752 individuals across NSW, Vic, and Tas in order to investigate dispersal patterns. The results of the study form a framework for the management of populations.
Serena et al., (2001) - Effect of food availability and habitat on the distribution of platypus	Data Quality/Value (Table 3-1) = 2d Data Quality/Quantity (Table 3-2) = 5	The study tracked individuals of platypus to determine the spatial distribution of platypus foraging activity in relation to habitat attributed or food present along a Victorian stream. The study found many relationships between platypus occurrence and activity across a variety of habitat variables.
Hawke et al., (2020) - A national assessment of the conservation status of the platypus	Data Quality/Value (Table 3-1) = 2d Data Quality/Quantity (Table 3-2) = 5	Key resource, being a thorough assessment of the conservation status of the platypus including range, ecology, biology, threats, and conservation actions. The study cites several reputable subject matter experts throughout.
Klamt et al., (2011) - Early response of the platypus to climate warming	Data Quality/Value (Table 3-1) = 2d Data Quality/Quantity (Table 3-2) = 5	Uses climatic modelling and platypus distribution records to study the effects of climate change on the platypus. This study contributes to threats identified in this report.
Microalgae		
Di Carvalho and Wickham, (2019) - Simulating eutrophication in a metacommunity landscape: An aquatic model ecosystem	Data Quality/Value (Table 3-1) = 2d Data Quality/Quantity (Table 3-2) = 5	The study simulated eutrophication and fragmentation in an experiment by using microalgae as primary producers and microplankton as grazers. The study revealed that nutrient supply combined with landscape factors supported a higher diversity of primary producers and grazers.

Key Literature	Reliability and Relevance to Study	Notes
General		
Atlas of Living Australia, (2022)	N/A	Provided locations of species records throughout Mary River Catchment. Several conservation significant records have altered (ALA altered) coordinates on small scales to protect known locations. Several recordings within this database include recordings from studies and WildNet. Duplicates were removed in this study.
WildNet, (2022)	N/A	Queensland government database providing locations of species records throughout Mary River Catchment. Data generally sourced from reporting. Several recordings within this database include recordings from studies and WildNet with duplicates being removed in this study.
Ecotone, (2007)	N/A	Data provided to SKM (2007) for Lungfish and Mary River cod mapping.
EPA, (unpublished)	N/A	Information sourced from the EPA, for Mary River turtle sightings much of the source information was unable to be verified.
Gatfield, (2022)	N/A	Incidental recording by Umwelt ecologist during BPHP terrestrial ecology surveys.
Connell, (2020)	N/A	Provided locations for Mary River turtle nesting. Data provided by MRCCC. Marilyn Connell is an established researcher focusing on freshwater turtles, with her PhD assessing the distribution of freshwater turtles in the Mary River.
Pickersgill (unpublished)	N/A	Datapoints of known cod holes much of the source information was unable to be verified.
Protected Matters Search Tool, (DCCEEW, 2022d)	N/A	This tool searches and reports matters protected under the EPBC Act by generating a list of protected matters that may occur in or near the Study Area. The tool uses known locations and modelled probability extents of EPBC listed matters.

Key Literature	Reliability and Relevance to Study	Notes
		The reported matters are not always confirmed with matters still potentially occurring within the Study Area and not being documented.
Matters of State Environmental Significance Reports (DES, 2022).	N/A	This tool searches Matters of State Environmental Significance (MSES) as referenced in the biodiversity state interest under the State Planning Policy (SPP). The reported matters are not always confirmed with matters still potentially occurring within the Study Area and not being documented.

This compilation has shown that there have been considerable aquatic ecological investigations across the wider Mary River catchment, though few investigations downstream of Lake Borumba along Yabba Creek, and relatively few investigations in Lake Borumba and the upstream extent of the proposed FSL, with no investigations within the proposed upper reservoir. There is no local information on platypus.

3.2 GAP ANALYSIS AND FIELD PLAN

Based on the desktop assessment, a field program was developed to confirm desktop findings and address identified knowledge gaps relevant to freshwater aquatic ecosystem values as defined in the Aquatic Ecology EIS guideline (DES, 2020). Table 3-4 defines the identified knowledge gaps and proposes suitable investigations to address these gaps.

Table 3-4 Identified gaps and means to address them.

Items	Comment on Gaps	Action	Method to address and/or Reference
Knowledge Gaps			
Habitat	• Outdated information on macro and microhabitat features or condition of aquatic habitats downstream of Borumba Dam in Yabba Creek and Mary River • Little/no data on macro and microhabitat features or condition of aquatic habitats within Lake Borumba, upstream of the FSL, and Proposed Upper Storage	• Undertake systematic habitat and condition assessments	• State of the Rivers • River Bioassessment • AUSRIVAS • Drone captured imagery • Side-scan sonar survey within Lake Borumba
Microalgae	• Little/no information on microalgae	• Undertake systematic microalgae surveys	• Undertake sampling as per QLD sampling manual for benthic microalgae sampling in shallow and deep waters
Aquatic flora	• Outdated species list and little locality specific data for aquatic macrophytes in the Study Area. • Little information/no data on the presence of macrophytes upstream of the FSL and Proposed Upper Storage. • Little understanding of macrophyte coverage and recruitment post flood events.	• Undertake systematic aquatic flora surveys	• Percentage cover and species identification surveys

Items	Comment on Gaps	Action	Method to address and/or Reference
Freshwater Turtles	• Outdated information on biota, downstream of Borumba Dam in Yabba Creek and Mary River • Little information/no data on these biota within Lake Borumba, Upstream of FSL and Proposed Upper Catchment	• Undertake systematic turtle surveys	• Undertake passive and active turtle surveys in accordance with the QLD sampling manual and threatened species survey guidelines
Freshwater Fish	• Outdated information on biota, downstream of Borumba Dam in Yabba Creek and Mary River • Little information/no data on these biota within Lake Borumba, Upstream of FSL and Proposed Upper Catchment	• Undertake systematic freshwater fish surveys	• Undertake passive and active freshwater fish surveys in accordance with the QLD sampling manual and threatened species survey guidelines • Length and weight ratios of fish • eDNA survey techniques
Macroinvertebrates and Macrocrustaceans	• Outdated information on macroinvertebrates and macrocrustaceans, downstream of Borumba Dam in Yabba Creek and Mary River. • Little information/no data on macroinvertebrates and macrocrustaceans within the Lake Borumba, Upstream of the FSL and Proposed Upper Catchment	• Undertake systematic surveys of macroinvertebrates and macrocrustaceans	• AUSRIVAS sampling • Undertake sampling of both bed & edge habitats • Undertake passive and active macrocrustacean surveys in accordance with the QLD sampling manual
Items of Aquatic Conservation Significance			
Conservation Significant Fauna	• Critically Endangered, Endangered, Vulnerable, and special least concern species known to occur within catchment of the Study Area. Knowledge of presence within Lake Borumba, Upstream of the FSL and Proposed Upper Catchment was limited. Presence throughout most of the Study Area downstream of Borumba Dam was confirmed but outdated	Undertake systematic aquatic fauna surveys and likelihood of assessment analysis based on collected habitat information.	• State and National survey guidelines for threatened species • eDNA survey techniques

3.3 SURVEY DESIGN AND SITE SELECTION

To address the identified gaps, a field survey was undertaken. During the fieldwork planning phase, potential sites within representative habitats and relevant localities were identified that appeared to be accessible. Specifically, the site locations (Table 3-6) were selected on the basis that they:

- Represented identified habitat variation within the Study Area (determined from aerial imagery and review, historical reports and State and Federal databases);
- Represented areas that would be directly and indirectly impacted by the Project (i.e. Lake Borumba, upstream of the proposed FSL, proposed upper reservoir, downstream of the dam, etc.);
- Represented key features in the Study Area such as Imbil weir;
- Included protected areas (i.e. high ecological significance areas (HES) (Figure 2-2);
- Included known habitats of threatened species;
- Could be readily accessed through existing infrastructure;
- Permitted the selected survey techniques to be carried out; and
- Could be safely sampled in prevailing water depths and velocities.

A total of 19 sites was selected and included:

- Sites within and on the watercourse downstream of the proposed upper reservoir;
- A total of 7 Sites within Lake Borumba;
- Sites along Yabba Creek including upstream of the current FSL and downstream of the dam;
- A site in Bella Creek, a tributary of Yabba Creek, downstream of the dam; and
- Sites within Mary River, including upstream and downstream from the confluence with Yabba Creek.

Sites were selected based on the then current version of the project layout. Since the field survey was undertaken a new version of the project layout has been released and the original intent of site locations to support later impact assessment has changed, though their purpose in describing the existing environment remains valid. A further breakdown of each site is detailed below in Table 3-5.

Table 3-5 Breakdown of sites sampled.

Site	Notes
S4	Representative of the existing environment of Kingaham Creek upstream of Lake Borumba. Located directly by a road crossing, both upstream and downstream of the crossing with bordering land used for cattle grazing. The site is a good example of the environment that will be inundated by the proposed raising of Borumba Dam FSL.
S3	Representative of the existing environment of Yabba Creek upstream of the existing Lake Borumba and the proposed FSL. The site is located directly by a road crossing, both upstream and downstream of the crossing with bordering land used for cattle grazing. The site is a good example of the environment that will be inundated by the proposed FSL.
S5	Representative of the existing environment of Yabba Creek further upstream of the existing Lake Borumba and the proposed FSL in a more montane like environment. The site is located adjacent to land used for cattle grazing. The site is a good indicator of the environment that will be inundated by the proposed FSL and also which will remain upstream of the proposed FSL.
S1	Representative of the existing environment downstream of the proposed Upper Reservoir. The site is located along an unnamed creek.
S2	Representative of the existing environment within the proposed Upper Reservoir. The site is located along an unnamed creek. The site is a good indicator of the species that are able to travel into and reside within the upper catchment area.
S6	Representative of the existing environment within the upper extent of Lake Borumba, where Yabba Creek discharges into the lake.
S7	Representative of the existing environment within the upper extent of Lake Borumba, where Kingaham Creek discharges into the lake.
S8	Representative of the existing environment within the upper extent of Lake Borumba, where Borumba Creek discharges into the lake.
S9	Representative of the existing environment of Borumba Creek, upstream of the existing Lake Borumba and the proposed FSL.
S10	Representative of the existing environment of the inner deeper sections of Lake Borumba close to the dam wall.
S11	Representative of the existing environment directly downstream of an unnamed creeks discharge into Lake Borumba The site provides knowledge of the species and aquatic conditions of smaller creeks that drain into Lake Borumba.
S12	Representative of the existing environment of Yabba Creek directly below the existing Borumba Dam spillway. The site will be inundated by the proposed new reservoir. The site is a good indicator of the existing environment of a site in the same location to the infrastructure relative to the proposed dam wall. This site will provide a good indication of species attempting to migrate upstream given its placement below a watercourse barrier.

Site	Notes
S13	Representative of the existing environment of Bella Creek which is the first unimpounded tributary of Yabba Creek downstream of Borumba Dam. Can serve as a control in future monitoring. The site is directly upstream of the confluence with Yabba Creek.
S14	Site is located downstream of Borumba Dam, between the town of Imbil and the Dam. The site was chosen to describe the existing environment of Yabba Creek between the barriers of Imbil Weir and Borumba Dam.
S15	Site is located within the weir pool of Imbil Weir, being directly upstream of the weir. It is adjacent the town of Imbil.
S16	Site is located directly below Imbil Weir. The site was chosen to describe the existing environment downstream of Imbil Weir following Yabba Creek Anabranch.
S17	Representative of the existing environment of Mary River upstream of the confluence with Yabba Creek, The site is to act as a control to influences from Yabba Creek.
S19	Representative of the existing environment of Mary River downstream of the confluence with Yabba Creek. The site is downstream of Borumba Dam and Imbil Weir. The site is also downstream of several large watercourses of the system being Kandanga, Skyring, and Coles Creek and the Seqwater pump station to Lake Macdonald.

Table 3-6 Site locations and assessed parameters during the June/July 2022 survey (datum: WGS84)

Site number	Area	Existing environment location	Impact location	Watercourse	Latitude	Longitude	Distance from Study Objective	Assessed Parameters
S4	Upstream of Lake Borumba	Kingaham Creek upstream of Lake Borumba	Within the proposed raised FSL	Kingaham Creek	-26.5085	152.4992	5.5 km upstream of Lake Borumba FSL	H, D, P, M, AV
S3		Yabba Creek upstream of proposed FSL	Within the proposed FSL	Yabba Creek	-26.5452	152.5020	3.5 km upstream of Lake Borumba FSL	H, P, M, AV
S5		Yabba Creek of Lake Borumba and within proposed raised FSL	Within the proposed FSL		-26.5392	152.5130	0.5 km upstream of Lake Borumba FSL	H, D, P, M, AV
S1	Proposed upper reservoir	Un-named small stream feeding into Lake Borumba	Downstream of proposed upper reservoir FSL	Unnamed Creek	-26.5480	152.5284	0.4 km downstream of the Proposed upper reservoir	H, P, M, AV
S2		Un-named small stream within proposed upper reservoir FSL	Within proposed upper reservoir FSL		-26.5601	152.5447	Within the Proposed upper reservoir	H, P, M, AV
S6	Lake Borumba	Existing water storage area	Within proposed water storage area	Lake Borumba	-26.5224	152.5438	Within Lake Borumba 5.4 km upstream from the dam wall.	H, D, P, M, AV
S7					-26.5085	152.5514	Within Lake Borumba 5.8 km upstream from the dam wall.	H, D, P, M, AV

Site number	Area	Existing environment location	Impact location	Watercourse	Latitude	Longitude	Distance from Study Objective	Assessed Parameters
S8					-26.5312	152.5626	Within Lake Borumba 3.6 km upstream from the dam wall.	H, D, P, M, AV
S10					-26.5219	152.5727	Within Lake Borumba 1.8 km upstream from the dam wall.	H, D, P, M, AV
S11					-26.5096	152.5730	Within Lake Borumba, 0.8 km upstream from the dam wall.	H, D, P, M, AV
S9				Borumba Creek	-26.5386	152.5700	Within tributary of Lake Borumba.	Could not access
S12	Downstream of Lake Borumba	Immediately downstream of dam	Within proposed FSL and near proposed Dam Wall	Yabba Creek	-26.5051	152.5829	0.2 km downstream of Borumba Dam	H, D, P, M, AV
S13	Control stream	Tributary of Yabba Creek downstream of dam	Tributary of Yabba Creek downstream of dam	Bella Creek	-26.4913	152.5876	0.1 km upstream of Yabba Creek confluence	H, D, P, M, AV
S14	Downstream of Lake Borumba	Downstream of dam	Downstream of Dam	Yabba Creek	-26.4736	152.6349	6.5 km downstream of Borumba Dam	H, D, P, M, AV
S15		Upstream of Imbil Weir within the weir pool			-26.4571	152.6847	11.5 km downstream of Borumba Dam	H, D, P, F, AV

Site number	Area	Existing environment location	Impact location	Watercourse	Latitude	Longitude	Distance from Study Objective	Assessed Parameters
S16		Immediately downstream of Imbil Weir			-26.4574	152.6864	12 km downstream of Borumba Dam	H, D, P, M, AV
S17	Control river	Upstream of Yabba Creek Confluence	Upstream of Yabba Creek Confluence	Mary River	-26.5129	152.7442	13 km upstream of Yabba Creek confluence	H, P, M, AV
S18	Downstream of Lake Borumba	Downstream of Yabba Creek Confluence	Downstream of Yabba Creek Confluence		-26.409	152.7316	19 km downstream of Lake Borumba and approximately 3.5 km downstream of Yabba Creek confluence	Could not access
S19		Downstream of Yabba Creek confluence	Downstream of Yabba Creek confluence		-26.3347	152.7048	28 km downstream of Lake Borumba and approximately 19.5 km downstream of Yabba Creek confluence	H, D, P, M, AV

H: Habitat; D: Drone; P: periphyton; M: Macroinvertebrates; AV: Aquatic vertebrates (fish, reptiles, and other aquatic vertebrates)

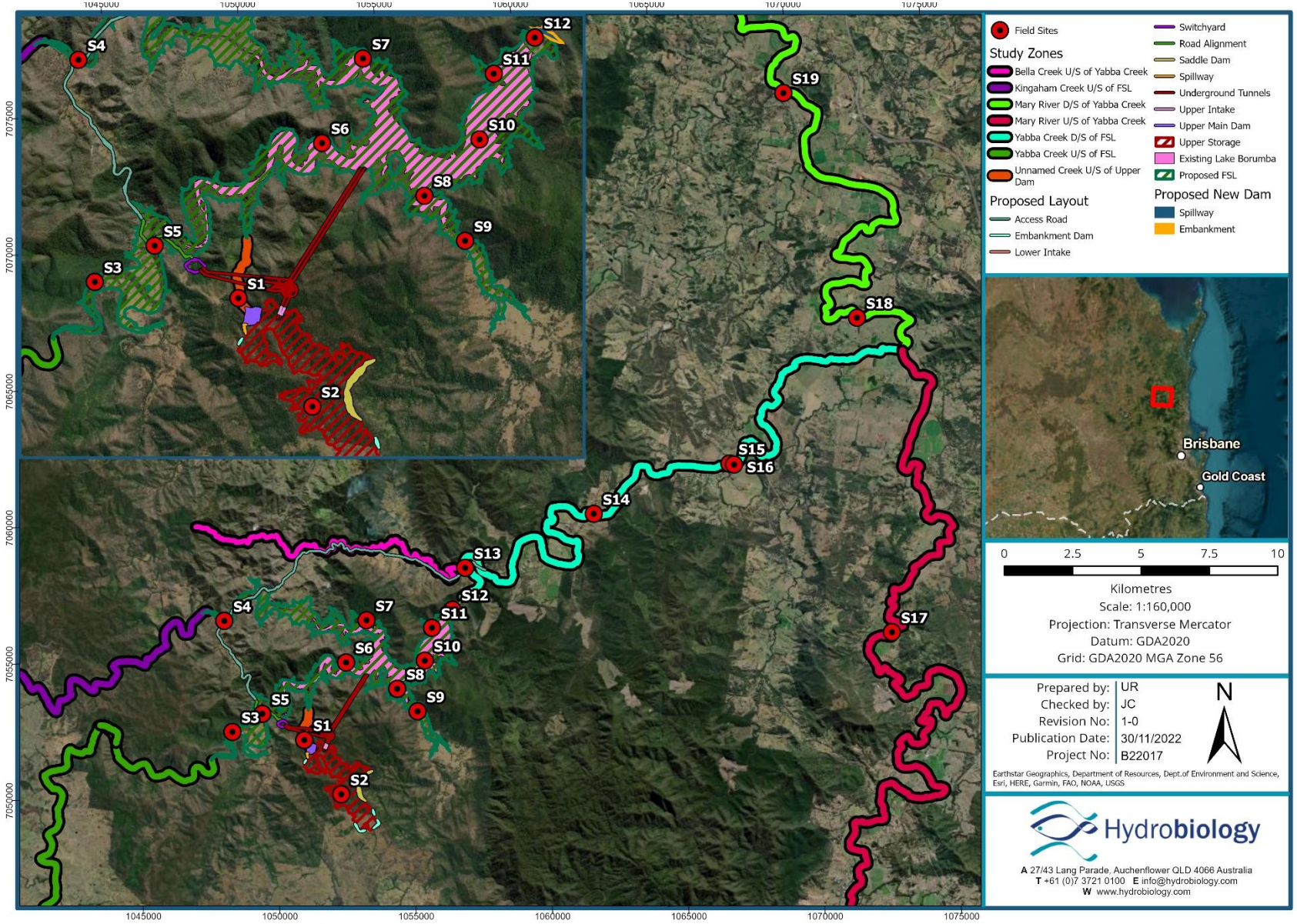


Figure 3-1 Zones within the Study Area and their respective sites.

3.4 FIELD SAMPLING METHODS

Aquatic ecological surveys were undertaken from 20 June to 3 July 2022. Overview of assessed parameters and implemented methods is detailed in Table 3-7. Method implementation is detailed in Appendix B.

The reporting and field sampling was undertaken and prepared by degree qualified ecologists with backgrounds in field ecology alongside sufficient expertise relevant to the issues of the project. The team also has relevant experience implementing the selected survey methods, consistent with State and National guidelines, as well as considerable expertise concerning the threatened species known or considered to possibly occur within the Study Area.

The team comprised:

- Dr. Ross Smith — Director — Technical Review
- Justin Cutajar — Principal Scientist — Field Studies and Reporting
- Joshua Hatton — Senior Scientist — Reporting
- Umair Rana — Scientist — Field Studies and Reporting
- Gracie Twidale — Scientist — Field Studies

Table 3-7 Sampling method breakdown and guidelines/subject matter advice guiding each method.

Species	Method	Guideline or Subject Matter Expert Advice
Fish		
Fish community in general including threatened species	eDNA Fyke netting Electrofishing	• DES (2018) – Monitoring and sampling manual • DSEWPC (2011a) – Survey guidelines for Australia's Threatened Fish • Guidance from subject matter experts at EnviroDNA, concerning eDNA sample collection and analysis
Turtles		
Turtle community in general including threatened species	Fyke netting Cathedral traps	• DSEWPC (2011b) – Survey guidelines for Australia's threatened reptiles • Advice from subject matter expert – Dr. Col Limpus (Chief Scientist at DES) • DES (2018) – Monitoring and sampling manual
Mammals		

Species	Method	Guideline or Subject Matter Expert Advice
Platypus	eDNA fyke netting Burrow searches	• DES (2018) – Monitoring and sampling manual • Lugg (2017) - Optimal survey designs for environmental DNA sampling • Guidance from subject matter experts at EnviroDNA, concerning eDNA sample collection and analysis
Habitat		
In-stream and Riparian Habitat	Systematic habitat and condition assessments Side-scan sonar survey within Lake Borumba Drone captured imagery	• Parsons et al., (2001) – Australian River Assessment System: AusRivAS Physical Assessment Protocol • DNRM (2001) – AusRivAS protocols for Queensland streams
Aquatic flora	Survey aquatic plants at each site and identify them to species level	• Use of available literature and taxonomic keys to assist with identification where required. • Cover estimate methods implemented as per DNRM (2001) – AusRivAS protocols for Queensland streams
Microalgae		
Microalgae	Surface sediment scrapes of biofilm in depositional microhabitats within watercourses Deep water benthic grab samples within Lake Borumba	• DES (2018) – Monitoring and Sampling manual for collecting microalage from shallow and deep waters.
Macroinvertebrates and Macrocrustaceans		
Macroinvertebrates and Macrocrustaceans	AusRivAS sampling of both bed & edge habitats in watercourse sites. Van veen grab collection within Lake Borumba. Passive and active macrocrustacean surveys through electrofishing, fyke netting, cathedral traps, and macroinvertebrate sampling.	• DNRM (2001) – AusRivAS protocols for Queensland streams • DES (2018) – Monitoring and sampling manual

3.5 SURVEY TIMING

Sampling was undertaken in late June – early July, primarily as a result of Mary River experiencing three peak discharges across the extended 2022 wet season (Figure 3-2). It represents a post-wet, winter sampling period. The current EIS survey guideline for aquatic ecological matters (DES, 2022) requires seasonal sampling to assess the full range of aquatic habitats and productivity. The current post-wet seasonal sampling is the first of two surveys that will be undertaken. The subsequent survey will be undertaken during the early/pre-wet survey window.

The protected turtle species known to occur within the Study Area have specific nesting and breeding periods, predominately occurring from July to December with the exception of the white-throated snapping turtle which nests during March to August (Table 3-8). The nesting and spawning periods coincide with the greatest movement extents. Additionally, turtles slow down substantially in winter with cooler waters and therefore trapping success may be reduced due to reduced movements. In general, surveys for reptiles should be conducted at times when the target species or communities are known to be active (i.e. during breeding and nesting) because periods of reptile activity are more likely to lead to capture success (for most species) (DSWPC, 2011b).

Many of the fish species, including threatened species known to occur in the Study Area are potamodromous, meaning that they complete their lives wholly in freshwater (Table 4-20) but do undertake migrations. The spawning activity of potamodromous species is usually highly related to flow regime. Meaning most species migrate from September to February during months of higher temperatures and rainfall with wet season conditions initiating migration and spawning. These periods are the peak movement times of fish and therefore their distributions are likely to be extended beyond what has been identified in the current survey. DESEWPC (2011), acknowledges the importance of timing surveys to coincide with migratory periods.

The DNRM (2001) AusRivAS protocols for Queensland streams requires a minimum of two sample sets in one year. These are sampled on a 'seasonal' basis from October - December (early wet - when flow has been established for at least four weeks) and May - July (late wet - recessional baseflows when flow has declined to a sampleable level, without significant flood peaks). The early wet samples are identified as Spring samples, the late wet as Autumn.

The method also states that sampling should not be conducted when streams are in flood unless the impact of flood is being investigated. If, during the scheduled sampling period, sites are consistently in flood, sampling should resume 4-6 weeks after floods have subsided.

As such, the optimal sampling time to capture the seasonal matters for threatened species and general fish communities i would be during the months of October to December. With the AusRivAS period for late wet (May – July) being met with the present survey occurring within 4-6 weeks after floods had subsided.

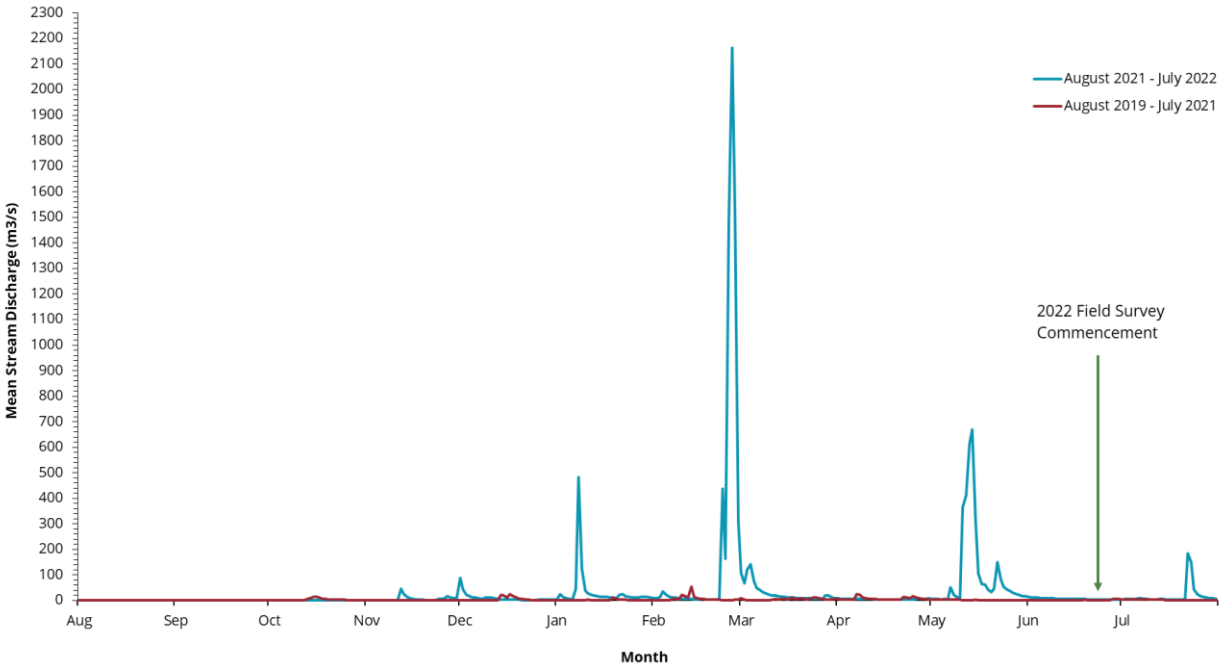


Figure 3-2 Average daily peak discharge within Mary River upstream of the Study Area, (Moy Pocket station (138111A) (DNRM, 2022).

Table 3-8 Known spawning/nesting periods of aquatic protected species known to occur within the Study Area (Pusey et al., 2004; Limpus, 2008; Grant, 2015).

Species	Common name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Neoceratodus forsteri	Australian lungfish							■	■	■	■	■	■
Maccullochella mariensis	Mary River cod									■	■	■	
Elseya albagula	White-throated snapping turtle			■	■	■	■	■	■				
Elusor macrurus	Mary River turtle										■	■	■
Ornithorhynchus anatinus	Platypus							■	■	■	■	■	

3.6 SURVEY LIMITATIONS

Prevailing flow conditions (flow speeds >1 m/s) and water depths (up to 2.5 m) limited backpack electrofishing efforts and the placement of passive sampling gear at some watercourse sites. In these areas, electrofishing and net deployment was in some cases restricted to areas of riffles close to the bank, bank undercuts, areas of log/branch accumulations and any small backwater habitat. Water flow conditions also constrained snorkelling survey efforts for turtles.

This report presents the survey results for a single seasonal survey. The survey was undertaken in winter which doesn't correspond with key movement periods of local threatened fishes and turtles as described previously in Section 3.5.

The survey did not include targeted surveys for conservation significant crayfish that could possibly occur in the Study Area.

A lack of access due to landowner restrictions and hazardous routes resulted in a failure to reach two sites.

The recent flooding significantly altered the catchment and the Study Area. This has resulted in the data being unrepresentative of what could be considered average or low flow conditions, though it does represent a post-flood period and floods are not uncommon in the catchment.

3.7 IMPACT ASSESSMENT AND MITIGATION

As defined by SMEC, the impact significance assessment is detailed in Table 3-9 and Table 3-10, which considered both unmitigated/raw significance and mitigated/residual significance, respectively. At this stage, the impact assessment is preliminary and high level. This will be updated through the EIS process.

Table 3-9 Unmitigated significance assessment criteria provided by SMEC

Issue Significance	Criteria
Positive	Expected to improve environmental, resulting in benefits for ecological communities Expected to generate socio-economic opportunities/benefits resulting in an improvement to the wellbeing of the affected stakeholder group(s).
Minor	Unlikely to be a significant issue for the project, the community, or the environment Associated risks/potential impacts (if any) can be managed through typical established industry practices Minimal (if any) design modification required to address.
Moderate	May be a significant issue in some circumstances Associated risks/potential impacts can be managed through a combination of established industry practices, and some targeted mitigation May require minor modification of design to address.
Major	Expected to be a significant issue for the project, the community, or the environment Associated risks/potential impacts can only be managed through targeted, bespoke mitigation measures Likely to require some modification of design to address.
Critical	Potentially insurmountable issue Associated risks/potential impacts cannot be feasibly addressed through application of mitigation measures Requires a substantial re-design of one or more project elements to address.

Table 3-10 Residual significance assessment criteria provided by SMEC

Issue Significance	Criteria
Positive	Proposed measures to enhance potential benefits and opportunities are considered appropriate The project will continue to investigate additional opportunities to enhance potential benefits and opportunities through future stages of design.
Minor	Proposed measures are considered appropriate to mitigate the associated risks/potential impacts to an acceptable degree These measures may be further refined as development of the project progresses, however no further re-design is likely to be required.
Moderate	Proposed measures are expected to reduce the risk/potential impact, but further mitigation may still be required Additional measures, which may include minor modification of design, will need to be identified as development of the project progresses Environmental offsets or other compensation for residual impacts may be required.
Major	Proposed measures are not sufficient to mitigate the associated risk/potential impact to an acceptable degree Additional measures, including further modification of design, are likely to be required as development of the project progresses Environmental offsets or other compensation for residual impacts are likely to be required.
Critical	Proposed measures are clearly insufficient to mitigate the risk/potential impact to an acceptable degree Substantial re-design of one or more fundamental project elements should be prioritised as development of the project progresses Extensive environmental offsets or other compensation for residual impacts required Requires amendment to government policy or statutory instruments in order for the project to progress.

4. EXISTING ENVIRONMENT

4.1 BASED ON HISTORIC INFORMATION

4.1.1 BASIN AND SUB-CATCHMENTS

The Study Area is located within Mary River basin, specifically within the Upper Mary River drainage sub-basin which includes the following sub-catchments under the Water Plan (Mary Basin) 2006:

- Upper Mary River (sub-catchment area B);
- Mid Mary River including Eel Creek (sub-catchment area O); and
- Yabba Creek (sub-catchment area C).

The proposed BPHP is located within the Yabba Creek sub-catchment which is designated as Priority Area 1 under Mary Valley Water Supply scheme within the Water Plan alongside the Mid Mary River sub-catchment. The Upper Mary River sub-catchment is designated within Priority Area 2 (Queensland Government, 2006; DES, 2013a). Both levels of delineation are illustrated in Figure 4-1. This delineation is relevant to the aquatic ecology report as several datasets and previous literature separate results according to upper and lower delineations of the Mary River.

Mary River basin is located within South-East Queensland on the Sunshine Coast, inland from the coastal Maroochy River and Noosa River catchments. It flows in a north easterly direction to its mouth at Hervey Bay in the Great Sandy Strait region. Mary River catchment has an area of approximately 9,595 km^2 and the river is approximately 300 km long (Brizga et al., 2003) (Figure 4-1). The upstream catchment area of Borumba Dam is 460.2 km^2 (Jacobs, 2014) with an approximate total of 608.4 km of DAF watercourses upstream of Lake Borumba.

The Study Area also includes a number of watercourses within the Upper Mary River sub-basin (Figure 4-2).

YABBA CREEK

Yabba Creek flows in an easterly direction into Lake Borumba and continues downstream of Borumba Dam in an easterly direction before discharging into Mary River. With respect to the Study Area, it is split between two sections, "Downstream of Borumba Dam" and "Upstream of Lake Borumba". Yabba Creek downstream of Borumba Dam is stream order 6 with an approximate length of 31 km. Lake Borumba currently inundates approximately 7.5 km of Yabba Creek. Yabba Creek directly upstream of Lake Borumba is a stream order 5 with an approximate length of 48 km. Yabba Creek begins at an elevation of 522 m near Jimna before ending at 65.4 m.

Imbil Weir is a concrete weir on Yabba Creek directly downstream of the town of Imbil (approximately 10 km downstream of Borumba dam). The weir maintains a storage of 46 ML with a FSL of 77.17 AHD. It inundates approximately 2 km of Yabba Creek. An anabranch is present on Yabba Creek beginning directly upstream of the weir and concluding directly downstream of the weir. The weir maintains no separate spillway or outlet works with surplus water discharging over the full width of the crest of the weir (Queensland Government, 2011).

KINGAHAM CREEK

Kingaham Creek flows parallel to Yabba Creek in an easterly direction into Lake Borumba. Kingaham Creek has a stream order of 5 where it enters the lake. The creek has an approximate length of 30 km, beginning at an elevation of approximately 580 m and ending at 135 m when it enters the lake, dropping by approximately 45 m over the duration of the watercourse.

BORUMBA CREEK

Borumba Creek flows in a north westerly direction into Lake Borumba. Borumba Creek has a stream order of 4 prior to discharging into Lake Borumba. The creek has an approximate length of 6 km, beginning at an elevation of approximately 350 m and ending at 135 m, dropping by approximately 215 m over the duration of the watercourse.

BELLA CREEK

Bella Creek flows in an easterly direction before discharging into Yabba Creek approximately 2.3 km downstream from Borumba dam. The creek has an approximate length of 14 km, beginning at an elevation of approximately 450 m and ending at 110 m, dropping by approximately 340 m over the duration of the watercourse.

UNNAMED CREEKS OF THE PROPOSED UPPER STORAGE CATCHMENT

The Unnamed creeks within the Proposed Upper Storage catchment join to drain into the current Lake Borumba. Due to their high elevation of approximately 485 - 493 m which drain into the current FSL at an elevation of 135 m the creeks are considered to be representative of a montane environment with low stream orders of 1 and 2.

MARY RIVER

Mary River flows in a north easterly direction before discharging into the Sandy Strait region. Mary River is a large and wide river with a stream order of 7 after the confluence with Yabba Creek. The river has a length of 291 km, beginning at Boorooein at an elevation of approximately 209 m and

ending east of Maryborough at 0 m, dropping by approximately 209 m over the duration of the watercourse.

LAKE BORUMBA AND BORUMBA DAM

Lake Borumba is situated approximately 31 km upstream of the confluence between Yabba Creek and Mary River. The lake is an impounded reservoir formed by Borumba Dam which impounds approximately 7.5 km of Yabba Creek. The Lake is mainly fed by 3 key systems being Yabba Creek, Kingaham Creek, and Borumba Creek (Figure 4-2).

Borumba Dam has a storage capacity at FSL; 135 m AHD of 46,000 ML and a total surface area of 482 ha alongside a maximum depth of 30 m and an average depth of 6.6 m. It has a spillway length of 101 m and discharge capacity of 3861 m^3/s (seqwater, 2022).

The water stored within the lake is used to supply raw drinking water and irrigation to the Mary Valley Water Supply Scheme (seqwater, 2022). The dam does not incorporate any fish passage devices with no multi-level off-take (it is bottom release) or destratifier.

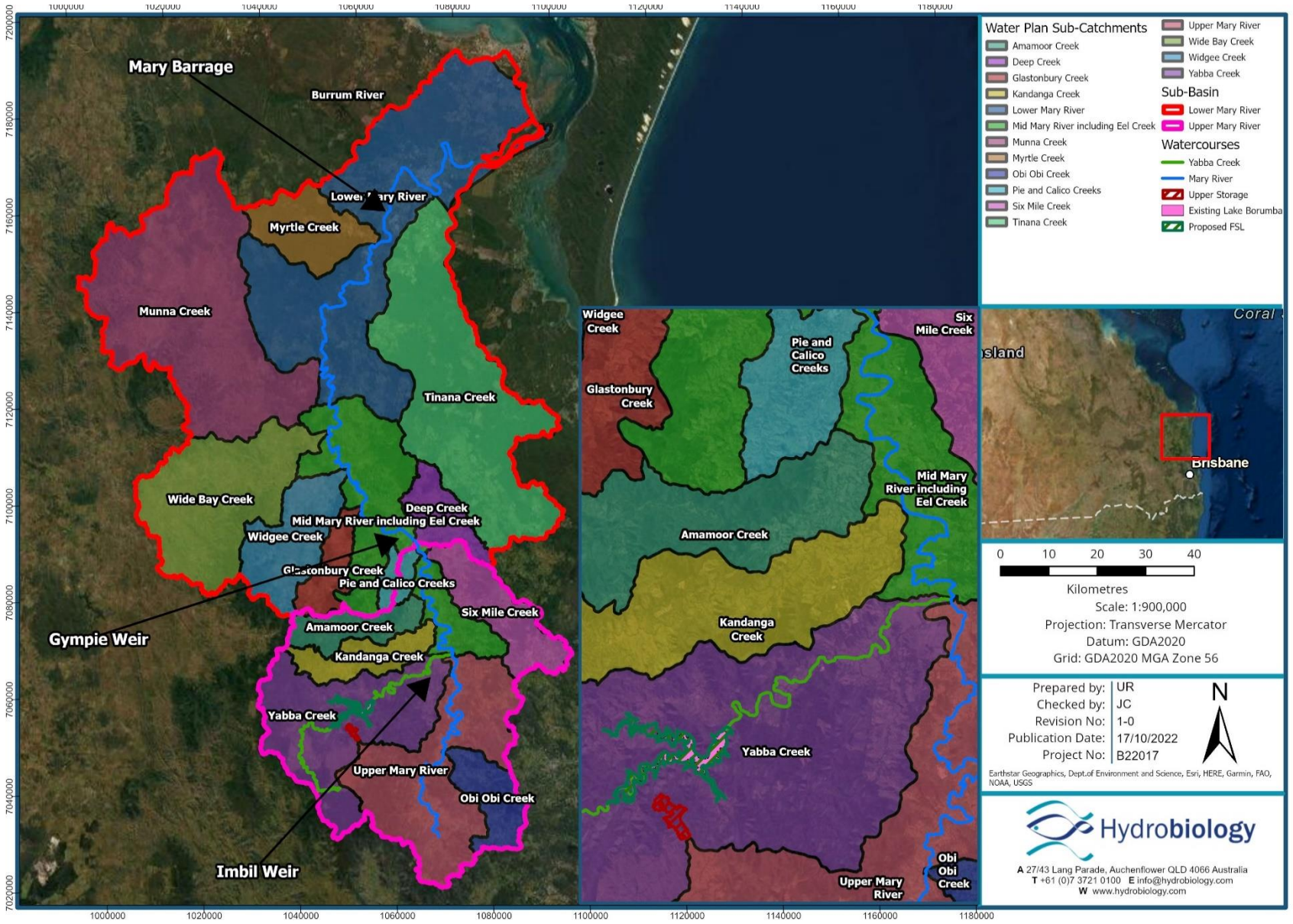


Figure 4-1 Mary River Basin and its associated sub-catchments

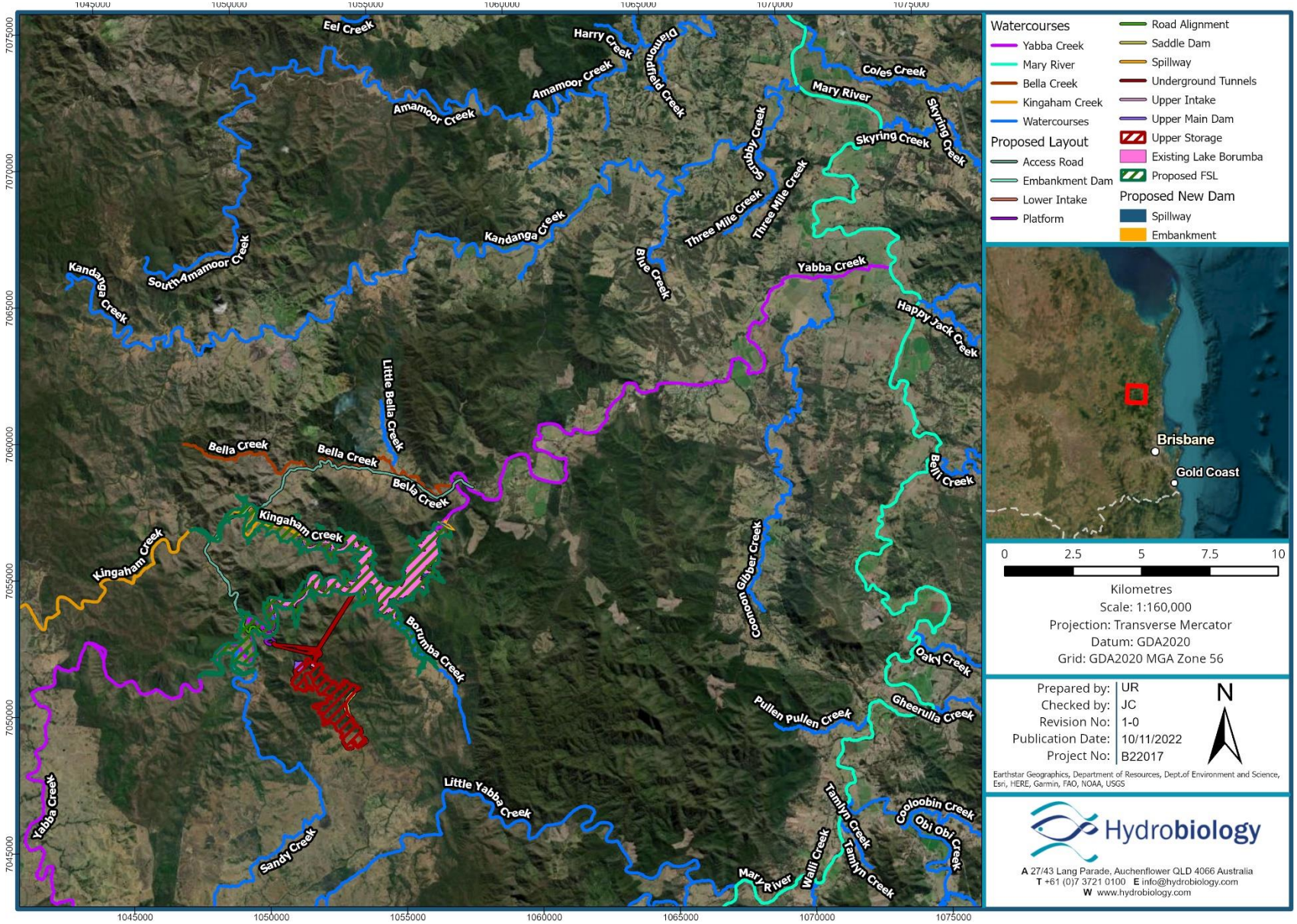


Figure 4-2 Watercourses and waterbodies within the Study Area. Not displaying minor stream orders (secondary streams).

4.1.2 CLIMATE

The Study Area lies within the Gympie region which is characterised as a humid subtropical climate with distinctive wet and dry seasons. The wet season occurs between the months of November and March. During the wet season, the region typically experiences hot and humid summers with heavy rainfall often account for approximately 55% of the annual rainfall. The dry season from May to November is generally cooler with less humidity and rainfall gradually decreasing until its lowest in August before increasing in rainfall towards the wet season.

. During typical summer periods, average maximum monthly temperatures can reach over 31°C while average monthly minimum temperatures can reach less than 7°C in winter (Figure 4-3).

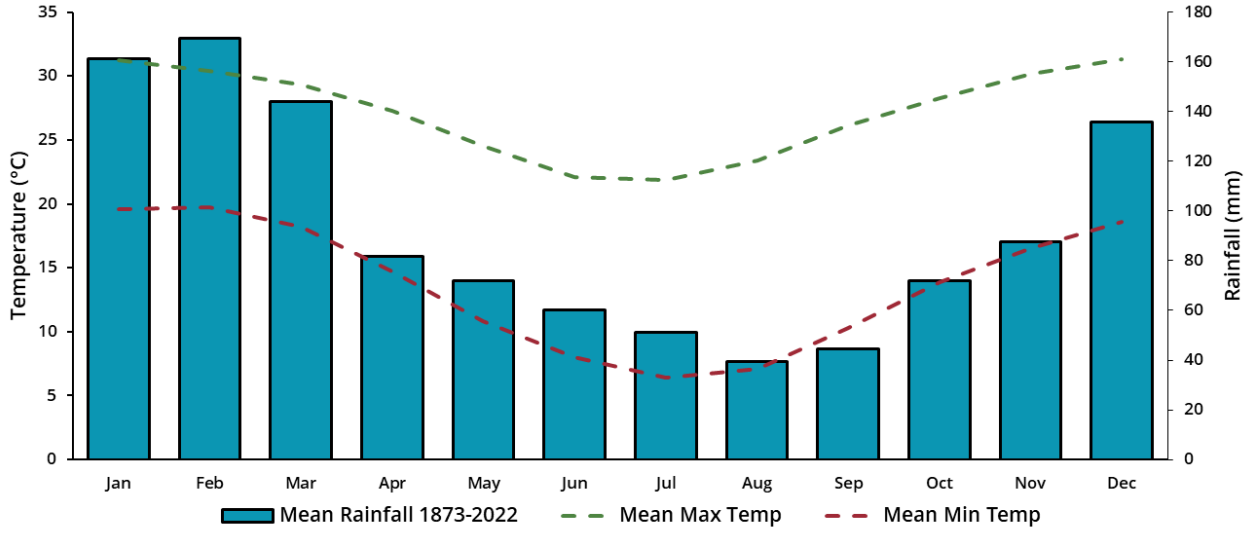


Figure 4-3 Average monthly climate statistics, sourced from Gympie Station (#40093) and Imbil Post Office Station (40099). Historical data inclusive from 1873 to present.

4.1.3 LAND USE

The watercourses and waterbodies within the Study Area and surrounds are located in a variety of landscapes both modified and natural, with cropping, grazing on native vegetation, plantation and production forestry, residential, natural, nature conservation, and Lake Borumba being the major land uses (Figure 4-4). Upstream of Lake Borumba, land use is comprised of 39% plantation forestry, 36% grazing and 22% nature conservation.

The land uses upstream of the natural areas which border Lake Borumba is comprised predominately of agricultural land which has undergone clearing for cattle grazing on modified pastures. The riparian zones of this area can generally be described as being limited or bare throughout the area due to clearing.

The proposed Upper Reservoir is located mostly within Powerlink owned reserve/freehold land being located, within relatively natural environments, specifically, grazing on native vegetation. The southern extent of the Upper Reservoir is cleared, and grazing land uses predominate.

Land uses surrounding Yabba Creek downstream of the dam are mixed, generally being dominated by plantation forests such as Imbil State Forest (forestry and cattle grazing uses), residential areas and farm infrastructure, grazing on irrigated modified pastures, grazing on native vegetation, and to a lesser degree intensive animal production, recreation and culture, and cropping.

The reach of Mary River within the Study Area is dominated by grazing on native vegetation and irrigated modified pastures, residential and farm infrastructure, and to a lesser degree of cropping, mining in the form of quarries, plantation forestry, and intensive animal production.

Forestry within Imbil State Forest is comprised of hoop pine (*Araucaria cunninghamii*) plantations which are periodically logged (clear felled) in blocks.

Relevant to the Study Area are the towns of Imbil and Jimna. Imbil is located approximately 10 km downstream of Borumba Dam along Yabba Creek with treated sewage being discharged by Imbil Sewage Treatment Plant onto land which are likely irrigation areas. Jimna is a small town located approximately 25 km upstream of Lake Borumba, along Yabba Creek. Sewage disposal is unknown but could be considered likely to be septic tanks and trenches.

Many of the modified land use types within the area can have significant impacts on the stability of the waterways, in-stream water quality and aquatic biota communities (Schmutzer et al., 2008) which has been taken into consideration for this assessment.

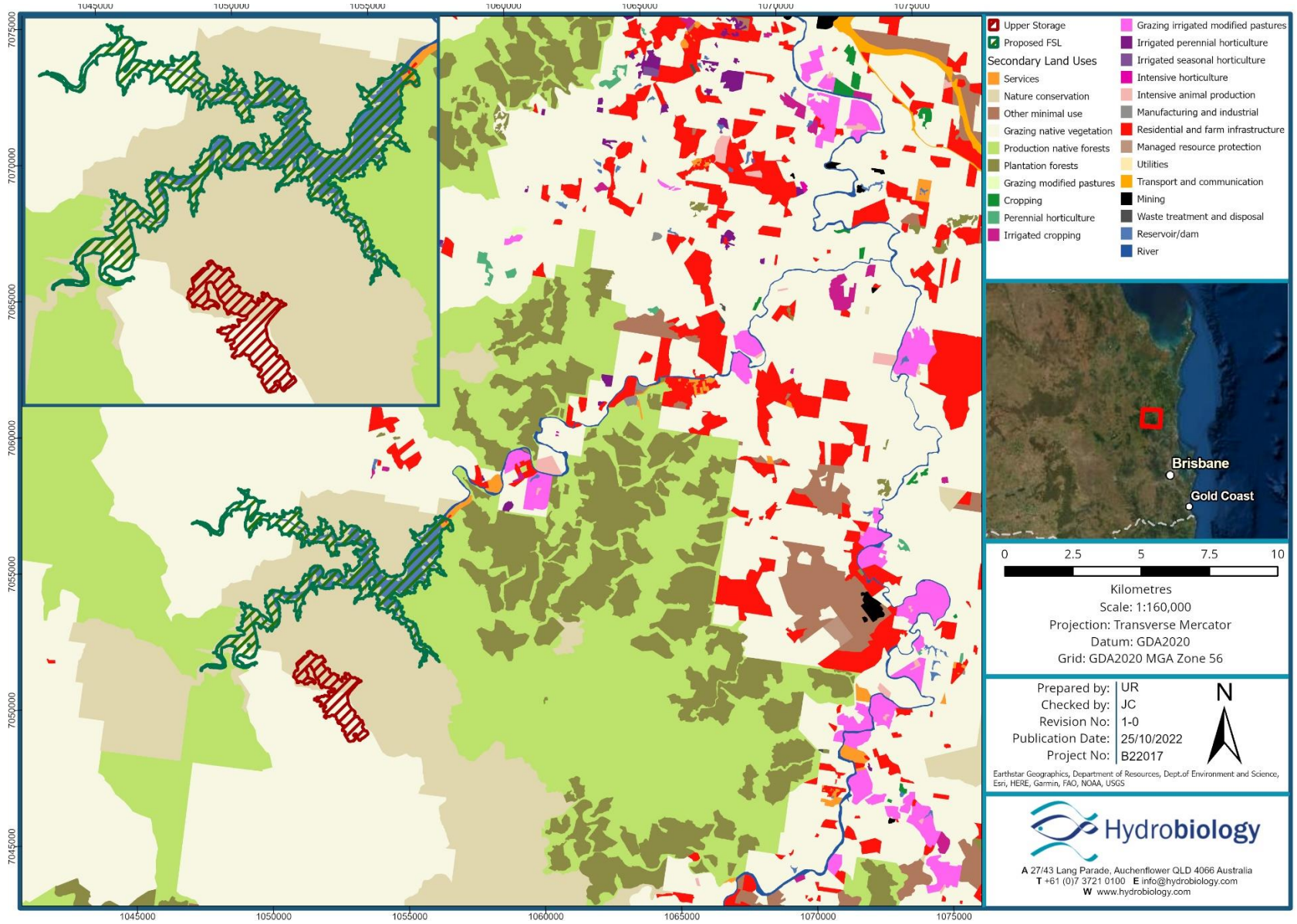


Figure 4-4 Land use of the Study Area

4.1.4 HYDROLOGY

Analysis of aerial imagery describes a catchment beginning in a constrained mountainous environment of heavy vegetation and thin streams. Downstream of Borumba Dam and Bella Creek the valley gradually changes into an alluvial plain. This is especially evident at Imbil which has undergone extensive clearing of forested areas and riparian zones of watercourses to support farming. Following from Imbil Weir, large meanders begin with an anabranch connecting Yabba Creek to both sides of Imbil Weir. Evidence of avulsion is present downstream of the weir, likely exacerbated by the weir itself because of its fixed broad crest with a narrow flow section.

Mary River is highly seasonal with approximately 70% of annual flow occurring between November and April. Water permanency within the Upper Mary River Catchment appears to be maintained year long. An analysis of historical aerial imagery within Mary River in the Study Area reveals a flowing bank to bank river in the wet season with the river gradually shifting to a series of pools and riffles in the dry season. Discharge data from the gauging station within, Moy Pocket (138111A) situated along Mary River, displayed in Figure 4-5 illustrates the three peak discharge events across the 2022 wet season with the March discharge event in particular resulting in widespread flooding throughout the Study Area. The high flows from this event may have modified the existing environment of the Study Area prior to our survey. The discharge data for 2022 in contrast with data from 1963 to 2022 can be used to display the significance of the flow events across the entire monitoring period (Figure 4-6).

Available data for the hydrology of Yabba Creek downstream of Borumba Dam links to three stations available from BOM (2022). The Borumba Dam Headwater storage (Figure 4-7) includes recent data which shows the level of water stored in Lake Borumba. The steep increase in 1999 reflects the FSL of the storage being raised to its current level. The storage level appears to be commonly maintained near FSL by regular inflows with short bursts above that level reflecting floods (the flood immediately after raising had nearly 5 m depth of water going over the spillway) and longer periods of drawdown during drought (the millennium drought in 2002-2004 saw the lake water level drop by nearly 14 m).

The Borumba Dam tailwater gauge (Figure 4-8), monitors the water level of Yabba Creek directly downstream from the dam. Continuous monitoring from 2007 to 2022 is available with 4 peaks in stream level being identified, in 2012, 2013, 2015, and 2022. General observation links these peaks with higher rainfall which indicates that the heightened stream levels were likely as a result of uncontrolled discharge from a spilling Borumba Dam. During periods where peaks are not observed it is evident that water levels are maintained by outlet releases. Releases from Borumba Dam to service downstream allocation holders show that Yabba Creek rarely dries out.

A station is present in Imbil along Yabba Creek (Figure 4-9) with a period of record from 1929 to 1972. The hydrology of the system appears to have generally been yearlong annual base flows, with flow decreasing substantially to a trickle in years of drought.

Similar to Mary River, water permanence within Yabba Creek appears to be maintained yearlong with large pools being observed both below the dam wall and further downstream near Imbil throughout the year, including during extended dry periods.

Hydrological information on other systems within the Study Area, particularly upstream of Lake Borumba, Kingaham Creek and Bella Creek do not exist (i.e. there are no gauging stations).

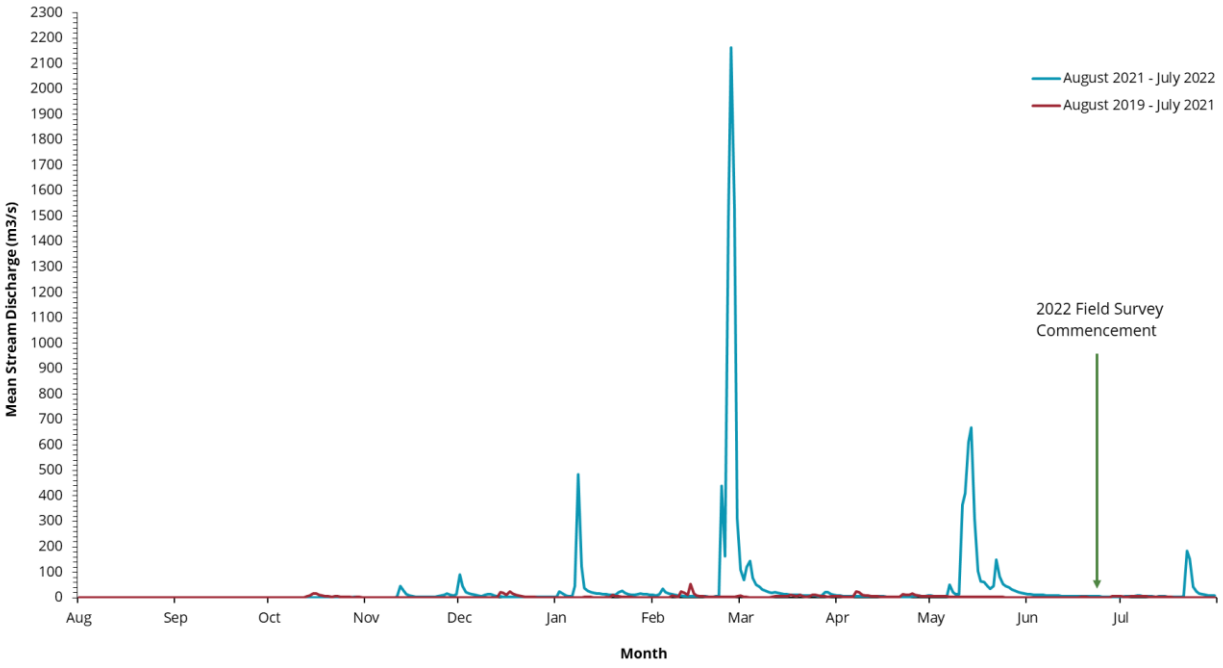


Figure 4-5 Average monthly discharge statistics within Mary River upstream of Yabba Creek, (Moy Pocket station (138111A) (DNRM, 2022).

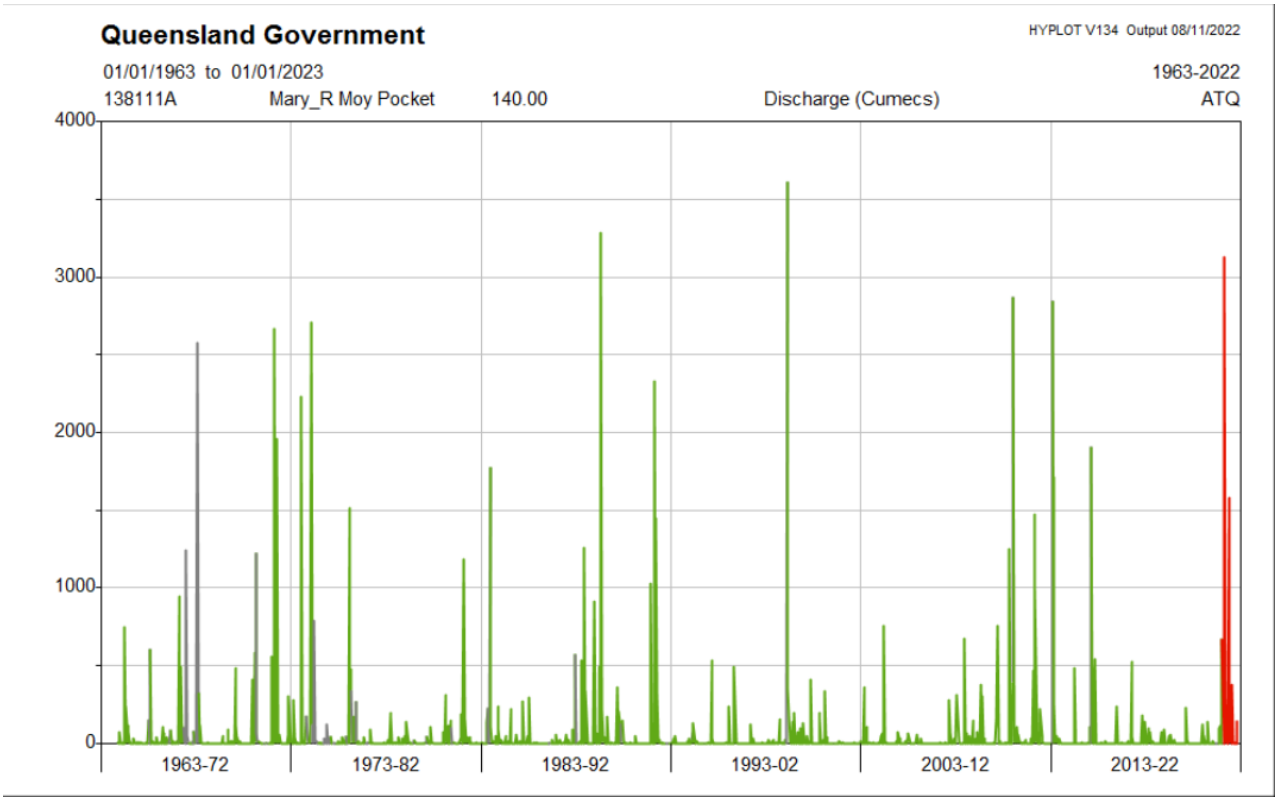


Figure 4-6 Total monthly discharge statistics from 1963 - 2022 within Mary River upstream of Yabba Creek, data from 2022 is signified by the red colouration (Moy Pocket station (138111A) (DNRM, 2022).



Figure 4-7 Daily mean Borumba Dam headwater storage level statistics from 1965-2022 (138112A).

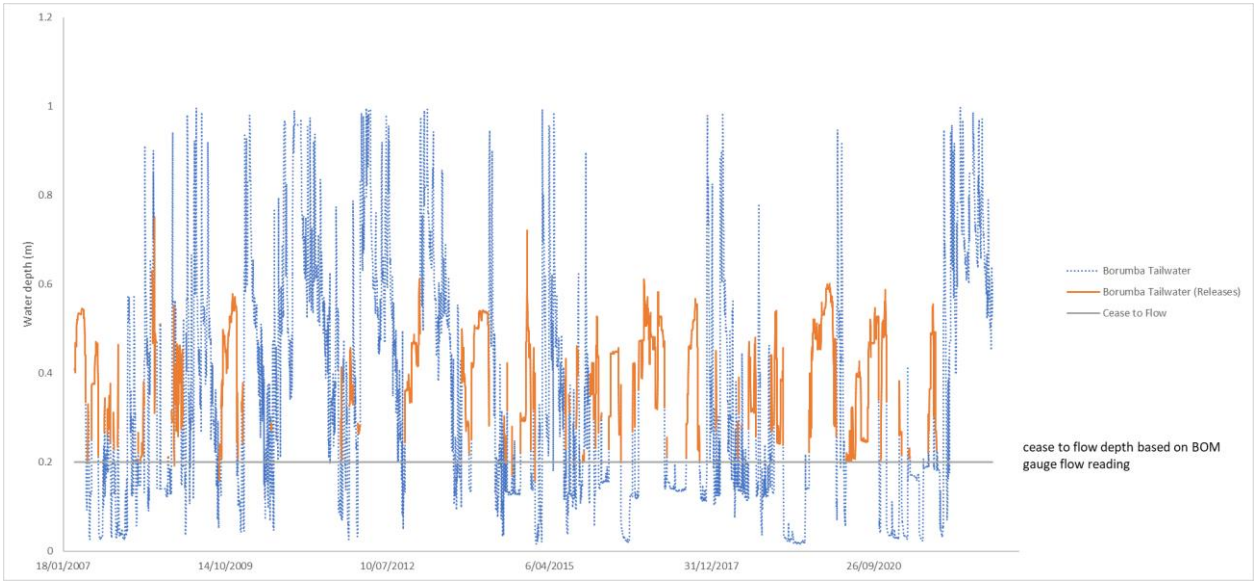


Figure 4-8 Continuous daily Borumba Dam tailwater vs. tailwater releases watercourse level from 2007-2022

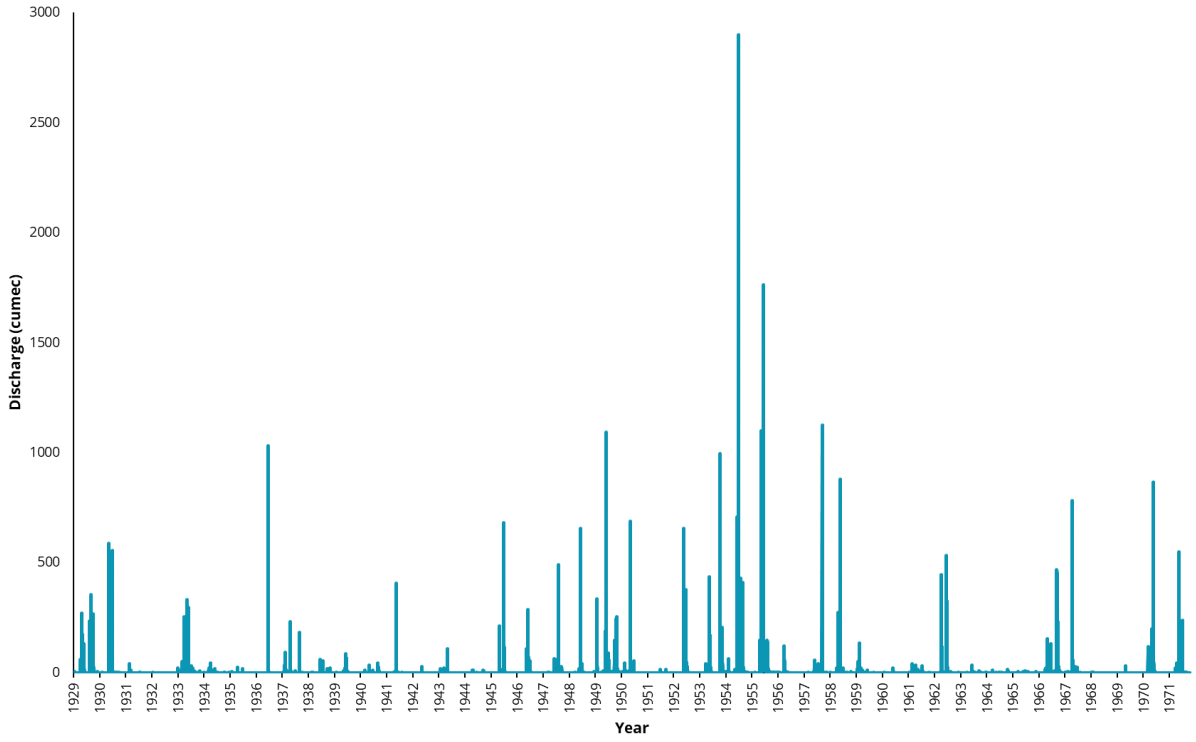


Figure 4-9 Daily mean Yabba Creek watercourse discharge from 1929-1972 at Imbil, upstream of Imbil Weir (138105C)

4.1.5 AQUATIC HABITAT

In accordance with the QLD wetland mapping categorisation and Mary River Basin EVs and WQOS (DERM, 2010), there are several aquatic habitat types occurring within the Study Area including:

- Numerous named and unnamed freshwater watercourses (riverine habitat – both upland and lowland systems); and
- Lake Borumba (lacustrine habitat).

A range of natural aquatic habitats exist within Mary River and its tributaries, including waterfalls, cascades, rapids and riffles in the steeper headwater areas and more glides, runs, pools and backwaters in the lower gradient regions. Within Mary River specifically, pools are generally the dominant feature on the main channel, with the middle and lower reaches characterised by long pools interspersed with bedrock and/or sand/gravel controls (SKM, 2007).

As the majority of streams of interest within the Study Area are easterly draining from mountainous areas it should be expected that these systems are characterised by high-energy conditions, with substrate compositions likely being comprised of mainly sand, gravel and cobbles (SKM, 2007).

YABBA CREEK

Yabba upstream of Lake Borumba

Yabba Creek is an order 5 stream at Borumba Dam. The section just upstream of Lake Borumba is moderately incised in some areas with a geomorphology characteristic of upland streams with a high percentage of coarse substrates, alongside a combination of small riffles and moderate pools.

No historical literature is available on aquatic habitats of Yabba Creek upstream of Lake Borumba.

Yabba Creek Downstream of Lake Borumba

SKM (2007) observed that the lower Yabba Creek was dominated by sand and gravel beds and featured relatively clear flowing water, as well as a number of instream habitat types (pools, riffles, runs and glides). In contrast to Yabba Creek above Lake Borumba, this section of the creek differs with a wide channel that narrows and expands between bends and zones of intense erosion. Yabba Creek widens near the town of Imbil prior to Imbil Weir before becoming more incised downstream of Imbil Weir until discharging into Mary River.

KINGAHAM CREEK

Kingaham Creek has a stream order of 5 and is a moderately incised stream which gradually widens in size before feeding into Lake Borumba. Kingaham Creek contains wider banks and deeper pool habitat alongside less riffle habitat and a gentler slope than Yabba Creek.

No historical literature is available on aquatic habitats Kingaham Creek upstream of Lake Borumba.

MARY RIVER

Mary River is 20 km downstream of Borumba Dam. Mary River is a large and wide river with a stream order of 7 after the confluence with Yabba Creek. SKM (2007) observed that the river was dominated by sand and gravel beds and featured relatively clear flowing water, as well as a number of instream habitat types (pools, riffles, runs and glides).

With regards to micro and macrohabitat features, SKM (2007) found many sites within Mary River supported patchy riparian vegetation, attributed to land clearing. As a consequence, tree root habitat was found to be limited, tending towards absence with less leaf and woody debris and limited shading. Macrophyte habitat was found to generally be abundant.

UNNAMED CREEKS OF THE PROPOSED UPPER STORAGE CATCHMENT

The unnamed creeks within the proposed upper reservoir drain into Lake Borumba. The creeks are order 1 and 2 streams. Given the small catchment size it is expected that during extended dry periods it is likely that the streams of this area would be reduced to very small, isolated pools. No information is available on the aquatic habitats of this area.

LAKE BORUMBA

Lake Borumba is situated approximately 20 km upstream of the confluence of Yabba Creek and Mary River. The Lake is mainly fed by three systems being Yabba Creek, Kingaham Creek, and Borumba Creek.

There is little information available on the aquatic habitat within Lake Borumba Dam; however, macrophytes persist along its fringes (Mackay, 2003). It is evident from aerial imagery that timber (large woody debris) is present along these margins, as well as the deeper flats, where death of trees has occurred.

BELLA CREEK

Bella Creek Is a tributary of Yabba Creek flowing in an easterly direction before discharging into Yabba Creek shortly after Borumba Dam.

Bella Creek attains a stream order of 4 prior to its confluence with Yabba Creek and is characterised by deep pools on bends and shallow rocky riffles with notable erosion in particular extents.

4.1.6 RIPARIAN VEGETATION

Stockwell (2001) conducted riparian reach assessments on Yabba Creek downstream of Borumba Dam and within Mary River. Mapping shows that Yabba Creek between the dam wall and the town of Imbil to be designated a mixture of “good riparian vegetation” and to a lesser extent “minor disturbance”. Downstream of Imbil to the confluence with Mary River showed few extents being classed as good with the majority being of minor disturbance, and to a lesser extent “major disturbance” and “no native riparian vegetation”. Mary River between the confluence with Yabba Creek and Gympie was dominated by major disturbance, no native riparian vegetation and minor disturbance rankings.

4.1.7 REACH REHABILITATION PRIORITISATION

Reach rehabilitation prioritisation throughout the catchment have been defined by Stockwell (2001) (Table 4-1). Upstream of Lake Borumba(Yabba Creek) and including Lake Borumba has been defined with a goal of rehabilitating the deteriorating strategic reach. In contrast, Yabba Creek downstream of Borumba Dam has been designated linking reaches and significant remnant sections. Mary River downstream of Yabba Creek has been designated reaches that have a limited chance of natural recovery in contrast to upstream of the confluence being defined as a moderate chance of natural recovery (Figure 4-10) (Stockwell, 2001).

Table 4-1 Reach Prioritisation Framework (Stockwell, 2001).

Rutherfurd et al (1999) Model	Brierley (1999) Model	Used in this Plan
Reaches in good condition throughout, that are already protected.	**Conservation reaches** - least disturbed - require strategies to maintain	**Protected Reaches in good condition throughout**
Protecting Regional Conservation Value Reaches - The highest priority is to preserve those reaches with assets that are important nationally or regionally.		**Unprotected Reaches of Regional Conservation Significance**
Protecting Local Conservation Value - These are reaches in such good condition that they can be considered to be surviving remnants of the original stream (a possible template reach) - unlike the above they are common in the region.		**Reaches of Local Conservation Value**
Protecting and improving deteriorating reaches. Some reaches are already damaged but their condition is continuing to deteriorate.	**Strategic Reaches** - sensitive to disturbance and may trigger off-site impacts - pre-emptive management strategies	**Deteriorating Strategic Reaches**
Improve close reaches expanding an area in good condition, rather than trying to create a new island of improved stream amongst degraded reaches.	**Connected reaches with high recovery potential** - signs of natural recovery **Isolated reaches with high recovery potential**	**Linking Reaches and Significant Remnant Sections**
Improve impeded recovery reaches (easily fixed reaches) - These are reaches in poor but stable condition (ie although degraded their condition is not deteriorating).		
Improve moderately damaged reaches (more difficult to fix) - these reaches that are damaged by human impact, have good potential to recover at reasonable cost.	**Moderate recovery potential** - river structure and vegetation require improvement	**Reaches with Moderate Recovery Potential**
Improve basket-case reaches These are reaches that are in poor condition, that do not threaten other reaches, but have little chance of recovering themselves over time.	**Highly degraded reaches** - Little natural recovery potential - signs of continued degradation, such as accelerated sedimentation or erosion	
Improve basket-case reaches with hope. These are reaches that are in very poor condition, that do not threaten other reaches, but that have some chance of recovering themselves		**Reaches with Little Chance of Natural Recovery**

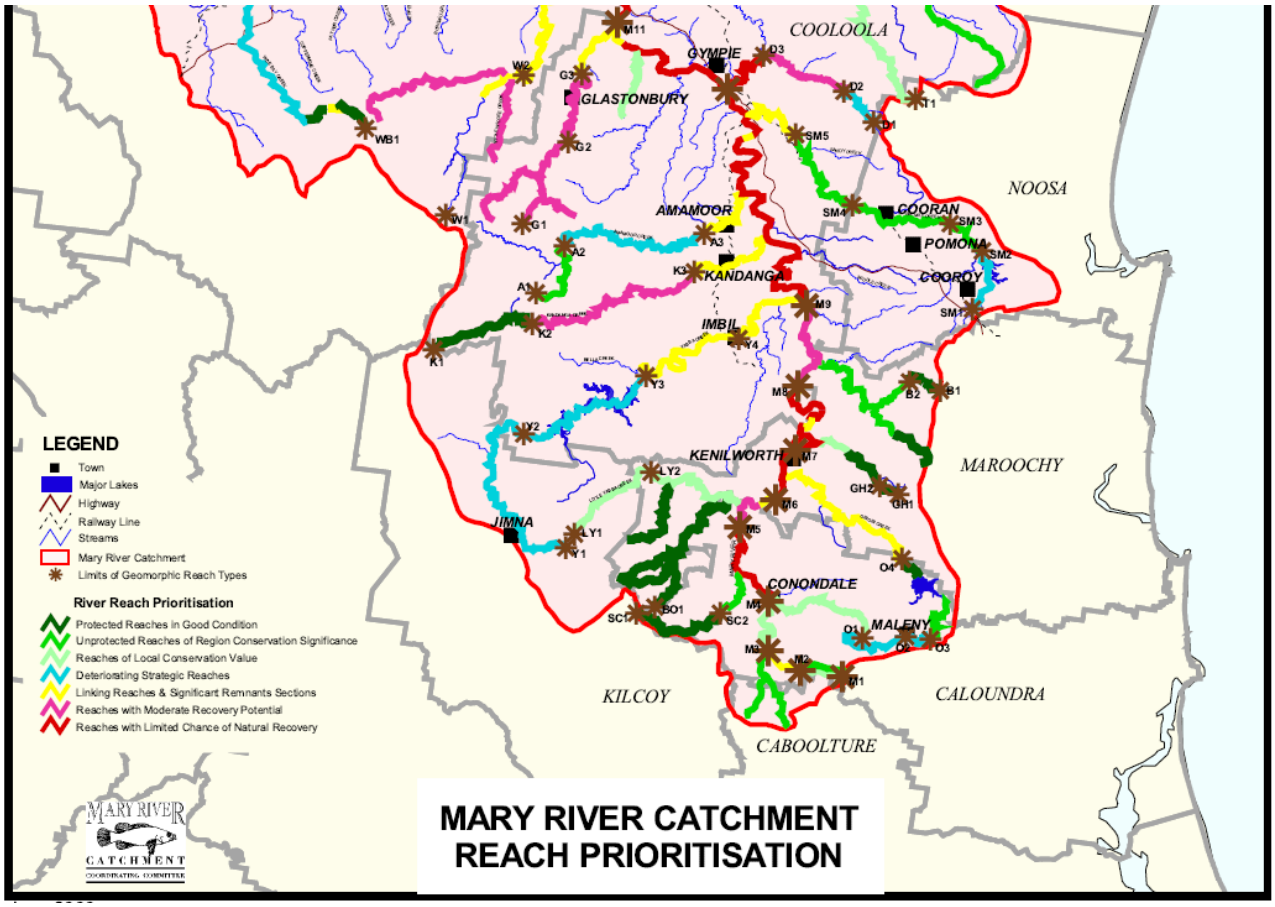


Figure 4-10 Mary River Catchment Reach Prioritisation (Stockwell 2001).

4.1.8 GROUNDWATER DEPENDENT ECOSYSTEMS – AQUATIC

MAPPED LIKELIHOODS

The likelihood presence of GDEs has not been mapped for the Study Area (BOM, 2021). The groundwater dependency of the riverine systems and other aquatic habitats of the Study Area is unknown.

ACTIVE SPRINGS

There are no mapped active springs within the Study Area (Appendix A).

4.1.9 AQUATIC CONSERVATION ASSESSMENT

The Aquatic Biodiversity Assessment and Mapping Method (AquaBAMM) is used to assess conservation values of wetlands (including watercourses) in Queensland. The majority of the key riverine systems of the Upper Mary River catchment were designated as generally maintaining a high to very high aquatic biodiversity significance at the state level.

- Within the Study Area, the Mary River from the confluence of Yabba Creek to Gympie rated very high in terms of aquatic biodiversity significance;
- The upstream extent of Mary River prior to the Yabba Creek confluence scored high to medium until Kenilworth;
- Yabba Creek varied between a score of high and medium between the Borumba Dam wall and the confluence with Mary River;

- Upstream of Lake Borumba Yabba Creek received a score of medium;
- Bella Creek scored very high;
- Kingaham Creek scored high;
- The streams of the proposed Upper Storage area all scored ratings of medium; and
- Lake Borumba itself scored a rating of medium aquatic biodiversity significance.

The high scores of the area are largely based on key habitat features for EVNT species and the presence of the species themselves. These key features were:

- Macrohabitat features (pools, riffles, and sand bars);
- Microhabitat features (large woody debris and detritus); and
- Other general features such as riparian vegetation, macrophytes, and substrate complexity.

The method also identified the NCA listed endangered Conondale spiny crayfish (*Euastacus hystricosus)* to be present within the Study Area (Table 4-2).

Table 4-2 Back on track ranks of Aquatic Conservation Assessment (ACA) identified threatened species within the Study Area and its surrounds.

Species	Common Name	Back on Track Rank
Elseya albagula	White-throated snapping turtle	High
Neoceratodus forsteri	Australian lungfish	Critical
Elusor macrurus	Mary River turtle	Critical
Euastacus hystricosus	Conondale spiny crayfish	Low
Maccullochella mariensis	Mary River cod	High
Tenuibranchiurus glypticus	swamp crayfish	Low

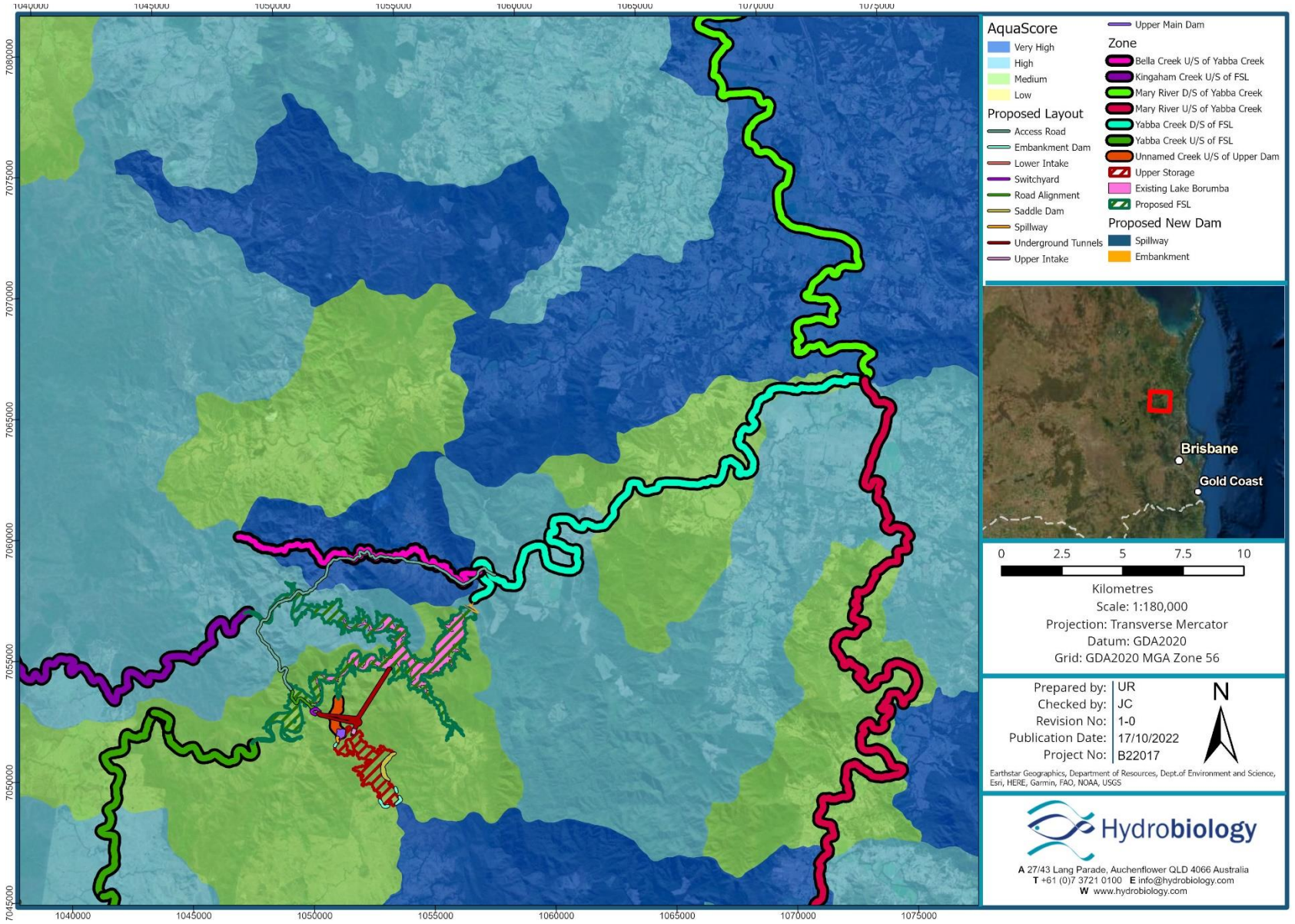


Figure 4-11 Riverine Aquatic Conservation Assessment

4.1.10 AQUATIC FLORA

SKM (2007) found 38 species of macrophytes throughout the system. Ten of the 38 species accounted for close to 90% of the mean macrophyte cover over the entire study (Table 4-5). The most common macrophyte species were broadly consistent with those found in healthy submerged macrophyte communities of lotic (flowing) habitats in SEQ (various authors cited in Mackay and Thompson 2000, Mackay et al, 2003). A complete database of recorded species from DES (2013b) in the Study Area can be viewed in Appendix C.

SKM (2007) determined that eelgrass (*Vallisneria nana)* was the mostly widely available Australian lungfish spawning habitat in Mary River, occurring at and often dominating most of their sites. Sago pondweed (*Stuckenia pectinata*) was found to be in the best condition downstream of the confluence of Yabba Creek and Mary River where increased water flow likely promoted its growth. Within the lower reaches of Yabba Creek *Potamogeton perfoliatus* was detected in high abundances alongside *Vallisneria nana.*

Within Lake Borumba, a study by Mackay (2003) determined that the water milfoil (*Myriophyllum* spp.) was the dominant macrophyte species. This was likely due to the species being very well adapted to changes in water levels, meaning it is often found in dams and intermittent wetland communities. Mackay (2003) also reported a shift in macrophyte assemblages in Yabba Creek from dominance of red water milfoil (*Myriophyllum verrucosum*) and eelgrass to *Potamogeton* pond weed species.

EXOTIC SPECIES

SKM (2007) recorded 10 exotic species with six being emergent/fringing taxa, three were floating taxa and one was a submerged taxon (Table 4-3).

Table 4-3 List of exotic macrophyte taxa recorded by SKM (2007).

Species Name	Common Name	Growth Form
Rorippa nasturtium-aquaticum	water cress	Floating
Cyperus eragrostis	umbrella sedge	Emergent / Fringing
Cyperus involucratus	umbrella sedge	Emergent / Fringing
Egeria densa	dense waterweed	Submerged
c.f. Arundo donax	giant reed	Emergent / Fringing
Urochloa mutica	para grass	Emergent / Fringing
Polypogon monspeliensis	annual beardgrass	Emergent / Fringing
Eichhornia crassipes	water hyacinth	Floating
Salvinia molesta	salvinia	Floating

SKM (2007) recorded the water hyacinth (*Eichhornia crassipes*) which is a WoNS. The species is a floating macrophyte that spreads both by seed (which it can produce in great quantities) and through vegetative means. It can form dense mats that may double in size within a few weeks. This species is problematic because low oxygen conditions can develop underneath the mats, reducing habitat suitability for many aquatic fauna. Water hyacinth was recorded at a number of locations within Mary River main channel, but typically in lower densities compared to other exotic macrophyte species.

Salvinia molesta (salvinia) is another invasive species and a WoNS. Salvina is a free-floating species native to South America, which can reach up to 400 tonnes of wet weight per hectare and grows extremely quickly as infestations can double in size every two to three days. It is easily spread, as one pair of fronds can start an entire new infestation and it is readily dispersed downstream during floods. The species was found within Mary River and Yabba Creek during the SKM (2007) survey. Stockwell (2001) noted excessive growth of macrophytes and the presence of Salvinia along the Imbil extent of the creek.

CONSERVATION SIGNIFICANT SPECIES

A number of conservation significant species are known to occur in the wider Upper Mary River Catchment (Table 4-4) with the majority being designated as "Special Least Concern" under the Nature Conservation (Plant) Regulation 2020. A single species, *Aponogeton elongatus*, is listed as "Near Threatened." *Aponogeton elongatus* subsp. *Elongatus* has been observed downstream of the Study Area, approximately 10 km downstream from site S19 (Hydrobiology, 2022b).

Table 4-4 Conservation significant macrophyte species known to occur within the Upper Mary River Catchment.

Species	Common Name	Status NC Act
Aponogeton elongatus	Queensland lace	Sub families for both species are listed as Near Threatened
Hydrilla verticillata	water thyme	Special Least Concern
Ottelia ovalifolia	swamp lily	Special Least Concern
Vallisneria annua	eelgrass	Special Least Concern
Vallisneria nana	eelgrass	Special Least Concern
Cycnogeton procerus		Special Least Concern
Cycnogeton rheophilus		Special Least Concern
Triglochin striata	streaked arrowgrass	Special Least Concern
Utricularia aurea	golden bladderwort	Special Least Concern
Utricularia subulata	zigzag bladderwort	Special Least Concern
Utricularia uliginosa	Asian bladderwort	Special Least Concern
Nymphoides indica	water snowflake	Special Least Concern
Najas tenuifolia	water nymph	Special Least Concern
Potamogeton crispus	curly pondweed	Special Least Concern
Potamogeton ochreatus	blunt pondweed	Special Least Concern
Potamogeton perfoliatus	perfoliate pondweed	Special Least Concern
Potamogeton tricarinatus	floating pondweed	Special Least Concern
Stuckenia pectinata	sago pondweed	Special Least Concern

Table 4-5 The ten most abundant macrophyte species recorded during the SKM (2007) surveys

Species name	Common name	Growth form	% of recorded cover
Vallisneria nana	eelgrass	Submerged	31
Hydrilla verticillata		Submerged	14
Spirodela spp.	duckweed	Floating (free-floating)	13
***Egeria densa* X**	dense waterweed **X**	Submerged	7
Myriophyllum verrucosum	red water milfoil	Submerged	6
Potamogeton perfoliatus	Perfoliate pond weed	Submerged	5
Azolla pinnata	ferny azolla	Floating (free-floating)	4
Ceratophyllum demersum	Hornwort	Submerged	4
Nymphoides indica	water snowflake	Floating (attached)	4
Persicaria decipiens	slender knot weed	Emergent / Fringing	2

X = Exotic Species

4.1.11 AQUATIC FAUNA

MACROINVERTEBRATES AND MICROCRUSTACEANS

SKM (2007) detected a total of 509,912 macroinvertebrate individuals belong to 81 families, 12 classes and 29 orders, and 7 phyla. These results indicate that Upper Mary River catchment supports a diverse macroinvertebrate fauna.

Within Yabba Creek, SKM (2007) found riffle habitat to be numerically dominated by Hydropsychid caddisfly larvae, Chironominae midge larvae, Tanypodinae midge larvae, and Orthocladiinae midge larvae. Edge samples within Yabba Creek differed with Copepoda copepod shrimps, Chironominae midge larvae, Tanypodinae midge larvae, and Cladocera water fleas numerically dominating.

The macroinvertebrate communities of Mary River catchment are broadly comparable in diversity and composition (in terms of the dominant taxa) to similar-sized rivers such as the Brisbane River (Choy et al., 2000) or the Burnett River (WBM, 2004). The SKM (2007) result compares well with the 131 families collected in MRHI surveys over a broader study of Mary River catchment (Connolly, 2003).

As was typical of macroinvertebrate communities, the distribution of abundance among taxa recorded during the SKM (2007) survey was strongly skewed. Ten taxa made up 95% of the individuals collected (Table 4-6). Microcrustacea such as Cladocera, Copepoda and Ostracoda were the most numerically dominant. These taxa are a source of food for some of the small-bodied fish commonly occurring in the catchment (Kennard 2003). Other common taxa included chironomid midge larvae (Chironominae and Tanypodinae), mayfly nymphs (Baetidae), hydropsychid caddisfly larvae, water mites (Acarina) and nematodes (round worms).

Table 4-6 The contribution of macroinvertebrate taxa to total recorded abundance in the SKM (2007) EIS survey.

Group	Taxa	Abundance	% total abundance	Cumulative % of total abundance
Microcrustacea	Cladocera	343837	67.4	67.4
Microcrustacea	Copepoda	58018	11.4	78.8
Microcrustacea	Ostracoda	19813	3.9	82.7
Diptera	Chironominae	18725	3.7	86.4
Oligochaeta	Oligochaeta	12056	2.4	88.7
Diptera	Tanypodinae	10632	2.1	90.8
Ephemeroptera	Baetidae	7903	1.5	92.4
Acarina	Acarina	5781	1.1	93.5
Nematoda	Nematoda	2979	0.6	94.1
Trichoptera	Hydropsychidae	2694	0.5	94.6

Previous studies have indicated that macroinvertebrate surveys in macrophyte and edge samples resulted in the highest average number of taxa present per sample, followed by riffle habitat and rock pool habitat, with the lowest taxa richness recorded for sandy pool habitat (Connolly, 2003). The results of the SKM (2007) survey differed with riffle habitat recording the highest mean taxa richness. The benthic habitat of deep pools maintained the lowest diversity. This result occurred regardless of season or position in the catchment (Figure 4-12).

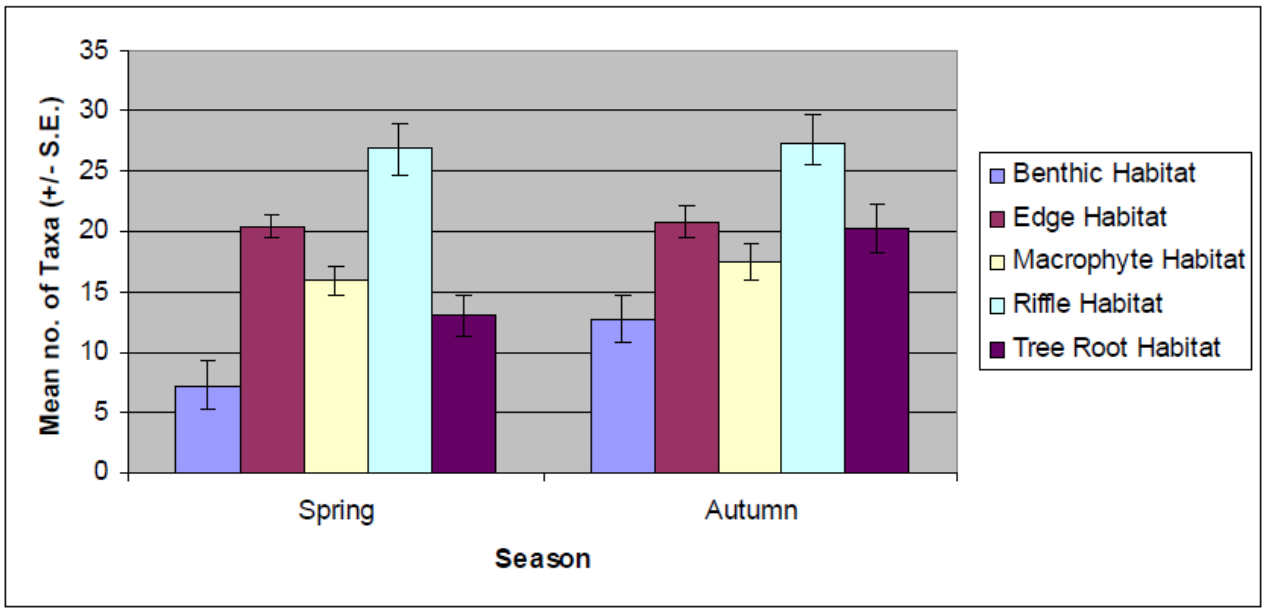


Figure 4-12 Variation in mean number of macroinvertebrate taxa recorded in the SKM (2007) EIS survey according to season and habitat.

Nine of the 10 most abundant taxa listed in Table 4-6 appear to be habitat generalists. With the exception of hydropsychid caddisfly larvae, all of the most abundant macroinvertebrate taxa occurred in at least three habitat types (Table 4-7). Ten out of the 28 taxa listed in this table were restricted to only one of the sampled habitats:

- Corbiculid bivalves were only recorded in benthic habitat samples;
- Hydriid bivalves and corixids (water boatmen) were only recorded in edge habitat samples;
- Thiarid gastropods and atyid shrimp were only recorded in macrophyte habitat samples; and
- Hydropsychid caddisflies, leptophlebiid mayflies, simulid blackflies and pyralid moths, along with gastropod hatchlings, were only recorded in riffle habitat samples.

However, most of these taxa, with the exception of Hydropsychidae, were not abundant in their respective habitats.

Benthic habitat was numerically dominated by oligochaete worms and Chironominae midge larvae (Table 4-7). Edge, macrophyte and tree root habitats were all numerically dominated by microcrustacea, but within the edge and macrophyte habitat were numerically dominated by copepods; tree root habitat was numerically dominated by Cladocera, which constituted 92% of the total abundance for this habitat. Riffle habitat was numerically dominated by baetid mayfly larvae and hydropsychid caddisfly larvae.

Table 4-7 Contribution of macroinvertebrate taxa to the total abundance of each habitat (SKM, 2007)

Taxa	Proportion of total abundance for each habitat (%)				
	Benthic	Edge	Macrophyte	Riffle	Tree Root
Acarina	7	2	4	2	0
Hydridae	0	1	0	0	0
Nematoda	7	2	2	0	0
Dugesiidae	3	0	0	1	0
Oligochaeta	27	10	5	2	0
Corbiculidae	1	0	0	0	0
Thiaridae	0	0	1	0	0
Gastropoda	0	0	0	1	0
Cladocera	0	15	13	0	92
Copepoda	1	21	36	2	5
Ostracoda	9	15	12	7	0
Atyidae	0	0	1	0	0
Elmidae	0	1	0	10	0
Ceratopogonidae	3	1	1	0	0

Taxa	Proportion of total abundance for each habitat (%)				
	Benthic	Edge	Macrophyte	Riffle	Tree Root
Chironominae	30	11	8	11	1
Orthocladiinae	0	0	1	5	0
Tanypodinae	7	6	7	5	0
Culicidae	0	0	1	0	1
Simuliidae	0	0	0	4	0
Baetidae	0	2	3	19	0
Caenidae	1	1	1	4	0
Leptophlebiidae	0	0	0	1	0
Corixidae	0	5	0	0	0
Pyralidae	0	0	0	1	0
Ecnomidae	1	0	0	2	0
Hydropsychidae	0	0	0	14	0
Hydroptilidae	0	1	1	5	0

MACROCRUSTACEANS

Two species of endangered macrocrustaceans have been observed within the Upper Mary River catchment (Table 4-8); *Euastacus hystricosus* (Conondale spiny crayfish) and *Tenuibranchiurus glypticus* (swamp crayfish). The swamp crayfish has been recorded downstream of the Study Area within a low level stream flowing into Kybong Creek and then Mary River. The Conondale spiny crayfish has been recorded 100 m upstream of Lake Borumba within the Borumba Creek sub-catchment. Locality and habitat requirements for this species are discussed below.

Table 4-8 Macrocrustaceans previously recorded in the Upper Mary River sub-basin

Species	Common name	Status (EPBC / NC Act)
Atyidae		
Atyidae	freshwater prawn	EPBC: N/A NCA: N/A
Palaemonidae		
Macrobrachium* sp.	freshwater prawn	EPBC: N/A NCA: N/A
Parastacidae		

Species	Common name	Status (EPBC / NC Act)
***Cherax* sp.**		EPBC: N/A NCA: N/A
Cherax depressus	orange-fingered yabby	EPBC: N/A NCA: N/A
Cherax dispar	slender yabbie	EPBC: N/A NCA: N/A
Cherax quadricarinatus	redclaw	EPBC: N/A NCA: N/A
Euastacus hystricosus	Conondale spiny crayfish	EPBC: N/A NCA: Endangered
Euastacus urospinosus	spiny crayfish	EPBC: N/A NCA: N/A
Tenuibranchiurus glypticus	swamp crayfish	EPBC: N/A NCA: Endangered

Swamp Crayfish

The swamp crayfish (*Tenuibranchiurus glypticus*) is an extremely rare species of crayfish known to occur along the central eastern coast of Australia with a presently known distribution from Bundaberg, QLD to Lake Hiawatha, NSW (Coughran et al., 2010; Dawkins et al., 2010). The species is the second smallest freshwater crayfish species in the world, with a maximum length of just 25 mm. It was initially described from two individuals collected from Brisbane, QLD however, the species has not been recorded within urban Brisbane in over 70 years (Davie, 2007; Dawkins et al., 2010). The swamp crayfish is known to inhabit deep burrows into soil within coastal wallum and *Melaleuca* swamps, often being found in sedges as opposed to pools of water (Riek, 1951).

Little information on the ecology and distribution of swamp crayfish is available. However, due to the lack of known coastal wallum and *Melaleuca* swamp habitat within the Study Area the presence of the swamp crayfish in the Study Area is unlikely.

While the species has been located within 5 km of the Study Area downstream of S19, there is no suitable habitat present within the upper Mary River and as such, it will be assessed no further (ALA, 2022).

Conondale spiny crayfish

The Conondale spiny crayfish (*Euastacus hystricosus*) is restricted to the montane and highland streams bordered by sclerophyll forest or rainforest (Smith et al., 1998) in the Conondale and Blackall Ranges of south-east QLD. This has relevance to the proposed Upper Dam as it is located directly adjacent to Conondale National Park with the nearest record for the species being located within the Borumba Creek sub-catchment. A record also exists from the Queensland Museum along Moy Pocket Road within Mary River, approximately 2.5 km upstream of S17. This location would be uncharacteristic for the species due to their montane habitat restriction (Table 4-19).

Aside from a study by Smith et al., (1998) within Booloumba and Bundaroo Creeks of the Conondale National Park, there is little other published information on the ecology and biology of the species. The study found the species to be restricted to watercourses with adults burrowing into banks under

large rocks with openings both below and above the surface. Juvenile individuals were generally found in shallow pools, sheltering under crevices, logs or rocks.

FISH

Based upon data and literature provided in SKM (2007), and DES (2013b), Kelly et al., (2004) a total of 50 species of fish are known to occur within the Upper Mary River basin, including 45 native and 5 introduced species (Table 4-9).

The range of species is broadly similar to those found in other SEQ catchments with the exception of 3 rare and threatened species, including:

- Mary River cod (*Maccullochella mariensis*) – EPBC act (Endangered);
- Australian lungfish (*Neoceratodus forsteri*) – EPBC act (Vulnerable); and
- honey blue eye (*Pseudomugil mellis*) – EPBC act (Endangered) and NC act (Vulnerable).

The fish species known to occur within the sub-basin range from those that primarily live in freshwater, such as the purple-spotted gudgeon (*Mogurnda adspersa*) or Agassiz's glassfish (*Ambassis agassizii*) to more estuarine and marine associated species such as sea mullet (*Mugil cephalus*) or yellowfin bream (*Acanthopagrus australis*), which migrate into freshwaters.

Kelly et al., (2004) recorded 11 species of fish within the plunge pool below the Borumba Dam spillway on Yabba Creek. SKM, (2007) undertook surveys in both Mary River and the lower extent of Yabba Creek near Imbil. Specifically, within Yabba Creek, both surveys recorded a total of 24 species in contrast to the 23 species detected within Mary River. Little notable differences occurred in species present with the blue catfish (*Neoarius graeffei)* being recorded only within Mary River and the southern saratoga (*Scleropages leichardti)* (stocked within Lake Borumba), the catadromous Bullrout (*Notesthes robusta*), and Silver perch (*Bidyanus bidyanus)* (stocked within Lake Borumba) only being detected within Yabba Creek. Generally the data show both Yabba Creek and Mary River fish community were dominated by small-bodied fish species (Table 4-9). Australian bass were detected in notably high abundances directly below the dam wall by Kelly et al., (2004) with a total of 2477 individuals.

Australian Lungfish has been observed within Yabba Creek downstream of Borumba Dam, within Lake Borumba and Mary River. The species has not been recorded upstream of Lake Borumba.

Mary River cod have been observed within Mary River and along Yabba Creek, both downstream of Borumba Dam and within Lake Borumba itself including the upper lake extents of Yabba and Kingaham Creeks. Previous records and habitat attributes of Mary River cod and Australia lungfish are described in, respectively.

Queensland fish stocking records for Borumba Dam are provided until 2018 which indicates that Borumba Dam has been stocked by the Lake Borumba Fish Stocking Association. With Australian bass, golden perch, Mary River cod and silver perch for both conservation and angling purposes. In 2017/18 the following were stocked from Stocked Impoundment Permit Scheme (SIPS) permit sales:

- 45,000 Australian bass;
- 25,000 golden perch;
- 19,608 silver perch; and
- 1,000 Mary River cod.

Till 2018 a known total of the following has been stocking Borumba Dam from SIPS:

- 581,340 Australian bass;
- 565,621 golden perch;
- 236,009 silver perch; and

- 5,000 Mary River cod.

Saratoga are also present within Borumba Dam from historical stocking which has established a breeding population of the species. Borumba Dam Fish Stocking Association Social media posts detail several recent instances of fish stocking of various species in Lake Borumba by the public.

Table 4-9 List of fish species recorded in the Upper Mary River sub-basin

Species	Common name	NCA	EPBC	Non-native	Known to occur in Yabba Ck downstream of Borumba Dam	Known to occur in Upper Mary River
Ambassidae						
Ambassis agassizii	Agassiz's glassfish	-	-	-	✓	✓
Ambassis marianus	estuary glassfish	-	-	-	-	-
Anguillidae						
Anguilla australis	southern shortfin eel	-	-	-	-	-
Anguilla reinhardtii	longfin eel	-	-	-	✓	✓
Apogonidae						
Glossamia aprion	mouth almighty	-	-	-	✓	✓
Ariidae						
Neoarius graeffei	blue catfish	-	-	-	-	✓
Atherinidae						
Craterocephalus marjoriae	Marjorie's hardyhead	-	-	-	✓	✓
Craterocephalus stercusmuscarum	flyspecked hardyhead	-	-	-	✓	✓
Neoceratodontidae						
Neoceratodus forsteri	Australian Lungfish	-	✓	-	✓	✓

Species	Common name	NCA	EPBC	Non-native	Known to occur in Yabba Ck downstream of Borumba Dam	Known to occur in Upper Mary River
Cichlidae						
Oreochromis mossambica	Mozambique mouthbrooder	-	-	✓	-	-
Clupeidae						
Nematalosa erebi	bony bream	-	-	-	✓	✓
Eleotridae						
Gobiomorphus australis	striped gudgeon	-	-	-	-	-
Gobiomorphus coxii	Cox gudgeon	-	-	-	-	-
Hypseleotris compressa	empire gudgeon	-	-	-	✓	-
Hypseleotris galii	firetail gudgeon	-	-	-	✓	✓
Hypseleotris klunzingeri	western carp gudgeon	-	-	-	✓	✓
Mogurnda adspersa	southern purple spotted gudgeon	-	-	-	-	-
Oxyeleotris lineolata	sleepy cod	-	-	-	-	-
Philypnodon grandiceps	flathead gudgeon	-	-	-	✓	✓
Philypnodon macrostomus	dwarf flathead gudgeon	-	-	-	-	-
Gobiidae						
Afurcagobius tamarensis	Tamar goby	-	-	-	-	-
Awaous acritosus	roman-nose goby	-	-	-	-	-

Species	Common name	NCA	EPBC	Non-native	Known to occur in Yabba Ck downstream of Borumba Dam	Known to occur in Upper Mary River
Redigobius bikolanus	speckled goby	-	-	-	-	-
Redigobius macrostoma	largemouth goby	-	-	-	-	-
Hemiramphidae						
Arrhamphus sclerolepis	snubnose garfish	-	-	-	-	-
Kuhliidae						
Kuhlia rupestris	jungle perch	-	-	-	-	-
Melanotaeniidae						
Melanotaenia duboulayi	crimson spotted rainbowfish	-	-	-	✓	✓
Rhadinocentrus ornatus	ornate rainbowfish	-	-	-	-	-
Mugilidae						
Mugil cephalus	sea mullet	-	-	-	✓	✓
Trachystoma petardi	pinkeye mullet	-	-	-	-	-
Osteoglossidae						
Scleropages leichardti	southern saratoga	-	-	-	✓	-
Percichthyidae						
Maccullochella mariensis	Mary River cod	-	✓	-	✓	✓
Macquaria ambigua	golden perch	-	-	-	✓	✓

Species	Common name	NCA	EPBC	Non-native	Known to occur in Yabba Ck downstream of Borumba Dam	Known to occur in Upper Mary River
Percalates novemaculeata	Australian bass	-	-	-	✓	✓
Plotosidae						
Neosilurus hyrtlii	Hyrtl's catfish	-	-	-	-	✓
Porochilus rendahli	Rendahl's catfish	-	-	-	-	-
Tandanus tandanus	freshwater catfish	-	-	-	✓	✓
Poeciliidae						
Gambusia holbrooki	mosquitofish	-	-	✓	✓	✓
Poecilia reticulata	guppy	-	-	✓	-	-
Xiphophorus hellerii	swordtail	-	-	✓	-	✓
Xiphophorus maculatus	platy	-	-	✓	-	-
Pseudomugilidae						
Pseudomugil mellis	honey blue eye	✓	✓	-	-	-
Pseudomugil signifer	Pacific blue eye	-	-	-	✓	✓
Retropinnidae						
Retropinna semoni	Australian smelt	-	-	-	✓	✓
Scorpaenidae						
Notesthes robusta	bullrout	-	-	-	✓	-

Species	Common name	NCA	EPBC	Non-native	Known to occur in Yabba Ck downstream of Borumba Dam	Known to occur in Upper Mary River
Sparidae						
Acanthopagrus australis	yellowfin bream	-	-	-	-	-
Synbranchidae						
Ophisternon bengalense	swamp eels	-	-	-	-	-
Terapontidae						
Hephaestus fuliginosus	sooty grunter	-	-	-	-	-
Leiopotherapon unicolor	spangled perch	-	-	-	✓	✓
Bidyanus bidyanus	silver perch				✓	

Note: occurrence records based off (SKM, 2007; Kelly et al., 2004; Ecotone, 2007)

Mary River Cod

Mary River cod (*Maccullochella mariensis*) is listed under the EPBC Act as endangered and a recovery plan has been adopted (Simpson and Jackson 1996). The main factors that are the cause of the species being eligible for listing in the Endangered category are its very restricted extent of occurrence, small population size and fragmented habitat that is subject to continuing to decline in quality of habitat due to degraded riparian lands (TSSC, 2016). The majority of literature used in this report is detailed within Mary River Threatened Species Recovery Plan (Australian Government, 2016). Mary River cod is one of the most endangered fish in Australia with natural populations restricted to Mary River system. It is predicted that the species now occurs in less than 30% of the previously known range with populations now isolated due to stream impoundments and habitat fragmentation (Simpson and Jackson 1996).

Mary River cod is an elongate fish which grows to 23.5 kg. However, it is uncommon for the species to exceed lengths of 70 cm and 5 kg in weight (DCCEEW, 2022).

Diet

Mary River cod are predators and appear to feed mainly on fish and crustaceans, though Simpson & Jackson (1996) noted that birds, bats and water rats have been found among stomach contents. Feeding at dawn and dusk appeared common.

Habitat

Mary River cod are known to occur only in Mary River catchment, where they have been found from high gradient, rocky upland streams to large to slow flowing pools with more silty substrata in lowland streams (Simpson and Mapleston, 2002). Based on the results of Simpson (1994) and Simpson and Mapleston (2002), large individual logs and log piles are favoured, but smaller branches and undercuts are also used. In Obi Obi Creek, where cod are relatively abundant, undercuts are believed to be utilised as preferred habitat because snags are largely absent. Juvenile cod tend to use both undercuts and fringing macrophytes for shelter and tend to use shallower habitats compared with adult fish (Simpson and Mapleston, 2002). Cod occur in a variety of depth conditions. While occurring mainly in very slow-flowing deep pools, relatively shallow parts of the stream were sometimes occupied when there was abundant cover. Cod were frequently found immediately downstream of a constriction of the stream (e.g. a riffle) where food was presumably concentrated by the water flow.

Mary River cod recovery plan details the habitat preferences for cod as comprising deep, shaded, slow flowing pools with plenty of snags and log-piles. Streambed substrates are usually fine sand or mud. Though the recovery plan also notes habitat preferences do vary and also includes deep and rocky, with little instream timber or overhanging vegetation.

Movement

Mary River Cod is known to migrate into smaller tributaries during late winter. Depending on the time of year and flows, individuals have been known to move over 30 km upstream or downstream (Simpson & Jackson, 1996).

Homing behaviour is common among Mary River cod. Individual fish are able to return to a previous home range after an absence of at least eight months and a return journey of at least 70 km (Simpson and Jackson, 1996).

A radio-telemetry study carried out by Simpson and Mapleston (2002) tracked the movements of 13 cod captured in Coondoo Creek and Six Mile Creek over a twenty-month period. Cod moved large distances (up to 35 km for one individual), and while movement was positively correlated with mean monthly discharge, the direction of movement was not consistent among individuals (i.e. no coordinated movement patterns were observed). Simpson and Mapleston (2002) believed that this

was an indication that large-scale movement was more likely related to foraging than to spawning. The three largest upstream migrations occurred in February, while the three longest downstream movements occurred in May. Merrick and Schmida (1984) suggested that cod migrate from the main river into smaller tributaries in winter. Simpson and Mapleston (2002) found evidence of site fidelity and territoriality. Small-scale daily patrolling movements between snags by individual cod indicated home ranges of between 70 m and 820 m, with upstream and downstream boundaries marked by obvious landmarks such as logs and/or riffles. Five cod undertook movements of greater than 10 km to return to sites where they had been recorded. Cod are thought to relocate to these sites using a combination of olfactory and visual senses (Simpson and Jackson, 1996).

Nesting and spawning

The majority of reproductive information for Mary River cod comes from captive fish within hatcheries (Simpson and Jackson 1996). The species form pairs and spawn yearly around spring, Males exhibit territorial behaviour and guard the nest sites which are presumed to be hollow logs. Spawning takes place soon after when water temperature rises to 20°C. The eggs will hatch within 7 days of being laid, the male will care for the young until nine days after hatching when the young are ready to disperse (Pusey et al., 2004).

Mary River cod fecundity is poorly known, though observations in captive fish suggest that females can produce around 2,000 eggs per kilogram of weight and that spawning can take place more than once a year. Again, it is unclear how these figures translate to wild populations.

Distribution

Mary River cod are regarded as being endemic to Mary River (Simpson and Jackson, 1996; Kennard, 2003). Historical and anecdotal information provided in Simpson and Jackson (1996) indicate that Mary River cod were originally present in reasonable numbers in larger freshwater stream reaches of the catchment. Mary River cod occurs from high gradient upland streams to slow flowing lower catchment reaches, but its range is thought to have been restricted to 30% of its former habitat (Simpson and Jackson, 1996). Kennard (2003) later reported cod as present in 34 of the 44 (75%) non-tidal reaches of Mary River and tributaries. Relatively abundant Mary River cod populations are found in the Tinana / Coondoo Creek, Six Mile Creek and Obi Obi Creek sub-catchments. Along with these creeks, Pickersgill (1998) regarded Amamoor Creek from McGills Creek to Amamoor as having a known cod population in good habitat. Kennard (2003) also lists Widgee Creek, and Munna Creek as reaches possibly with naturally reproducing populations. Pickersgill (1998) referred to these creeks and parts of Yabba, Kandanga and Glastonbury creeks as having cod populations living in poor habitat. In comparison, populations in Mary River main channel are regarded by most authorities as patchy and relatively small.

Confirmed sightings with respect to the Study Area include recordings in Yabba Creek below Borumba Dam and upstream from Imbil (ALA, 2022); however, surveys in Yabba Creek indicated very low numbers (SKM, 2007). A project for the dewatering of the Borumba Dam plunge pool undertaken directly below the Borumba Dam spillway on Yabba Creek by Kelly et al., (2004) recorded 2 individuals of Mary River cod. There are also known records upstream of Lake Borumba along both Kingaham and Yabba Creek (Figure 4-13). Mary River Cod has been stocked within Lake Borumba since 1992 with an additional 1000 individuals being added in 2017/2018 bringing the total number to 5000 individuals stocked.

With regards to Mary River, there are numerous records between the confluence of Yabba Creek and Amamoor Creek.

Mary River Cod captive breeding program has released fingerlings in approximately 85-90% of the species former range. Research by Dunlop, (2016) has confirmed the presence of Mary River Cod

larvae within the systems of Six Mile, Tinana, and Obi Obi Creeks, which indicates that spawning is occurring. Outside of Mary River, the species has also been stocked for conservation purposes in the Stanley, Logan-Albert, Coomera, and Brisbane rivers including stocking for angling opportunities in Hinze, Maroon, Moogerah, Sommerset, Wivenhoe, Wyaralong, Ewen Maddock dams and Lake Samsonvale and Dwyer (Fisheries Queensland, 2020).

Threats

Table 4-10 has been adapted from the TSSC (2016) in approximate order of severity of risk.

Table 4-10 Known and potential threats impacting Mary River cod, in approximate order of severity of risk based on available evidence.

Threat Factor	Evidence Base
Habitat Loss and Fragmentation	
Creation of fish barriers and changes to flow regimes	Several large barriers to cod movement occur in Mary River catchment. Borumba dam on Yabba Creek acts as an impassable barrier to cod moving in an upstream direction, while a number of weirs, such as Imbil Weir on Yabba Creek can be expected to act as barriers to some extent. Barriers to cod movement posed by numerous road and fords crossing creeks would have additional impacts. Impounded streams may stop cod from travelling both in and out of home ranges, resulting in further fragmentation of the species and population decline. Altered hydrology from barriers such as Borumba Dam have also been implicated in the reduction of cod numbers in the system due to modified flow regimes and temperature changes that in turn effect breeding conditions for Mary River cod. (Simpson, 1994).
Loss of habitat through riparian vegetation and in-stream macrohabitat loss	Riparian and catchment vegetation in Mary River basin has been extensively cleared. This has resulted in a loss of shaded deep pools which the cod inhabits (Simpson, 1994). In addition, much of the large woody material in streams has been removed to improve river navigability, or to reduce perceived flood risk. For Mary River cod, this has led to a large decrease in available structural habitat on two separate fronts; removal of established habitats and the inability of remaining riparian vegetation to provide replacement habitat.
Invasive Species	
Grazing disturbance on riparian vegetation	Grazing disturbances on stream banks by cattle prevents native riparian vegetation from regenerating (Simpson & Jackson, 1996). This vegetation provides critical cod habitat which is the cover along the stream channels.
Resource competition and predation from exotic fishes	Exotic species known to inhabit Mary River system such as the mosquito-fish (*Gambusia holbrooki*), guppy (*Poecilia reticulata*), and swordtail (*Xiphophorus helleri*) (Pusey et al., 1993) compete with Mary River cod larva for food and habitat. Mosquitofish are recognised to be predators and competitors of small fish potentially including larval cod (Simpson & Jackson, 1996).

Threat Factor	Evidence Base
Resource competition from translocated native fish	The golden perch (*Macquaria ambigua*) (a translocated native species) was considered by Simpson (1994) to be the species most likely to have an impact on cod. This species is now reasonably abundant and, like cod, is an ambush predator, overlapping in diet and space requirements. Additional translocated species which may compete include the silver perch (*Bidyanus bidyanus*), saratoga (*Scleropages leichardtii*) and sooty grunter (*Hephaestus fuliginosus*).
Overfishing	
Overfishing	In 2016, this species was listed as a no take species in areas that have not been restocked (DEHP 2016). Prior to being listed as no take, cod were fished by a range of means, many now illegal such as shooting, explosives and netting. Larger cod, once the target of fishers, are now uncommon. Overfishing is likely to have impacted cod population size in two ways; firstly by targeting large individuals that were likely to be the main breeders, and secondly, by simply removing individuals from the population faster than the replenishment rate.

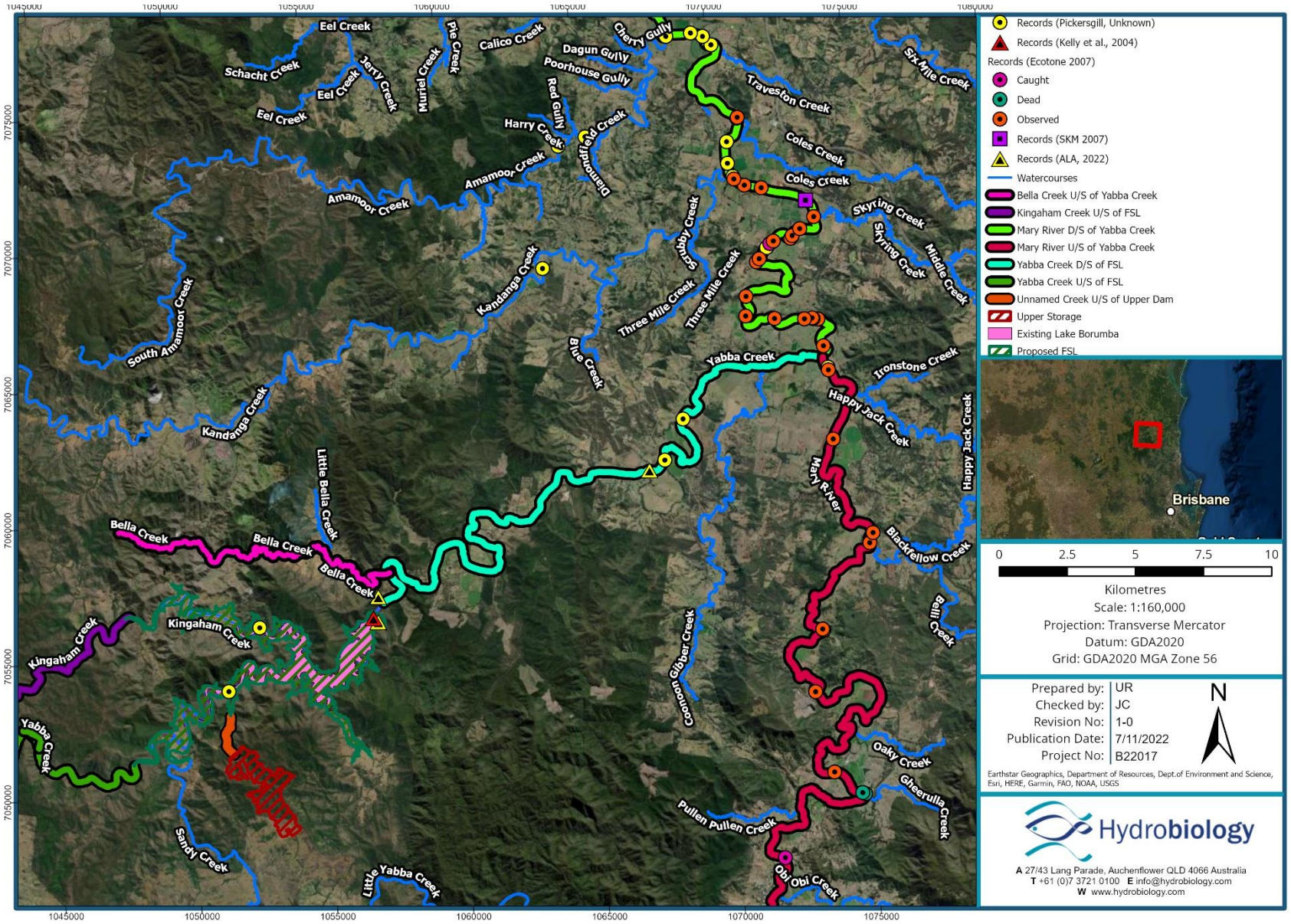


Figure 4-13 Mary River cod records within the Study Area and surrounds

Australian lungfish

The Australian lungfish (*Neoceratodus forsteri*) is listed under the EPBC Act as vulnerable and a recovery plan has been drafted (DCCEEW, 2017). It is also a no-take species under the *Fisheries Act 1994.* The species was eligible for listing as vulnerable given (DotE, 2014): as a result of past changes to its core habitat, it is suspected that the recruitment to the adult breeding population has been, and is still, unsustainably low; and that the species is likely to undergo a substantial population reduction over the next three generations. The species also has a limited geographic distribution that is precarious for its survival. Its area of occupancy is estimated to be less than 2,000 km^2 and continued decline in quality and extent of spawning and nursery habitat is likely as further water infrastructure development occurs in this populated area of Queensland.

The Australian lungfish is a large and elongated freshwater fish which can reach a maximum size of approximately 150 cm in length and 48 kg in weight (Allen et al., 2002). The Australian lungfish is one of only six lungfish species in the world and is considered to be one of the oldest known extant vertebrate species (Cavin and Kemp, 2011; SKM, 2007).

Diet

Adult Australian lungfish are suctorial feeders and consume large amounts of material such as plant matter and sand that they do not digest (Spencer, 1892). Adults have crushing plates and, in captivity, would eat fish, insect larvae, molluscs, tadpoles, crustaceans (such as *Macrobrachium* spp.) and aquatic vegetation such as *Vallisneria spp*. and *Hydrilla spp.* making them low level benthic carnivores (Kemp, 1981; Kemp, 2016). Juvenile and hatchling lungfish are active predators and consume small invertebrates such as tubifex worms and water fleas (Kemp, 1981).

The Australian lungfish are nocturnal foragers, with the ability to detect prey via electroreception which allows lungfish to sense electric fields generated by prey. Within Mary River adults have been noted to predominately forage within macrophyte beds in water less than 2 m deep. Juveniles are ambush predators using aquatic macrophytes as cover to catch prey (Kind, 2002; Watt et al., 1999).

Habitat

The Australian lungfish requires clear or turbid, low-flow or still, vegetated, shallow pools to support spawning and feeding (Allen, 1989; Merrick & Schmida, 1984). Macrophytes are essential for reproduction with submerged or emergent variants providing nesting surfaces for egg laying and refuges for juveniles (Kemp, 2014).

Adult lungfish favour submerged logs, dense banks of aquatic vegetation, or underwater caves formed by bed scouring under submerged logs. While lungfish can be found in both pools and riffles, their preferred habitats are pools of 3-10 m depth. In habitats such as these, they can often live in large groups (Kemp, 1986). All lungfish under 500 mm in length collected by Brooks and Kind (2002) were caught in dense macrophyte growth favoured for spawning, suggesting that juveniles prefer the same habitat and are probably slow to disperse after hatching. Juvenile lungfish are almost always found in dense macrophyte bed cover or similar in water of 500 mm depth or less. Within Mary River and its tributaries, lungfish were found by Kind (2002) to be located predominately in pool habitat (67%) of an average depth of 1.8 m with remaining individuals being found in runs (21%) of an average depth of 1.2 m, riffles (11%), and backwaters (1%), the average stream width of these environments was less than 30 m. Within pools, macrophytes coverage was approximately 37-55% with rocks, eroded banks, and woody debris throughout the pool with typically sandy substrates (Kind, 2002).

Adult lungfish in Mary River inhabit complex shady habitat in overhanging riparian vegetation, woody debris and macrophyte beds. Lungfish within Mary River avoid open water and rarely utilise rocky

habitat and eroded riverbanks (Kind, 2002). Lungfish prefer deeper water during winter months and shallower water in summer and during the spawning season. Kind (2002) found that all radio tracked individuals in Mary River population utilised Hydrilla (*Hydrilla vertillata*) and Vallisneria (*Vallisneria gigantea*) macrophytes. However, Kind (2002) failed to locate adult lungfish within hornwort (*Ceratophyllum demersum*), nitella (*Nitella* sp.), baby tears (*Bacopa monniera*), or water milfoils (*Myriophyllum* spp.). Dependent on species availability, lungfish within Mary River preferred the dense water weed (*E. densa*) and *Hydrilla* as these species form very dense submerged banks across a range of depths. Lungfish also prefer mixed macrophyte compositions of submerged and floating macrophyte beds, alongside two floating macrophyte species: the water primrose (*Ludwigia peploides*) and waterlilies (*Nymphoides* sp.) (Kind, 2002).

Long term monitoring related to Paradise Dam by DAF, (2017) confirmed that lungfish populations remained common and widely distributed within the Burnett River 10 years after the construction of Paradise Dam and still continued to be after the report (DAF, 2017).

The Draft National Recovery Plan for the Australian Lungfish, DCCEEW, (2017) lists the following to be habitat critical to survival:

- Any breeding or foraging habitat in areas where the species occurs (as defined by the distribution map provided in Figure 4-14); and
- Any newly discovered breeding or foraging locations.

Movement

In rivers with natural flows of water, lungfish are largely sedentary, with adults usually moving only short distances at night, returning each day to a certain habitat such as those listed above. Individuals are routinely found resting in the same daytime retreat over many months or even years (Brooks & Kind, 2002; Berghuis & Broadfoot, 2004). In such systems, movements exceeding one kilometre are reportedly rare. A radio-tracking study of lungfish in Mary River carried out by Kind (2002) found only four of the twenty tagged lungfish moved more than 5 km from their original site. Lungfish in Mary River were not observed to undertake spawning migrations.

In waterways subject to water resource development, lungfish are known to undertake much larger scale movements. For example, one individual in an impounded section of the Burnett River traversed 48 km at least four times between 1998 and 2001 (Kind, 2002). Fish later returned to their downstream home ranges. Downstream movement in this reach was stimulated by flow from the weir and distance moved was positively correlated with flow rate (Kind, 2002). During the non-spawning season, fish in established storages showed strong site fidelity in a restricted area, similar to fish in flowing parts of the river (Kind, 2002).

More recent data relevant to Paradise Dam (DAF, 2017) concluded that nine tagged lungfish within Paradise Dam were able to traverse the impoundment being found downstream of the dam wall. It is inferred that the individuals had either utilised the fishway or moved downstream during flood events.

However, in the Ned Churchard Weir pondage, lungfish made only local movements, similar to fish in the un-impounded section of the Burnett River. With the exception of one individual that moved out of the storage and travelled 11 km upstream, they did not move away from the inundated area to find a spawning site (Brooks and Kind, 2002). During a spawning season soon after the weir was filled, Brooks and Kind observed large groups of lungfish milling around the water surface over previous spawning sites that had been flooded by the weir. These workers suggested that searching for spawning habitat further afield is a behaviour learned by lungfish in established storages over time.

Nesting and Spawning

Lungfish spawning occurs annually between August and December, depending on the suitability of environmental conditions (Kemp, 1995). The species generally reaches sexual maturity between 15 to 17 years of age in males and 20 to 22 in females (TSSC, 2003; Arthington, 2009). Lungfish regularly begin to breed within 11 weeks of the shortest day of the year (Kemp, 1986). Spawning stimuli are thought to be largely unrelated to flow and more related to photoperiod. Increasing water temperature may also be a stimulus, although this differs from findings presented in Kemp (1986). Factors affecting the choice of spawning location are reportedly complex but include macrophyte cover >70%, shallow depths, still and slow-flowing water and the presence of particular macrophyte species.

Brooks and Kind (2002) revealed that Lungfish spawn over a variety of substrates, and on a broader variety of macrophytes than reported in Kemp (1984; 1986). Ribbon weed (*Vallisneria sp.*) was the preferred spawning media in flowing conditions and eggs were generally laid in the root systems. Root systems of Callistemon trees are known to be used, (Kemp, 1984) as are introduced macrophytes such as para grass and water hyacinth (Kemp, 1984; Brooks and Kind (2002)). Brooks and Kind (2002) also postulated that feathery submerged macrophytes such as *Myriophyllum spp.* offered better protection against eggs falling to the riverbed and dying.

The ten-year study of lungfish populations and spawning events by DAF (2017), recorded a single spawning event in Paradise dam compared to more frequent events that occurred in lotic systems. Additionally, lotic systems were associated with higher live egg numbers. Further evidence of recruitment was noted with sub-adult individuals being collected after 4 years of monitoring which infers that successful spawning had occurred prior to or during construction of the dam. The study also noted lungfish to be thriving within the reaches downstream of the dam with an increasing population likely from downstream movement following flood events (DAF, 2017).

The monitoring program also located lungfish eggs during 7 of the 10 years surveyed. The majority being located downstream of Paradise dam and Ned Churchward Weir, these eggs were often found within shallow water, sheltered by emergent and submerged macrophyte beds. Approximately 50 live lungfish eggs were observed within the impounded waters of Paradise Dam on a single occasion (DAF, 2017).

Distribution

The Australian lungfish is restricted to southeast Queensland with its natural distribution assumed to that of Mary and Burnett systems with claims of being native to the Brisbane River with Pine River systems being subject to debate (Commonwealth of Australia, 2017; Kemp, 2014; Wager, 1993). The species has also been translocated to several systems with populations persisting in the Condamine, Logan, Albert, and Coomera Rivers (Kemp, 2014).

The species is considered to be quite healthy throughout its range in Mary River being known to occur throughout Mary River itself from the Tidal Barrage upstream and to the town of Conondale and several tributaries including Yabba, Tinana, Coondoo, Wide Bay, Obi Obi, Munna Creeks (Kind, 2002; Kind et al., 2008; Simpson, 1994). Kind (2002) caught and observed Lungfish at several Mary River sites including Moy Pocket, Traveston Crossing, Widgee Crossing, Kenilworth, Tiana Creek, Conodoo Creek, and Yabba Creek.

A long term 10-year monitoring program for Paradise Dam DAF (2017) found no evidence of a decline in lungfish populations throughout their Study Area in the Burnett River, with Catch Per Unit Effort estimates offering comparable populations with pre dam construction surveying.

Confirmed sightings with respect to the Study Area include two recordings on Yabba Creek downstream of Borumba Dam at Imbil Weir and Imbil Bridge by Kind (2002), and another on Yabba Creek at a road crossing upstream of Imbil (Hatton, 2022) [unpublished]. Mary River has a number of recordings throughout the Study Area between the confluence of Yabba Creek and the town of Gympie. The majority of these recordings were identified by SKM, (2007) including numerous recordings of the species along Mary River between the Yabba and Amamoor Creek confluences. Lungfish have also been sighted in Lake Borumba itself (Kind et al., 2008). A project for the dewatering of the Borumba Dam plunge pool undertaken directly below the Borumba Dam spillway on Yabba Creek by Kelly et al., (2004) recorded 201 individuals of Australian lungfish.

There have been no confirmed recordings of Australian lungfish upstream of Lake Borumba (Figure 4-15). This is not an indication of Lungfish presence/absence but instead a representation of limited survey effort in these areas. However, the current draft recovery plan for this species includes the known distribution of Australian lungfish in areas upstream of Lake Borumba along Yabba Creek. Other areas such as Six Mile Creek are not included in the known distribution of this species despite recent (frc environmental, 2018) and historical (Kind, 2002) records within this creek.

Threats

While lungfish have survived for millions of years despite inherent low genetic variability (Frentiu et al., 2000), only limited numbers of individuals from one natural site (Miva, on Mary River, 1896) were used to support translocated populations in SEQ (DCCEEW, 2022c) assuming lungfish did not already exist in the areas into which they were translocated. This means that the translocated populations are likely to have particularly limited genetic variation and only the natural populations, such as those in Mary River, are likely to possess the full evolutionary potential of the species.

As lungfish are long-lived, slow to reach sexual maturity and have a population structure based on sporadic periods of successful recruitment, they are potentially vulnerable to change including anthropogenic change.

The key known threats to Australian lungfish as described in DCCEEW, (2017), are the following:

- Instream barriers;
- Regulated flows;
- Habitat degradation/reduced water quality;
- Introduced native and non-native invasive species; and
- Fishing and boating activities.

Table 4-11 details known and potential threats (past and present) impacting Australian Lungfish.

Table 4-11 Known and potential threats impacting the Australian lungfish, based on available evidence.

Threat Factor	Threat Ranking Adapted From DCCEEW (2017)	Evidence Base
Habitat Loss and Fragmentation		
Creation of fish barriers	High	Several large barriers to lungfish movement occur in Mary River catchment. Borumba dam on Yabba Creek can act as an impassable barrier to lungfish attempting to move upstream, while weirs, such as Imbil Weir on Yabba Creek can be expected to act as barriers to some extent. Barriers to lungfish movement posed by numerous road and fords crossing creeks would have additional impacts. Impounded streams may stop lungfish from travelling both in and out of home ranges, resulting in further fragmentation of the species and population decline. While storages provide feeding habitat for lungfish and, hence allow adults to survive in them, successful spawning has rarely been observed within them. The main reason is thought to be that many storages are not conducive to producing dense growth of macrophytes (DCEEW, 2022c). Lungfish are known to travel over dam walls and become stranded from preferred habitats. Stranding can also occur from water drawdowns with stepped spillways also resulting in mortalities. Large spillways in several dams which are not stepped have also led to substantial lungfish mortalities with the effects of other large barriers unknown however, they are thought to be significant (DCCEEW, 2017).
Loss of habitat through riparian vegetation and in-stream macrohabitat loss	High	Riparian and catchment vegetation in Mary River basin has been extensively cleared. This has resulted in a loss of habitat for lungfish as they generally spawn and shelter amongst overhanging vegetation, this is particularly evident in Mary River. The clearing of this vegetation also increases susceptibility of systems to floods and removes the cover that lungfish require to prevent themselves from being displaced by strong flowing water (Kind, 2002). Leaf litter and ground layer habitat are also essential for juvenile Australian lungfish to take refuge in. The invertebrates that depend on the litter can also provide an important source of food for larvae (DCCEEW, 2017).
Regulated Flows	High	River regulation has significantly altered the flow regimes within the natural distribution of the Australian lungfish. Water infrastructure such as dams and weirs have altered the volume, duration,

Threat Factor	Threat Ranking Adapted From DCCEEW (2017)	Evidence Base
		timing, and frequency of flows within Mary River catchment. Fluctuating and permanently flooded water levels impact macrophyte establishment in impoundments while also significantly impacting the condition and growth of macrophyte beds downstream of these barriers (DCCEEW, 2017). It is important to note that flows from water storage infrastructure can also provide ideal habitat downstream for macrophytes which can maintain water permanency during periods of drought (SKM, 2007; DCCEEW, 2017). Generally, flow alterations have caused a reduction in fish habitat, water volumes, increased fluctuations in water levels, the stranding of adults, egg desiccation and changes to lungfish movement alongside the permanent inundation of habitat (DCCEEW, 2017).
Modifications of geomorphology within Mary River	Medium (Australian Government 2016)	The reduction of undercuts and deep pool habitats by modifications which have the capacity to alter sediment regimes which can fill lungfish habitat with sediments and decrease breeding habitat (Australian Government, 2016). Impacts on riffle habitat can adversely affect macrophytes which are often located near riffles. The destruction of macrophytes can reduce this important breeding habitat for this species (Australian Government, 2016).
Invasive Species		
Spread of invasive macrophytes	Medium	Invasive macrophytes may outcompete native macrophyte species preferred by lungfish such as *Hydrilla* and *Vallisneria*. Flood events or other impacts may clear native macrophyte populations and inhibit the recovery of these species due to rapid reclamation by invasive weed species. However, the Australian lungfish has been known to spawn on some introduced macrophytes such as para grass and water hyacinth (Kemp, 1984; Brooks and Kind (2002).
Grazing disturbance on riparian vegetation	High	Grazing disturbances on stream banks by cattle prevents native riparian vegetation from regenerating (Simpson & Jackson, 1996). This vegetation provides cover along the stream channels (Kind, 2002).
Resource competition and predation from exotic fishes	Medium	Exotic species known to inhabit Mary River system such as Tilapia (*Oreochromis mossambica*), (DCCEEW, 2022b; Pusey et al., 1993) can possibly

Threat Factor	Threat Ranking Adapted From DCCEEW (2017)	Evidence Base
		compete with lungfish for food and habitat. Tilapia may also have the capacity to prey on lungfish eggs (DCCEEW, 2022b).
Resource competition from translocated native fish	Medium	Translocated native species may compete with lungfish such as golden perch (*Macquaria ambigua*), silver perch (*Bidyanus bidyanus*) and saratoga (*Scleropages leichardtii*). Golden perch, which are ambush predators, may overlap in diet and space with adult lungfish which are also ambush predators.
Water Quality		
Water quality disturbances	High	Water quality reductions for parameters such as temperature, pH, dissolved oxygen, conductivity, and toxins can impact egg development and lungfish growth. Lungfish are susceptible to changes in salinity due to their intolerance of saline waters (DoEE, 2017). Turbid conditions can smother and kill eggs of lungfish, with sediment also smothering macrophyte beds, a vital spawning habitat for lungfish. Low levels of dissolved oxygen may also lead to adverse impacts on lungfish eggs and larvae (DCCEEW, 2017). Waters drawn from impoundments are considered to be potentially detrimental for lungfish due to the low oxygen levels, reduced temperatures found in deeper sections (DCCEEW, 2017).
Overfishing		
Overfishing	Medium/Low	Lungfish are known to be captured incidentally in recreational fishing, with illegal takes also occurring for human or pet consumption (S. Brooks pers. Comm. 2012). Abandoned carcases have also been found on riverbanks (Kind, 2002).

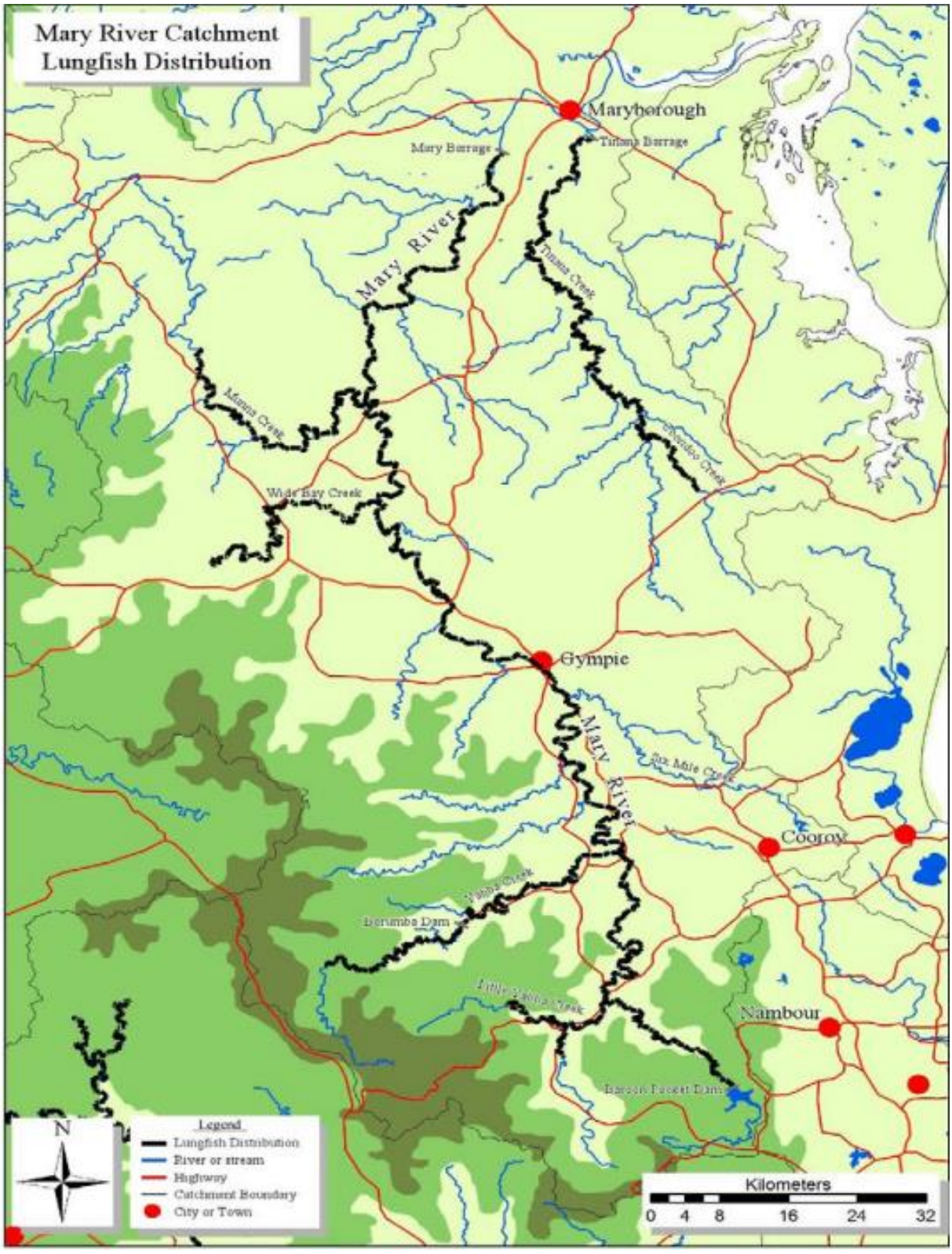


Figure 4-14 Map of lungfish distributions within Mary River catchment (DCCEEW, 2017)

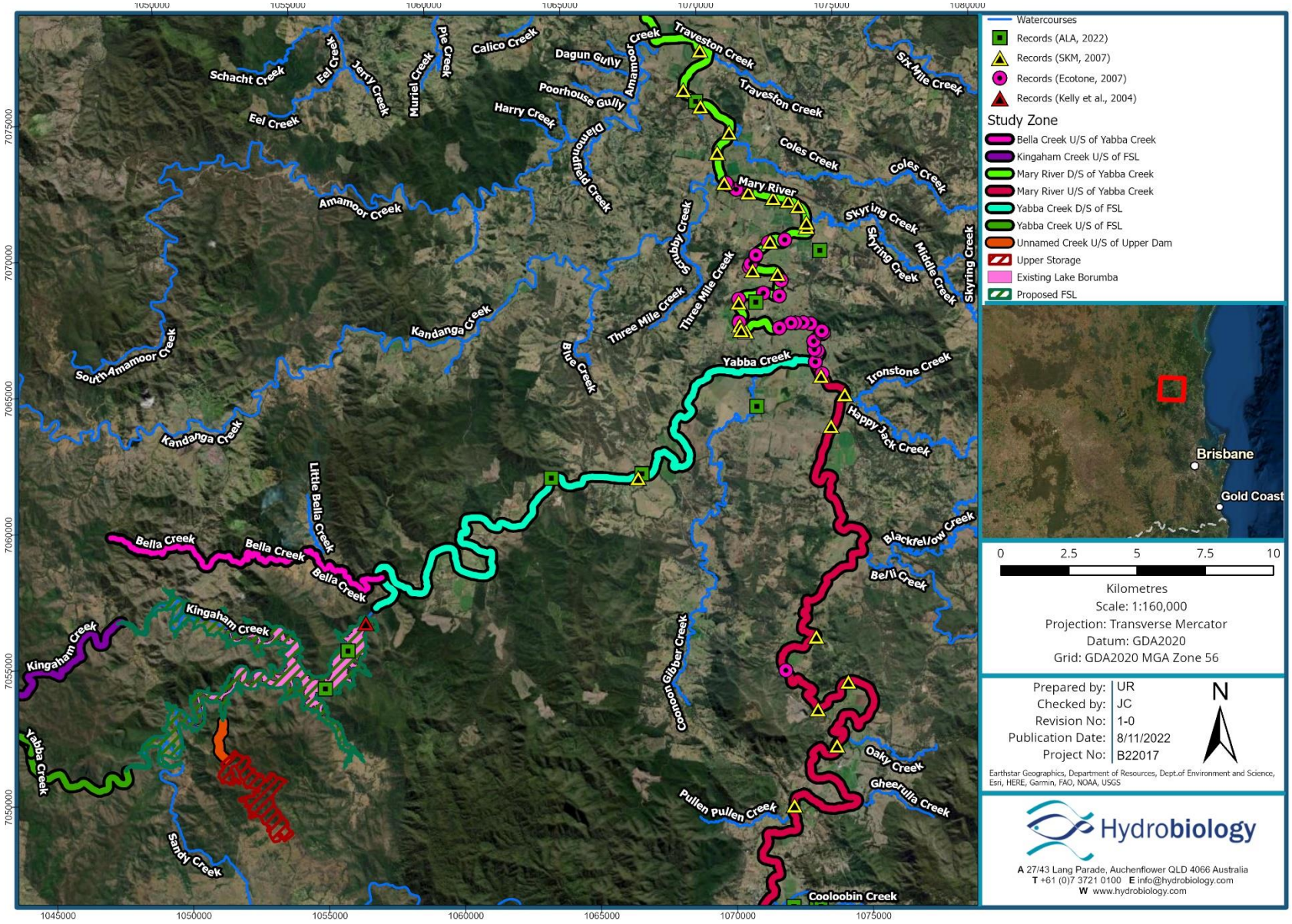


Figure 4-15 Australian Lungfish records within the Study Area and surrounds

FRESHWATER TURTLES

Based upon data and literature provided by DES (2022), Limpus (2008), SKM (2007) a total of six turtle species are known to occur in Mary River catchment including both the White-throated snapping turtle (*Elseya albagula*) and Mary River turtle (*Elusor macrurus*) being of conservation significance (Table 4-12). This is a high biodiversity of freshwater turtles in the context of the Australian fauna.

White-throated snapping turtle and Mary River turtle are described below.

Table 4-12 Freshwater turtles recorded in the Upper Mary River sub-basin

Species	Common name	Status (EPBC / NC Act)
Elusor macrurus	Mary River turtle	EPBC: Endangered NCA: Endangered
Wollumbinia latisternum	saw-shelled turtle	EPBC: N/A NCA: N/A
Chelodina expansa	broad-shelled turtle	EPBC: N/A NCA: N/A
Chelodina longicollis	Eastern snake-necked turtle	EPBC: N/A NCA: N/A
Emydura macquarii krefftii	Krefft's turtle	EPBC: N/A NCA: N/A
Elseya albagula	White-throated snapping turtle	EPBC: Critically Endangered NCA: Critically Endangered

White-throated snapping turtle

The white-throated snapping turtle (*Elseya albagula*) is listed under the EPBC and NC Acts as critically endangered. The recommendation for this status (DotE, 2014) was due to the recruitment rate of the breeding population dropping to approximately 1% each year.

The main causes of the reduction in population are predation of eggs, nest bank trampling, lack of suitable nesting habitat and infrastructure (dams and weir structures) causing the fracturing of important populations. The occupancy area of the white-throated snapping turtle is estimated to be less than 500 km^2 and the turtle is found only in the Fitzroy, Burnett and Mary River catchments (DotE, 2014).

Known as one of the largest short-necked freshwater turtles in Australia, the white-throated snapping turtle can grow up to 42 cm in length and can weigh up to 5 kg reaching maturity at around 15-20 years of age.

Diet

The white-throated snapping turtle is classified as a benthic foraging species with a broad diet with mature adults being primarily herbivorous and juveniles, carnivorous. However, various variables can affect the diet such as; gender; season; and impoundment of streams.

According to a study based on the analysis of the stomach contents and faecal matter of the turtle the diet of the adults largely consists of fruit and buds of riparian vegetation (*Livistona, Ficus, Syzygium, Celtis chinensis* and *Castanospermum austral*), macrophytes (*Vallisneria, Schoenoplectus, Spirogyra,* and

Nitella) and terrestrial plant leaves and stems (*Mougeotia*) (Rogers, 2000; Armstrong & Booth, 2005; Thomson et al., 2006; Limpus et al., 2011). Adults are known to occasionally feed on carrion, cane toads, insect larvae, and freshwater sponges (Thomson et al., 2006; Hamann et al., 2007). The juvenile snapping turtles feed largely on benthic invertebrates. However, according to a stable isotope analysis it was found that female snapping turtles primarily assimilate carbon from filamentous algae and crustaceans (Micheli-Campbell et al., 2017). Interseasonal variability can also significantly change the diet of the turtle; extended dry periods or significant flooding can impact the availability of macrophyte beds therefore limiting food resources for the turtle. During times of limited food resources, the females are able to reabsorb developing yolk instead of producing eggs. They also consume filamentous algae and submerged terrestrial grass during these times (Hamann et al., 2007).

While studies differ, it is noted that the majority of the mature snapping turtles diet consists of macrophytes and other vegetation while the juvenile diet consists of benthic macroinvertebrates.

Habitat

The preferred habitat of the white-throated snapping turtle is clear, flowing well-oxygenated waters. Increased suspended sediment inhibits the turtle's ability to utilise dissolved oxygen through cloacal respiration (Schaffer et al., 2015). While this habitat is preferred, they are known to inhabit both clear and turbid waters with varying depths and flow rates. According to Fitzroy and Mary River catchment records, the white-throated snapping turtle is regularly associated with shallow riffle zones at night and submerged logs and log jams during the day (Tracey, 2017).

Permanent water bodies are extremely important to this species, as it has not yet been recorded in temporary systems. A strong preference for certain microhabitats is exhibited in the catch records such as undercut banks/overhanging banks, mid or high density of log jams/submerged boulders, overhanging riparian vegetation, and high cover of macrophytes (Hamann et al., 2007). However, juveniles are known to occupy shallow waters (1 m deep) where no log cover is available, and macrophyte beds are present.

Historically it was believed that impoundments provided little habitat for the white-throated snapping turtle. It has since been confirmed that the shallow wetted areas which also contain macrophyte cover provide suitable habitat for this species (C, Limpus, personal communication 2022). Individuals have also been found to inhabit impoundments in Mary catchment including Borumba Dam, Tallegalla Weir, Imbil Weir, and Mary River Barrage (Limpus, 2008).

The National Recovery Plan for White-throated Snapping Turtle Commonwealth of Australia, (2020) dictates that the following areas are to be regarded as representing habitat critical to the survival of the species:

- Parts of riverine systems with permanent water, including pools, within the species' distribution that contain shelter and refuges (e.g. bank overhangs, overhanging riparian vegetation, macrophyte beds, moderate to high densities of submerged boulders and/or log jams); and
- All currently known and new aggregated nesting sites (all nesting sites should be considered to be part of an aggregation unless it can be demonstrated otherwise).

The plan notes that further research is required to more clearly define the habitat critical to survival of the species, particularly for juveniles and hatchlings.

Movement

The species reportedly maintains small home ranges, commonly moving over distances of less than 1 km with uncharacteristic movements of close to 10 km being recorded (Commonwealth of Australia, 2020). However, C. Limpus, (personal communication (2022) stated that the species has a home range of up to 80 km. The turtle is most active during dusk and dawn with frequent entry into shallow rapid habitats and deeper pools. Movements between different depths may also occur in response to seasonal conditions, e.g. during dry periods the turtles move into deeper pools which function as dry season refugia (Limpus et al., 2011).

Nesting

This species nests from autumn through to early spring, with peak activity between May and July, with hatching occurring in early summer (December-January) (Hamann et al. 2007). Once reaching sexual maturity at 15-20 years, females are presumed to breed annually, unless unable to from injuries or weakness, or habitat-based factors such as a loss of riverine habitat due to drought or water extraction (Commonwealth of Australia, 2020). During the breeding season, shallow nests are constructed on alluvial and loam banks deposited by flood waters on a range of soil types from sand to dark clay/loam (Hamann et al., 2007). A single clutch of eggs is laid with an average of 14 eggs in a clutch (Hamann et al., 2007; Limpus, 2008; Limpus et al., 2011).

While nests occur in sandy-loam banks, they also can occur in loose or compact soils (Hamann et al., 2007; Limpus et al., 2011). Ranging from 1-86 m from the water's edge, nests are shallow with an approximate depth of 23 cm on sloped banks with an average slope of 27°. Nesting occurs in aggregations at particular sites with individuals being known to repeatedly nest within the same area for decades (Hamann et al., 2007; Limpus et al., 2011). Known nesting along Upper Mary River is limited; however there is a single confirmed record of the species nesting approximately 3 km downstream of the confluence of Yabba Creek and Mary River. Another record exists from Limpus, (2008) which reports that the species has been recorded nesting within Imbil Weir, along Yabba Creek, approximately 12 km downstream of Borumba Dam. The recording is support with data or any further information provided, furthermore, the included map of recorded nesting sites for this species fails to include a point at Imbil Weir.

Distribution

Endemic to the Burnett, Mary and Fitzroy Rivers with a total possible occurrence of approximately 3,300 km (Hamann et al., 2007). However, the white-throated snapping turtle is only known to occupy less than an estimated 500 km^2 (DotE, 2014). There are numerous areas within each catchment where the species is abundant. All areas with high abundance/densities represent important populations, as threats impacting them could result in high losses. Populations can be fragmented due to several impacts/threats including infrastructure development such as dams and weirs. As individuals can be abundant in impoundment areas, and some may move over or around such infrastructure, the species' distribution is not considered severely fragmented (DotE, 2014).

Confirmed sightings with respect to the Study Area include recordings in Yabba Creek below the dam and recordings on Yabba Creek downstream of the Bella Creek confluence and upstream from Imbil. A project for the dewatering of the Borumba Dam plunge pool (Kelly et al., 2004) undertaken directly below the Borumba Dam spillway on Yabba Creek recorded 17 individuals of *Elseya albagula*. Limpus, (2008) provides data that indicates Yabba Creek below the Borumba Dam wall to have higher percentages of immature (35%) individuals to adults (65%) in contrast to those within Mary River of 18% immature and 82% adults. However, there were much lower abundances recorded within Yabba Creek in contrast to Mary River.

Within Bella Creek a record exists approximately 4 km upstream of the confluence with Yabba Creek. Within Lake Borumba a record from recent field survey was noted along the Kingaham creek branch (Gatfield D, visual observation in 2022, not confirmed). An individual has been recorded along Kingaham Creek upstream of Lake Borumba (Limpus, 2008) (Figure 4-16). With regards to Mary River, records exist for upstream and downstream of the confluence with Yabba Creek.

Threats

Historically the causes of the decline of this species are attributed to the loss of eggs due to various predators and nest bank trampling by livestock. The population size has also declined due to river regulation and infrastructure for agricultural and industrial uses.

Table 4-13 details known and potential threats impacting white-throated snapping turtle, largely being adapted from the National Recovery Plan for white throated snapping turtle (Commonwealth of Australia, 2020).

Table 4-13 Known and potential threats impacting the white-throated snapping turtle, based on available evidence.

Threat Factor	Threat Severity Ranking Adapted From Commonwealth of Australia, (2020)*	Evidence Base
Habitat Loss and Fragmentation		
Trampling at nesting sites	1	Egg loss is continuing and has been occurring for at least a generation, with the majority of the population comprised of older adults with very low recruitment into the adult breeding population. The trampling is caused mainly by animals such as cattle and pigs as well as human impacts.
In-stream barriers	2	Impoundment structures can obstruct movement and prevent turtles returning to a section of river after being displaced (mostly in the order of a few tens of kilometres) by a flood or overtopping event. Existing structures which facilitate fish passage past dams/weirs are not effective for facilitating the passage of the white-throated snapping turtle (Hamann et al., 2007; Limpus et al., 2011). Road causeways can also impede the movement of turtles along waterways due to excessive flow velocities (Limpus et al., 2011). Turtles may be injured or killed on impoundment structures when they strike hard surfaces during overtopping (from flood events and water releases), drown in trash filter screens, or fall back onto hard substrate during attempts to climb infrastructure walls
Invasive Species		

Threat Factor	Threat Severity Ranking Adapted From Commonwealth of Australia, (2020)*	Evidence Base
Predation of eggs	1	Predation by feral (fox, dog, pig, cat) and native (e.g. goanna, water rat) predators is a great impact on eggs and emerging young.
Water Quality		
Degradation of habitat and water quality	2	Habitat has been degraded through various processes including the clearing of riparian vegetation, slumping of stream banks, increased sedimentation loads in rivers, damage to stream banks and shallow water macrophyte beds from cattle and vehicle crossings, increased nutrient loads from agricultural runoff and faecal deposition from domestic stock. Increased sedimentation and turbidity can inhibit cloacal respiration in turtles, particularly juveniles, and reduced habitat availability and water quality is likely to expose juveniles to increased predation (Schaffer et al., 2015).
Climate change	3	Higher water temperatures and associated decreased dissolved oxygen levels may decrease the species' diving duration, exposing it to increased predation pressure (Mathie & Franklin, 2006). An increase in water temperature raises metabolic rate and oxygen demand; dives of juvenile turtles become significantly shorter (i.e. surfacing frequency increased) when water temperatures were increased from 20°C to 30°C (Storey et al., 2008). Extended drought periods can be combated through impoundments which can maintain water during droughts while also releasing water to replenish and reconnect rivers to prevent habitat loss and maintain river connectivity for species. This can prevent a cessation of flow within the river during longer droughts. Areas outside of dam influence may experience low or no flows during drought periods which can be associated with a reduction in water quality; reductions in breeding rates due to an inability to access nesting banks, which is presumed to increase mortality of turtles (Limpus et al., 2011); and a reduction in in-stream vegetation (Hamann et al., 2007).
Overfishing		
Fishing and boating activities	3	Direct impacts from recreational fishing result from hooking injuries to the mouth and throat, or mortality when turtles are cut loose from fishing

Threat Factor	Threat Severity Ranking Adapted From Commonwealth of Australia, (2020)*	Evidence Base
		lines, break away with ingested hooks, or drown in fish or crayfish traps (Limpus et al., 2008)

* Threat Severity Ranking based in order of 1 – 3 with 1 being the highest and 3 the lowest in threat.

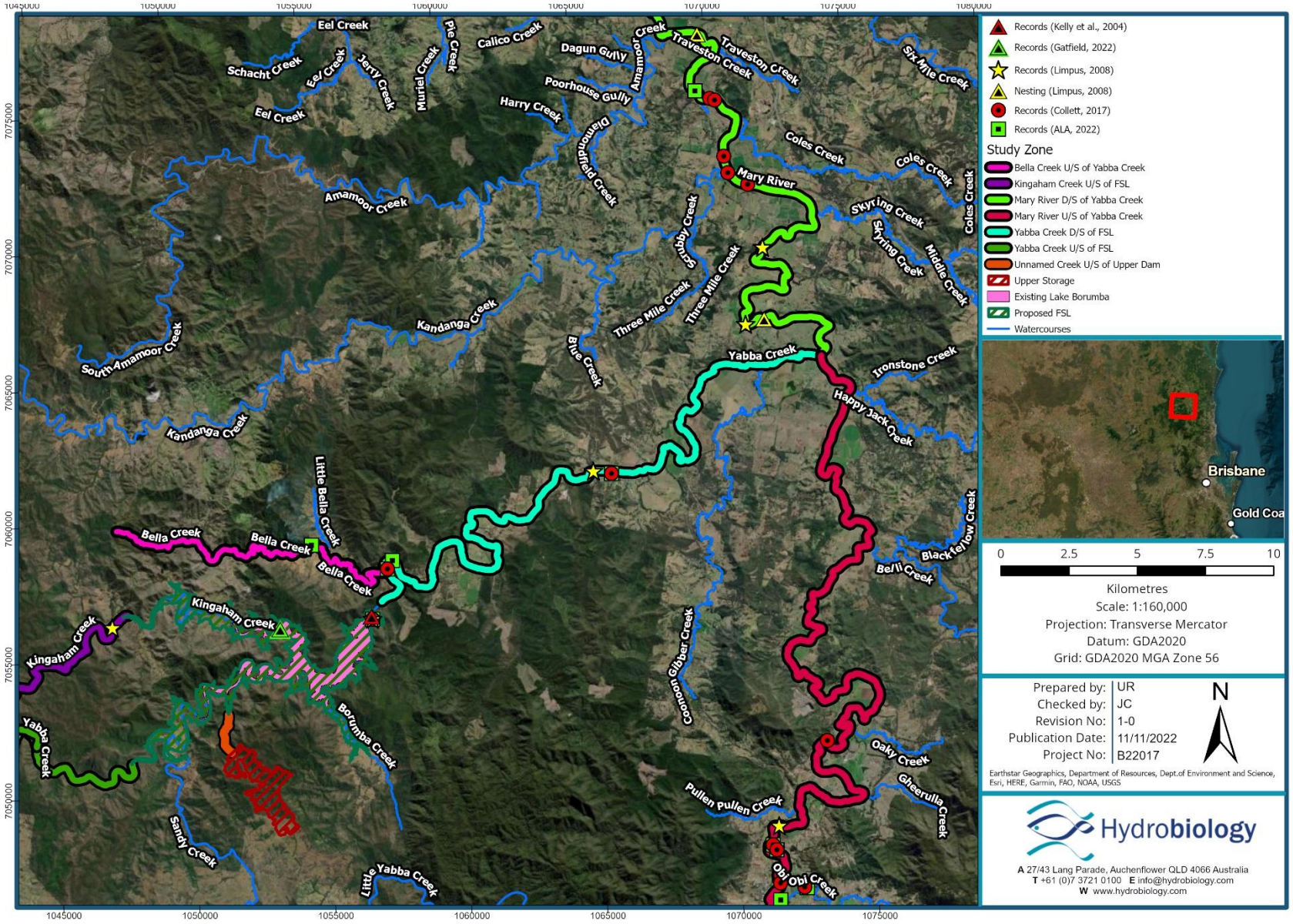


Figure 4-16 White-throated snapping turtle records within the Study Area.

Mary River turtle

Mary River Turtle (*Elusor macrurus*) is listed as endangered under the EPBC and NC Act. There is no species recovery plan; however we note a draft Mary River Threatened Aquatic Species Recovery Plan, which includes Mary River. The species is one of the largest freshwater turtles in Queensland and displays atypical chelid sexual dimorphism, with the adult female being smaller than the adult male. The species has the largest males amongst chelid turtles in Australia. Adult males also have extremely large tails compared to those of other species (Limpus, 2008). The species is iconic, being one of five Queensland species of turtle with well-developed bimodal ventilation – using gas exchange from the air by the lungs and from the water by an elaborate cloacal gill system (Limpus, 2008).

The turtle was subject to intense egg harvest for producing hatchling turtles, "penny turtles", for the pet trade in the 1960s through to 1974 when the species was protected under the *Fauna Act 1974* with a corresponding cessation of the trade (Cann, 1998; Flakus, 2002). It is estimated that there has been an approximate 95% decline in the size of the annual nesting population at a major nesting site (Tiaro, Mary River) from the 1960s to the late 1990s.

Diet

Adult Mary River turtles are primarily herbivorous and feed on a range of macrophytes as well as the fallen fruits of riparian trees including figs, lillypilly and black beans (Flakus, 2002). Macrophytes make up approximately 79% of the turtle's diet, the most significant species being *Vallisneria* sp., *Myriophyllum* sp., *Cabomba caroliniana, Eloda canadensis, Hydrilla verticulata,* and *Nitella* sp. Macroinvertebrates are also an important staple of the juvenile turtles diet.

Habitat

Like other turtles with cloacal respiration, Mary River Turtle occurs in flowing, well oxygenated sections of streams. Its habitat consists of riffles and shallow stretches alternating with deeper, flowing pools. Limited data on juveniles suggest that they occur in rocky areas with sand or gravel on the river bed, in a variety of water depths (Flakus, 2002). Adults can be found in areas with underwater shelter, such as sparse to dense macrophyte cover, submerged logs and rock crevices.

Mary River Turtles move upstream during times of high flow or flooding and position themselves in backwaters or eddies until the flow returns to normal, when they return to their usual home ranges (Flakus 2002).

Mary River Threatened Species Recovery Plan, Australian Government, (2016) lists the following to be of key habitat for the survival, breeding and connectivity of Mary River turtle.

- In-stream basking rocks and logs;
- A temperature of less than 30°C in suitable nests along the bank;
- Undisturbed sand banks that are available above the heightened water level during the nesting season;
- Deep pools between 1-5 m or above within rivers with high dissolved oxygen concentrations alongside instream macrohabitat of riffles and shallow stretches;
- A variety of instream microhabitat including macrophytes, algae, submerged logs, small woody debris (twigs and sticks), and submerged trees. Alongside food sources of invertebrates and crustaceans; and
- Flowing, and oxygenated streams alongside portions of slow moving, and shallow water upstream and downstream of riffles for juvenile individuals.

Movement

The limited radio tracking data (Flakus, 2002) indicated that Mary River turtle will migrate variable but short distances from a foraging area to aggregate at traditional nesting banks – and return to the same foraging areas after the breeding season. During the non-breeding season, the length of the home range used was 200 to 650 m with an average distance of 192 m moved per day.

Nesting

Nesting is in the spring/summer months (October-December) and this species aggregates for nesting on traditional nesting banks known as clutch sites that are revisited across multiple years (Cann, 1998; Flakus, 2002). While there are numerous sand banks occurring throughout Mary Catchment, no nesting has been recorded at the majority of them (Limpus, 2008).

Rainfall has been recognised as an environmental trigger for nesting in Mary River turtle and many other Australian freshwater turtles. This is due to the rainfall providing moisture to bank substrate which allows for nest building and the subsequent flow in the system connecting instream habitats within a watercourse (Bowen et al. 2005; Booth 2010).

Van Kampen et al. (2003) determined that protected and undisturbed nests had a high proportion of eggs hatching with 81.6% reportedly hatching and 78.4% of hatchlings travelling into water. However, a large number of nests are preyed upon by feral predators, goannas, water rats, and trampled by cattle (Flakus, 2002; Tiaro and District Landcare Group Inc. 2005; Connell and Wedlock, 2006; van Kampen et al. 2003). From the above studies, Limpus (2008) had determined that in the absence of nest protection, 100% of eggs will likely be destroyed by cattle and predators, at a minimum within the mid to lower sections of Mary River Catchment.

Several areas of Mary River Turtle nesting sites have been identified along Mary River with the closest to the Study Area being approximately 3 km downstream of the confluence between Yabba Creek and Mary River. Another record is detailed in Limpus (2008), which reports that the species has been recorded breeding within Imbil Weir, along Yabba Creek, approximately 12 km downstream of Borumba Dam. The definition is ambiguous as to whether breeding indicated copulation or nesting within the site. Regardless, the included map of recorded nesting sites fails to include a point at Imbil Weir, similar to that of locations mapped by Limpus (2008) for the white-throated snapping turtle. Others exist slightly upstream of the confluence approximately 7 and 10 km away. Within the Study Area, the majority of nesting sites occur along Mary River between Traveston and Coles Creek (Figure 4-18).

For the majority of the nesting, the turtle lays its eggs into alluvial deposits of sand or loam, usually within 6 m of the water (Van Kampen et al., 2003). These alluvial banks are reworked with each significant flooding event. They dig nests in sparsely vegetated sandy banks, between 2 – 51 m from the water's edge and on both steep and shallow slopes, either protected or unprotected by vegetation.

Distribution

Found naturally only within Mary River catchment Mary River turtle primarily occurs in the mainstream Mary River and major tributaries, including Tinana Creek, Yabba Creek and Obi Obi Creeks. The turtle occurs from the downstream freshwater limits within Mary River Barrage up into the upstream mountain reaches above Kenilworth in the upper catchment. The species has not been recorded within any dams of Mary River Catchment (Baroon Pocket Dam, Borumba Dam, Six Mile Creek Dam, or Cedar Pocket Dam). However, no known targeted surveys have occurred within the dams with the exception of Six Mile Creek Dam in which no Mary River turtles were detected during surveys (SMEC, 2019). Limpus, (2008) also claims that no individuals of the species were detected within Borumba Dam or further upstream of Yabba Creek. However, the study makes these claims

with no surveys being undertaken in either Borumba Dam or Yabba Creek upstream of the dam (see Figure 4-17 for study sites undertaken by Limpus (2008). Within the Mary River, abundances are highest in upstream reaches (Connell, 2018).

The species is however, known to occur in the permanent stream and large pool habitats, and weirs of Mary River Catchment (Limpus, 2008).

Confirmed sightings with respect to the Study Area include records throughout Mary River and within Yabba Creek, approximately 15 km downstream of Lake Borumba. A project for the dewatering of the Borumba Dam plunge pool undertaken directly below the Borumba Dam spillway on Yabba Creek by Kelly et al., (2004) recorded an undefined number of Mary River turtle. Mary River turtle has not been surveyed within Lake Borumba or upstream (Figure 4-18).

Threats

The main identified threats to Mary River Turtle include predation and lack of recruitment as well as the decline in water quality. Other impacts such as changes in hydrology and streamflow due to dams and weirs; and habitat loss/degradation through soil and water pollution, invasive weeds are considered to be less of a threat (TSSC, 2008).

Table 4-14 details known and potential threats impacting Mary River turtle. Predation and trampling of nests are considered to be the greatest threat (very high ranking) to this species.

Table 4-14 Known and potential threats impacting Mary River Turtle, based on available evidence.

Threat Factor	Threat Ranking Adapted From Australian Government, (2016)	Evidence Base
Predation		
Animal Predation	Very high	Hatching success in the wild continues to be very low. Predation by feral (fox, dog, pig, cat) and native (e.g. goanna, water rat) predators is a great impact on eggs and emerging young.
Trampling of nests	Very high	Trampling is caused mainly by feral animals such as cattle and pigs as well as human impacts. Cattle trampled all nesting sand banks monitored by Flakus (2002) in 1997 and 1998, but in these cases the eggs were buried deep enough to escape damage. Cattle trampling damaged the anti-predator screen over one nest in 2002 (Van Kampen et al. 2003).
Infrastructure Development		
Decline in water Quality	High	The preferred habitat of this species (and of other turtles with cloacal respiration) is flowing water with plenty of dissolved oxygen throughout (Thomson 2006; Tucker 1999).
Dam and weirs	Medium	Turtles can be injured or killed by abrasion and shearing against the spillway face when they pass over the top of dam walls during high water flows.

Threat Factor	Threat Ranking Adapted From Australian Government, (2016)	Evidence Base
Increased predation on juveniles	Medium	The decline in water quality reduces the time that turtles with cloacal respiration can spend diving for food and increases exposure of juveniles to predators when they surface frequently to breathe (Franklin and Priest, 1999). This is likely to be exacerbated by the lack of protective cover, as macrophyte density is reduced in dams.
Decline in food quality and availability	Medium	The aquatic insect larvae that juvenile Mary River turtles eat rely on shallow riffle habitat, so they are absent or nearly absent from impoundments (Tucker et al., 1999). Adult turtles eat mainly macrophytes, which are severely reduced or lost when impoundments are created and when their water levels fluctuate. Flooding washes away macrophyte beds, and turbid (muddy) flows smother recovering macrophytes Tucker et al. (1999).
Nest site loss, and loss of access to traditional nesting areas	Medium	Nesting habitats for Mary River turtle are lost or reduced in size through flooding when dams and weirs are built, and conditions in impoundments do not create the sand banks needed for nesting.
Lack of access to refuge habitat during floods	Medium	Mary River Turtles move upstream to safer sites during floods, to protect themselves from being washed downstream of their home ranges. Dam walls block this movement (Flakus, 2002).
Decrease in Habitat Quality		
Damage to the riparian vegetation	Medium	Much of the vegetation surrounding the lower and middle sections of Mary River has been cleared for cropping and cattle grazing (Flakus, 2002; Tucker, 1999).
Erosion	Medium	Increased siltation and filling of deeper holes may have reduced the area of available habitat (Hauser et al., 1992).
Weed infestation	Low	Weed infestation can cause sand banks to become unsuitable for nesting. Weeds such as *Urochloa mutica*, *Lantana camara*, and thistles (species in the family Asteraceae) block the access of turtles to nesting banks. Weeds growing on the nesting banks can also kill eggs.

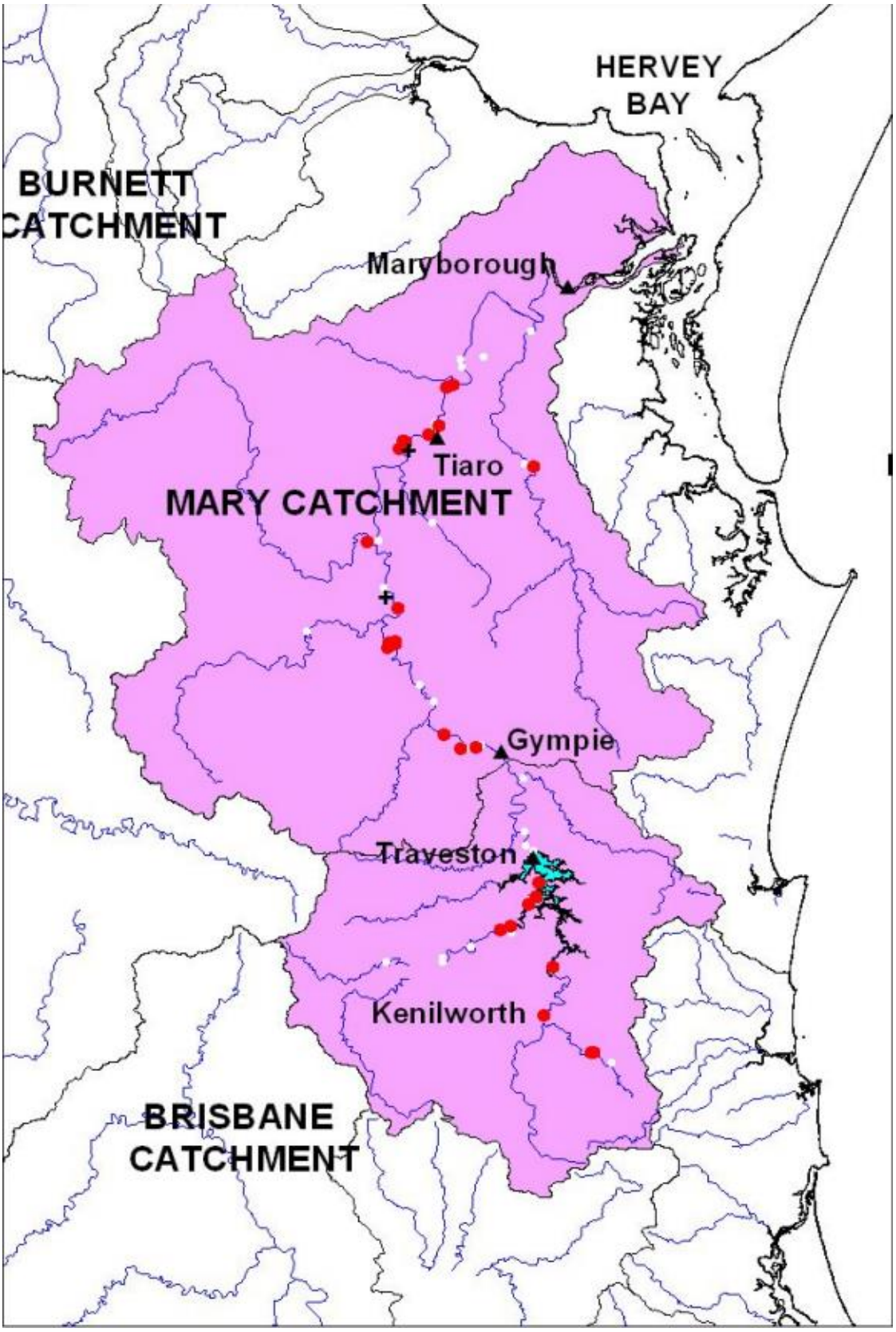


Figure 4-17 "Mary River turtle, *Elusor macrurus*: Distribution of recorded sites in Mary River Catchment. Red dots denote capture and/or observation records. White dots denote sites examined where the species were not recorded. Black crosses denote type specimen localities. These records were extracted from the freshwater turtle research database of the former EPA Queensland" (Limpus, 2008). The Traveston Crossing Dam does not exist.

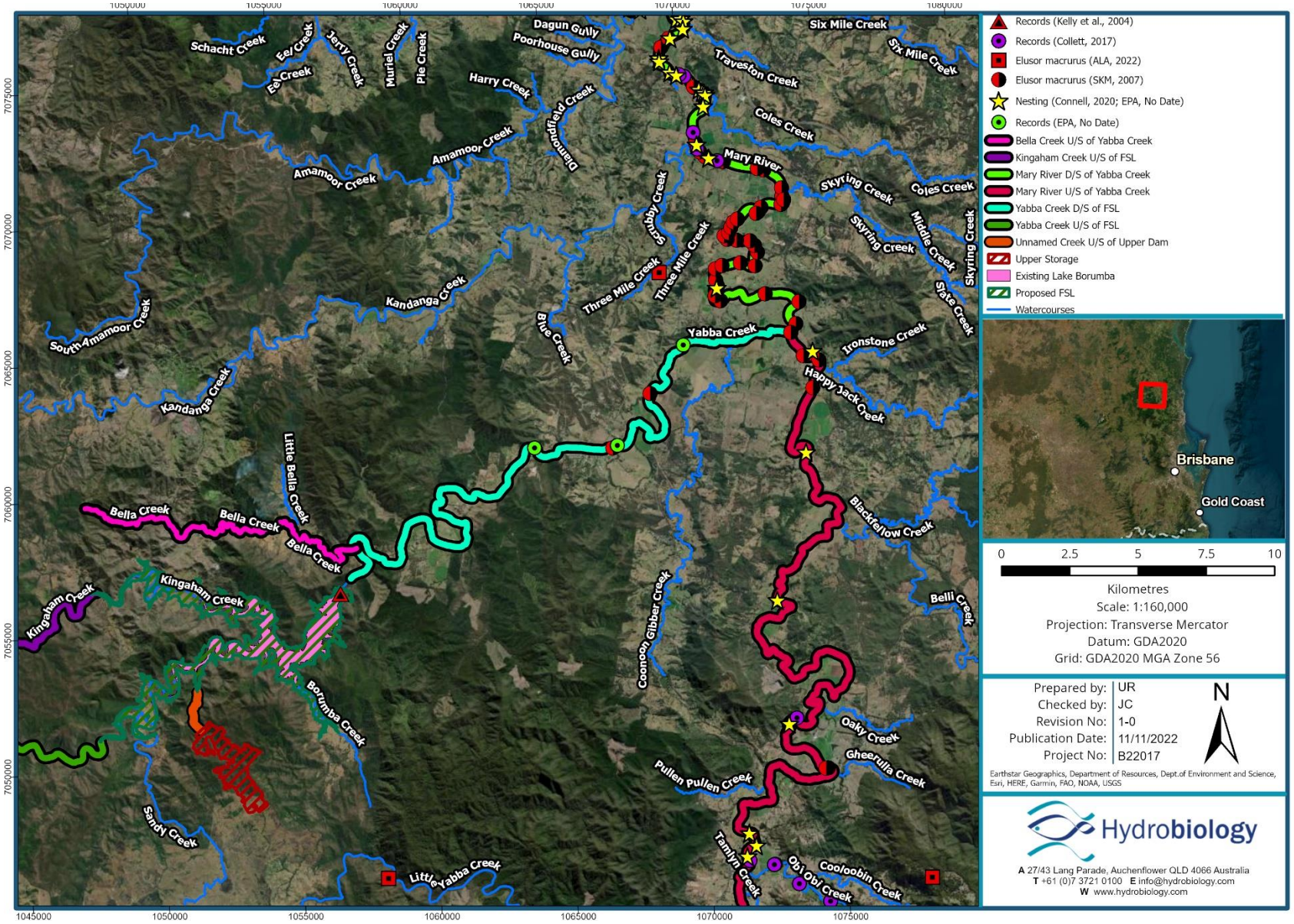


Figure 4-18 Mary River turtle records within the Study Area and surrounds

OTHER AQUATIC BIOTA

Other aquatic biota of interest include the NC Act listed special least concern platypus (*Ornithorhynchus anatinus*) and the EPBC and NC Act listed, vulnerable false water rat (*Xeromys myoides*). The platypus is known to occur within the Study Area and its surrounds. The false water rat however has not been recorded within the Upper Mary River Catchment (ALA, 2022) and is unlikely to inhabit the Study Area because the species is restricted to coastal areas with the nearest recording being approximately 170 km downstream of the Study Area as such, it will not be discussed further. (ALA, 2022) (Table 4-25).

Platypus

The platypus (*Ornithorhynchus anatinus*) is listed as special least concern under the NC Act for its cultural significance. The platypus is a semi-aquatic monotreme that is the only living species of the Ornithorhynchidae family. It is both morphologically and evolutionarily unique, which has led to platypus being recognised as one of the most iconic and distinct living mammals (Grant & Fanning, 2007). The platypus is primarily known for its distinctive duck like bill, webbed feet, waterproof fur, and spurs on the rear legs of males. It also has the unique ability among mammals in their hunting method of electroreception, and reproduction through eggs shared only with echidnas (Grant & Fanning, 2007).

Diet

Platypuses are generally known to forage for the majority of each day and are primarily opportunistic, generalist carnivores predominately preying on seasonally abundant benthic macroinvertebrates and crustaceans that inhabit the riffle and pool habitats of watercourses. They have also occasionally been known to feed on tadpoles, small fish, snails, and worms (Bino et al., 2019; Grant, 2015).

Platypuses feed by moving along the substrate of lakes and streams and probing the material with their bill through the use of electroreception to detect prey. Platypus are known to exert both subtle and strong ecological effects on aquatic food webs through the suppression of freshwater macroinvertebrate prey abundance (Grant, 2015; McLachlan-Troup et al., 2020).

Habitat

Platypuses are mainly aquatic but are known to occasionally travel over land to move between river catchment and waterbodies. Platypuses are known to inhabit a range of freshwater habitats including permanent freshwater streams and stream banks, shallow lakes, ephemeral streams and isolated pools, wetlands, and artificial water sources such as weirs, storage lakes, artificial ponds, and farm dams. Platypuses are also known to occasionally inhabit caves and brackish areas of estuaries for nesting (Furlan et al., 2013; Grant, 2015).

Substrate composition is an important driver of platypus habitat quality with a substrate composition of pebbles, cobbles, gravel and other coarser rocks forming preferred habitats (Grant, 2004). Platypuses construct burrows above the water surface into the side of streambanks, generally preferring vegetation-consolidated banks of greater than 0.95 m in height (Brunt et al., 2018). Due to this, riparian vegetation is also known as a key platypus habitat driver with vegetation providing bank stability which is essential for platypus burrows (Serena et al., 2001).

Foraging

Adult platypuses are known to inhabit a territory of 0.5-15 km of a river system with males typically moving larger distances than their female counterparts (Bino et al., 2019). Platypuses are mainly active at night and shelter and burrow during the day, time spent outside of shelter is generally used for feeding. Platypuses will dive when foraging taking several short dives on average of 75 dives per hour when foraging (Grant, 2015).

Reproduction

Platypuses reach sexual maturity in the second breeding season following their independence, with breeding occurring seasonally through courtship, mating and nest building taking place in late winter to early spring, occurring earlier in northern Australia. Egg laying will occur between July and November with young leaving their burrows in December to April (Grant, 2015).

Eggs are incubated by a female within a nest in a burrow, gestation takes approximately 21 days with 1-3 eggs being laid each breeding season. Following hatching, the majority of rearing occurs within the nest over 120 – 140 days in captivity, but likely shorter in the wild. Platypus young feed by being nursed on milk from their mother (Grant, 2015; Thomas et al., 2018).

Distribution

The platypus is endemic to Australia, occurring across eastern Australia with the distribution of the platypuses occurring from Cooktown in northern Queensland to Tasmania, and South Australia. Within Queensland, platypuses generally inhabit eastern flowing watercourses with limited occurrences elsewhere throughout the state (Hawke et al., 2020). It is hypothesised that warm temperatures may limit the range of platypuses within northern Australia (Nicol, 2017).

Confirmed sightings with respect to the Study Area include recordings throughout Mary River and Yabba Creek, downstream of the dam but not in or upstream of Lake Borumba (Figure 4-19)

Threats

The key threats to platypus populations are the loss of riparian vegetation, urbanisation, water resource development, predation by invasive species, fishing by-catch, pollution, drought and flood, and climate change.

Land clearing is considered to be a significant threat to platypus habitat (Bino et al., 2019). Increases in urbanisation and agriculture have resulted in extensive clearing of vegetation which destroys riparian vegetation along streams which in turn reduces instream organic matter (Bradshaw, 2012; Evans, 2016). This has resulted in a decrease in available habitat for platypuses with a lack of riparian vegetation limiting suitability for burrows on banks and increasing sedimentation and turbidity (Hawke et al., 2020).

Water resource development such as the construction of dams and water extraction are significant threats to platypuses (Hawke et al., 2020). The existing Borumba dam could alter the flow regimes. This could potentially impact platypus abundances in Yabba creek below the dam. High dam walls such as Borumba can impede the ability of platypus to disperse which can in turn limit breeding opportunities and decrease genetic diversity (Furlan et al., 2012).

Climate change is a key threat impacting platypuses by impacting habitat suitability throughout their range. During dry periods, a reduction in flows and increases in temperature have been predicted to have impacts on the persistence of platypus within their northern, warmer ranges (Klamt et al., 2011). Scarcity of water can increase the risk of individuals to predation as they move between suitable habitats (Robinson, 1954). The predicted increased severity of droughts and floods is estimated to cause local extinctions within roughly 40% of the species range by the year 2070 (Klamt et al., 2011; Grant, 2015; Bino et al., 2020). Furthermore, distribution is expected to move south of Brisbane to its near entirety due to changes in climate with approximately 30% of suitable habitat to decrease by 2070 (Klamt et al., 2011).

Other threats include predation by introduced species such as dogs, feral cats and red foxes (Woinarski and Burbidge 2016; Grant & Fanning 2007) and capture in fishing traps which can result in drowning (Serena and Williams 2010).

EVNT SPECIES POTENTIALLY OCCURING IN THE STUDY AREA

The likelihood of species occurring was considered under four categories; (i) unlikely; (ii) possible; (iii) likely; and (iv) Known. The criterion used to define each category is provided in Table 4-15.

The habitat and distribution of threatened freshwater species detected by desktop searches is identified in Table 4-16 and maps of records for is provided in Figure 4-13, Figure 4-15, Figure 4-16, Figure 4-18, and Figure 4-19.

To summarise, the following threatened species were identified as having a potential or confirmed presence in the Study Area:

- Freshwater fish: two species;
- Freshwater turtles: two species;
- Mammals: a species;
- Freshwater crustaceans: two species; and
- Aquatic macrophytes.

Table 4-15 Criteria used for assigning likelihood of occurrences relevant to EVNT and special least concern species

Likelihood of occurrence category	Criteria
Unlikely	• No suitable habitat present.
Possible	• Suitable habitat present.
Likely	• Suitable habitat present; and • A record occurs nearby (5 km) in similar habitat.
Known	• Past records within the Study area

Table 4-16 Threatened Species – Likelihood of Occurrence.

Species	Status (EPBC / NC Act)	Distribution / Habitat	Likelihood of Occurrence
Freshwater Fish			
Neoceratodus forsteri **Australian lungfish**	EPBC: Vulnerable NCA: N/A	Naturally occurs in Mary and Burnett systems and introduced to the Brisbane River (Kemp, 2014). Requires clear or turbid, low-flow or still, vegetated, shallow pools to support spawning and feeding (Allen, 1989; Merrick & Schmida, 1984). Lungfish favour submerged logs, dense banks of aquatic vegetation, or underwater caves formed by bed scouring under submerged logs (Kemp, 1986). Mary River population utilises *Hydrilla* and *Vallisneria* macrophytes (Kind, 2002).	**Known**, species has been observed within the Study Area (SKM, 2007). Specifically, in Lake Borumba, Yabba Creek downstream of Borumba Dam and, Mary River (Figure 4-15).
Maccullochella mariensis **Mary River Cod**	EPBC: Endangered NCA: N/A	Naturally occur only in Mary River catchment. (Kennard, 2003) Inhabits high gradient, rocky upland streams to large, slow flowing pools with more silty substrata in lowland streams. Favour large logs and log piles, but also utilise small branches and undercuts (Simpson and Mapleston, 2002).	**Known**, species has been observed within the Study Area (SKM, 2007). Specifically, within Lake Borumba, Yabba Creek downstream of Borumba Dam, and Mary River (Figure 4-13).
Nannoperca oxleyana **Oxleyan Pygmy perch**	EPBC: Endangered NCA: Vulnerable	Species is restricted to coastal heath or "wallum" habitats from the Richmond River and coastal lakes near Evans Head in northern NSW, to the dune lakes between the Maroochy and Noosa River systems in South East Qld. It also occurs in similar habitats on Moreton, Fraser and North Stradbroke islands (SKM, 2007).	**Unlikely,** the closest population to the Study Area occurs in the Tinana and Coondoo Creek systems (Kennard, 2003). The species is located approximately 60 km north from the Study Area and has no (natural) freshwater connections to the Study Area.
Pseudomugil mellis **Honey blue eye**	EPBC: Vulnerable NCA: Vulnerable	Species is restricted to two disjunct areas of Wallum heathland in central and south-eastern Queensland. Inhabits somewhat acidic	**Unlikely,** closest population are Dismal Swamp 70 km northeast of Rockhampton, and then from lakes

Species	Status (EPBC / NC Act)	Distribution / Habitat	Likelihood of Occurrence
		(pH 4.4 – 6.8) clear or tannin-stained lakes, wetlands, and streams. Prefers muddy or sandy substrates in Wallum ecosystems with little or no flow. Favours dense submerged and emergent sedges or other macrophytes (Arthington & Marshall, 1993; Wagner & Jackson, 1993).	and streams around Tin Can Bay south to Tibrogargan Creek 45 km north of Brisbane. There are also no Wallum ecosystems located within the Study Area.
Freshwater Reptiles			
Elusor macrurus **Mary River turtle**	EPBC: Endangered NCA: Endangered	Naturally occur only in Mary River catchment primarily occurring in the mainstream Mary River and major tributaries, including Tinnana Creek, Yabba Creek and Obi Obi Creeks. Inhabits riffles and shallow stretches alternating with deeper, flowing pools. It generally does not occur in impoundments (Flakus, 2002).	**Known**, species has been observed within the Study Area (SKM 2007; Flakus, 2002). Specifically in Yabba Creek below Borumba Dam and in Mary River (Figure 4-18).
Elseya albagula **White-throated snapping turtle**	EPBC: Critically Endangered NCA: Critically Endangered	Endemic to the Burnett, Mary and Fitzroy Rivers (Hamann et al., 2007). Favours clear, flowing well-oxygenated waters, turbid waters are highly unfavoured but is known to inhabit both clear and turbid waters with varying depths and flow rates (Schaffer et al., 2015). Inhabits shallow riffle zones at night and submerged logs and log jams during the day (Tracey, 2017). Has only being observed in permanent waterbodies has not yet been recorded in temporary waterbodies. Prefers undercut banks/overhanging banks, log jams/submerged boulders, overhanging riparian vegetation, and high macrophyte coverage (Hamann et al., 2007).	**Known**, species has been observed within the Study Area (SKM 2007). Specifically Kingaham Creek, within Lake Borumba, in Yabba Creek below Borumba Dam, , Bella Creek, and in Mary River (Figure 4-16).

Species	Status (EPBC / NC Act)	Distribution / Habitat	Likelihood of Occurrence
Crocodylus porosus **Salt-water crocodile**	EPBC: Migratory, NCA: Vulnerable	Inhabits swamps, coastal rivers, estuary mouths, inland rivers and open sea (Wilson & Swan, 2003).	**Unlikely,** species has not been observed within the Study Area, records exist along the coastline, approximately 40 km east of the Study Area with no connection to the Study Area. The nearest record with connection to the Study Area is 170 km downstream of the Study Area within the Lower Mary River in estuarine and riverine environments (ALA, 2022).
Crustaceans			
Tenuibranchiurus glypticus **Swamp crayfish**	EPBC: N/A NCA: Endangered	Endemic to Qld, found in highly fragmented habitats with a very restricted distribution from Woodgate QLD to South Brisbane. Inhabits the edges of paperbark wallum swamps and shallow drainage channels, rarely moving into open pools of water. Favours damp clay to which to burrow into but can also be occasionally found in peaty sand (Coughran, Dawkins, & Furse, 2010).	**Unlikely**, species has been observed within 5 km of S19 on Mary River, but no suitable habitat is present within the upper Mary River (ALA, 2022) (Figure 4-19).
Euastacus hystricosus **Conondale spiny crayfish**	EPBC: N/A NCA: Endangered	The species is known to be restricted to montane and highland streams boarded by sclerophyll forest or rainforest (Smith et al., 1998). The species is restricted to aquatic habitats with adults burrowing into banks under large rocks with openings both below and above the surface. Juvenile individuals were generally found in shallow pools, sheltering under crevices, logs or rocks (Smith et al., 1998).	**Known**, species has been observed within the surrounds of the Study Area, within 100 m upstream of the proposed Lake Borumba FSL and approximately 800 m upstream of the existing FSL (ALA, 2022) A record also exists from the Queensland Museum along Moy Pocket Road within Mary River, approximately 2.5 km upstream of S19, this location would be uncharacteristic for the species due

Species	Status (EPBC / NC Act)	Distribution / Habitat	Likelihood of Occurrence
			to their montane restriction (ALA, 2022) (Figure 4-19)
Mammals			
Ornithorhynchus anatinus **Platypus**	EPBC: N/A NCA: Special Least Concern	The platypus is endemic to Australia, generally being limited to eastern Australia. Within Queensland, platypuses generally inhabit eastern flowing watercourses with limited occurrences elsewhere throughout the state (Hawke et al., 2020). They are known to inhabit permanent freshwater streams and banks, shallow lakes, ephemeral streams and isolated pools, wetlands, and artificial water sources. Platypuses are also known to occasionally inhabit caves and brackish areas of estuaries for nesting (Furlan et al., 2013; Grant, 2015).	**Known**, species has been observed within the Study Area (ALA, 2022). Specifically, within Yabba Creek downstream of Borumba Dam, and Mary River (Figure 4-19).
Xeromys myoides **False water rat**	EPBC: Vulnerable NCA: Vulnerable	Within south-east Queensland the species inhabits upper tidal areas in mangroves, grasslands, freshwater wetlands and sedgelands (Van Dyck & Durbidge 1992; Van Dyck 1997; Van Dyck & Gynther 2003).	**Unlikely,** Suitable species habitat in present within Lake Borumba. However, the species is restricted to coastal areas with the nearest recording being approximately 50 km to the east of the Study Area with no connection. No records have occurred within the Upper Mary, the closest connected reference to the Study Area is the approximately 170 km downstream.

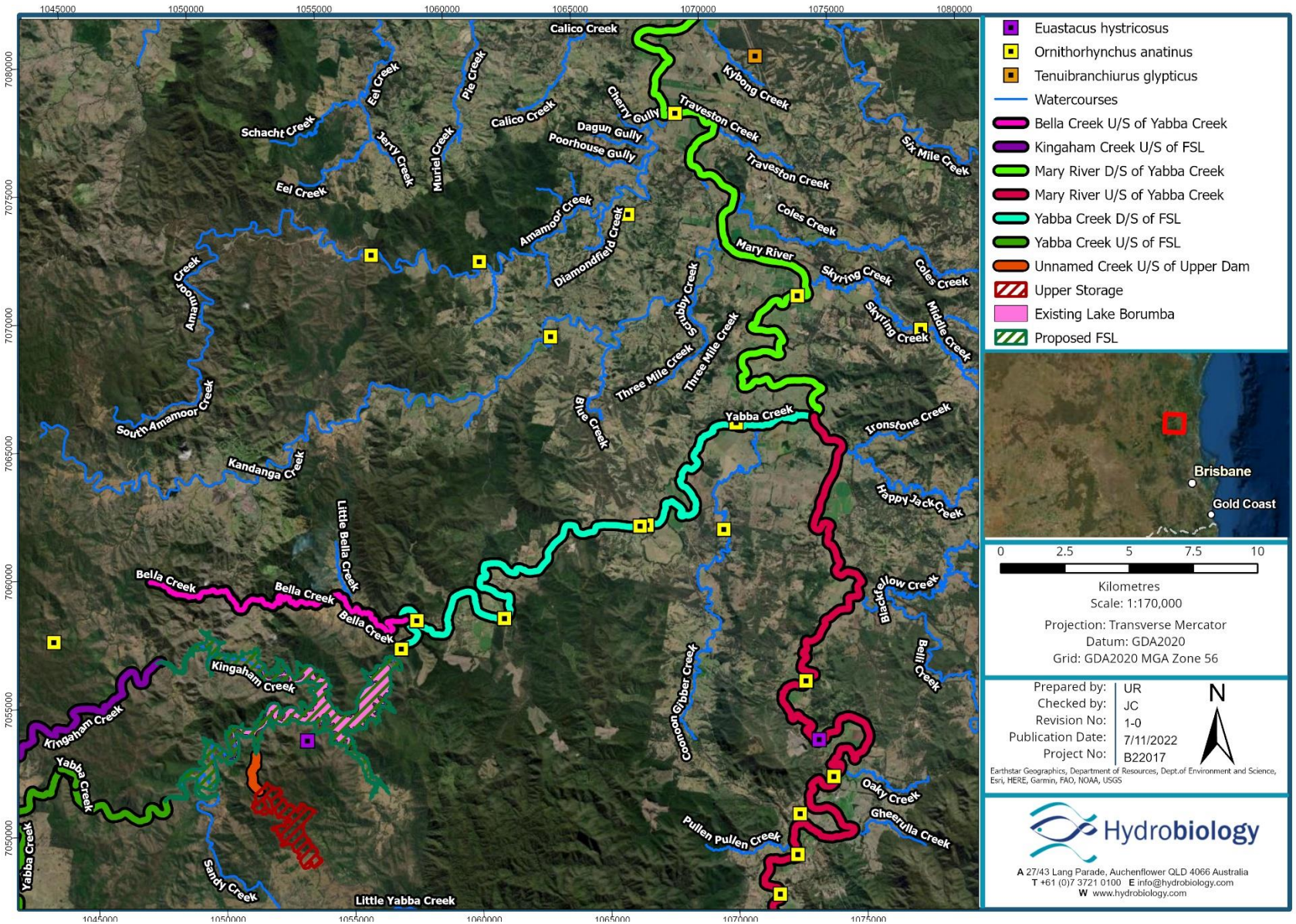


Figure 4-19 Conservation significant fauna records within the Study Area and surrounds (ALA, 2022), other than those already discussed.

4.2 FIELD SURVEY RESULTS

4.2.1 HABITAT

Detailed site profiles and drone imagery capture can be viewed in Appendix D and Appendix E, respectively. Drone imagery and site photos were collected at all sites, with the exception of drone imagery not being collected at S1, S2, S3, and S11 due the surrounding montane environment producing a high crash risk. Field photographs have instead been included in Appendix E.

HABITAT FEATURES OVERVIEW

Aquatic habitats generally varied between watercourses and with respect to their positioning in relation to Borumba Dam e.g., sites positioned upstream of the dam contrasted in habitat structure to those downstream of the dam.

With respect to the field sampling program the hydrological state of aquatic ecosystems throughout the Study Area had been significantly altered from what could be considered typical due to flood flows during the wet season. These flood events caused extensive bank erosion and bottom scouring, resulting in altered habitats at all scales and overall degraded systems. Key changes in aquatic structure can be characterised by the following:

- Systems dominated by excessive amounts of detritus alongside small and large woody debris, often accumulating heavily on bends and obstructions in the watercourse;
- A noticeable low cover of macrophytes throughout the Study Area, with extents downstream of Borumba Dam completely devoid of macrophytes;
- Extensive streambank erosion and a lack of emergent vegetation and tree form riparian vegetation at several sites downstream of Borumba Dam. Many areas were noticeably bare of vegetation, largely as a result of land clearing with exacerbation from flooding. Figure 4-20 shows the difference in riparian vegetation along Yabba Creek prior to and after the flood event; and
- Heavily eroded banks and stream beds with others being characterised by large undercut banks

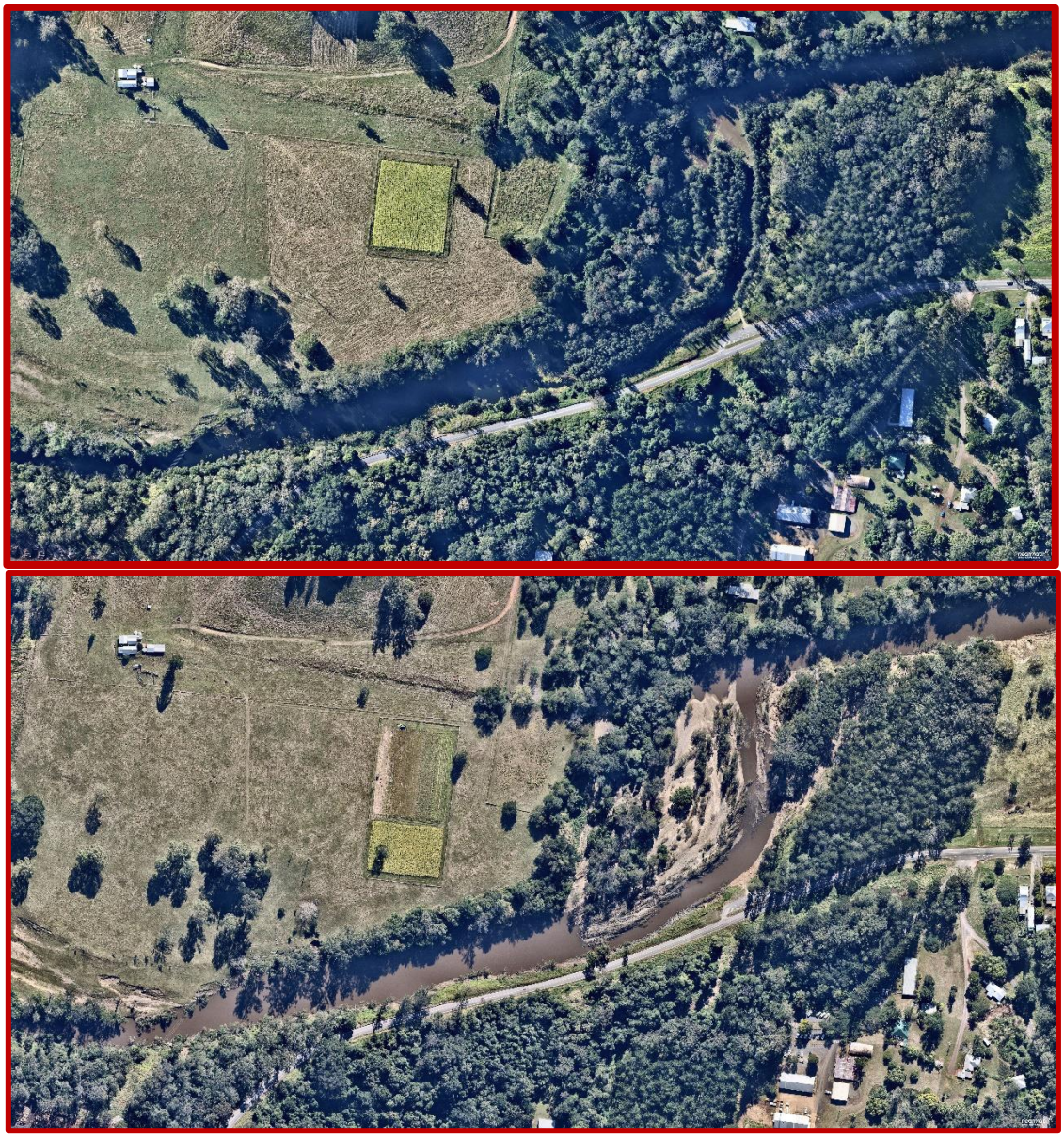


Figure 4-20 Nearmap aerial imagery of Yabba Creek in Imbil QLD in May 2021 (top) prior to the flood event and July 2022 (below) following the flood event.

HABITAT CONDITION

Habitat condition scores ranged from “fair” to “excellent”. The majority of sites scored “good” or above (Figure 4-21). Score characteristics within each reach are discussed below.

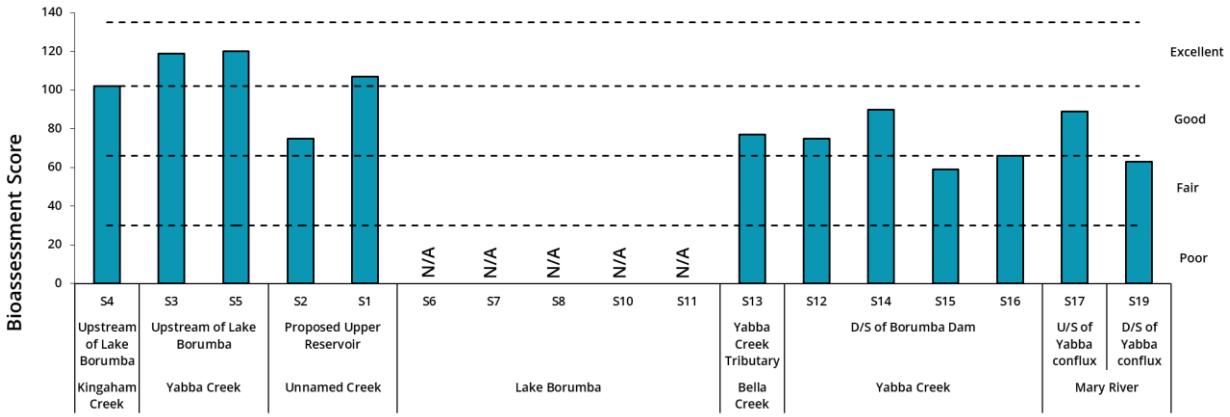


Figure 4-21 Habitat bioassessment scores of each watercourse surveyed. Lake Borumba scores presented separately.

Yabba and Kingaham Creek Upstream of Lake Borumba

Sites S4 along Kingaham Creek, S3 and S5 along Yabba Creek, were all rated "excellent". Sites along Yabba Creek had noticeably less evidence of habitat impacts by the previous flood events. This is likely due high rock cover of both bed and banks at S3, while the braided stream network at S5 would reduce water velocities during high flow events. Kingaham Creek site S4 received slightly lower scores due to evidence of scouring and bank erosion, alongside channel alteration likely a result the extreme flow event. All sites had minor anthropogenic influences with the exception of grazing activities, which were significant.

Within the Proposed Upper Reservoir

S1 (the more downstream site) comprised of cascades (up to 2 m in height) through a series of bedrock pools with a variety of instream habitat. Baseflow was present, though trickled between pool habitats. The site is considered very typical of a high elevation, pristine montane stream, hence the ranking of "excellent". In contrast at S2, the stream was highly incised with a relatively low slope, with the upstream extent forming a pool and a wider channel. The score of "good" is reflected by finer sediments, less microhabitat in the form of logs and detritus, and noticeably less macrohabitat, essentially being a stream with the occasional bend, no riffles, and a small pool. S2 is located close to the cleared headwaters.

Lake Borumba

Both Riverstyles and the Parsons et al., (2001) – Australian River Assessment System: AusRivAS Physical Assessment Protocol scores do not apply to wetlands (i.e. lacustrine and palustrine systems). The AquaBAMM method used to score wetlands and riverine systems is discussed in Section 4.1.9; however, the method is generally only used to assesses natural and near natural wetlands and cannot be applied to Lake Borumba. Therefore an adapted habitat condition grading for the Australian River Assessment System method has been developed for this report and applied to Lake Borumba sites (Figure 4-22). The sites within Lake Borumba are fairly uniform ranging from "fair to poor". The lack of substrate, micro and macrohabitat (deep pool only) diversity at S10 ranked the site as poor. Other sites scored higher due to increases in microhabitat (large woody debris) cover and greater macrohabitat diversity (deep and shallow pool habitat).

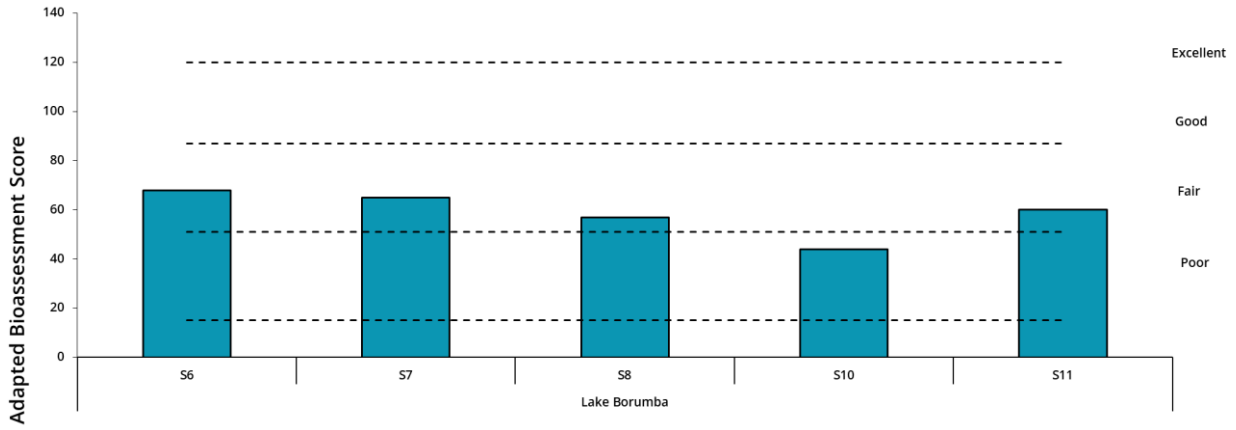


Figure 4-22 Adapted habitat bioassessment scores of each site surveyed in Lake Borumba.

Bella Creek

Site S13 within Bella Creek ranked "good". The site was situated upstream and downstream of a bridge crossing prior to the confluence with Yabba Creek. The habitat condition within the site ranged widely with the upper portion of the site being alongside private land appearing to be of a high condition with high canopy and riparian tree coverage, coarse substrates, and a range of microhabitat features in contrast to the lower section being highly degraded with a sparse to bare riparian vegetation, significant erosion, little microhabitat and predominately fine sediments. Due to the stark differences in habitat sections, the bioassessment varied resulting in a score of "good".

Yabba Creek Downstream of Lake Borumba

Site S12, is located directly below the Borumba Dam wall and received a rank of "good" with the score based on low macrohabitat diversity and bank cover. The site is unique in its positioning being almost entirely made up of boulders and cobbles due to the dam wall and its associated spillway. The site is represented by a large very deep open pool below the spillway (probably representing clear water scouring) followed by a stream bed comprised entirely of boulders and cobbles.

Site S14 received a score of "good" as a result of high rankings in bed substrates with coarse sediments, diverse compositions of microhabitat and several macrohabitats dominated by deep pools and riffles. The site was heavily degraded from agricultural clearing, cattle degradation, and the past flood events receiving very low scores for vegetation and riparian coverage, bank and bed erosion, and channel alteration.

Sites S15 and S16 are situated upstream and downstream of Imbil Weir respectively. The effects of erosion on the sites were very evident with bottom scouring and bank erosion throughout. S15 scored "fair" due to high erosion and bottom scouring with several high erosion escarpments along banks and very deep pools on bends. The channel had been notably altered with low cover of mature trees leaving the dominant vegetation to be grasses or bare. Bank stability was highly unstable (Figure 4-23).

S16 also scored "fair" for similar reasons with the majority of the site having been eroded to bedrock forming a cascade like feature. The downstream portion differed prior to continuing into Yabba Creek or its anabranch and was characterised by extremely high flows and sandy unvegetated banks with sandy deposition throughout. A large sandy backwater pool was also present prior to the anabranch.



Figure 4-23 Nearmap aerial imagery of Yabba Creek upstream of Imbil Weir at S15 in April 2020 (top) prior to the flood event and August 2022 (below) following the flood event.

Mary River Downstream of Confluence with Yabba Creek

Site S19 received a score of "fair" with extensive erosion present throughout the site with large escarpments and heavily eroded pools on bends being present. The site maintained heavy deposits of fine sandy materials and bar development throughout. High flow was still present at the site with protected low flow sandy pools present throughout. Further contributing to the low score was a general absence of streamside coverage with over 50% of the streambanks lacking riparian vegetation.

Mary River Upstream of Confluence with Yabba Creek

Site S17, received a score of "good". This can generally be attributed to the effects of the flood event with high flows still present and erosion throughout. The site received higher scores than Mary River site further downstream due to a diverse composition of available microhabitat including a mixture of coarse and fine sediment types alongside a number of riffles, deep pools, runs, and slow flowing

protected pools. The most notable difference to that of sites within downstream reaches of Yabba Creek was a relatively intact riparian tree line with the majority of streambank surfaces being vegetated.

MACROHABITAT

Macrohabitat throughout the Study Area ranged between pools, riffles, and runs. Composition was fairly uniform, following no distinctive trend or correlation with no discernible difference between sites being observed with the exception of sites within the proposed Upper Storage catchment (Figure 4-24). The lack of differences between sites is likely due to the hydrological state of the system with moderate to high flow being present throughout most sites.

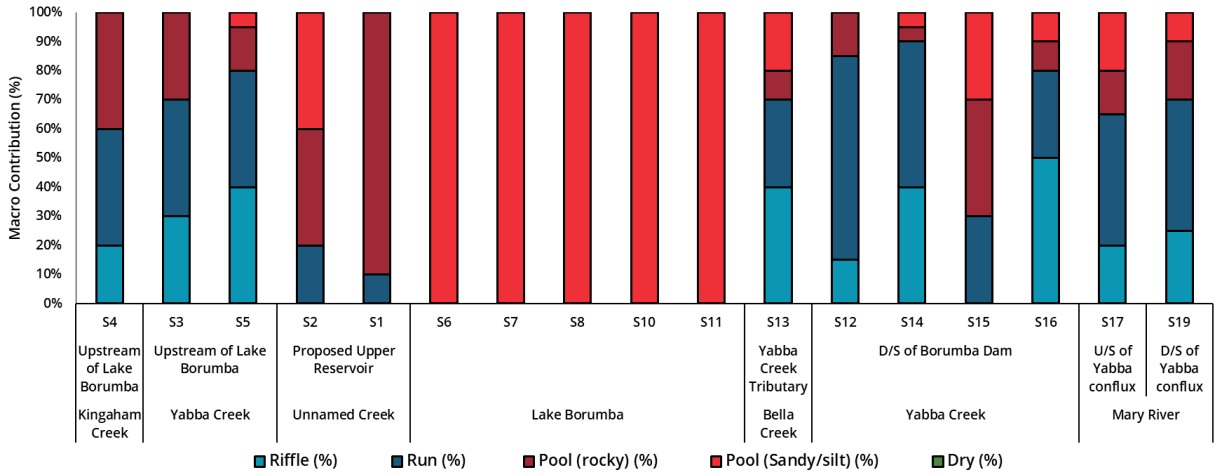


Figure 4-24 Macrohabitat composition at each site

Yabba and Kingaham Creek upstream of Lake Borumba

Sites upstream of Lake Borumba were comprised of rocky pool, run, and riffle habitat with the exception of S5 having some sandy pools. These differed little to that of other sites with only slightly more pool habitats than those downstream of Borumba Dam. This is likely due to less flow within sites upstream of Lake Borumba. At the time of sampling, many of these sites were declining in flowing run habitats with distinct pools habitats starting to form, particularly at Kingaham Creek, hence the correspondingly higher pool habitat.

Within the Proposed Upper Reservoir

The upper storage catchment maintained a unique macrohabitat composition in contrast to the wider Study Area due to the montane environment of sites S2 and S1. The sites were generally dominated by pool habitats alongside smaller sections of runs. This is due to the likely lack of water permanency within these sites with the sites likely normally maintaining small pockets of water or being dry after long periods without rainfall. Due to the significant rainfall prior to surveys many of the pools were deep or still connected by flow. As a result, the majority of watercourses within these systems are likely dominated by pool habitats in contrast to the run and riffle dominated habitats downstream of Borumba Dam.

Lake Borumba

All sites within Lake Borumba, as can be expected with lakes are comprised completely of pool habitats. This included deep pools of >10 m closer to the dam. Shallow pool depths typically ranged from 1 to 3 metres the branches of Kingaham, and Yabba Creek recorded maximum depths of up to 6 m at the time of sampling.

Bella Creek

Site 13 of Bella Creek differed little from sites downstream of Lake Borumba with a large proportion of riffle habitats alongside run and pool habitats. The more extensive riffle habitat within this site can mostly be attributed to a large riffle upstream of the bridge crossing in contrast to the extensive run and pool habitats downstream of the crossing before flowing into Yabba Creek.

Yabba Creek Downstream of Lake Borumba

Site S12, was dominated by run habitat alongside a small riffle and a pool due to the high flow from the spillway of Borumba Dam forming a continuous stretch of run habitat.

Sites S14, S15, and S16 of Yabba Creek were comprised of riffle, pool, and run habitat. Site S14 had the smallest pool habitat out of sites in the Study Area with high flow riffles and run habitat dominating.

Site S15 upstream of Imbil Weir was comprised of run and pool habitat due to the high amount of erosion forming large deep pools on bends. The remaining habitat was comprised of low flow runs extending to the weir. S16 differed with a large riffle habitat extending from the weir before changing into a high flow run habitat continuing into an incised channel. A large backwater pool was also present.

Mary River Downstream of Confluence with Yabba Creek

Site S19 showed little variation in macrohabitat complexity being comprised of sandy and rocky pool habitat alongside a set of small riffles and large high flow run habitats.

Mary River Upstream of Confluence with Yabba Creek

S17 had nearly identical macrohabitat composition to S19, though a small difference was noted with less sand in pools and less pool habitat.

With respect to the wider Study Area downstream of Borumba Dam, little difference was noted.

MICROHABITAT

Microhabitat throughout the watercourses in the Study Area was generally dominated by undercut banks and large woody debris, and to a lesser extent small woody debris and detritus (Figure 4-25). Conversely, past surveys of Yabba Creek and Mary River by SKM (2007) found that these systems contained low detritus and woody debris cover due to the absence of mature trees in the riparian zone.

Sites downstream of Borumba Dam along Yabba Creek generally lack riparian vegetation so some of the large woody debris must have been transported from upstream by flood flows. Surveys also noted a high percentage of undercut banks, especially downstream of Borumba Dam in contrast to less upstream of Lake Borumba, this is likely due to scouring and erosion of stream banks due to sustained high flows during flooding in which the upstream sites are within a more constrained rocky environment less susceptible to erosion than those downstream which are located on a more meandering alluvial plain. As such it is likely that these sites downstream of Borumba Dam would usually contain fewer woody debris, detritus, and undercut banks.

Large and small woody debris, alongside undercut backs are considered to be key fish microhabitat features, while also being key habitat for the ENVT Mary River cod. Undercut banks are noted to be key habitat features for the platypus and Australian lungfish, with large woody debris applying to the white-throated snapping turtle and Mary River turtle.

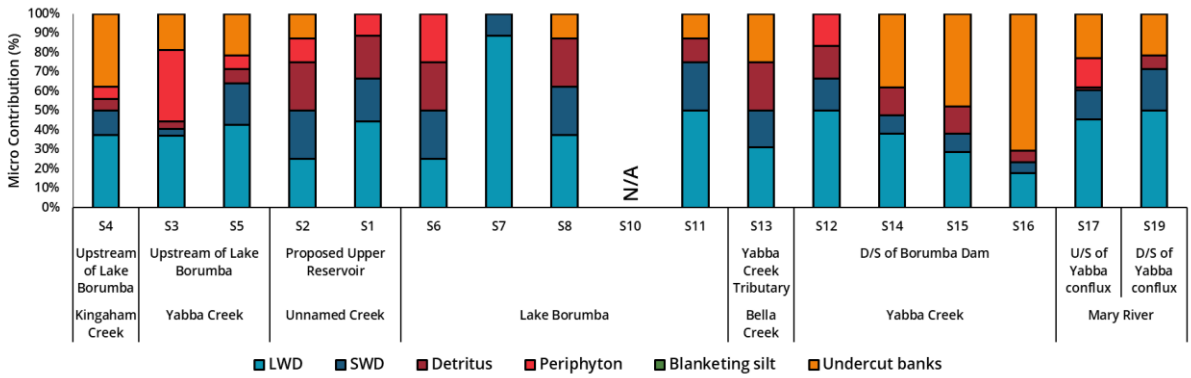


Figure 4-25 Microhabitat composition at each site

Yabba and Kingaham Creek upstream of Lake Borumba

Sites upstream of Lake Borumba had compositions of undercut banks, periphyton, detritus, small woody debris, and large woody debris. Kingaham Creek site S4 was noted to have a higher percentage of undercut banks than other sites upstream of Lake Borumba, this is likely due to the incised channel and a lack of vegetation along banks. Within Yabba Creek, periphyton was found to be higher at S3 due to the presence of slow flow and several shallow still pools and backwater areas within the site.

Within the Proposed Upper Reservoir

The upper storage catchment was unique in having few undercut banks, an even split of large and small woody debris and higher contributions of detritus and periphyton. This is due to the upland environment. Site S1 was entirely comprised of bedrock and due to this had no undercut banks in contrast to S2 which maintained a few undercut banks on bends, this is likely a result of less flow (being more upstream) and the presence of aquatic and streambank vegetation. Unlike sites downstream of Borumba Dam, the higher small woody debris compositions alongside large woody debris and detritus were indicative of the heavily vegetated environment surrounding the streams which can replenish woody debris and detritus outside of flood events.

Lake Borumba

Microhabitat composition in Lake Borumba was measured visually and with the assistance of sonar. A combination of these methods has revealed the majority of the bottom of these sites along the Lake fringes to the initial open water habitat to be dominated by large and small woody debris (mostly in the form of large, submerged trees). Additionally, the presence of periphyton alongside detritus could be observed from grab samples and undercut banks were also occasionally noted. Deeper areas of Lake Borumba such as S10 were found to be mostly bare (Figure 4-29).

Bella Creek

Site S13 on Bella Creek had a similar composition to that of Yabba Creek Upstream of Lake Borumba. As discussed previously the site differed noticeably on either side of the road crossing, with less microhabitat diversity being located downstream of the crossing in contrast to far more diversity upstream of the crossing but only comprising of a small percentage of the reach. As such, the result is skewed to represent a higher microhabitat diversity when much of the site is largely lacking in microhabitat diversity downstream of the crossing.

Yabba Creek Downstream of Lake Borumba

Notable differences downstream of Lake Borumba include very high percentages of undercut banks which are the highest found within the Study Area. This is due to the high flows experienced shortly

before the sampling. This can be particularly noted at S16 downstream of Imbil Weir in which flows increase during the steep decline into a more incised channel which is exacerbated by land clearing and increased velocities from Imbil Weir. The presence of large woody debris in contrast to small woody debris is due to many of the trees of the area being removed by floodwaters and carried downstream into Yabba Creek. Compared with sites upstream of Lake Borumba which were found to have fewer undercut banks and more periphyton. This is likely due to sites undergoing erosion from recent high flows which have displaced periphyton and formed more undercut banks in contrast to shorter high flow periods upstream of Lake Borumba.

Site S12 below the Borumba Dam wall differed to the remaining downstream Yabba Creek sites with no undercut banks and the presence of periphyton on the largely dominant cobble substrate.

Mary River Downstream and Upstream of Confluence with Yabba Creek

Mary River sites were largely similar between upstream and downstream of the confluence with Yabba Creek being dominated by woody debris, particularly large debris and undercut banks to a lesser extent alongside detritus and periphyton. The presence of periphyton in the upstream portion of S17 is due to the presence of slow flowing shallow pools and backwaters along coarse substrates in contrast to the high flowing largely sandy S19 downstream of Yabba Creek.

SUBSTRATE COMPOSITION

Substrate composition varied throughout the Study Area with the main trend being coarser substrates upstream of Lake Borumba in more montane areas and a mixture of coarse and fine substrates downstream (Figure 4-26). SKM (2007) noted that Yabba Creek and Mary River were characterised by sand and gravel beds due to the high-energy conditions of the Study Area. The results of the current survey largely reflect that, with the dominant substrates being sand, gravel, pebbles and cobbles.

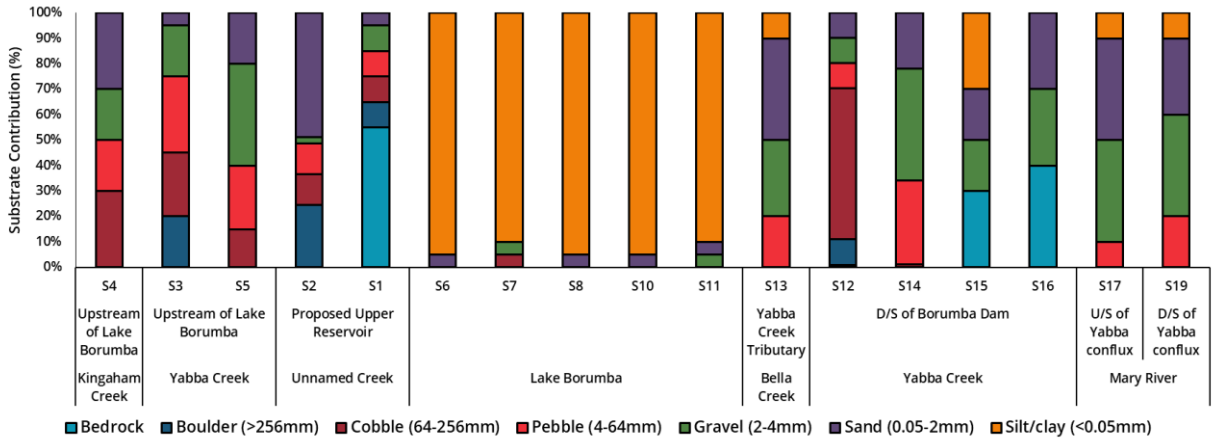


Figure 4-26 Substrate composition at each site

Yabba and Kingaham Creek upstream of Lake Borumba

These sites were generally comprised of relatively coarse substrates. S4 of Kingaham Creek contained similar proportions of cobbles, pebbles, gravel and sand, with roughly 70% of the substrate being coarser materials. Site S5 on Yabba Creek was similar but S3 supported a very small amount of fine material due to the incised channel being made completely of bedrock and boulders.

Within the Proposed Upper Reservoir

Site S2 had a relatively high composition of sand. Site S1 was entirely typical of a montane stream being comprised of a series of eroded bedrock pools.

Lake Borumba

In Lake Borumba all sites were dominated by silt/clay substrates with smaller amounts of sand, gravel, and occasionally pebbles along edge margins. Observations were made within the lake while collecting sediment samples where cobbles were evident adjacent to tributary inflows of lower order streams and adjacent to cliff faces.

Based upon approximate visual determinations via side imaging and down scan views it is clear that the dominant habitat type along the bottom of Lake Borumba was of smooth sand/mud and large woody debris (generally standing submerged trees) (Figure 4-27 and Figure 4-28). Estimates of the habitats present can be viewed in Figure 4-29. Composition estimates are approximate based off visual analysis.

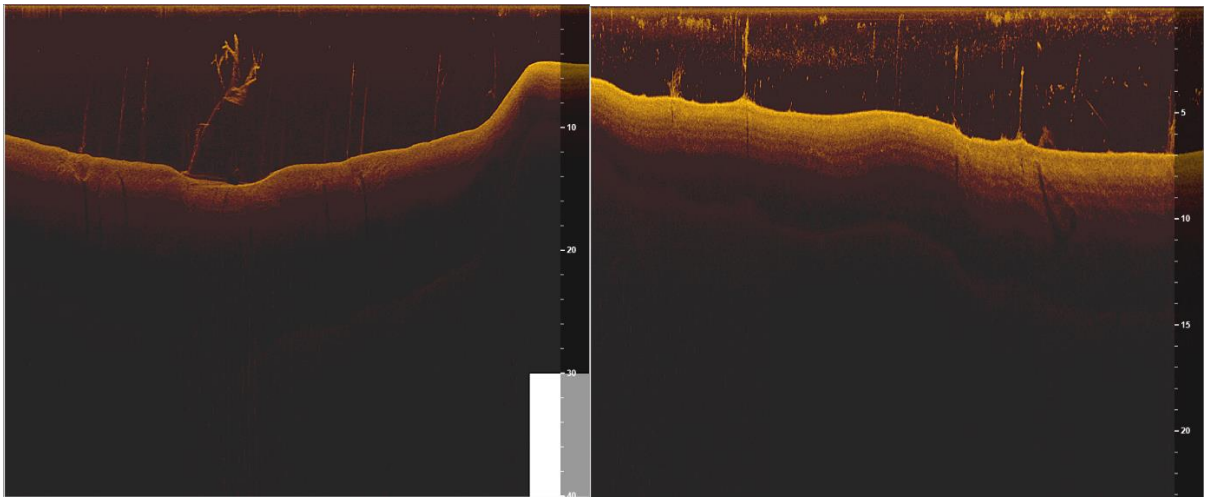


Figure 4-27 Downscan imagery of woody debris and vegetation along the bed

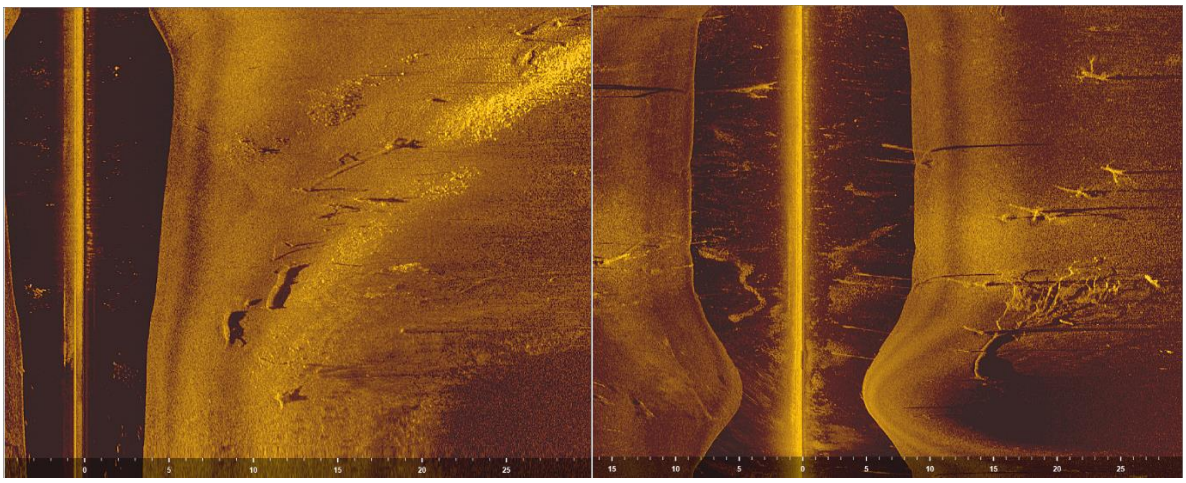


Figure 4-28 Sidescan imagery of Woody debris and rocks along the bed

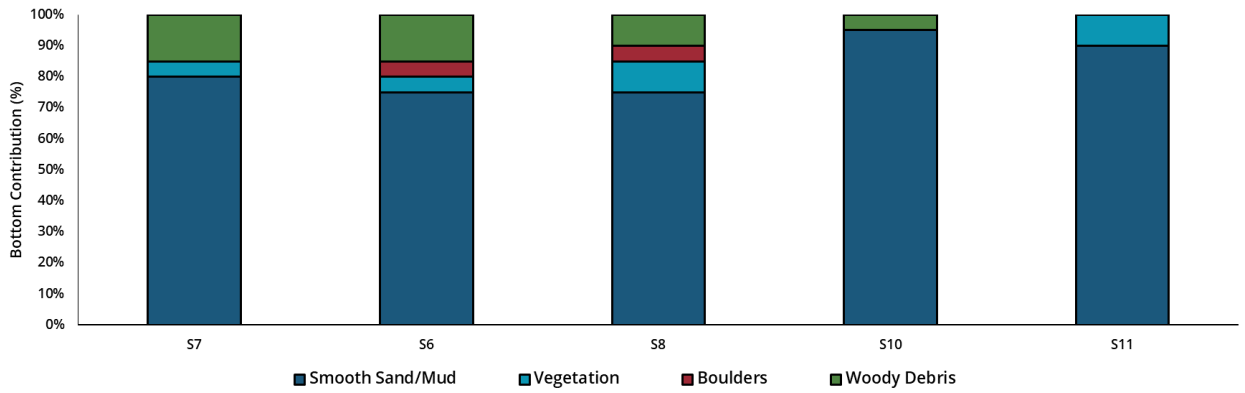


Figure 4-29 Percent cover estimates of habitats detected in sonar analysis.

Upstream Tributary of Yabba Creek

S13 maintained a somewhat even split of coarse and fine substrates, the site follows the description detailed by SKM (2007) for that of Mary River and its tributaries, with the site being dominated by sand and gravel with silt/clay and pebbles to a lesser extent.

Yabba Creek Downstream of Lake Borumba

Site S12, directly below the Borumba Dam wall was entirely dominated by larger substrate in the form of crushed rock (fill) and other substrates such as pebbles, gravel, and boulders.

Site S14 was dominated by gravel and sand with less sand and more pebbles and gravel. This is likely due to the flood event altering the system and moving finer substrates further downstream. The Imbil Weir sites S15 and S16 differed due to the presence of the Weir with notable sand and clay deposition occurring within S15. This is likely a combination of build up at the weir obstruction and from the high levels of erosion on site. Large amounts of bedrock were also present due to the erosion surrounding the weir and the fact that it was built upon a natural bedrock outcrop.

Mary River Downstream and Upstream of Confluence with Yabba Creek

Mary River sites differed little from each other with S17 having slightly more sand rather than the greater cover of pebbles downstream. Within the wider Study Area, the sites were consistent with the descriptions provided by SKM (2007) of gravel and sand dominated systems.

4.2.2 AQUATIC FLORA

Macrophytes were present at all sites upstream of Lake Borumba, the Proposed Upper Storage Catchment, and within Lake Borumba. No macrophytes were present at any sites within Mary River, Yabba Creek downstream of Borumba Dam, or Bella Creek (Table 4-17). A previous study by SKM (2007) detailed 38 species throughout the Upper Mary system, describing large submerged macrophyte communities throughout Yabba Creek and Mary River.

It is likely that the recent flooding resulted in the scouring of macrophytes and many other aquatic plants throughout the catchment. Many of the macrophytes observed outside of Lake Borumba were often isolated and juvenile in form indicating that these species were repopulating the watercourse. The upper areas of the catchment of Yabba Creek, Kingaham Creek and the Proposed Upper Storage Area are thought to have had lower flows due to being higher in the catchment, and lower duration flood flows in contrast to sites downstream of Borumba Dam which received extended duration higher flows as a result of discharges from the dam. Borumba Dam was discharging during the surveys with the headwater storage level in the dam at approximately 135 m.

Macrophytes were most diverse at Lake Borumba sites as these generally contained large areas of relatively shallow water alongside the edges of the lake that are exposed to the high degree of sunlight beneficial for macrophyte growth. We note that macrophyte cover was evidently less than what can be seen from historical aerial imagery.

Emergent forms such as basket grass (*Lomanda longifolia*) tended to be dominant within watercourses upstream of Lake Borumba and within the Proposed Upper Storage Catchment. Submerged macrophytes such as water thyme (*Hydrilla verticillata*) and floating forms such as water snowflake (*Nymphoides indica*) and primrose-willow (*Ludwigia peploides*) formed a notable proportion of the macrophytes at Lake Borumba.

Several conservation significant macrophyte species were recorded during the survey:

- Queensland lace *(Aponogeton elongatus)* – Near Threatened;
- Water thyme (*Hydrilla verticillata*) – Special Least Concern;
- Eelgrass (*Vallisneria nana*) – Special Least Concern; and
- Water snowflake (*Nymphoides indica*) – Special Least Concern.

No invasive macrophyte species were detected. This is important due to many invasive species abilities to rapidly repopulate areas following the loss of large macrophyte populations and outcompete and displace native species. In addition to this, dams may create more favourable conditions for exotic macrophytes. To date no such outbreaks have been documented.

Table 4-17 Macrophytes presence and their area of cover (%)

Species	Common name	Form	Upstream of Lake Borumba			Unnamed Creek		Lake Borumba				Bella Creek	Downstream of Lake Borumba					
			Kingaham Creek U/S	Yabba Creek U/S		Proposed Upper Reservoir						Tributary of Yabba Creek	Yabba Creek D/S				Mary River	
																	U/S of Yabba Creek Confluence	D/S of Yabba Creek Confluence
			S4	S3	S5	S2	S1	S6	S7	S8	S11	S13	S12	S14	S15	S16	S17	S19
Asparagaceae																		
Lomanda longifolia	basket grass	Emergent	70	90	70	50	100											
Aponogetonaceae																		
Aponogeton elongatus	Queenland Lace	Submerged			15													
Cyperaceae																		
Cyperus sp.	sedge	Emergent						5										
Eleocharis sp.	spike rush	Emergent							5									
Eleocharis palustris	spike rush	Emergent				35												
Hydrocharitaceae																		
Hydrilla verticillata	water thyme	Submerged				5		15	70									
Vallisneria sp.	eelgrass	Submerged						20										
Vallisneria nana	eelgrass	Submerged	30	10	10													
Juncaceae																		
Juncus sp.	Rush	Emergent			5													
Menyanthaceae																		
Nymphoides indica	water snowflake	Floating						40	5	5	10							
Onagraceae																		
Ludwigia peploides	floating primrose	Floating							15	90	80							
Polygonaceae																		
Persicaria spp.	knotweed	Floating				10												
Salviniaceae																		
Azolla pinnata	mosquitofern	Floating						20	5	5	10							

4.2.3 RIPARIAN STRUCTURE AND COVER

Riparian structure and cover differed notably between sites downstream and upstream of Borumba Dam with little tree vegetation found within sites downstream and greater areas of bare and grass coverage (Figure 4-30). Within upstream sites the dominant vegetation was of tree form. This is likely due to armouring afforded by present bedrock (notably sites with the proposed Upper Reservoir), less land clearing and a lack of high flood conditions which in the lower sub-catchment uprooted and washed away many trees along already thin riparian extents along Yabba Creek.

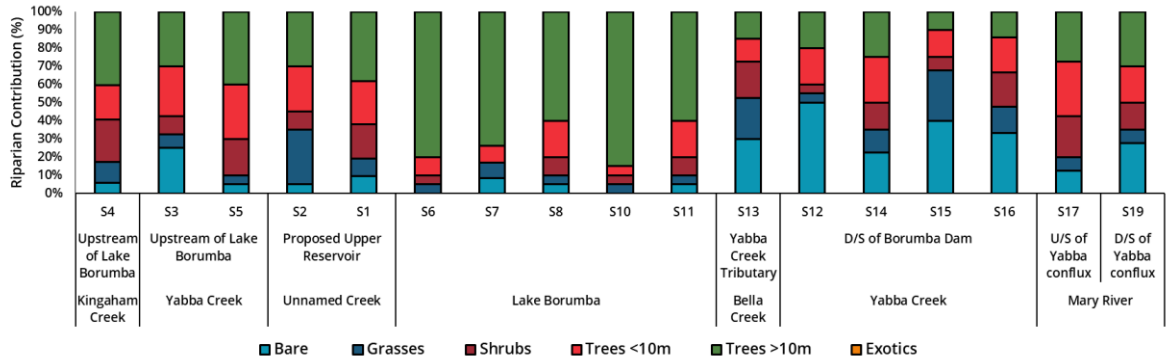


Figure 4-30 Riparian composition at each site

Yabba and Kingaham Creek upstream of Lake Borumba

Site S4 along Kingaham Creek had 50% cover of tree vegetation with the majority being trees greater than 10 m, the remainder being shrubs with grasses and bare ground situated along the road crossing. S3 and S5 of Yabba Creek were similar with trees being the dominant vegetation type. However, S3 was largely unvegetated on the right side of the bank due to cobble substrates and tree loss from flooding. Drone imagery of the site reveals more extensive riparian vegetation downstream of the site, inferring a widening riparian extent further along the reach of the site (Appendix E).

Within the Proposed Upper Reservoir

Vegetation was dominated by tree forms with small and large trees alongside shrubs. Site S2 was a small, incised stream located within a flat clearing with no distinct riparian tree line, so a greater portion included grasses. The clearing appeared to be an exception along the watercourse, while it is not clear as to why, it could be due to clearing for a road crossing.

Lake Borumba

The riparian areas of Lake Borumba were heavily forested with large trees above 10 m dominating the edges of the lake. Smaller proportions of grasses, shrubs and small trees were also present, but these were all generally below a combined 30% cover.

Bella Creek

S13 of Bella Creek was unique between sections with the majority of the lower section being of bare and grass form in contrast to forested upper section. This is reflected in the composition with approximately 50% of bare and grass with trees while shrubs formed the remaining 50%.

Yabba Creek Downstream of Lake Borumba

S12 of Yabba Creek downstream was generally bare on the downstream right bank with large cobbles throughout and few trees (possibly from original dam construction, upgrade or maintenance and/or loss from flooding). The left bank maintained far more trees than the right.

Site S14 was heavily cleared and eroded in some sections due to erosion from high flows and land clearing for agriculture. Forested areas were comprised of an even split of tall and short trees with cleared areas having bare riparian sections with shrubs and grasses.

S15 at Imbil Weir contained close to 70% grass cover or bare banks with small patches of trees, generally below 10 m in height. S16 was comparable with slightly more shrubs, trees below 10 m, and trees greater 10 m. At least 50% of the site still maintained bare and grassy riparian areas.

Mary River Downstream and Upstream of Confluence with Yabba Creek

Trees dominated S17 with both shrubs and grasses and to a less extent alongside bare areas. S19 was however distinctly more eroded with much larger bare areas. This is due to the high degree of erosion of the right side of the streambank upstream of the bridge in contrast to the elevated and vegetated left bank. Downstream of the bridge was similar with heavily eroded sections on the left and somewhat more vegetated on the right.

4.2.4 BENTHIC MICROALGAE

ABUNDANCE AND RICHNESS

Benthic microalage species richness and abundance was generally lower in the proposed Upper Reservoir and Lake Borumba compared to the other waterways (Figure 4-31 and Figure 4-32). Lake Borumba comprises of standing water (lentic), in which primary producers are more closely associated to geography of the surrounding habitat including the slope, banks, and shape (Di Carvalho and Wickham, 2019, Vasconcelos et al., 2019). Other factors influencing differences in microalage diversity indices included substrate type, shading, and water depth. Lake Borumba samples were taken from greater depth than creek/river sites, meaning that there was likely less light available for photosynthesis, while the unnamed creeks in the proposed Upper Reservoir contained a closed canopy where light availability would also be low. All other sites had open canopy extents.

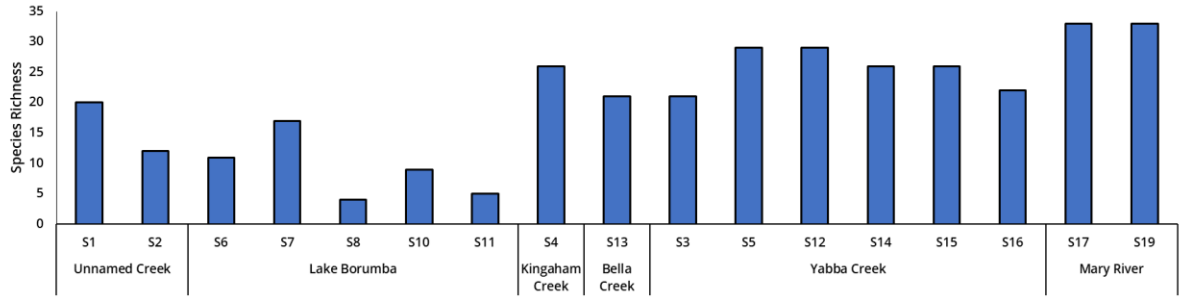


Figure 4-31 Microalgae species richness.

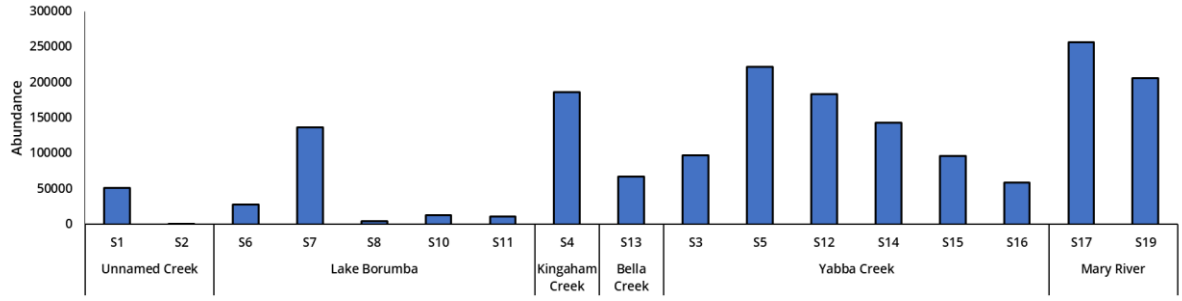


Figure 4-32 Microalgae abundance.

COMMUNITY ASSEMBLAGE

Microalgae communities were significantly different between systems (creek, lake, river) (p = 0.03 Figure 4-33) with lake sites dissimilar from river and creek sites.

Lake sites were low in species evenness, being generally dominated by just two species; *Nitzschia linearis* and to a lesser extent *Acnanthes* spp. (Figure 4-34). Conversely, creek and river sites showed a higher degree of species evenness, being characterised by *Acanthes exigua*, *Navicula radiosa* and *Nitzchia linearis*.

The differences in diatom communities between lake and creek/river sites likely reflects differences in flow regime (lentic versus lotic), substrate (homogonous muds and organic matter versus rock) and depth (deep versus shallow).

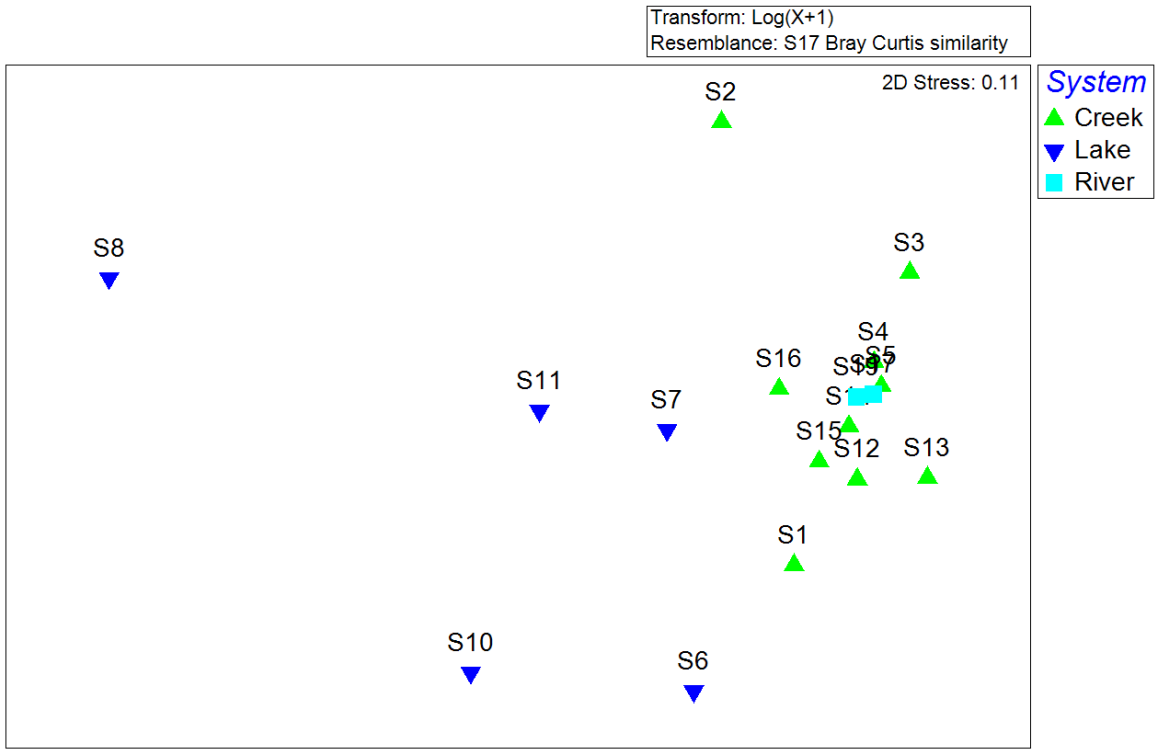


Figure 4-33 MDS ordination of microalgal communities.

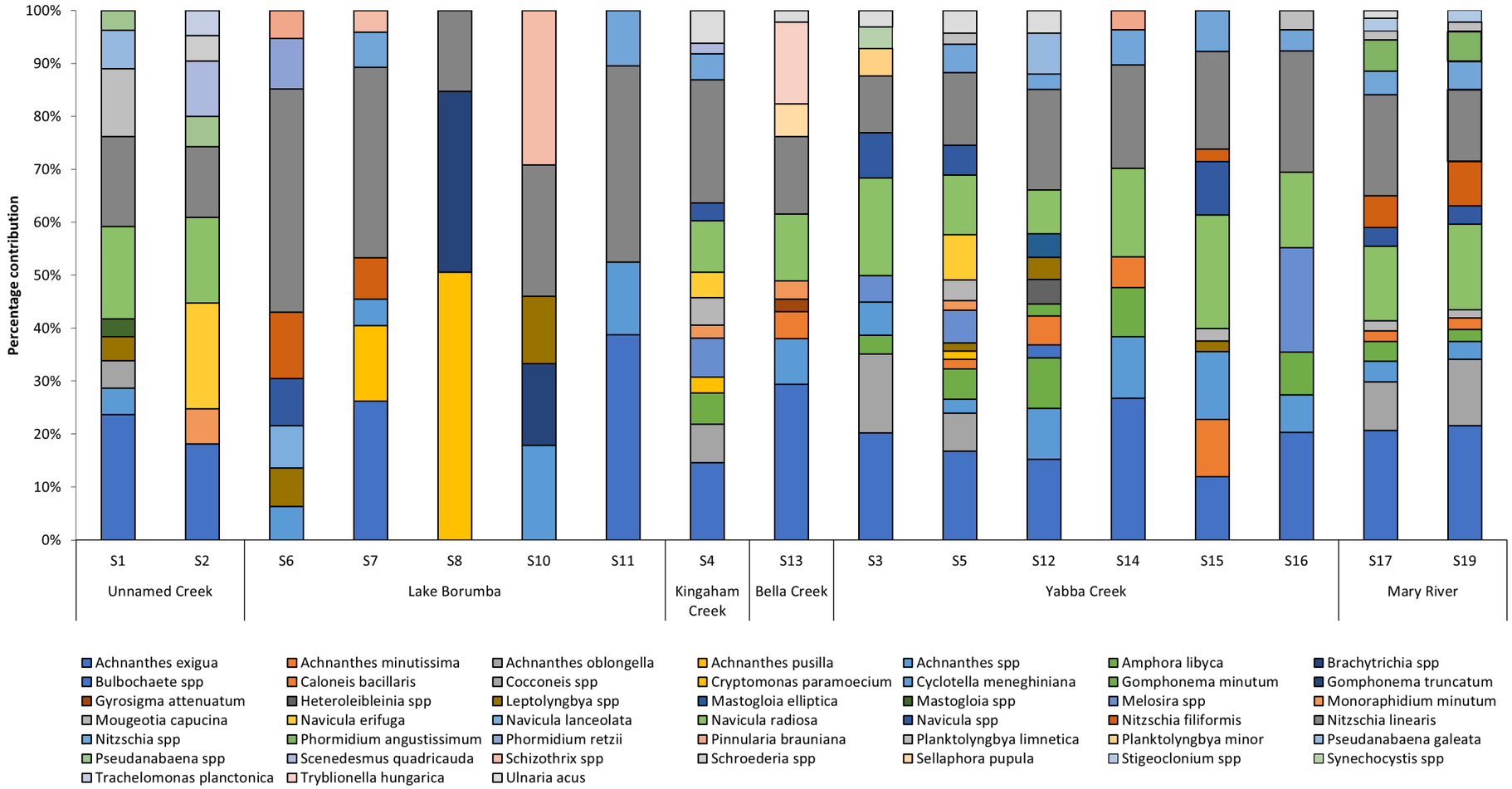


Figure 4-34 Microalgae community composition. Species represent those contributing to 90% of the community

WATER QUALITY DESCRIPTORS

Where available, habitat and water quality indicators were assigned to diatom species as designated by Van Dam et al. (1994). These indicators included tolerances to salinity, acidity and nutrients levels.

Salinity

Diatom communities were dominated by species able to tolerate fresh to brackish water (Figure 4-35). There were no notable differences between waterways or systems, despite the higher conductivity noted in the proposed upper reservoir (S1 and S2).

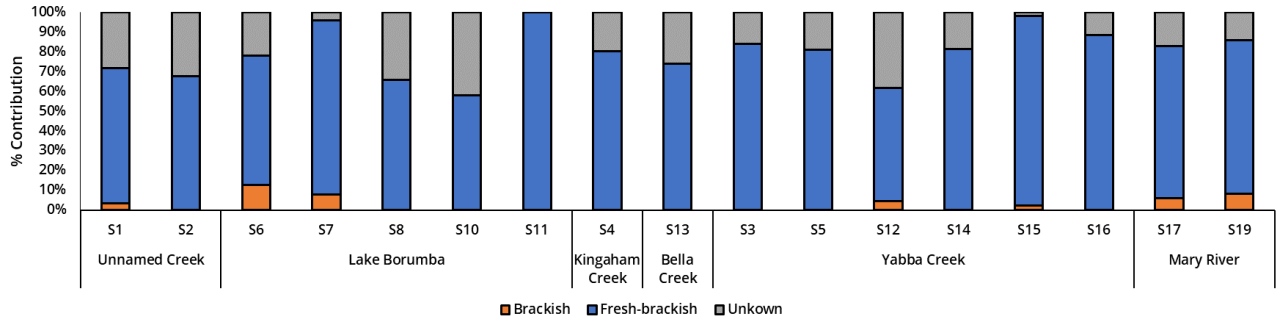


Figure 4-35 Diatom salinity tolerance.

Acidity

The Study Area was dominated by diatom species that are either alkilophilous or circumneutral in regard to pH tolerance (Figure 4-36). There were no notable differences between waterways or systems.

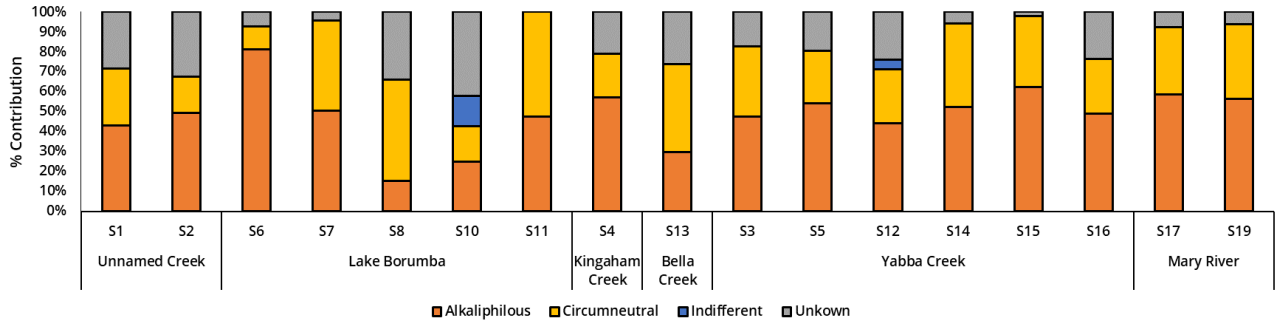


Figure 4-36 Diatom acidity tolerance.

Nutrients

Diatom communities were dominated by species that are able to tolerate a wide range of nutrient levels (olig-eutraphentic) and those that are tolerant to a moderate (meso-eutraphentic) to high (eutraphentic) level of nutrients (Figure 4-37). There were no notable differences between waterways or systems.

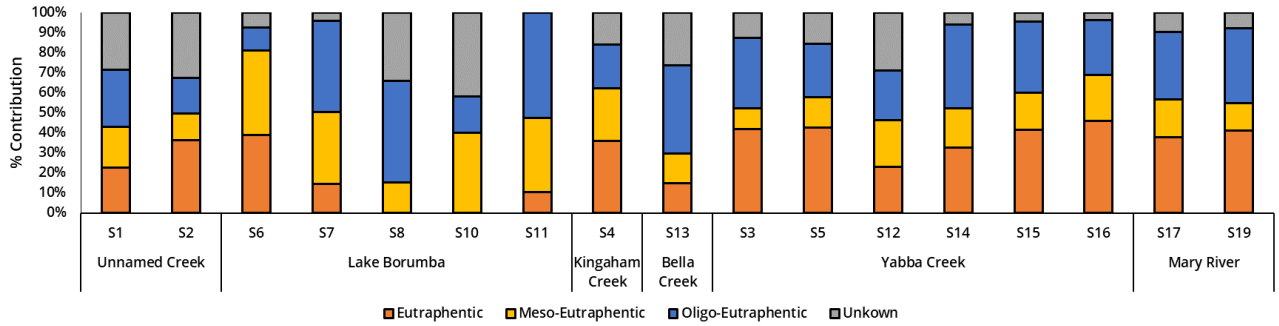


Figure 4-37 Diatom nutrient tolerance.

HARMFUL ALGAL BLOOM SPECIES

No Harmful Algal Bloom (HAB) species were detected in the Study Area. HAB species are associated with the production of cyanotoxins that can be harmful to aquatic life and human health in high concentrations. Cyanobacteria blooms occur regularly in Lake Borumba (Stockwell, 2001; seqwater 2011). No quantitative or semi-quantitative data is available for these events.

4.2.5 MACROINVERTEBRATES

DIVERSITY INDICIES

Macroinvertebrates were not sampled at S15 due to issues with accessibility to sample safely. Apart from site S11 there were no macroinvertebrates recorded in bed habitats of Lake Borumba. This is unsurprising as samples were collected from greater water depth, homogenous substrate (silts and muds) within minimal microhabitat. Lake Borumba site 11 was characterised solely by oligochaete worms, a highly adaptable group typical of soft sediments. Samples will be collected from edge habitats in the next survey. The edge habitat will likely have greater diversity given the overlapping habitat niches noted in these areas.

Creek sites upstream of Lake Borumba and river sites downstream were relatively similar in taxa richness, PET richness and SIGNAL2 score. This was likely due to the similar diversity of macrohabitat (run, riffle and pools) and microhabitat (macrophytes, large woody debris).

Creek sites downstream of Lake Borumba were variable but could be generally characterised by moderate diversity indices. Yabba Creek sites downstream of Lake Borumba were relatively low in microhabitat diversity, including less woody debris and a lack of macrophytes. General habitat condition was also lower at sites downstream of Lake Borumba, with varying degrees of riparian clearing, road crossings and a high level of erosion and scouring from recent flood events.

River sites had relatively high diversity indices which can be attributed to the larger degree of water availability and relatively diverse micro and macrohabitat availability.

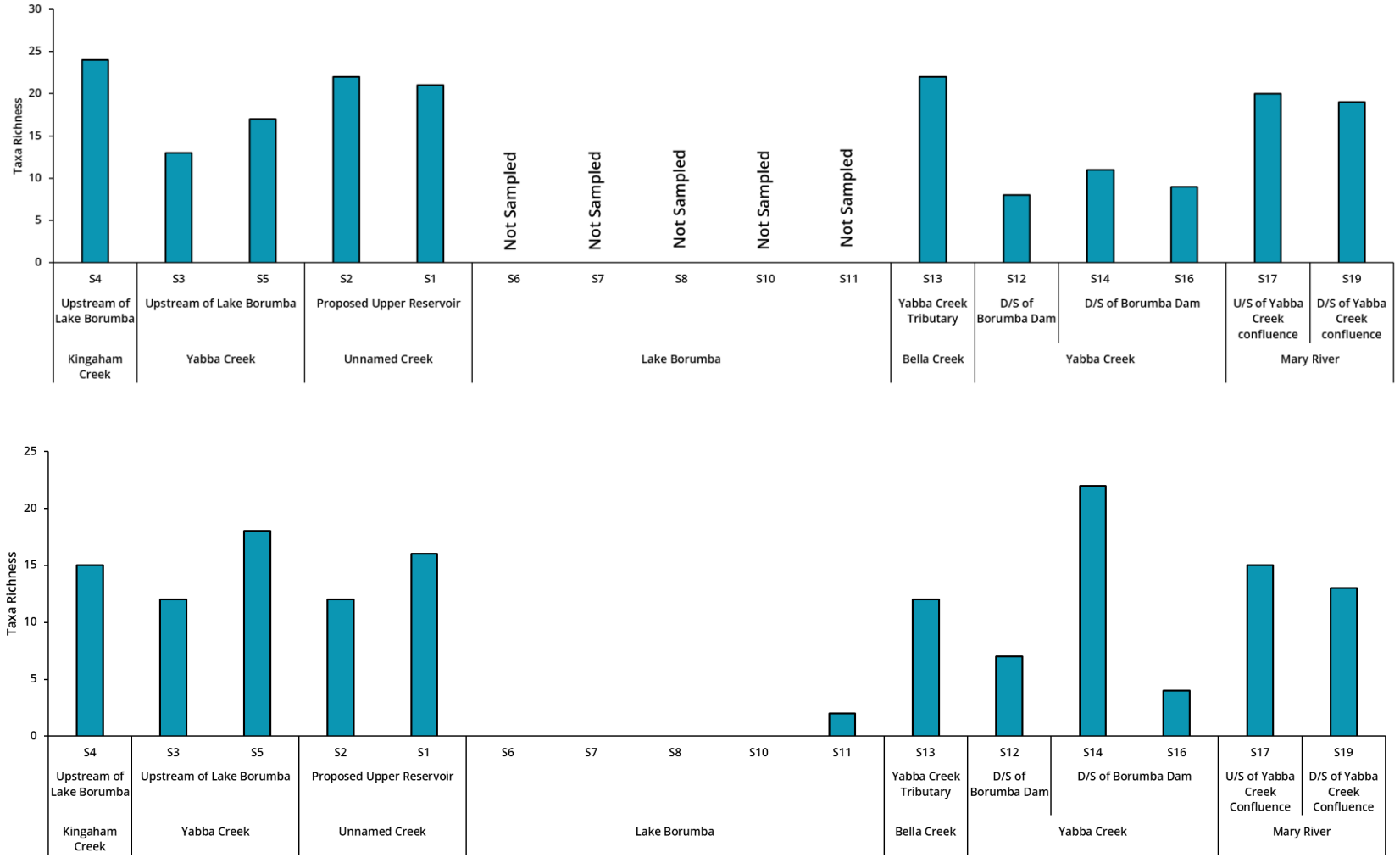


Figure 4-38 Macroinvertebrate taxonomic richness of edge (top) and bed (bottom) habitat.

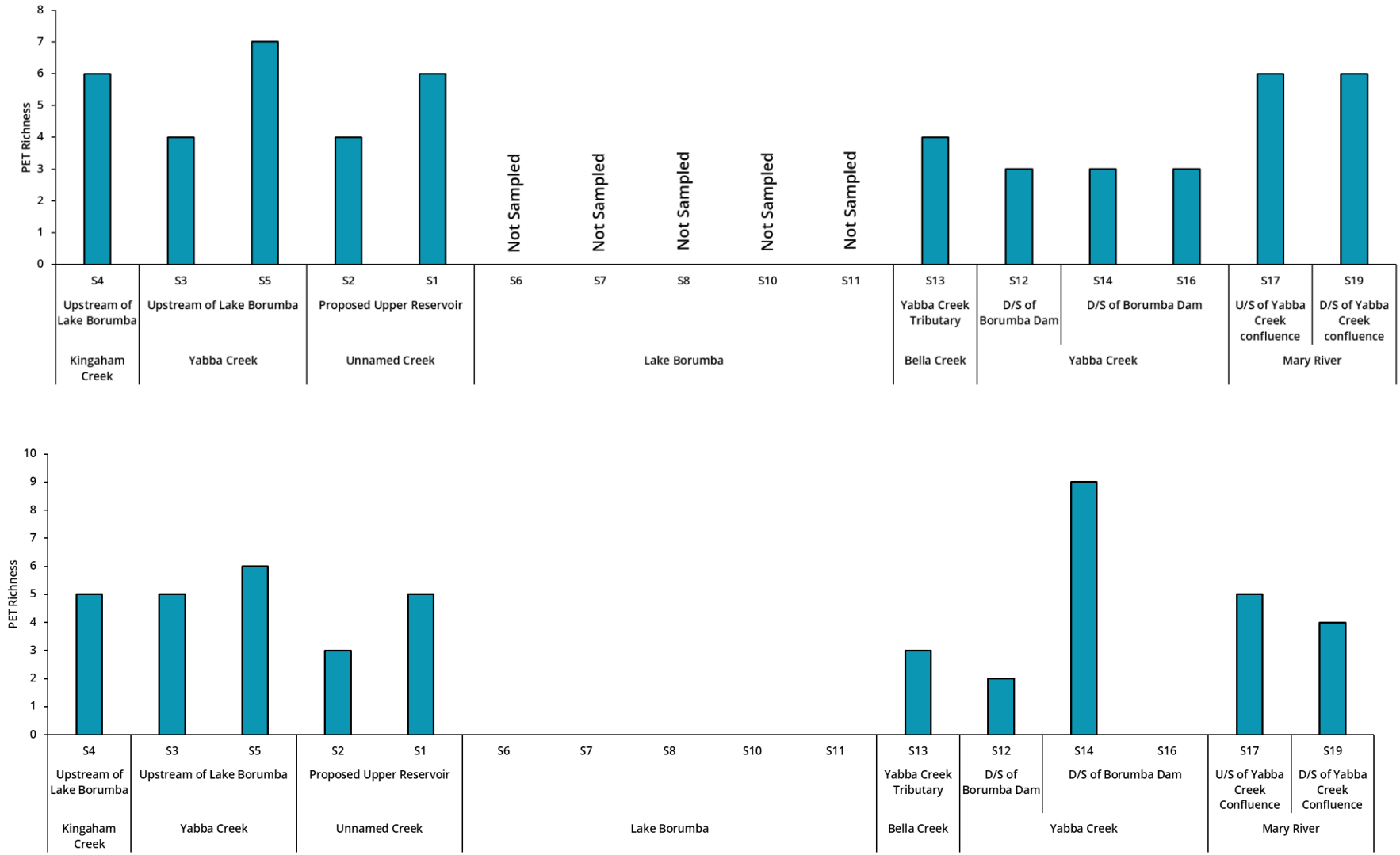


Figure 4-39 Macroinvertebrate PET richness of edge (top) and bed (bottom) habitat.

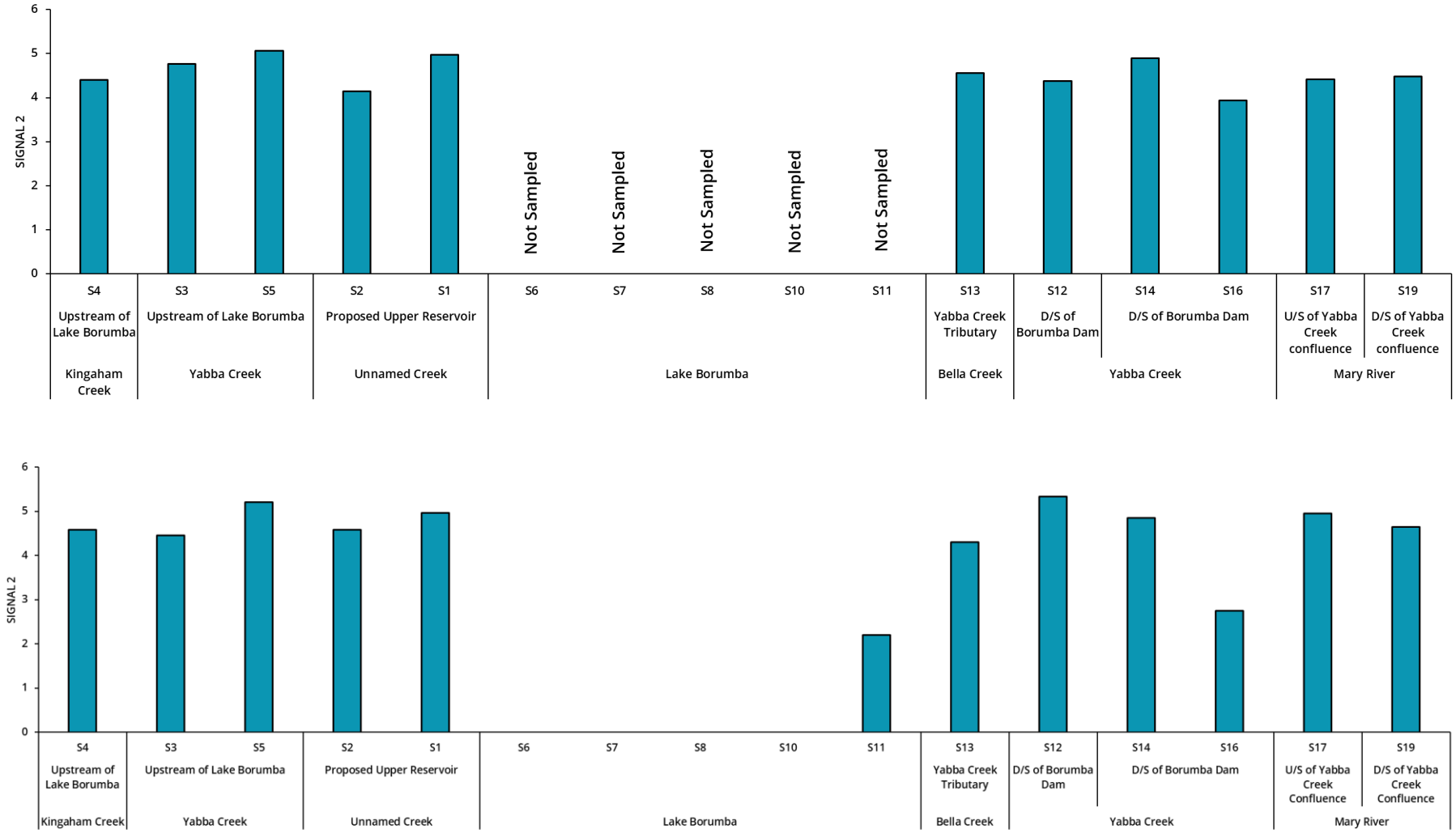


Figure 4-40 Macroinvertebrate SIGNAL2 Score of edge (top) and bed (bottom) habitat.

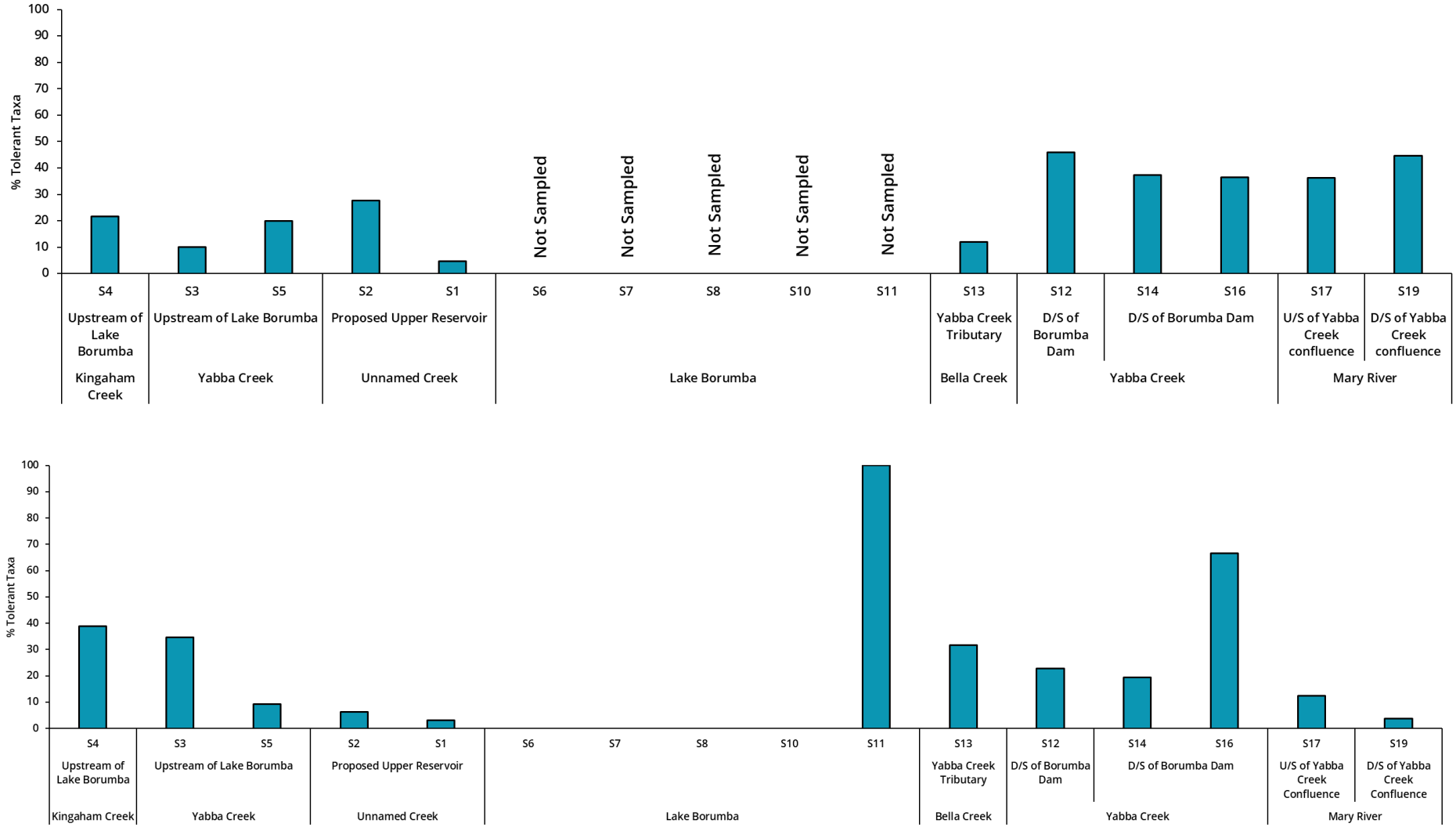


Figure 4-41 Macroinvertebrate % tolerant taxa of edge (top) and bed (bottom) habitat.

STATISTICAL ANALYSIS

Statistical analysis revealed that bed communities of both creek and river sites were significantly different to lake sites (P<0.05). This difference can clearly be seen through the separation of points based on sites in the MDS plot (Figure 4-42). In Lake Borumba, samples were collected from non-wadable depths via a Van Veen grab in accordance with DES (2018) rather than the dip net used at creek and river sites.

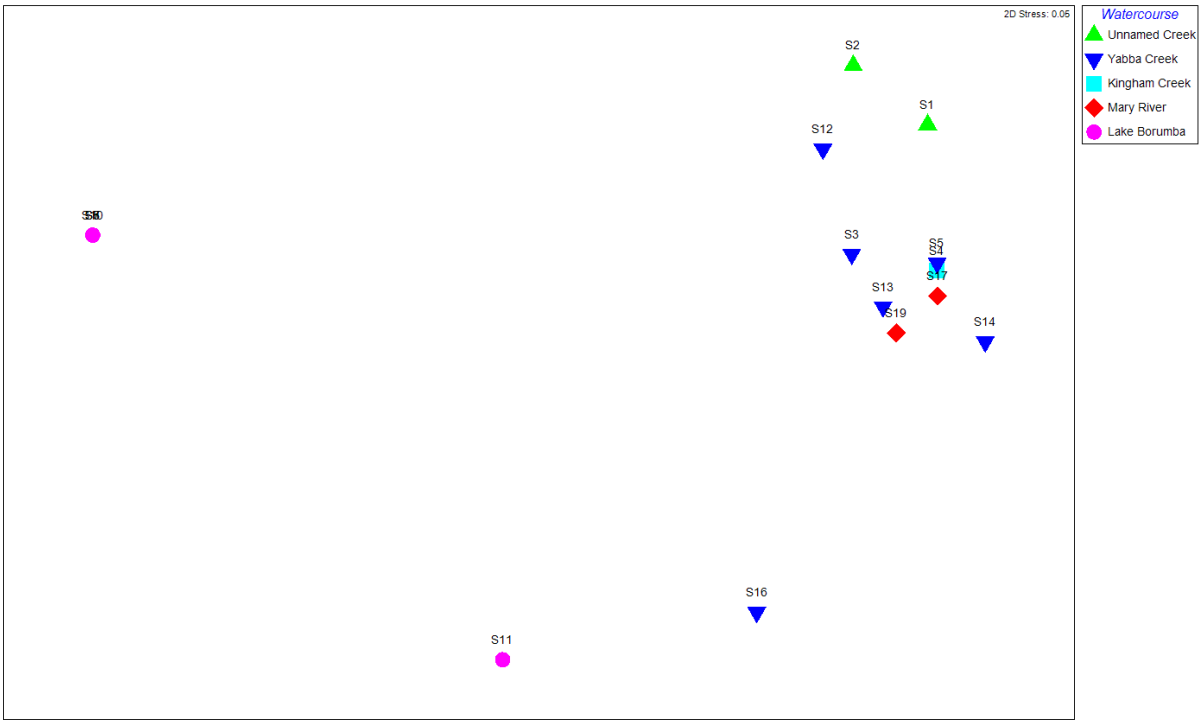


Figure 4-42 MDS plot of bed habitat communities at sites compared by watercourse.

COMMUNITY COMPOSITION

Edge Habitat

Communities of edge habitat were broadly similar to those of bed habitats, being characterised by fly larvae (Chironominae, Tanypodinae and Orthocladiinae) and mayfly larvae (Leptophlebiidae, Caenidae and Baetidae). Macroinvertebrate communities in edge habitat of creek and river sites are likely predominantly governed by the availability of microhabitat (e.g. macrophytes, woody debris, undercut banks etc.).

Bed Habitat

Bed habitats of creek and river sites were characterised by fly larvae (Chironominae and Orthocladinae), mayfly larvae (Leptophlebiidae, Caenidae and Baetidae) and caddisfly larvae (Hydropsychidae). These communities include a mixture of taxa that are highly tolerant of a wide range of conditions such as fly larvae and taxa that are generally considered to be more sensitive to disturbances such as mayfly and caddisfly larvae. Leptophlebiidae and Hydropsychidae are typically associated with fast flowing upland streams with rocky substrate, a noted characteristic of many of the creek sites. It should be noted that the stonefly family Gripopterygidae was recorded at sites upstream and downstream of Lake Borumba. Stoneflies are generally highly sensitive to habitat disturbances and are typically good bioindicators of environmental quality.

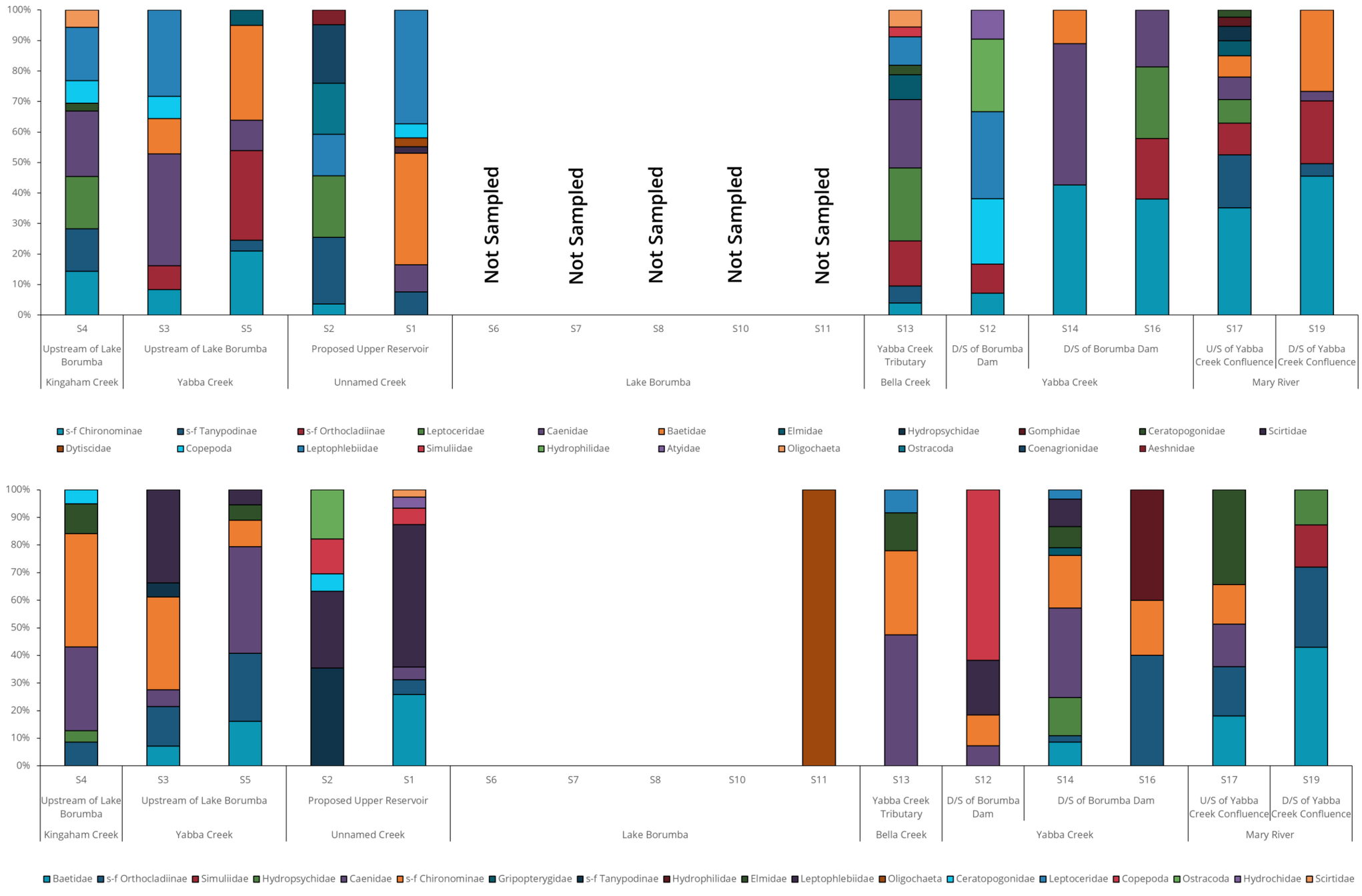


Figure 4-43 Macroinvertebrate assemblage composition from edge (top) and bed (bottom) habitats.

FUNCTIONAL FEEDING GUILDS

Edge Habitat

Edge communities were characterised by macroinvertebrate taxa that incorporate a wide range of feeding methods and that are adaptable to a range of food sources rather than having specialised feeding requirements (Figure 4-44).

Bed Habitat

Bed communities exhibited a wide range of feeding modes but families that include scraping taxa tended to dominate (Figure 4-44). Scrapers feed on periphyton that forms on hard surfaces and the abundance of rocky substrate within the Study Area likely benefits this feeding method.

AUSRIVAS

Edge Habitat

AusRivAS scores showed that macroinvertebrate communities of edge habitat were generally in good condition, with scores that were either similar to reference condition or showed some disturbance (significantly impaired) (Figure 4-45). Scores tended to be lower on Yabba Creek sites downstream of Lake Borumba, likely reflecting the decrease in habitat condition through riparian clearing and damage from recent flood events removing microhabitat (e.g., woody debris, macrophytes). It is noted that both Upper Storage Catchment edge sites were reported as "out of range of model" this is due to a lack of reference dataset in the AusRivAS model at the elevations similar to S2 and S1.

Bed Habitat

Bed AusRivAS scores were generally more variable than edge samples, with sites ranging from reference condition to a moderate/high degree of disturbance (severely impaired) (Figure 4-45). Notable taxa that were missing from samples and negatively influenced AusRivAS scores included the caddisfly family Hydropsychidae and the mayfly family Baetidae. These were generally widespread over the Study Area and their absence at these sites could be due to site-specific habitat variation.

HISTORICAL COMPARISON

The macroinvertebrate community assemblages of the Study Area were broadly similar to those recorded in previous sampling events (SKM, 2007).

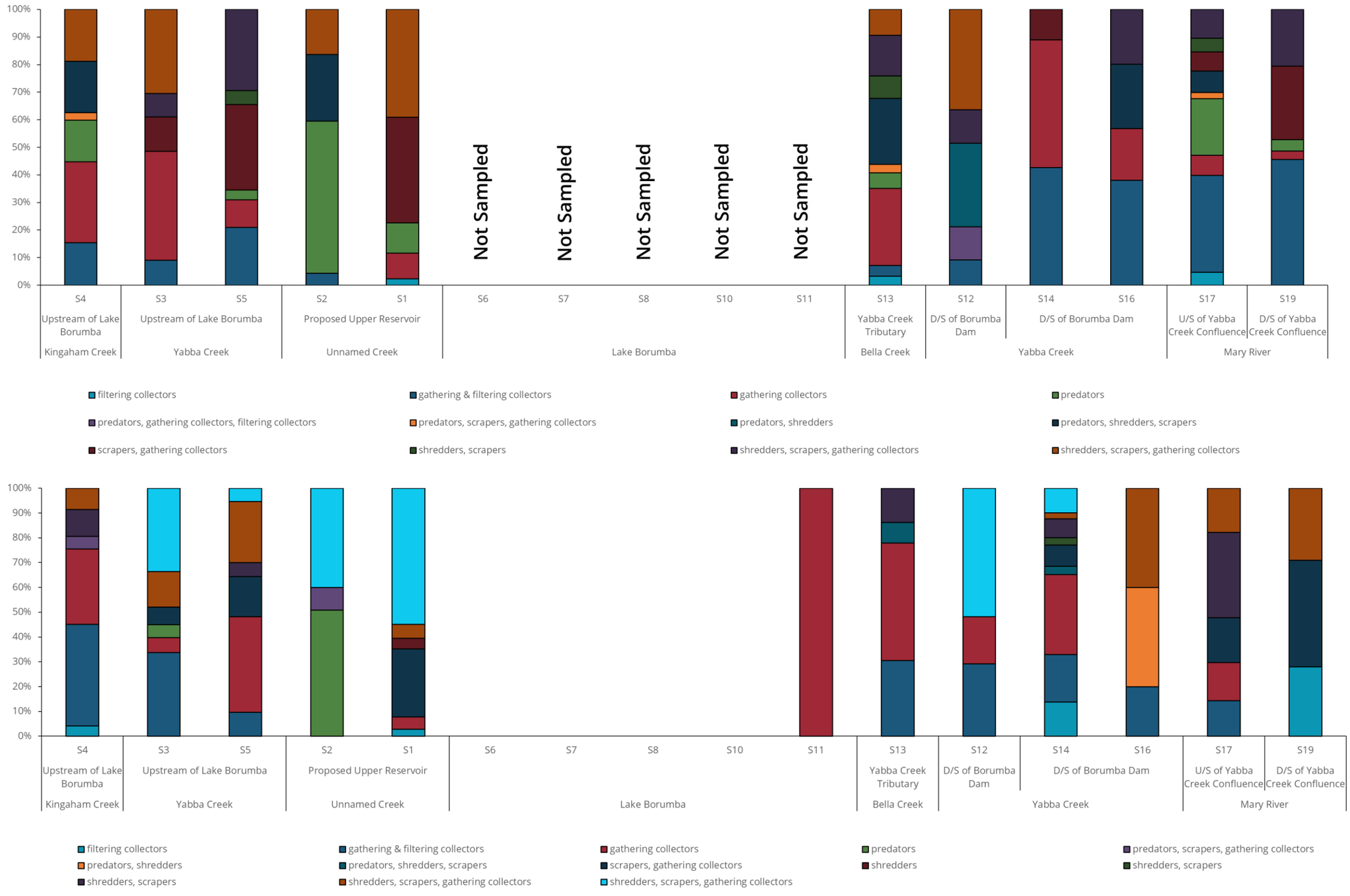


Figure 4-44 Macroinvertebrate functional feeding guild composition from edge (top) and bed (bottom) habitats.

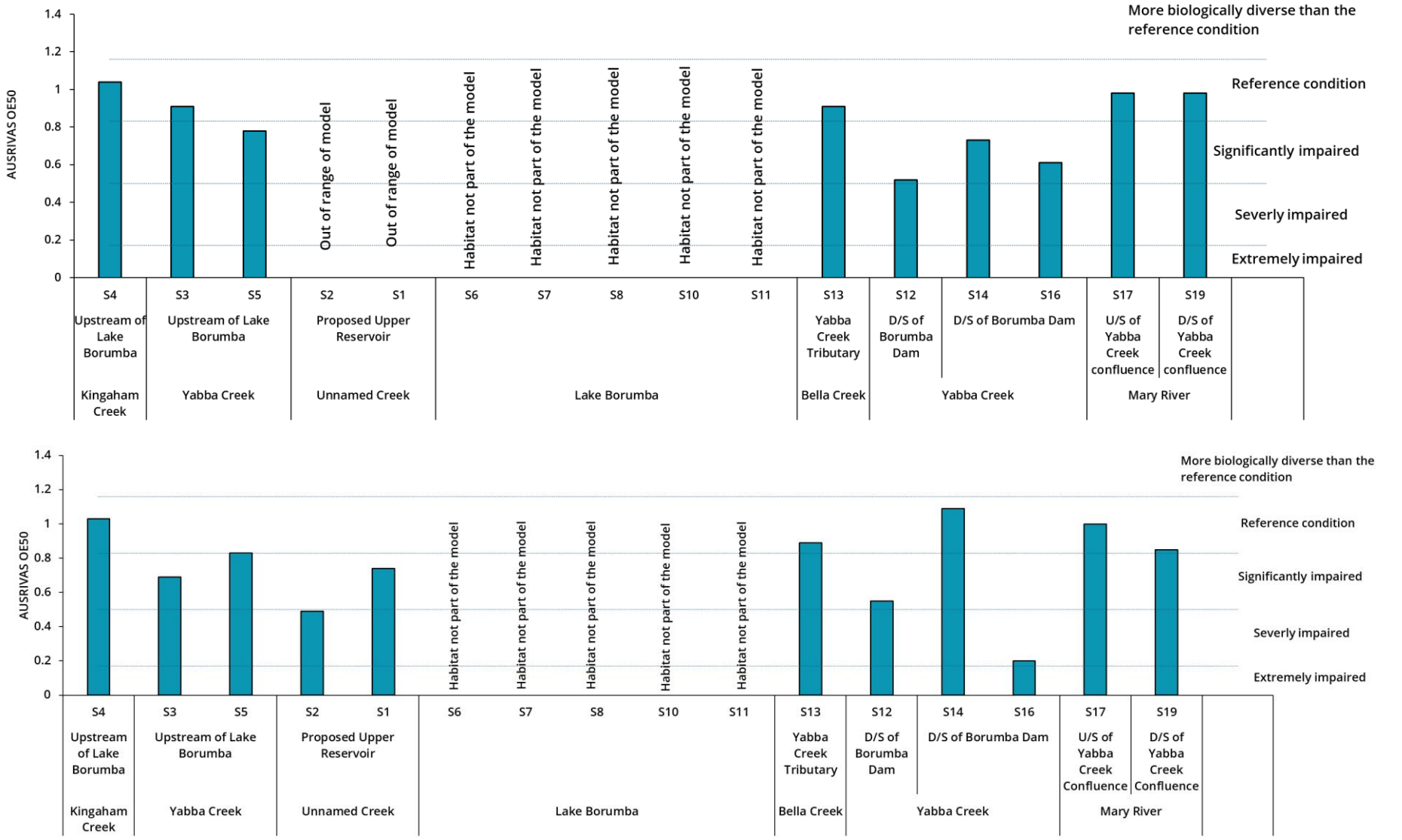


Figure 4-45 Macroinvertebrate AUSRIVAS OE50 from edge (top) and bed (bottom) habitats.

4.2.6 FISH

COMPOSITION

Overview

A total of 26 native and 5 exotic fish species were recorded over the Study Area (Table 4-19). The most widespread species was the crimson spotted rainbowfish (*Melanotaenia duboulayi*) which was recorded at all sites except S2. Other widespread species included bony bream (*Nematolosa erebi*), Australian smelt (*Retropinna semoni*), Agassiz's Glassfish (*Ambassis agassizii*) and Australian bass (*Percalates novemaculeata*).

There were more fish species recorded downstream of the of the dam (N=26) than upstream (N=18). The following species were only recorded below the dam:

- Mouth almighty (*Glossamia aprion*);
- Marjorie's Hardyhead (*Craterocephalus marjoriae*);
- Empire gudgeon (*Hypseleotris compressa*);
- Firetail gudgeon (*Hypseleotris galii*);
- Sea mullet (*Mugil cephalus*);
- Hyrtl's tandan (*Neosilurus hyrtlii*); and
- Sooty grunter (*Hephaestus fuliginosus*).

Although Empire and firetail gudgeon were not physically caught at sites above the dam wall there were records of the genus (*Hypseleotris sp*.) collected from eDNA. eDNA analysis is not yet able to distinguish between species of this genera and it is therefore unclear whether '*Hyseleotris* sp.' represent empire and firetail gudgeon, and/or western carp gudgeon (*Hypseleotris klunzingeri*). However, it is more likely that 'Hypseleotris' sp. represents western carp gudgeon as these were caught above the dam.

Relevant to threatened species, Mary River cod (*Maccullochella mariensis*) was recorded at 4 sites, showing a large distribution range across the Study Area, with records upstream of Lake Borumba in Yabba Creek (S3), within Lake Borumba (S8), downstream of the dam in Yabba Creek (S14) and within the main Mary River channel upstream of the confluence with Yabba Creek (S17). Australian lungfish (*Neoceratodus forsteri*) was recorded within Lake Borumba at one site (S7) and within deep pools at two sites downstream of the dam in Yabba Creek at S12 directly below the dam wall and S16 below Imbil Weir.

While recorded both upstream and downstream of the dam, populations of Australian Bass in upstream areas are likely maintained by stocking efforts in Lake Borumba (i.e. Australian Bass migrate to brackish and marine waters to spawn).

A summary of fish communities recorded within each study region is provided below.

Yabba Creek and Kingaham Creek – Upstream of Lake Borumba

The upstream reaches of Yabba Creek and Kingaham Creek were moderately diverse (N=14) and were largely dominated by small-bodied species such as gudgeon (*H. klunzingeri*, *Mogurnda adspersa*) and rainbowfish (*M. duboulayi*). Larger bodied fish species were also present although these were caught in smaller numbers (Australian bass – *P. novemaculeata*), or detected through eDNA only, such as Mary River cod (*M. mariensis*) (Site S3 on Yabba Creek). The abundance of tandan catfish (*Tandanus tandanus*) was notably higher in this region (N=30).

Long-finned eels (*Anguilla reinhardtii*) were recorded in this region despite being catadromous and requiring migration to the ocean to spawn. This species is known to move considerable distances across dry land when conditions are suitable (Pusey *et al.*, 2004), while also having the capability to

ascend weirs and some dam spillways which suggests they are able to circumvent watercourse barriers to access upstream reaches.

Unnamed Creeks – Proposed Upper Reservoir

Within the proposed Upper Reservoir

Fish in this area were only detected via eDNA survey techniques. Site S2 had the lowest species richness (N=6) of all areas sampled, comprising of all small bodied species, two of which were exotics. No threatened species were detected. The presence of cascades and likely high velocities during flowing conditions (i.e. steep bed grade and incised nature of the waterways) would limit connectivity to these areas, while the presence of only small pool habitat provides fewer habitat opportunities. It is anticipated that during typical dry seasonal conditions, pool habitat is likely to recede and dry out. It is also possible that the recent peak flow events provided connectivity to these areas which historically may have been limited or completely unavailable for extended periods of time.

The concentration of fish eDNA was notably low compared to other regions of the Study Area. The quantity of eDNA recorded of a particular fish species has been shown to correlate with the abundance measured using traditional means (e.g. netting, electrofishing etc) (Spear et al., 2021).

While low amounts of DNA may indicate the target species is actually present in low abundance, it may also arise from sample contamination through the sampling or laboratory screening process (minimised through strict protocols and negative controls) and/or facilitated movement of DNA between waterbodies (i.e. water birds, predator scats). We note that the eDNA blank samples returned no fish DNA, eliminating any potential links with sampler contamination.

Downstream of the proposed Upper Reservoir

No fish were captured via traditional survey techniques and eDNA was not employed. At the very least, the identified species in the proposed upper reservoir would also be present in this section.

Lake Borumba

Fish communities within Lake Borumba were moderately rich in species (N=13), comprising of a range of small and large body fish species. The community was generally dominated by bony bream (*N erebi*), followed by Agassiz's Glassfish (*A. agassizii*) and crimson spotted rainbowfish (*M. duboulayi*). Numbers of larger bodied commercially important fish species were relatively high, this included yellow belly (*M. ambigua*), Australian bass (*P. novemaculeata*) and southern saratoga (*Scleropages leichardti*). These species are regularly stocked within the lake for recreational fishing purposes. While native to Australia, yellow belly and southern saratoga are not locally native. Australian Bass occurs naturally in the Upper Mary River catchment below Borumba and has become more abundant throughout the Study Area due to stocking.

Australian lungfish (*N. forsteri*) was observed at site S7 and Mary River cod (*M. mariensis*) was recorded at site S8.

Downstream of Borumba Dam

Bella Creek

The fish communities of Bella Creek were moderately rich in species (N=14) with crimson-spotted rainbowfish (*M. duboulayi*) and Agassiz's Glassfish (*A. agassizii*) being the dominant species, followed by Australian smelt (*R. semoni*) and Pacific blue-eyes (*Pseudomugil signifier*).

Yabba Creek Downstream

This section had the widest range of fish species present, with crimson-spotted rainbowfish (*M. duboulayi*), Agassiz's Glassfish (*A. agassizii*) being the dominant species, followed by Australian smelt

(*Retropinna semoni*) and Marjorie's hardyhead (*Craterocephalus marjoriae*). This section also included the eDNA detection of Mary River cod (*M. mariensis*) and the capture of 17 individuals of Australian lungfish (*Neoceratodus forsteri*). Sixteen of these were recorded immediately below the dam.

Another potential fish barrier along Yabba Creek is Imbil Weir. Species presence/absence comparison between site S16 downstream of the weir and sites S12, S14 and S15 upstream of the weir indicated that Imbil weir is unlikely to be a significant long term fish barrier. However, it may be a low-flow barrier. The Yabba Creek anabranch could also provide connectivity above the weir.

Mary River

Fish communities of Mary River were generally similar in composition to the downstream section of Yabba Creek but were lower in species richness, with 14 species recorded upstream and 17 species recorded downstream of the confluence with Yabba Creek. Australian smelt (*R. semon*i) was the dominant fish species caught, followed by crimson-spotted rainbowfish (*M. duboulayi*), and Agassiz's Glassfish (*A. agassizii*). Mary River sites included two species that were recorded nowhere else in the Study Area, these included mouth almighty (*Glossamia aprion*) and sooty grunter (*Hephaestus fuliginosus*). Sooty grunters are native to northern Queensland, and it is likely that these have been translocated.

Mary River cod (*M. mariensis*) was detected by eDNA in Mary River upstream of the confluence with Yabba Creek.

EXOTIC SPECIES

Five exotic species were detected in the Study Area:

- Mozambique tilapia (*Oreochromis mossambicus*);
- Goldfish/common carp (*Crassius auratus/Cyprinus carpio*);
- Swordtail (*Xiphophorus helleri*);
- Platy (*Xiphophorus maculatus*); and
- Mosquitofish (*Gambusia holbrooki*).

Goldfish/common carp (*C. auratus/C. carpio*) appear to be restricted to sites above the dam wall, whereas Mozambique tilapia (*O. mossambicus*) were restricted to below the dam wall. Background information and detection across the Study Area for each exotic species are discussed below.

Goldfish/Carp (*Crassius auratus/Cyprinus carpio)*

For this assessment goldfish and carp are grouped together as eDNA cannot effectively separate these species, which was the only way they were detected in this survey. Goldfish/Carp have not been recorded in Mary River Basin (DES, 2013a).

This species group was detected at S3 upstream of Lake Borumba, at S2 in the proposed Upper Reservoir, and at S8 in Lake Borumba. At this stage their distribution appears to be restricted to areas upstream of the dam, which, assuming the data are correct, raises the question of how they got there.

Mozambique tilapia (*Oreochromis mossambicus*)

Mozambique tilapia had not yet reached Mary River catchment in 2006/2007 (SKM, 2007), though in 2012 (Gorrie, 2012) populations of both adults and juveniles were noted in Mary River near the town of Tiaro (MRCCC, 2014). In the current survey Mozambique tilapia were only noted along Mary River at sites S17 and S19. Distribution within Yabba Creek appears limited at this stage with no historical records. It is likely that Borumba Dam would limit their distribution into the catchment above.

Platy (*Xiphophorus maculatus*)

The platy is a predominantly tropical species occurring in warm, still waters of creeks and swamps around the Brisbane, Barron, Babinda and Johnstone rivers, Queensland. Populations have been established in Australia since the early 1960s after aquarium specimens were released into waterways (Bray and Gomon, 2022). In the current survey platys were noted at sites within Mary River, Lake Borumba and Bella Creek.

This species was detected via eDNA in S6 and S8 of Lake Borumba and S19 of Mary River. The species was also captured by electrofishing in S13 of Bella Creek. The results suggest this is the most widely distributed exotic across the Study Area.

Swordtail (*Xiphophorus helleri*)

Swordtails are a predominantly tropical species native to Central America occurring in warm low flow freshwater watercourses with minimal vegetation and gravel beds. They can also be found amongst aquatic plants in the edges of creeks and within drains. Populations have been established in Australia since the early 1960's after releases of aquarium specimens into waterways (Thompson and Bray, 2022).

This species was detected via eDNA at S17 along Mary River.

Mosquitofish (*Gambusia holbrooki*)

The mosquitofish was intentionally released into Australian waterways to control mosquito populations. The species is now distributed throughout the majority of waterbodies in Australia. Mosquitofish inhabit warm slow flowing or still waters, taking shelter within aquatic macrophytes and overhanging vegetation. The species is known to inhabit dams, lakes, billabongs, marshes, aqueducts and slow flowing streams while also being very tolerant to a wide range of water conditions from marine to freshwater environments and temperate to tropical conditions (Gomon and Bray, 2022).

The species was largely ineffective in controlling the mosquito population instead becoming a vigorous, expansive, and highly adaptable invasive species. The species has been involved in the decline of at least 9 fish species in Australia due to their aggression and habitat/food competition (Gomon and Bray, 2022) This species was detected via eDNA in S6 of Lake Borumba and S2 of the proposed Upper Reservoir.

HISTORICAL COMPARISON

The core fish community recorded over the Study Area was broadly similar to that recorded in surveys of Mary River by SKM, (2007), Kelly et al., (2004) and Ecotone, (2007) (Table 4-18). The SKM, (2007) surveys were also dominated by small-bodied species such as crimson-spotted rainbowfish (*M. duboulayi*), Agassiz's Glassfish (*A. agassizii*), Australian smelt (*R. semoni*) and Pacific blue-eyes (*P. signifier*) (SKM, 2007). All species recorded in 2006/2007 were recorded in the current survey apart from fork-tailed catfish (*Neoarius graeffei*) and bullrout (*Notesthes robusta*), which were both caught in the lower reaches of the Mary River (SKM, 2007). These species did not occur in the current survey as sites were located in the upper catchment where these species are generally less common.

Sooty grunter (*Hephaestus fuliginosus*) was present in the current study but absent from surveys in 2006/2007. This species is native to catchments of northern Queensland and individuals in Mary River represent a translocated population (Pusey *et al.*, 2004).

The exotic species detected in the current survey which have not been recorded across the Upper Mary River Catchment, are:

- Goldfish/carp (*Crassius auratus/Cyprinus carpio*);
- Mozambique tilapia (*Oreochromis mossambicus*); and

- Platy (*Xiphophorus maculatus*).

Both the platy and the Mozambique tilapia have been previously recorded in the wider Mary River catchment (DES, 2013a).

Table 4-18 Comparison between historical fish records of Mary River Upper Catchment area and the present field survey.

Species	Common Name	Recorded Historically	Recorded in Present Survey
Ambassidae			
Ambassis agassizii	Agassiz's glassfish	✓	✓
Ambassis marianus	estuary glassfish	✓	-
Anguillidae			
Anguilla reinhardtii	longfin eel	✓	✓
Anguilla australis	southern shortfin eel	✓	-
Apogonidae			
Glossamia aprion	Mouth almighty	✓	✓
Ariidae			
Neoarius graeffei	blue catfish	✓	-
Atherinidae			
Craterocephalus sp.	Hardyhead	-	✓
Craterocephalus marjoriae	Marjorie's hardyhead	✓	✓
Craterocephalus stercusmuscarum	flyspecked hardyhead	✓	✓
Cichlidae			
***Oreochromis mossambica* X**	Mozambique mouthbrooder	✓	✓
Clupeidae			
Nematalosa erebi	bony bream	✓	✓
Cyprinidae			
***Crassius auratus/Cyprinus carpio* X**	Goldfish/common carp	-	✓
Eleotridae			
Hypseleotris sp.	Carp gudgeon	-	✓
Gobiomorphus australis	striped gudgeon	✓	-

Species	Common Name	Recorded Historically	Recorded in Present Survey
Gobiomorphus coxii	Cox gudgeon	✓	-
Oxyeleotris lineolata	sleepy cod	✓	-
Hypseleotris compressa	empire gudgeon	✓	✓
Hypseleotris galii	firetail gudgeon	✓	✓
Hypseleotris klunzingeri	western carp gudgeon	✓	✓
Mogurnda adspersa	southern purple spotted gudgeon	✓	✓
Philypnodon grandiceps	flathead gudgeon	✓	✓
Philypnodon macrostomus	dwarf flathead gudgeon	✓	-
Gobiidae			
Afurcagobius tamarensis	Tamar goby	✓	-
Awaous acritosus	roman-nose goby	✓	-
Redigobius bikolanus	speckled goby	✓	-
Redigobius macrostoma	largemouth goby	✓	-
Hemiramphidae			
Arrhamphus sclerolepis	snubnose garfish	✓	-
Kuhliidae			
Kuhlia rupestris	Jungle perch	✓	-
Melanotaeniidae			
Melanotaenia duboulayi	Crimson spotted rainbowfish	✓	✓
Rhadinocentrus ornatus	ornate rainbowfish	✓	-
Pseudomugil signifer	Pacific Blue Eye	✓	✓
Mugilidae			
Mugil cephalus	sea mullet	✓	✓
Trachystoma petardi	pinkeye mullet	✓	-
Neoceratodontidae			
Neoceratodus forsteri	Australian Lungfish	✓	✓
Osteoglossidae			

Species	Common Name	Recorded Historically	Recorded in Present Survey
***Scleropages leichardti* T**	southern saratoga	✓	✓
Percichthyidae			
Maccullochella mariensis	Mary River cod	✓	✓
***Macquaria ambigua* T**	golden perch	✓	✓
Percalates novemaculeata	Australian bass	✓	✓
Plotosidae			
Neosilurus hyrtlii	Hyrtl's catfish	✓	✓
Porochilus rendahli	Rendahl's catfish	✓	-
Tandanus tandanus	freshwater catfish	✓	✓
Poeciliidae			
***Gambusia holbrooki* X**	mosquitofish	✓	✓
***Poecilia reticulata* X**	guppy	-	-
***Xiphophorus hellerii* X**	swordtail	✓	✓
***Xiphophorus maculatus* X**	platy	-	✓
Retropinnidae			
Retropinna semoni	Australian smelt	✓	✓
Scorpaenidae			
Notesthes robusta	bullrout	✓	-
Synbranchidae			
Ophisternon bengalense	swamp eels	-	✓
Terapontidae			
***Hephaestus fuliginosus* T**	sooty grunter	-	✓
Leiopotherapon unicolor	spangled perch	✓	✓
***Bidyanus bidyanus* T**	Silver perch	✓	-

Historical records include: (SKM, 2007; Kelly et al., 2004; Ecotone, 2007; DES, 2013b)

X = exotic species

T = translocated species

Table 4-19 Total fish species abundances among sites, regions and systems. Tick marks represent species detected using eDNA.

				Kingaham Creek	Yabba Creek U/S		Unnamed Creek		Lake Borumba			Bella Creek		Downstream of Borumba Dam						
												Yabba Creek Tributary		Yabba Creek D/S			Mary River			
				Upstream of Lake Borumba	Upstream of Lake Borumba		Proposed Upper Reservoir	Downstream of Proposed Upper Reservoir									U/S of Yabba Creek Confluence		D/S of Yabba Creek Confluence	Total
Species	Common name	EPBC Listing	NCA Listing	S4	S3	S5	S2	S1	S6	S7	S8	S11	S13	S12	S14	S15	S16	S17	S19	
Ambassidae																				
Ambassis agassizii	Agassiz's Glassfish			✓	✓	7			✓	132	✓		53 ✓		✓	70	3 ✓	22	24 ✓	311
Anguillidae																				
Anguilla reinhardtii	Long-finned eel				✓				✓		✓		1 ✓	16 ✓	✓	1	✓	✓	1 ✓	19
Apogonidae																				
Glossamia aprion	Mouth almighty																		✓	0
Atherinidae																				
Craterocephalus sp.	Hardyhead												✓							0
Craterocephalus marjoriae	Marjorie's Hardyhead														3	18			3	24
Craterocephalus stercusmuscarum	Flyspecked Hardyhead								✓				7			7		✓	2	16
Cichlidae																				
Oreochromis mossambicus*^	Mozambique tilapia																	✓	✓	0
Clupeidae																				
Nematalosa erebi	Bony Bream			✓	✓		✓		✓	422 ✓	52 ✓	1		10 ✓	✓	3	1 ✓	✓	2 ✓	491
Cyprinidae																				
Crassius auratus/Cyprinus carpio*	Goldfish/common carp				✓		✓				✓									0
Eleotridae																				
Hypseleotris sp.	Carp gudgeon			✓	✓		✓		✓		✓		✓	✓	✓		✓	✓	✓	0

Species	Common name	EPBC Listing	NCA Listing	Kingaham Creek	Yabba Creek U/S		Unnamed Creek		Lake Borumba			Bella Creek		Downstream of Borumba Dam						Total
												Yabba Creek Tributary		Yabba Creek D/S			Mary River			
				Upstream of Lake Borumba	Upstream of Lake Borumba		Proposed Upper Reservoir	Downstream of Proposed Upper Reservoir									U/S of Yabba Creek Confluence		D/S of Yabba Creek Confluence	
				S4	S3	S5	S2	S1	S6	S7	S8	S11	S13	S12	S14	S15	S16	S17	S19	
Hypseleotris compressa	empire Gudgeon												4							4
Hypseleotris galii	firetail Gudgeon													26		6				32
Hypseleotris klunzingeri	western Carp Gudgeon			7		29							7			13		2	16	74
Mogurnda adspersa	southern purplespotted gudgeon			9 ✓	8 ✓	8					✓		1 ✓				✓	✓	✓	26
Philypnodon grandiceps	flathead gudgeon				✓	1	✓								✓					1
Melanotaeniidae																				
Melanotaenia duboulayi	crimson spotted rainbowfish			ü	3 ✓	60			✓	✓	35 ✓	29	95 ✓	40	9 ✓	125	2 ✓	24 ✓	15 ✓	437
Pseudomugil signifer	Pacific blue eye					2							34		6 ✓	4		1	18	65
Mugilidae																				
Mugil cephalus	sea mullet													✓			✓	✓	✓	0
Neoceratodontidae																				
Neoceratodus forsteri	Australian lungfish	V								O				16			✓			16
Osteoglossidae																				
Scleropages leichardti	southern saratoga								✓	1 ✓	✓			✓	✓	1	✓			2
Percichthyidae																				
Maccullochella mariensis	Mary River cod	E			✓						✓				✓			✓		0
Macquaria ambigua	yellow belly									1		12	✓	✓	✓		✓			13
Percalates novemaculeata	Australian bass			✓	✓	1			✓	16 ✓	4 ✓	2	1 ✓	✓	✓		2 ✓		1 ✓	27

Species	Common name	EPBC Listing	NCA Listing	Kingaham Creek	Yabba Creek U/S		Unnamed Creek		Lake Borumba			Bella Creek		Downstream of Borumba Dam						Total
				Upstream of Lake Borumba	Upstream of Lake Borumba		Proposed Upper Reservoir	Downstream of Proposed Upper Reservoir				Yabba Creek Tributary		Yabba Creek D/S			Mary River			
																	U/S of Yabba Creek Confluence		D/S of Yabba Creek Confluence	
				S4	S3	S5	S2	S1	S6	S7	S8	S11	S13	S12	S14	S15	S16	S17	S19	
Plotosidae																				
Neosilurus hyrtlii	Hyrtl's catfish															1				1
Tandanus tandanus	tandan catfish			2		30					4		7	4	1	1		9	4	62
Poeciliidae																				
Gambusia holbrooki*	mosquitofish						✓		✓											0
Xiphophorus helleri*	swordtail																	✓		0
Xiphophorus maculatus*	platy								✓		✓		1						✓	1
Retropinnidae																				
Retropinna semoni	Australian smelt			1	✓	1			✓	✓	✓		37 ✓	✓	5 ✓	20	6 ✓	160 ✓	196 ✓	426
Terapontidae																				
Hephaestus fuliginosus	sooty grunter																	✓	✓	0
Leiopotherapon unicolour	spangled perch				✓		✓		✓		✓			✓					3	3
Total Count				19	11	139	0	0	0	572	95	44	248	112	24	270	14	218	285	4102
Total Native Species				19	11	139	0	0	0	572	95	44	247	112	24	270	14	218	285	4102
Total Exotic Species				0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0

* = Exotic introduced

^ = recorded as Oreochromis sp. but likely O. mossambicus based on distribution

V = Vulnerable

E = Endangered

O = Observed

MIGRATORY AND SPAWNING PATTERNS

Relative to the below discussion, migration involves bi-directional large- or small-scale movements by individuals between habitats that fulfill competing needs that may occur within and between different life-stages. The below discussion focusses on spawning migrations undertaken by fish. Such migrations are considered the greatest distance fish will migrate.

Catadromous fish

Sea mullet (*M. cephalus*), Australian bass (*P. novemaculeata*) and long-finned eels (*A. reinhardtii*) are catadromous, meaning that they must migrate downstream to estuarine/marine waters to spawn before migrating back upstream as they mature into adults. Sea mullet were not recorded within or upstream of Lake Borumba, suggesting they are unable to migrate upstream past the dam wall. Australian bass are also probably unable to move upstream past the dam wall, however they are regularly stocked within the dam, and appear to also move out of Lake Borumba into upper Yabba Creek. Continual stocking of this species is required to maintain populations of this fish in Lake Borumba and upstream areas.

Long-finned eels (*Anguilla reinhardtii*) were recorded via eDNA upstream of the dam wall and require migration of adults to marine waters to spawn and return of juvenile elvers. This species is known to move considerable distances across dry land when conditions are suitable (Pusey *et al.*, 2004).

Amphidromous

Amphidromous fish migrate from fresh to salt water or from salt to fresh water at some stage of the life cycle for reasons other than spawning. Empire gudgeon larvae are thought to hatch in freshwater habitats before being washed down into estuarine reaches, where they begin development before moving upstream. The absence of empire gudgeon upstream of large dams in New South Wales (Shoalhaven River) and South-east Queensland (North Pine River) is attributed to this reproductive mode (Pusey *et al.*, 2004). This may be why empire gudgeon were absent in Lake Borumba and associated upstream areas. However, it should be noted that migration requirements of empire gudgeon are not well understood, and they are also able to complete their life-cycle in freshwater. Empire gudgeon are therefore best described as semi-amphidromous.

Potamodromous

Most of the fish species identified are potamodromous, meaning that they complete their lives wholly in freshwater (Table 4-21) but do undertake migrations. The spawning activity of potamodromous species is usually highly related to flow regime. In most instances, flooding events that coincide with typical wet seasonal periods are generally recognised as the most common factor initiating migration and spawning, followed by associated changes in temperature and day-length (Smith and Kwak, 2015). As identified in Table 4-20 there appears to be considerable overlap in key migratory and spawning periods of the identified fish recorded within the Study Area.

Given the length frequencies identified in Appendix F, where considerable variation in lengths of fish sampled was identified, it appears that potamodromous species in areas both upstream and downstream from the dam are recruiting. An exception to this trend was noted solely for Saratoga (not locally native) and southern purple spotted gudgeon. Variation in lengths of fish also indicated several different recruitment events including more recent events. Successful recruitment events for potamodromous species upstream of Lake Borumba were evident. In particular, tandan catfish are successfully recruiting upstream of Lake Borumba where young of the year were identified throughout upstream portions of Yabba and Kingaham Creek.

Mary River cod complete their lifecycle in freshwater. The location of DNRM, (2016) “stronghold” status spawning sites of Mary River cod have been confirmed to be Six Mile, Obi Obi, and Tinana creeks

(Dunlop, 2016). However spawning behaviour has never been observed in the wild (Simpson and Jackson, 1996). This species was not captured in this survey but rather detected via eDNA survey methods. As such it is not possible to ascertain if Mary River cod are recruiting in the Study Area. This species spawns in hollow logs which were observed throughout the Study Area. However, given their preference for deep, shaded, slow-flowing pools with mud/clay substrates, abundant woody debris and log-jams and well shaded by overhanging vegetation, spawning is expected to occur in the following areas:

- Upstream of Lake Borumba along Yabba and Kingaham Creek;
- Downstream of the dam along Yabba Creek; and
- Mary River both upstream and downstream of the confluence of Yabba Creek.

It is not known if Mary River cod will breed in impoundments, however breeding success and recruitment among impoundment populations of other Australian percichthyid fishes is often very low or non-existent (Barlow, 1991). Large wood debris in Lake Borumba was evident in both shallow edge margins and deep pool sections.

Table 4-20 Key migratory and spawning periods of fish identified downstream of the dam wall. Data summarised from Pusey (2004).

Species	Common name	Migratory Pattern	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ambassidae														
Ambassis agassizii	Agassiz's Glassfish	Potamodromous									■	■	■	■
Aopogonidae														
Glossamia aprion	Mouth almighty	Potamodromous	■								■	■	■	■
Anguillidae														
Anguilla reinhardtii	Long-finned eel	Catadromous	■	■							■	■	■	■
Atherinidae														
Craterocephalus marjoriae	Marjorie's Hardyhead	Potamodromous	■	■						■	■	■	■	■
Craterocephalus stercusmuscarum	Flyspecked Hardyhead	Potamodromous	■	■						■	■	■	■	■
Clupeidae														
Nematalosa erebi	Bony Bream	Potamodromous	■	■	■	■						■	■	■
Eleotridae														
Hypseleotris compressa	Empire Gudgeon	Semi-amphidromous	■	■	■	■	■							
Hypseleotris galii	Firetail Gudgeon	Potamodromous	■	■	■					■	■	■	■	■
Hypseleotris klunzingeri	Western Carp Gudgeon	Potamodromous	■	■	■	■	■			■	■	■	■	■
Mogurnda adspersa	Southern Purplespotted Gudgeon	Potamodromous	■	■							■	■	■	■

Philypnodon grandiceps	Flathead Gudgeon	Potamodromous												
Melanotaeniidae														
Melanotaenia duboulayi	Crimsonspotted Rainbowfish	Potamodromous												
Pseudomugil signifer	Pacific Blue Eye	Potamodromous												
Mugilidae														
Mugil cephalus	Sea mullet	Catadromous												
Neoceratodontidae														
Neoceratodus forsteri	Australian Lungfish	Potamodromous												
Osteoglossidae														
Scleropages leichardti	Southern Saratoga	Potamodromous												
Percichthyidae														
Maccullochella mariensis	Mary River cod	Potamodromous												
Macquaria ambigua	Yellow belly	Potamodromous												
Percalates novemaculeata	Australian Bass	Catadromous												
Plotosidae														
Neosilurus hyrtlii	Hyrtl's catfish	Potamodromous												
Tandanus tandanus	Tandan Catfish	Potamodromous												
Retropinnidae														
Retropinna semoni	Australian smelt	Potamodromous												

Terapontidae														
Hephaestus fuliginosus	Sooty grunter	Potamodromous												
Leiopotherapon unicolour	Spangled perch	Potamodromous												

HABITAT

Fish recorded in the Study Area are known to inhabit a wide range of habitats but generally speaking, most species prefer low to moderate flow reaches in addition to still-water billabongs, lakes, ponds and lagoons (Table 4-21). Many of the species recorded in the Study Area (including Mary River cod and Australian lungfish) have a preference for deep, slow-flow pools associated with large woody debris, overhanging vegetation and dense macrophyte beds.

Many species of the Study Area are known to inhabit Borumba Dam, these include:

- Agassizii's glassfish (*A. agassizii*);
- Flyspecked hardyhead (*C. stercusmuscarum*);
- Bony Bream (*N. erebi*);
- Crimson spotted rainbowfish (*M. duboulayi*);
- Tandan catfish (*T. tandanus*);
- Australian lungfish (*N. forsteri*);
- Mary River cod (*M. mariensis*);
- Australian bass (*P. novemaculeata*);
- Yellow belly (*M. ambigua*);
- Southern saratoga (*S. leichardti*);
- Longfin eel (*A. reinhardtii*);
- Mosquitofish (*G. holbrooki*);
- Platy (*X. maculatus*);
- Carp gudgeon (*Hypseleotris sp.*);
- Goldfish/common carp (*C. auratus/C. carpio*);
- Southern purple spotted gudgeon (*M. adspersa*);
- Australian smelt (*R. semoni*); and
- Spangled perch (*L. unicolour*).

The following were also found upstream of Lake Borumba but not within the lake itself and while not recorded during surveys can also potentially inhabit the lake.

- Western Carp Gudgeon (*H. klunzingeri*);
- Flathead Gudgeon (*P. grandiceps*); and
- Pacific Blue Eye (*P. signifer*).

DIET

Most of the identified fish within the Study Area have non-selective diets, consuming a wide variety of macroinvertebrates, micro and macrocrustaceans, terrestrial insects, fish, algae, aquatic plants and detritus (Table 4-21).

Bony bream (*N. erebi*) and sea mullet (*M. cephalus*) have the most specialist diets, being comprised of plant material, microalgae (e.g., diatoms) and detritus. Bony bream are the dominant species within Lake Borumba, suggesting that sufficient food resources are available in this habitat.

Table 4-21 Habitat, feeding and breeding/nesting requirements of fish species within the Study area. Data summarised from Pusey (2004).

Species	Common Name	Migratory Pattern	Habitat	Breeding and Nesting	Feeding Guild and Diet	Detailed Diet Composition
Ambassidae						
Ambassis agassizii	Agassiz's Glassfish	Potamodromous	Still or slow flowing large lowland rivers, upland rivers and coastal streams. Also occurs lakes, ponds, swamps, dams and weirs.	Spawns and matures in freshwater. Eggs are deposited on the substrate, within aquatic plants and marginal vegetation.	Microphagic carnivore	Mostly aquatic insects and microcrustaceans. Minor component of macrocrustaceans and terrestrial insects.
Anguillidae						
Anguilla reinhardtii	Long-finned eel	Catadromous	Prefers still water but found in a wide range of habitats including lakes, swamps, lagoons and rivers.	Breeding adults undertake very large migrations from freshwater reaches down through estuaries and into the open ocean. Spawning occurs in the Coral Sea. Juvenile eels migrate back into freshwater reaches where they mature into adults.	Carnivore	Adults: aquatic insects, fish, terrestrial invertebrates and vertebrates. Juveniles: aquatic insects, molluscs and macrocrustaceans.
Aopogonidae						
Glossamia aprion	Mouth almighty	Potamodromous	Found in in floodplain lagoons and to a lesser extent, lowland muddy lagoons, sandy creeks, escarpment perennial streams and main channel waterbodies. Most commonly occurs in deep, slow-flowing pools where submerged aquatic macrophytes and submerged marginal vegetation are common.	Males brood eggs and young in mouth.	Carnivore	Aquatic insects, macrocrustaceans and fish.
Atherinidae						
Craterocephalus marjoriae	Marjorie's Hardyhead	Potamodromous	Found in a wide variety of lotic habitats but generally limited to larger river systems. A pelagic schooling species, usually in the mid-water column in open water.	Spawns and matures in freshwater. Probably spawns in aquatic macrophytes and marginal vegetation.	Microphagic omnivore	Algae, macrophytes, microcrustaceans and aquatic insects.
Craterocephalus stercusmuscarum	Flyspecked Hardyhead	Potamodromous	A wide variety of habitats including large rivers, billabongs, small rainforest streams, volcanic crater lakes, dune lakes, dams, weirs and estuaries. Prefers runs and pools of moderate depth.	Spawns and matures in freshwater. Probably spawns in aquatic macrophytes and marginal vegetation.	Microphagic omnivore	Algae, macrophytes, microcrustaceans and aquatic insects.
Clupeidae						
Nematalosa erebi	Bony Bream	Potamodromous	Found in a wide variety of habitats such as salt lakes, lowland rivers, floodplain billabongs and lagoons, impoundments to rainforest streams.	Spawns in shallow still water embayments, lagoons and backwaters.	Detritivore/algivore	Diet generally dominated by microbenthic algae such as desmids and diatoms.
Eleotridae						

Species	Common Name	Migratory Pattern	Habitat	Breeding and Nesting	Feeding Guild and Diet	Detailed Diet Composition
Hypseleotris compressa	Empire Gudgeon	Semi-amphidromous. Can reproduce solely in freshwater but juveniles often begin life in estuaries.	Usually occurs in the lowland portions of river basins in a variety of lotic and lentic habitats including lowland rainforest streams, lowland sections of large rivers, floodplain wetlands, coastal streams, swamps and seepages, dune lake systems and estuaries. Prefers low flow runs and pools.	Spawning occurs amongst aquatic vegetation, sand, rocks, woody debris. Eggs and larvae thought to be washed down into estuaries.	Microphagic omnivore	Aquatic insects, algae and planktonic microcrustaceans.
Hypseleotris galii	Firetail Gudgeon	Potamodromous	Generally restricted to lowland rivers however has been recorded in the headwaters of Mary River. Inhabits a variety of lotic and lentic habitats including small coastal streams, throughout large rivers and their floodplain habitats (billabongs and wetlands), coastal wetlands, dune lake and stream. Prefers slow flow.	The eggs of are usually attached to the under surface of firm substrates such as gravel, rocks, woody debris or aquatic plants.	Microphagic carnivore	Aquatic insects, microcrustaceans and macrocrustaceans.
Hypseleotris klunzingeri	Western Carp Gudgeon	Potamodromous	Similar to *H. galii* but with a higher preference for larger river channels, riffles and higher velocity waters.	Spawns amongst aquatic and submerged marginal vegetation.	Microphagic carnivore	Aquatic insects and microcrustaceans
Mogurnda adspersa	Southern Purplespotted Gudgeon	Potamodromous	Occurs in a wide diversity of different stream types ranging from the main river channel at low elevation and close to the river mouth through to headwater streams at high elevation and including most stream types between these two extremes. Prefers low currents and abundant cover.	Eggs are deposited on rocks, woody debris, broadleafed aquatic plants and other hard substrates.	Microphagic carnivore	Aquatic insects and terrestrial invertebrates.
Philypnodon grandiceps	Flathead Gudgeon	Potamodromous	Occurs in a variety of lotic and lentic habitats including small coastal streams, throughout large rivers and their floodplain habitats (billabongs and wetlands), inland saline lakes and coastal wetlands. Although usually found in freshwater habitats, it is also common in brackish and estuarine waters.	Spawns on solid substratum such as a rock or wood.	Microphagic carnivore	Aquatic insects and molluscs.
Melanotaeniidae						
Melanotaenia duboulayi	Crimsonspotted Rainbowfish	Potamodromous	large lowland rivers, upland rivers and streams, small coastal streams, dune lake and stream systems on Fraser Island, lakes, ponds and river impoundments (dams and weirs).	Spawns in beds of aquatic macrophytes and submerged marginal vegetation	Omnivore	Terrestrial and aquatic insects, algae and macrophytes.
Pseudomugil signifer	Pacific Blue Eye	Potamodromous	A variety of lotic and lentic habitats including small coastal streams, rainforest streams, large rivers and in dune lake and stream systems. It is also common in coastal lagoons, wetlands, salt marshes, estuaries and inshore marine areas	Spawns in aquatic macrophytes and submerged marginal vegetation. Sometimes on bare substrate.	Microphagic carnivore	Terrestrial and aquatic insects.
Neoceratodontidae						
Neoceratodus forsteri	Australian Lungfish	Potamodromous	Prefers slow-flowing rivers and still water including reservoirs with some aquatic vegetation along the banks and is most common in deep pools. Usually closely associated with overhanging vegetation, submerged woody debris, and dense macrophyte beds	Thought to be heavily dependent on the presence of aquatic plants, although also known to spawn amongst root masses.	Omnivorous	Adults: Insect larvae, molluscs, tadpoles, crustaceans, terrestrial and aquatic vegetation such as *Vallisneria spp.* and *Hydrilla spp*. Juveniles: Microcrustaceans, fly larvae and filamentous algae
Mugilidae						

Species	Common Name	Migratory Pattern	Habitat	Breeding and Nesting	Feeding Guild and Diet	Detailed Diet Composition
Mugil cephalus	Sea mullet	Catadromous	Moves extensively throughout its life. Inhabits estuaries to hundreds of kilometres upstream. Tends not to enter fast-flowing tributaries.	Broadcast spawner (into the water column) in the surf zone of coastal waters.	Detritivore	Fine detrital material, plant fibres, sand, grit, diatoms and filamentous algae
Osteoglossidae						
Scleropages leichardti	Southern Saratoga	Potamodromous	Prefers long deep turbid waterholes, with a reduced flow rate and abundant snags, undercut banks and overhanging vegetation	The female incubates the eggs in the buccal cavity and guards the young until they are old enough to leave.	Carnivorous	Surface feeder on insects, crustaceans, frogs and fish
Percichthyidae						
Maccullochella mariensis	Mary River cod	Potamodromous	A variety of types of habitat in Mary River system from high-gradient rocky upland streams to large, slow-flowing pools in lowland areas. The ideal habitat appears to be deep, shaded, slow-flowing pools with mud/clay substrates, abundant woody debris and log-jams, well shaded by overhanging vegetation	Structures such as hollow logs.	Carnivorous	Data deficient. Probably crustaceans and fish, and possibly also frogs, snakes, waterbirds and mice.
Macquaria ambigua	Yellow belly	Potamodromous	Prefers habitats containing relatively deep, slow-flowing water, cover, shade and shelter.	Spawning takes place near the surface.	Opportunistic, macrophagic carnivores	Macrocrustaceans (shrimps, crayfish), aquatic (and terrestrial) insects, molluscs, microcrustaceans and fish
Percalates novemaculeata	Australian Bass	Catadromous	Estuarine areas upstream to high elevation tributaries	Spawning habitat may include aquatic macrophyte beds, rocky reefs and sand bars.	Euryphagic carnivore	Large crustaceans, aquatic/terrestrial insects and fish.
Plotosidae						
Neosilurus hyrtlii	Hyrtl's catfish	Potamodromous	Makes use of virtually every aquatic habitat available within a river with the exception of the estuarine reaches. a benthic species found over a wide range of water depths and most frequently observed in close association with the substrate	Gravel beds suggested to be important.	Carnivorous	Aquatic invertebrates, microcrustaceans and detritus.
Tandanus tandanus	Tandan Catfish	Potamodromous	A variety of lotic and lentic habitats including small coastal streams, rainforest streams, large rivers and in dune lake and stream systems. It is also common in some artificial lakes and impoundments. Prefers abundant aquatic macrophytes, filamentous algae, leaf litter undercut banks and root masses.	Builds a circular, saucer-shaped depression in the substrate, 0.5 to 2 m in diameter, and made of coarse sand or gravel with a central depression, usually of coarser material such as coarse gravel and sometimes rocks and sticks.	Carnivorous	large crustaceans aquatic/terrestrial insects, detritus molluscs and fish
Retropinnidae						
Retropinna semoni	Australian smelt	Potamodromous	A variety of habitats including still or slow-flowing aquatic habitats in large lowland floodplain rivers (e.g. backwaters, swamps and billabongs), upland rivers and streams, small coastal streams, dune lakes river impoundments (dams and weirs) and brackish river estuaries	Spawns over aquatic vegetation or gravel substrate	Microphagic carnivore	Aquatic/terrestrial insects and microcrustaceans
Terapontidae						

Species	Common Name	Migratory Pattern	Habitat	Breeding and Nesting	Feeding Guild and Diet	Detailed Diet Composition
Hephaestus fuliginosus	Sooty grunter	Potamodromous	A variety of streams ranging from small first-order tributaries of small catchment area through to fifth-order rivers with much larger catchments. The small streams included both headwater streams moderately distant from the river mouth and at elevations, as well as lowland adventitious streams located close to the river mouth.	Spawn in aggregations in shallow, lateral, slackwater habitats adjacent to riffle/rapid habitats.	Omnivorous	Terrestrial insects and vegetation, fish, aquatic insect larvae, macrocrustacean and aquatic vegetation.
Leiopotherapon unicolour	Spangled perch	Potamodromous	Found over a wide range of conditions including desert springs and bores, billabongs, impoundments, rivers and streams.	soft substrate in backwaters and still pools of lagoons and sandy creek-bed habitats	Omnivorous	Aquatic invertebrates, macrocrustaceans, fish, aquatic macrophytes and algae.

4.2.7 MACROCRUSTACEANS

Four macrocrustacean species were recorded across the Study Area (Table 4-22). The most widespread species were freshwater shrimps (Atyidae) and prawns (*Macrobrachium* spp.) which were found both upstream and downstream of the dam. These two taxa were absent from S1 and S2 and were not recorded within Lake Borumba.

Yabbies/crayfish (*Cherax destructor* and *Cherax quadricarinatus*) were rare over the Study Area and were limited to <2 individuals at two sites (one being within Lake Borumba). This may be because these species generally prefer consolidated soils and clays in which to make their burrows, whereas the substrates of the Study Area were dominated by sand, gravel and other rocky material. Redclaw crayfish (*C. quadricarinatus*) are native to northern Queensland so those recorded within the Study Area represent a translocated population (they are commonly used in aquaculture).

No threatened or listed macrocrustacean species were recorded in the Study Area though Conondale Spiny crayfish may be present.

Table 4-22 Macrocrustaceans caught over the Study Area.

Species	Common name	EPBC Listing	NCA Listing	Kingaham Creek Upstream of Lake Borumba	Yabba Creek (U/S) Upstream of Lake Borumba		Unnamed creek Proposed Upper Reservoir	Unnamed creek Downstream of proposed Upper Reservoir	Lake Borumba			Bella Creek Tributary of Yabba Creek	Downstream of Lake Borumba Yabba Creek D/S				Mary River U/S of Yabba Creek Confluence	Mary River D/S of Yabba Creek Confluence
				S4	S3	S5	S2	S1	S7	S8	S9	S13	S12	S14	S15	S16	S17	S19
Atyidae	freshwater shrimp			79	42	43						55	72	88	4	112	20	76
Cherax destructor	common yabby					2						1						
Cherax quadricarinatus	redclaw crayfish						1			1								
***Macrobrachium* spp.**	freshwater prawn			19	90	23						49	84	122	14	280	256	285

4.2.8 AQUATIC REPTILES

Three species of freshwater turtles were recorded across the Study Area with Mary River turtle (*Elusor macrurus*) being recorded downstream of Borumba Dam on Yabba Creek and in Mary River upstream of Yabba Creek confluence (Table 4-23). The white-throated snapping turtle (*Elseya albagula*) and Krefft's river turtle (*Emydura macquarii krefftii*) were recorded at a single site within Lake Borumba.

Overall abundance and diversity of turtles were low in this survey despite the multiple survey methods implemented (e-fishing, fyke netting, cathedral traps and spotlighting). The low number may reflect survey timing in that turtles slow down substantially in winter. Other survey methods such as snorkelling and muddling, were not implemented due to raised water levels, high flows and turbid water during the current survey. These methods may yield further individuals when employed during warmer months.

Noted turtle habitat characteristics are detailed in Section 4.2.10.

Table 4-23 Turtles recorded over the Study Area.

Species name	Common name	EPBC listing	NCA Listing	Kingaham Creek Within proposed FSL	Yabba Creek (U/S)		Unnamed creek		Lake Borumba				Bella Creek	Downstream of Lake Borumba					
							Within proposed Upper Reservoir	Downstream of proposed Upper Reservoir					Upstream tributary of Yabba Creek	Yabba Creek D/S				Mary River	
																		U/S of Yabba Creek Confluence	D/S of Yabba Creek Confluence
				S4	S3	S5	S2	S1	S6	S7	S8	S11	S13	S12	S14	S15	S16	S17	S19
Elseya albagula	White-throated snapping turtle	CE	CR						1										
Elusor macrurus	Mary River Turtle	E	E											2				1	
Emydura macquarii krefftii	Krefft's river turtle								1										

E=Endangered

CE, CR=Critically Endangered

4.2.9 PLATYPUS

eDNA analysis recorded platypus (*Ornithorhynchus anatinus*) at six sites, with records tending to be more numerous downstream of Lake Borumba (Table 4-24) though they were recorded at several sites upstream of the lake. Burrow sightings were also noted at a number of sites where eDNA was also detected. Despite fyke net deployments at many sites, no platypuses were caught, nor were any detected during spotlighting efforts.

Noted platypus habitat characteristics are detailed in Section 4.2.10.

Table 4-24 Platypus detection through eDNA.

Waterway/region			Site	Platypus detection	Burrow Sighting
Kingaham Creek	Proposed FSL		S4		✓
Yabba Creek U/S			S3	✓	✓
			S5		✓
Unnamed creek	Proposed Upper Reservoir		S2		
	Downstream of proposed Upper Reservoir		S1		
Lake Borumba			S6		
			S7		
			S8		
			S11		
Bella Creek	Upstream tributary of Yabba Creek		S13	✓	
Downstream of Dam	Yabba Creek D/S		S12		
			S14	✓	
			S15		
			S16	✓	✓
	Mary River	U/S of Yabba Creek Confluence	S17	✓	✓
		D/S of Yabba Creek Confluence	S19	✓	

4.2.10 EVNT AND CONSERVATION SIGNIFICANT SPECIES

LIKELIHOOD ASSESSMENT

The results indicate that EVNT/conservation significant species are either known from or are likely to occur over much of the Study Area due to the similarity in habitat requirements. Species specific habitat attributes present within each study region are detailed in the sections below (Table 4-25).

Table 4-25 Summary of likelihood assessment for aquatic species of "possible" occurrence or higher within the Study Area (Section 4.1.11). Confirmed sightings are based on historical sightings and the current survey.

Waterway/region		White-throated snapping turtle	Mary River turtle	Mary River cod	Australian lungfish	Platypus	Conondale Spiny Crayfish
Kingaham Creek	Upstream of Lake Borumba	Known	Likely	Known	Likely	Known	Unlikely
Yabba Creek (U/S)		Likely	Likely	Known	Likely	Known	Unlikely
Unnamed creeks		Likely	Likely	Likely	Likely	Likely	Known
Unnamed Creek	Within proposed Upper Reservoir	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Likely
	D/S of proposed Reservoir	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Likely
Bella Creek	U/S tributary of Yabba Creek	Likely	Likely	Likely	Likely	Likely	Unlikely
Lake Borumba		Known	Likely	Known	Known	Likely	Unlikely
D/S of the Dam	Yabba Creek D/S	Known	Known	Known	Known	Known	Unlikely
Mary River	U/S of Yabba Creek Confluence	Known	Known	Known	Known	Known	Known
	D/S of Yabba Creek Confluence	Known	Known	Known	Known	Known	Unlikely

White-throated snapping turtle

This species is known from Lake Borumba and all downstream regions. The proximity of records to the confluence of Bella and Yabba creek suggests that it is likely that this species also utilises Bella Creek for at least some distance.

Suitable habitat for this species was found throughout the Study Area and habitat attributes preferred by this species were generally shared between those regions deemed 'likely' to contain this species and those where their presence was known. These attributes included:

- Permanent water (likely to be sustained during typical dry seasonal conditions, even where baseflow may cease);
- Riffles;

- Large boulders;
- Large woody debris; and
- Low flow waters.

Sites upstream of Lake Borumba on Kingaham Creek and Yabba Creek were assessed as likely to contain white-throated snapping turtles despite only the single record for this species along Kingaham Creek. These sites tended to have improved riparian condition (reduced clearing) and increased overhanging/in-stream vegetation.

Suitable nesting habitat (unconsolidated banks) were recorded across the Study Area, except the proposed Upper Reservoir.

The sites located within and downstream of the proposed Upper Reservoir were generally unsuitable for white-throated snapping turtles, largely due to the lack of suitable available habitat.

Mary River turtle

Mary River turtle records in the current survey were confined to reaches downstream of Lake Borumba, but suitable habitat was found at all sites apart from those associated with the proposed Upper Reservoir. Suitable habitat attributes included:

- Permanent water (likely to be sustained during typical dry seasonal conditions, even where baseflow may cease);
- Undercut banks;
- Riffles;
- Sand/gravel substrate with crevices; and
- Large woody debris.

Suitable nesting habitat (unconsolidated banks) were recorded across the Study Area, except the proposed Upper Reservoir. No aggregated nesting sites are known to occur in the Study Area.

Mary River cod

Suitable Mary River cod habitat attributes were recorded across most sites in the Study Area, except the proposed Upper Reservoir. Records of this species spanned a wide range of regions from the upstream reaches of Yabba Creek, Lake Borumba, to downstream of the dam in Yabba Creek and Mary River. Suitable habitat attributes included:

- Large woody debris;
- High riparian cover;
- Undercut banks; and
- Slow flowing pools.

Australian lungfish

Historic Lungfish records and those from the latest survey were restricted to within Lake Borumba and reaches below the dam. However, suitable habitat was common in the Study Area, except the proposed Upper Reservoir. Noted lungfish habitat attributes included:

- Still/low flow waters;
- Permanent water;
- High riparian cover;
- Large woody debris; and
- Undercut banks.

Lungfish are often closely associated with dense macrophyte beds, but macrophytes of the Study Area were generally sparse due to recent scouring from flood flows. Macrophytes were largely restricted to the upstream reaches of Yabba Creek and Kingaham Creek. Known macrophytes associated with lungfish (*Vallisneria spiralis* and *Vallisneria gigantea*) were recorded at these sites.

Platypus

Suitable platypus habitat attributes were recoded across much of the Study Area. Preferred habitat attributes included:

- Low flow waters;
- Permanent water;
- Unconsolidated banks;
- Fine sediments on substrate/banks; and
- Undercut banks.

Widespread eDNA detections indicated that platypus likely utilise most of the Study Area, although they were not recorded in Lake Borumba and the proposed Upper Reservoir. The rocky banks in the proposed Upper Reservoir are unsuitable for burrowing.

Conondale Spiny Crayfish

The nearest record for the species is located approximately 800 m upstream of Lake Borumba another from the Queensland Museum is recorded along Moy Pocket Road within Mary River, approximately 2.5 km upstream of S19.

The species is known to be restricted to montane highland streams bordered by wet sclerophyll forest or rainforest, due to this elevation restriction the only possible suitable habitat for the species exists in the Upper Catchment area. Adults are known to burrow into banks under large rocks with openings both below and above the surface. Juvenile individuals were generally found in shallow pools, sheltering under crevices, logs or rocks.

5. IMPACT ASSESSMENT

Impacts from the construction and operation of the BPHP have been assessed at a preliminary level due to the stage of development of design and construction methodologies of the project. A future EIS will undertake a thorough analysis.

5.1 CONSTRUCTION PHASE IMPACTS

The overall impact assessment risk table for the construction phase is shown in Table 5-1. Overall, the potential direct and indirect, permanent and temporary impacts can be summarised as follows:

- Physical disturbance of watercourse bed and banks by instream and bank works resulting in:
  - The loss of habitat through both direct (footprint disturbance) and indirect (sedimentation) pathways. This includes habitat for listed threatened fish and turtles.
  - Damage and or death of aquatic fauna during dewatering works and infrastructure development. In particular, the construction of the new dam for the Lower Reservoir may destroy turtle (including threatened turtles) and platypus nesting sites/burrows.
  - Barriers to movement of aquatic fauna.
  - Introduction and spread of aquatic weeds either through vehicles, watercraft, machinery and other construction equipment.
- Changes to water quality associated with:
  - Clearing and construction (increase in suspended sediments).
  - Filling of the dams, leading to rotting vegetation and a reduction in dissolved oxygen.
  - Release of degraded water to downstream creek reaches. Releases may contain a high concentration of suspended sediments and/or low dissolved oxygen.

  - Release of wastewaters generated from workers camps, spills and leaks from holding areas and construction equipment, inundation of contaminated sites and/or the use of contaminated fill during construction.
- Flow and water level management which may result in the loss or reduction of feeding, nesting and spawning resources. Such impacts are associated with both temporary and permanent instream infrastructure. Flow allowances have been proposed during the filling of the Lower Reservoir that will maintain low flow and hydraulic habitat requirements. A multilevel offtake is included in the design of the Lower Reservoir which will likely have a beneficial impact on the current scenario where water releases occur via a low-level outlet;
- Increased fishing pressures as a result of recreational fishing by construction workers; and
- Noise and vibration impacts largely from drilling, blasting and other instream works.

Table 5-1 Construction impact assessment. Unmitigated impacts include legally required obligations; however, have been included as part of the identified mitigations.

PROJECT PHASE AND ACTIVITY		ISSUE	UNMITIGATED SIGNIFICANCE	MITIGATION	RESIDUAL SIGNIFICANCE
C	Catchment clearing, instream and bank works - physical disturbance of watercourse beds and banks	• Loss of habitat • Damage and or death of aquatic fauna • Introduction and spread of aquatic weeds	Major	• Minimisation of the construction footprint. • Nest surveys for threatened turtle species undertaken prior to the construction activities. Identified active nests should be removed with eggs provided to a local hatchery (historically local hatcheries have been set up near known nesting localities of Mary River turtle). Further direction should be sourced from the Threatened Species Unit (TSU) at DES. • Platypus burrow surveys with relocation of animals if present. • Include fish salvage as per the Fish Salvage Guidelines described for least concern (DAFF, 2022) and threatened species (DSEWPC, no date) and developed species management plans. • Prevent aquatic fauna from re-entering the works area during works. • Prepare and implement a Weed Management Plan (WMP). • Any noxious plants removed and treated as per guidelines prior to commencement of works. • Snags or other woody debris that is removed should be re-instated (as soon as reasonably practicable) or moved to a usable area. • Temporary waterway barrier works actions, if applicable. • Development and implementation of a progressive Rehabilitation Management Plan (RMP).	Moderate
C	Works management in general, catchment clearing, instream works, spills, contaminated sites, waste management	• Changes to water quality	Major	• Minimisation of the construction footprint. • Implementation of best practice erosion and sediment control plans at all work sites, including specific plans for works within the lake or watercourses. • Timing of major earth works to coincide with low rainfall and low flow periods as far as practicable. • Development and implementation of a progressive RMP. • Develop a vegetation/land clearing strategy which includes minimisation, staging and salvage and re-use where possible, including as aquatic habitat. • Dam water release strategy related to water quality to be developed. • The use and storage of hazardous substances will be managed in accordance with relevant legislation, guidelines and standards. • Spill management procedures developed and equipment available to deploy if needed. • Imported materials will be classified as 'clean earth' under the QLD Environmental Protection Regulation 2019. • Existing contamination remediated prior to lake filling. • Beneficial re-use of treated effluent discharge licence (Class A).	Moderate

PROJECT PHASE AND ACTIVITY		ISSUE	UNMITIGATED SIGNIFICANCE	MITIGATION	RESIDUAL SIGNIFICANCE
	Flow management during construction	• Flow and water level management – loss and reduced access to feeding, nesting and spawning resources • Changes to water quality	Major	• Aim to achieve catchment Water Plan EFOs. Maintain low flow regime and hydraulic habitat requirements for the identified threatened species. Aim to pass clean water (not significantly affected by construction) downstream. • Relate releases to the quality of water in storage. • If dewatering is required, ensure the rate of change of downstream water levels is minimised and does not impact turtle nest sites or platypus burrows at critical times.	Minor
C	Dam filling	• Flow and water level management - loss and reduced access to feeding, nesting and spawning resources • Changes to water quality	Major	• Develop a first fill strategy incorporating releases during key fish/turtle migratory periods and to maintain downstream habitat. Consistent with Mary Basin Water Plan, maintain low flow regime and hydraulic habitat requirements. • Clearing strategy to be cognisant of potential water quality impacts during and shortly after filling. • Waterway barrier works adopt the principals of maintaining fish passage and cater for the range of expected flows. • Releases during filling to be related to water quality. • Salvage teams available if required e.g., if pools become isolated or in the case of anoxic conditions developing.	Minor
C	Workforce recreational time	• Increased fishing pressure	Moderate	• Prohibit employees of the project from recreational fishing.	Minor
C	Drilling, blasting, instream works	• Increase in noise and vibration	Moderate	• Avoid drilling, blasting and instream works during critical spawning and nesting periods.	Minor

5.2 OPERATIONAL PHASE IMPACTS

Overall impact assessment risk table for the operational phase which details the impact process and associated management, and mitigation measures can be viewed in Table 5-2. Overall, the high level direct and indirect, permanent and temporary impacts can be summarised as follows:

- Physical disturbance of watercourse bed and banks resulting in:
  - The loss of habitat through river impoundment. Lotic environments of the upper reservoir will be converted to lentic systems. However, the operational requirements of the upper reservoir will see the depth recede regularly and, in some instances, the Upper Reservoir could be emptied almost completely, limiting the ability of the area to support a functional ecosystem. This is unlikely to change and will represent a residual impact on the biota in this area. In the Lower Reservoir, depth will increase in Lake Borumba and portions between the current FSL and proposed FSL will also change from lotic to lentic. These areas are known to support threatened species such as Mary River cod, white-throated snapping turtle, and special least concern platypus, while lungfish and Mary River turtle are also likely to occur in these areas. Due to the fluctuating water levels associated with the operation of the Lower Reservoir, nesting and spawning habitat will likely be lost for these species.
  - Clear water scouring below the new dam wall as is currently evident with Borumba Dam. This may benefit larger fish species, including Mary River cod and lungfish as demonstrated in the current survey.
- Changes to water quality associated with:
  - The increase in wetted area and depth of the lower reservoir which may increase the likelihood of stratification events occurring; however, this increased risk is expected to be offset by the expected fluctuation in depth and mixing in the Lower Reservoir as a result of water transfer between the two reservoirs.
  - Inundation of riparian communities in the riverine areas of Yabba and Kingaham Creeks (i.e. upstream of Lake Borumba), resulting in their death. The wetted widths in these areas will also increase, meaning there will unlikely be any canopy cover overlap through the open water areas further reducing riparian cover moderation.
  - Shoreline erosion within the newly inundated which can result in further sediment delivery increasing suspended sediment loads.
  - Spills of hazardous substances.
- Flow and water level management which may result in the loss or reduction to feeding, nesting and spawning resources. These are associated with:
  - The loss of nesting (platypus and turtles) and spawning grounds for aquatic biota downstream of the proposed dam along Yabba Creek; however, this should not change beyond the current scenario, as flow will be managed in accordance with the Water Plan. Consideration should also be given to providing flow in the stream section below the Upper Reservoir to maintain aquatic values.
  - The new Borumba dam will provide fish passage while the current dam does not. This is essentially an improvement but just how successful it will be is yet to be determined.
- Damage and or death of aquatic fauna via:
  - Passage through hydraulic turbines and entrainment on to intake screens. Recent guidelines have been developed concerning design specifications for fish protection screens in Australia (DPI, 2022), which could be followed. Any screen design will also need to consider the presence of turtles as the can be sucked onto the screens protecting the intakes where they can drown.

  - Passage over the spillway or through outlet works may be a direct or indirect cause of injury or mortality to both fish and turtles. The design of these structures will take into account the requirements of SDAP 18 with regard to safe passage of fish and otherwise through consultation with DES regarding safe passage of turtles.
- The likelihood of introducing aquatic weeds to the Lower Reservoir is considered low, given the weed species have not proliferated since the operation of Borumba Dam.
- The introduction of exotic fauna, in particular tilapia to the Lower Reservoir may pose a biodiversity risk. A review by Russel et al. (2012) of the impacts of tilapia on aquatic ecosystems of Australia found that the general consensus is that tilapia will have no impact on native fish species in Australia through competition for food or predation. Rather, they may displace native species through aggressive behaviour during mating periods when the males vigorously defend their display pits or females defend their brood (Moran et al., 2004). Arthington and McKenzie (1997) demonstrated that tilapia kept native species out of their breeding territories.

Table 5-2 Operational impact assessment. Unmitigated impacts include legally required obligations; however, have been included as part of the identified mitigations.

PROJECT PHASE AND ACTIVITY		ISSUE	UNMITIGATED SIGNIFICANCE	MITIGATION	RESIDUAL SIGNIFICANCE
O	Dam flooding and releases during floods - clear water scouring, physical disturbance of watercourse beds and banks	• Loss of habitat – Macro and Microhabitat	Major	• The conversion of lotic to lentic systems cannot be feasibly mitigated. • Mitigate through design of spillway and outlet works, and works such as stilling basins, watercourse armouring etc. • Operations Manual to include consideration of aquatic habitat damage, particularly in relation to the needs of threatened fauna. Items could include riparian and instream habitat and nesting opportunities upstream of the proposed FSL or at other known strongholds of these species (may be part of offsets). • Habitat reinstatement post flood.	Major
O	Reservoir water level and release management -	• Changes to water quality	Moderate	• Operation of pumped hydro will minimise the potential for stratification to occur but may cause mobilisation of sediment and contaminants. • Downstream releases to Yabba creek via a multilevel offtake (will be an improvement). • Improve riparian cover where necessary along lake margin to create riparian vegetation buffers. • Monitoring of lake perimeter for slumping or related impacts with rapid remediation.	Minor
O	Reservoir release management – downstream flow regime	• Flow regime management to consider feeding, nesting and spawning requirements of key species	Moderate	• Releases to satisfy Water Plan EFOs. Water releases during operation to maintain low flow and hydraulic habitat requirements along Yabba Creek. • Timing and level of releases to be targeted where possible at maximising turtle nesting success and supporting movement, breeding, egg laying, and recruitment of Mary River Cod and Lungfish. • Avoid rapid changes in release rates.	Minor
C	Fauna passage – fishway/turtleway, spillway, outlet works	• Damage and or death of aquatic fauna • Facilitated movement of noxious species	Major	• Use of screens over intakes to protect fish and turtles. Current guidelines include DPI (2022). • The spillway should be designed to reduce fish mortality and injury. • The spillway is to be designed to reduce nitrogen supersaturation. • Fishway/turtleway design and safe fish/turtle passage features based on input from specialists and DAF advice. • Exclude noxious species where possible.	Moderate

PROJECT PHASE AND ACTIVITY		ISSUE	UNMITIGATED SIGNIFICANCE	MITIGATION	RESIDUAL SIGNIFICANCE
C	Operation of pumped hydro	• Damage and/or death of aquatic fauna	Moderate	• Minimise the flow rate at intakes and outfalls. • Screen intakes with consideration given to fish and turtle species. Current guidelines include DPI (2022).	Minor

5.2.1 IMPACTS ON MNES AND MSES

The following section provides a high-level preliminary impact assessment for MNES and MSES. This includes threatened aquatic species, waterways providing fish passage and protected wildlife habitat. Threatened species that are known to occur or have a likely chance of occurring within the Study Area have been assessed. Where relevant, National (DoE, 2013) and State (DES, 2014) significant residual impact (SRI) criteria have been applied.

THREATENED AND SPECIAL LEAST CONCERN AQUATIC FAUNA

Due to similar habitat requirements and listing status, significant residual impact evaluation relevant to threatened Mary River turtle, Mary River cod and white-throated snapping turtle are addressed in a single table (Table 5-3). While lungfish also has similar habitat requirements, it is listed as vulnerable so is assessed separately (Table 5-4). White-throated snapping turtle and Mary River turtle are listed under both the EPBC Act and NC Act, and as such, SRI evaluation criteria under the EPBC act have been applied. The platypus, being listed as special least concern under the NC Act is also assessed separately (Table 5-5).

Some actions likely to have an impact require further assessment upon the provision of more data.

Table 5-3 Significant residual impact assessment for EPBC listed critically endangered and endangered species

Action likely to have significant impact	White-throated Snapping Turtle	Mary River Turtle	Mary River cod
Lead to a long-term decrease in the size of a population	Uncertain – No specific documented populations in the recovery plan, though recovery plan describes important population where they are abundant. Further surveys are required, particularly upstream of Lake Borumba to determine abundances relative to current known abundances across the basin.	Uncertain – No documented populations; however distribution of this species in the basin wide recovery plan include Yabba Creek. The highest nesting densities occur in Mary River near Tiaro and a series of nesting banks supporting a lower density of nesting in the upstream reaches between Traveston and Kenilworth. Further surveys are required, particularly upstream of Lake Borumba.	No - The current species specific recovery plan does not indicate that Yabba Creek contains a "population". The documented populations in the recovery plans include Tinana-Coondoo Creek, Six Mile Creek, and Obi Obi Creek. The project will have no impact on these populations.
Reduce the area of occupancy of the species	No – low flow and hydraulic habitat requirements will be maintained along Yabba Creek downstream of the dam wall. The Lower Reservoir will likely provide low-grade foraging habitat. Along Mary River, basin EFO objectives will be maintained.	No – low flow and hydraulic habitat requirements will be maintained along Yabba Creek downstream of the dam wall. The Lower Reservoir will likely provide low-grade foraging habitat. Along Mary River, basin EFO objectives will be maintained.	No – low flow and hydraulic habitat requirements will be maintained along Yabba Creek downstream of the dam wall. The Lower Reservoir will likely provide low-grade foraging habitat. Along Mary River, basin EFO objectives will be maintained.
Fragment an existing population into two or more populations	No – The existing dam has no turtleway. Turtle passage is currently being considered as part of the proposed fishway design.	No – The existing dam has no turtleway allowance. Turtle passage is currently being considered as part of the proposed fishway design.	No – The existing dam has no fishway allowance. Fish passage will be included as part of the new dam.
Adversely affect habitat critical to the survival of a species	Uncertain - As per the definition in the current recovery plan, inundation of reaches along Yabba and Kingaham Creek upstream and downstream of Lake Borumba contain habitat critical to the survival of this species. Whether this is significant, will be determined upon further surveys describing abundances across the Study Area.	Uncertain - As per the definition in the current recovery plan, inundation of reaches along Yabba and Kingaham Creek upstream and downstream of Lake Borumba contain habitat critical to the survival of this species. Whether this is significant, will be determined upon further surveys describing abundances across the Study Area.	No – No defined habitat critical for the survival of this species is defined in the recovery plan; however identified populations as per the recovery plan do not occur in these reaches.
Disrupt the breeding cycle of a population	Uncertain - Further assessment of abundances are required particularly upstream of Lake Borumba to determine if abundances are high relative to other studies. Beyond Yabba Creek potential impacts from the project are unlikely given EFOs will be upheld.	Uncertain – Currently there are no defined populations. Further assessment of abundances is required particularly upstream of Lake Borumba to compare to the three main studies assessing abundances across the Mary River. Beyond Yabba Creek potential impacts from the project are unlikely given EFOs will be upheld.	No - The current species specific recovery plan does not indicate that Yabba Creek contains a "population". The documented populations in the recovery plan include Tinana-Coondoo Creek, Six Mile Creek, and Obi Obi Creek. The project will have no impact on these populations.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Uncertain – The conversion of habitat from lotic to lentic will modify available habitat upstream and downstream of Lake Borumba, while the operation of the dam will likely see water level fluctuations which will reduce the quality of available habitat. Further determination of abundance is required to identify if this will lead to a significant decline. Beyond Yabba Creek potential impacts from the project are unlikely given EFOs will be upheld.	Uncertain – The conversion of habitat from lotic to lentic will modify available habitat upstream of Lake Borumba, while the operation of the dam will likely see water level fluctuations which will reduce the quality of available habitat. Further determination of abundance is required to identify if this will lead to a significant decline. Beyond Yabba Creek potential impacts from the project are unlikely given EFOs will be upheld.	No – The project will not impact identified populations in the recovery plan.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	No – Invasive aquatic and terrestrial species have been identified as a low priority threat to this species. The project is not anticipated to elevate the risk of aquatic weed occurrences beyond the current scenario. Terrestrial weeds will be managed as per the developed WMP. Relevant to invasive and exotic fish the impacts are considered consistent with the current scenario.	No – Invasive aquatic and terrestrial species have been identified as a low priority threat to this species. The project is not anticipated to elevate the risk of aquatic weed occurrences beyond the current scenario. Terrestrial weeds will be managed as per the developed WMP. Relevant to invasive and exotic fish the impacts are considered consistent with the current scenario.	No – Invasive aquatic species have been identified as a medium priority threat to this species. Relevant to invasive and exotic fish the impacts are considered consistent with the current scenario.

Action likely to have significant impact	White-throated Snapping Turtle	Mary River Turtle	Mary River cod
Introduce disease that may cause the species decline	No – disease is not identified as a threatening process in the species recovery plan.	No – disease is not identified as a threatening process in the species recovery plan.	No – disease is not identified as a threatening process in the species recovery plan.
Interfere with the recovery of the species	Uncertain – Further determination of abundances particularly where habitat modification and quality will be reduced (upstream of Lake Borumba and Lake Borumba) are required. Beyond Yabba Creek potential impacts from the project are unlikely given EFOs will be upheld.	Uncertain – Further determination of abundances particularly where habitat modification and quality will be reduced (upstream of Lake Borumba and Lake Borumba) are required. Beyond Yabba Creek potential impacts from the project are unlikely given EFOs will be upheld.	No – The project will not interfere with the recovery of the species.

Table 5-4 Significant residual impact for EPBC listed vulnerable aquatic fauna (Lungfish)

Action likely to have significant impact	Lungfish
Lead to a long-term decrease in the size of an important population of a species	Uncertain – Important populations (those localities mentioned in the current recovery plan where lungfish are common) for this species includes Yabba Creek (no delineation provide; however the distribution map includes Lake Borumba and upstream and downstream extents). Further surveys are required to determine if an important population exists upstream of Lake Borumba. Water releases are proposed to maintain low flow and hydraulic habitat requirements downstream of the dam along Yabba Creek both during the construction and operational phase of the project. This will limit impacts to this species in these extents. Other important populations documented in the recovery plan include Mary River (between the tidal barrage and Conondale) and a number of its tributaries (Tinana/Coondoo Creek system, Obi Obi Creek, Six Mile Creek, Little Yabba Creek, and Wide Bay Creek). The project will not impact these areas.
Reduce the area of occupancy of an important population	Uncertain – as per the above.
Fragment an existing important population into two or more populations	No – the existing dam has no fishway allowance. Fish passage will be included as part of the new dam.
Adversely affect habitat critical to the survival of a species	Uncertain – inundation of reaches along Yabba and Kingaham Creek upstream and downstream of Lake Borumba contain suitable habitat critical to their survival as per the definition in the recovery plan. Water level fluctuations within the dam will reduce breeding and feeding opportunities. Whether this is significant given the current extent, will be determined upon further surveys.
Disrupt the breeding cycle of an important population	Yes - most likely to occur during construction. Suitable habitat present.

Action likely to have significant impact	Lungfish
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Uncertain – The conversion of habitat from lotic to lentic will modify available habitat upstream and downstream of Lake Borumba, while the operation of the dam will likely see water level fluctuations which will reduce the quality of available habitat. Further determination of abundances is required to identify if this will lead to a significant decline. Fishway and safe fish passage will improve movement capacity between habitats. Beyond Yabba Creek potential impacts from the project are unlikely given EFOs will be upheld.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	No – Invasive aquatic species have been identified as a medium priority threat to this species. The project is not anticipated to elevate the risk of aquatic weed occurrences beyond the current scenario. Terrestrial weeds will be managed as per the developed WMP. Relevant to invasive and exotic fish the impacts are considered consistent with the current scenario.
Introduce disease that may cause the species decline	No – Disease is not identified as a threatening process in this species recover plan.
Interfere substantially with the recovery of the species	Uncertain – Further determination of abundances particularly where habitat modification and quality will be reduced (upstream of Lake Borumba and Lake Borumba) are required. Beyond Yabba Creek potential impacts from the project are unlikely given EFOs will be upheld.

Table 5-5 Significant residual impact assessment for NC listed special least concern aquatic fauna – animal wildlife habitat

Action likely to have significant impact	Platypus
Long-term decrease in the size of a local population	Uncertain – No current recovery plan for this species and therefore no defined populations. Further surveys required to determine the significance of the local population.

Action likely to have significant impact	Platypus
Reduce the extent of occurrence of the species	No – Low flow and hydraulic habitat requirements will be maintained along the Yabba Creek downstream of the dam wall. While the Lower Reservoir will likely provide low-grade foraging habitat. Along Mary River, basin EFO's will be maintained.
Fragment an existing population	No – The existing dam has no fishway allowance. Fishway design is currently being addressed by another consultant and should consider platypus. Fishlocks have been used by platypus (DEEDI, 2012).
Result in genetically distinct populations forming as a result of habitat isolation	No – The existing dam has no allowance for a fishway. Fishway design is currently being addressed by another consultant. Fishlocks have been used by platypus (DEEDI, 2012).
Disruption to ecologically significant locations (breeding, feeding or nesting sites) of a species	Uncertain – Water level depth changes in the Lower Reservoir may limit area for nesting burrows. The current upstream extents of Kingaham and Yabba Creek provide suitable bank characteristics for burrow creation, with platypus burrows noted along both reaches. The significance of this impact requires further investigation once the importance of the local population is determined.

WETLANDS AND WATERCOURSES

The construction and operation of the Lower Reservoir may result in a significant residual impact to wetlands of HES along Yabba Creek (less likely along the Mary River), which are mapped downstream of the proposed dam (note the proposed dam does not overlap the mapped wetlands of HES). While it is assumed EFOs will be met, the future water quality is uncertain. Impact determination is dependent on the results of further investigations. A significant residual impact may be due to the following:

- A measurable change in water quality of the wetland or watercourse—for example a change in the level of the physical and/or chemical characteristics of the water, including salinity, pollutants, or nutrients in the wetland or watercourse, to a level that exceeds the water quality guidelines for the waters; and
- A substantial and measurable change in the hydrological regime or recharge zones of the wetland, e.g. a substantial change to the volume, timing, duration and frequency of ground and surface water flows to and within the wetland.

WATERWAY PROVIDING FOR FISH PASSAGE

The construction and operation of the Upper Reservoir will result in a significant residual impact to fish passage as the bulk of the subcatchment will be inundated and it is not planned to provide fish passage at the dam. The extent of impact will depend on results of further surveying the utility of the habitat present and the natural availability of passage.

The increased inundation extent of the Lower Reservoir is also likely to result in a significant residual impact to fish passage though it will be at least partly mitigated through the provision of fish passage and improvements to the provision of safe passage. Design and operation the infrastructure in relation to passage will satisfy the requirements of SDAP 18.

6. POTENTIAL OFFSET REQUIREMENTS

Offsets are measures that compensate for the significant residual impacts of an action on the environment, after avoidance and mitigation measures are taken. The below provides a high level understanding of potential offset requirements informed by the SRI assessment undertaken in Section 5.2.1

Where these is an overlap in State and National Matters, in this case threatened species (Mary River turtle and white-throated snapping turtle), these have been assessed under the EPBC Act.

6.1.1 EPBC ACT

As identified in Section 5.2.1, the project may have a significant residual impact on threatened species (Mary River turtle, white-throated snapping turtle and Australian lungfish). At this stage the impact calculator for area of habitat can be processed. There is no determined offset area to be processed through the Offsets Assessment Guide. A significant residual impact downstream from the dam has not been included. For National Matters land-based offsets are preferred rather than financial settlements:

- The area of habitat providing feeding and nesting habitat for each species is the same, being that lost to inundation. . This represents approximately 56 hectares of total area (creek length X width) in the proposed Lower Reservoir, the quality of habitat is considered high (scaled at 8), therefore the total quantum of impact is 44.8 hectares (adjusted).

6.1.2 ENVIRONMENTAL OFFSETS ACT 2014 (QLD)

As identified in Section 5.2.1, the project is likely to have a significant residual impact on the following MSES:

- Wetlands of HES. This potentially represents up to approximately 189 hectares of mapped wetlands of HES downstream of the proposed dam wall;
- Waterways providing for fish passage. This represents approximately 58 hectares of waterways (creek length X width) in the proposed Lower and Upper Reservoir; and
- An area of habitat providing nesting habitat for the special least concern platypus. This represents approximately 56 hectares of available habitat (creek length X width) in the proposed Lower Reservoir.

Financial settlement can be provided to the State or notional offset areas which are:

- 1:1 impact:protection ratio for fish passage; and
- 1:4 impact:protection ratio for endangered and special least concern fauna.

Other options could include assistance with improving hatchling success for both the threatened species of turtles, as this is considered low across Mary River basin, offsets could also include:

- Feral animal management;
- Livestock management near known clutch sites;
- Nest protection at known clutch sites. This could be done in conjunction with local catchment management groups; and
- Funding to an allocated turtle hatchery for Mary River and white-throated snapping turtles. Existing hatcheries occur for Mary River turtle, these appear to be operated by the Tiaro and District Landcare Inc.

A number of programs exist for the stocking of Mary River cod, with three known hatcheries in the catchment.

Hatcheries for the Australian lungfish are limited with Hydrobiology only determining a single Australian lungfish hatchery, known as Hinternoosa Hatchery which offers services for both Australian lungfish and Mary River cod. Professor Jean Joss successfully bred the species at Macquarie University in Sydney and supplied specimens for research purposes for many years.

7. CONCLUSION

Natural geomorphology with superimposed habitat modification dictates the nature and extent of aquatic habitats within the Study Area. The Study Area can be broadly grouped into the following habitat types, including:

1. Upper Reservoir (steep confined valley) – Single channel, low sinuosity. Macrohabitat features include run, rapid, cascade and pool (largely shallow). Substrate was dominated by bedrock, boulder and cobble complexes, though in the upper reaches sand deposits were also noted;
2. Creeks upstream of Lake Borumba (partly confined valley) - Largely single channel with occasional backwater. Sinuous valley alignment. Macrohabitat features include run, rapid, riffle, pool (deep and shallow) and macrophytes. Substrate was dominated by cobble, pebbles and gravel complexes;
3. Lake Borumba - Lacustrine habitat including both shallow (less frequent) and deep open waters. Macrophytes occur along fringing shallow extents. Substrates are largely fine (dominated by silts), though larger substrates are evident adjacent to cliff faces; and
4. Downstream of Lake Borumba including Yabba Creek and Mary River (partly confined valley with flood pockets, though Mary River becoming less confined downstream of the Yabba Creek confluence) - Largely single channel though highly variable channel width, frequent backwaters. Macrohabitats include run, riffle, pool (shallow and deep). Absence of macrophytes due to recent scouring from flood flows. Substrates in these reaches were more varied than other areas and were representative of local impacts. Overall pebbles and gravel substrates dominated composition followed by sand and cobbles.

The aquatic community and habitat condition of the Study Area can be summarised as follows:

- The Study Area has a diverse community of aquatic fauna that shares a range of species with the Upper Mary River catchment and to a lesser extent the Lower Mary River catchment;

- The Study Area (excluding the proposed Upper Reservoir), features multiple conservation significant species, including lungfish, Mary River cod, white-throated snapping turtle, Mary River turtle and platypus. These species are considered threatened under the National *Environment Protection and Biodiversity Conservation Act 1999* and/or the State *Nature Conservation Act 1992*;
- Riverine habitats used by aquatic fauna of Yabba Creek, Kingaham Creek and Mary River include riffles, runs, pools (shallow and deep), stream edges and shallow margins, macrophytes, woody debris and tree roots. While these habitats are favoured by particular suites of species, many fish and macroinvertebrates show flexible habitat requirements;
- Riverine habitats used by the aquatic fauna of the upper reservoir are not considered specific. However, the presence of specialist crayfish species (i.e., Conondale crayfish) require confirmation;
- A number of non-native species occur in the Study Area, including those introduced into Australia and translocated native (though not native to the study area) species that have been deliberately or incidentally stocked. Abundances and biomass of species that were introduce into Australia are considered low in the Study Area including areas where they could proliferate (i.e., Lake Borumba). For those species which are native to Australia though not within the Study Area, abundance and biomass are high in Lake Borumba. It is not anticipated that these species (including tilapia) will outcompete native species as a result of the BPHP; and
- The aquatic fauna of the Study Area has been subject to a number of current and historic impacts, of which the most locally significant is water resource development (i.e. Borumba dam). This includes habitat change (lentic to lotic systems) and barriers to fish movement. Those unrelated to water resource development are associated with agricultural land uses and include land clearing in general, significant loss of riparian vegetation, increase in nutrients and sedimentation, cattle access to streams and introduction of feral animals, while other issues include aquatic weed infestations, historic fishing pressure on Mary River cod and harvesting of Mary River turtles eggs for the pet trade (now stopped; this has been noted for Mary River and not Yabba Creek).

The impacts of greatest significance to aquatic habitat and fauna would be during the operational phase of the proposed project and are associated with:

- The conversion of a lotic to a lentic system (for predicted extents beyond the current FSL of Lake Borumba) will reduce macrohabitat diversity and suitability for key species in the projected FSL of the Lower Reservoir. This represents a residual impact and cannot be mitigated.
- Lotic environments of the Upper Reservoir will also be converted to lentic systems. This represents a residual impact and cannot be mitigated.
- Operation of the pumped hydro:
  - Predicted rapid water level fluctuations in the lower reservoir will limit macrophyte establishment and thus spawning habitat for lungfish and also access to large woody debris in shallower nearshore areas which are important for several species.
  - the operational requirements of the Upper Reservoir will see the depth recede regularly and, in some instances, the Upper Reservoir could be emptied almost completely, limiting the ability of the area to support a functional ecosystem. This is unlikely to change and will represent a residual impact on the biota in this area.
- Flow regime changes downstream – is likely to be limited once the storage fills.
- Improved fish and turtle passage through provision of specific infrastructure (none exists now).
- Improved quality water released downstream through replacement of the current bottom release with a multi-level offtake (though depending on water quality impacts of the water transfer associated with the hydro scheme).

Based on the significant residual impact (SRI) assessment there are potential residual impacts to both State and National Matters of Environmental Significance, including:

- Threatened species listed under the EPBC Act including white-throated snapping turtle, Mary River turtle and Australian lungfish;
- Protected wildlife habitat for the special least concern species listed under the NC Act including platypus;
- Wetlands of high ecological significance (HES); and
- Waterways providing fish passage.

The identified SRI impacts will likely require offsetting. Relevant to State matters, offsets can come in the form of a financial settlement or other agreed method, while National matters typically require land-based offset.

Further studies will be undertaken to support the EIS and the assessment of impacts, potential mitigation strategies and need for offsets will be re-assessed at that time.

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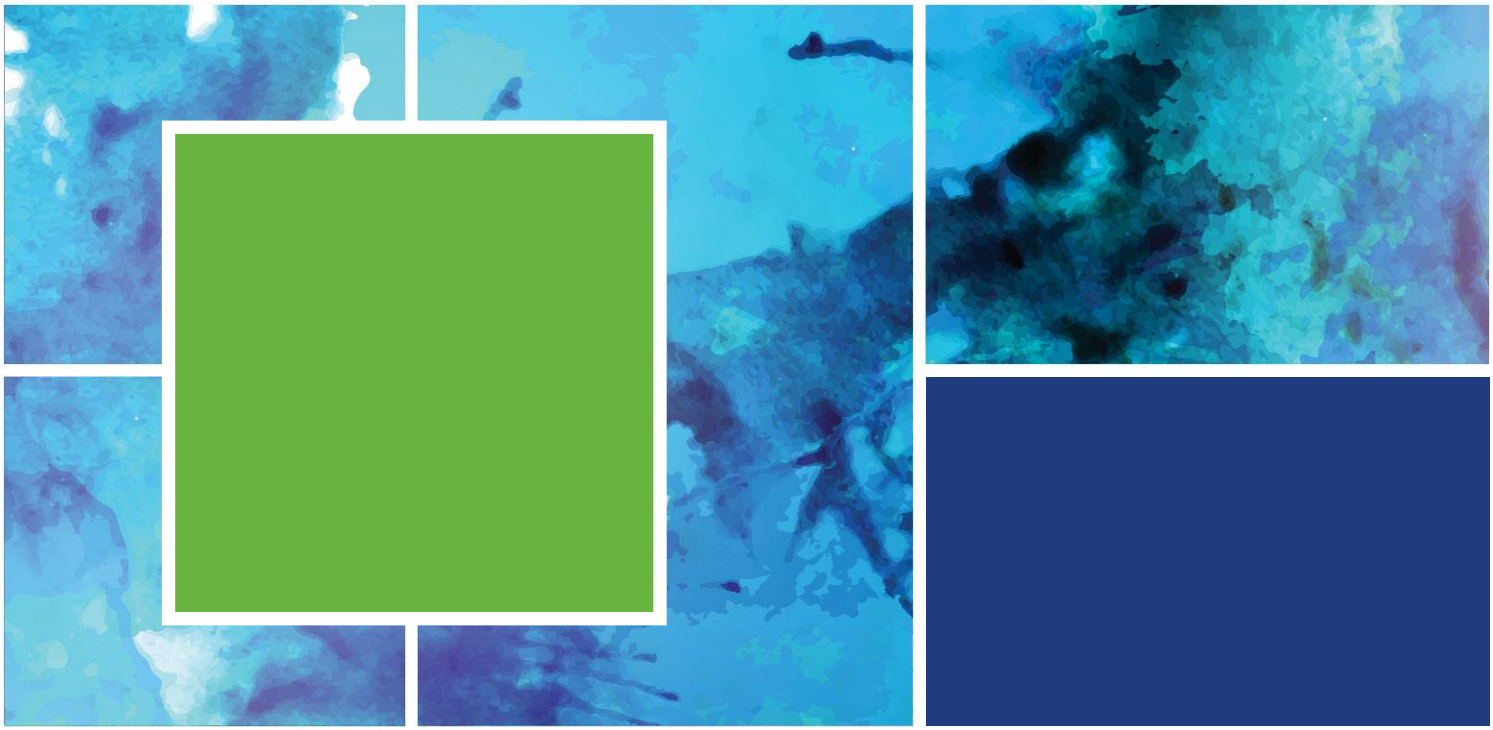
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APPENDIX A. DATABASE EXTRACTS



Aquatic Ecosystem Rehabilitation Mapping Report

Part of the Aquatic Ecosystem Rehabilitation Process

Version 1.0



For selected area of interest Custom Geometry

Current as at 05/07/2022

Cover image above depicts aquatic ecosystems throughout Queensland, top left quadrant - Olive River, top right quadrant - stilted mangroves, bottom right quadrant - melaleuca wetlands, and bottom left quadrant - Jardine River, overlayed by a freshwater long-neck turtle representing the connection between land and water. Turtle designed by John Locke. Photos by Gary Cranitch, Queensland Museum. Image compiled by Trent Munns.

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Aquatic Ecosystem Rehabilitation Mapping Report

Purpose

The report provides key information to assist with developing an Aquatic Ecosystem Rehabilitation Plan including:

- Understanding the location, extent and classification of aquatic ecosystems
- Understanding the components and processes of the aquatic ecosystems and the broader landscape
- Understanding the conservation values of the aquatic ecosystems
- Understanding planning and legislative requirements
- Understanding surrounding land use
- Determining the ecosystem services which may be provided by the aquatic ecosystem
- Establishing objectives, undertaking detailed design and implementation of the project

The report provides a snapshot of key information to assist with understanding ecological, hydrological and administrative features that may affect a rehabilitation activity.

The information is for the direct wetland area and some surrounding area but not the broader landscapes (such as, upstream or downstream), which will be required for a Whole-of-System, Values-Based approach, to ensure that the purpose of the project reduces unintended outcomes, at the site and catchment/landscape-scales.

For more information on the aquatic ecosystem/wetlands rehabilitation, visit:
https://wetlandinfo.des.qld.gov.au/wetlands/management/rehabilitation/rehab-process/

Statutory regulatory planning

Matters of State Environmental Significance (MSES)
https://environment.des.qld.gov.au/management/planning-guidelines/method-mapping-mses

Environmental values (EVs) and water quality objectives (WQOs)
https://environment.des.qld.gov.au/management/water/policy

Development Assessment Mapping System (DAMS)
https://dams.dsdip.esriaustraliaonline.com.au/damappingsystem/

Environmental Reports - General Information

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due to either state mapping not being undertaken for the AOI, that state mapping is incomplete for the AOI, or that no matters of interest have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Important Note to User

Information presented in this report is based upon the mapping of water bodies and wetland regional ecosystems across Queensland. The Queensland wetland mapping was produced using existing information including water body mapping derived from Landsat satellite imagery, regional ecosystem mapping, topographic data, and a springs database. The result is a consistent wetland map for the whole of Queensland.
Ancillary data, such as higher resolution imagery (for example SPOT and aerial photographs), other vegetation and wetland mapping, geology, soil and land system mapping was also used in attributing and assessing the derived Queensland Wetlands Program wetland mapping products.
The wetland mapping was done in accordance with a detailed peer reviewed methodology which included quality assurance measures for all steps in the process. For more detailed information on how the Queensland Wetlands Program wetland mapping was produced, please see the Wetland Mapping and Classification Methodology.

Disclaimer

The State of Queensland, as represented by this department, gives no warranty in relation to the data (including without limitation, accuracy, reliability, completeness or fitness for a particular purpose) hosted on this website.
The user accepts sole responsibility and risk associated with the use and results of department data hosted on this website, irrespective of the purpose to which such use or results are applied. It is recommended that users consider independently verifying any information obtained from this website.
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Summary Information

The following table provides an overview of the area of interest (AOI).

Summary information for Custom Geometry, size: 54831.55ha

Local Government Area
Noosa Shire
Gympie Regional

Click here for information on LGAs

NRM Region
Burnett Mary

Click here for information on Natural Resource Management bodies

Vegetation category
Category R
Category X
Category B
Category C
Category A
Category Water

Click here for information on vegetation clearing codes

Biogeographic region(s)	Biogeographic sub region(s)
Southeast Queensland	Gympie Block

Click here for information on bioregions and here for information on biogeographic sub regions

Drainage divisions
North East Coast

Click here for information on drainage divisions

Drainage basins
Mary

Click here for information on drainage basins

Drainage sub-basin
Upper Mary River
Lower Mary River

Click here for information on drainage basin sub areas

Aquatic Conservation Assessments (ACA)
Wide Bay-Burnett catchments

Click here for information on ACAs

Regional ecosystem type
12.12.16
12.12.15
12.11.10/12.11.16
12.3.2/12.3.11
12.3.17
12.11.16
non-remnant
12.11.14
12.3.11
12.11.10/12.11.11
12.11.3
12.11.3/12.11.10
12.3.1a
12.3.7/12.3.11
12.11.5
12.11.10
water
12.11.1
12.8.24
12.8.14
12.11.9
plantation
12.9-10.17b
12.11.3/12.11.14
12.3.7
12.11.3/12.11.5
12.11.3a
12.8.13
12.3.2
12.11.10/12.11.2
12.11.10/12.11.3
12.11.2/12.11.10
12.3.7b
12.3.7c
12.11.9/12.11.3
12.11.3/12.11.18
12.9-10.16
12.9-10.7a

Regional ecosystem type
12.11.11
12.12.13/12.12.16
12.12.3
12.12.12
12.3.11/12.3.7
12.9-10.21
12.9-10.17b/12.9-10.21
12.9-10.14
12.5.2a
12.11.18
12.9-10.29
12.9-10.21/12.9-10.17b
12.11.3/12.11.17
12.11.17
12.12.15/12.12.16
12.12.28
12.12.11

Click here for information on regional ecosystem types

Landzone
11
3
12
9-10
5
8

Click here for land zone definitions

Water Resource Planning Area
Mary Basin

Click here for information on water plan areas

Tables

Groundwater Dependent Ecosystems types in the AOI:

GDE Surface Areas

GDE Ruleset Name	Area (ha)
Alluvia - WBB	192.9

GDE Terrestrial

GDE Ruleset Name	Area (ha)
Alluvia - WBB	582.8
Alluvia on fractured hard rock (granites and Agnes Water Volcanics) - WBB	21.0

GDE Subterranean

No results in the AOI

Wetland habitat types in the AOI:

Wetland Class	Habitat type	Area (ha)
	Coastal/ Sub-coastal floodplain tree swamps (Melaleuca and Eucalypt)	1953.68
Riverine	Riverine	1276.66
	Coastal/ Sub-Coastal non-floodplain tree swamps (Melaleuca and Eucalypt)	264.52
Lacustrine	Artificial/ highly modified wetlands (dams, ring tanks, irrigation channel	147.38
Palustrine	Coastal/ Sub-coastal floodplain grass, sedge and herb swamps	1.48

Intertidal and Subtidal Ecosystem Types in the AOI:

Intertidal

No results in the AOI

Subtidal

No results in the AOI

Species Lists

The information in Species List, Weed List, and Pest List is derived from a spatial layer generated from the WildNet database managed by the Department of Environment and Science. The layer which is generated weekly contains the WildNet wildlife records that are not classed as erroneous or duplicate, that have a location precision equal to or less than 10000 metres and do not have a count of zero.

The WildNet dataset is constantly being enhanced and the taxonomic and status information revised. If a species is not listed in this report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area. It is recommended that you also access other internal and external data sources for species information in your area of interest (Refer Links and Support).

Conservation Significant Species List, Weed List and Pest List

The following lists may be requsted from the Environmental reports online page.

- **WildNet records - Conservation Significant Species List** - Summarises the conservation significant species records from the WildNet database for a selected area and its 1km buffer
- **WildNet records - Weed list** - summarises wildlife records for all weed species (introduced flora) within a specified location, from the WildNet database
- **WildNet records - Pest list** - summarises wildlife records for all pest species (introduced fauna and flora) within a specified location, from the WildNet database

Useful links and further information

WetlandSummary tool: https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/

Queensland Spatial Catalogue: http://qldspatial.information.qld.gov.au/catalogue/custom/index.page

Queensland Globe: https://qldglobe.information.qld.gov.au/

Environmental reports online: https://environment.ehp.qld.gov.au/report-request/environment/

Wetland on-line education modules: https://wetlandinfo.des.qld.gov.au/wetlands/resources/training/

Regional Ecosystem Mapping information:
https://www.qld.gov.au/environment/plants-animals/plants/herbarium/mapping-ecosystems

Aquatic Conservation Assessments: https://wetlandinfo.des.qld.gov.au/wetlands/assessment/assessment-methods/aca/

Groundwater Dependent Ecosystems Information:
https://wetlandinfo.des.qld.gov.au/wetlands/ecology/aquatic-ecosystems-natural/groundwater-dependent/

Groundwater Dependent Ecosystems - Mapping Rulesets:
https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/gde-background/gde-faq/gde-map-rules/

Wetlands (aquatic ecosystem) types information:
https://wetlandinfo.des.qld.gov.au/wetlands/ecology/aquatic-ecosystems-natural/

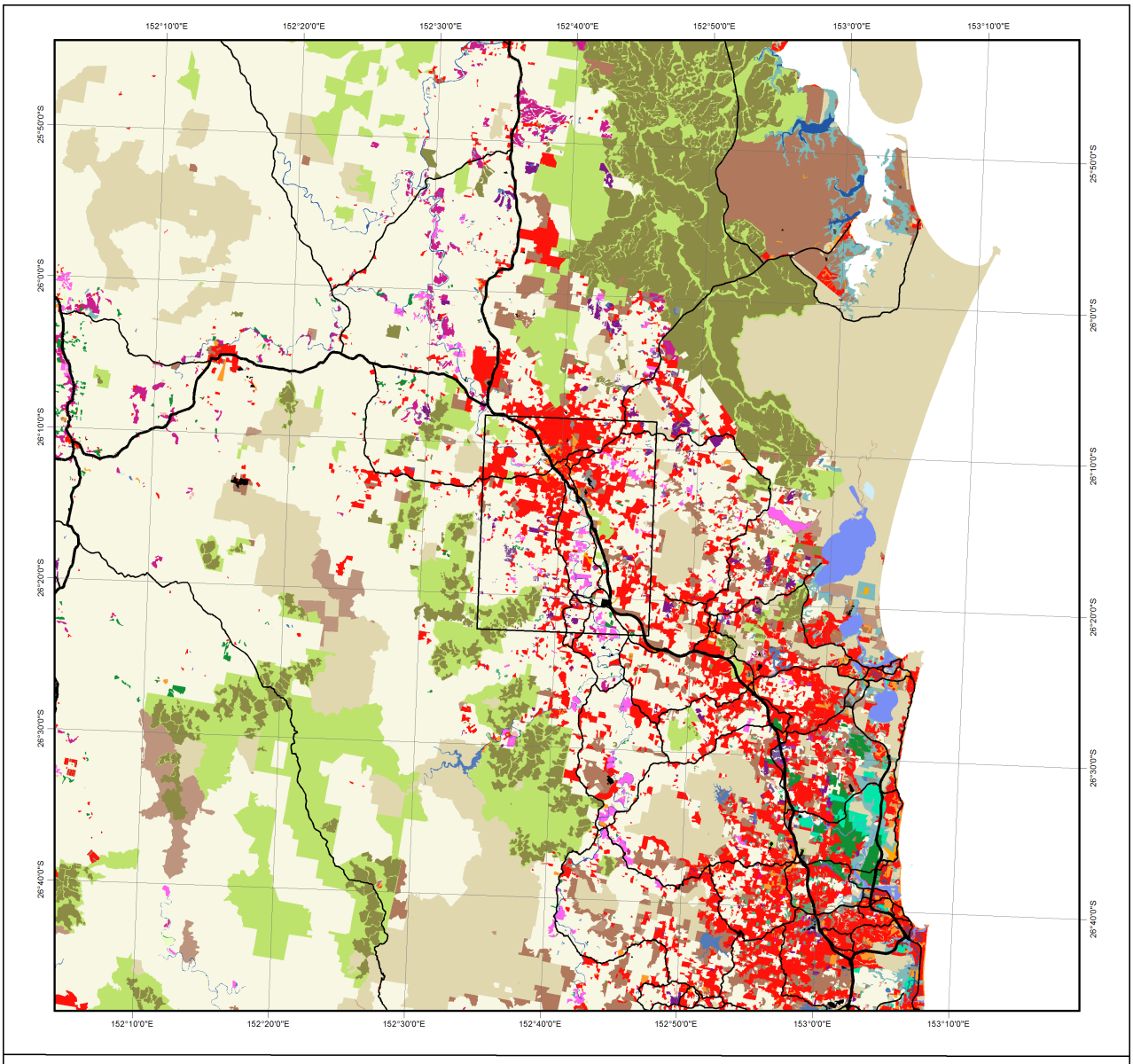
Intertidal and subtidal Ecosystem types information:
https://wetlandinfo.des.qld.gov.au/wetlands/ecology/aquatic-ecosystems-natural/estuarine-marine/descriptions/#q=

More information

For more information on the Aquatic Ecosystem Rehabilitation Process, visit:
https://wetlandinfo.des.qld.gov.au/wetlands/management/rehabilitation/rehab-process/

Maps

Land Use Map



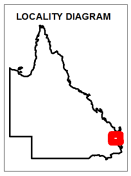
Land Use

Queensland Land Use Mapping Program

Legend

ALUM v8 Secondary level

- polygon
- Nature conservation
- Managed resource protection
- Other minimal use
- Grazing native vegetation
- Production native forests
- Plantation forests
- Grazing modified pastures
- Cropping
- Perennial horticulture
- Seasonal horticulture
- Land in transition
- Grazing irrigated modified pastures
- Irrigated cropping
- Irrigated perennial horticulture
- Irrigated seasonal horticulture
- Irrigated land in transition
- Intensive horticulture
- Intensive animal production
- Manufacturing and industrial
- Residential and farm infrastructure
- Services
- Utilities
- Transport and communication
- Mining
- Waste treatment and disposal
- Lake
- Reservoir/dam
- River
- Channel/aquedeuct
- Marsh/wetland
- Estuary/coastal waters
- Freeways / motorways; Highways
- Secondary roads; Streets



N

0 6700 13400 20100 26800 33500 m

This product is projected into GDA 1994 Queensland Albers

The land use dataset is a product of the Queensland Land use Mapping Program (QLUMP), at a nominal scale of 1:50,000. The layer is a polygon dataset with each feature having attributes describing land use . It presents the most current land use information available in Queensland.

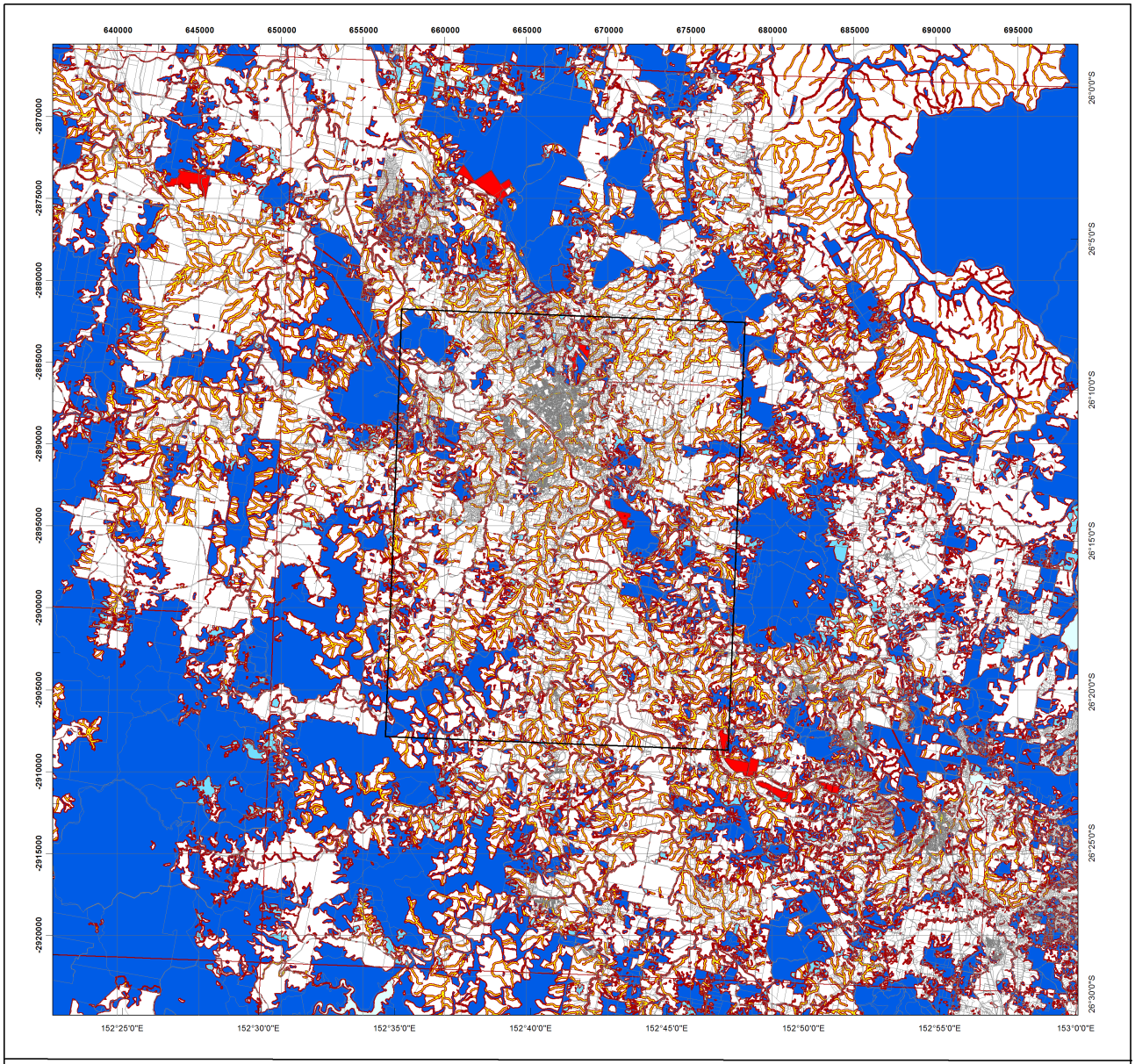
Land use is classified according to the Australian Land Use and Management Classification (ALUMC) Version 8, October 2016. Primary and secondary levels relate to land use (i.e. the principal use of the land in terms of the objectives of the land manager), the tertiary level further discriminate land use, eg. commodity/intensity. Where required and possible, attribution is performed to tertiary level. QLUMP maps the land use classes of sugar and cotton consistently to tertiary level. The minimum attribution level for land use mapping in Queensland is secondary land use, as presented in this map.

Refer to the contact position for additional information regarding source data. Further information relating to land use mapping can be found at http://www.qld.gov.au/environment/land/vegetation/mapping/qlump/ and http://www.agriculture.gov.au/abares/aclump/land-use/

While every care is taken to ensure the accuracy of this information, the Department of Environment and Science makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which might be incurred as a result of the information being inaccurate or incomplete in any way and for any reason.

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Regulated Vegetation Management Map

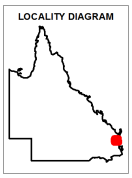


Regulated Vegetation Management Map

Legend

- polygon
- Category A area (Vegetation offsets/compliance notices/VDecs)
- Category B area (Remnant vegetation)
- Category C area (High-value regrowth vegetation)
- Category R area (Reef regrowth watercourse vegetation)
- Category X area (Exempt clearing work on Freehold, Indigenous and Leasehold land)
- Water
- Area not categorised
- Other land parcel boundaries

LOCALITY DIAGRAM



N

0 3,300 6,600 9,900 13,200 16,500 m

This product is projected into:
GDA 1994 Queensland Albers

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Additional information required for the assessment of vegetation values is provided in the accompanying "Vegetation Management Supporting map". For further information go to the web site: www.resources.qld.gov.au or contact the Department of Resources.

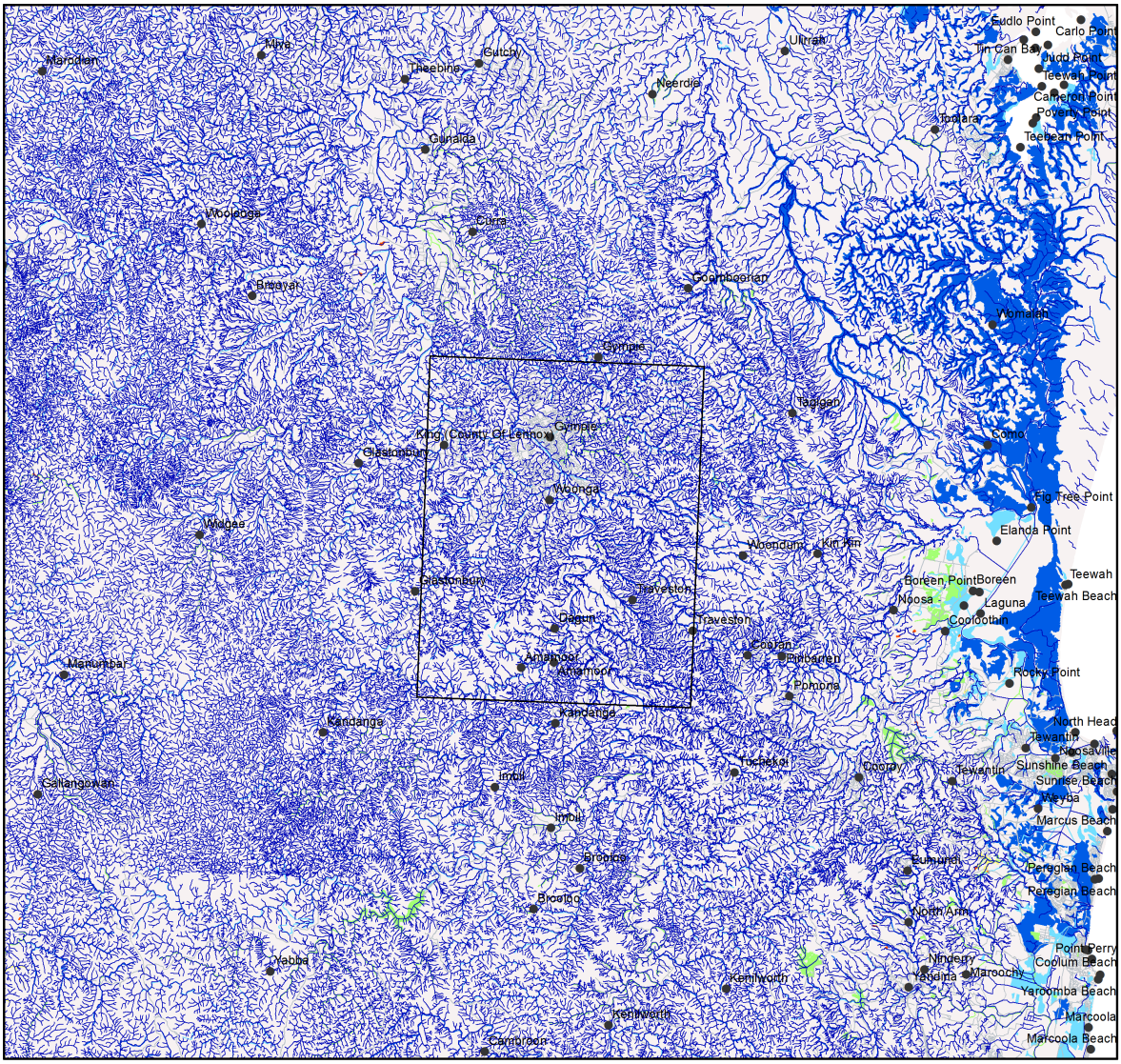
Digital data for the regulated vegetation management map is available from the Queensland Spatial Portal at http://www.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

This map is updated on a monthly basis to ensure new PMAVs are included as they are approved.

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Aquatic Conservation Assessment Map



Aquatic Conservation Assessment Map

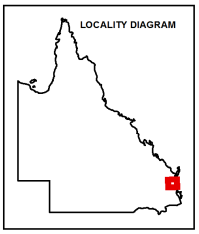
Legend

- polygon
- Towns
- Roads
- Rivers/Creeks

Riverine Buffered Streams

ACA Non-riverine

- Very High
- High
- Medium
- Low
- Very Low
- Queensland



N

0 4600 9200 13800 18400 23000 m

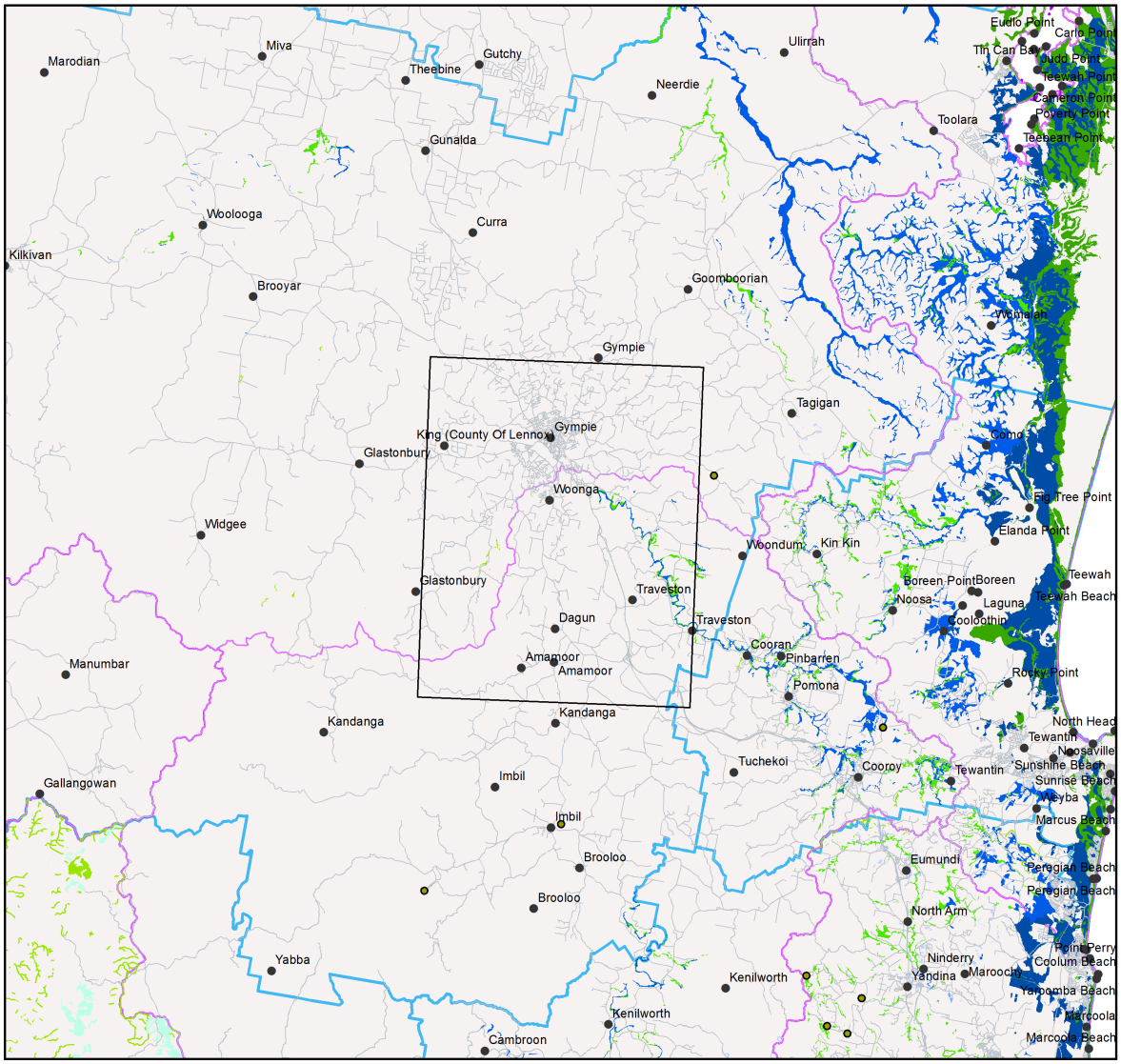
This product is projected into GDA 1994 Queensland Albers

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Groundwater Dependent Ecosystems Map



Groundwater Dependant Ecosystem Map

Legend

polygon

GDE Confidence – Surface Expression

- 81-100% GDE, Known GDE
- 81-100% GDE, Derived GDE - High Confidence
- 81-100% GDE, Derived GDE - Moderate Confidence
- 81-100% GDE, Derived GDE - Low Confidence
- 01-80% GDE, Derived GDE - High Confidence
- 01-80% GDE, Derived GDE - Moderate Confidence
- 01-80% GDE, Derived GDE - Low Confidence

GDE Confidence – Terrestrial GDE

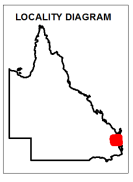
- 81-100% GDE, Known GDE
- 81-100% GDE, Derived GDE - High Confidence
- 81-100% GDE, Derived GDE - Moderate Confidence
- 81-100% GDE, Derived GDE - Low Confidence
- 01-80% GDE, Derived GDE - High Confidence
- 01-80% GDE, Derived GDE - Moderate Confidence
- 01-80% GDE, Derived GDE - Low Confidence

GDE Confidence – Subterranean

- Known GDE
- Derived GDE - High Confidence
- Derived GDE - Moderate Confidence
- Derived GDE - Low Confidence
- Derived GDE - Unknown Confidence
- Queensland

- Dams and weirs
- Sub-basin
- Drainage basin
- Roads
- Towns
- Local Government Areas

LOCALITY DIAGRAM



N

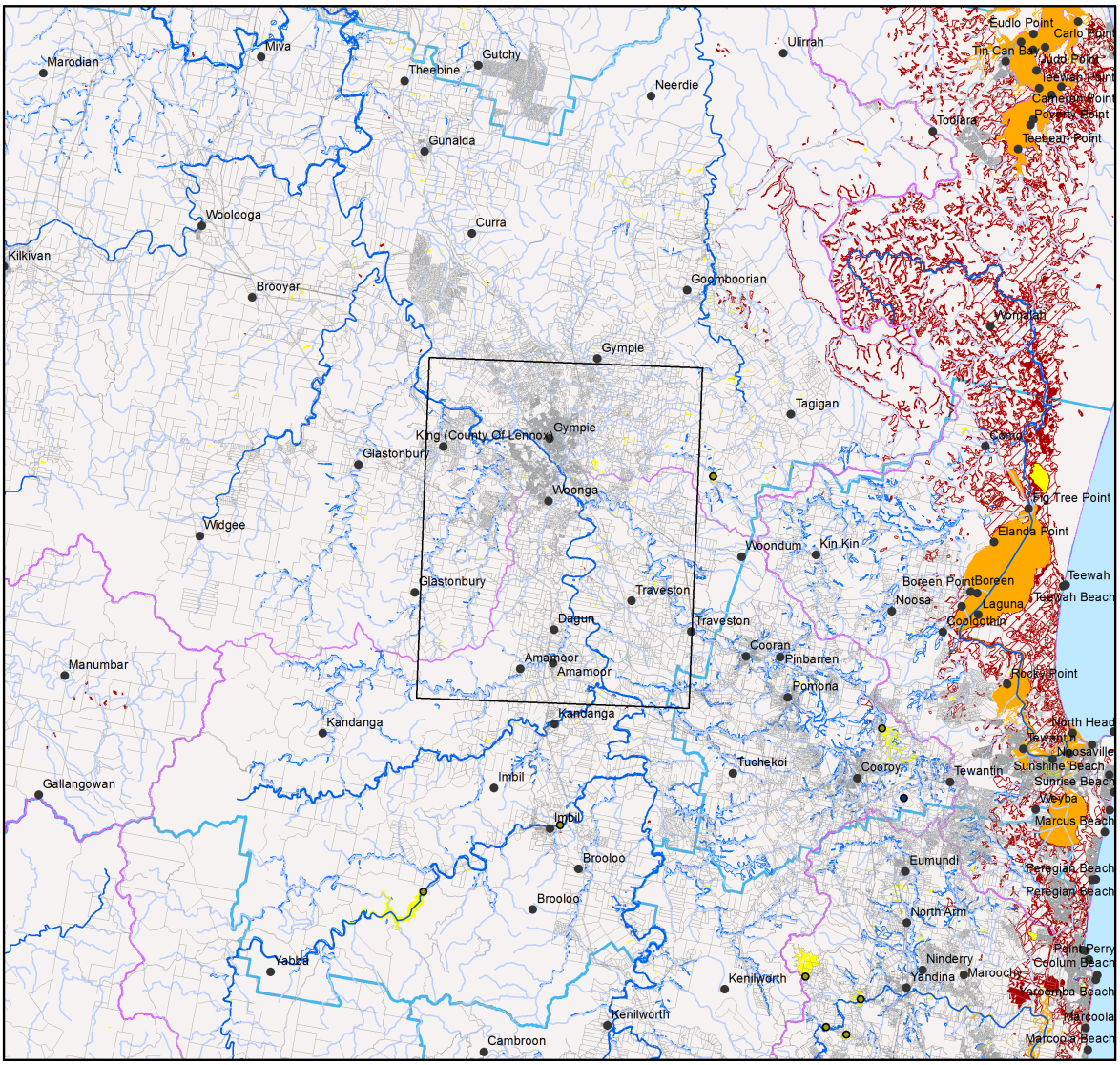
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Wetlands Map



Legend

- polygon
- Springs - Active
- Dams and weirs
- Biopassage Structures (Fishways)
- Towns
- Roads
- Cadastral boundaries
- Local Government Areas

Riverine System Drainage Lines

- Major
- Minor
- Drainage basin
- Sub-basin

Wetland Mapping

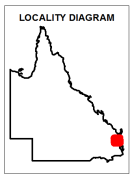
Wetland System - Water Bodies

- Marine Waterbodies
- Estuarine Waterbodies
- Riverine Waterbodies
- Lacustrine Waterbodies
- Palustrine Waterbodies

Wetland System - Regional Ecosystems

- Marine RE
- Estuarine RE
- Riverine RE
- Lacustrine RE
- Palustrine RE
- RE 51_80% wetland (mosaic units)
- Queensland

Wetlands Map



N

0 4600 9200 13800 18400 23000 m

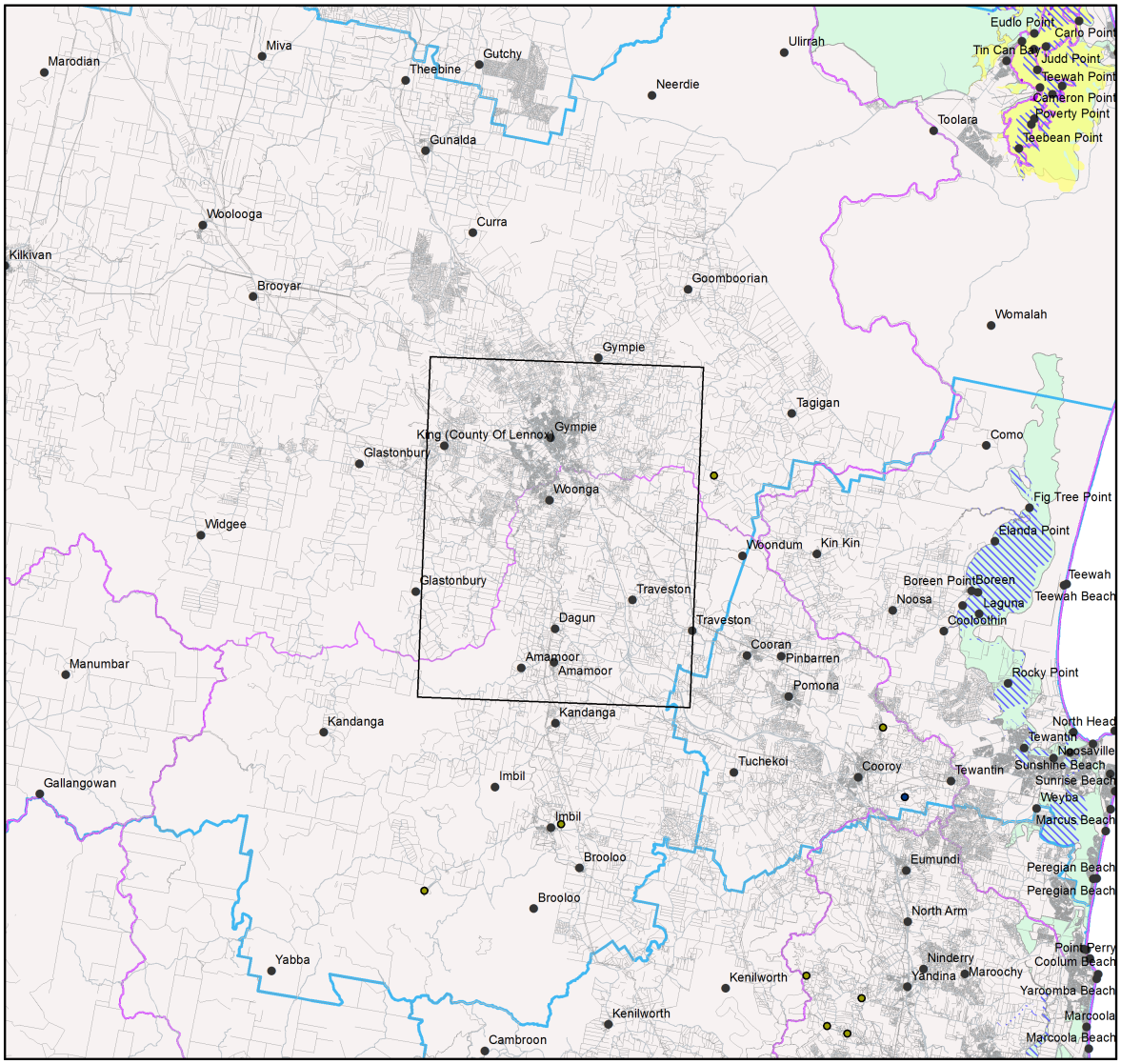
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Important Wetlands Map



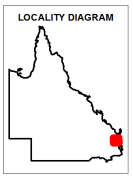
Important Wetlands of Queensland Map

Legend

- polygon
- Dams and weirs
- Springs - Active
- Wetland
- HAT (Highest Astronomical Tide)

Ramsar Site

- Bowling Green Bay
- Currawinya Lakes
- Great Sandy Strait
- Moreton Bay
- Shoalwater and Corio Bays Area
- Fish Habitat Areas
- Drainage basin
- Sub-basin
- Towns
- Cadastral boundaries
- Roads
- Local Government Areas
- Queensland



N

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0 4600 9200 13800 18400 23000 m

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Aquatic Ecosystem Rehabilitation Mapping Report

Part of the Aquatic Ecosystem Rehabilitation Process

Version 1.0



For selected area of interest Custom Geometry

Current as at 05/07/2022

Cover image above depicts aquatic ecosystems throughout Queensland, top left quadrant - Olive River, top right quadrant - stilted mangroves, bottom right quadrant - melaleuca wetlands, and bottom left quadrant - Jardine River, overlayed by a freshwater long-neck turtle representing the connection between land and water. Turtle designed by John Locke. Photos by Gary Cranitch, Queensland Museum. Image compiled by Trent Munns.

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Aquatic Ecosystem Rehabilitation Mapping Report

Purpose

The report provides key information to assist with developing an Aquatic Ecosystem Rehabilitation Plan including:

- Understanding the location, extent and classification of aquatic ecosystems
- Understanding the components and processes of the aquatic ecosystems and the broader landscape
- Understanding the conservation values of the aquatic ecosystems
- Understanding planning and legislative requirements
- Understanding surrounding land use
- Determining the ecosystem services which may be provided by the aquatic ecosystem
- Establishing objectives, undertaking detailed design and implementation of the project

The report provides a snapshot of key information to assist with understanding ecological, hydrological and administrative features that may affect a rehabilitation activity.

The information is for the direct wetland area and some surrounding area but not the broader landscapes (such as, upstream or downstream), which will be required for a Whole-of-System, Values-Based approach, to ensure that the purpose of the project reduces unintended outcomes, at the site and catchment/landscape-scales.

For more information on the aquatic ecosystem/wetlands rehabilitation, visit:
https://wetlandinfo.des.qld.gov.au/wetlands/management/rehabilitation/rehab-process/

Statutory regulatory planning

Matters of State Environmental Significance (MSES)
https://environment.des.qld.gov.au/management/planning-guidelines/method-mapping-mses

Environmental values (EVs) and water quality objectives (WQOs)
https://environment.des.qld.gov.au/management/water/policy

Development Assessment Mapping System (DAMS)
https://dams.dsdip.esriaustraliaonline.com.au/damappingsystem/

Environmental Reports - General Information

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due to either state mapping not being undertaken for the AOI, that state mapping is incomplete for the AOI, or that no matters of interest have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Important Note to User

Information presented in this report is based upon the mapping of water bodies and wetland regional ecosystems across Queensland. The Queensland wetland mapping was produced using existing information including water body mapping derived from Landsat satellite imagery, regional ecosystem mapping, topographic data, and a springs database. The result is a consistent wetland map for the whole of Queensland.
Ancillary data, such as higher resolution imagery (for example SPOT and aerial photographs), other vegetation and wetland mapping, geology, soil and land system mapping was also used in attributing and assessing the derived Queensland Wetlands Program wetland mapping products.
The wetland mapping was done in accordance with a detailed peer reviewed methodology which included quality assurance measures for all steps in the process. For more detailed information on how the Queensland Wetlands Program wetland mapping was produced, please see the Wetland Mapping and Classification Methodology.

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Summary Information

The following table provides an overview of the area of interest (AOI).

Summary information for Custom Geometry, size: 92615.68ha

Local Government Area
Sunshine Coast Regional
Noosa Shire
Gympie Regional
Somerset Regional

Click here for information on LGAs

NRM Region
Burnett Mary

Click here for information on Natural Resource Management bodies

Vegetation category
Category X
Category R
Category C
Category B
Category A
Category Water

Click here for information on vegetation clearing codes

Biogeographic region(s)	Biogeographic sub region(s)
Southeast Queensland	Burringbar - Conondale Ranges
Southeast Queensland	Gympie Block

Click here for information on bioregions and here for information on biogeographic sub regions

Drainage divisions
North East Coast

Click here for information on drainage divisions

Drainage basins
Mary

Click here for information on drainage basins

Drainage sub-basin
Upper Mary River

Click here for information on drainage basin sub areas

Aquatic Conservation Assessments (ACA)
Wide Bay-Burnett catchments

Click here for information on ACAs

Regional ecosystem type
non-remnant
12.11.5
12.3.7b
12.3.1a
12.11.10/12.11.11
12.11.3
12.11.9
12.11.3a
plantation
12.11.14
12.11.10/12.11.2
12.3.11
12.3.2
12.3.7
12.11.10/12.11.3
12.8.13
12.11.3/12.11.18
12.3.7/12.3.11
12.11.10
12.11.2
12.3.7/12.3.1a
12.11.15
12.11.1
12.12.13/12.12.16
12.12.15
12.12.12
12.11.10/12.11.1
12.3.8
12.11.18/12.11.3
12.12.16
12.12.3
12.8.16
12.8.14
water
12.11.9/12.11.3
12.12.16/12.12.1
12.12.2/12.12.6
12.11.11

Regional ecosystem type
12.12.23
12.11.3/12.11.9
12.12.1
12.12.15a
12.11.3/12.11.10
12.11.2/12.11.9
12.11.10/12.11.11/12.11.3
12.3.11/12.3.7
12.12.14
12.12.15/12.12.23
12.12.10
12.12.2
12.12.14/12.12.10
12.11.18
12.11.3/12.11.14
12.3.7c
12.3.1a/12.3.2
12.11.2/12.11.3/12.11.10
12.3.2/12.3.1a
12.11.3/12.11.2
12.12.28/12.12.23
12.11.3/12.12.15
12.12.15/12.12.28
12.12.15/12.11.3

Click here for information on regional ecosystem types

Landzone
3
11
8
12
5

Click here for land zone definitions

Water Resource Planning Area
Mary Basin

Click here for information on water plan areas

Tables

Groundwater Dependent Ecosystems types in the AOI:

GDE Surface Areas

GDE Ruleset Name	Area (ha)
Alluvia - WBB	178.9

GDE Terrestrial

GDE Ruleset Name	Area (ha)
Alluvia - WBB	273.0

GDE Subterranean

No results in the AOI

Wetland habitat types in the AOI:

Wetland Class	Habitat type	Area (ha)
Riverine	Riverine	2978.15
	Coastal/ Sub-coastal floodplain tree swamps (Melaleuca and Eucalypt)	801.37
	Coastal/ Sub-Coastal non-floodplain tree swamps (Melaleuca and Eucalypt)	576.43
Lacustrine	Artificial/ highly modified wetlands (dams, ring tanks, irrigation channel	456.55
Palustrine	Coastal/ Sub-coastal floodplain grass, sedge and herb swamps	6.36

Intertidal and Subtidal Ecosystem Types in the AOI:

Intertidal

No results in the AOI

Subtidal

No results in the AOI

Species Lists

The information in Species List, Weed List, and Pest List is derived from a spatial layer generated from the WildNet database managed by the Department of Environment and Science. The layer which is generated weekly contains the WildNet wildlife records that are not classed as erroneous or duplicate, that have a location precision equal to or less than 10000 metres and do not have a count of zero.

The WildNet dataset is constantly being enhanced and the taxonomic and status information revised. If a species is not listed in this report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area. It is recommended that you also access other internal and external data sources for species information in your area of interest (Refer Links and Support).

Conservation Significant Species List, Weed List and Pest List

The following lists may be requsted from the Environmental reports online page.

- **WildNet records - Conservation Significant Species List** - Summarises the conservation significant species records from the WildNet database for a selected area and its 1km buffer
- **WildNet records - Weed list** - summarises wildlife records for all weed species (introduced flora) within a specified location, from the WildNet database
- **WildNet records - Pest list** - summarises wildlife records for all pest species (introduced fauna and flora) within a specified location, from the WildNet database

Useful links and further information

WetlandSummary tool: https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/

Queensland Spatial Catalogue: http://qldspatial.information.qld.gov.au/catalogue/custom/index.page

Queensland Globe: https://qldglobe.information.qld.gov.au/

Environmental reports online: https://environment.ehp.qld.gov.au/report-request/environment/

Wetland on-line education modules: https://wetlandinfo.des.qld.gov.au/wetlands/resources/training/

Regional Ecosystem Mapping information:
https://www.qld.gov.au/environment/plants-animals/plants/herbarium/mapping-ecosystems

Aquatic Conservation Assessments: https://wetlandinfo.des.qld.gov.au/wetlands/assessment/assessment-methods/aca/

Groundwater Dependent Ecosystems Information:
https://wetlandinfo.des.qld.gov.au/wetlands/ecology/aquatic-ecosystems-natural/groundwater-dependent/

Groundwater Dependent Ecosystems - Mapping Rulesets:
https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/gde-background/gde-faq/gde-map-rules/

Wetlands (aquatic ecosystem) types information:
https://wetlandinfo.des.qld.gov.au/wetlands/ecology/aquatic-ecosystems-natural/

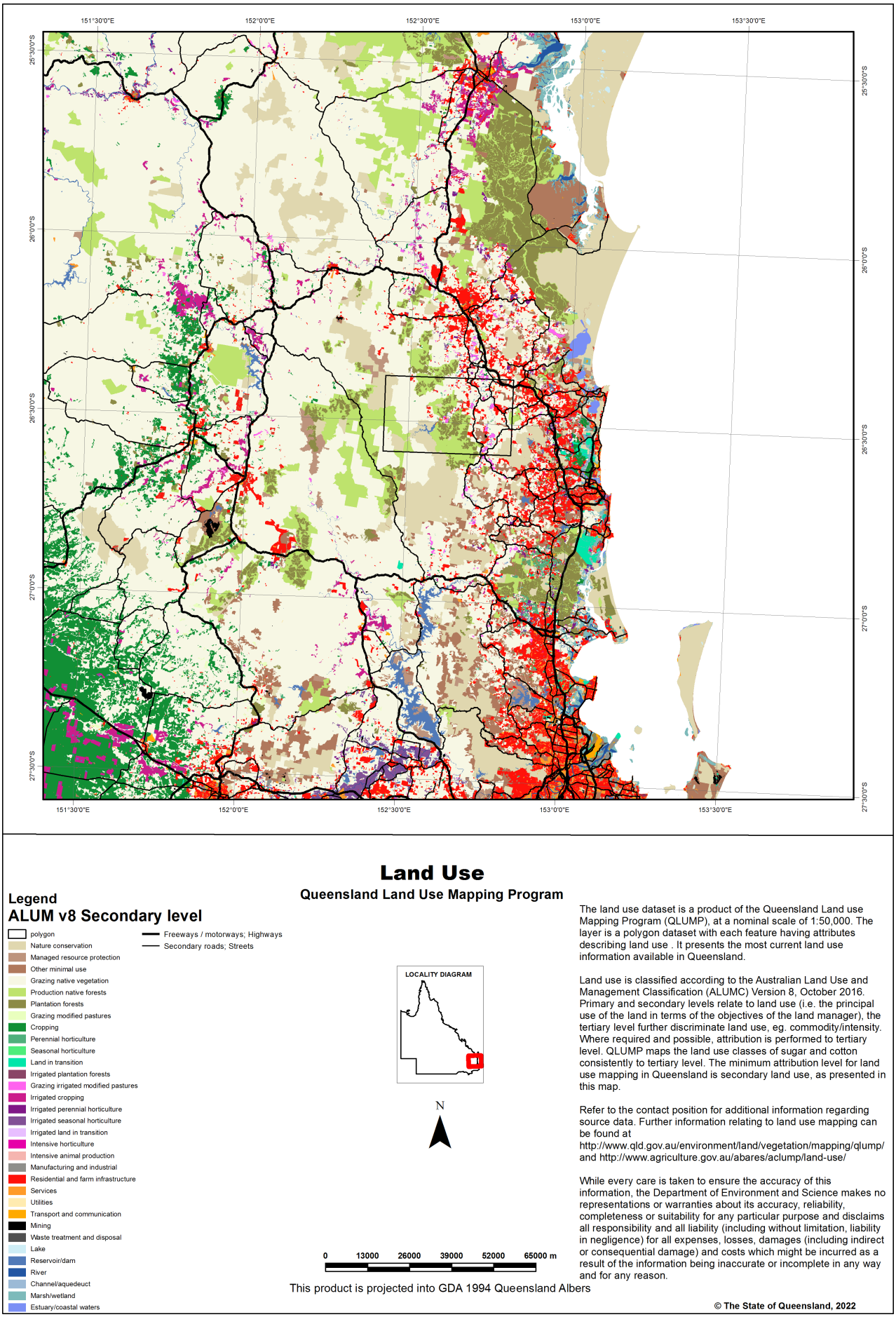
Intertidal and subtidal Ecosystem types information:
https://wetlandinfo.des.qld.gov.au/wetlands/ecology/aquatic-ecosystems-natural/estuarine-marine/descriptions/#q=

More information

For more information on the Aquatic Ecosystem Rehabilitation Process, visit:
https://wetlandinfo.des.qld.gov.au/wetlands/management/rehabilitation/rehab-process/

Maps

Land Use Map



Land Use

Queensland Land Use Mapping Program

Legend

ALUM v8 Secondary level

- polygon
- Nature conservation
- Managed resource protection
- Other minimal use
- Grazing native vegetation
- Production native forests
- Plantation forests
- Grazing modified pastures
- Cropping
- Perennial horticulture
- Seasonal horticulture
- Land in transition
- Irrigated plantation forests
- Grazing irrigated modified pastures
- Irrigated cropping
- Irrigated perennial horticulture
- Irrigated seasonal horticulture
- Irrigated land in transition
- Intensive horticulture
- Intensive animal production
- Manufacturing and industrial
- Residential and farm infrastructure
- Services
- Utilities
- Transport and communication
- Mining
- Waste treatment and disposal
- Lake
- Reservoir/dam
- River
- Channel/aquedeuct
- Marsh/wetland
- Estuary/coastal waters
- Freeways / motorways; Highways
- Secondary roads; Streets

LOCALITY DIAGRAM

N

0 13000 26000 39000 52000 65000 m

This product is projected into GDA 1994 Queensland Albers

The land use dataset is a product of the Queensland Land use Mapping Program (QLUMP), at a nominal scale of 1:50,000. The layer is a polygon dataset with each feature having attributes describing land use . It presents the most current land use information available in Queensland.

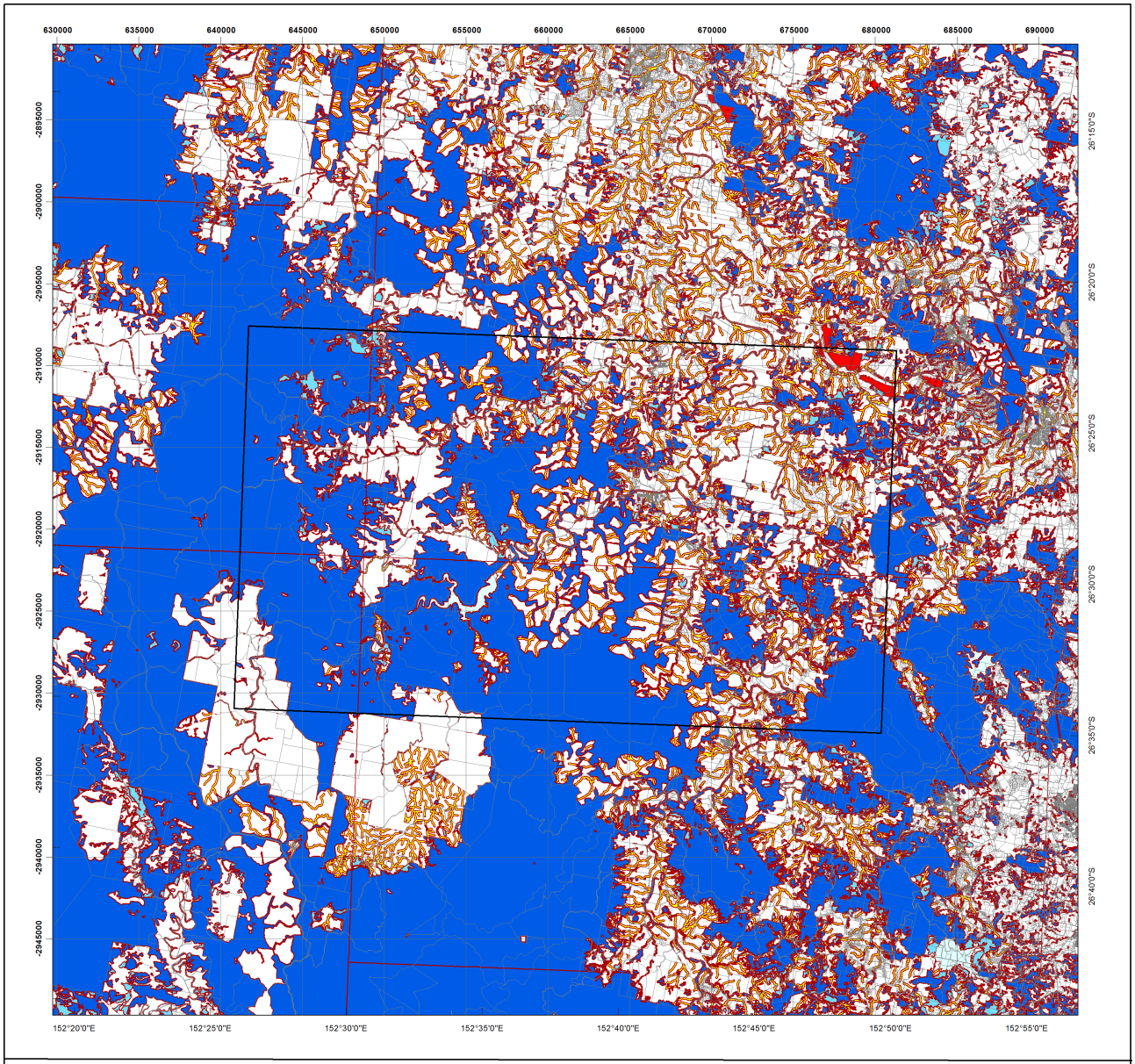
Land use is classified according to the Australian Land Use and Management Classification (ALUMC) Version 8, October 2016. Primary and secondary levels relate to land use (i.e. the principal use of the land in terms of the objectives of the land manager), the tertiary level further discriminate land use, eg. commodity/intensity. Where required and possible, attribution is performed to tertiary level. QLUMP maps the land use classes of sugar and cotton consistently to tertiary level. The minimum attribution level for land use mapping in Queensland is secondary land use, as presented in this map.

Refer to the contact position for additional information regarding source data. Further information relating to land use mapping can be found at http://www.qld.gov.au/environment/land/vegetation/mapping/qlump/ and http://www.agriculture.gov.au/abares/aclump/land-use/

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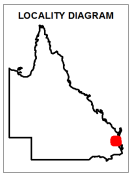
Regulated Vegetation Management Map



Regulated Vegetation Management Map

Legend

- polygon
- Category A area (Vegetation offsets/compliance notices/VDecs)
- Category B area (Remnant vegetation)
- Category C area (High-value regrowth vegetation)
- Category R area (Reef regrowth watercourse vegetation)
- Category X area (Exempt clearing work on Freehold, Indigenous and Leasehold land)
- Water
- Area not categorised
- Other land parcel boundaries



N

0 3,300 6,600 9,900 13,200 16,500 m

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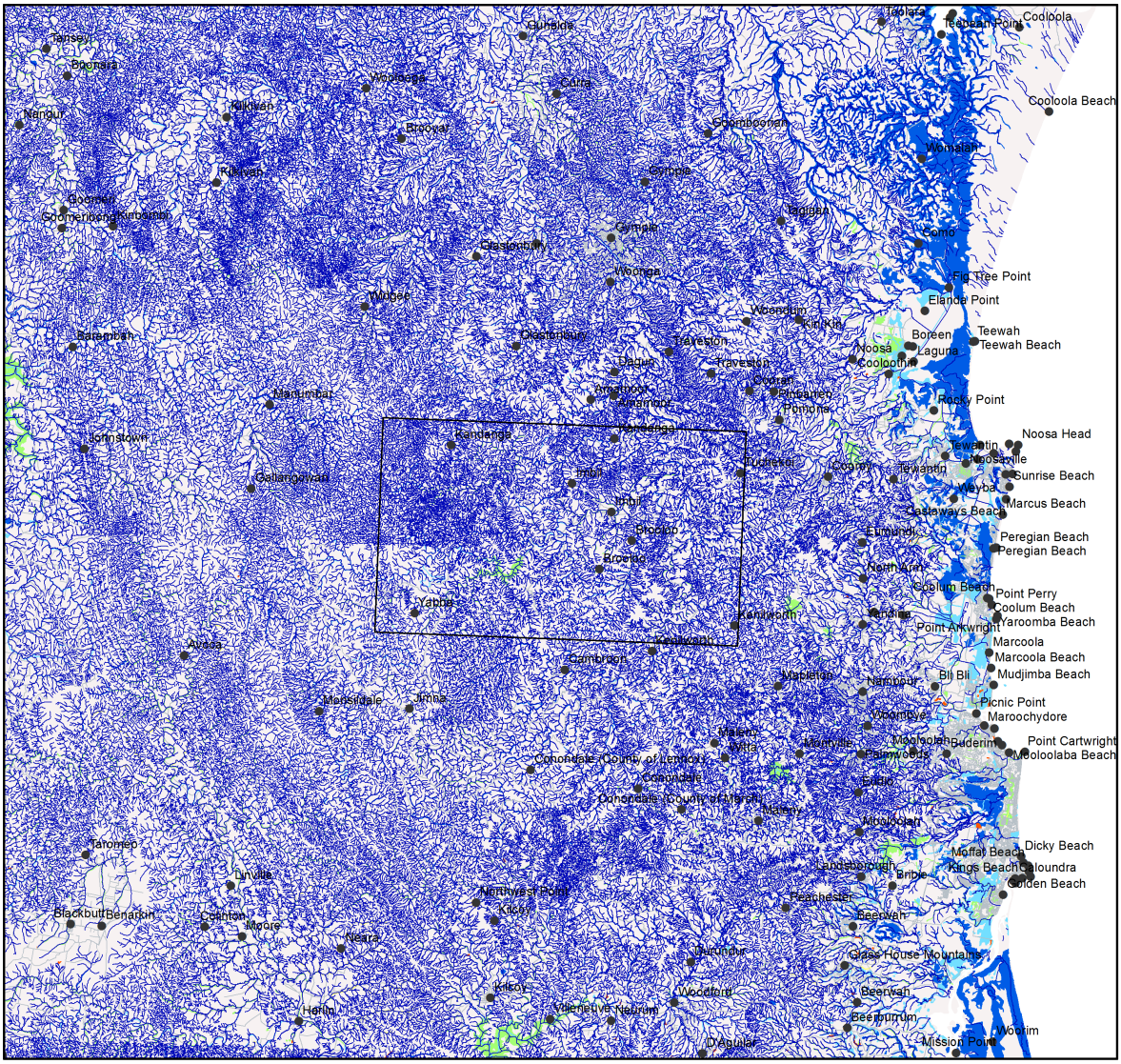
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Land parcel boundaries are provided as locational aid only.

This map is updated on a monthly basis to ensure new PMAVs are included as they are approved.

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Aquatic Conservation Assessment Map



Aquatic Conservation Assessment Map

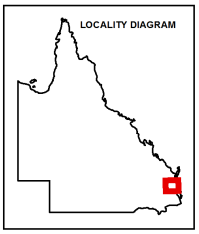
Legend

- polygon
- Towns
- Roads
- Rivers/Creeks

Riverine Buffered Streams

ACA Non-riverine

- Very High
- High
- Medium
- Low
- Very Low
- Queensland



N

0 6500 13000 19500 26000 32500 m

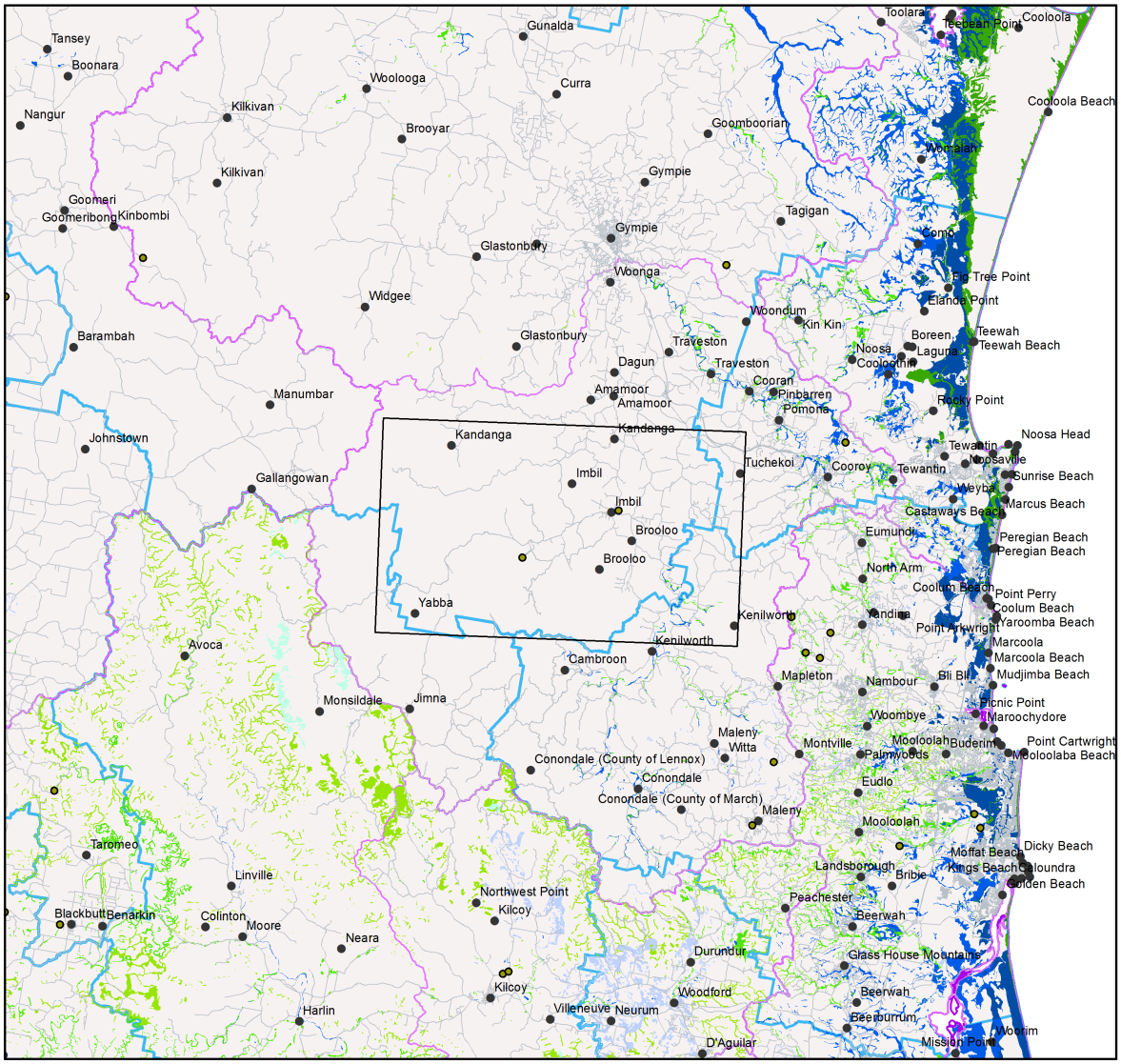
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Groundwater Dependent Ecosystems Map



Groundwater Dependant Ecosystem Map

Legend

polygon

GDE Confidence – Surface Expression

- 81-100% GDE, Known GDE
- 81-100% GDE, Derived GDE - High Confidence
- 81-100% GDE, Derived GDE - Moderate Confidence
- 81-100% GDE, Derived GDE - Low Confidence
- 01-80% GDE, Derived GDE - High Confidence
- 01-80% GDE, Derived GDE - Moderate Confidence
- 01-80% GDE, Derived GDE - Low Confidence

GDE Confidence – Terrestrial GDE

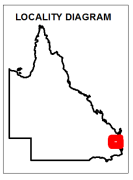
- 81-100% GDE, Known GDE
- 81-100% GDE, Derived GDE - High Confidence
- 81-100% GDE, Derived GDE - Moderate Confidence
- 81-100% GDE, Derived GDE - Low Confidence
- 01-80% GDE, Derived GDE - High Confidence
- 01-80% GDE, Derived GDE - Moderate Confidence
- 01-80% GDE, Derived GDE - Low Confidence

GDE Confidence – Subterranean

- Known GDE
- Derived GDE - High Confidence
- Derived GDE - Moderate Confidence
- Derived GDE - Low Confidence
- Derived GDE - Unknown Confidence
- Queensland

- Dams and weirs
- Sub-basin
- Drainage basin
- Roads
- Towns
- Local Government Areas

LOCALITY DIAGRAM



N

0 6500 13000 19500 26000 32500 m

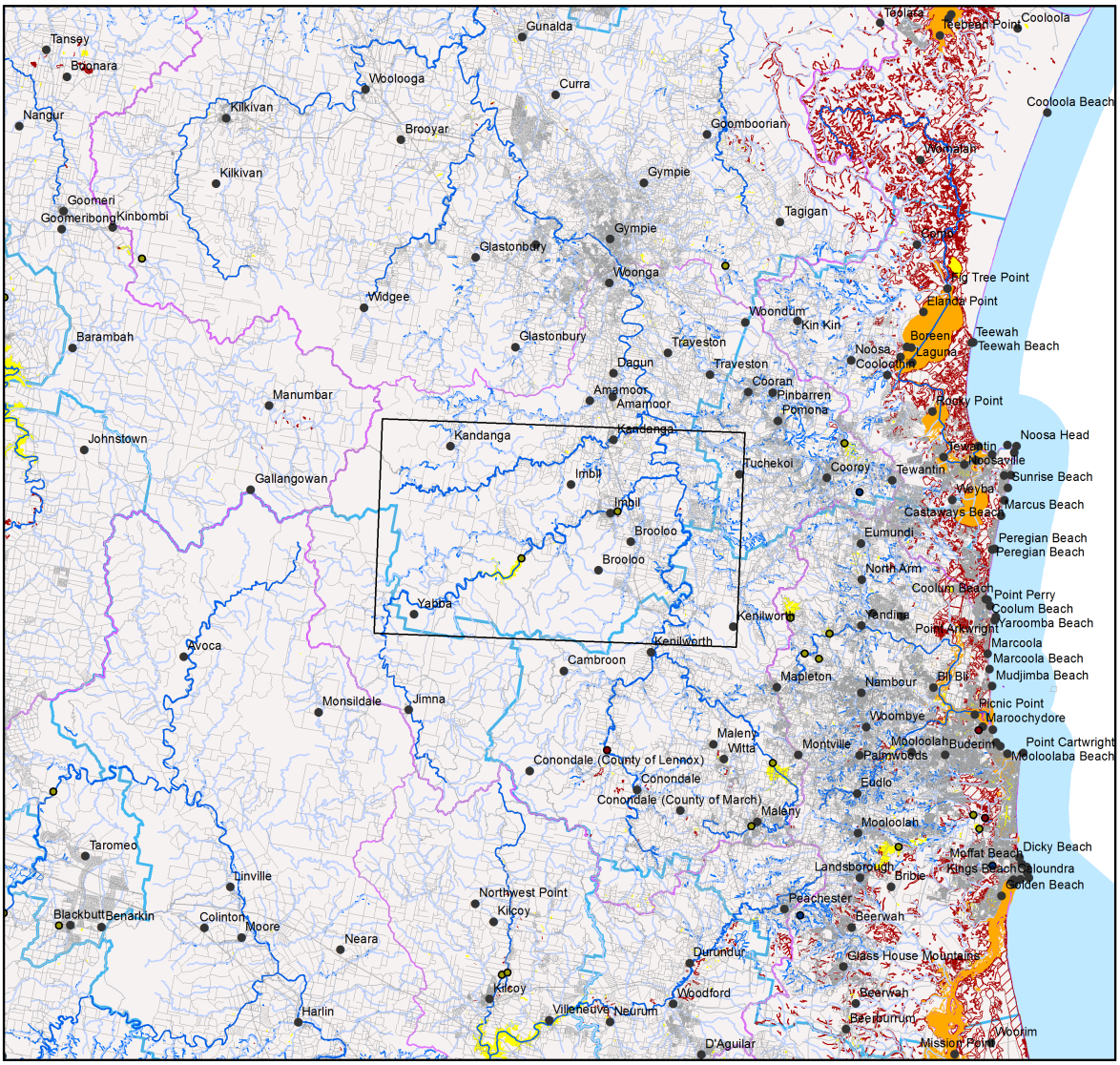
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Wetlands Map



Legend

- polygon
- Springs - Active
- Dams and weirs
- Biopassage Structures (Fishways)
- Towns
- Roads
- Cadastral boundaries
- Local Government Areas

Riverine System Drainage Lines

- Major
- Minor
- Drainage basin
- Sub-basin

Wetland Mapping

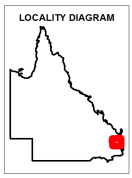
Wetland System - Water Bodies

- Marine Waterbodies
- Estuarine Waterbodies
- Riverine Waterbodies
- Lacustrine Waterbodies
- Palustrine Waterbodies

Wetland System - Regional Ecosystems

- Marine RE
- Estuarine RE
- Riverine RE
- Lacustrine RE
- Palustrine RE
- RE 51_80% wetland (mosaic units)
- Queensland

Wetlands Map



N

0 6500 13000 19500 26000 32500 m

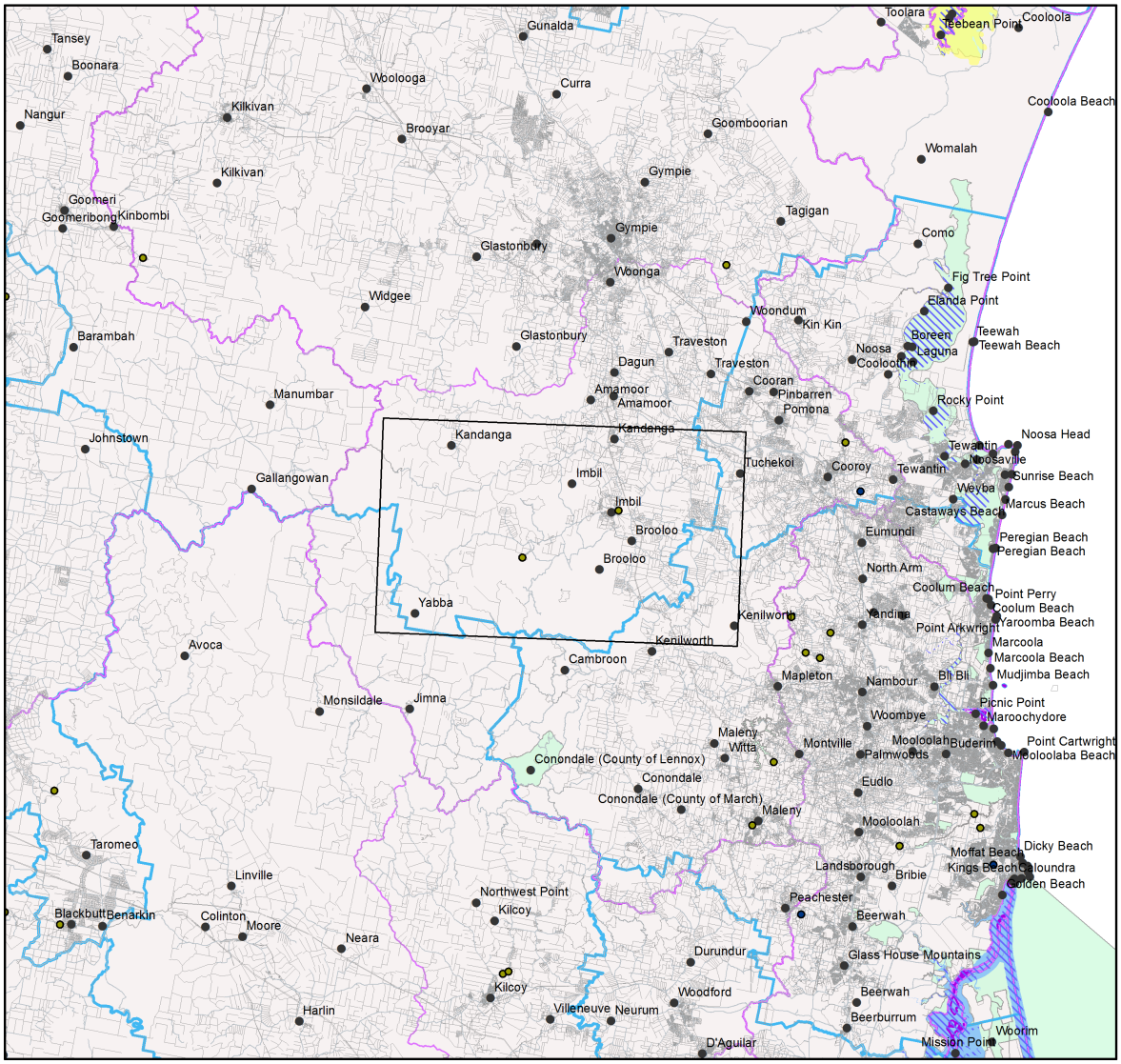
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Important Wetlands Map



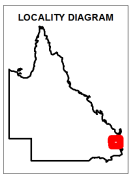
Important Wetlands of Queensland Map

Legend

- polygon
- Dams and weirs
- Springs - Active
- Wetland
- HAT (Highest Astronomical Tide)

Ramsar Site

- Bowling Green Bay
- Currawinya Lakes
- Great Sandy Strait
- Moreton Bay
- Shoalwater and Corio Bays Area
- Fish Habitat Areas
- Drainage basin
- Sub-basin
- Towns
- Cadastral boundaries
- Roads
- Local Government Areas
- Queensland



N

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Queensland Government

Department of Environment and Science

Environmental Reports

Biodiversity and Conservation Values

Biodiversity Planning Assessments and Aquatic Conservation Assessments

For the selected area of interest
Custom Geometry

Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or Area of Interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "Central co-ordinates" option, the resulting assessment area encompasses an area extending from 2km radius from the point of interest.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Please direct queries about these reports to: biodiversity.planning@des.qld.gov.au

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Summary Information

Tables 1 to 8 provide an overview of the AOI with respect to selected topographic and environmental values.

Table 1: Area of interest details: Custom Geometry

Size (ha)	54,831.55
Local Government(s)	Noosa Shire, Gympie Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Gympie Block
Catchment(s)	Mary

The following table identifies available Biodiversity Planning Assessments (BPAs) and Aquatic Conservation Assessments (ACAs) with respect to the AOI.

Table 2: Available Biodiversity Planning and Aquatic Conservation Assessments

Assessment Type	Assessment Area and Version
Biodiversity Planning Assessment(s)	Southeast Queensland v4.1
Aquatic Conservation Assessment(s) (riverine)	Wide Bay-Burnett Catchments v1.1
Aquatic Conservation Assessment(s) (non-riverine)	Wide Bay-Burnett Catchments v1.1

Table 3: Remnant regional ecosystems within the AOI as per the Qld Herbarium's 'biodiversity status'

Biodiversity Status	Area (Ha)	% of AOI
Endangered	748.01	1.36
Of concern	1,589.77	2.9
No concern at present	5,997.12	10.94

The following table identifies the extent and proportion of the user specified area of interest (AOI) which is mapped as being of "State", "Regional" or "Local" significance via application of the Queensland Department of Environment and Science's *Biodiversity Assessment and Mapping Methodology* (BAMM).

Table 4: Summary table, biodiversity significance

Biodiversity significance	Area (Ha)	% of AOI
State Habitat for EVNT taxa	1,828.99	3.34
State	3,019.04	5.51
Regional	1,704.50	3.11
Local or Other Values	1,914.42	3.49

Table 5: Non-riverine wetlands intersecting the AOI

Non-riverine wetland types intersecting the area of interest	#
Number of Palustrine wetlands	1
Number of Lacustrine wetlands	33

Non-riverine wetland types intersecting the area of interest	#
Total number of non-riverine wetlands	34

NB. The figures presented in the table above are derived from the relevant non-riverine Aquatic Conservation Assessment(s). Later releases of wetland mapping produced via the Queensland Wetland Mapping Program may provide more recent information in regards to wetland extent.

Table 6: Named waterways intersecting the AOI

Name	Permanency
AMAMOOR CREEK	Non-perennial
EEL CREEK	Non-perennial
KANDANGA CREEK	Non-perennial
MARY RIVER	Perennial
SANDY CREEK	Non-perennial
SIX MILE CREEK	Non-perennial

Refer to **Map 1** for general locality information.

The following two tables identify the extent and proportion of the user specified AOI which is mapped as being of "Very High", "High", "Medium", "Low", or "Very Low" aquatic conservation value for riverine and non-riverine wetlands via application of the Queensland Department of Environment and Science's *Aquatic Biodiversity Assessment and Mapping Method* (AquaBAMM).

Table 7: Summary table, aquatic conservation significance (riverine)

Aquatic conservation significance (riverine wetlands)	Area (Ha)	% of AOI
Very High	21,091.34	38.47
High	31,301.88	57.09
Medium	2,437.55	4.45
Low	0.0	0.0
Very Low	0.0	0.0

Table 8: Summary table, aquatic conservation significance (non-riverine)

Aquatic conservation significance (non-riverine wetlands)	Area (Ha)	% of AOI
Very High	0.0	0.0
High	0.0	0.0
Medium	62.95	0.11
Low	0.0	0.0
Very Low	0.0	0.0

Biodiversity Planning Assessments

Introduction

The Department of Environment and Science (DES) attributes biodiversity significance on a bioregional scale through a Biodiversity Planning Assessment (BPA). A BPA involves the integration of ecological criteria using the *Biodiversity assessment and Mapping Methodology* (BAMM) and is developed in two stages: 1) **diagnostic criteria**, and 2) **expert panel criteria**. The diagnostic criteria are based on existing data which is reliable and uniformly available across a bioregion, while the expert panel criteria allows for the refinement of the mapped information from the diagnostic output by incorporating local knowledge and expert opinion.

The BAMM methodology has application for identifying areas with various levels of significance solely for biodiversity reasons. These include threatened ecosystems or taxa, large tracts of habitat in good condition, ecosystem diversity, landscape context and connection, and buffers to wetlands or other types of habitat important for the maintenance of biodiversity or ecological processes. While natural resource values such as dryland salinity, soil erosion potential or land capability are not dealt with explicitly, they are included to some extent within the biodiversity status of regional ecosystems recognised by the DES.

Biodiversity Planning Assessments (BPAs) assign three levels of overall biodiversity significance.

- **State significance** - areas assessed as being significant for biodiversity at the bioregional or state scales. They also include areas assessed by other studies/processes as being significant at national or international scales. In addition, areas flagged as being of State significance due to the presence of endangered, vulnerable and/or near threatened taxa, are identified as "State Habitat for EVNT taxa".
- **Regional significance** - areas assessed as being significant for biodiversity at the subregional scale. These areas have lower significance for biodiversity than areas assessed as being of State significance.
- **Local significance and/or other values** - areas assessed as not being significant for biodiversity at state or regional scales. Local values are of significance at the local government scale.

For further information on released BPAs and a copy of the underlying methodology, go to:

http://www.qld.gov.au/environment/plants-animals/biodiversity/planning/

The GIS results can be downloaded from the Queensland Spatial Catalogue at:

http://qspatial.information.qld.gov.au/geoportal/

The following table identifies the extent and proportion of the user specified AOI which is mapped as being of "State", "Regional" or "Local" significance via application of the BAMM.

Table 9: Summary table, biodiversity significance

Biodiversity significance	Area (Ha)	% of AOI
State Habitat for EVNT taxa	1,828.99	3.34
State	3,019.04	5.51
Regional	1,704.50	3.11
Local or Other Values	1,914.42	3.49

Refer to **Map 2** for further information.

Diagnostic Criteria

Diagnostic criteria are based on existing data which is reliable and uniformly available across a bioregion. These criteria are diagnostic in that they are used to filter the available data and provide a "first-cut" or initial determination of biodiversity significance. This initial assessment is then combined through a second group of other essential criteria.

A description of the individual diagnostic criteria is provided in the following sections.

Criteria A. Habitat for EVNT taxa: Classifies areas according to their significance based on the presence of endangered, vulnerable and/or rare (EVNT) taxa. EVNT taxa are those scheduled under the *Nature Conservation Act 1992* and/or the

Environment Protection and Biodiversity Conservation Act 1999. It excludes highly mobile fauna taxa which are instead considered in Criterion H and brings together information on EVNT taxa using buffering of recorded sites or habitat suitability models (HSM) where available.

Criteria B. Ecosystem value: Classifies on the basis of biodiversity status of regional ecosystems, their extent in protected areas (presence of poorly conserved regional ecosystems), the presence of significant wetlands; and areas of national importance such as the presence of Threatened Ecological Communities, World Heritage areas and Ramsar sites. Ecosystem value is applied at a bioregional (**B1**) and regional (**B2**) scale.

Criteria C. Tract size: Measures the relative size of tracts of vegetation in the landscape. The size of any tract is a major indicator of ecological significance, and is also strongly correlated with the long-term viability of biodiversity values. Larger tracts are less susceptible to ecological edge effects and are more likely to sustain viable populations of native flora and fauna than smaller tracts.

Criteria D. Relative size of regional ecosystems: Classifies the relative size of each regional ecosystem unit within its bioregion (**D1**) and its subregion (**D2**). Remnant units are compared with all other occurrences with the same regional ecosystem. Large examples of a regional ecosystem are more significant than smaller examples of the same regional ecosystem because they are more representative of the biodiversity values particular to the regional ecosystem, are more resilient to the effects of disturbance, and constitute a significant proportion of the total area of the regional ecosystem.

Criteria F. Ecosystem diversity: Is an indicator of the number of regional ecosystems occurring within an area. An area with high ecosystem diversity will have many regional ecosystems and ecotones relative to other areas within the bioregion.

Criteria G. Context and connection: Represents the extent to which a remnant unit incorporates, borders or buffers areas such as significant wetlands, endangered ecosystems; and the degree to which it is connected to other vegetation.

A summary of the biodiversity status based upon the diagnostic criteria is provided in the following table.

Table 10: Summary of biodiversity significance based upon diagnostic criteria with respect to the AOI

Biodiversity significance	Description	Area (Ha)	% of AOI
State	Nat. Threatened Ecol. Community (B1)	685.49	1.25
State	Nat. Threatened Ecol. Community (B1) & Remnant contains at least one Of Concern RE (B1)	6.26	0.01
State	Nat. Threatened Ecol. Community (B1) & Remnant is part of a Tract that is one of the largest in the bioregion (C) & Remnant has Ecosystem diversity in the top quartile (F)	250.27	0.46
State	Nat. Threatened Ecol. Community (B1) & Remnant is part of a Tract that is one of the largest in the bioregion (C) & Remnant has high connectivity or buffers an endangered RE or Sig. Wetland (G)	8.53	0.02
State	Remnant contains at least 1 Endangered or 2 Vulnerable or Near Threatened species (A)	1,187.68	2.17
State	Remnant contains at least 1 Endangered or 2 Vulnerable or Near Threatened species (A) & Nat. Threatened Ecol. Community (B1)	641.32	1.17
State	Remnant contains at least 1 Endangered RE (B1)	283.2	0.52
State	Remnant contains at least 1 Endangered RE (B1) & Nat. Threatened Ecol. Community (B1)	149.01	0.27
State	Remnant contains at least 1 Vulnerable or Near Threatened species (A) & Nat. Threatened Ecol. Community (B1)	47.7	0.09
Regional	Remnant contains an RE that is one of the largest of its type in the subregion (D2) & Remnant has Ecosystem diversity in the top third quartile (F) & Remnant has moderate levels of connectivity (G)	200.08	0.36
Regional	Remnant contains at least 1 RE with <10 pc extent remaining or rare in subregion (B2)	13.66	0.02
Regional	Remnant contains at least 1 Vulnerable or Near Threatened species (A)	515.38	0.94
Regional	Remnant contains at least one Of Concern RE (B1)	858.39	1.57
Regional	Remnant is part of a Tract that is one of the largest in the bioregion (C) & Remnant contains an RE that is one of the largest of its type in the subregion (D2)	16.32	0.03
Regional	Remnant is part of a Tract that is one of the largest in the bioregion (C) & Remnant has Ecosystem diversity in the top quartile (F)	17.53	0.03
Regional	Remnant is part of a Tract that is one of the largest in the bioregion (C) & Remnant has high connectivity or buffers an endangered RE or Significant Wetland (G)	98.07	0.18
Local or Other Values	Refer to diagnostic data for additional information	3,488.07	6.36

Assessment of diagnostic criteria with respect to the AOI

The following table reflects an assessment of the individual diagnostic criteria noted above in regards to the AOI.

Table 11: Assessment of individual diagnostic criteria with respect to the AOI

Diagnostic Criteria	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
A: Habitat for EVNT Taxa	1,828.99	3.3	563.74	1.0	5,940.18	10.8	134.01	0.2

Diagnostic Criteria	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
B1: Ecosystem Value (Bioregion)	2,179.65	4.0	1,500.54	2.7	951.73	1.7	3,835.00	7.0
B2: Ecosystem Value (Subregion)	28.92	0.1	1,417.84	2.6	6,289.48	11.5	730.68	1.3
C: Tract Size	1,541.10	2.8	2,882.90	5.3	602.31	1.1	3,440.61	6.3
D1: Relative RE Size (Bioregion)	296.91	0.5	165.76	0.3	213.4	0.4	7,790.85	14.2
D2: Relative RE Size (Subregion)	696.93	1.3	170.09	0.3	729.02	1.3	6,870.88	12.5
F: Ecosystem Diversity	967.89	1.8	4,583.02	8.4	1,791.41	3.3	1,124.60	2.1
G: Context and Connection	1,589.49	2.9	2,323.98	4.2	3,874.45	7.1	679.0	1.2

Other Essential Criteria

Other essential criteria (also known as expert panel criteria) are based on non-uniform information sources and which may rely more upon expert opinion than on quantitative data. These criteria are used to provide a "second-cut" determination of biodiversity significance, which is then combined with the diagnostic criteria for an overall assessment of relative biodiversity significance. A summary of the biodiversity status based upon the other essential criteria is provided in the following table.

Table 12: Summary of biodiversity significance based upon other essential criteria with respect to the AOI

Biodiversity significance	Description	Area (Ha)	% of AOI
State	Remnant contains Core Habitat for Priority Taxa (H)	736.56	1.34
State	Remnant contains Core Habitat for Priority Taxa (H) & Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I)	71.29	0.13
State	Remnant contains Core Habitat for Priority Taxa (H) & Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I) & Remnant forms part of a bioregional corridor (J)	603.39	1.1
State	Remnant contains Core Habitat for Priority Taxa (H) & Remnant forms part of a bioregional corridor (J)	236.36	0.43
State	Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I)	1,319.37	2.41
State	Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I) & Remnant forms part of a bioregional corridor (J)	1,202.20	2.19
State	Remnant forms part of a bioregional corridor (J)	85.01	0.16
Regional	Remnant contains Core Habitat for Priority Taxa (H)	4.09	0.01
Regional	Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I)	136.51	0.25

Biodiversity significance	Description	Area (Ha)	% of AOI
Regional	Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I) & Remnant forms part of a bioregional corridor (J)	21.77	0.04
Regional	Remnant forms part of a bioregional corridor (J)	953.47	1.74
Local	Refer to Expert Panel data for additional information	574.64	1.05

A description of each of the other essential criteria and associated assessment in regards to the AOI is provided in the following sections.

Criteria H. Essential and general habitat for priority taxa: Priority taxa are those which are at risk or of management concern, taxa of scientific interest as relictual (ancient or primitive), endemic taxa or locally significant populations (such as a flying fox camp or heronry), highly specialised taxa whose habitat requirements are complex and distributions are not well correlated with any particular regional ecosystem, taxa important for maintaining genetic diversity (such as complex spatial patterns of genetic variation, geographic range limits, highly disjunct populations), taxa critical for management or monitoring of biodiversity (functionally important or ecological indicators), or economic and culturally important taxa.

Criteria I. Special biodiversity values: areas with special biodiversity values are important because they contain multiple taxa in a unique ecological and often highly biodiverse environment. Areas with special biodiversity values can include the following:

- Ia - centres of endemism - areas where concentrations of taxa are endemic to a bioregion or subregion are found.
- Ib - wildlife refugia (Morton *et al*. 1995), for example, islands, mound springs, caves, wetlands, gorges, mountain ranges and topographic isolates, ecological refuges, refuges from exotic animals, and refuges from clearing. The latter may include large areas that are not suitable for clearing because of land suitability/capability.
- Ic - areas with concentrations of disjunct populations.
- Id - areas with concentrations of taxa at the limits of their geographic ranges.
- Ie - areas with high species richness.
- If - areas with concentrations of relictual populations (ancient and primitive taxa).
- Ig - areas containing REs with distinct variation in species composition associated with geomorphology and other environmental variables.
- Ih - an artificial waterbody or managed/manipulated wetland considered by the panel/s to be of ecological significance.
- Ii - areas with a high density of hollow-bearing trees that provide habitat for animals.
- Ij - breeding or roosting sites used by a significant number of individuals.
- Ik - climate change refuge.

The following table identifies the value and extent area of the Other Essential Criteria H and I within the AOI.

Table 13: Relative importance of expert panel criteria (H and I) used to access overall biodiversity significance with respect to the AOI

Expert Panel	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
H: Core Habitat Priority Taxa	1,327.54	2.4	324.15	0.6	1,041.43	1.9	5,773.80	10.5
Ia: Centres of Endemism	724.78	1.3	1,484.92	2.7				
Ib: Wildlife Refugia	3,354.53	6.1						
Ic: Disjunct Populations			509.56	0.9				

Expert Panel	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
Id: Limits of Geographic Ranges			1,994.48	3.6				
Ie: High Species Richness			1,881.50	3.4				
If: Relictual Populations								
Ig: Variation in Species Composition			509.56	0.9				
Ih: Artificial Wetland								
Ii: Hollow Bearing Trees	308.56	0.6	10.84					
Ij: Breeding or Roosting Site	4.87							
Ik: Climate Refugia	264.68	0.5						

NB. Whilst biodiversity values associated with Criteria I may be present within the site (refer to tables 12 and 15), for the New England Tableland and Central Queensland Coast BPAs, area and % area figures associated with Criteria Ia through to Ij cannot be listed in the table above (due to slight variations in data formats between BPAs).

Criteria J. Corridors: areas identified under this criterion qualify either because they are existing vegetated corridors important for contiguity, or cleared areas that could serve this purpose if revegetated. Some examples of corridors include riparian habitats, transport corridors and "stepping stones".

Bioregional and subregional conservation corridors have been identified in the more developed bioregions of Queensland through the BPAs, using an intensive process involving expert panels. Map 3 displays the location of corridors as identified under the Statewide Corridor network. The Statewide Corridor network incorporates BPA derived corridors and for bioregions where no BPA has been assessed yet, corridors derived under other planning processes. *Note: as a result of updating and developing a statewide network, the alignment of corridors may differ slightly in some instances when compared to those used in individual BPAs.*

The functions of these corridors are:

- **Terrestrial** Bioregional corridors, in conjunction with large tracts of remnant vegetation, maintain ecological and evolutionary processes at a landscape scale, by:

  • Maintaining long term evolutionary/genetic processes that allow the natural change in distributions of species and connectivity between populations of species over long periods of time;

  • Maintaining landscape/ecosystems processes associated with geological, altitudinal and climatic gradients, to allow for ecological responses to climate change;

  • Maintaining large scale seasonal/migratory species processes and movement of fauna;

  • Maximising connectivity between large tracts/patches of remnant vegetation;

  • Identifying key areas for rehabilitation and offsets; and

- **Riparian** Bioregional Corridors also maintain and encourage connectivity of riparian and associated ecosystems.

The location of the corridors is determined by the following principles:

- Terrestrial

  • Complement riparian landscape corridors (i.e. minimise overlap and maximise connectivity);

  • Follow major watershed/catchment and/or coastal boundaries;

  • Incorporate major altitudinal/geological/climatic gradients;

  • Include and maximise connectivity between large tracts/patches of remnant vegetation;

• Include and maximise connectivity between remnant vegetation in good condition; and

- Riparian

• Located on the major river or creek systems within the bioregion in question.

The total extent of remnant vegetation triggered as being of "State", "Regional" or "Local" significance due to the presence of an overlying BPA derived terrestrial or riparian corridor within the AOI, is provided in the following table. For further information on how remnant vegetation is triggered due to the presence of an overlying BPA derived corridor, refer to the relevant landscape BPA expert panel report(s).

Table 14: Extent of triggered remnant vegetation due to the presence of BPA derived corridors with respect to the AOI

Biodiversity Significance	Area (Ha)	% of AOI
State	1,333.79	2.43
Regional	1,768.41	3.23
Local	0.0	0.0

NB: area figures associated with the extent of corridor triggered remnant vegetation are only available for those bioregions where a BPA has been undertaken.

Refer to **Map 3** for further information.

Threatening process/condition (Criteria K) - areas identified by experts under this criterion may be used to amend (upgrade or downgrade) biodiversity significance arising from the "first-cut" analysis. The condition of remnant vegetation is affected by threatening processes such as weeds, ferals, grazing and burning regime, selective timber harvesting/removal, salinity, soil erosion, and climate change.

Assessment of Criteria K with respect to the AOI is not currently included in the "Biodiversity and Conservation Values" report, as it has not been applied to the majority of Queensland due to data/information limitations and availability.

Special Area Decisions

Expert panel derived "Special Area Decisions" are used to assign values to Other Essential Criteria. The specific decisions which relate to the AOI in question are listed in the table below.

Table 15: Expert panel decisions for assigning levels of biodiversity significance with respect to the AOI

Decision Number	Description	Panel Recommended Significance	Criteria Values
seq_fa_02	Lowland rainforest & wet sclerophyll forest	State	Ib (wildlife refugia): VERY HIGH
seq_fa_03	Cyclopsitta diophthalma coxeni - Coxen's fig-parrot habitat	State	Ib (habitat refugia): VERY HIGH
seq_fa_26	Lowland areas likely to contain reasonable densities of hollow bearing trees	State	Ib (wildlife refugia): VERY HIGH Ii (hollow bearing trees): VERY HIGH Ij (breeding / roosting sites): VERY HIGH
seqn_fl_17	Central to Northern SEQ gallery rainforests	State	Ia (SEQ endemic taxa): VERY HIGH Ib (wildlife refugia): VERY HIGH Ic (disjunct populations): HIGH Id (limits of geographic range): HIGH Ig (ecosystem variation): HIGH
seqn_fl_42	Remnant tract encompassing Yabba State Forest and surrounding Protected Area Estate	State	Ia (SEQ endemic taxa): HIGH Ib (wildlife refugia): VERY HIGH Id (limits of geographic range): HIGH Ie (high species richness): HIGH
seqn_l_01	Terrestrial bioregional corridors	State or Regional	Criterion J
seqn_l_13	Riparian bioregional corridors	State	Criterion J

Decision Number	Description	Panel Recommended Significance	Criteria Values
seqn_l_50	Riparian lowland forest systems (other than riparian/gallery rainforests systems)	Regional	Ib (wildlife refugia): VERY HIGH Ie (high species richness: HIGH Ii (hollow bearing trees): VERY HIGH
seqs_l_10	Riparian rainforest along Six Mile Creek below Lake McDonald	State	Ia (SEQ endemic taxa): VERY HIGH
seqs_l_11	Mesic eucalypt forest and rainforest on the Beenham / Wolvi Range area	State	Ia (SEQ endemic taxa): VERY HIGH Ib (wildlife refugia): VERY HIGH Ik (climate refugia): VERY HIGH
seqs_l_57	Riparian lowland forest systems (other than riparian/gallery rainforests systems)	State	Ib (wildlife refugia): VERY HIGH Ie (high species richness: HIGH Ii (hollow bearing trees): HIGH

Expert panel decision descriptions:

seq_fa_02

Across the entire bioregion, all rainforest and wet sclerophyll forest with a rainforest understory at elevations of < 300m asl be designated as being of State significance. Based on importance for mesic fauna (e.g. Richmond birdwing Ornithoptera richmondia, giant barred-frog Mixophyes iteratus, Fleay's barred-frog Mixophyes fleayi, Coxen's fig-parrot Cyclopsitta diophthalma coxeni), and as drought/fire refugia.

seq_fa_03

Important habitat areas for Coxen's fig-parrot Cyclopsitta diophthalma coxeni identified by expert.

seq_fa_26

Lowland mature vegetation communities likely to support reasonable densities of hollow bearing trees. Preferential clearing of lowland areas for agriculture and urban expansion has resulted in reduced habitat complexities across remnant communities in SEQ (Eyre 2005; Treby Castley 2015).

Large contiguous areas of relatively undisturbed vegetation dominated by species such as Lophostemon confertus, Eucalyptus microcorys, E. racemosa, E. acmenoides, E. psammitica, E. helidonica, E. carnea, E. latisinensis, E. contracta, , E. tereticornis, E. major, E. moluccana, A. leiocarpa, E. longirostrata, Corymbia intermedia have significant wildlife refugial and nesting value due to their tendencies to form hollows.

seqn_fl_17

Localised linear patches of complex notophyll type lowland rainforest (RE 12.3.1) in fragmented landscapes in central part of region. They provide refugia for animal and plant species more commonly associated with the higher rainfall parts of SEQ especially the coastal lowlands south of Gympie and Granite Creek near Miriam Vale.

These patches are restricted in the landscape although they are more extensive than the current mapping indicates which pretty much restricts the type to Tinana Creek and Coondoo Creek, one of its major tributaries. These streams rise in the Wolvi and Beenham Ranges on the south-western margins of Cooloola and flow northwards towards Maryborough where Tinana Creek drains into the Mary River. In places the streams retain vegetated corridors through areas planted with exotic pine in Toolara and Tuan State Forests and there are patches of riverine rainforest that contain species of special conservation interest. The Kin Kin Creek catchment lies immediately south of the Tinana -Coondoo system. Kin Kin Creek has a similar riparian corridor identified by the Southern SEQ expert panel. Other streams known to support lowland complex notophyll rainforest remnants include Harwood Creek south-west of Lenthall's Dam, Gregory River, Burnett River and Gin Gin Creek.

The key values identified for Tinana-Coondoo Creeks include:

SEQ endemic taxa especially rainforest taxa - **Acacia bakeri, Acacia attenuata, Argyrodendron** sp. (Kin Kin W.D.Francis AQ81198), **Arytera microphylla, Backhousia subargentea, Cossinia australiana, Fontainea rostrata, Macrozamia parcifolia, M. pauli-guilielmi, Melaleuca cheelii, Pilidiostigma rhytispermum, Quassia bidwillii Symplocos harroldii, Rhodamnia acuminata, R. dumicola, Xanthostemon oppositifolius.**

Wildlife refugia especially refugia from clearing (Criterion Ib)

Disjunct populations (Criterion Ic): **Agathis robusta, Doodia linearis, Podocarpus spinulosus, Quassia bidwillii**.

Note: refer also to seqn_l_13 for a similar decision addressing riparian rainforest communities in eastern catchments north of (and including) the Granite Creek area.

seqn_fl_42

SEQ endemic taxa including narrow endemic taxa (Criterion Ia): **Acomis acoma, Araucaria bidwillii, Arytera distylis, A. foveolata, Backhousia subargentea, Eucalyptus dura, E. montivaga, Macrozamia longispina, Marsdenia coronata, Citrus australis, Pilidiostigma rhytispermum, Plectranthus omissus, Rhodamnia dumicola**.

Wildlife refugia (Criterion Ib).

Northern limit of range (Criterion Id): of wet sclerophyll and complex notophyll vine forest species, e.g. **Eucalyptus pilularis** (apart from Fraser Id), **Sloanea woollsii**.

Area of high species richness (Criterion Ie).

seqn_l_01

The expert panel reviewed the existing bioregional corridors for northern SEQ. Corridors were assigned as being of State or Regional significance.

For further information, refer to sections 2.3.2 and 3.2 of this report.

seqn_l_13

The riparian bioregional corridors provide connectivity through lowland areas of SEQ.

See Table 4 for list of waterways considered riparian corridors.

For further information, refer to sections 2.3.2 and 3.2 of this report.

seqn_l_50

Riparian lowland forest ecosystems are important components of the lowland landscape, frequently exhibiting higher species richness and abundance than surrounding habitats. They act as movement pathways along riparian systems for a number of species, especially aves. They also often provide critical resources for many species in terms of food, shelter and nesting site. For example, the seasonal flowering of melaleuca is important for species of honeyeaters, whilst narrow bands of flooded gum along watercourses are significant habitat for koalas **Phascolarctos cinereus**, especially in times of drought. Large trees in these systems also act as a source of nest hollows for many species of birds, bats and arboreal mammals (Lovett Price 2007).

Due to historical and preferential clearing in SEQ, remaining systems are often heavily fragmented and have undergone a substantial reduction in their extent. In many areas, condition is often poor and subject to substantial weed problems.

Wildlife refugia (Criterion Ib).

High species richness (Criterion Ie).

Larger trees in such systems are often a significant source of nest hollows (Criterion Ii).

Note - for the same decision relevant to the southern portion of the SEQ bioregion refer to seqs_l_57.

seqs_l_10

The Panel identified the following values.

SEQ endemic taxa (Criterion Ia): **Cupaniopsis serrata, Medicosma forsteri**, **Triunia robusta, Xanthostemon oppositifolius**, Mary River cod **Maccullochella mariensis**, Mary River turtle **Elusor macrurus** nesting sites, Coxen's fig-parrot **Cyclopsitta diophthalma coxeni** habitat.

seqs_l_11

The wet sclerophyll complex comprises gully systems with interesting eucalypt ecosystems, such as spotted gum **Corymbia citriodora** communities on ridgetops which are moister than typical.

The Panel identified the area as having a combination of flora and fauna values.

SEQ endemic rainforest taxa (Criterion Ia): **Acacia bakeri, Archidendron lovelliae, Argyrodendron** sp. (Kin Kin W.D.Francis AQ81198), **Arytera distylis, Bosistoa transversa, Corynocarpus rupestris** subsp. **arborescens, Cupaniopsis newmanii, Dissiliaria baloghioides, Floydia praealta, Macadamia ternifolia, Medicosma cunninghamii, Nothoalsomitra suberosa, Pararistolochia praevenosa, Samadera bidwillii, Rhodamnia acuminata, Romnalda strobilacea**.

Wildlife refugia (Criterion Ib): the area was subject to historical clearing for horticulture and presently expanding rural residential land use.

Climate refugia (Criterion Ik): A combination of ecosystem and landscape elements are present across much of the general area described considered to provide refugial functions and/or which facilitate adaptation zones (SEQ Catchments 2016).

seqs_l_57

Riparian lowland forest ecosystems are important components of the lowland landscape, frequently exhibiting higher species richness and abundance than surrounding habitats. They act as movement pathways along riparian systems for a number of species, especially birds. They also often provide critical resources for many species in terms of food, shelter and nesting sites. For example, the seasonal flowering of melaleuca is important for species of honeyeaters, whilst narrow bands of flooded gum along watercourses are significant habitat for koalas **Phascolarctos cinereus**, especially in times of drought. Large trees in these systems also act as a source of nest hollows for many species of birds, bats and arboreal mammals. (Lovett Price 2007)

Due to historical and preferential clearing in SEQ, remaining systems are often heavily fragmented and have undergone a substantial reduction in their extent. In many areas, condition is often poor and subject to considerable weed problems.

Values include:

Wildlife refugia (Criterion Ib).

High species richness (Criterion Ie).

Larger trees in such systems are often a significant source of nest hollows (Criterion Ii).

Note - for the same decision relevant to the northern portion of the SEQ bioregion refer to seqn_l_50.

Aquatic Conservation Assessments

Introduction

The Aquatic Biodiversity Assessment and Mapping Method or AquaBAMM (Clayton *et al.* 2006), was developed to assess conservation values of wetlands in queensland, and may also have application in broader geographical contexts. It is a comprehensive method that uses available data, including data resulting from expert opinion, to identify relative wetland conservation/ecological values within a specified study area (usually a catchment). The product of applying this method is an Aquatic Conservation Assessment (ACA) for the study area.

An ACA using AquaBAMM is non-social, non-economic and identifies the conservation/ecological values of wetlands at a user-defined scale. It provides a robust and objective conservation assessment using criteria, indicators and measures that are founded upon a large body of national and international literature. The criteria, each of which may have variable numbers of indicators and measures, are naturalness (aquatic), naturalness (catchment), diversity and richness, threatened species and ecosystems, priority species and ecosystems, special features, connectivity and representativeness. An ACA using AquaBAMM is a powerful decision support tool that is easily updated and simply interrogated through a geographic information system (GIS).

Where they have been conducted, ACAs can provide a source of baseline wetland conservation/ecological information to support natural resource management and planning processes. They are useful as an independent product or as an important foundation upon which a variety of additional environmental and socio-economic elements can be added and considered (i.e. an early input to broader 'triple-bottom-line' decision-making processes). An ACA can have application in:

- determining priorities for protection, regulation or rehabilitation of wetlands and other aquatic ecosystems
- on-ground investment in wetlands and other aquatic ecosystems
- contributing to impact assessment of large-scale development (e.g. dams)
- water resource and strategic regional planning prcesses

For a detailed explanation of the methodology please refer to the summary and expert panel reports relevant to the ACA utilised in this assessment. These reports can be accessed at Wetland *Info*:

http://wetlandinfo.des.qld.gov.au/wetlands/assessment/assessment-methods/aca

The GIS results can be downloaded from the Queensland Spatial Catalogue at:

http://qspatial.information.qld.gov.au/geoportal/

Explanation of Criteria

Under the AquaBAMM, eight criteria are assessed to derive an overall conservation value. Similar to the Biodiversity Assessment and Mapping Methodology, the criteria may be primarily diagnostic (quantitative) or primarily expert opinion (qualitative) in nature. The following sections provide a brief description of each of the 8 criteria.

Criteria 1. Naturalness - Aquatic: This attribute reflects the extent to which a wetland's (riverine, non-riverine, estuarine) aquatic state of naturalness is affected through relevant influencing indicators which include: presence of exotic flora and fauna; presence of aquatic communities; degree of habitat modification and degree of hydrological modification.

Criteria 2. Naturalness - Catchment: The naturalness of the terrestrial systems of a catchment can have an influence on many wetland characteristics including: natural ecological processes e.g. nutrient cycling, riparian vegetation, water chemistry, and flow. The indicators utilised to assess this criterion include: presence of exotic flora and/or fauna; riparian, catchment and flow modification.

Criteria 3. Naturalness - Diversity and Richness: This criterion is common to many ecological assessment methods and can include both physical and biological features. It includes such indicators as species richness, riparian ecosystem richness and geomorphological diversity.

Criteria 4. Threatened Species and Ecosystems: This criterion evaluates ecological rarity characteristics of a wetland. This includes both species rarity and rarity of communities / assemblages. The communities and assemblages are best represented by regional ecosystems. Species rarity is determined by NCA and EPBC status with Endangered, Vulnerable or Near-threatened species being included in the evaluation. Ecosystem rarity is determined by regional ecosystem biodiversity status i.e. Endangered, Of Concern, or Not of Concern.

Criteria 5. Priority Species and Ecosystems: Priority flora and fauna species lists are expert panel derived. These are aquatic, semi-aquatic and riparian species which exhibit at least 1 particular trait in order to be eligible for consideration. For

flora species the traits included:

- It forms significant macrophyte beds (in shallow or deep water).
- It is an important food source.
- It is important/critical habitat.
- It is implicated in spawning or reproduction for other fauna and/or flora species.
- It is at its distributional limit or is a disjunct population.
- It provides stream bank or bed stabilisation or has soil binding properties.
- It is a small population and subject to threatening processes.

Fauna species are included if they meet at least one of the following traits:

- It is endemic to the study area (>75 per cent of its distribution is in the study area/catchment).
- It has experienced, or is suspected of experiencing, a serious population decline.
- It has experienced a significant reduction in its distribution and has a naturally restricted distribution in the study area/catchment.
- It is currently a small population and threatened by loss of habitat.
- It is a significant disjunct population.
- It is a migratory species (other than birds).
- A significant proportion of the breeding population (>one per cent for waterbirds, >75 per cent other species) occurs in the waterbody (see Ramsar criterion 6 for waterbirds).
- Limit of species range.

See the individual expert panel reports for the priority species traits specific to an ACA.

Criteria 6. Special Features: Special features are areas identified by flora, fauna and ecology expert panels which exhibit characteristics beyond those identified in other criteria and which the expert panels consider to be of the highest ecological importance. Special feature traits can relate to, but are not solely restricted to geomorphic features, unique ecological processes, presence of unique or distinct habitat, presence of unique or special hydrological regimes e.g. spring-fed streams. Special features are rated on a 1 - 4 scale (4 being the highest).

Criteria 7. Connectivity: This criterion is based on the concept that appropriately connected aquatic ecosystems are healthy and resilient, with maximum potential biodiversity and delivery of ecosystem services.

Criteria 8. Representativeness: This criterion applies primarily to non-riverine assessments, evaluates the rarity and uniqueness of a wetland type in relation to specific geographic areas. Rarity is determined by the degree of wetland protection within "protected Areas" estate or within an area subject to the *Fisheries Act 1994*, *Coastal Protection and Management Act 1995*, or *Marine Parks Act 2004*. Wetland uniqueness evaluates the relative abundance and size of a wetland or wetland management group within geographic areas such as catchment and subcatchment.

Riverine Wetlands

Riverine wetlands are all wetlands and deepwater habitats within a channel. The channels are naturally or artificially created, periodically or continuously contain moving water, or connecting two bodies of standing water. AquaBAMM, when applied to riverine wetlands uses a discrete spatial unit termed subsections. A subsection can be considered as an area which encompasses discrete homogeneous stream sections in terms of their natural attributes (i.e. physical, chemical, biological and utilitarian values) and natural resources. Thus in an ACA, an aquatic conservation significance score is calculated for each subsection and applies to all streams within a subsection, rather than individual streams as such.

Please note, the area figures provided in Tables 16 and 17, are derived using the extent of riverine subsections within the AOI. Refer to **Map 5** for further information. A summary of the conservation significance of riverine wetlands within the AOI is provided in the following table.

Table 16: Overall level/s of riverine aquatic conservation significance

Aquatic conservation significance (riverine wetlands)	Area (Ha)	% of AOI
Very High	21,091.34	38.47

Aquatic conservation significance (riverine wetlands)	Area (Ha)	% of AOI
High	31,301.88	57.09
Medium	2,437.55	4.45
Low	0.0	0.0
Very Low	0.0	0.0

The individual aquatic conservation criteria ratings for riverine wetlands within the AOI are listed below.

Table 17: Level/s of riverine aquatic conservation significance based on selected criteria

Criteria	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
1. Naturalness aquatic	21,514.58	39.2	30,542.52	55.7	2,773.68	5.1		
2. Naturalness catchment	9,572.18	17.5	5,805.22	10.6	39,301.08	71.7	152.3	0.3
3. Diversity and richness			30,097.81	54.9	24,479.34	44.6	253.63	0.5
4. Threatened species and ecosystems	50,812.44	92.7	3,637.59	6.6				
5. Priority species and ecosystems	35,295.17	64.4	14,379.47	26.2	856.21	1.6		
6. Special features	18,750.41	34.2						
7. Connectivity	23,541.69	42.9	25,113.04	45.8	6,174.61	11.3	1.44	
8. Representative-ness								

The table below lists and describes the relevant expert panel decisions used to assign conservation significance values to riverine wetlands within the AOI.

Table 18: Expert panel decisions for assigning overall levels of riverine aquatic conservation significance

Decision number	Special feature	Catchment	Criteria/Indicator/Measure	Conservation rating (1-4)
my_r_ec_02	Pools, riffles and sand bars	Mary	6.3.1, 6.2.1	4, 4
my_r_fa_07	Pools, riffles and sand bars	Mary	6.3.1, 6.2.1	4, 4
my_r_ec_06	Tinana and Coondoo Creeks	Mary	6.3.1, 6.4.1	4, 4
my_r_fa_03	Tinana and Coondoo Creeks	Mary	6.3.1, 6.4.1	4, 4
my_r_fa_05	Six Mile Creek	Mary	6.3.1	4
my_r_fa_09	Flying fox camps	Mary	6.3.1	4

4 is the highest rating/value

Expert panel decision descriptions:

my_r_ec_02

Pool, riffle and sand bar sequences commence above the upper end of the Mary barrage impoundment, but also occur upstream chiefly along the main trunk of the Mary River. Pool, riffle and sand bar sequence ecosystems has been nominated as an endangered ecosystem under the **Environmental Protection and Biodiversity Conservation Act 1999**, for its geomorphological values, transient, dynamic nature and diversity of special ecological processes. Fauna utilising these sequences include the Mary River Cod (**Maccullochella peelii mariensis**) (pools), Mary River Turtle (**Elusor macrurus**) (pool, riffles and sandbar) and the Australian lungfish (**Neoceratodus forsteri**). The wetland ecology panel recommended that known locations be captured by selecting: (i) nine deep pools monitored by the DERM Aquatic Ecosystems group; and (ii) areas within the lowland reaches of the main branch of the Mary, where pool/riffle/sand bars ecosystems have been previously identified by DERM during the identification of High Ecological Value areas in 2004. The Mary River turtle (**Elusor macrurus)** is dependent on pools for adult habitat, riffles for juvenile habitat associated with their macroinvertebrate diet, and sand bars for nesting habitat (Flakus and Connell 2008). There was some discussion during the wetland ecology panel that sequences of pools, riffles and sand bars can apply to the whole catchment and this is a representative example of the values. This area was originally nominated by the fauna panel and was reviewed and endorsed by the wetland ecology panel as both an ecology and fauna decision. The wetland ecology panel also noted that these ecosystems are on the current federal priority list.

Note: This decision also applies as a fauna decision (decision number my_r_fa_07).

my_r_fa_07

Pool, riffle and sand bar sequences commence above the upper end of the Mary barrage impoundment, but also occur upstream chiefly along the main trunk of the Mary River. Pool, riffle and sand bar sequence ecosystems has been nominated as an endangered ecosystem under the **Environmental Protection and Biodiversity Conservation Act 1999**, for its geomorphological values, transient, dynamic nature and diversity of special ecological processes. Fauna utilising these sequences include the Mary River Cod (**Maccullochella peelii mariensis**) (pools), Mary River Turtle (**Elusor macrurus**) (pool, riffles and sandbar) and the Australian lungfish (**Neoceratodus forsteri**). The wetland ecology panel recommended that known locations be captured by selecting: (i) nine deep pools monitored by the DERM Aquatic Ecosystems group; and (ii) areas within the lowland reaches of the main branch of the Mary, where pool/riffle/sand bars ecosystems have been previously identified by DERM during the identification of High Ecological Value areas in 2004. The Mary River turtle (**Elusor macrurus**) is dependent on pools for adult habitat, riffles for juvenile habitat associated with their macroinvertebrate diet, and sand bars for nesting habitat (Flakus and Connell 2008). There was some discussion during the wetland ecology panel that sequences of pools, riffles and sand bars can apply to the whole catchment and this is a representative example of the values. This area was originally nominated by the fauna panel and was reviewed and endorsed by the wetland ecology panel as both an ecology and fauna decision. The wetland ecology panel also noted that these ecosystems are on the current federal priority list.

Note: This decision also applies as a ecology decision (decision number my_r_ec_02).

my_r_ec_06

Tinana and Coondoo Creeks are important Mary River cod (**Maccullochella peelii mariensis**) habitat and are one of two areas left unstocked. The area is identified as an area of high ecological value (HEV) and values listed in the HEV report (EPP Water 2009) include the only self-sustaining naturally occurring populations of cod in the Mary catchment (and Qld), supports Ornate Rainbow (**Rhadinocentrus ornatus**), Honey Blue Eye (**Pseudomugil mellis**) and Oxleyan Pygmy Perch (**Nannoperca oxleyana)**. In-stream and riparian habitat are natural, intact and high in quality, although it is naturally low in fish and aquatic plan species richness. Threatened species of frog include the Giant barred (**Mixophyes iterates**) and wallum frogs. Water quality is good upstream of the impoundments although pH levels are low. This area was originally nominated by the fauna panel and later reviewed by both the flora and wetland ecology panes. The flora panel commented that there are significant macrophyte beds as well as being is a centre of **Quassia bidwillii** distribution. The wetland ecology panel endorsed this as an ecology decision and noted its value as a complete functioning system with reasonable riparian buffers.

Note: This decision also applies as a fauna decision (decision number my_r_fa_03).

my_r_fa_03

Tinana and Coondoo Creeks contain important self-sustaining Mary River cod (**Maccullochella peelii mariensis**) populations. It is the only area now containing wild stocks. These creeks support fish species including ornate rainbow

(Rhadinocentrus ornatus), honey blue eye (**Pseudomugil mellis**) and oxleyan pygmy perch (**Nannoperca oxleyana**). Frog species include the giant barred frog (**Mixophyes iterates**) and wallum frogs. The flora panel commented on the significant macrophyte beds of these tributaries. It is also the centre of **Quassia bidwillii** distribution. This area was originally nominated by fauna panel but was considered to have multiple values. The wetland ecology panel agreed that this should also be an ecology decision, observing that Tinana and Coondoo Creeks are more of a complete functioning system with reasonable riparian buffers. These are scheduled as High Ecological Value (HEV) waters: Upstream of the impoundments has good water quality and streams are characterised by low pH levels.

Note: This decision also applies as a ecology decision (decision number my_r_ec_06).

my_r_fa_05

This tributary of the Mary was recognised within the Mary Water Resource Plan especially for its values as Mary River cod (**Maccullochella peelii mariensis**) habitat and one of three known significant cod breeding populations (as per Mary River Cod Recovery Plan). This species requires deep pools with in-stream large woody debris (e.g. logs) as well as canopy closure to reduce noise and provide stream shading. All values are linked back to the riparian vegetation. This means that if there is no vegetation it is of no habitat value for the species. Six Mile Creek is an unusual alluvial system in that it is a sandy stream without gravel riffles which are formed by large woody debris and exhibits all the above features. Riparian vegetation in this area has been mapped at a finer scale appropriate to identify habitat. Six Mile Creek has good connectivity, despite being impounded in its upper reach. Its water quality is statistically different from other tributaries of the Mary due to its significantly lower pH. In addition to the Mary River cod, other notable fauna species include threatened frog species such as the giant barred frog (**Mixophyes iterates**) and the tusked frog (**Adelotus brevis**); the Australian lungfish (**Neoceratodus forsteri**) and honey blue eye (**Pseudomugil mellis**). The panel indicated this decision should also include the rock pools and streams of Mothar Mountain, which is the northern limit of the cascade treefrog (**Litoria pearsoniana**) south of Kroombit. The wetland ecology panel also recommended extending this area to include Dingo, Coomber, Sandy and Boulder creeks which have slightly different ecological values including remnant lowland rainforest, tall messmate and significant cultural values. However, following further consideration, this decision remained as a fauna panel decision.

my_r_fa_09

The aquatic fauna expert panel convened for the Burnett ACA (conducted in 2006) considered flying fox camps to be a significant breeding or roosting phenomenon. The black flying-fox (**Pteropus alecto**), little red flying-fox (**Pteropus scapulatus**) and the 'vulnerable' grey headed flying fox (**Pteropus poliocephalus)** are known to make camp in the Burnett River catchment. The majority of camps for these species are located along watercourses. It is thought that the riparian zone is favoured because of the higher humidity levels than the surrounding terrestrial areas and because the flying foxes may use the streams for navigation. Wherever permanent and temporary camps occur, the riparian zone vegetation should be identified as special habitat. The panel noted that some roosts occurred within non-riverine wetlands.

Note: This decision was taken from the previous Burnett River ACA (decision number afep_burn_7). It has been applied as a riverine decision in all the other catchments (bu_r_fa_07; bm_r_fa_04; cc_r_fa_01; fr_r_fa_02; ko_r_fa_01) and as a non-riverine decision in other catchments (bm_nr_fa_02; ko_nr_fa_02; my_nr_fa_02) within the Wide Bay-Burnett study area.

Non-riverine Wetlands

Non-riverine wetlands include both lacustrine and palustrine wetlands, however, do not currently incorporate estuarine, marine or subterranean wetland types. A summary of the conservation significance of non-riverine wetlands within the AOI is provided in the following table. Refer to **Map 6** for further information.

Table 19: Overall level/s of non-riverine aquatic conservation significance

Aquatic conservation significance (non-riverine wetlands)	Area (Ha)	% of AOI
Very High	0.0	0.0
High	0.0	0.0
Medium	62.95	0.11
Low	0.0	0.0

Aquatic conservation significance (non-riverine wetlands)	Area (Ha)	% of AOI
Very Low	0.0	0.0

The following table provides an assessment of non-riverine wetlands within the AOI and associated aquatic conservation criteria values.

Table 20: Level/s of non-riverine aquatic conservation significance based on selected criteria

Criteria	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
1. Naturalness aquatic			1.48		24.21		37.26	0.1
2. Naturalness catchment			1.54		46.14	0.1	15.27	
3. Diversity and richness			14.41		18.16		30.38	0.1
4. Threatened species and ecosystems	38.53	0.1						
5. Priority species and ecosystems	41.32	0.1	21.63					
6. Special features								
7. Connectivity								
8. Representative-ness	1.48							

The table below lists and describes the relevant expert panel decisions used to assign conservation significance values to non-riverine wetlands within the AOI.

Table 21: Expert panel decisions for assigning overall levels of non-riverine aquatic conservation significance.

Decision number	Special feature	Catchment	Criteria/Indicator/Measure	Conservation rating (1-4)
(No Records)				

4 is the highest rating/value

Expert panel decision descriptions:

(No Records)

Threatened and Priority Species

Introduction

This chapter contains a list of threatened and priority flora and/or fauna species that have been recorded on, or within 4km of the Assessment Area.

The information presented in this chapter with respect to species presence is derived from compiled databases developed primarily for the purpose of BPAs and ACAs. Data is collated from a number of sources and is updated periodically.

It is important to note that the list of species provided in this report, may differ when compared to other reports generated from other sources such as the State government's WildNet, Herbrecs or the federal government's EPBC database for a number of reasons.

Records for threatened and priority species are filtered and checked based on a number of rules including:

- Taxonomic nomenclature - current scientific names and status,
- Location - cross-check co-ordinates with location description,
- Taxon by location - requires good knowledge of the taxon and history of the record,
- Duplicate records - identify and remove,
- Expert panels - check records and provide new records,
- Flora cultivated records excluded,
- Use precise records less than or equal to 2000m,
- Use recent records greater than or equal to 1975 animals, greater than or equal to 1950 plants.

Threatened Species

Threatened species are those species classified as "Endangered" or "Vulnerable" under the *Environment Protection and Biodiversity Conservation Act 1999* or "Endangered", "Vulnerable" or "Near threatened" under the *Nature Conservation Act 1992*.

The following threatened species have been recorded on, or within approximately 4km of the AOI.

Table 22: Threatened species recorded on, or within 4km of the AOI

Species	Common name	NCA status	EPBC status	Back on Track rank	Migratory species*	Wetland species**	Identified flora/fauna
Acanthophis antarcticus	common death adder	V		Medium			FA
Adelotus brevis	tusked frog	V		Medium		I	FA
Archidendron lovelliae	bacon wood	V	V	Low			FL
Argynnis hyperbius inconstans	Australian fritillary	E	CE	Low			FA
Bosistoa transversa	three-leaved bosistoa	C	V				FL
Coleus omissus		E	E				FL
Crinia tinnula	wallum froglet	V		High		I	FA
Croton lucens		CE					FL
Cupaniopsis shirleyana	wedge-leaf tuckeroo	V	V	High			FL
Dasyurus maculatus maculatus	spotted-tailed quoll (southern subspecies)	E	E	High			FA
Delma torquata	collared delma	V	V	High			FA
Elseya albagula	southern snapping turtle	CE	CE	High		I	FA
Elusor macrurus	Mary River turtle	E	E	Critical		I	FA
Floydia praealta	ball nut	V	V	Medium			FL
Fontainea rostrata		V	V	Low			FL

Species	Common name	NCA status	EPBC status	Back on Track rank	Migratory species*	Wetland species**	Identified flora/fauna
Fontainea venosa		V	V	Low			FL
Hemiaspis damelii	grey snake	E		Medium			FA
Leichhardtia coronata		V					FL
Litoria pearsoniana	cascade treefrog	V		Low		I	FA
Macadamia integrifolia	macadamia nut	V	V	Medium			FL
Macadamia ternifolia	bopple nut	V	V	Low			FL
Maccullochella mariensis	Mary River cod		E	High		D	FA
Macrozamia pauli-guilielmi		E	E	Critical			FL
Mixophyes iteratus	giant barred frog	V	E	Medium			FA
Neoceratodus forsteri	Australian lungfish		V	Critical		D	FA
Ninox strenua	powerful owl	V		Medium			FA
Ornithoptera richmondia	Richmond birdwing	V		Critical			FA
Petauroides armillatus	central greater glider	E	V				FA
Petauroides armillatus	central greater glider	E	V	Low			FA
Petaurus australis australis	yellow-bellied glider (southern subspecies)	V		High			FA
Phascolarctos cinereus	koala	E	E	Low			FA
Picris conyzoides		V		High			FL
Podargus ocellatus plumiferus	plumed frogmouth	V		Low			FA
Pteropus poliocephalus	grey-headed flying-fox	C	V	Critical			FA
Pterostylis sp. (Gundiah W.W.Abell AQ72188)		NT		Data Deficient			FL
Rhodamnia dumicola	rib-fruited malletwood	E					FL
Rhodamnia rubescens	scrub turpentine	CE	CE				FL
Rhodomyrtus psidioides	native guava	CE	CE				FL
Ricinocarpos speciosus		V		Medium			FL
Samadera bidwillii		V	V	Medium			FL
Symplocos harroldii	hairy hazelwood	NT		Low			FL
Tenuibranchiurus glypticus	swamp crayfish	E		Low			FA
Turnix melanogaster	black-breasted button-quail	V	V	Critical			FA
Zieria verrucosa		V	V	Medium			FL

NB. Please note that the threatened species listed in this section are based upon the most recently compiled DES internal state-wide threatened species dataset. This dataset may contain additional records that were not originally available for inclusion in the relevant individual BPAs and ACAs.

**JAMBA - Japan-Australia Migratory Bird Agreement; CAMBA - China-Australia Migratory Bird Agreement; ROKAMBA - Republic of Korea-Australia Migratory Bird Agreement; CMS - Convention on the Conservation of Migratory Species*.

***I - wetland indicator species; D - wetland dependent species*.

BPA Priority Species

A list of BPA priority species that have been recorded on, or within approximately 4km of the AOI is contained in the following table.

Table 23: Priority species recorded on, or within 4km of the AOI

Species	Common name	Back on Track rank	Identified flora/fauna
Acacia bakeri	marblewood	M	FL
Acacia longissima	None	None	FL
Acronychia wilcoxiana	silver aspen	L	FL
Agathis robusta	kauri pine	None	FL
Antechinus subtropicus	Subtropical Antechinus	L	FA
Ardea sumatrana	Great-billed Heron	L	FA
Austromyrtus dulcis	midgen berry	None	FL
Backhousia citriodora	lemon ironwood	L	FL
Backhousia subargentea	None	None	FL
Brunoniella spiciflora	None	H	FL
Callicarpa pedunculata	velvet leaf	L	FL
Cherax dispar	Lobby	L	FA
Cherax punctatus	Land Yabby	DD	FA
Croton lucens	None	None	FL
Ctenotus arcanus	None	L	FA
Cyclorana alboguttata	Greenstripe Frog	L	FA
Decaspermum humile	silky myrtle	None	FL
Diphyoropa jonesi	Goomeri Copper Pinwheel Snail	None	FA
Echotrida substrangeoides	Glastonbury Carnivorous Snail	None	FA
Endiandra compressa	None	L	FL
Endiandra lowiana	white apple	L	FL
Ephippiorhynchus asiaticus	Black-necked Stork	L	FA
Eroticoscincus graciloides	None	M	FA
Eupomatia bennettii	small bolwarra	None	FL
Gossia acmenoides	None	None	FL
Gossia hillii	None	None	FL
Gyrocochlea raveni	Raven's Pinwheel Snail	None	FA
Hedleyella maconelli	Maconell's Panda-snail	None	FA
Hoplocephalus bitorquatus	Pale-headed Snake	M	FA
Kerivoula papuensis	Golden-tipped Bat	M	FA
Lampropholis couperi	None	L	FA
Litoria dentata	Bleating Treefrog	L	FA
Litoria tyleri	Southern Laughing Treefrog	L	FA
Lophoictinia isura	Square-tailed Kite	L	FA
Macropus dorsalis	Black-striped Wallaby	L	FA
Melithreptus gularis	Black-chinned Honeyeater	L	FA
Mormopterus norfolkensis	East-coast Freetail Bat	L	FA
Mugil cephalus	Sea Mullet	L	FA
Nautiliropa omicron	Red-flamed Pinwheel Snail	None	FA
Nitor wiangariensis	Wiangarie Forest Glass-snail	None	FA

Species	Common name	Back on Track rank	Identified flora/fauna
Ophioscincus ophioscincus	None	L	FA
Ornithorhynchus anatinus	Platypus	L	FA
Pedinogyra ultra	Giant Flat-coiled Snail	None	FA
Petaurus australis australis	Yellow-bellied Glider (southern subsp.)	H	FA
Pleuropoma draytonensis	Drayton Droplet Snail	None	FA
Pleuropoma gladstonensis	Gladstone Droplet Snail	None	FA
Pomatostomus temporalis	Grey-crowned Babbler	None	FA
Pseudovanilla foliata	giant climbing orchid	L	FL
Pteropus alecto	Black Flying-fox	L	FA
Pteropus scapulatus	Little Red Flying-fox	L	FA
Ramogenia challengeri	Challenger's Bristle Snail	None	FA
Rhodamnia dumicola	rib-fruited malletwood	None	FL
Rhodamnia rubescens	None	None	FL
Rhodomyrtus psidioides	native guava	None	FL
Sarcochilus dilatatus	brown sarcochilus	L	FL
Scoteanax rueppellii	Greater Broad-nosed Bat	M	FA
Signepupina strangei	Dwarf Chrysalis-snail	None	FA
Signepupina wilcoxi	Wilcox's Chrysalis-snail	None	FA
Squamagenia separanda	Pine Rivers Bristle Snail	None	FA
Strangesta maxima	Giant Carnivorous Snail	None	FA
Syzygium oleosum	blue cherry	None	FL
Trachystoma petardi	Pinkeye Mullet	L	FA
Tyto tenebricosa tenebricosa	Sooty Owl	L	FA

NB. Please note that the list of priority species is based on those species identified in the BPAs, however records for these species may be more recent than the originals used. furthermore, the BPA priority species databases are updated from time to time. At each update, the taxonomic details for all species are amended as necessary to reflect current taxonomic name and/or status changes.

ACA Priority Species

A list of ACA priority species used in riverine and non-riverine ACAs that have been recorded on, or within approximately 4km of the AOI are contained in the following tables.

Table 24: Priority species recorded on, or within 4 km of the AOI - riverine

Species	Common name	Back on Track rank	Identified flora/fauna
Acrocephalus australis	Australian Reed-Warbler	Low	FA
Ardea alba modesta	Eastern Great Egret	Low	FA
Azolla pinnata	ferny azolla	None	FL
Bacopa monnieri	None	None	FL
Bolboschoenus fluviatilis	None	None	FL
Bubulcus ibis	Cattle Egret	Low	FA
Casuarina cunninghamiana subsp. cunninghamiana	None	None	FL
Ceratophyllum demersum	hornwort	None	FL

Species	Common name	Back on Track rank	Identified flora/fauna
Cyperus exaltatus	tall flatsedge	None	FL
Elseya albagula	Southern Snapping Turtle	High	FA
Eucalyptus tereticornis	None	None	FL
Gallinago hardwickii	Latham's Snipe	Low	FA
Haliaeetus leucogaster	White-bellied Sea-Eagle	Low	FA
Hydrilla verticillata	hydrilla	None	FL
Juncus prismatocarpus	branching rush	None	FL
Juncus usitatus	None	None	FL
Litoria rothii	Northern Laughing Treefrog	Low	FA
Litoria tyleri	Southern Laughing Treefrog	Low	FA
Macquaria novemaculeata	Australian Bass	Low	FA
Myriophyllum verrucosum	water milfoil	None	FL
Nymphaea gigantea	None	Low	FL
Nymphoides indica	water snowflake	None	FL
Ottelia ovalifolia	swamp lily	None	FL
Persicaria decipiens	slender knotweed	None	FL
Persicaria hydropiper	water pepper	None	FL
Persicaria lapathifolia	pale knotweed	None	FL
Persicaria praetermissa	None	None	FL
Phragmites australis	common reed	None	FL
Potamogeton crispus	curly pondweed	None	FL
Potamogeton perfoliatus	perfoliate pondweed	None	FL
Schoenoplectus subulatus	None	None	FL
Schoenoplectus tabernaemontani	None	None	FL
Stuckenia pectinata	fennel pondweed	None	FL
Vallisneria nana	None	Low	FL
Waterhousea floribunda	weeping lilly pilly	None	FL

Table 25: Priority species recorded on, or within 4 km of the AOI - non-riverine

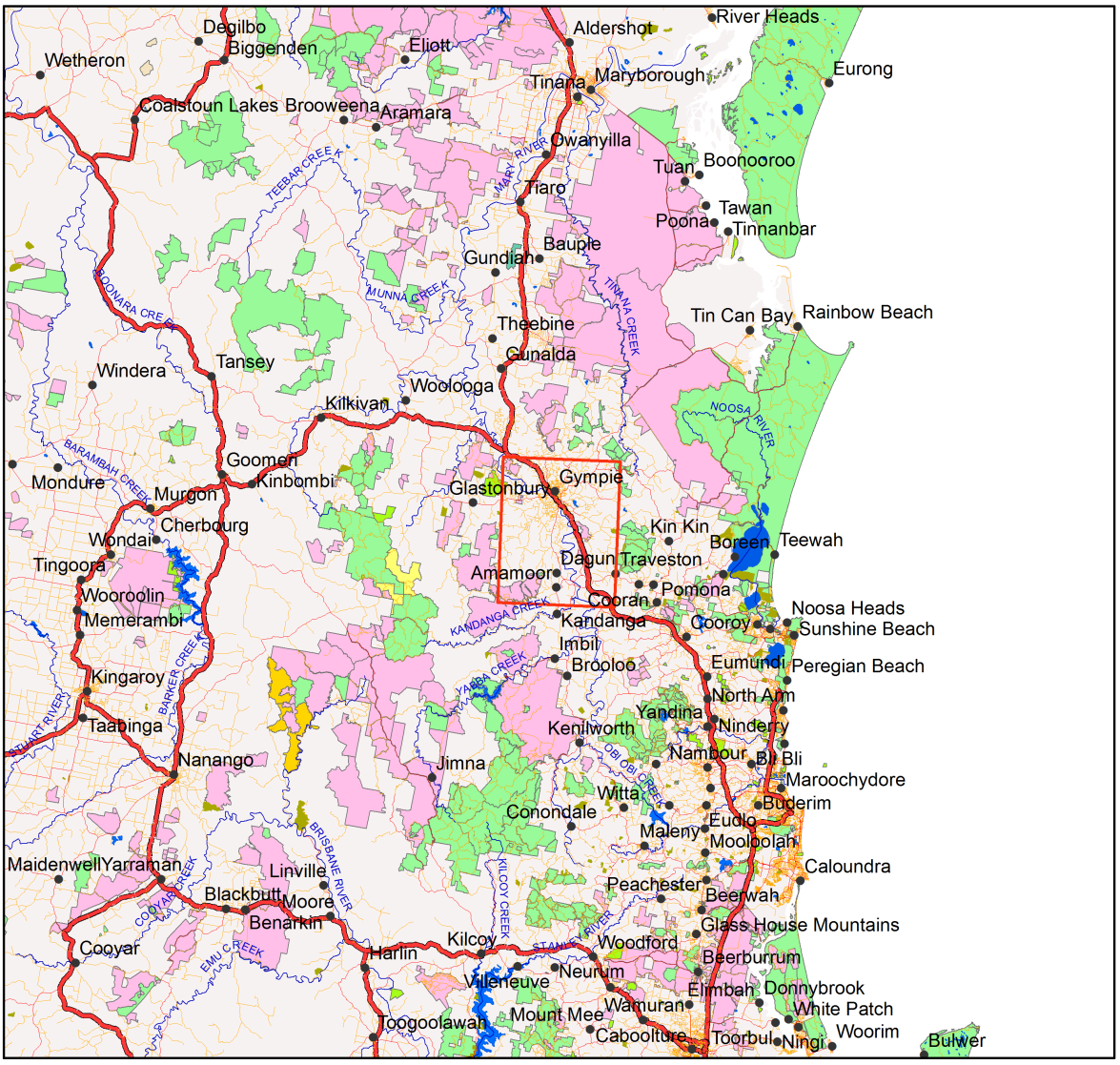
Species	Common name	Back on Track rank	Identified flora/fauna
Acrocephalus australis	Australian Reed-Warbler	Low	FA
Ardea alba modesta	Eastern Great Egret	Low	FA
Azolla pinnata	ferny azolla	None	FL
Bacopa monnieri	None	None	FL
Bolboschoenus fluviatilis	None	None	FL
Bubulcus ibis	Cattle Egret	Low	FA
Cyclorana alboguttata	Greenstripe Frog	Low	FA
Cyperus exaltatus	tall flatsedge	None	FL
Eleocharis sphacelata	tall spikerush	None	FL
Eucalyptus tereticornis	None	None	FL
Gallinago hardwickii	Latham's Snipe	Low	FA

Species	Common name	Back on Track rank	Identified flora/fauna
Haliaeetus leucogaster	White-bellied Sea-Eagle	Low	FA
Hydrilla verticillata	hydrilla	None	FL
Juncus prismatocarpus	branching rush	None	FL
Juncus usitatus	None	None	FL
Litoria rothii	Northern Laughing Treefrog	Low	FA
Marsilea mutica	shiny nardoo	None	FL
Myriophyllum verrucosum	water milfoil	None	FL
Nymphaea gigantea	None	Low	FL
Nymphoides indica	water snowflake	None	FL
Ottelia ovalifolia	swamp lily	None	FL
Persicaria decipiens	slender knotweed	None	FL
Persicaria hydropiper	water pepper	None	FL
Persicaria lapathifolia	pale knotweed	None	FL
Persicaria praetermissa	None	None	FL
Phragmites australis	common reed	None	FL
Potamogeton crispus	curly pondweed	None	FL
Potamogeton perfoliatus	perfoliate pondweed	None	FL
Schoenoplectiella mucronata	None	None	FL
Schoenoplectus subulatus	None	None	FL
Schoenoplectus tabernaemontani	None	None	FL
Stuckenia pectinata	fennel pondweed	None	FL
Vallisneria nana	None	Low	FL

NB. Please note that the priority species records used in the above two tables are comprised of those adopted for the released individual ACAs. The ACA riverine and non-riverine priority species databases are updated from time to time to reflect new release of ACAs. At each update, the taxonomic details for all ACAs records are amended as necessary to reflect current taxonomic name and/or status changes.

Maps

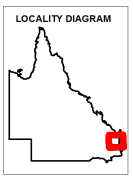
Map 1 - Locality Map



Locality Map

Legend

- polygon
- Towns
- Highway
- Connector
- Street/Local Road
- Reservoirs
- Lakes
- National Park (Scientific)
- National Park
- National Park (CYPAL)
- Conservation Park
- Resources Reserve
- Forest Reserve
- State Forest
- Timber Reserve
- Nature Refuges
- Coordinated Conservation Areas
- Major rivers/creeks
- Queensland



N

0 10000 20000 30000 40000 50000 m

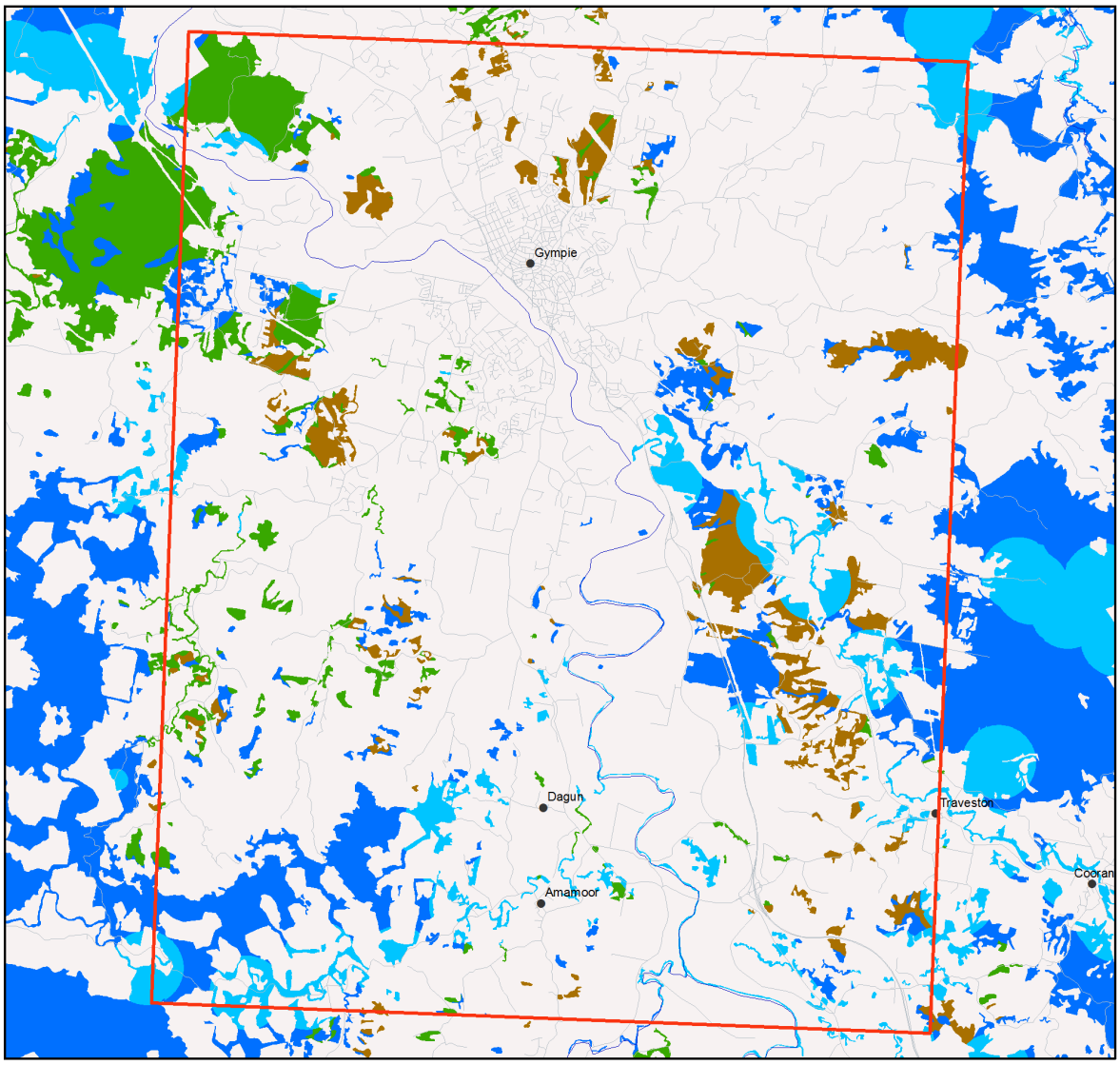
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Map 2 - Biodiversity Planning Assessment (BPA)



Biodiversity Planning Assessments

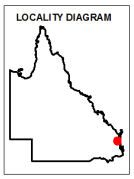
Legend

- polygon
- Towns
- Roads
- Major rivers/creeks
- Queensland

Biodiversity Planning Assessment

- State Habitat for EVNT taxa
- State
- Regional
- Local or Other Values
- Non Bioregion Ecosystem

LOCALITY DIAGRAM



N

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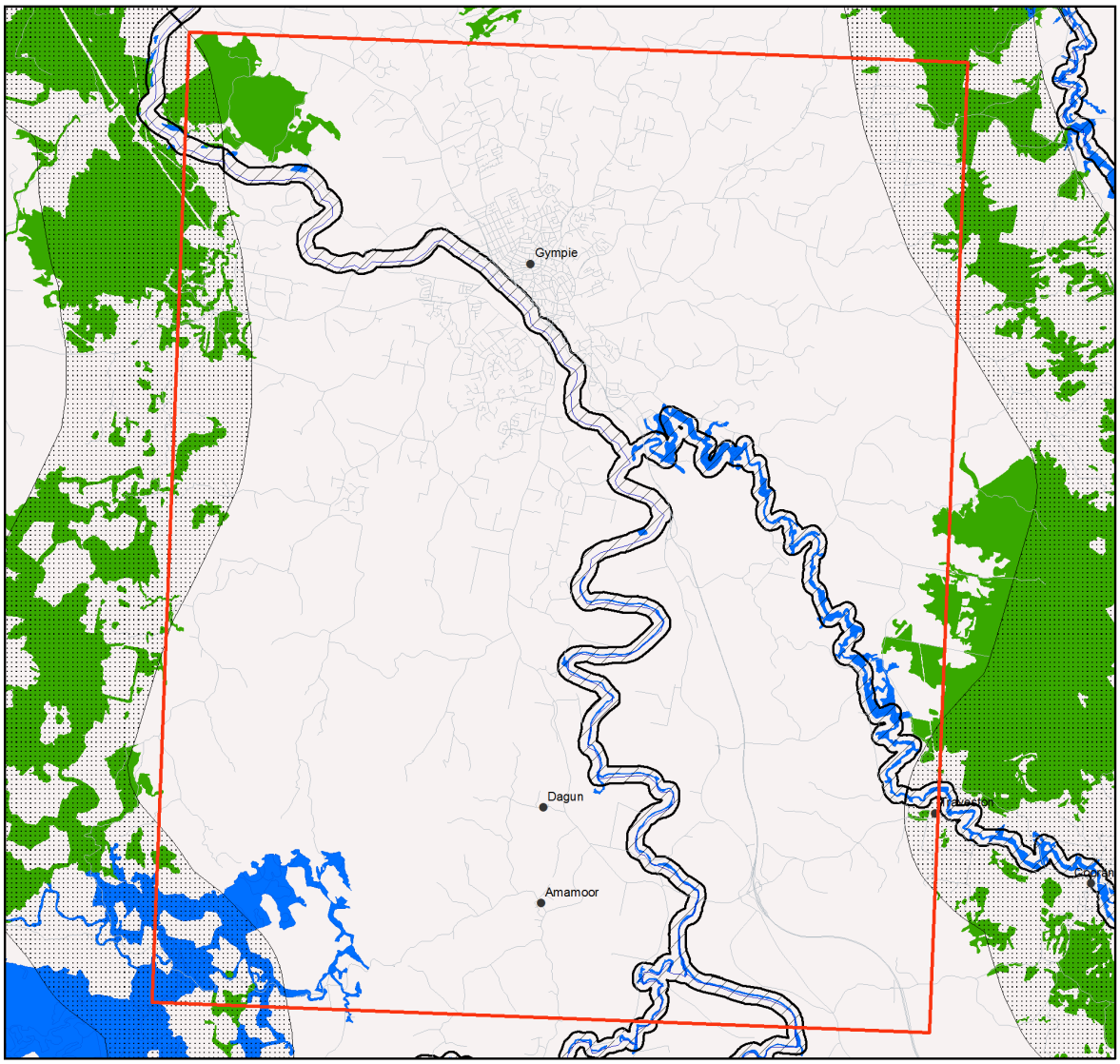
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0 1600 3200 4800 6400 8000 m

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Map 3 - Corridors



Corridors

Legend

- polygon
- Towns
- Roads
- Major rivers/creeks
- Queensland

Corridors

- State
- Regional

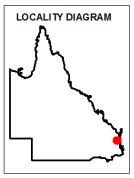
Corridor Triggered Vegetation

- State
- Regional
- Local

Core Area Vegetation

- Brigalow Belt only

LOCALITY DIAGRAM



N

0 1600 3200 4800 6400 8000 m

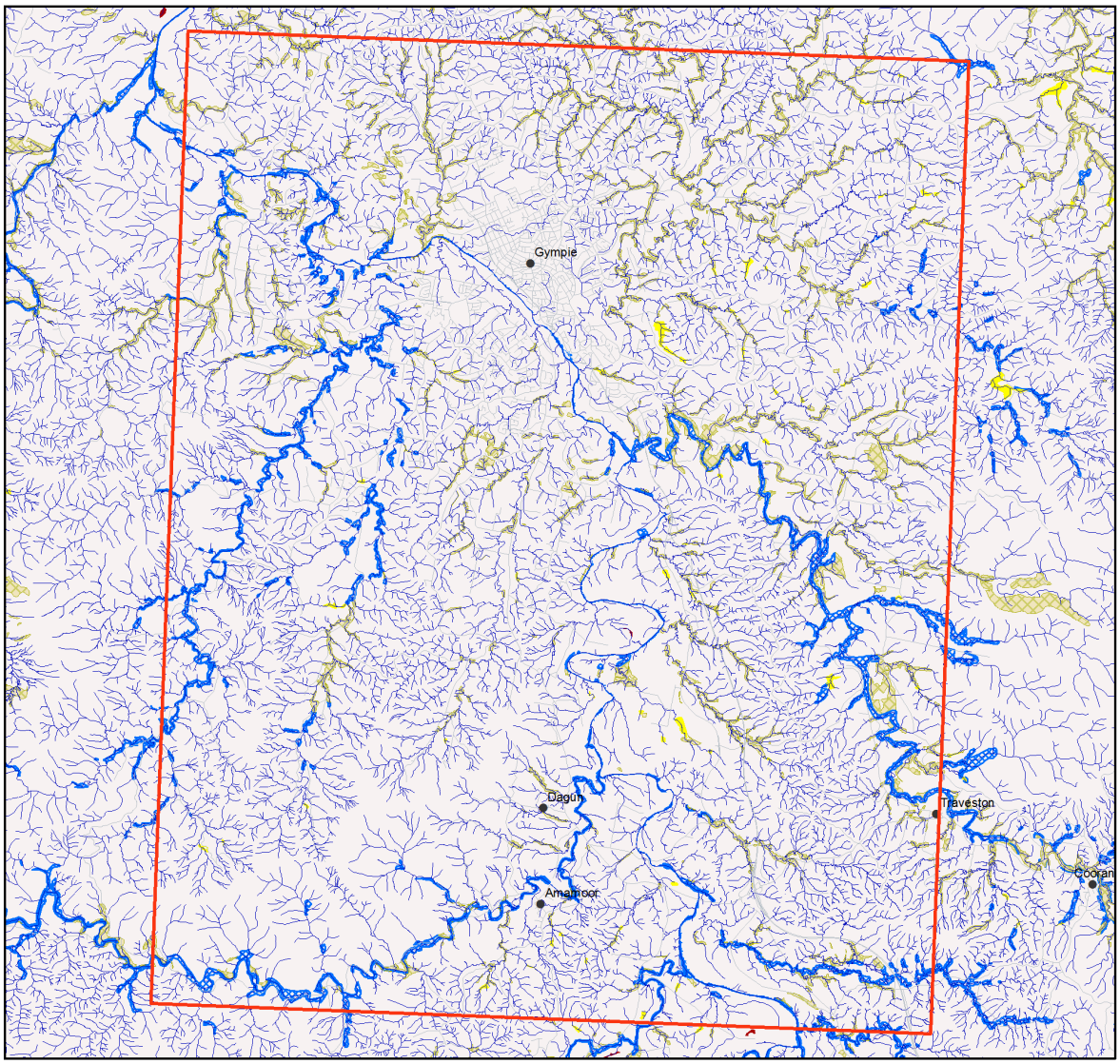
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Map 4 - Wetlands and waterways



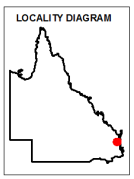
Wetlands and Waterways

Legend

- polygon
- Towns
- Roads
- Springs
- Rivers/Creeks
- Directory of Important Wetlands
- Ramsar Sites - QLD
- Queensland

Wetland Type

- Marine Waterbodies
- Estuarine Waterbodies
- Riverine Waterbodies
- Lacustrine Waterbodies
- Palustrine Waterbodies
- Marine RE
- Estuarine RE
- Riverine RE
- Lacustrine RE
- Palustrine RE
- RE 51-80% wetland (mosaic units)
- RE 1-50% wetland (mosaic units)



N

0 1600 3200 4800 6400 8000 m

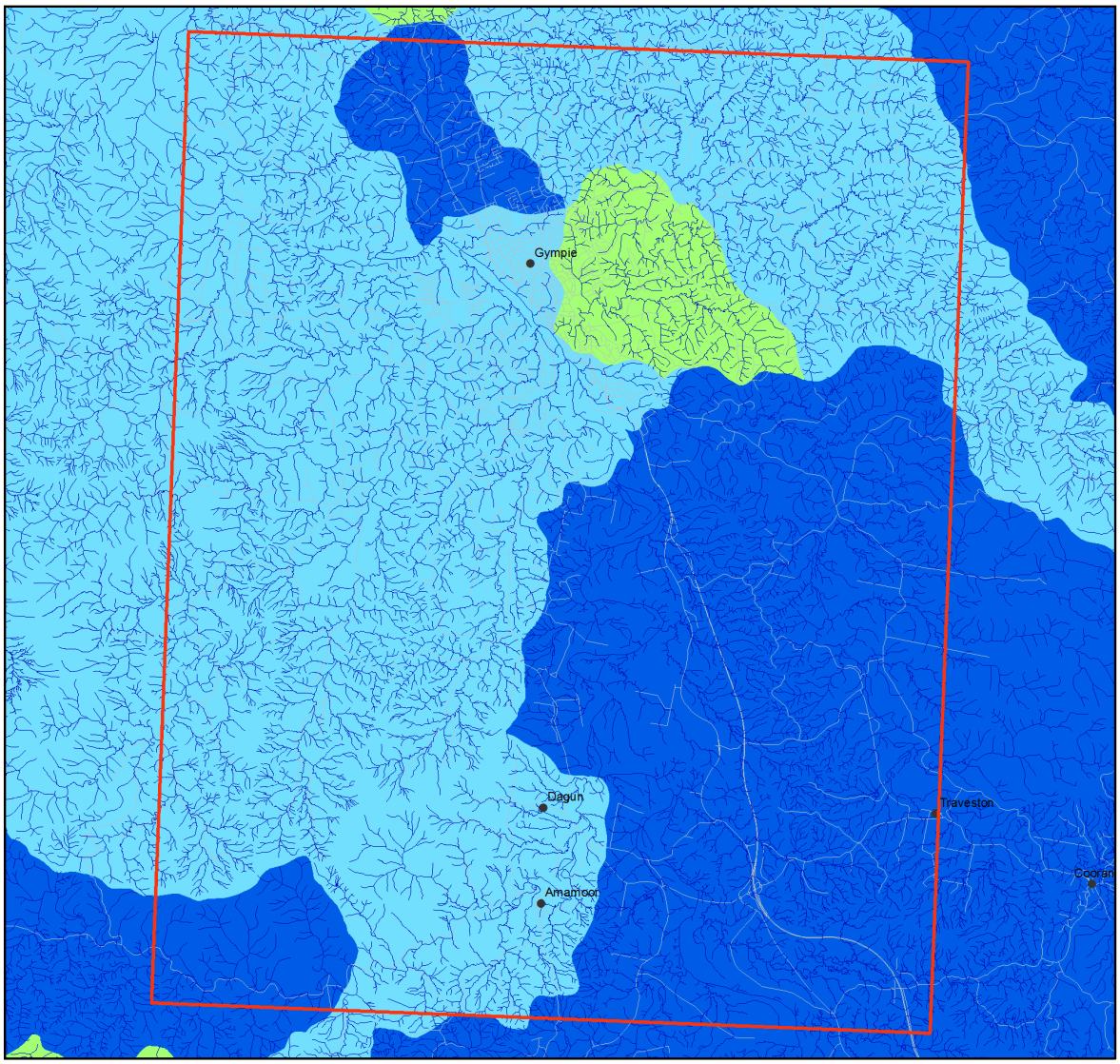
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Map 5 - Aquatic Conservation Assessment (ACA) - riverine



Aquatic Conservation Assessment (ACA) - riverine

Legend

- polygon
- Towns
- Roads
- Rivers/Creeks
- Queensland

ACA Riverine - Subcatchment Significance

- Very High
- High
- Medium
- Low
- Very Low

LOCALITY DIAGRAM

N

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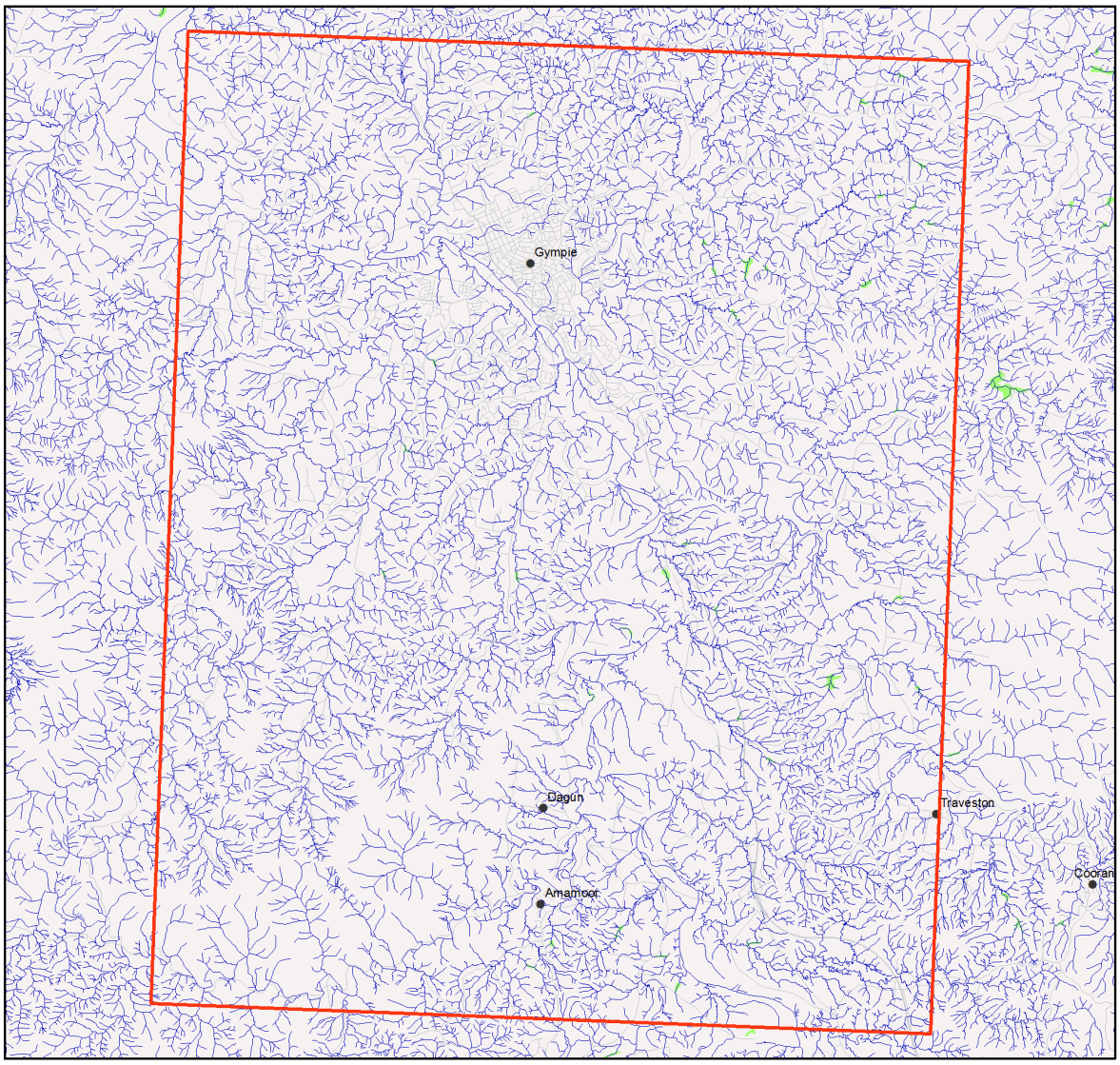
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Map 6 - Aquatic Conservation Assessment (ACA) - non-riverine



Aquatic Conservation Assessment (ACA) - nonriverine

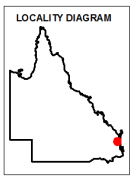
Legend

- polygon
- Towns
- Roads
- Rivers/Creeks
- Queensland

ACA Non-riverine

- Very High
- High
- Medium
- Low
- Very Low

LOCALITY DIAGRAM



N

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Appendices

Appendix 1 - Source Data

Theme	Datasets
Aquatic Conservation Assessments Non-riverine*	Combination of the following datasets: Cape York Peninsula Non-riverine v1.1 Eastern Gulf of Carpentaria v1.1 Great Barrier Reef Catchment Non-riverine v1.3 Lake Eyre and Bulloo Basins v1.1 QMDB Non-riverine ACA v1.4 Southeast Queensland ACA v1.1 WBB Non-riverine ACA v1.1 Southern Gulf Catchments Non-riverine ACA v1.1
Aquatic Conservation Assessments Riverine*	Combination of the following datasets: Cape York Peninsula Riverine v1.1 Eastern Gulf of Carpentaria v1.1 Great Barrier Reef Catchment Riverine v1.1 Lake Eyre and Bulloo Basins v1.1 QMDB Riverine ACA v1.4 Southeast Queensland ACA v1.1 WBB Riverine ACA v1.1 Southern Gulf Catchments Riverine ACA v1.1
Biodiversity Planning Assessments*	Combination of the following datasets: Brigalow Belt BPA v2.1 Cape York Peninsula BPA v1.1 Central Queensland Coast BPA v1.3 Channel Country BPA v1.1 Desert Uplands BPA v1.3 Einasleigh Uplands BPA v1.1 Gulf Plains BPA v1.1 Mitchell Grass Downs BPA v1.1 Mulga Lands BPA v1.4 New England Tableland v2.3 Northwest Highlands v1.1 Southeast Queensland v4.1 Wet Tropics v1.1
Statewide BPA Corridors*	Statewide corridors v1.6
Threatened Species	An internal DES database compiled from Wildnet, Herbrecs, Corveg, the QLD Museum, as well as other incidental sources.
BPA Priority Species	An internal DES database compiled from Wildnet, Herbrecs, Corveg, the QLD Museum, as well as other incidental sources.
ACA Priority Species	An internal DES database compiled from Wildnet, Herbrecs, Corveg, the QLD Museum, as well as other incidental sources.

***These datasets are available at:**

http://dds.information.qld.gov.au/DDS

Appendix 2 - Acronyms and Abbreviations

AOI	- Area of Interest
ACA	- Aquatic Conservation Assessment
AQUABAMM	- Aquatic Biodiversity Assessment and Mapping Methodology
BAMM	- Biodiversity Assessment and Mapping Methodology
BoT	- Back on Track
BPA	- Biodiversity Planning Assessment
CAMBA	- China-Australia Migratory Bird Agreement
DES	- Department of Environment and Science
EPBC	- *Environment Protection and Biodiversity Conservation Act 1999*
EVNT	- Endangered, Vulnerable, Near Threatened
GDA94	- Geocentric Datum of Australia 1994
GIS	- Geographic Information System
JAMBA	- Japan-Australia Migratory Bird Agreement
NCA	- *Nature Conservation Act 1992*
RE	- Regional Ecosystem
REDD	- Regional Ecosystem Description Database
ROKAMBA	- Republic of Korea-Australia Migratory Bird Agreement

Queensland Government

Department of Environment and Science

Environmental Reports

Biodiversity and Conservation Values

Biodiversity Planning Assessments and Aquatic Conservation Assessments

For the selected area of interest
Custom Geometry

Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or Area of Interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "Central co-ordinates" option, the resulting assessment area encompasses an area extending from 2km radius from the point of interest.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Please direct queries about these reports to: biodiversity.planning@des.qld.gov.au

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Summary Information

Tables 1 to 8 provide an overview of the AOI with respect to selected topographic and environmental values.

Table 1: Area of interest details: Custom Geometry

Size (ha)	92,615.68
Local Government(s)	Sunshine Coast Regional, Noosa Shire, Gympie Regional, Somerset Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Burringbar - Conondale Ranges, Gympie Block
Catchment(s)	Mary

The following table identifies available Biodiversity Planning Assessments (BPAs) and Aquatic Conservation Assessments (ACAs) with respect to the AOI.

Table 2: Available Biodiversity Planning and Aquatic Conservation Assessments

Assessment Type	Assessment Area and Version
Biodiversity Planning Assessment(s)	Southeast Queensland v4.1
Aquatic Conservation Assessment(s) (riverine)	Wide Bay-Burnett Catchments v1.1
Aquatic Conservation Assessment(s) (non-riverine)	Wide Bay-Burnett Catchments v1.1

Table 3: Remnant regional ecosystems within the AOI as per the Qld Herbarium's 'biodiversity status'

Biodiversity Status	Area (Ha)	% of AOI
Endangered	844.54	0.91
Of concern	8,501.70	9.18
No concern at present	38,401.17	41.46

The following table identifies the extent and proportion of the user specified area of interest (AOI) which is mapped as being of "State", "Regional" or "Local" significance via application of the Queensland Department of Environment and Science's *Biodiversity Assessment and Mapping Methodology* (BAMM).

Table 4: Summary table, biodiversity significance

Biodiversity significance	Area (Ha)	% of AOI
State Habitat for EVNT taxa	11,415.67	12.33
State	34,832.99	37.61
Regional	969.83	1.05
Local or Other Values	678.05	0.73

Table 5: Non-riverine wetlands intersecting the AOI

Non-riverine wetland types intersecting the area of interest	#
Number of Palustrine wetlands	3
Number of Lacustrine wetlands	6

Non-riverine wetland types intersecting the area of interest	#
Total number of non-riverine wetlands	9

NB. The figures presented in the table above are derived from the relevant non-riverine Aquatic Conservation Assessment(s). Later releases of wetland mapping produced via the Queensland Wetland Mapping Program may provide more recent information in regards to wetland extent.

Table 6: Named waterways intersecting the AOI

Name	Permanency
BELLA CREEK	Non-perennial
KANDANGA CREEK	Non-perennial
MARY RIVER	Perennial
MIDDLE CREEK	Non-perennial
YABBA CREEK	Non-perennial

Refer to **Map 1** for general locality information.

The following two tables identify the extent and proportion of the user specified AOI which is mapped as being of "Very High", "High", "Medium", "Low", or "Very Low" aquatic conservation value for riverine and non-riverine wetlands via application of the Queensland Department of Environment and Science's *Aquatic Biodiversity Assessment and Mapping Method* (AquaBAMM).

Table 7: Summary table, aquatic conservation significance (riverine)

Aquatic conservation significance (riverine wetlands)	Area (Ha)	% of AOI
Very High	22,000.27	23.75
High	40,568.71	43.8
Medium	30,047.16	32.44
Low	0.0	0.0
Very Low	0.0	0.0

Table 8: Summary table, aquatic conservation significance (non-riverine)

Aquatic conservation significance (non-riverine wetlands)	Area (Ha)	% of AOI
Very High	3.84	0.0
High	0.0	0.0
Medium	421.05	0.45
Low	0.0	0.0
Very Low	0.0	0.0

Biodiversity Planning Assessments

Introduction

The Department of Environment and Science (DES) attributes biodiversity significance on a bioregional scale through a Biodiversity Planning Assessment (BPA). A BPA involves the integration of ecological criteria using the *Biodiversity assessment and Mapping Methodology* (BAMM) and is developed in two stages: 1) **diagnostic criteria**, and 2) **expert panel criteria**. The diagnostic criteria are based on existing data which is reliable and uniformly available across a bioregion, while the expert panel criteria allows for the refinement of the mapped information from the diagnostic output by incorporating local knowledge and expert opinion.

The BAMM methodology has application for identifying areas with various levels of significance solely for biodiversity reasons. These include threatened ecosystems or taxa, large tracts of habitat in good condition, ecosystem diversity, landscape context and connection, and buffers to wetlands or other types of habitat important for the maintenance of biodiversity or ecological processes. While natural resource values such as dryland salinity, soil erosion potential or land capability are not dealt with explicitly, they are included to some extent within the biodiversity status of regional ecosystems recognised by the DES.

Biodiversity Planning Assessments (BPAs) assign three levels of overall biodiversity significance.

- **State significance** - areas assessed as being significant for biodiversity at the bioregional or state scales. They also include areas assessed by other studies/processes as being significant at national or international scales. In addition, areas flagged as being of State significance due to the presence of endangered, vulnerable and/or near threatened taxa, are identified as "State Habitat for EVNT taxa".
- **Regional significance** - areas assessed as being significant for biodiversity at the subregional scale. These areas have lower significance for biodiversity than areas assessed as being of State significance.
- **Local significance and/or other values** - areas assessed as not being significant for biodiversity at state or regional scales. Local values are of significance at the local government scale.

For further information on released BPAs and a copy of the underlying methodology, go to:

http://www.qld.gov.au/environment/plants-animals/biodiversity/planning/

The GIS results can be downloaded from the Queensland Spatial Catalogue at:

http://qspatial.information.qld.gov.au/geoportal/

The following table identifies the extent and proportion of the user specified AOI which is mapped as being of "State", "Regional" or "Local" significance via application of the BAMM.

Table 9: Summary table, biodiversity significance

Biodiversity significance	Area (Ha)	% of AOI
State Habitat for EVNT taxa	11,415.67	12.33
State	34,832.99	37.61
Regional	969.83	1.05
Local or Other Values	678.05	0.73

Refer to **Map 2** for further information.

Diagnostic Criteria

Diagnostic criteria are based on existing data which is reliable and uniformly available across a bioregion. These criteria are diagnostic in that they are used to filter the available data and provide a "first-cut" or initial determination of biodiversity significance. This initial assessment is then combined through a second group of other essential criteria.

A description of the individual diagnostic criteria is provided in the following sections.

Criteria A. Habitat for EVNT taxa: Classifies areas according to their significance based on the presence of endangered, vulnerable and/or rare (EVNT) taxa. EVNT taxa are those scheduled under the *Nature Conservation Act 1992* and/or the

Environment Protection and Biodiversity Conservation Act 1999. It excludes highly mobile fauna taxa which are instead considered in Criterion H and brings together information on EVNT taxa using buffering of recorded sites or habitat suitability models (HSM) where available.

Criteria B. Ecosystem value: Classifies on the basis of biodiversity status of regional ecosystems, their extent in protected areas (presence of poorly conserved regional ecosystems), the presence of significant wetlands; and areas of national importance such as the presence of Threatened Ecological Communities, World Heritage areas and Ramsar sites. Ecosystem value is applied at a bioregional (**B1**) and regional (**B2**) scale.

Criteria C. Tract size: Measures the relative size of tracts of vegetation in the landscape. The size of any tract is a major indicator of ecological significance, and is also strongly correlated with the long-term viability of biodiversity values. Larger tracts are less susceptible to ecological edge effects and are more likely to sustain viable populations of native flora and fauna than smaller tracts.

Criteria D. Relative size of regional ecosystems: Classifies the relative size of each regional ecosystem unit within its bioregion (**D1**) and its subregion (**D2**). Remnant units are compared with all other occurrences with the same regional ecosystem. Large examples of a regional ecosystem are more significant than smaller examples of the same regional ecosystem because they are more representative of the biodiversity values particular to the regional ecosystem, are more resilient to the effects of disturbance, and constitute a significant proportion of the total area of the regional ecosystem.

Criteria F. Ecosystem diversity: Is an indicator of the number of regional ecosystems occurring within an area. An area with high ecosystem diversity will have many regional ecosystems and ecotones relative to other areas within the bioregion.

Criteria G. Context and connection: Represents the extent to which a remnant unit incorporates, borders or buffers areas such as significant wetlands, endangered ecosystems; and the degree to which it is connected to other vegetation.

A summary of the biodiversity status based upon the diagnostic criteria is provided in the following table.

Table 10: Summary of biodiversity significance based upon diagnostic criteria with respect to the AOI

Biodiversity significance	Description	Area (Ha)	% of AOI
State	Nat. Threatened Ecol. Community (B1)	2,084.47	2.25
State	Nat. Threatened Ecol. Community (B1) & Remnant contains at least one Of Concern RE (B1)	158.44	0.17
State	Nat. Threatened Ecol. Community (B1) & Remnant is part of a Tract that is one of the largest in the bioregion (C) & Remnant contains a RE that is one of the largest of its type in the bioregion (D1)	307.1	0.33
State	Nat. Threatened Ecol. Community (B1) & Remnant is part of a Tract that is one of the largest in the bioregion (C) & Remnant contains a RE that is one of the largest of its type in the subregion (D2)	2,031.44	2.19
State	Nat. Threatened Ecol. Community (B1) & Remnant is part of a Tract that is one of the largest in the bioregion (C) & Remnant has Ecosystem diversity in the top quartile (F)	1,308.79	1.41
State	Nat. Threatened Ecol. Community (B1) & Remnant is part of a Tract that is one of the largest in the bioregion (C) & Remnant has high connectivity or buffers an endangered RE or Sig. Wetland (G)	2,675.87	2.89
State	Remnant contains at least 1 Endangered or 2 Vulnerable or Near Threatened species (A)	6,898.42	7.45
State	Remnant contains at least 1 Endangered or 2 Vulnerable or Near Threatened species (A) & Nat. Threatened Ecol. Community (B1)	4,517.25	4.88
State	Remnant contains at least 1 Endangered RE (B1) & Nat. Threatened Ecol. Community (B1)	399.54	0.43
State	Remnant contains at least 1 Vulnerable or Near Threatened species (A) & Nat. Threatened Ecol. Community (B1)	121.17	0.13
State	Remnant contains at least one Of Concern RE (B1) & Remnant contains an RE that is one of the largest of its type in the bioregion (D1)	1,556.72	1.68
State	Remnant is part of a Tract that is one of the largest in the bioregion (C) & Remnant contains an RE that is one of the largest of its type in the bioregion (D1)	1,268.94	1.37
Regional	Remnant contains at least 1 RE with <10 pc extent remaining or rare in subregion (B2)	19.68	0.02
Regional	Remnant contains at least 1 RE with 10-30 percent extent remaining in the subregion (B2) & Remnant is part of a Tract that is one of the largest in the bioregion (C)	829.99	0.9
Regional	Remnant contains at least 1 Vulnerable or Near Threatened species (A)	2,681.88	2.9
Regional	Remnant contains at least one Of Concern RE (B1)	4,317.55	4.66
Regional	Remnant is part of a Tract that is one of the largest in the bioregion (C) & Remnant contains an RE that is one of the largest of its type in the subregion (D2)	2,683.78	2.9
Regional	Remnant is part of a Tract that is one of the largest in the bioregion (C) & Remnant has Ecosystem diversity in the top quartile (F)	1,157.79	1.25
Regional	Remnant is part of a Tract that is one of the largest in the bioregion (C) & Remnant has high connectivity or buffers an endangered RE or Significant Wetland (G)	8,636.65	9.33
Local or Other Values	Refer to diagnostic data for additional information	4,241.08	4.58

Assessment of diagnostic criteria with respect to the AOI

The following table reflects an assessment of the individual diagnostic criteria noted above in regards to the AOI.

Table 11: Assessment of individual diagnostic criteria with respect to the AOI

Diagnostic Criteria	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
A: Habitat for EVNT Taxa	11,415.78	12.3	3,448.98	3.7	30,979.74	33.4	2,052.44	2.2
B1: Ecosystem Value (Bioregion)	13,604.19	14.7	7,637.10	8.2	5,731.71	6.2	20,899.99	22.6
B2: Ecosystem Value (Subregion)	219.34	0.2	3,932.33	4.2	28,320.56	30.6	15,400.76	16.6
C: Tract Size	38,302.68	41.4	5,449.08	5.9	773.54	0.8	3,347.69	3.6
D1: Relative RE Size (Bioregion)	4,234.46	4.6	357.38	0.4	7,238.75	7.8	36,042.40	38.9
D2: Relative RE Size (Subregion)	12,139.15	13.1	3,164.60	3.4	5,877.55	6.3	26,691.69	28.8
F: Ecosystem Diversity	6,420.66	6.9	29,184.65	31.5	11,089.04	12.0	1,178.64	1.3
G: Context and Connection	27,829.90	30.0	9,505.39	10.3	9,757.81	10.5	779.89	0.8

Other Essential Criteria

Other essential criteria (also known as expert panel criteria) are based on non-uniform information sources and which may rely more upon expert opinion than on quantitative data. These criteria are used to provide a "second-cut" determination of biodiversity significance, which is then combined with the diagnostic criteria for an overall assessment of relative biodiversity significance. A summary of the biodiversity status based upon the other essential criteria is provided in the following table.

Table 12: Summary of biodiversity significance based upon other essential criteria with respect to the AOI

Biodiversity significance	Description	Area (Ha)	% of AOI
State	Remnant contains Core Habitat for Priority Taxa (H)	294.85	0.32
State	Remnant contains Core Habitat for Priority Taxa (H) & Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I)	229.91	0.25
State	Remnant contains Core Habitat for Priority Taxa (H) & Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I) & Remnant forms part of a bioregional corridor (J)	1,707.91	1.84
State	Remnant contains Core Habitat for Priority Taxa (H) & Remnant forms part of a bioregional corridor (J)	144.74	0.16
State	Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I)	1,688.58	1.82

Biodiversity significance	Description	Area (Ha)	% of AOI
State	Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I) & Remnant forms part of a bioregional corridor (J)	40,520.90	43.75
State	Remnant forms part of a bioregional corridor (J)	1,148.69	1.24
Regional	Remnant contains Core Habitat for Priority Taxa (H)	10.02	0.01
Regional	Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I)	258.7	0.28
Regional	Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I) & Remnant forms part of a bioregional corridor (J)	138.14	0.15
Regional	Remnant forms part of a bioregional corridor (J)	10.02	0.01
Local	Refer to Expert Panel data for additional information	274.76	0.3

A description of each of the other essential criteria and associated assessment in regards to the AOI is provided in the following sections.

Criteria H. Essential and general habitat for priority taxa: Priority taxa are those which are at risk or of management concern, taxa of scientific interest as relictual (ancient or primitive), endemic taxa or locally significant populations (such as a flying fox camp or heronry), highly specialised taxa whose habitat requirements are complex and distributions are not well correlated with any particular regional ecosystem, taxa important for maintaining genetic diversity (such as complex spatial patterns of genetic variation, geographic range limits, highly disjunct populations), taxa critical for management or monitoring of biodiversity (functionally important or ecological indicators), or economic and culturally important taxa.

Criteria I. Special biodiversity values: areas with special biodiversity values are important because they contain multiple taxa in a unique ecological and often highly biodiverse environment. Areas with special biodiversity values can include the following:

- Ia - centres of endemism - areas where concentrations of taxa are endemic to a bioregion or subregion are found.
- Ib - wildlife refugia (Morton *et al*. 1995), for example, islands, mound springs, caves, wetlands, gorges, mountain ranges and topographic isolates, ecological refuges, refuges from exotic animals, and refuges from clearing. The latter may include large areas that are not suitable for clearing because of land suitability/capability.
- Ic - areas with concentrations of disjunct populations.
- Id - areas with concentrations of taxa at the limits of their geographic ranges.
- Ie - areas with high species richness.
- If - areas with concentrations of relictual populations (ancient and primitive taxa).
- Ig - areas containing REs with distinct variation in species composition associated with geomorphology and other environmental variables.
- Ih - an artificial waterbody or managed/manipulated wetland considered by the panel/s to be of ecological significance.
- Ii - areas with a high density of hollow-bearing trees that provide habitat for animals.
- Ij - breeding or roosting sites used by a significant number of individuals.
- Ik - climate change refuge.

The following table identifies the value and extent area of the Other Essential Criteria H and I within the AOI.

Table 13: Relative importance of expert panel criteria (H and I) used to access overall biodiversity significance with respect to the AOI

Expert Panel	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
H: Core Habitat Priority Taxa	1,201.98	1.3	1,185.48	1.3	8,515.16	9.2	36,970.37	39.9

Expert Panel	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
Ia: Centres of Endemism	8,091.36	8.7	33,638.04	36.3				
Ib: Wildlife Refugia	37,977.55	41.0	899.64	1.0				
Ic: Disjunct Populations			1,311.97	1.4	10,604.39	11.4		
Id: Limits of Geographic Ranges			27,190.90	29.4				
Ie: High Species Richness	7,806.84	8.4	32,477.90	35.1				
If: Relictual Populations								
Ig: Variation in Species Composition			8,091.36	8.7				
Ih: Artificial Wetland								
Ii: Hollow Bearing Trees	6,207.11	6.7	245.41	0.3				
Ij: Breeding or Roosting Site	85.08	0.1						
Ik: Climate Refugia	7,806.84	8.4						

NB. Whilst biodiversity values associated with Criteria I may be present within the site (refer to tables 12 and 15), for the New England Tableland and Central Queensland Coast BPAs, area and % area figures associated with Criteria Ia through to Ij cannot be listed in the table above (due to slight variations in data formats between BPAs).

Criteria J. Corridors: areas identified under this criterion qualify either because they are existing vegetated corridors important for contiguity, or cleared areas that could serve this purpose if revegetated. Some examples of corridors include riparian habitats, transport corridors and "stepping stones".

Bioregional and subregional conservation corridors have been identified in the more developed bioregions of Queensland through the BPAs, using an intensive process involving expert panels. Map 3 displays the location of corridors as identified under the Statewide Corridor network. The Statewide Corridor network incorporates BPA derived corridors and for bioregions where no BPA has been assessed yet, corridors derived under other planning processes. *Note: as a result of updating and developing a statewide network, the alignment of corridors may differ slightly in some instances when compared to those used in individual BPAs.*

The functions of these corridors are:

- **Terrestrial** Bioregional corridors, in conjunction with large tracts of remnant vegetation, maintain ecological and evolutionary processes at a landscape scale, by:

  • Maintaining long term evolutionary/genetic processes that allow the natural change in distributions of species and connectivity between populations of species over long periods of time;

  • Maintaining landscape/ecosystems processes associated with geological, altitudinal and climatic gradients, to allow for ecological responses to climate change;

  • Maintaining large scale seasonal/migratory species processes and movement of fauna;

  • Maximising connectivity between large tracts/patches of remnant vegetation;

  • Identifying key areas for rehabilitation and offsets; and

- **Riparian** Bioregional Corridors also maintain and encourage connectivity of riparian and associated ecosystems.

The location of the corridors is determined by the following principles:

- Terrestrial
    - Complement riparian landscape corridors (i.e. minimise overlap and maximise connectivity);
    - Follow major watershed/catchment and/or coastal boundaries;
    - Incorporate major altitudinal/geological/climatic gradients;
    - Include and maximise connectivity between large tracts/patches of remnant vegetation;
    - Include and maximise connectivity between remnant vegetation in good condition; and

- Riparian
    - Located on the major river or creek systems within the bioregion in question.

The total extent of remnant vegetation triggered as being of "State", "Regional" or "Local" significance due to the presence of an overlying BPA derived terrestrial or riparian corridor within the AOI, is provided in the following table. For further information on how remnant vegetation is triggered due to the presence of an overlying BPA derived corridor, refer to the relevant landscape BPA expert panel report(s).

Table 14: Extent of triggered remnant vegetation due to the presence of BPA derived corridors with respect to the AOI

Biodiversity Significance	Area (Ha)	% of AOI
State	42,281.60	45.65
Regional	1,388.82	1.5
Local	0.0	0.0

NB: area figures associated with the extent of corridor triggered remnant vegetation are only available for those bioregions where a BPA has been undertaken.

Refer to **Map 3** for further information.

Threatening process/condition (Criteria K) - areas identified by experts under this criterion may be used to amend (upgrade or downgrade) biodiversity significance arising from the "first-cut" analysis. The condition of remnant vegetation is affected by threatening processes such as weeds, ferals, grazing and burning regime, selective timber harvesting/removal, salinity, soil erosion, and climate change.

Assessment of Criteria K with respect to the AOI is not currently included in the "Biodiversity and Conservation Values" report, as it has not been applied to the majority of Queensland due to data/information limitations and availability.

Special Area Decisions

Expert panel derived "Special Area Decisions" are used to assign values to Other Essential Criteria. The specific decisions which relate to the AOI in question are listed in the table below.

Table 15: Expert panel decisions for assigning levels of biodiversity significance with respect to the AOI

Decision Number	Description	Panel Recommended Significance	Criteria Values
seq_fa_02	Lowland rainforest & wet sclerophyll forest	State	Ib (wildlife refugia): VERY HIGH
seq_fa_03	Cyclopsitta diophthalma coxeni - Coxen's fig-parrot habitat	State	Ib (habitat refugia): VERY HIGH
seq_fa_07	Forested Estates with high vertebrate endemism	Regional	Ia (SEQ endemic taxa): HIGH
seq_fa_09	Forested Estates with high vertebrate diversity	Regional	Ie (high species richness): HIGH
seq_fa_26	Lowland areas likely to contain reasonable densities of hollow bearing trees	State	Ib (wildlife refugia): VERY HIGH Ii (hollow bearing trees): VERY HIGH Ij (breeding / roosting sites): VERY HIGH

Decision Number	Description	Panel Recommended Significance	Criteria Values
seqn_fl_05	Serpentinite country between Yabba Creek and Mount Mudlo	State	Ia (SEQ endemic taxa): VERY HIGH Ic (disjunct populations): MEDIUM Ig (ecosystem variation): HIGH
seqn_fl_17	Central to Northern SEQ gallery rainforests	State	Ia (SEQ endemic taxa): VERY HIGH Ib (wildlife refugia): VERY HIGH Ic (disjunct populations): HIGH Id (limits of geographic range): HIGH Ig (ecosystem variation): HIGH
seqn_fl_42	Remnant tract encompassing Yabba State Forest and surrounding Protected Area Estate	State	Ia (SEQ endemic taxa): HIGH Ib (wildlife refugia): VERY HIGH Id (limits of geographic range): HIGH Ie (high species richness): HIGH
seqn_l_01	Terrestrial bioregional corridors	State or Regional	Criterion J
seqn_l_13	Riparian bioregional corridors	State	Criterion J
seqn_l_50	Riparian lowland forest systems (other than riparian/gallery rainforests systems)	Regional	Ib (wildlife refugia): VERY HIGH Ie (high species richness: HIGH Ii (hollow bearing trees): VERY HIGH
seqs_fl_24	Localised mountains +/- rock outcrops that are remnants of the Triassic North Arm Volcanics (Kenilworth Bluff, Mt Ninderry, Mt Eerwah). Note: Swains Peak and Mt Bottle and Glass are part of this group but are included within south landscape decision 8 - seqs_l_08	Regional	Ia (SEQ endemic taxa): HIGH Ib (wildlife refugia): HIGH Ic (disjunct taxa): MEDIUM
seqs_l_08	North Arm Mapleton	State	Ia (SEQ endemic taxa): VERY HIGH Ie (species richness): VERY HIGH Ig (ecosystem variation): HIGH Ik (climate refugia): VERY HIGH
seqs_l_22	Terrestrial bioregional corridors	State or Regional	Criterion J
seqs_l_28	Conondale Range	State	Ia (SEQ endemic taxa): HIGH Ib (wildlife refugia) : VERY HIGH Ic (disjunct populations): MEDIUM Ie (high species richness): VERY HIGH Ii (hollow bearing trees): VERY HIGH Ik (climate refugia): VERY HIGH
seqs_l_49	Riparian bioregional corridors	State	Criterion J
seqs_l_57	Riparian lowland forest systems (other than riparian/gallery rainforests systems)	State	Ib (wildlife refugia): VERY HIGH Ie (high species richness: HIGH Ii (hollow bearing trees): HIGH

Expert panel decision descriptions:

seq_fa_02

Across the entire bioregion, all rainforest and wet sclerophyll forest with a rainforest understory at elevations of < 300m asl be designated as being of State significance. Based on importance for mesic fauna (e.g. Richmond birdwing Ornithoptera richmondia, giant barred-frog Mixophyes iteratus, Fleay's barred-frog Mixophyes fleayi, Coxen's fig-parrot Cyclopsitta diophthalma coxeni), and as drought/fire refugia.

seq_fa_03

Important habitat areas for Coxen's fig-parrot Cyclopsitta diophthalma coxeni identified by expert.

seq_fa_07

Forested areas assessed as being centres of vertebrate endemism. Based on CRA analysis (McFarland 1998) and subsequent recommendations by expert panel, e.g. Noosa, Springbrook and Kroombit Tops (Kroombit tinkerfrog Taudactylus pleione, Kroombit Tops treefrog Litoria kroombitensis, silver-headed antechinus Antechinus argentus, Euastacus monteithorum and various other invertebrates - Hines 2014) National Parks, and Oakview NP and SF (Oakview leaf-tailed gecko Phyllurus kabikabi, Nangur skink Nangura spinosa).

seq_fa_09

Forested areas assessed as being centres of vertebrate diversity. Based on CRA analysis (McFarland 1998) and subsequent recommendations by expert panel, e.g. Karawatha Forest (high frog and raptor diversity), Noosa NP and parts of Eurimbula NP.

Several areas, e.g. Fraser Island-Cooloola, Scenic Rim and Conondales recognised as Important Bird Areas being key sites for bird conservation (Dutson et al. 2009).

seq_fa_26

Lowland mature vegetation communities likely to support reasonable densities of hollow bearing trees. Preferential clearing of lowland areas for agriculture and urban expansion has resulted in reduced habitat complexities across remnant communities in SEQ (Eyre 2005; Treby Castley 2015).

Large contiguous areas of relatively undisturbed vegetation dominated by species such as Lophostemon confertus, Eucalyptus microcorys, E. racemosa, E. acmenoides, E. psammitica, E. helidonica, E. carnea, E. latisinensis, E. contracta, , E. tereticornis, E. major, E. moluccana, A. leiocarpa, E. longirostrata, Corymbia intermedia have significant wildlife refugial and nesting value due to their tendencies to form hollows.

seqn_fl_05

The serpentinite woodlands in the mid-Mary Valley - Kilkivan - Gallangowan areas are distinctive in terms of floristics and vegetation structure and contrast with surrounding country. There is often a dense understorey of grass trees or shrubs. Floristic patterns need further investigation as there is variation from site to site.

SEQ endemic taxa (Criterion Ia): including narrow endemic species - **Acomis acoma, Hakea florulenta, Macrozamia longispina**, **Plectranthus omissus. Philotheca difformis** subsp. **smithiana**.

Disjunct taxa (Criterion Ic) - **Astrotricha biddulphiana, Daviesia genistifolia, Leucopogon imbricatus, L. mitchellii, Logania albiflora, L. pusilla**.

Ecosystem variation associated with geology (the vegetation is very distinctive in terms of floristic composition and vegetation structure) (Criterion Ig).

seqn_fl_17

Localised linear patches of complex notophyll type lowland rainforest (RE 12.3.1) in fragmented landscapes in central part of region. They provide refugia for animal and plant species more commonly associated with the higher rainfall parts of SEQ especially the coastal lowlands south of Gympie and Granite Creek near Miriam Vale.

These patches are restricted in the landscape although they are more extensive than the current mapping indicates which pretty much restricts the type to Tinana Creek and Coondoo Creek, one of its major tributaries. These streams rise in the Wolvi and Beenham Ranges on the south-western margins of Cooloola and flow northwards towards Maryborough where Tinana Creek drains into the Mary River. In places the streams retain vegetated corridors through areas planted with exotic pine in Toolara and Tuan State Forests and there are patches of riverine rainforest that contain species of special conservation interest. The Kin Kin Creek catchment lies immediately south of the Tinana -Coondoo system. Kin Kin Creek has a similar riparian corridor identified by the Southern SEQ expert panel. Other streams known to support lowland complex notophyll rainforest remnants include Harwood Creek south-west of Lenthall's Dam, Gregory River, Burnett River and Gin Gin

Creek.

The key values identified for Tinana-Coondoo Creeks include:

SEQ endemic taxa especially rainforest taxa - **Acacia bakeri, Acacia attenuata, Argyrodendron** sp. (Kin Kin W.D.Francis AQ81198), **Arytera microphylla, Backhousia subargentea, Cossinia australiana, Fontainea rostrata, Macrozamia parcifolia, M. pauli-guilielmi, Melaleuca cheelii, Pilidiostigma rhytispermum, Quassia bidwillii Symplocos harroldii, Rhodamnia acuminata, R. dumicola, Xanthostemon oppositifolius.**

Wildlife refugia especially refugia from clearing (Criterion Ib)

Disjunct populations (Criterion Ic): **Agathis robusta, Doodia linearis, Podocarpus spinulosus, Quassia bidwillii**.

Note: refer also to seqn_l_13 for a similar decision addressing riparian rainforest communities in eastern catchments north of (and including) the Granite Creek area.

seqn_fl_42

SEQ endemic taxa including narrow endemic taxa (Criterion Ia): **Acomis acoma, Araucaria bidwillii, Arytera distylis, A. foveolata, Backhousia subargentea, Eucalyptus dura, E. montivaga, Macrozamia longispina, Marsdenia coronata, Citrus australis, Pilidiostigma rhytispermum, Plectranthus omissus, Rhodamnia dumicola**.

Wildlife refugia (Criterion Ib).

Northern limit of range (Criterion Id): of wet sclerophyll and complex notophyll vine forest species, e.g. **Eucalyptus pilularis** (apart from Fraser Id), **Sloanea woollsii**.

Area of high species richness (Criterion Ie).

seqn_l_01

The expert panel reviewed the existing bioregional corridors for northern SEQ. Corridors were assigned as being of State or Regional significance.

For further information, refer to sections 2.3.2 and 3.2 of this report.

seqn_l_13

The riparian bioregional corridors provide connectivity through lowland areas of SEQ.

See Table 4 for list of waterways considered riparian corridors.

For further information, refer to sections 2.3.2 and 3.2 of this report.

seqn_l_50

Riparian lowland forest ecosystems are important components of the lowland landscape, frequently exhibiting higher species richness and abundance than surrounding habitats. They act as movement pathways along riparian systems for a number of species, especially aves. They also often provide critical resources for many species in terms of food, shelter and nesting site. For example, the seasonal flowering of melaleuca is important for species of honeyeaters, whilst narrow bands of flooded gum along watercourses are significant habitat for koalas **Phascolarctos cinereus**, especially in times of drought. Large trees in these systems also act as a source of nest hollows for many species of birds, bats and arboreal mammals

(Lovett Price 2007).

Due to historical and preferential clearing in SEQ, remaining systems are often heavily fragmented and have undergone a substantial reduction in their extent. In many areas, condition is often poor and subject to substantial weed problems.

Wildlife refugia (Criterion Ib).

High species richness (Criterion Ie).

Larger trees in such systems are often a significant source of nest hollows (Criterion Ii).

Note - for the same decision relevant to the southern portion of the SEQ bioregion refer to seqs_l_57.

seqs_fl_24

SEQ endemic taxa (Criterion Ia): especially rainforest taxa - **Araucaria bidwillii, Arytera distylis, Bosistoa transversa, Citrus australis, Dissiliaria baloghioides, Doodia heterophylla, Gossia punctata, Macadamia ternifolia,, Mallotus megadontus, Philotheca difformis** subsp. **smithiana, Platysace** sp. (Mt Ninderry P.R.Sharpe+ 2092), **Plectranthus torrenticola, Seringia hillii Toechima tenax, Triunia robusta**.

Wildlife refugia (Criterion Ib): parts of surrounding country have been heavily fragmented.

Disjunct taxon (Criterion Ic): **Sannantha collina**.

seqs_l_08

The Panel identified the area as having a combination of flora, fauna and landscape values. The area delineated extends from the edge of the coastal lowlands onto the Blackall Range and encompasses a range of topography including higher landmarks such as Swains Peak and Mt Bottle and Glass. The rainfall is high and the geology is variable, comprising acid, intermediate and basic rocks of the North Arm Volcanics. The acid volcanic areas have low fertility soils.

SEQ endemic taxa (Criterion Ia): **Acacia bakeri, Arytera distylis**, **Astrotricha umbrosa, Comesperma hispidulum, Goodenia** sp. (Mt Castletower M.D.Crisp 2753), **Gossia inophloia, Hakea florulenta, Leucopogon rupicola, Macadamia ternifolia, Marsdenia coronata, Medicosma cunninghamii, Nothoalsomitra suberosa, Plectranthus torrenticola, Philotheca difformis subsp. smithiana, Romnalda strobilacea, Triunia robusta, Westringia blakeana, Zieria furfuracea** subsp. **euthadenia**.

Ecosystem variation (Criterion Ig): associated with high rainfall and range of different substrates - some noteworthy examples are patches of scribbly gum forest and simple notophyll gully rainforests with **Callicoma serratifolia** on rhyolite.

Surveys suggest high floristic species richness - approx. 800 sp (Criterion Ie)

Climate refugia (Criterion Ik): A combination of ecosystem and landscape elements are present across much of the general area described considered to provide refugial functions and/or which facilitate adaptation zones (SEQ Catchments 2016).

seqs_l_22

The expert panel reviewed the existing bioregional corridors for southern SEQ. Corridors were assigned as being of State or Regional significance.

For further information, refer to section 2.3.2 and 3.2 of this report.

seqs_l_28

The Conondale Range is elevated country with a range of different flora, fauna and landscape values that contribute to the area being outstanding in the SEQ regional context. It is relatively large, receives high rainfall, and remains connected to other forested tracts. The area also contains remnants of old growth wet sclerophyll forest.

Considered an Important Bird Area for bird conservation (Dutson et al. 2009).

Much of the area lies on metamorphic rocks and the soils are of only moderate fertility. The Conondale Range has a distinctive vegetation pattern of wet and dry sclerophyll forest on ridges with rainforest or wet sclerophyll forest on lower slopes and along watercourses. QLD Herbarium modelling indicates this area is a threatened species hotspot.

SEQ endemic plant taxa (Ia): **Acmena ingens, Acomis acoma, Araucaria bidwillii, Arytera distylis, Bosistoa transversa, Citrus australis, Comesperma hispidulum, Eucalyptus montivaga, Gossia punctata, Macadamia ternifolia, Macrozamia lucida, Medicosma cunninghamii, Niemeyera chartacea, Pilidiostigma rhytispermum, Pararistolochia praevenosa**.

Wildlife refugia (Criterion Ib): it is a very large elevated area.

Disjunct species populations (Criterion Ic): **Atractocarpus benthamianus** subsp. **glaber, Blechnum wattsii, Dodonaea megazyga, Doryphora sassafras, Endiandra compressa, Galbulimima baccata, Prostanthera nivea**.

Area of very high species richness especially birds and frogs (Criterion Ie): reflecting the influences of altitude and micro-topographic variation. Additionally, habitat models produced by the Queensland Herbarium suggest that the area may contain habitat for a number of EVNT taxa.

The area also contains a high density of hollow bearing trees which provide habitat for hollow dependent fauna (Criterion Ii).

Climate refugia (Criterion Ik): A combination of ecosystem and landscape elements are present across much of the general area described considered to provide refugial functions and/or which facilitate adaptation zones (SEQ Catchments 2016).

seqs_l_49

The riparian bioregional corridors provide connectivity through lowland areas of SEQ.

See Table 4 for list of waterways considered riparian corridors.

For further information, refer to sections 2.3.2 and 3.2 of this report.

seqs_l_57

Riparian lowland forest ecosystems are important components of the lowland landscape, frequently exhibiting higher species richness and abundance than surrounding habitats. They act as movement pathways along riparian systems for a number of species, especially birds. They also often provide critical resources for many species in terms of food, shelter and nesting sites. For example, the seasonal flowering of melaleuca is important for species of honeyeaters, whilst narrow bands of flooded gum along watercourses are significant habitat for koalas **Phascolarctos cinereus**, especially in times of drought. Large trees in these systems also act as a source of nest hollows for many species of birds, bats and arboreal mammals. (Lovett Price 2007)

Due to historical and preferential clearing in SEQ, remaining systems are often heavily fragmented and have undergone a substantial reduction in their extent. In many areas, condition is often poor and subject to considerable weed problems.

Values include:

Wildlife refugia (Criterion Ib).

High species richness (Criterion Ie).

Larger trees in such systems are often a significant source of nest hollows (Criterion Ii).

Note - for the same decision relevant to the northern portion of the SEQ bioregion refer to seqn_l_50.

Aquatic Conservation Assessments

Introduction

The Aquatic Biodiversity Assessment and Mapping Method or AquaBAMM (Clayton *et al.* 2006), was developed to assess conservation values of wetlands in queensland, and may also have application in broader geographical contexts. It is a comprehensive method that uses available data, including data resulting from expert opinion, to identify relative wetland conservation/ecological values within a specified study area (usually a catchment). The product of applying this method is an Aquatic Conservation Assessment (ACA) for the study area.

An ACA using AquaBAMM is non-social, non-economic and identifies the conservation/ecological values of wetlands at a user-defined scale. It provides a robust and objective conservation assessment using criteria, indicators and measures that are founded upon a large body of national and international literature. The criteria, each of which may have variable numbers of indicators and measures, are naturalness (aquatic), naturalness (catchment), diversity and richness, threatened species and ecosystems, priority species and ecosystems, special features, connectivity and representativeness. An ACA using AquaBAMM is a powerful decision support tool that is easily updated and simply interrogated through a geographic information system (GIS).

Where they have been conducted, ACAs can provide a source of baseline wetland conservation/ecological information to support natural resource management and planning processes. They are useful as an independent product or as an important foundation upon which a variety of additional environmental and socio-economic elements can be added and considered (i.e. an early input to broader 'triple-bottom-line' decision-making processes). An ACA can have application in:

- determining priorities for protection, regulation or rehabilitation of wetlands and other aquatic ecosystems
- on-ground investment in wetlands and other aquatic ecosystems
- contributing to impact assessment of large-scale development (e.g. dams)
- water resource and strategic regional planning prcesses

For a detailed explanation of the methodology please refer to the summary and expert panel reports relevant to the ACA utilised in this assessment. These reports can be accessed at Wetland *Info*:

http://wetlandinfo.des.qld.gov.au/wetlands/assessment/assessment-methods/aca

The GIS results can be downloaded from the Queensland Spatial Catalogue at:

http://qspatial.information.qld.gov.au/geoportal/

Explanation of Criteria

Under the AquaBAMM, eight criteria are assessed to derive an overall conservation value. Similar to the Biodiversity Assessment and Mapping Methodology, the criteria may be primarily diagnostic (quantitative) or primarily expert opinion (qualitative) in nature. The following sections provide a brief description of each of the 8 criteria.

Criteria 1. Naturalness - Aquatic: This attribute reflects the extent to which a wetland's (riverine, non-riverine, estuarine) aquatic state of naturalness is affected through relevant influencing indicators which include: presence of exotic flora and fauna; presence of aquatic communities; degree of habitat modification and degree of hydrological modification.

Criteria 2. Naturalness - Catchment: The naturalness of the terrestrial systems of a catchment can have an influence on many wetland characteristics including: natural ecological processes e.g. nutrient cycling, riparian vegetation, water chemistry, and flow. The indicators utilised to assess this criterion include: presence of exotic flora and/or fauna; riparian, catchment and flow modification.

Criteria 3. Naturalness - Diversity and Richness: This criterion is common to many ecological assessment methods and can include both physical and biological features. It includes such indicators as species richness, riparian ecosystem richness and geomorphological diversity.

Criteria 4. Threatened Species and Ecosystems: This criterion evaluates ecological rarity characteristics of a wetland. This includes both species rarity and rarity of communities / assemblages. The communities and assemblages are best represented by regional ecosystems. Species rarity is determined by NCA and EPBC status with Endangered, Vulnerable or Near-threatened species being included in the evaluation. Ecosystem rarity is determined by regional ecosystem biodiversity status i.e. Endangered, Of Concern, or Not of Concern.

Criteria 5. Priority Species and Ecosystems: Priority flora and fauna species lists are expert panel derived. These are aquatic, semi-aquatic and riparian species which exhibit at least 1 particular trait in order to be eligible for consideration. For

flora species the traits included:

- It forms significant macrophyte beds (in shallow or deep water).
- It is an important food source.
- It is important/critical habitat.
- It is implicated in spawning or reproduction for other fauna and/or flora species.
- It is at its distributional limit or is a disjunct population.
- It provides stream bank or bed stabilisation or has soil binding properties.
- It is a small population and subject to threatening processes.

Fauna species are included if they meet at least one of the following traits:

- It is endemic to the study area (>75 per cent of its distribution is in the study area/catchment).
- It has experienced, or is suspected of experiencing, a serious population decline.
- It has experienced a significant reduction in its distribution and has a naturally restricted distribution in the study area/catchment.
- It is currently a small population and threatened by loss of habitat.
- It is a significant disjunct population.
- It is a migratory species (other than birds).
- A significant proportion of the breeding population (>one per cent for waterbirds, >75 per cent other species) occurs in the waterbody (see Ramsar criterion 6 for waterbirds).
- Limit of species range.

See the individual expert panel reports for the priority species traits specific to an ACA.

Criteria 6. Special Features: Special features are areas identified by flora, fauna and ecology expert panels which exhibit characteristics beyond those identified in other criteria and which the expert panels consider to be of the highest ecological importance. Special feature traits can relate to, but are not solely restricted to geomorphic features, unique ecological processes, presence of unique or distinct habitat, presence of unique or special hydrological regimes e.g. spring-fed streams. Special features are rated on a 1 - 4 scale (4 being the highest).

Criteria 7. Connectivity: This criterion is based on the concept that appropriately connected aquatic ecosystems are healthy and resilient, with maximum potential biodiversity and delivery of ecosystem services.

Criteria 8. Representativeness: This criterion applies primarily to non-riverine assessments, evaluates the rarity and uniqueness of a wetland type in relation to specific geographic areas. Rarity is determined by the degree of wetland protection within "protected Areas" estate or within an area subject to the *Fisheries Act 1994*, *Coastal Protection and Management Act 1995*, or *Marine Parks Act 2004*. Wetland uniqueness evaluates the relative abundance and size of a wetland or wetland management group within geographic areas such as catchment and subcatchment.

Riverine Wetlands

Riverine wetlands are all wetlands and deepwater habitats within a channel. The channels are naturally or artificially created, periodically or continuously contain moving water, or connecting two bodies of standing water. AquaBAMM, when applied to riverine wetlands uses a discrete spatial unit termed subsections. A subsection can be considered as an area which encompasses discrete homogeneous stream sections in terms of their natural attributes (i.e. physical, chemical, biological and utilitarian values) and natural resources. Thus in an ACA, an aquatic conservation significance score is calculated for each subsection and applies to all streams within a subsection, rather than individual streams as such.

Please note, the area figures provided in Tables 16 and 17, are derived using the extent of riverine subsections within the AOI. Refer to **Map 5** for further information. A summary of the conservation significance of riverine wetlands within the AOI is provided in the following table.

Table 16: Overall level/s of riverine aquatic conservation significance

Aquatic conservation significance (riverine wetlands)	Area (Ha)	% of AOI
Very High	22,000.27	23.75

Aquatic conservation significance (riverine wetlands)	Area (Ha)	% of AOI
High	40,568.71	43.8
Medium	30,047.16	32.44
Low	0.0	0.0
Very Low	0.0	0.0

The individual aquatic conservation criteria ratings for riverine wetlands within the AOI are listed below.

Table 17: Level/s of riverine aquatic conservation significance based on selected criteria

Criteria	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
1. Naturalness aquatic	27,651.08	29.9	54,562.00	58.9	10,403.06	11.2		
2. Naturalness catchment	26,214.09	28.3	51,818.97	56.0	14,583.08	15.7		
3. Diversity and richness	2,977.80	3.2	71,226.37	76.9	18,273.71	19.7	138.26	0.1
4. Threatened species and ecosystems	86,674.67	93.6	2,566.27	2.8	3,375.20	3.6		
5. Priority species and ecosystems	58,881.22	63.6	19,500.50	21.1	8,559.99	9.2		
6. Special features	3,725.21	4.0	4,826.46	5.2				
7. Connectivity	55,567.33	60.0	25,514.64	27.5	4,155.89	4.5	7,378.28	8.0
8. Representative-ness								

The table below lists and describes the relevant expert panel decisions used to assign conservation significance values to riverine wetlands within the AOI.

Table 18: Expert panel decisions for assigning overall levels of riverine aquatic conservation significance

Decision number	Special feature	Catchment	Criteria/Indicator/Measure	Conservation rating (1-4)
my_r_fa_01	Reaches associated with Conondale National Park	Mary	6.3.1	4
my_r_fa_04	Belli Creek	Mary	6.3.1	3
my_r_fa_09	Flying fox camps	Mary	6.3.1	4

4 is the highest rating/value

Expert panel decision descriptions:

my_r_fa_01

This special feature covers the stream sections associated with the lower reach of Little Yabba Creek within Conondale National Park. Fauna values include the presence of crayfish, threatened frog species, Coxen's fig parrot (**Cyclopsitta diophthalma coxeni**) and Richmond birdwing butterfly (**Ornithoptera richmondii**).

my_r_fa_04

Belli Creek is a deep pool alluvial system which remains relatively intact and is one of the few well-connected reaches in the Mary River. It has a high frog species diversity including threatened frog species such as the giant barred frog (**Mixophyes iterates**), the cascade treefrog (**Litoria pearsoniana**) and the tusked frog (**Adelotus brevis**); the Richmond birdwing butterfly (**Ornithoptera richmondii**); natural records of Mary River cod (**Maccullochella peelii mariensis**) and good cod habitat with deep pools and riffles. The area contains riparian rainforest vegetation (regional ecosystem 12.3.1) and includes threatened plant species.

my_r_fa_09

The aquatic fauna expert panel convened for the Burnett ACA (conducted in 2006) considered flying fox camps to be a significant breeding or roosting phenomenon. The black flying-fox (**Pteropus alecto**), little red flying-fox (**Pteropus scapulatus**) and the 'vulnerable' grey headed flying fox (**Pteropus poliocephalus)** are known to make camp in the Burnett River catchment. The majority of camps for these species are located along watercourses. It is thought that the riparian zone is favoured because of the higher humidity levels than the surrounding terrestrial areas and because the flying foxes may use the streams for navigation. Wherever permanent and temporary camps occur, the riparian zone vegetation should be identified as special habitat. The panel noted that some roosts occurred within non-riverine wetlands.

Note: This decision was taken from the previous Burnett River ACA (decision number afep_burn_7). It has been applied as a riverine decision in all the other catchments (bu_r_fa_07; bm_r_fa_04; cc_r_fa_01; fr_r_fa_02; ko_r_fa_01) and as a non-riverine decision in other catchments (bm_nr_fa_02; ko_nr_fa_02; my_nr_fa_02) within the Wide Bay-Burnett study area.

Non-riverine Wetlands

Non-riverine wetlands include both lacustrine and palustrine wetlands, however, do not currently incorporate estuarine, marine or subterranean wetland types. A summary of the conservation significance of non-riverine wetlands within the AOI is provided in the following table. Refer to **Map 6** for further information.

Table 19: Overall level/s of non-riverine aquatic conservation significance

Aquatic conservation significance (non-riverine wetlands)	Area (Ha)	% of AOI
Very High	3.84	0.0
High	0.0	0.0
Medium	421.05	0.45
Low	0.0	0.0
Very Low	0.0	0.0

The following table provides an assessment of non-riverine wetlands within the AOI and associated aquatic conservation criteria values.

Table 20: Level/s of non-riverine aquatic conservation significance based on selected criteria

Criteria	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
1. Naturalness aquatic			5.76				419.13	0.5
2. Naturalness catchment			413.54	0.4	7.93		3.42	
3. Diversity and richness	4.83		412.85	0.4	7.21			

Criteria	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
4. Threatened species and ecosystems	424.89	0.5						
5. Priority species and ecosystems	424.89	0.5						
6. Special features								
7. Connectivity								
8. Representative-ness	5.76							

The table below lists and describes the relevant expert panel decisions used to assign conservation significance values to non-riverine wetlands within the AOI.

Table 21: Expert panel decisions for assigning overall levels of non-riverine aquatic conservation significance.

Decision number	Special feature	Catchment	Criteria/Indicator/Measure	Conservation rating (1-4)
(No Records)				

4 is the highest rating/value

Expert panel decision descriptions:

(No Records)

Threatened and Priority Species

Introduction

This chapter contains a list of threatened and priority flora and/or fauna species that have been recorded on, or within 4km of the Assessment Area.

The information presented in this chapter with respect to species presence is derived from compiled databases developed primarily for the purpose of BPAs and ACAs. Data is collated from a number of sources and is updated periodically.

It is important to note that the list of species provided in this report, may differ when compared to other reports generated from other sources such as the State government's WildNet, Herbrecs or the federal government's EPBC database for a number of reasons.

Records for threatened and priority species are filtered and checked based on a number of rules including:

- Taxonomic nomenclature - current scientific names and status,
- Location - cross-check co-ordinates with location description,
- Taxon by location - requires good knowledge of the taxon and history of the record,
- Duplicate records - identify and remove,
- Expert panels - check records and provide new records,
- Flora cultivated records excluded,
- Use precise records less than or equal to 2000m,
- Use recent records greater than or equal to 1975 animals, greater than or equal to 1950 plants.

Threatened Species

Threatened species are those species classified as "Endangered" or "Vulnerable" under the *Environment Protection and Biodiversity Conservation Act 1999* or "Endangered", "Vulnerable" or "Near threatened" under the *Nature Conservation Act 1992*.

The following threatened species have been recorded on, or within approximately 4km of the AOI.

Table 22: Threatened species recorded on, or within 4km of the AOI

Species	Common name	NCA status	EPBC status	Back on Track rank	Migratory species*	Wetland species**	Identified flora/fauna
Acanthophis antarcticus	common death adder	V		Medium			FA
Adelotus brevis	tusked frog	V		Medium		I	FA
Allocasuarina rigida subsp. exsul		V		Low			FL
Anthochaera phrygia	regent honeyeater	CE	CE	Medium			FA
Bidyanus bidyanus	silver perch		CE	Medium		D	FA
Bosistoa transversa	three-leaved bosistoa	C	V				FL
Calyptorhynchus lathami lathami	glossy black-cockatoo (eastern)	V		High			FA
Coleus torrenticola		E	E				FL
Corunastylis cranei		V					FL
Corynocarpus rupestris subsp. arborescens	southern corynocarpus	V		Medium			FL
Cyclopsitta diophthalma coxeni	Coxen's fig-parrot	E	E	Critical			FA
Dasyurus maculatus maculatus	spotted-tailed quoll (southern subspecies)	E	E	High			FA

Species	Common name	NCA status	EPBC status	Back on Track rank	Migratory species*	Wetland species**	Identified flora/fauna
Elseya albagula	southern snapping turtle	CE	CE	High		I	FA
Elusor macrurus	Mary River turtle	E	E	Critical		I	FA
Euastacus hystricosus		E		Low			FA
Floydia praealta	ball nut	V	V	Medium			FL
Geophaps scripta scripta	squatter pigeon (southern subspecies)	V	V	Medium			FA
Gossia inophloia		CE		Low			FL
Leichhardtia coronata		V					FL
Lenwebbia sp. (Blackall Range P.R.Sharpe 5387)		E		Low			FL
Litoria pearsoniana	cascade treefrog	V		Low		I	FA
Macadamia integrifolia	macadamia nut	V	V	Medium			FL
Macadamia ternifolia	bopple nut	V	V	Low			FL
Maccullochella mariensis	Mary River cod		E	High		D	FA
Mallotus megadontus		V		Low			FL
Mixophyes iteratus	giant barred frog	V	E	Medium			FA
Neoceratodus forsteri	Australian lungfish		V	Critical		D	FA
Ninox strenua	powerful owl	V		Medium			FA
Nothoalsomitra suberosa		NT		Low			FL
Ornithoptera richmondia	Richmond birdwing	V		Critical			FA
Pararistolochia praevenosa		NT		High			FL
Parsonsia largiflorens		E		Medium			FL
Petauroides armillatus	central greater glider	E	V	Low			FA
Petauroides armillatus	central greater glider	E	V				FA
Petaurus australis australis	yellow-bellied glider (southern subspecies)	V		High			FA
Phascolarctos cinereus	koala	E	E	Low			FA
Phyllodes imperialis smithersi			E	Low			FA
Picris conyzoides		V		High			FL
Plectorrhiza beckleri		NT					FL
Podargus ocellatus plumiferus	plumed frogmouth	V		Low			FA
Potorous tridactylus tridactylus	long-nosed potoroo	V	V	Medium			FA
Pteropus poliocephalus	grey-headed flying-fox	C	V	Critical			FA
Pterostylis sp. (Gundiah W.W.Abell AQ72188)		NT		Data Deficient			FL
Rhodamnia dumicola	rib-fruited malletwood	E					FL
Rhodamnia rubescens	scrub turpentine	CE	CE				FL
Rhodomyrtus psidioides	native guava	CE	CE				FL
Ricinocarpos speciosus		V		Medium			FL

Species	Common name	NCA status	EPBC status	Back on Track rank	Migratory species*	Wetland species**	Identified flora/fauna
Romnalda strobilacea		V	V	Medium			FL
Rostratula australis	Australian painted-snipe	E	E	Medium		I	FA
Symplocos harroldii	hairy hazelwood	NT		Low			FL
Thesium australe	toadflax	V	V	Medium			FL
Thismia rodwayi		NT		Medium			FL
Triunia robusta		E	E	High			FL
Turnix melanogaster	black-breasted button-quail	V	V	Critical			FA
Westringia blakeana		NT		Low			FL
Zieria verrucosa		V	V	Medium			FL

NB. Please note that the threatened species listed in this section are based upon the most recently compiled DES internal state-wide threatened species dataset. This dataset may contain additional records that were not originally available for inclusion in the relevant individual BPAs and ACAs.

**JAMBA - Japan-Australia Migratory Bird Agreement; CAMBA - China-Australia Migratory Bird Agreement; ROKAMBA - Republic of Korea-Australia Migratory Bird Agreement; CMS - Convention on the Conservation of Migratory Species*.

***I - wetland indicator species; D - wetland dependent species*.

BPA Priority Species

A list of BPA priority species that have been recorded on, or within approximately 4km of the AOI is contained in the following table.

Table 23: Priority species recorded on, or within 4km of the AOI

Species	Common name	Back on Track rank	Identified flora/fauna
Acacia longissima	None	None	FL
Acomis acoma	None	L	FL
Acronychia wilcoxiana	silver aspen	L	FL
Antechinus subtropicus	Subtropical Antechinus	L	FA
Austromyrtus dulcis	midgen berry	None	FL
Austromyrtus glabra	None	L	FL
Backhousia citriodora	lemon ironwood	L	FL
Backhousia subargentea	None	None	FL
Beyeria lasiocarpa	None	L	FL
Biziura lobata	Musk Duck	L	FA
Brunoniella spiciflora	None	H	FL
Callicarpa pedunculata	velvet leaf	L	FL
Cheramoeca leucosterna	White-backed Swallow	L	FA
Coenocharopa macromphala	Sickle-bladed Pinweell Snail	None	FA
Coenocharopa sordidus	Dirt-covered Pinwheel snail	None	FA
Ctenotus arcanus	None	L	FA
Decaspermum humile	silky myrtle	None	FL
Delma plebeia	Common Delma	M	FA

Species	Common name	Back on Track rank	Identified flora/fauna
Dinosperma melanophloium	None	None	FL
Echotrida substrangeoides	Glastonbury Carnivorous Snail	None	FA
Endiandra compressa	None	L	FL
Endiandra lowiana	white apple	L	FL
Ephippiorhynchus asiaticus	Black-necked Stork	L	FA
Eroticoscincus graciloides	None	M	FA
Euastacus hystricosus	Giant Spiny Crayfish	L	FA
Eupomatia bennettii	small bolwarra	None	FL
Gossia acmenoides	None	None	FL
Gossia hillii	None	None	FL
Gyrocochlea raveni	Raven's Pinwheel Snail	None	FA
Hedleyella maconelli	Maconell's Panda-snail	None	FA
Hildapina kenilworth	Kenilworth Chrysalis-snail	None	FA
Ixobrychus dubius	Australian Little Bittern	DD	FA
Kerivoula papuensis	Golden-tipped Bat	M	FA
Lampropholis couperi	None	L	FA
Limnodynastes dumerilii	Grey Bellied Pobblebonk	L	FA
Litoria brevipalmata	Green-thighed Frog	M	FA
Litoria dentata	Bleating Treefrog	L	FA
Litoria tyleri	Southern Laughing Treefrog	L	FA
Lophoictinia isura	Square-tailed Kite	L	FA
Luturopa kenilworth	Kenilworth Waxy Pinwheel Snail	None	FA
Macropus dorsalis	Black-striped Wallaby	L	FA
Macularion aquila	Black-spotted Semi-slug	None	FA
Melithreptus gularis	Black-chinned Honeyeater	L	FA
Mormopterus norfolkensis	East-coast Freetail Bat	L	FA
Mugil cephalus	Sea Mullet	L	FA
Mussonula verax	Northern Temple Pinwheel Snail	None	FA
Nautiliropa omicron	Red-flamed Pinwheel Snail	None	FA
Necopupina costata	Mount Mee Chrysalis-snail	None	FA
Nitor pudibunda	Pink Glass-snail	None	FA
Nitor wiangariensis	Wiangarie Forest Glass-snail	None	FA
Ophioscincus ophioscincus	None	L	FA
Ornithorhynchus anatinus	Platypus	L	FA
Papuexul bidwilli	Mottled Treesnail	None	FA
Petaurus australis australis	Yellow-bellied Glider (southern subsp.)	H	FA
Phascogale tapoatafa tapoatafa	Brush-tailed Phascogale	L	FA
Pleuropoma draytonensis	Drayton Droplet Snail	None	FA
Pomatostomus temporalis	Grey-crowned Babbler	None	FA
Pteropus alecto	Black Flying-fox	L	FA

Species	Common name	Back on Track rank	Identified flora/fauna
Pteropus scapulatus	Little Red Flying-fox	L	FA
Ramogenia challengeri	Challenger's Bristle Snail	None	FA
Rhodamnia dumicola	rib-fruited malletwood	None	FL
Rhodamnia rubescens	None	None	FL
Rhodomyrtus psidioides	native guava	None	FL
Rhophodon colmani	Colman's Pinwheel Snail	None	FA
Rhophodon minutissimus	Minute Pinwheel Snail	None	FA
Rotacharopa densilamellata	Domed Pinwheel Snail	None	FA
Sarcochilus dilatatus	brown sarcochilus	L	FL
Scoteanax rueppellii	Greater Broad-nosed Bat	M	FA
Signepupina strangei	Dwarf Chrysalis-snail	None	FA
Signepupina wilcoxi	Wilcox's Chrysalis-snail	None	FA
Sphaerospira sidneyi	Maryborough Dark Snail	None	FA
Squamagenia separanda	Pine Rivers Bristle Snail	None	FA
Squamagenia yabba	Kenilworth Scaly Snail	None	FA
Strangesta maxima	Giant Carnivorous Snail	None	FA
Syzygium oleosum	blue cherry	None	FL
Terrycarlessia bullacea	Bunya Mountains Carnivorous Snail	None	FA
Trachystoma petardi	Pinkeye Mullet	L	FA
Triflorensia cameronii	None	None	FL
Tyto tenebricosa tenebricosa	Sooty Owl	L	FA
Whiteheadia globosa	Whitehead's Pinwheel Snail	None	FA

NB. Please note that the list of priority species is based on those species identified in the BPAs, however records for these species may be more recent than the originals used. furthermore, the BPA priority species databases are updated from time to time. At each update, the taxonomic details for all species are amended as necessary to reflect current taxonomic name and/or status changes.

ACA Priority Species

A list of ACA priority species used in riverine and non-riverine ACAs that have been recorded on, or within approximately 4km of the AOI are contained in the following tables.

Table 24: Priority species recorded on, or within 4 km of the AOI - riverine

Species	Common name	Back on Track rank	Identified flora/fauna
Acrocephalus australis	Australian Reed-Warbler	Low	FA
Ardea alba modesta	Eastern Great Egret	Low	FA
Azolla pinnata	ferny azolla	None	FL
Bacopa monnieri	None	None	FL
Bolboschoenus fluviatilis	None	None	FL
Bubulcus ibis	Cattle Egret	Low	FA
Casuarina cunninghamiana subsp. cunninghamiana	None	None	FL
Ceratophyllum demersum	hornwort	None	FL
Chelodina expansa	Broad-shelled River Turtle	Low	FA

Species	Common name	Back on Track rank	Identified flora/fauna
Cyclopsitta diophthalma coxeni	Coxen's Fig-Parrot	Critical	FA
Cyperus exaltatus	tall flatsedge	None	FL
Eleocharis cylindrostachys	None	None	FL
Elseya albagula	Southern Snapping Turtle	High	FA
Euastacus hystricosus	Giant Spiny Crayfish	Low	FA
Eucalyptus tereticornis	None	None	FL
Ficus racemosa var. racemosa	None	None	FL
Gallinago hardwickii	Latham's Snipe	Low	FA
Haliaeetus leucogaster	White-bellied Sea-Eagle	Low	FA
Hydrilla verticillata	hydrilla	None	FL
Juncus polyanthemus	None	None	FL
Juncus prismatocarpus	branching rush	None	FL
Juncus usitatus	None	None	FL
Litoria rothii	Northern Laughing Treefrog	Low	FA
Litoria tyleri	Southern Laughing Treefrog	Low	FA
Litoria verreauxii	Whistling Treefrog	Low	FA
Lomandra hystrix	None	None	FL
Macquaria novemaculeata	Australian Bass	Low	FA
Melaleuca bracteata	None	None	FL
Melaleuca linariifolia	snow-in summer	None	FL
Myriophyllum verrucosum	water milfoil	None	FL
Nymphaea gigantea	None	Low	FL
Nymphoides indica	water snowflake	None	FL
Ottelia ovalifolia	swamp lily	None	FL
Pandion cristatus	Eastern Osprey	Low	FA
Paspalum distichum	water couch	None	FL
Persicaria decipiens	slender knotweed	None	FL
Persicaria hydropiper	water pepper	None	FL
Persicaria lapathifolia	pale knotweed	None	FL
Phragmites australis	common reed	None	FL
Plegadis falcinellus	Glossy Ibis	Low	FA
Potamogeton crispus	curly pondweed	None	FL
Potamogeton perfoliatus	perfoliate pondweed	None	FL
Schoenoplectus tabernaemontani	None	None	FL
Stuckenia pectinata	fennel pondweed	None	FL
Vallisneria nana	None	Low	FL
Waterhousea floribunda	weeping lilly pilly	None	FL

Table 25: Priority species recorded on, or within 4 km of the AOI - non-riverine

Species	Common name	Back on Track rank	Identified flora/fauna
Acrocephalus australis	Australian Reed-Warbler	Low	FA

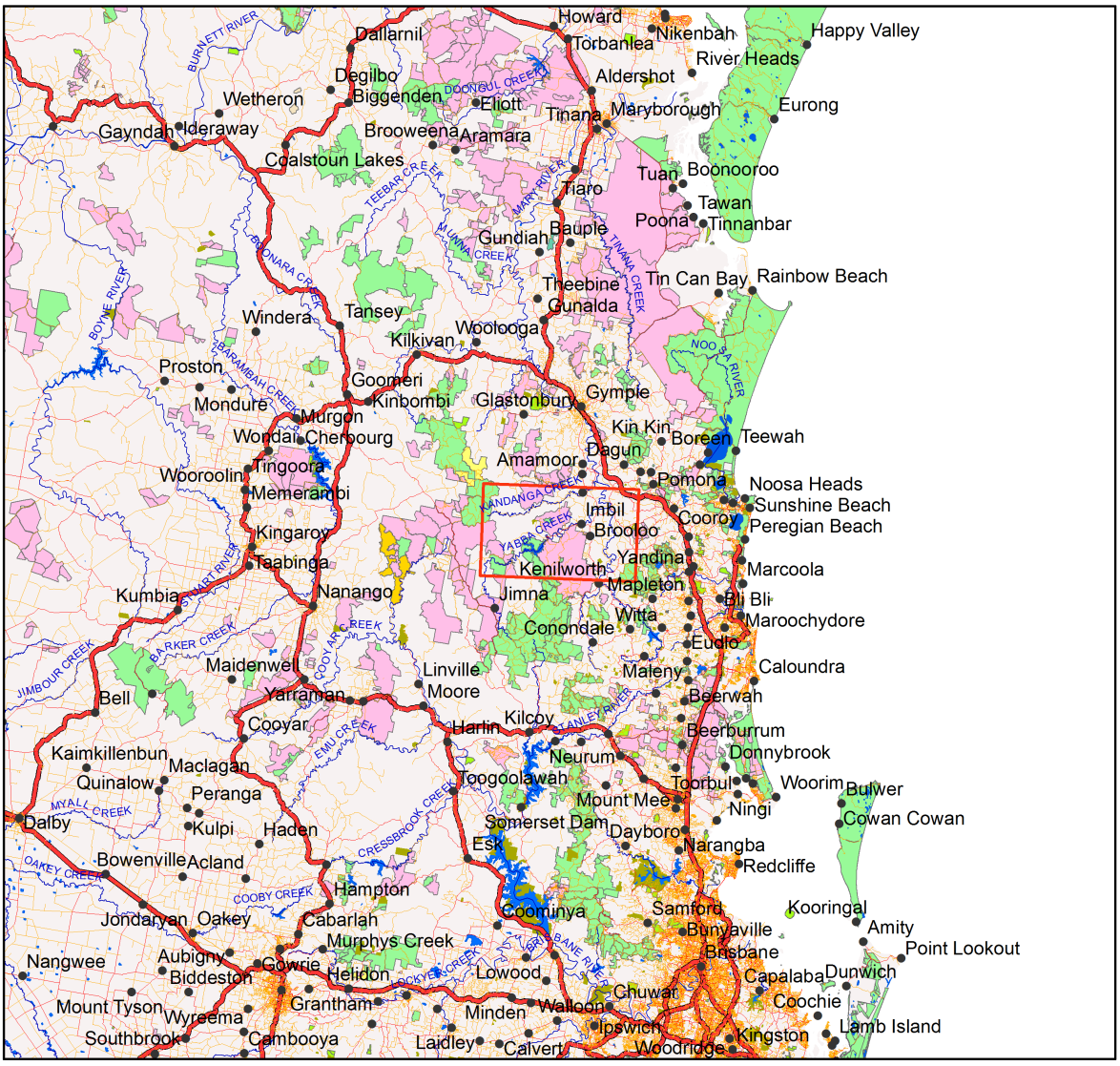
Species	Common name	Back on Track rank	Identified flora/fauna
Ardea alba modesta	Eastern Great Egret	Low	FA
Azolla pinnata	ferny azolla	None	FL
Bacopa monnieri	None	None	FL
Bolboschoenus fluviatilis	None	None	FL
Bubulcus ibis	Cattle Egret	Low	FA
Chelodina expansa	Broad-shelled River Turtle	Low	FA
Cyclopsitta diophthalma coxeni	Coxen's Fig-Parrot	Critical	FA
Cyperus exaltatus	tall flatsedge	None	FL
Eleocharis cylindrostachys	None	None	FL
Eleocharis sphacelata	tall spikerush	None	FL
Eucalyptus tereticornis	None	None	FL
Gallinago hardwickii	Latham's Snipe	Low	FA
Haliaeetus leucogaster	White-bellied Sea-Eagle	Low	FA
Hydrilla verticillata	hydrilla	None	FL
Juncus polyanthemus	None	None	FL
Juncus prismatocarpus	branching rush	None	FL
Juncus usitatus	None	None	FL
Litoria rothii	Northern Laughing Treefrog	Low	FA
Litoria verreauxii	Whistling Treefrog	Low	FA
Lomandra hystrix	None	None	FL
Marsilea mutica	shiny nardoo	None	FL
Melaleuca bracteata	None	None	FL
Melaleuca linariifolia	snow-in summer	None	FL
Myriophyllum verrucosum	water milfoil	None	FL
Nymphaea gigantea	None	Low	FL
Nymphoides indica	water snowflake	None	FL
Ottelia ovalifolia	swamp lily	None	FL
Pandion cristatus	Eastern Osprey	Low	FA
Paspalum distichum	water couch	None	FL
Persicaria decipiens	slender knotweed	None	FL
Persicaria hydropiper	water pepper	None	FL
Persicaria lapathifolia	pale knotweed	None	FL
Phragmites australis	common reed	None	FL
Plegadis falcinellus	Glossy Ibis	Low	FA
Potamogeton crispus	curly pondweed	None	FL
Potamogeton perfoliatus	perfoliate pondweed	None	FL
Pseudoraphis spinescens	spiny mudgrass	None	FL
Rostratula australis	Australian Painted Snipe	Medium	FA
Schoenoplectiella mucronata	None	None	FL

Species	Common name	Back on Track rank	Identified flora/fauna
Schoenoplectus tabernaemontani	None	None	FL
Stuckenia pectinata	fennel pondweed	None	FL
Vallisneria nana	None	Low	FL

NB. Please note that the priority species records used in the above two tables are comprised of those adopted for the released individual ACAs. The ACA riverine and non-riverine priority species databases are updated from time to time to reflect new release of ACAs. At each update, the taxonomic details for all ACAs records are amended as necessary to reflect current taxonomic name and/or status changes.

Maps

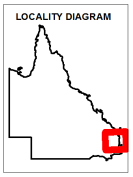
Map 1 - Locality Map



Locality Map

Legend

- polygon
- Towns
- Highway
- Connector
- Street/Local Road
- Reservoirs
- Lakes
- National Park (Scientific)
- National Park
- National Park (CYPAL)
- Conservation Park
- Resources Reserve
- Forest Reserve
- State Forest
- Timber Reserve
- Nature Refuges
- Coordinated Conservation Areas
- Major rivers/creeks
- Queensland



N

0 15000 30000 45000 60000 75000 m

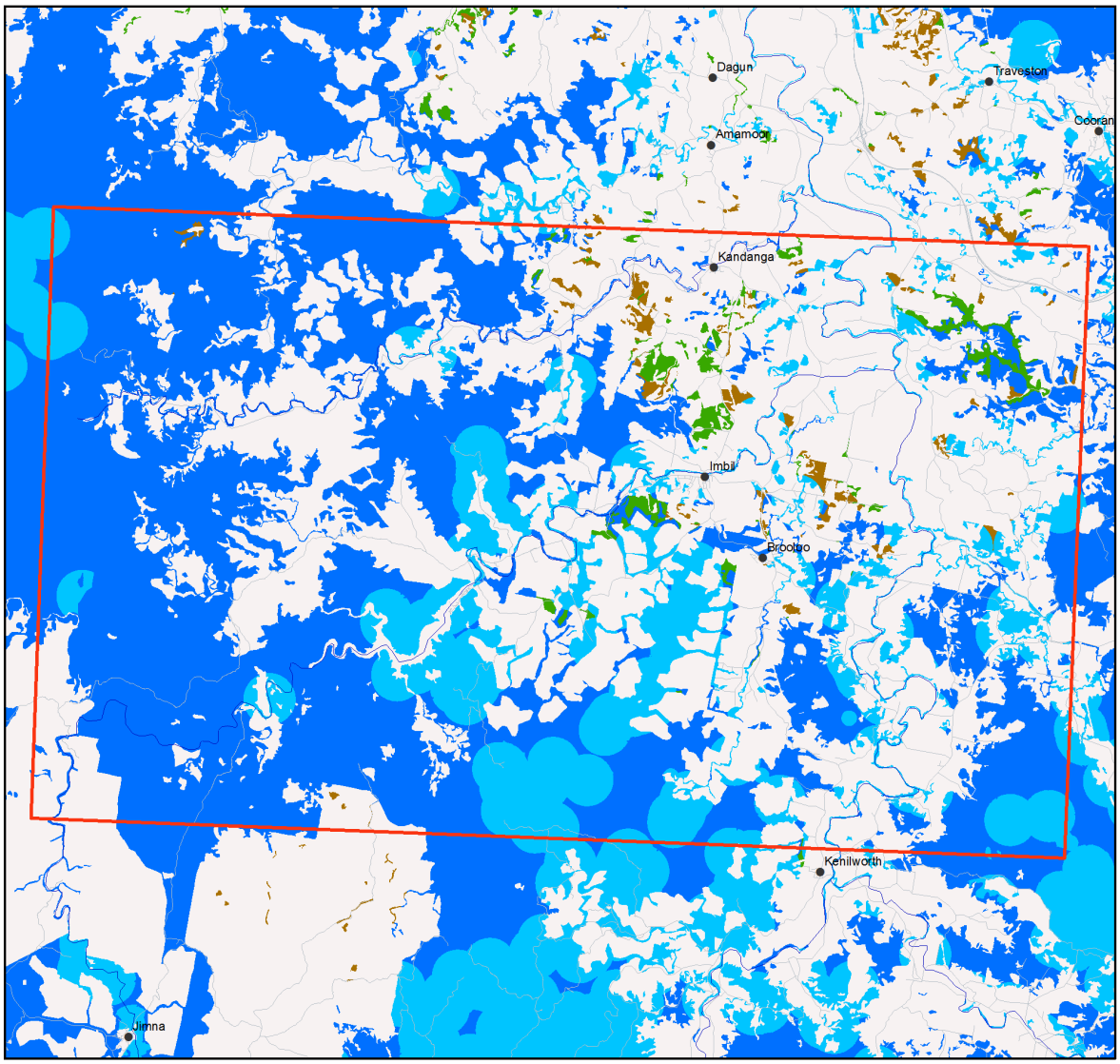
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Map 2 - Biodiversity Planning Assessment (BPA)



Biodiversity Planning Assessments

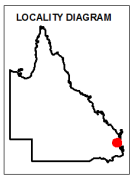
Legend

- polygon
- Towns
- Roads
- Major rivers/creeks
- Queensland

Biodiversity Planning Assessment

- State Habitat for EVNT taxa
- State
- Regional
- Local or Other Values
- Non Bioregion Ecosystem

LOCALITY DIAGRAM



N

0 2300 4600 6900 9200 11500 m

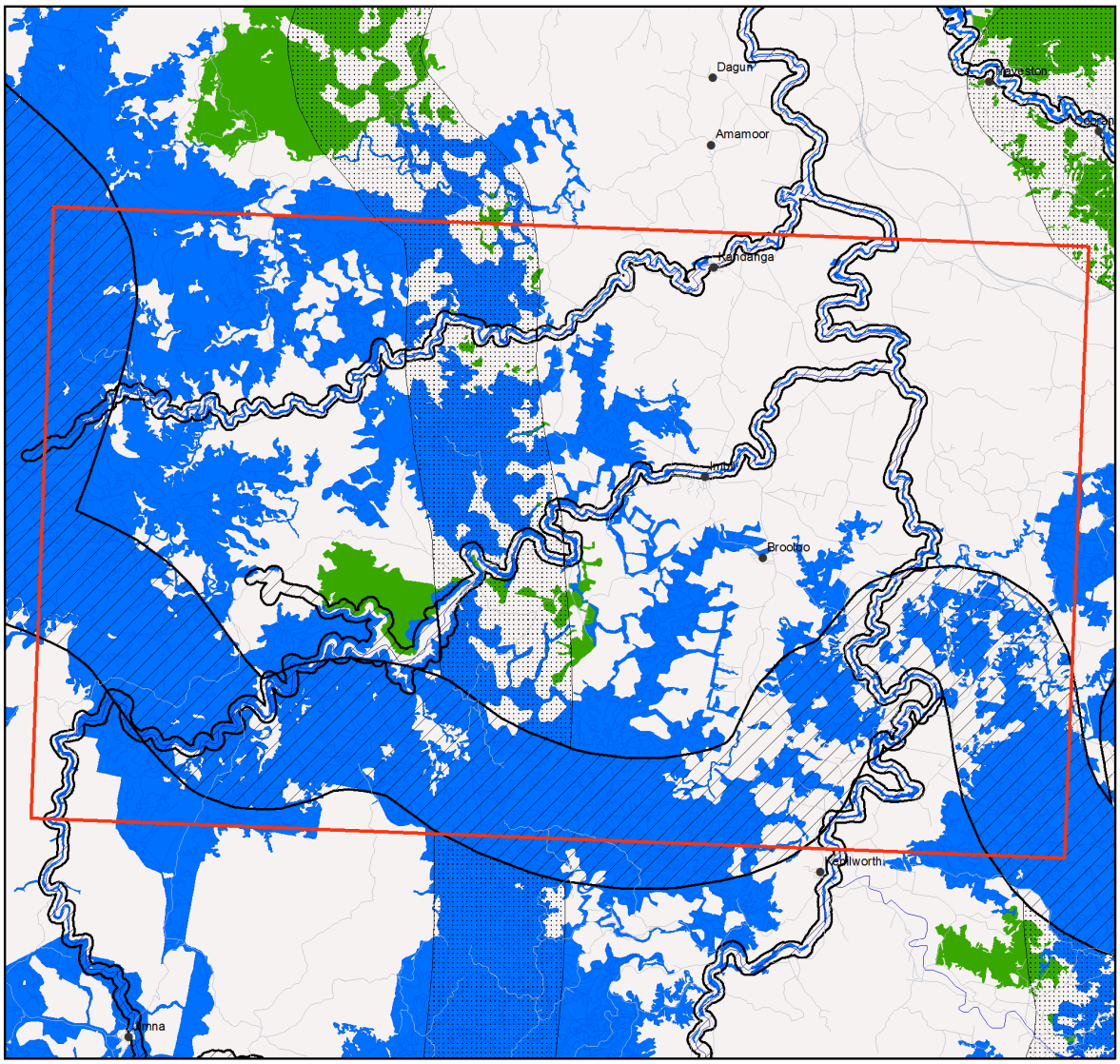
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Map 3 - Corridors



Corridors

Legend

- polygon
- Towns
- Roads
- Major rivers/creeks
- Queensland

Corridors

- State
- Regional

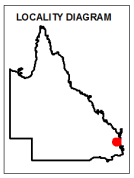
Corridor Triggered Vegetation

- State
- Regional
- Local

Core Area Vegetation

- Brigalow Belt only

LOCALITY DIAGRAM



N

0 2300 4600 6900 9200 11500 m

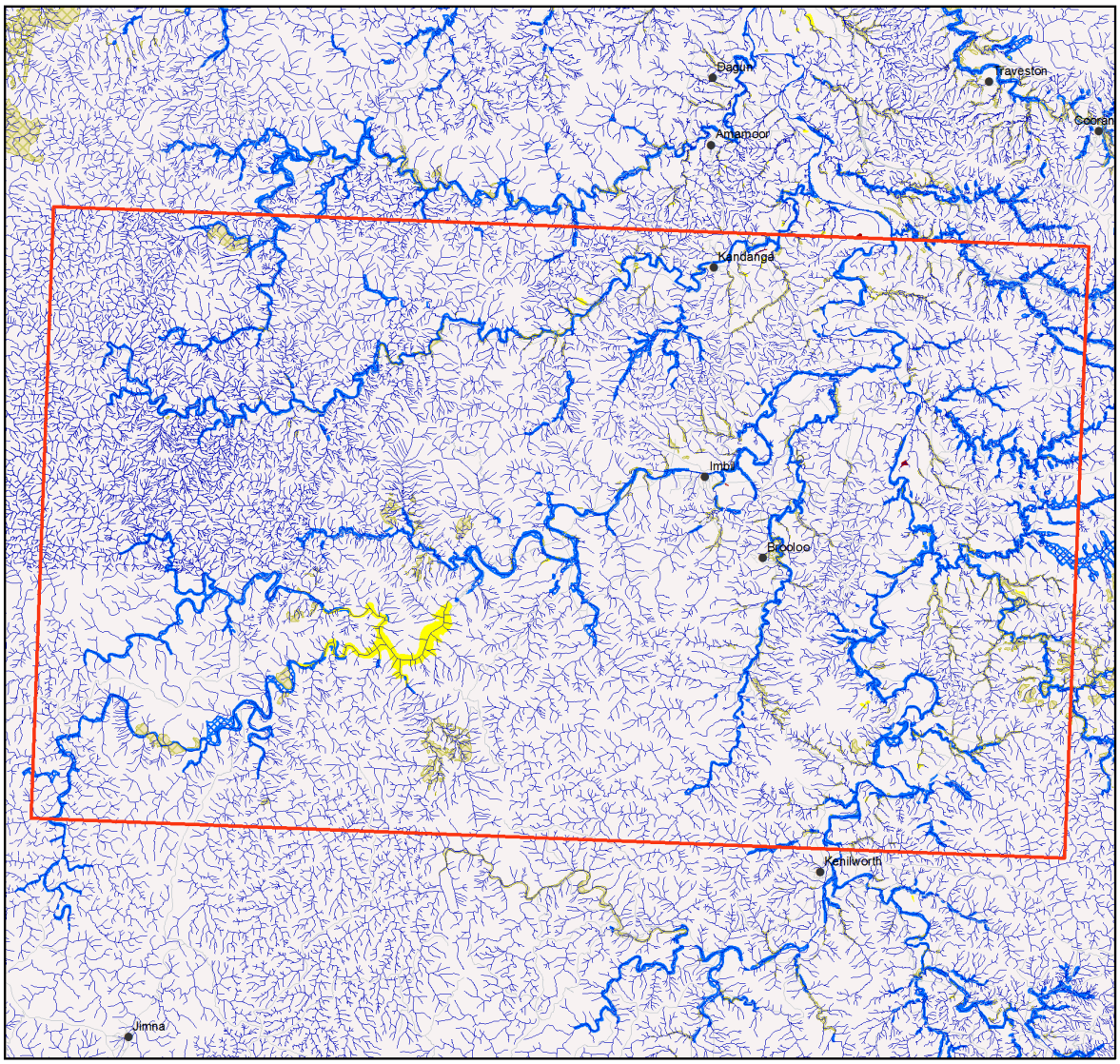
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Map 4 - Wetlands and waterways



Wetlands and Waterways

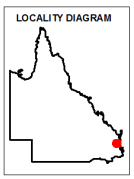
Legend

- polygon
- Towns
- Roads
- Springs
- Rivers/Creeks
- Directory of Important Wetlands
- Ramsar Sites - QLD
- Queensland

Wetland Type

- Marine Waterbodies
- Estuarine Waterbodies
- Riverine Waterbodies
- Lacustrine Waterbodies
- Palustrine Waterbodies
- Marine RE
- Estuarine RE
- Riverine RE
- Lacustrine RE
- Palustrine RE
- RE 51-80% wetland (mosaic units)
- RE 1-50% wetland (mosaic units)

LOCALITY DIAGRAM



N

0 2300 4600 6900 9200 11500 m

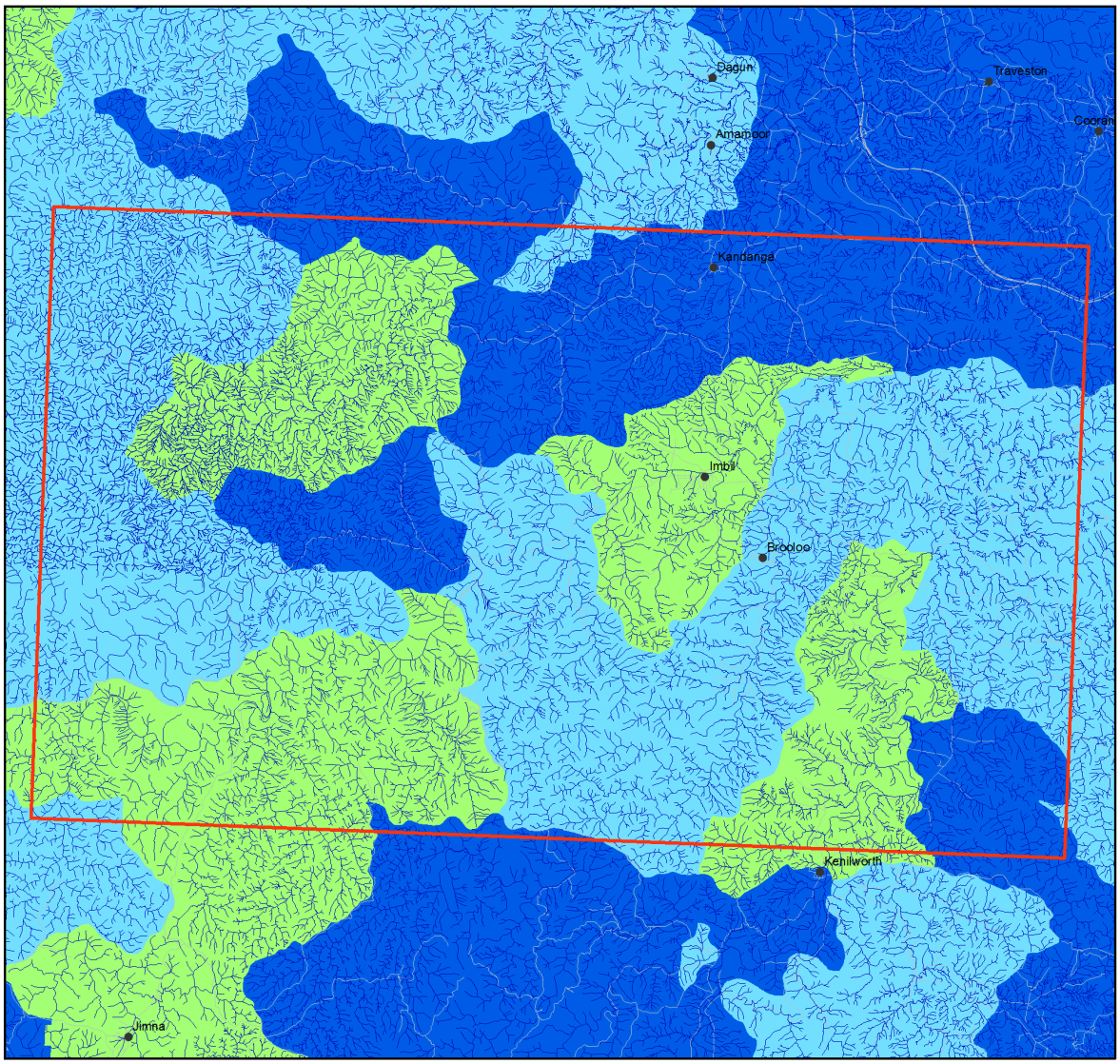
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Map 5 - Aquatic Conservation Assessment (ACA) - riverine



Aquatic Conservation Assessment (ACA) - riverine

Legend

- polygon
- Towns
- Roads
- Rivers/Creeks
- Queensland

ACA Riverine - Subcatchment Significance

- Very High
- High
- Medium
- Low
- Very Low

LOCALITY DIAGRAM

N

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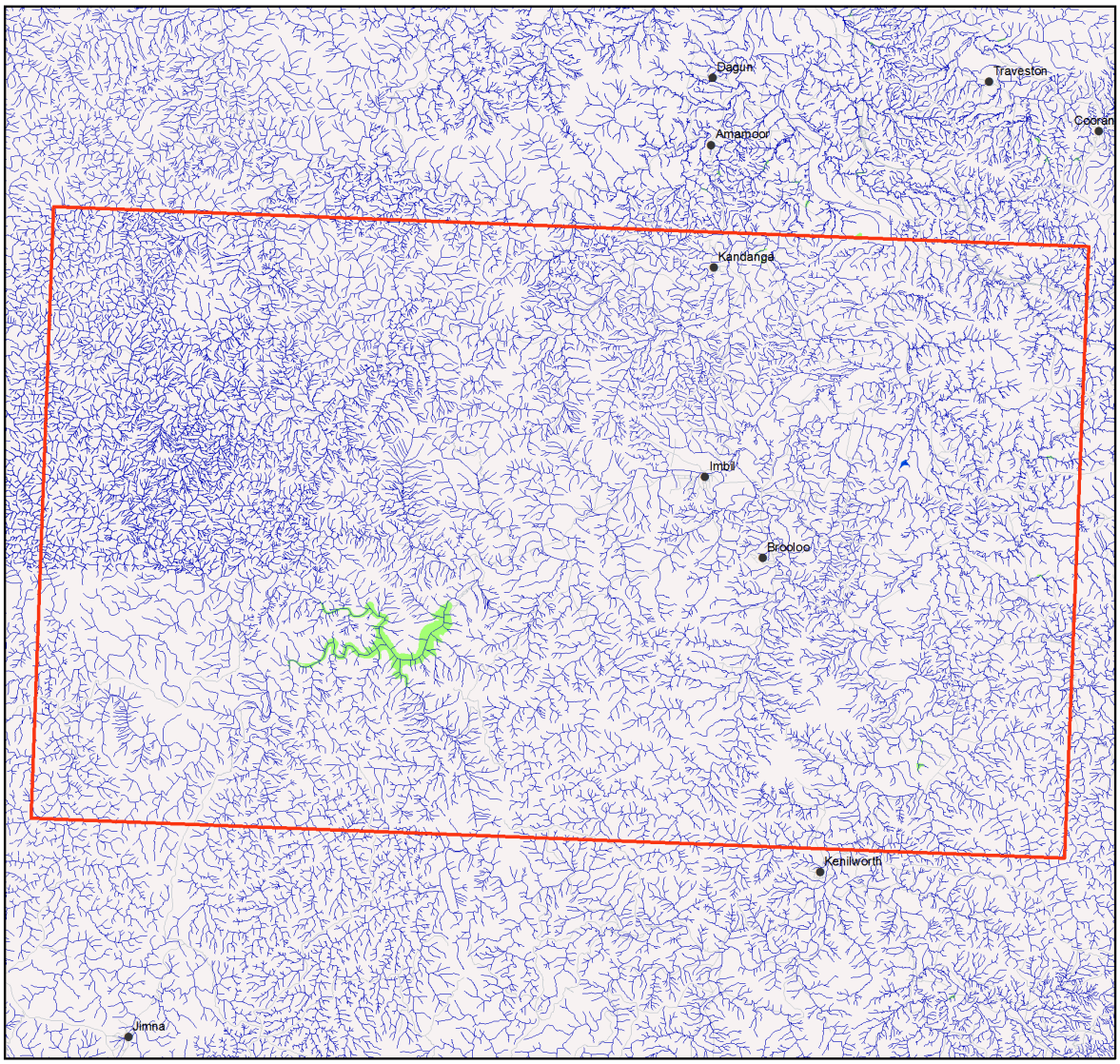
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0 2300 4600 6900 9200 11500 m

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Map 6 - Aquatic Conservation Assessment (ACA) - non-riverine



Aquatic Conservation Assessment (ACA) - nonriverine

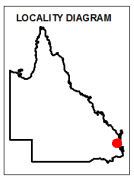
Legend

- polygon
- Towns
- Roads
- Rivers/Creeks
- Queensland

ACA Non-riverine

- Very High
- High
- Medium
- Low
- Very Low

LOCALITY DIAGRAM



N

0 2300 4600 6900 9200 11500 m

This product is projected into GDA 1994 Queensland Albers

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Appendices

Appendix 1 - Source Data

Theme	Datasets
Aquatic Conservation Assessments Non-riverine*	Combination of the following datasets: Cape York Peninsula Non-riverine v1.1 Eastern Gulf of Carpentaria v1.1 Great Barrier Reef Catchment Non-riverine v1.3 Lake Eyre and Bulloo Basins v1.1 QMDB Non-riverine ACA v1.4 Southeast Queensland ACA v1.1 WBB Non-riverine ACA v1.1 Southern Gulf Catchments Non-riverine ACA v1.1
Aquatic Conservation Assessments Riverine*	Combination of the following datasets: Cape York Peninsula Riverine v1.1 Eastern Gulf of Carpentaria v1.1 Great Barrier Reef Catchment Riverine v1.1 Lake Eyre and Bulloo Basins v1.1 QMDB Riverine ACA v1.4 Southeast Queensland ACA v1.1 WBB Riverine ACA v1.1 Southern Gulf Catchments Riverine ACA v1.1
Biodiversity Planning Assessments*	Combination of the following datasets: Brigalow Belt BPA v2.1 Cape York Peninsula BPA v1.1 Central Queensland Coast BPA v1.3 Channel Country BPA v1.1 Desert Uplands BPA v1.3 Einasleigh Uplands BPA v1.1 Gulf Plains BPA v1.1 Mitchell Grass Downs BPA v1.1 Mulga Lands BPA v1.4 New England Tableland v2.3 Northwest Highlands v1.1 Southeast Queensland v4.1 Wet Tropics v1.1
Statewide BPA Corridors*	Statewide corridors v1.6
Threatened Species	An internal DES database compiled from Wildnet, Herbrecs, Corveg, the QLD Museum, as well as other incidental sources.
BPA Priority Species	An internal DES database compiled from Wildnet, Herbrecs, Corveg, the QLD Museum, as well as other incidental sources.
ACA Priority Species	An internal DES database compiled from Wildnet, Herbrecs, Corveg, the QLD Museum, as well as other incidental sources.

***These datasets are available at:**

http://dds.information.qld.gov.au/DDS

Appendix 2 - Acronyms and Abbreviations

AOI	- Area of Interest
ACA	- Aquatic Conservation Assessment
AQUABAMM	- Aquatic Biodiversity Assessment and Mapping Methodology
BAMM	- Biodiversity Assessment and Mapping Methodology
BoT	- Back on Track
BPA	- Biodiversity Planning Assessment
CAMBA	- China-Australia Migratory Bird Agreement
DES	- Department of Environment and Science
EPBC	- *Environment Protection and Biodiversity Conservation Act 1999*
EVNT	- Endangered, Vulnerable, Near Threatened
GDA94	- Geocentric Datum of Australia 1994
GIS	- Geographic Information System
JAMBA	- Japan-Australia Migratory Bird Agreement
NCA	- *Nature Conservation Act 1992*
RE	- Regional Ecosystem
REDD	- Regional Ecosystem Description Database
ROKAMBA	- Republic of Korea-Australia Migratory Bird Agreement

Queensland Government

Department of Environment and Science

Environmental Reports

Matters of State Environmental Significance

For the selected area of interest
Custom Geometry

Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the point of interest.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Please direct queries about these reports to: Planning.Support@des.qld.gov.au

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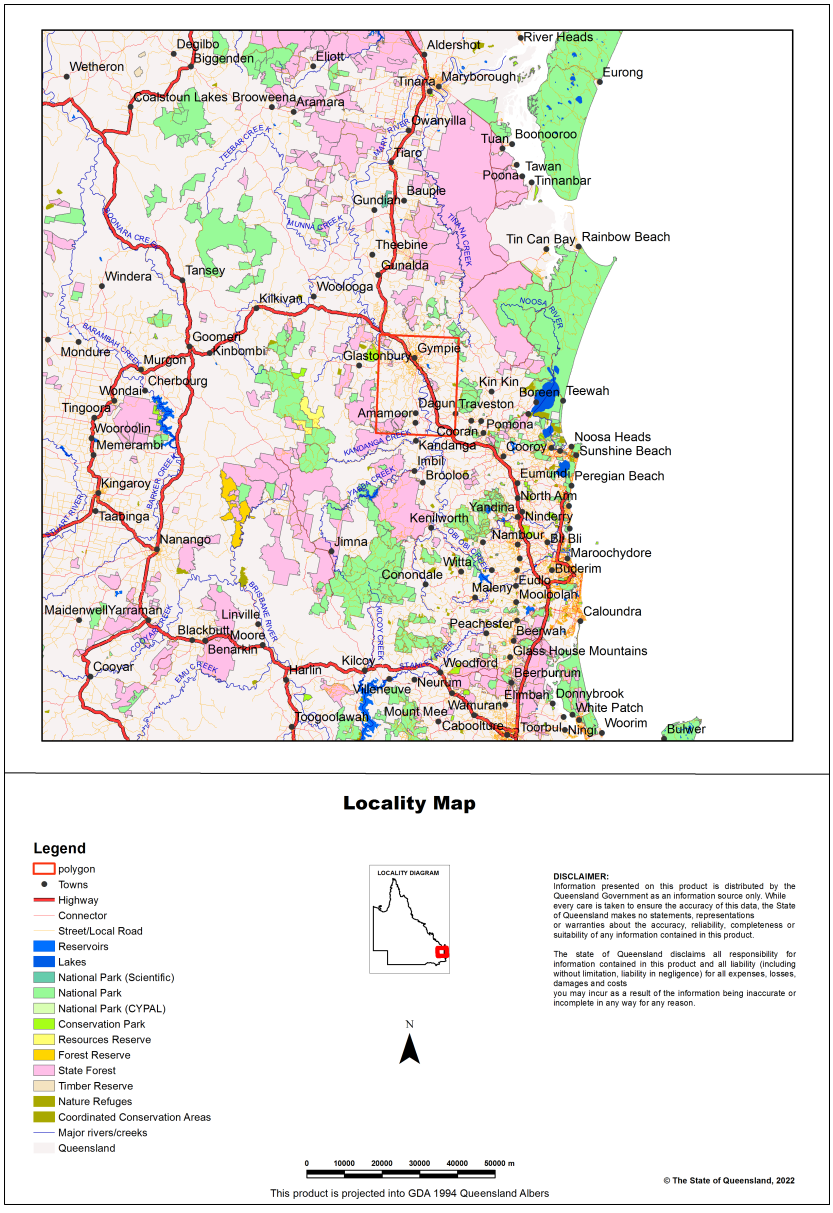
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Assessment Area Details

The following table provides an overview of the area of interest (AOI) with respect to selected topographic and environmental values.

Table 1: Summary table, details for AOI Custom Geometry

Size (ha)	54,831.55
Local Government(s)	Noosa Shire, Gympie Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Gympie Block
Catchment(s)	Mary



Matters of State Environmental Significance (MSES)

MSES Categories

Queensland's State Planning Policy (SPP) includes a biodiversity State interest that states:

'The sustainable, long-term conservation of biodiversity is supported. Significant impacts on matters of national or state environmental significance are avoided, or where this cannot be reasonably achieved; impacts are minimised and residual impacts offset.'

The MSES mapping product is a guide to assist planning and development assessment decision-making. Its primary purpose is to support implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations. Similarly, the SPP biodiversity policy does not override or replace specific requirements of other Acts or regulations.

The SPP defines matters of state environmental significance as:

- Protected areas (including all classes of protected area except coordinated conservation areas) under the *Nature Conservation Act 1992* ;

- Marine parks and land within a 'marine national park', 'conservation park', 'scientific research', 'preservation' or 'buffer' zone under the *Marine Parks Act 2004* ;

- Areas within declared fish habitat areas that are management A areas or management B areas under the Fisheries Regulation 2008;

- Threatened wildlife under the *Nature Conservation Act 1992* and special least concern animals under the Nature Conservation (Wildlife) Regulation 2006;

- Regulated vegetation under the *Vegetation Management Act 1999* that is:

    • Category B areas on the regulated vegetation management map, that are 'endangered' or 'of concern' regional ecosystems;

    • Category C areas on the regulated vegetation management map that are 'endangered' or 'of concern' regional ecosystems;

    • Category R areas on the regulated vegetation management map;

    • Regional ecosystems that intersect with watercourses identified on the vegetation management watercourse and drainage feature map;

    • Regional ecosystems that intersect with wetlands identified on the vegetation management wetlands map;

- Strategic Environmental Areas under the *Regional Planning Interests Act 2014* ;

- Wetlands in a wetland protection area of wetlands of high ecological significance shown on the Map of Queensland Wetland Environmental Values under the Environment Protection Regulation 2019;

- Wetlands and watercourses in high ecological value waters defined in the Environmental Protection (Water) Policy 2009, schedule 2;

- Legally secured offset areas.

MSES Values Present

The MSES values that are present in the area of interest are summarised in the table below:

Table 2: Summary of MSES present within the AOI

1a Protected Areas- estates	324.97 ha	0.6%
1b Protected Areas- nature refuges	61.07 ha	0.1%
1c Protected Areas- special wildlife reserves	0.0 ha	0.0 %
2 State Marine Parks- highly protected zones	0.0 ha	0.0 %
3 Fish habitat areas (A and B areas)	0.0 ha	0.0 %
4 Strategic Environmental Areas (SEA)	0.0 ha	0.0 %
5 High Ecological Significance wetlands on the map of Referable Wetlands	658.68 ha	1.2%
6a High Ecological Value (HEV) wetlands	9.23 ha	0.0%
6b High Ecological Value (HEV) waterways **	3.3 km	Not applicable
7a Threatened (endangered or vulnerable) wildlife	4145.66 ha	7.6%
7b Special least concern animals	1678.01 ha	3.1%
7c i Koala habitat area - core (SEQ)	52.59 ha	0.1%
7c ii Koala habitat area - locally refined (SEQ)	14.91 ha	0.0%
8a Regulated Vegetation - Endangered/Of concern in Category B (remnant)	2176.65 ha	4.0%
8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth)	892.5 ha	1.6%
8c Regulated Vegetation - Category R (GBR riverine regrowth)	8650.48 ha	15.8%
8d Regulated Vegetation - Essential habitat	4590.49 ha	8.4%
8e Regulated Vegetation - intersecting a watercourse **	1484.2 km	Not applicable
8f Regulated Vegetation - within 100m of a Vegetation Management Wetland	15.1 ha	0.0%
9a Legally secured offset areas- offset register areas	0.0 ha	0.0 %
9b Legally secured offset areas- vegetation offsets through a Property Map of Assessable Vegetation	0.0 ha	0.0 %

Additional Information with Respect to MSES Values Present

MSES - State Conservation Areas

1a. Protected Areas - estates

Estate name
Goomboorian National Park
Woondum National Park
King Conservation Park
Amamoor National Park

1b. Protected Areas - nature refuges

Name
Lacebark Nature Refuge
Wurraglen Nature Refuge

1c. Protected Areas - special wildlife reserves

(no results)

2. State Marine Parks - highly protected zones

(no results)

3. Fish habitat areas (A and B areas)

(no results)

Refer to **Map 1 - MSES - State Conservation Areas** for an overview of the relevant MSES.

MSES - Wetlands and Waterways

4. Strategic Environmental Areas (SEA)

(no results)

5. High Ecological Significance wetlands on the Map of Queensland Wetland Environmental Values

Natural wetlands that are 'High Ecological Significance' (HES) on the Map of Queensland Wetland Environmental Values are present.

6a. Wetlands in High Ecological Value (HEV) waters

Natural wetlands that occur in HEV (maintain) freshwater and estuarine areas under the Environmental Protection (water) Policy are present.

6b. Waterways in High Ecological Value (HEV) waters

Natural waterways that occur in HEV (maintain) freshwater and estuarine areas under the Environmental Protection (water) Policy are present.

Refer to **Map 2 - MSES - Wetlands and Waterways** for an overview of the relevant MSES.

MSES - Species

7a. Threatened (endangered or vulnerable) wildlife

Values are present

7b. Special least concern animals

Values are present

7c i. Koala habitat area - core (SEQ)

Values are present

7c ii. Koala habitat area - locally refined (SEQ)

Values are present

Threatened (endangered or vulnerable) wildlife habitat suitability models

Species	Common name	NCA status	Presence
Boronia keysii		V	None
Calyptorhynchus lathami	Glossy black cockatoo	V	Core
Casuarius casuarius johnsonii	Sthn population cassowary	E	None
Crinia tinnula	Wallum froglet	V	None
Denisonia maculata	Ornamental snake	V	None
Litoria freycineti	Wallum rocketfrog	V	None
Litoria olongburensis	Wallum sedgefrog	V	None
Melaleuca irbyana		E	None
Petaurus gracilis	Mahogany Glider	E	None
Petrogale persephone	Proserpine rock-wallaby	E	None
Phascolarctos cinereus	Koala - outside SEQ*	V	Core
Pezoporus wallicus wallicus	Eastern ground parrot	V	None
Taudactylus pleione	Kroombit tinkerfrog	E	None
Xeromys myoides	Water Mouse	V	None

**For koala model, this includes areas outside SEQ. Check 7c SEQ koala habitat for presence/absence.*

Threatened (endangered or vulnerable) wildlife species records

Scientific name	Common name	NCA status	EPBC status	Migratory status
Adelotus brevis	tusked frog	V		
Turnix melanogaster	black-breasted button-quail	V	V	

Scientific name	Common name	NCA status	EPBC status	Migratory status
Ninox strenua	powerful owl	V		
Elusor macrurus	Mary River turtle	E	E	
Ornithoptera richmondia	Richmond birdwing	V		
Macadamia integrifolia	macadamia nut	V	V	
Dasyurus maculatus maculatus	spotted-tailed quoll (southern subspecies)	V	E	
Macadamia ternifolia	bopple nut	V	V	
Fontainea rostrata		V	V	
Floydia praealta	ball nut	V	V	
Argynnis hyperbius inconstans	Australian fritillary	E	CE	
Rhodamnia rubescens		E		
Elseya albagula	southern snapping turtle	E	CE	
Zieria verrucosa		V	V	
Samadera bidwillii		V	V	
Petauroides volans	greater glider	V	V	
Rhodomyrtus psidioides	native guava	E		
Marsdenia coronata	slender milkvine	V		
Mixophyes iteratus	giant barred frog	E	E	
Tenuibranchiurus glypticus	swamp crayfish	E		
Litoria pearsoniana	cascade treefrog	V		
Fontainea venosa		V	V	
Acanthophis antarcticus	common death adder	V		
Hemiaspis damelii	grey snake	E		
Delma torquata	collared delma	V	V	

Special least concern animal species records

Scientific name	Common name	Migratory status
Ornithorhynchus anatinus	platypus	
Tachyglossus aculeatus	short-beaked echidna	

**Nature Conservation Act 1992 (NCA) Status- Endangered (E), Vulnerable (V) or Special Least Concern Animal (SL). Environment Protection and Biodiversity Conservation Act 1999 (EPBC) status: Critically Endangered (CE) Endangered (E), Vulnerable (V)*

Migratory status (M) - China and Australia Migratory Bird Agreement (C), Japan and Australia Migratory Bird Agreement (J), Republic of Korea and Australia Migratory Bird Agreement (R), Bonn Migratory Convention (B), Eastern Flyway (E)

To request a species list for an area, or search for a species profile, access Wildlife Online at:
https://www.qld.gov.au/environment/plants-animals/species-list/

Refer to **Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals** and **Map 3b - MSES - Species - Koala habitat area (SEQ)** for an overview of the relevant MSES.

MSES - Regulated Vegetation

For further information relating to regional ecosystems in general, go to:
https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/
For a more detailed description of a particular regional ecosystem, access the regional ecosystem search page at:
https://environment.ehp.qld.gov.au/regional-ecosystems/

8a. Regulated Vegetation - Endangered/Of concern in Category B (remnant)

Regional ecosystem	Vegetation management polygon	Vegetation management status
12.11.16	E-dom	rem_end
12.3.17	O-dom	rem_oc
12.5.2a	E-dom	rem_end
12.3.11/12.3.7	O-dom	rem_oc
12.9-10.7a	O-dom	rem_oc
12.12.12	O-dom	rem_oc
12.3.11	O-dom	rem_oc
12.9-10.16	O-dom	rem_oc
12.3.2/12.3.11	O-dom	rem_oc
12.3.2	O-dom	rem_oc
12.9-10.29	O-dom	rem_oc
12.12.28	O-dom	rem_oc
12.3.7/12.3.11	O-subdom	rem_oc
12.11.14	O-dom	rem_oc
12.11.10/12.11.16	E-subdom	rem_end
12.3.1a	E-dom	rem_end
12.11.3/12.11.17	O-subdom	rem_oc
12.11.17	O-dom	rem_oc
12.11.9	O-dom	rem_oc
12.8.24	E-dom	rem_end
12.11.3/12.11.14	O-subdom	rem_oc
12.8.13	O-dom	rem_oc
12.11.9/12.11.3	O-dom	rem_oc

8b. Regulated Vegetation - Endangered/Of concern in Category C (regrowth)

Regional ecosystem	Vegetation management polygon	Vegetation management status
12.11.16	E-dom	hvr_end
12.12.12	O-dom	hvr_oc
12.3.2/12.3.11	O-dom	hvr_oc
12.11.14	O-dom	hvr_oc
12.3.17	O-dom	hvr_oc
12.3.11	O-dom	hvr_oc
12.11.10/12.11.16	E-subdom	hvr_end

Regional ecosystem	Vegetation management polygon	Vegetation management status
12.3.2/12.3.1a	E-subdom	hvr_end
12.8.24	E-dom	hvr_end
12.3.2	O-dom	hvr_oc
12.8.13	O-dom	hvr_oc
12.3.1a	E-dom	hvr_end
12.3.11/12.3.7	O-dom	hvr_oc
12.11.9	O-dom	hvr_oc
12.9-10.7a	O-dom	hvr_oc
12.5.2a	E-dom	hvr_end
12.9-10.16	O-dom	hvr_oc
12.12.8	O-dom	hvr_oc
12.12.28	O-dom	hvr_oc
12.11.3/12.11.14	O-subdom	hvr_oc
12.11.3/12.11.9	O-subdom	hvr_oc

8c. Regulated Vegetation - Category R (GBR riverine regrowth)

Regulated vegetation map category	Map number
R	9445
R	0

8d. Regulated Vegetation - Essential habitat

Values are present

8e. Regulated Vegetation - intersecting a watercourse**

A vegetation management watercourse is mapped as present

8f. Regulated Vegetation - within 100m of a Vegetation Management wetland

Regulated vegetation map category	Map number
R	9445
B	9445

Refer to **Map 4 - MSES - Regulated Vegetation** for an overview of the relevant MSES.

MSES - Offsets

9a. Legally secured offset areas - offset register areas

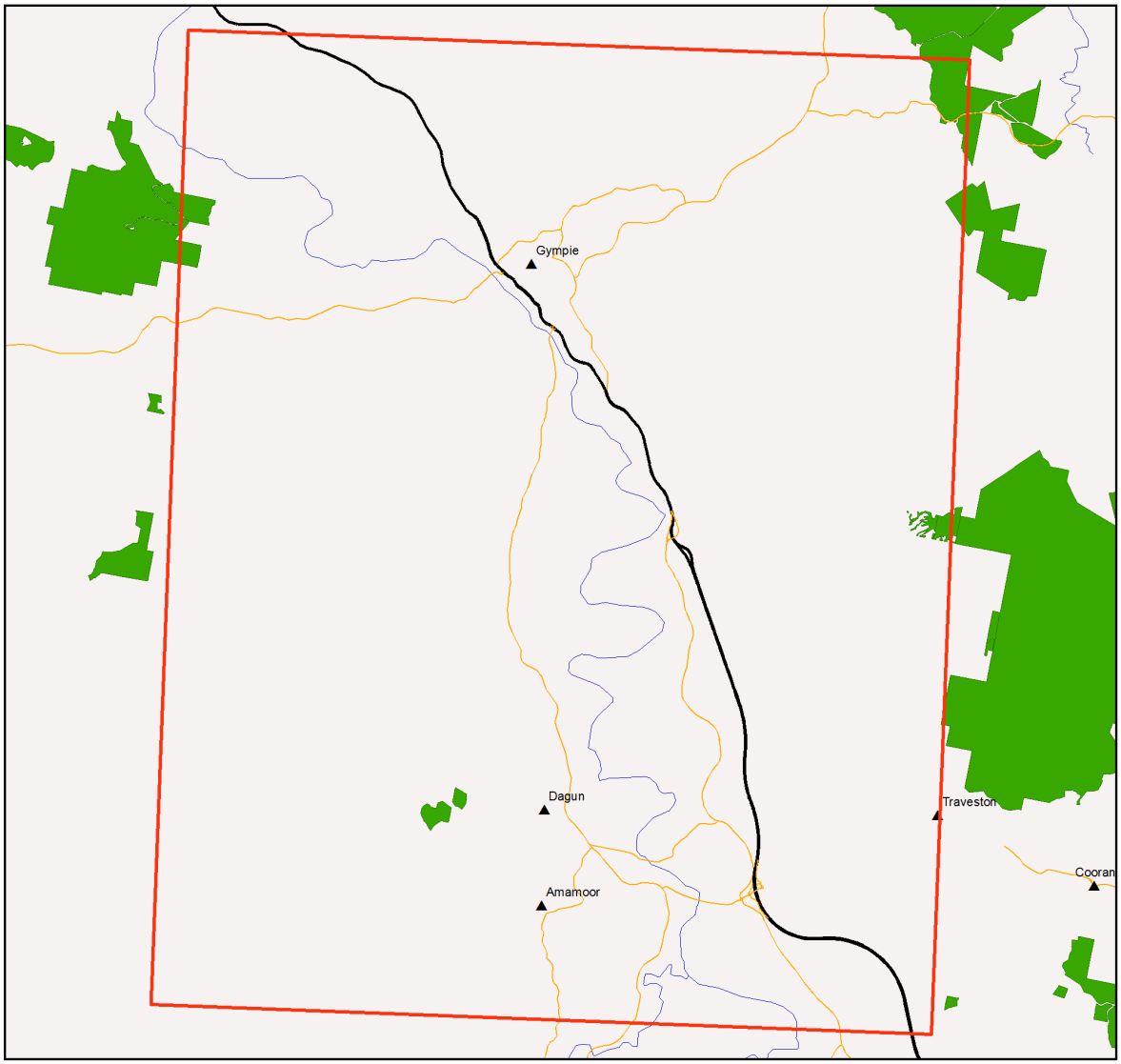
(no results)

9b. Legally secured offset areas - vegetation offsets through a Property Map of Assessable Vegetation

(no results)

Refer to **Map 5 - MSES - Offset Areas** for an overview of the relevant MSES.

Map 1 - MSES - State Conservation Areas

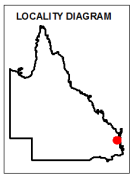


MSES - State Conservation Areas

Area of Interest

- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Protected area (estates, nature refuges, special wildlife reserves)
- Declared fish habitat area (A and B areas)
- Marine park (highly protected)

LOCALITY DIAGRAM



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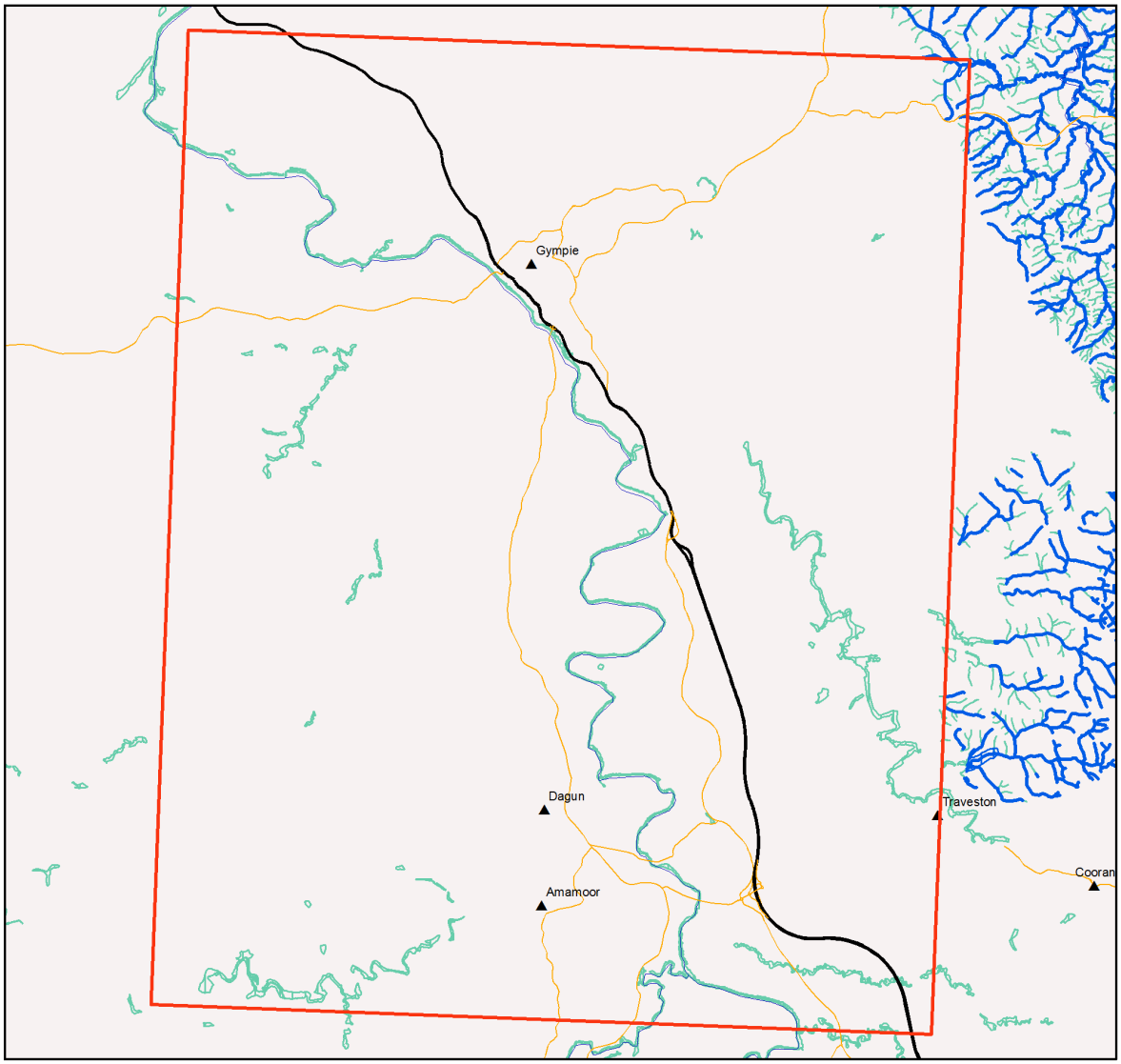
N

0 1600 3200 4800 6400 8000 m

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Map 2 - MSES - Wetlands and Waterways

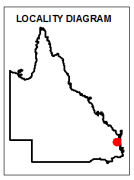


MSES - Wetlands and Waterways

Area of Interest

- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Declared high ecological value waters (watercourse)
- Strategic environmental area (designated precinct)
- Declared high ecological value waters (wetland)
- High ecological significance wetlands

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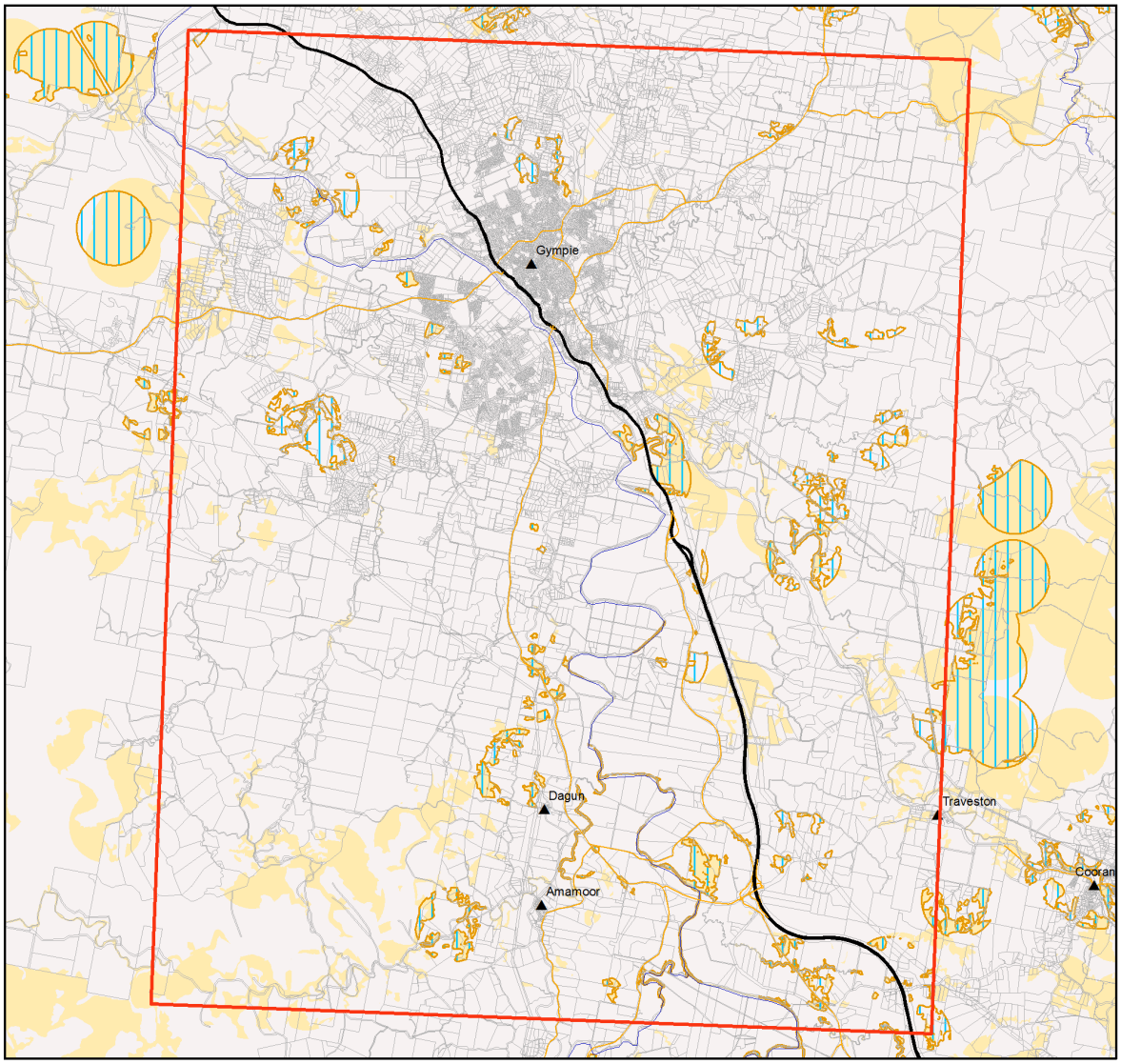
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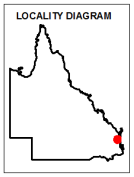
Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals



MSES - Species
Threatened (endangered or vulnerable) wildlife and special least concern animals

Area of Interest

- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Wildlife habitat (special least concern)
- Wildlife habitat (endangered or vulnerable)



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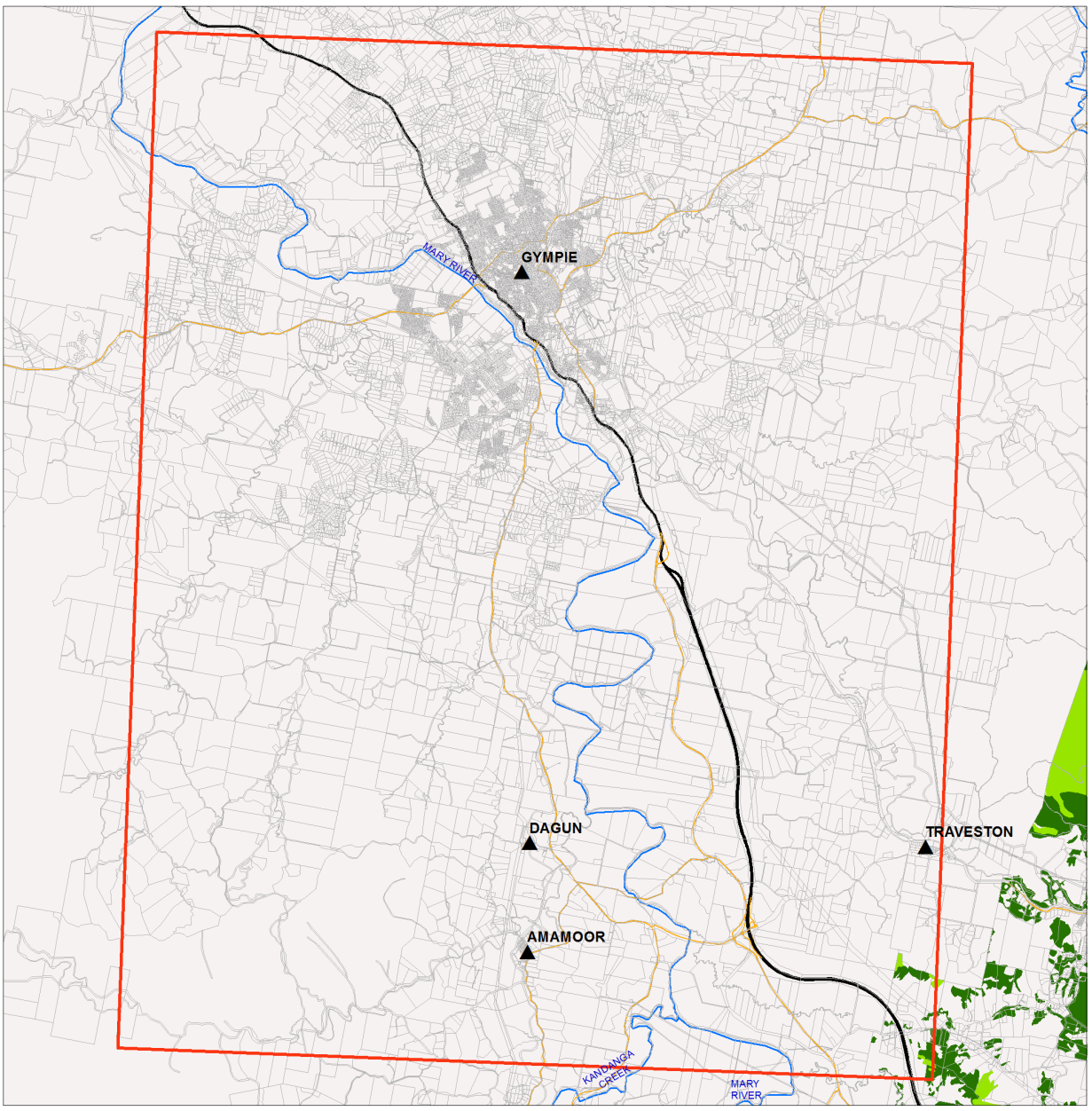
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Map 3b - MSES - Species - Koala habitat area (SEQ)



MSES - Species
Koala habitat area (SEQ)

Area of Interest
- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Koala habitat area (core)
- Koala habitat area (locally refined)

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The represented layers for SEQ 'koala habitat area-core' and 'koala habitat area- locally refined' in MSES are sourced directly from the regulatory mapping under the Nature Conservation (Koala) Conservation Plan 2017. Whilst every effort is made to ensure the information remains current, there may be delays between updating versions. Please refer to the original mapping for the most recent version. See https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping

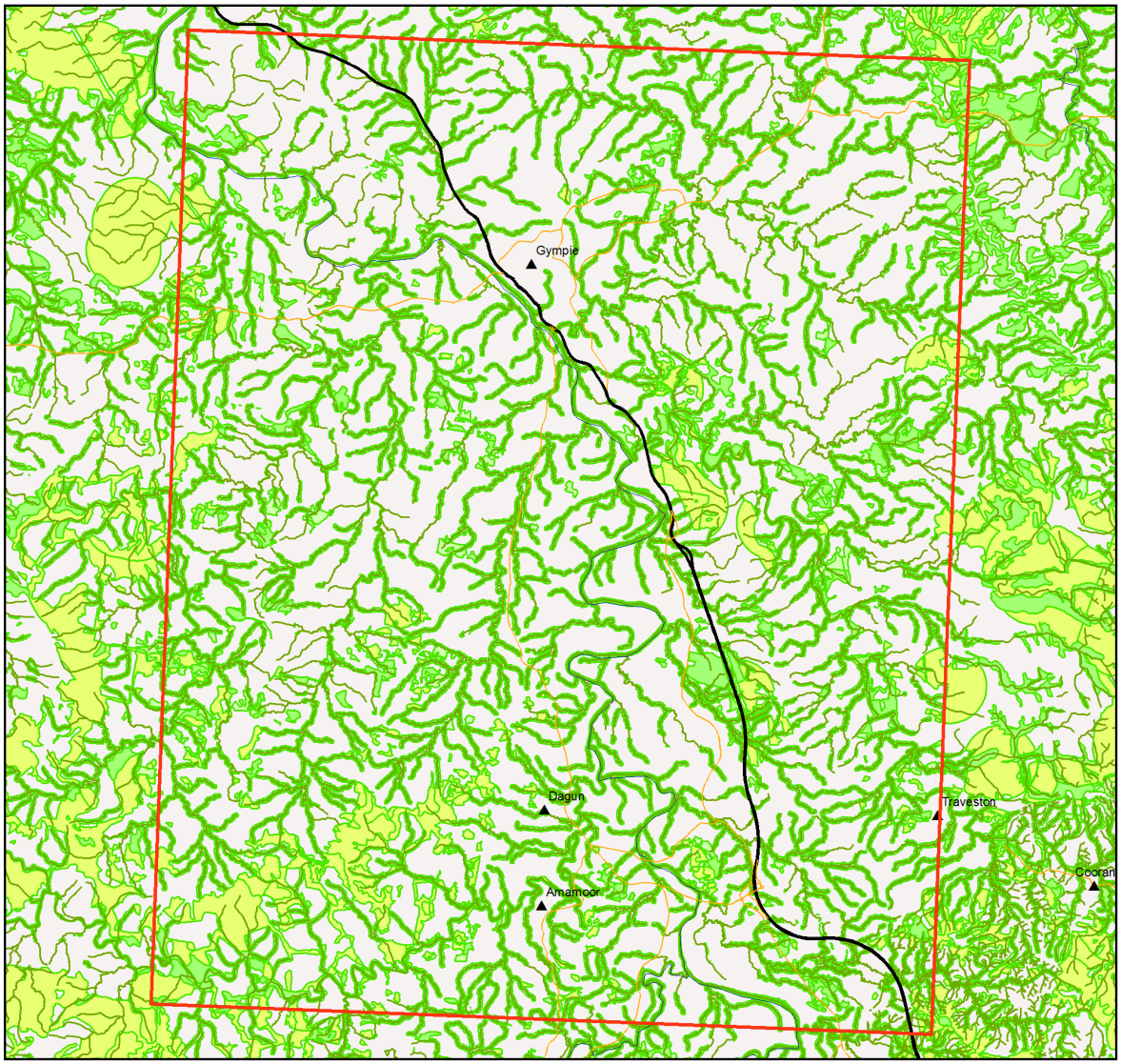
The koala habitat mapping within South East Queensland uses regional ecosystem linework compiled at a scale varying from 1:25,000 to 1:100,000. Linework should be used as a guide only. The positional accuracy of regional ecosystem data mapped at a scale of 1:100,000 is +/- 100 metres.

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0 1,400 2,800 4,200 5,600 7,000 m

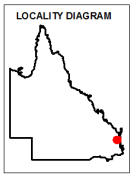
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Map 4 - MSES - Regulated Vegetation



MSES - Regulated Vegetation

Area of Interest
- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Regulated vegetation (intersecting a watercourse)
- Regulated vegetation (100m from wetland)
- Regulated vegetation (category B - endangered or of concern)
- Regulated vegetation (category C - endangered or of concern)
- Regulated vegetation (category R - GBR riverine)
- Regulated vegetation (essential habitat)



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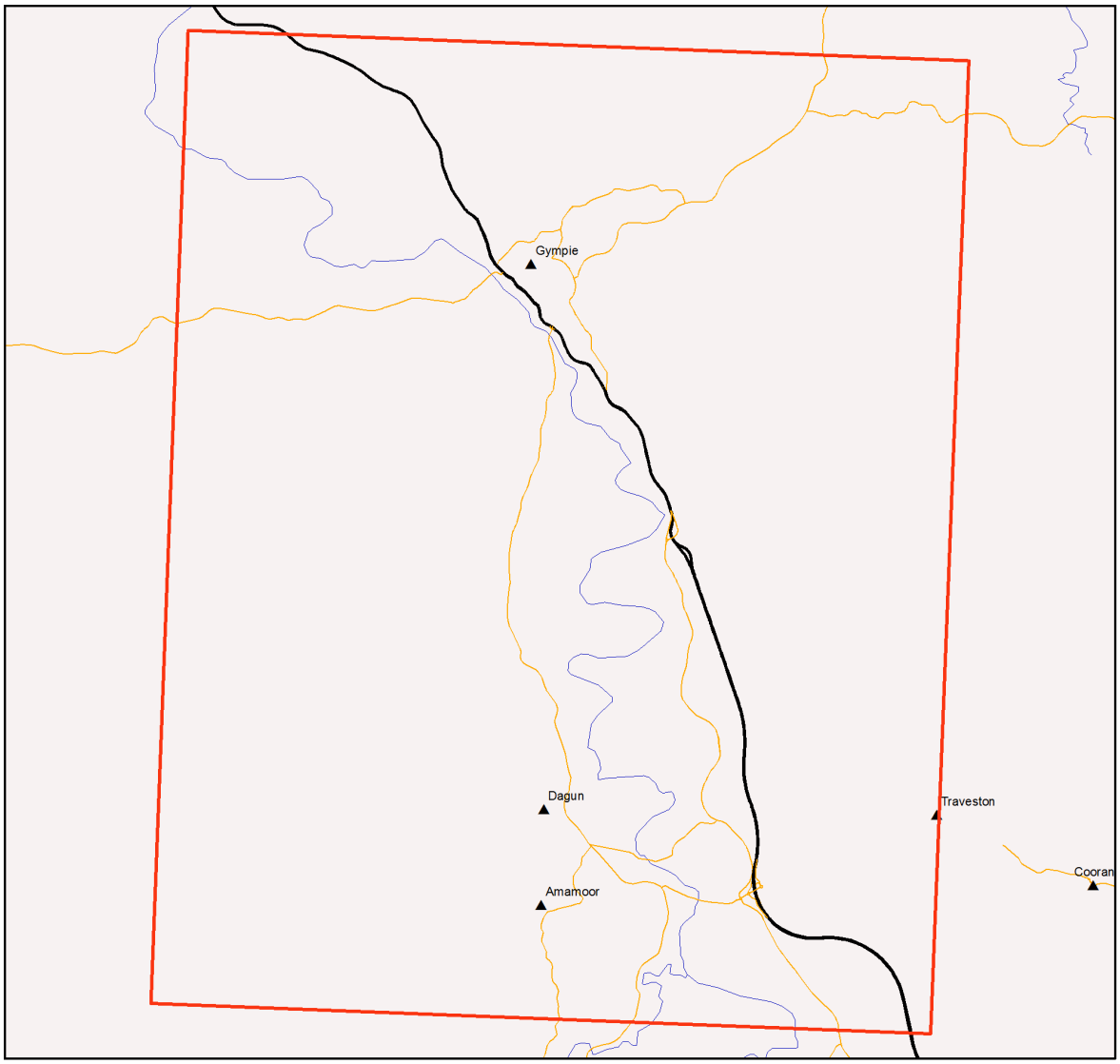
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Map 5 - MSES - Offset Areas

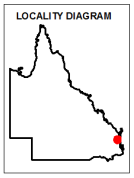


MSES - Offsets

Area of Interest

- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Legally secured offset area (offset register)
- Legally secured offset area (vegetation offsets)

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Appendices

Appendix 1 - Matters of State Environmental Significance (MSES) methodology

MSES mapping is a regional-scale representation of the definition for MSES under the State Planning Policy (SPP). The compiled MSES mapping product is a guide to assist planning and development assessment decision-making. Its primary purpose is to support implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations. Similarly, the SPP biodiversity policy does not override or replace specific requirements of other Acts or regulations.

The Queensland Government's "Method for mapping - matters of state environmental significance for use in land use planning and development assessment" can be downloaded from:

http://www.ehp.qld.gov.au/land/natural-resource/method-mapping-mses.html .

Appendix 2 - Source Data

The datasets listed below are available on request from:

http://qldspatial.information.qld.gov.au/catalogue/custom/index.page

- Matters of State environmental significance

Note: MSES mapping is not based on new or unique data. The primary mapping product draws data from a number of underlying environment databases and geo-referenced information sources. MSES mapping is a versioned product that is updated generally on a twice-yearly basis to incorporate the changes to underlying data sources. Several components of MSES mapping made for the current version may differ from the current underlying data sources. To ensure accuracy, or proper representation of MSES values, it is strongly recommended that users refer to the underlying data sources and review the current definition of MSES in the State Planning Policy, before applying the MSES mapping.

Individual MSES layers can be attributed to the following source data available at QSpatial:

MSES layers	**current QSpatial data (http://qspatial.information.qld.gov.au)**
Protected Areas-Estates, Nature Refuges, Special Wildlife Reserves	- Protected areas of Queensland - Nature Refuges - Queensland - Special Wildlife Reserves- Queensland
Marine Park-Highly Protected Zones	Moreton Bay marine park zoning 2008
Fish Habitat Areas	Queensland fish habitat areas
Strategic Environmental Areas-designated	Regional Planning Interests Act - Strategic Environmental Areas
HES wetlands	Map of Queensland Wetland Environmental Values
Wetlands in HEV waters	HEV waters: - EPP Water intent for waters Source Wetlands: - Queensland Wetland Mapping (Current version 5) Source Watercourses: - Vegetation management watercourse and drainage feature map (1:100000 and 1:250000)
Wildlife habitat (threatened and special least concern)	-WildNet database species records - habitat suitability models (various) - SEQ koala habitat areas under the Koala Conservation Plan 2019
VMA regulated regional ecosystems	Vegetation management regional ecosystem and remnant map
VMA Essential Habitat	Vegetation management - essential habitat map
VMA Wetlands	Vegetation management wetlands map
Legally secured offsets	Vegetation Management Act property maps of assessable vegetation. For offset register data-contact DES
Regulated Vegetation Map	Vegetation management - regulated vegetation management map

Appendix 3 - Acronyms and Abbreviations

AOI	- Area of Interest
DES	- Department of Environment and Science
EP Act	- *Environmental Protection Act 1994*
EPP	- Environmental Protection Policy
GDA94	- Geocentric Datum of Australia 1994
GEM	- General Environmental Matters
GIS	- Geographic Information System
MSES	- Matters of State Environmental Significance
NCA	- *Nature Conservation Act 1992*
RE	- Regional Ecosystem
SPP	- State Planning Policy
VMA	- *Vegetation Management Act 1999*

Queensland Government

Department of Environment and Science

Environmental Reports

Matters of State Environmental Significance

For the selected area of interest
Custom Geometry

Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the point of interest.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Please direct queries about these reports to: Planning.Support@des.qld.gov.au

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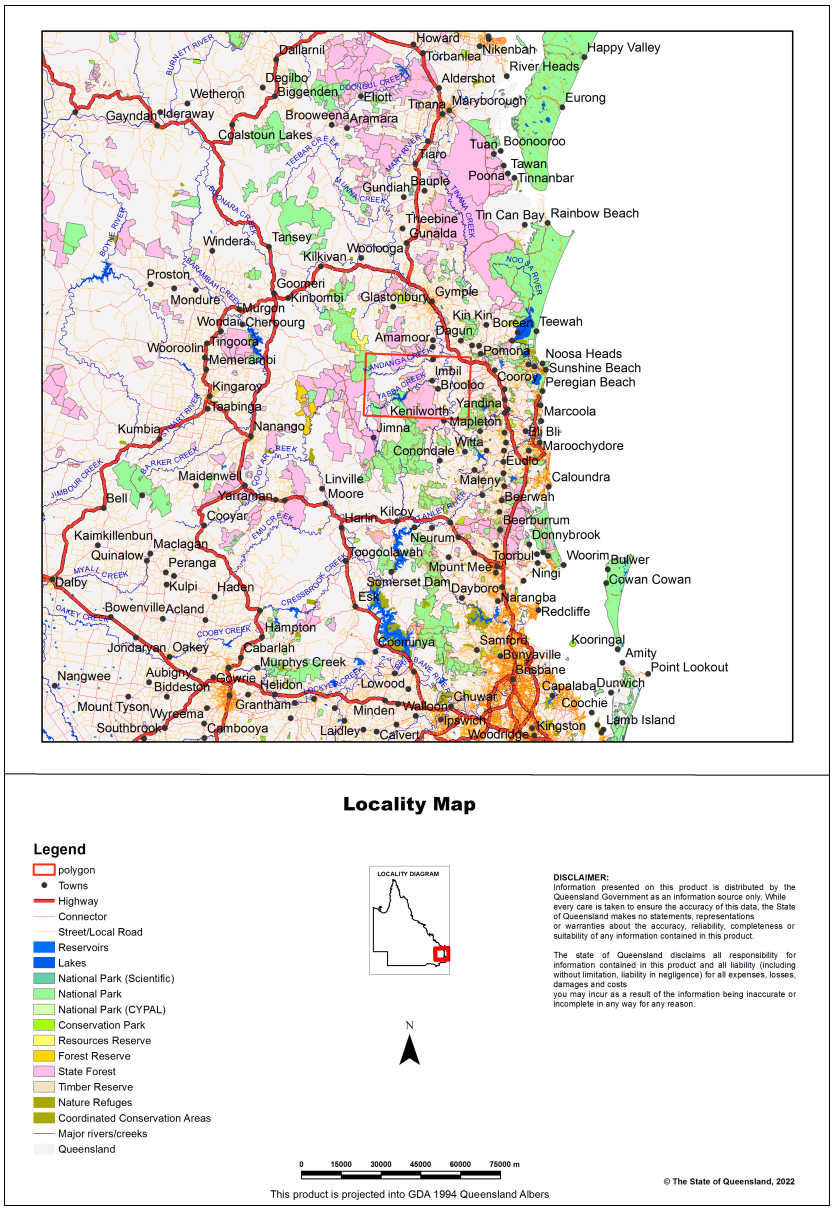
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Assessment Area Details

The following table provides an overview of the area of interest (AOI) with respect to selected topographic and environmental values.

Table 1: Summary table, details for AOI Custom Geometry

Size (ha)	92,615.68
Local Government(s)	Sunshine Coast Regional, Noosa Shire, Gympie Regional, Somerset Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Burringbar - Conondale Ranges, Gympie Block
Catchment(s)	Mary



Matters of State Environmental Significance (MSES)

MSES Categories

Queensland's State Planning Policy (SPP) includes a biodiversity State interest that states:

'The sustainable, long-term conservation of biodiversity is supported. Significant impacts on matters of national or state environmental significance are avoided, or where this cannot be reasonably achieved; impacts are minimised and residual impacts offset.'

The MSES mapping product is a guide to assist planning and development assessment decision-making. Its primary purpose is to support implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations. Similarly, the SPP biodiversity policy does not override or replace specific requirements of other Acts or regulations.

The SPP defines matters of state environmental significance as:

- Protected areas (including all classes of protected area except coordinated conservation areas) under the *Nature Conservation Act 1992* ;

- Marine parks and land within a 'marine national park', 'conservation park', 'scientific research', 'preservation' or 'buffer' zone under the *Marine Parks Act 2004* ;

- Areas within declared fish habitat areas that are management A areas or management B areas under the Fisheries Regulation 2008;

- Threatened wildlife under the *Nature Conservation Act 1992* and special least concern animals under the Nature Conservation (Wildlife) Regulation 2006;

- Regulated vegetation under the *Vegetation Management Act 1999* that is:

    • Category B areas on the regulated vegetation management map, that are 'endangered' or 'of concern' regional ecosystems;

    • Category C areas on the regulated vegetation management map that are 'endangered' or 'of concern' regional ecosystems;

    • Category R areas on the regulated vegetation management map;

    • Regional ecosystems that intersect with watercourses identified on the vegetation management watercourse and drainage feature map;

    • Regional ecosystems that intersect with wetlands identified on the vegetation management wetlands map;

- Strategic Environmental Areas under the *Regional Planning Interests Act 2014* ;

- Wetlands in a wetland protection area of wetlands of high ecological significance shown on the Map of Queensland Wetland Environmental Values under the Environment Protection Regulation 2019;

- Wetlands and watercourses in high ecological value waters defined in the Environmental Protection (Water) Policy 2009, schedule 2;

- Legally secured offset areas.

MSES Values Present

The MSES values that are present in the area of interest are summarised in the table below:

Table 2: Summary of MSES present within the AOI

1a Protected Areas- estates	9334.77 ha	10.1%
1b Protected Areas- nature refuges	176.07 ha	0.2%
1c Protected Areas- special wildlife reserves	0.0 ha	0.0 %
2 State Marine Parks- highly protected zones	0.0 ha	0.0 %
3 Fish habitat areas (A and B areas)	0.0 ha	0.0 %
4 Strategic Environmental Areas (SEA)	0.0 ha	0.0 %
5 High Ecological Significance wetlands on the map of Referable Wetlands	1358.11 ha	1.5%
6a High Ecological Value (HEV) wetlands	51.89 ha	0.1%
6b High Ecological Value (HEV) waterways **	171.1 km	Not applicable
7a Threatened (endangered or vulnerable) wildlife	20221.84 ha	21.8%
7b Special least concern animals	3216.63 ha	3.5%
7c i Koala habitat area - core (SEQ)	5303.07 ha	5.7%
7c ii Koala habitat area - locally refined (SEQ)	330.73 ha	0.4%
8a Regulated Vegetation - Endangered/Of concern in Category B (remnant)	12058.5 ha	13.0%
8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth)	919.65 ha	1.0%
8c Regulated Vegetation - Category R (GBR riverine regrowth)	7259.79 ha	7.8%
8d Regulated Vegetation - Essential habitat	28268.49 ha	30.5%
8e Regulated Vegetation - intersecting a watercourse **	2932.9 km	Not applicable
8f Regulated Vegetation - within 100m of a Vegetation Management Wetland	19.85 ha	0.0%
9a Legally secured offset areas- offset register areas	0.0 ha	0.0 %
9b Legally secured offset areas- vegetation offsets through a Property Map of Assessable Vegetation	0.0 ha	0.0 %

Additional Information with Respect to MSES Values Present

MSES - State Conservation Areas

1a. Protected Areas - estates

Estate name
Wrattens National Park
Mapleton National Park
Mapleton Forest Reserve
Conondale National Park

1b. Protected Areas - nature refuges

Name
Bellbird Stud Nature Refuge
Kenilworth Bluff Nature Refuge
Little Bella Nature Refuge

1c. Protected Areas - special wildlife reserves

(no results)

2. State Marine Parks - highly protected zones

(no results)

3. Fish habitat areas (A and B areas)

(no results)

Refer to **Map 1 - MSES - State Conservation Areas** for an overview of the relevant MSES.

MSES - Wetlands and Waterways

4. Strategic Environmental Areas (SEA)

(no results)

5. High Ecological Significance wetlands on the Map of Queensland Wetland Environmental Values

Natural wetlands that are 'High Ecological Significance' (HES) on the Map of Queensland Wetland Environmental Values are present.

6a. Wetlands in High Ecological Value (HEV) waters

Natural wetlands that occur in HEV (maintain) freshwater and estuarine areas under the Environmental Protection (water) Policy are present.

6b. Waterways in High Ecological Value (HEV) waters

Natural waterways that occur in HEV (maintain) freshwater and estuarine areas under the Environmental Protection (water) Policy are present.

Refer to **Map 2 - MSES - Wetlands and Waterways** for an overview of the relevant MSES.

MSES - Species

7a. Threatened (endangered or vulnerable) wildlife

Values are present

7b. Special least concern animals

Values are present

7c i. Koala habitat area - core (SEQ)

Values are present

7c ii. Koala habitat area - locally refined (SEQ)

Values are present

Threatened (endangered or vulnerable) wildlife habitat suitability models

Species	Common name	NCA status	Presence
Boronia keysii		V	None
Calyptorhynchus lathami	Glossy black cockatoo	V	Core
Casuarius casuarius johnsonii	Sthn population cassowary	E	None
Crinia tinnula	Wallum froglet	V	None
Denisonia maculata	Ornamental snake	V	None
Litoria freycineti	Wallum rocketfrog	V	None
Litoria olongburensis	Wallum sedgefrog	V	None
Melaleuca irbyana		E	None
Petaurus gracilis	Mahogany Glider	E	None
Petrogale persephone	Proserpine rock-wallaby	E	None
Phascolarctos cinereus	Koala - outside SEQ*	V	Core
Pezoporus wallicus wallicus	Eastern ground parrot	V	None
Taudactylus pleione	Kroombit tinkerfrog	E	None
Xeromys myoides	Water Mouse	V	None

**For koala model, this includes areas outside SEQ. Check 7c SEQ koala habitat for presence/absence.*

Threatened (endangered or vulnerable) wildlife species records

Scientific name	Common name	NCA status	EPBC status	Migratory status
Elusor macrurus	Mary River turtle	E	E	
Macadamia ternifolia	bopple nut	V	V	
Petauroides volans	greater glider	V	V	
Ornithoptera richmondia	Richmond birdwing	V		
Podargus ocellatus plumiferus	plumed frogmouth	V		
Mixophyes iteratus	giant barred frog	E	E	
Adelotus brevis	tusked frog	V		
Rostratula australis	Australian painted snipe	E	E	
Ricinocarpos speciosus		V		
Mallotus megadontus		V		
Coleus torrenticola		E	E	
Turnix melanogaster	black-breasted button-quail	V	V	
Rhodamnia rubescens		E		
Dasyurus maculatus maculatus	spotted-tailed quoll (southern subspecies)	V	E	
Corunastylis cranei		V		
Litoria pearsoniana	cascade treefrog	V		
Potorous tridactylus tridactylus	long-nosed potoroo	V	V	
Elseya albagula	southern snapping turtle	E	CE	
Thesium australe	toadflax	V	V	
Marsdenia coronata	slender milkvine	V		
Macadamia integrifolia	macadamia nut	V	V	
Floydia praealta	ball nut	V	V	
Corynocarpus rupestris subsp. arborescens	southern corynocarpus	V		
Picris conyzoides		V		
Lenwebbia sp. (Blackall Range P.R.Sharpe 5387)		E		
Ninox strenua	powerful owl	V		
Rhodomyrtus psidioides	native guava	E		
Acanthophis antarcticus	common death adder	V		
Cyclopsitta diophthalma coxeni	Coxen's fig-parrot	E	E	
Geophaps scripta scripta	squatter pigeon (southern subspecies)	V	V	

Special least concern animal species records

Scientific name	Common name	Migratory status
Ornithorhynchus anatinus	platypus	
Tachyglossus aculeatus	short-beaked echidna	
Gallinago hardwickii	Latham's snipe	M-J/R/B/E

**Nature Conservation Act 1992 (NCA) Status- Endangered (E), Vulnerable (V) or Special Least Concern Animal (SL). Environment Protection and Biodiversity Conservation Act 1999 (EPBC) status: Critically Endangered (CE) Endangered (E), Vulnerable (V)*

Migratory status (M) - China and Australia Migratory Bird Agreement (C), Japan and Australia Migratory Bird Agreement (J), Republic of Korea and Australia Migratory Bird Agreement (R), Bonn Migratory Convention (B), Eastern Flyway (E)

To request a species list for an area, or search for a species profile, access Wildlife Online at:

https://www.qld.gov.au/environment/plants-animals/species-list/

Refer to **Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals** and **Map 3b - MSES - Species - Koala habitat area (SEQ)** for an overview of the relevant MSES.

MSES - Regulated Vegetation

For further information relating to regional ecosystems in general, go to:

https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/

For a more detailed description of a particular regional ecosystem, access the regional ecosystem search page at:

https://environment.ehp.qld.gov.au/regional-ecosystems/

8a. Regulated Vegetation - Endangered/Of concern in Category B (remnant)

Regional ecosystem	Vegetation management polygon	Vegetation management status
12.11.9	O-dom	rem_oc
12.3.1a	E-dom	rem_end
12.8.13	O-dom	rem_oc
12.3.2	O-dom	rem_oc
12.3.11	O-dom	rem_oc
12.11.9/12.11.3	O-dom	rem_oc
12.11.3/12.11.9	O-subdom	rem_oc
12.11.14	O-dom	rem_oc
12.3.7/12.3.11	O-subdom	rem_oc
12.3.8	O-dom	rem_oc
12.3.2/12.3.1a	E-subdom	rem_end
12.8.16	O-dom	rem_oc
12.11.15	O-dom	rem_oc
12.3.1a/12.3.2	E-dom	rem_end
12.11.3/12.11.14	O-subdom	rem_oc
12.3.1a/12.3.2/12.3.11	E-dom	rem_end
12.12.12	O-dom	rem_oc
12.12.14	O-dom	rem_oc
12.12.14/12.12.10	O-dom	rem_oc
12.12.1	O-dom	rem_oc
12.11.2/12.11.9	O-subdom	rem_oc
12.3.11/12.3.7	O-dom	rem_oc
12.12.10	O-dom	rem_oc

Regional ecosystem	Vegetation management polygon	Vegetation management status
12.12.28/12.12.23	O-dom	rem_oc
12.12.2/12.12.6	O-subdom	rem_oc
12.12.16/12.12.1	O-subdom	rem_oc
12.3.7/12.3.1a	E-subdom	rem_end
12.12.15/12.12.28	O-subdom	rem_oc
12.11.18/12.11.3/12.11.9	O-subdom	rem_oc

8b. Regulated Vegetation - Endangered/Of concern in Category C (regrowth)

Regional ecosystem	Vegetation management polygon	Vegetation management status
12.11.14	O-dom	hvr_oc
12.3.11	O-dom	hvr_oc
12.11.9	O-dom	hvr_oc
12.3.1a	E-dom	hvr_end
12.5.2a	E-dom	hvr_end
12.11.3/12.11.14	O-subdom	hvr_oc
12.12.12	O-dom	hvr_oc
12.3.1a/12.3.2	E-dom	hvr_end
12.8.13	O-dom	hvr_oc
12.3.1a/12.3.2/12.3.11	E-dom	hvr_end
12.3.2	O-dom	hvr_oc
12.12.2/12.12.6	O-subdom	hvr_oc
12.3.7/12.3.1a	E-subdom	hvr_end
12.11.15	O-dom	hvr_oc
12.3.7/12.3.11	O-subdom	hvr_oc
12.8.16	O-dom	hvr_oc
12.3.11/12.3.7	O-dom	hvr_oc
12.11.3/12.11.9	O-subdom	hvr_oc
12.12.14	O-dom	hvr_oc
12.12.1	O-dom	hvr_oc

8c. Regulated Vegetation - Category R (GBR riverine regrowth)

Regulated vegetation map category	Map number
R	9445
R	9344
R	9345
R	9444

8d. Regulated Vegetation - Essential habitat

Values are present

8e. Regulated Vegetation - intersecting a watercourse**

A vegetation management watercourse is mapped as present

8f. Regulated Vegetation - within 100m of a Vegetation Management wetland

Regulated vegetation map category	Map number
R	9445
B	9445

Refer to **Map 4 - MSES - Regulated Vegetation** for an overview of the relevant MSES.

MSES - Offsets

9a. Legally secured offset areas - offset register areas

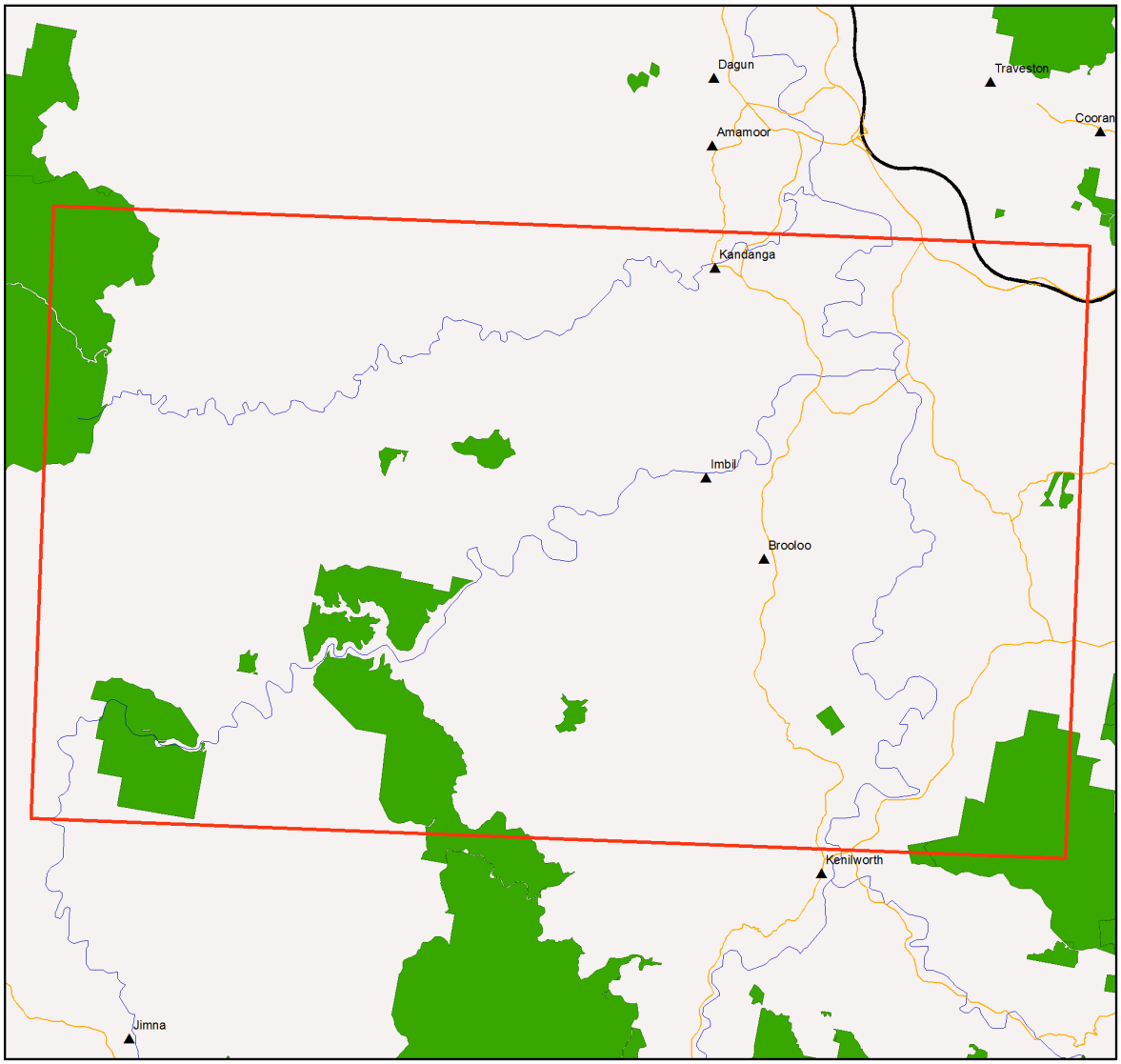
(no results)

9b. Legally secured offset areas - vegetation offsets through a Property Map of Assessable Vegetation

(no results)

Refer to **Map 5 - MSES - Offset Areas** for an overview of the relevant MSES.

Map 1 - MSES - State Conservation Areas

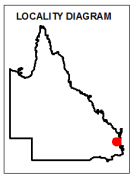


MSES - State Conservation Areas

Area of Interest

- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Protected area (estates, nature refuges, special wildlife reserves)
- Declared fish habitat area (A and B areas)
- Marine park (highly protected)

LOCALITY DIAGRAM



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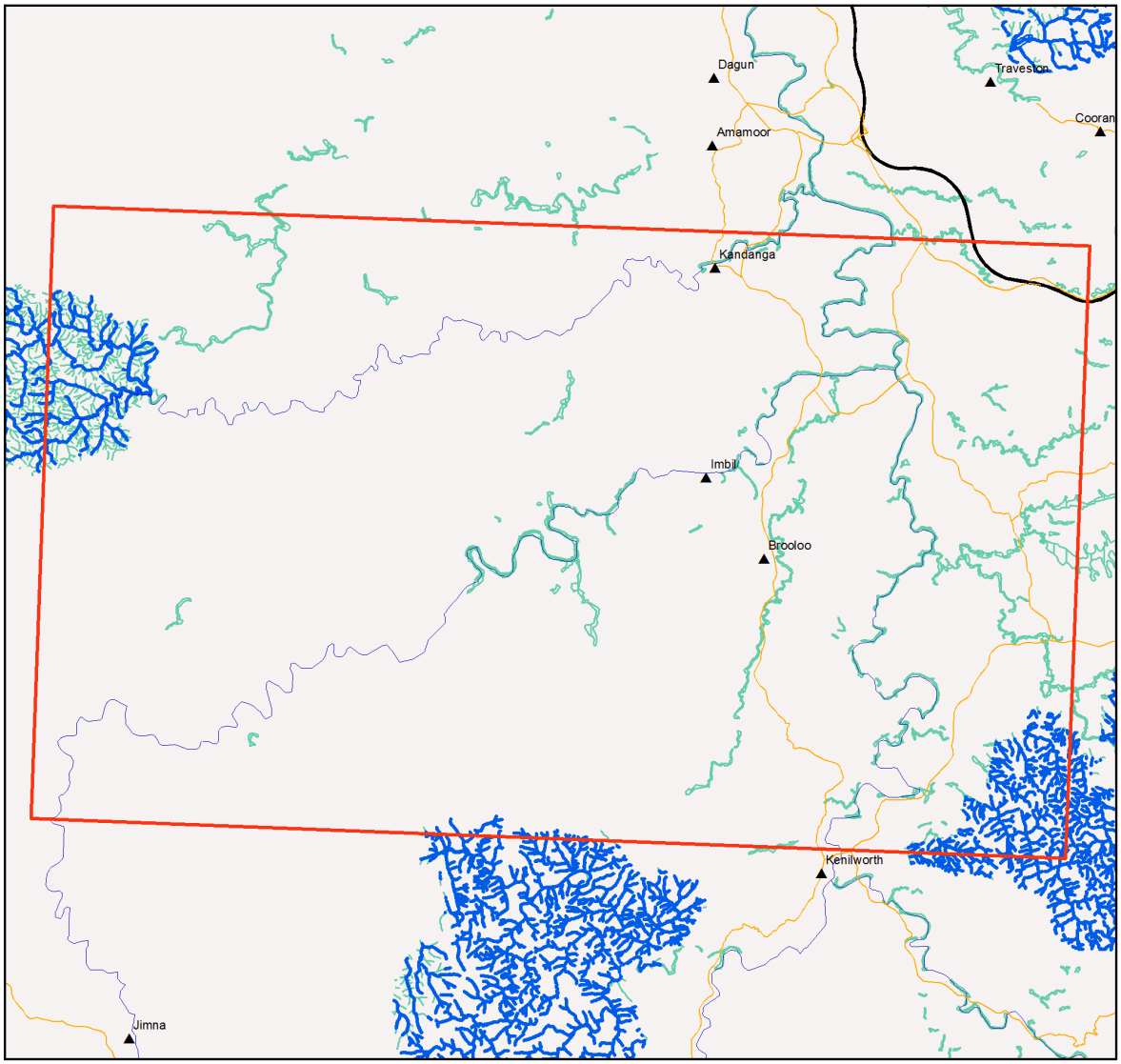
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0 2300 4600 6900 9200 11500 m

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Map 2 - MSES - Wetlands and Waterways

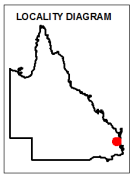


MSES - Wetlands and Waterways

Area of Interest

- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Declared high ecological value waters (watercourse)
- Strategic environmental area (designated precinct)
- Declared high ecological value waters (wetland)
- High ecological significance wetlands

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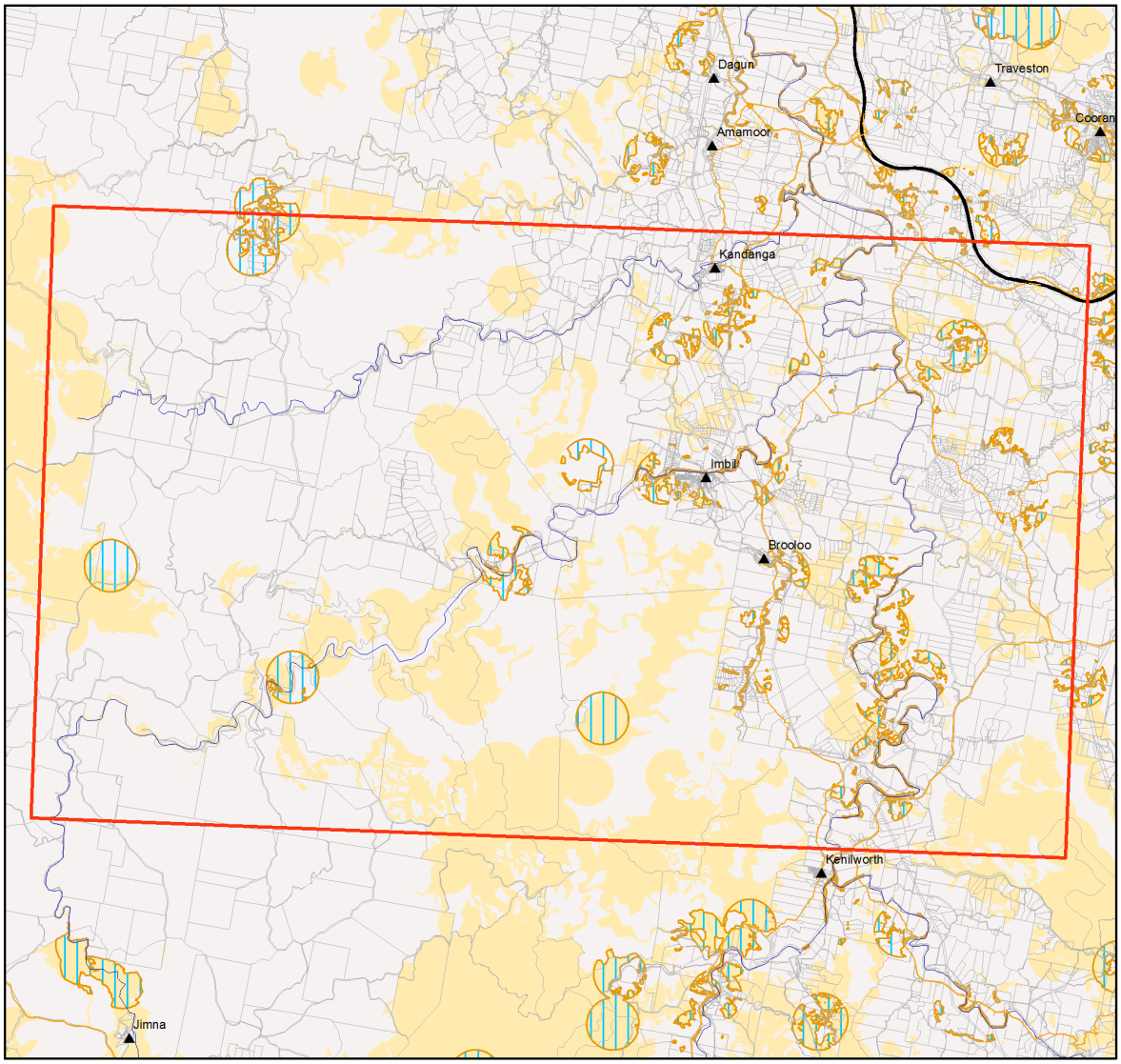
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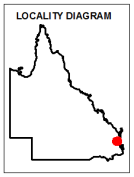
Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals



MSES - Species
Threatened (endangered or vulnerable) wildlife and special least concern animals

Area of Interest

- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Wildlife habitat (special least concern)
- Wildlife habitat (endangered or vulnerable)



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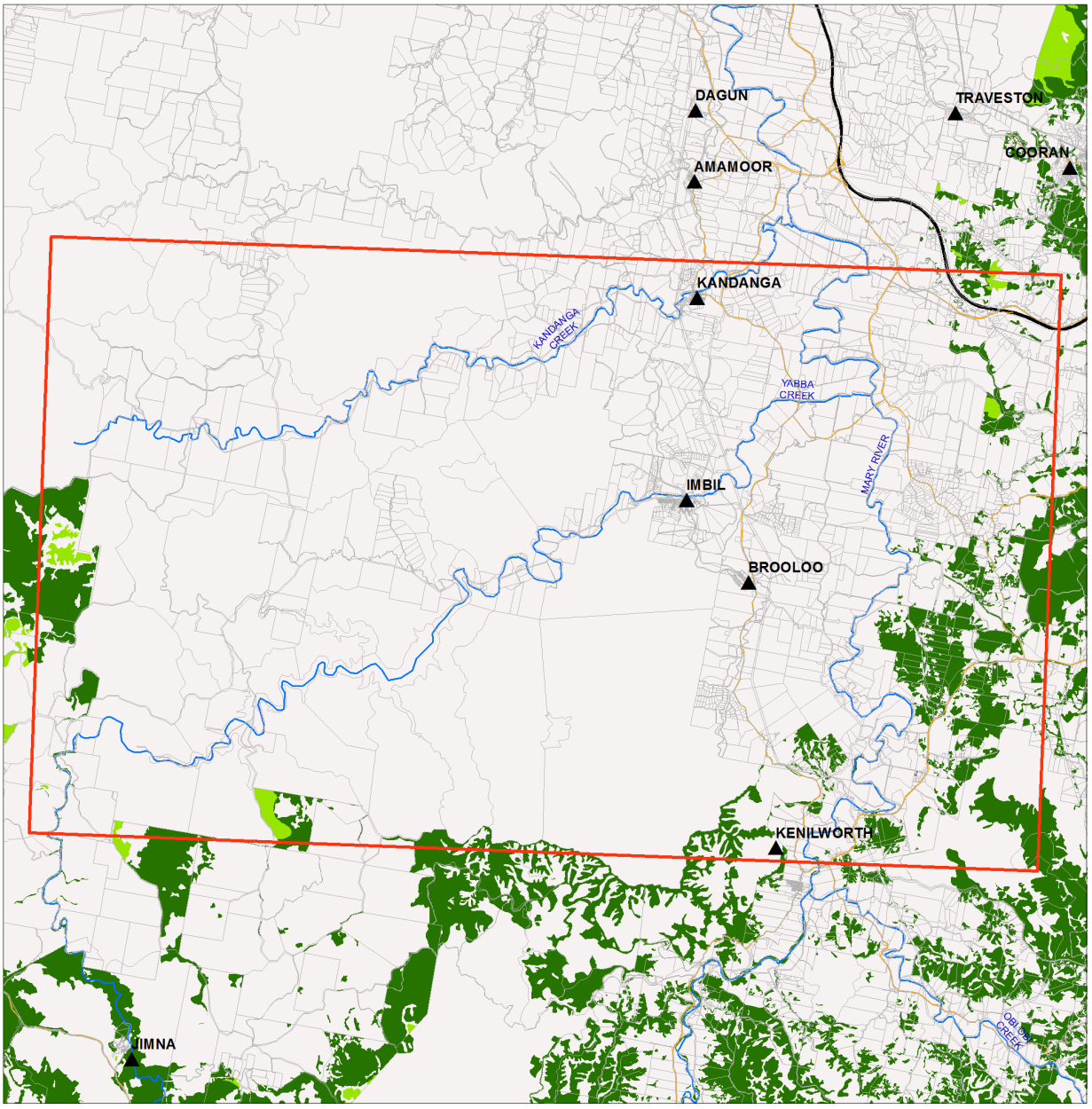
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Map 3b - MSES - Species - Koala habitat area (SEQ)



MSES - Species
Koala habitat area (SEQ)

Area of Interest
- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Koala habitat area (core)
- Koala habitat area (locally refined)

LOCALITY DIAGRAM



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The represented layers for SEQ 'koala habitat area-core' and 'koala habitat area- locally refined' in MSES are sourced directly from the regulatory mapping under the Nature Conservation (Koala) Conservation Plan 2017. Whilst every effort is made to ensure the information remains current, there may be delays between updating versions. Please refer to the original mapping for the most recent version. See https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping

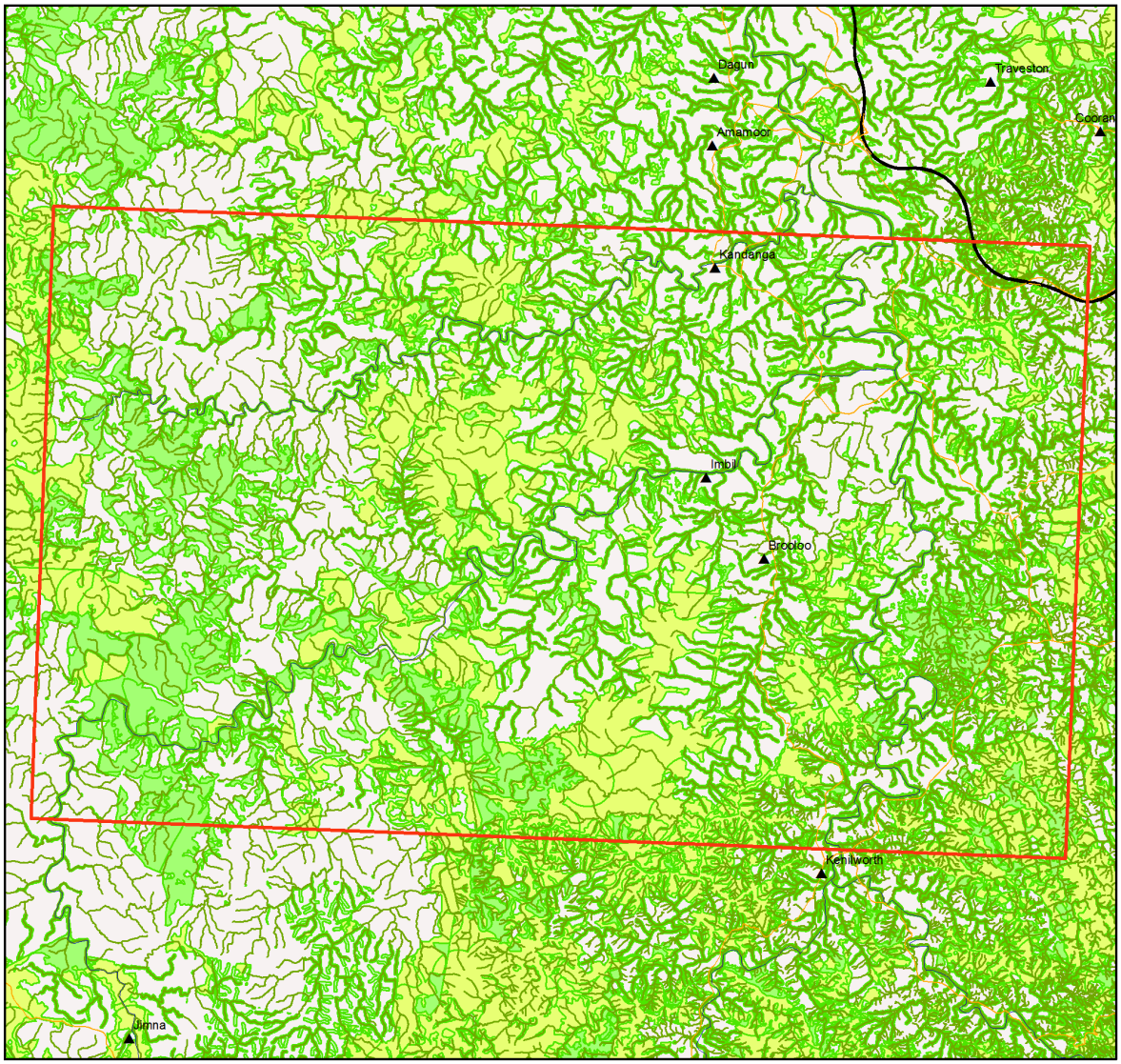
The koala habitat mapping within South East Queensland uses regional ecosystem linework compiled at a scale varying from 1:25,000 to 1:100,000. Linework should be used as a guide only. The positional accuracy of regional ecosystem data mapped at a scale of 1:100,000 is +/- 100 metres.

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0 2,100 4,200 6,300 8,400 10,500 m

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Map 4 - MSES - Regulated Vegetation

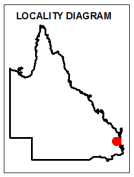


MSES - Regulated Vegetation

Area of Interest

- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Regulated vegetation (intersecting a watercourse)
- Regulated vegetation (100m from wetland)
- Regulated vegetation (category B - endangered or of concern)
- Regulated vegetation (category C - endangered or of concern)
- Regulated vegetation (category R - GBR riverine)
- Regulated vegetation (essential habitat)

LOCALITY DIAGRAM



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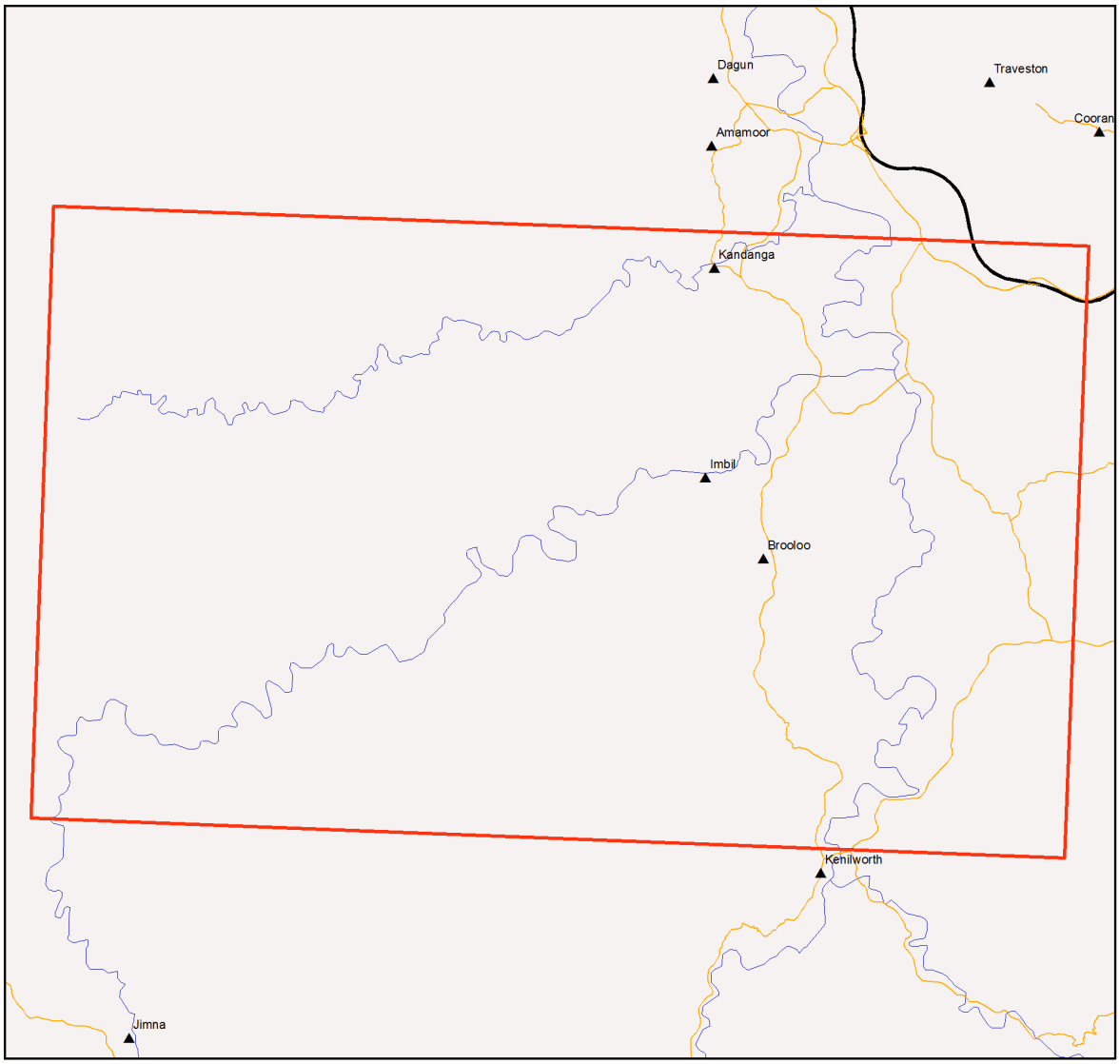
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Map 5 - MSES - Offset Areas

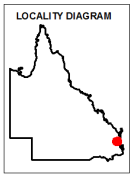


MSES - Offsets

Area of Interest

- polygon
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Legally secured offset area (offset register)
- Legally secured offset area (vegetation offsets)

LOCALITY DIAGRAM



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0 2300 4600 6900 9200 11500 m

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Appendices

Appendix 1 - Matters of State Environmental Significance (MSES) methodology

MSES mapping is a regional-scale representation of the definition for MSES under the State Planning Policy (SPP). The compiled MSES mapping product is a guide to assist planning and development assessment decision-making. Its primary purpose is to support implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations. Similarly, the SPP biodiversity policy does not override or replace specific requirements of other Acts or regulations.

The Queensland Government's "Method for mapping - matters of state environmental significance for use in land use planning and development assessment" can be downloaded from:

http://www.ehp.qld.gov.au/land/natural-resource/method-mapping-mses.html .

Appendix 2 - Source Data

The datasets listed below are available on request from:

http://qldspatial.information.qld.gov.au/catalogue/custom/index.page

- Matters of State environmental significance

Note: MSES mapping is not based on new or unique data. The primary mapping product draws data from a number of underlying environment databases and geo-referenced information sources. MSES mapping is a versioned product that is updated generally on a twice-yearly basis to incorporate the changes to underlying data sources. Several components of MSES mapping made for the current version may differ from the current underlying data sources. To ensure accuracy, or proper representation of MSES values, it is strongly recommended that users refer to the underlying data sources and review the current definition of MSES in the State Planning Policy, before applying the MSES mapping.

Individual MSES layers can be attributed to the following source data available at QSpatial:

MSES layers	**current QSpatial data (http://qspatial.information.qld.gov.au)**
Protected Areas-Estates, Nature Refuges, Special Wildlife Reserves	- Protected areas of Queensland - Nature Refuges - Queensland - Special Wildlife Reserves- Queensland
Marine Park-Highly Protected Zones	Moreton Bay marine park zoning 2008
Fish Habitat Areas	Queensland fish habitat areas
Strategic Environmental Areas-designated	Regional Planning Interests Act - Strategic Environmental Areas
HES wetlands	Map of Queensland Wetland Environmental Values
Wetlands in HEV waters	HEV waters: - EPP Water intent for waters Source Wetlands: - Queensland Wetland Mapping (Current version 5) Source Watercourses: - Vegetation management watercourse and drainage feature map (1:100000 and 1:250000)
Wildlife habitat (threatened and special least concern)	-WildNet database species records - habitat suitability models (various) - SEQ koala habitat areas under the Koala Conservation Plan 2019
VMA regulated regional ecosystems	Vegetation management regional ecosystem and remnant map
VMA Essential Habitat	Vegetation management - essential habitat map
VMA Wetlands	Vegetation management wetlands map
Legally secured offsets	Vegetation Management Act property maps of assessable vegetation. For offset register data-contact DES
Regulated Vegetation Map	Vegetation management - regulated vegetation management map

Appendix 3 - Acronyms and Abbreviations

AOI	- Area of Interest
DES	- Department of Environment and Science
EP Act	- *Environmental Protection Act 1994*
EPP	- Environmental Protection Policy
GDA94	- Geocentric Datum of Australia 1994
GEM	- General Environmental Matters
GIS	- Geographic Information System
MSES	- Matters of State Environmental Significance
NCA	- *Nature Conservation Act 1992*
RE	- Regional Ecosystem
SPP	- State Planning Policy
VMA	- *Vegetation Management Act 1999*

Australian Government

Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

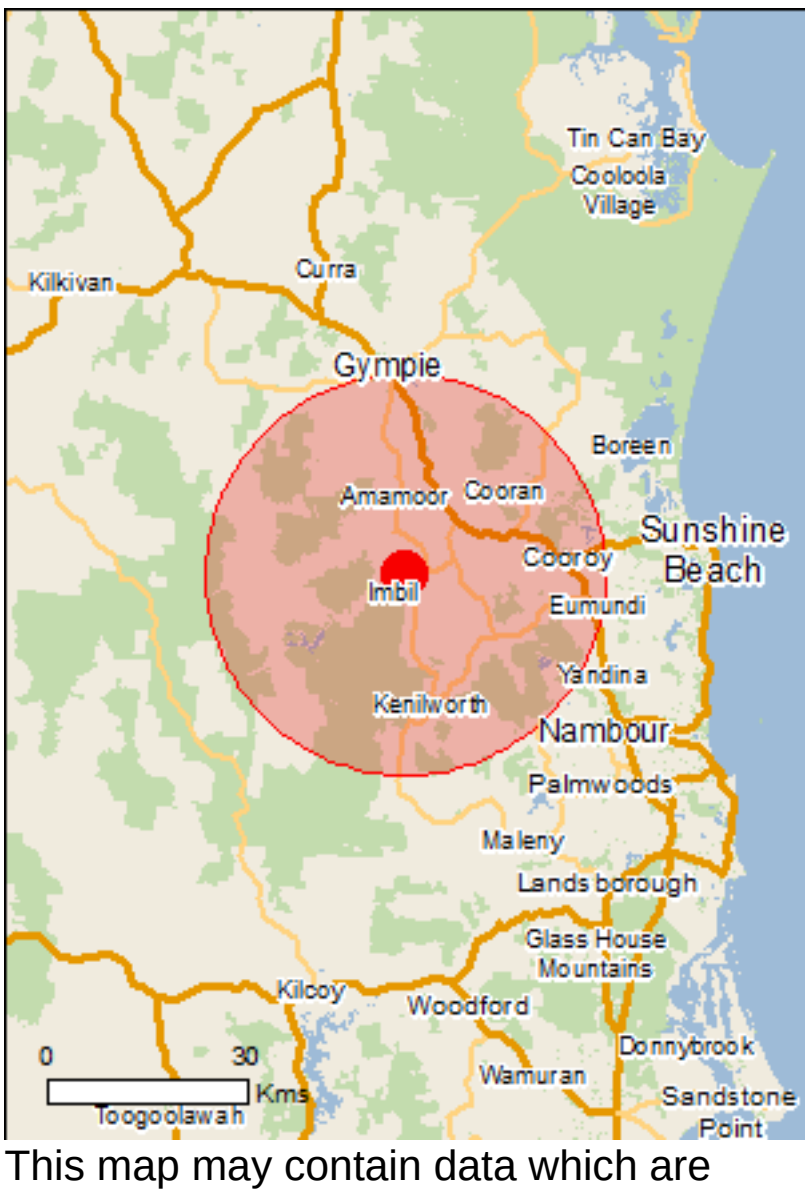
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 25/05/22 12:07:14

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

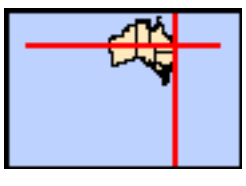
Caveat
Acknowledgements



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

Coordinates

Buffer: 30.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	76
Listed Migratory Species:	17

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	1
Commonwealth Heritage Places:	1
Listed Marine Species:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	52
Regional Forest Agreements:	None
Invasive Species:	42
Nationally Important Wetlands:	2
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar) [Resource Information]

Name	Proximity
Great sandy strait (including great sandy strait, tin can bay and tin can	20 - 30km upstream

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community known to occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat likely to occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat known to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat known to occur within area
Fish		
Maccullochella mariensis Mary River Cod [83806]	Endangered	Species or species habitat known to occur within area
Nannoperca oxleyana Oxleyan Pygmy Perch [64468]	Endangered	Species or species habitat may occur within area
Neoceratodus forsteri Australian Lungfish, Queensland Lungfish [67620]	Vulnerable	Species or species habitat known to occur within area
Pseudomugil mellis Honey Blue Eye, Honey Blue-eye [26180]	Vulnerable	Species or species habitat may occur within area
Frogs		
Litoria olongburensis Wallum Sedge Frog [1821]	Vulnerable	Species or species habitat may occur within area
Mixophyes fleayi Fleay's Frog [25960]	Endangered	Species or species habitat known to occur within area
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Vulnerable	Species or species habitat known to occur within area
Insects		
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat likely to occur within area
Phyllodes imperialis smithersi Pink Underwing Moth [86084]	Endangered	Breeding may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat known to occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area
Potorous tridactylus tridactylus Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Plants		
Acacia attenuata [10690]	Vulnerable	Species or species habitat likely to occur within area
Archidendron lovelliae Bacon Wood, Tulip Siris [13451]	Vulnerable	Species or species habitat known to occur within area
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area
Baloghia marmorata Marbled Balogia, Jointed Baloghia [8463]	Vulnerable	Species or species habitat likely to occur within area
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area
Cossinia australiana Cossinia [3066]	Endangered	Species or species habitat likely to occur within area
Cryptocarya foetida Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat likely to occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area
Cupaniopsis shirleyana Wedge-leaf Tuckeroo [3205]	Vulnerable	Species or species habitat known to occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Eucalyptus conglomerata Swamp Stringybark [3160]	Endangered	Species or species habitat may occur within area
Floydia praealta Ball Nut, Possum Nut, Big Nut, Beefwood [15762]	Vulnerable	Species or species habitat known to occur within area

Name	Status	Type of Presence
Fontainea rostrata [24039]	Vulnerable	Species or species habitat likely to occur within area
Fontainea venosa [24040]	Vulnerable	Species or species habitat known to occur within area
Haloragis exalata subsp. velutina Tall Velvet Sea-berry [16839]	Vulnerable	Species or species habitat may occur within area
Lepidium peregrinum Wandering Pepper-cress [14035]	Endangered	Species or species habitat may occur within area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat known to occur within area
Macadamia ternifolia Small-fruited Queensland Nut, Gympie Nut [7214]	Vulnerable	Species or species habitat known to occur within area
Macadamia tetraphylla Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat known to occur within area
Macrozamia pauli-guilielmi Pineapple Zamia [5712]	Endangered	Species or species habitat likely to occur within area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat may occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat known to occur within area
Planchonella eerwah Shiny-leaved Condoo, Black Plum, Wild Apple [17340]	Endangered	Species or species habitat likely to occur within area
Plectranthus nitidus Nightcap Plectranthus, Silver Plectranthus [55742]	Endangered	Species or species habitat likely to occur within area
Plectranthus omissus [55729]	Endangered	Species or species habitat may occur within area
Plectranthus torrenticola [55728]	Endangered	Species or species habitat likely to occur within area
Prostanthera spathulata [88266]	Vulnerable	Species or species habitat likely to occur within area
Rhaponticum australe Austral Cornflower, Native Thistle [22647]	Vulnerable	Species or species habitat likely to occur within area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat known to occur within area

Name	Status	Type of Presence
Romnalda strobilacea [5948]	Vulnerable	Species or species habitat likely to occur within area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area
Sarcochilus fitzgeraldii Ravine Orchid [19131]	Vulnerable	Species or species habitat likely to occur within area
Sarcochilus weinthalii Blotched Sarcochilus, Weinthals Sarcanth [12673]	Vulnerable	Species or species habitat likely to occur within area
Sophora fraseri [8836]	Vulnerable	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area
Triunia robusta Glossy Spice Bush [14747]	Endangered	Species or species habitat known to occur within area
Xanthostemon oppositifolius Penda, Southern Penda, Luya's Hardwood [8738]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		
Coeranoscincus reticulatus Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat known to occur within area
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area
Elseya albagula Southern Snapping Turtle, White-throated Snapping Turtle [81648]	Critically Endangered	Species or species habitat known to occur within area
Elusor macrurus Mary River Turtle, Mary River Tortoise [64389]	Endangered	Species or species habitat known to occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Marine Species		
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		

Name	Threatened	Type of Presence
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area
Limnodromus semipalmatus Asian Dowitcher [843]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Defence - GYMPIE TRAINING DEPOT

Commonwealth Heritage Places [Resource Information]

Name	State	Status
Historic		
Cooroy Post Office	QLD	Listed place

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat likely to occur within area
Anseranas semipalmata		
Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea ibis		
Cattle Egret [59542]		Breeding likely to occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus		
White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor		
Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Limnodromus semipalmatus		
Asian Dowitcher [843]		Species or species habitat may occur within area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis		
Black-faced Monarch [609]		Species or species

Name	Threatened	Type of Presence
		habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area
Reptiles		
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Amamoor	QLD
Bellbird Stud	QLD
Braehead	QLD
Burrawingee	QLD
Conondale	QLD
Conondale	QLD
Curramore	QLD
Curramore Farm Forest	QLD
Curramore Farm Forest	QLD
Curramore Sanctuary	QLD
Cycadelic	QLD
Gil'la	QLD
Glastonbury	QLD
Golden Gully	QLD
Goomboorian	QLD
Gumnut Park	QLD
Haven	QLD
Jilumbar	QLD
Kenilworth Bluff	QLD
King	QLD
Kondalilla	QLD
Koolewong	QLD

Name	State
Lacebark	QLD
Little Bella	QLD
Maleny	QLD
Mapleton	QLD
Mapleton	QLD
Mapleton	QLD
Mapleton Falls	QLD
Maroochy 2	QLD
Mount Cooroy	QLD
Mount Eerwah	QLD
Mount Monty Rainforest	QLD
Mount Pinbarren	QLD
Rainforest Ridge	QLD
Rainforest Ridge	QLD
Rivendell	QLD
Rock of Ages	QLD
Six Mile Creek	QLD
Stoney Edge	QLD
Symplocos	QLD
Tewantin	QLD
Tuan Environmental Reserve	QLD
Tuchekoi	QLD
Tuchekoi	QLD
Wong'ai	QLD
Woondum	QLD
Woondum	QLD
Wrattens	QLD
Wrattens	QLD
Wurraglen	QLD
Yurol	QLD

Invasive Species

[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard, Northern Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove, Spotted Dove [780]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Equus caballus Horse [5]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Annona glabra Pond Apple, Pond-apple Tree, Alligator Apple, Bullock's Heart, Cherimoya, Monkey Apple, Bobwood, Corkwood [6311]		Species or species habitat likely to occur within area
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Asparagus africanus Climbing Asparagus, Climbing Asparagus Fern [66907]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. rotundata Bitou Bush [16332]		Species or species habitat likely to occur within area
Cryptostegia grandiflora Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda [18913]		Species or species habitat likely to occur within area
Dolichandra unguis-cati Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]		Species or species habitat likely to occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Hymenachne amplexicaulis Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Prosopis spp. Mesquite, Algaroba [68407]		Species or species habitat likely to occur within area
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area
Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat may occur within area

Nationally Important Wetlands	[Resource Information]
Name	State
Conondale Range Aggregation	QLD
Obi Obi Creek	QLD

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-26.43959 152.69059

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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WetlandMaps Report



For selected area of interest Custom Geometry

Current as at 05/07/2022

Environmental Reports - General Information

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is ot present within the Area of Interest(AOI) (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no matters of interest have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Important Note to User

Information presented in this report is based upon the mapping of water bodies and wetland regional ecosystems across Queensland. The Queensland wetland mapping was produced using existing information including water body mapping derived from Landsat satellite imagery, regional ecosystem mapping, topographic data, and a springs database. The result is a consistent wetland map for the whole of Queensland.

Ancillary data, such as higher resolution imagery (for example SPOT and aerial photographs), other vegetation and wetland mapping, geology, soil and land system mapping was also used in attributing and assessing the derived Queensland Wetlands Program wetland mapping products.

The wetland mapping was done in accordance with a detailed peer reviewed methodology which included quality assurance measures for all steps in the process. For more detailed information on how the Queensland Wetlands Program wetland mapping was produced, please see the Wetland Mapping and Classification Methodology.

Disclaimer

The State of Queensland, as represented by this department, gives no warranty in relation to the data (including without limitation, accuracy, reliability, completeness or fitness for a particular purpose) hosted on this website.

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Summary Information

The following table provides an overview of the area of interest.

Table 1. Area of interest details

Size (ha)	54,831.55
Local Government(s)	Noosa Shire, Gympie Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Gympie Block
Catchment(s)	Mary
Drainage sub-basin	Upper Mary River, Lower Mary River

NRM Regions

The following NRM region(s) are in the area of interest:

Burnett Mary Regional Group

Water Resource Plan Boundaries

The following Water Resource Plan(s) are in the area of interest:

Mary Basin

Learn more about how Wetlands are mapped in Queensland:

Queensland Wetlands Mapping Definitions

Wetlands are areas of permanent or periodic/intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed 6 metres. To be a wetland the area must have one or more of the following attributes:

- at least periodically the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or
- the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or
- the substratum is not soil and is saturated with water, or covered by water at some time.

Examples under this definition **include**:

- those areas shown as a river, stream, creek, swamp, lake, marsh, waterhole, wetland, billabong, pool or spring on the latest Sunmap 1:25,000, 1:50,000, 1:100,000 or 1:250,000 topographic map
- areas defined as wetlands on local or regional maps prepared with the aim of mapping wetlands
- wetland regional ecosystems (REs) as defined by the Queensland Herbarium (Environmental Protection Agency 2005a)
- areas containing recognised hydrophytes as provided by the Queensland Herbarium
- saturated parts of the riparian zone
- artificial wetlands such as farm dams
- water bodies not connected to rivers or flowing water such as billabongs and rock pools.

Examples under this definition **exclude**:

- areas that may be covered by water but are not wetlands according to the definition
- floodplains that are intermittently covered by flowing water but do not meet the hydrophytes and soil criteria
- riparian zone above the saturation level.

Wetland Systems

Riverine wetlands are all wetlands and deepwater habitats within a channel. The channels are naturally or artificially created, periodically or continuously contain moving water, or connecting two bodies of standing water.

Palustrine wetlands are primarily vegetated non-channel environments of less than 8 hectares. They include billabongs, swamps, bogs, springs, soaks etc, and have more than 30% emergent vegetation.

Lacustrine wetlands are large, open, water-dominated systems (for example, lakes) larger than 8ha. This definition also applies to modified systems (for example, dams), which are similar to lacustrine systems (for example, deep, standing or slow-moving waters).

Marine wetlands include the area of ocean from the coastline or estuary, extending to the jurisdictional limits of Queensland waters (3 nautical mile limit). This definition differs from that in Ramsar, as it includes waters deeper than 6m below the lowest astronomical tide.

Estuarine wetlands are those with oceanic water sometimes diluted with freshwater run-off from the land.

Subterranean wetlands are wetlands occurring below the surface of the ground and that are fed by groundwater i.e. caves and aquifers. These wetlands provide water to groundwater dependent ecosystems.

Methodology and Wetland Classification: https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/wetland-background/

Links and support

Other sites that deliver wetland related information include:

Wetland*Summary* tool: https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/

Queensland Spatial Catalogue: http://qldspatial.information.qld.gov.au/catalogue/custom/index.page

Queensland Globe: https://qldglobe.information.qld.gov.au/

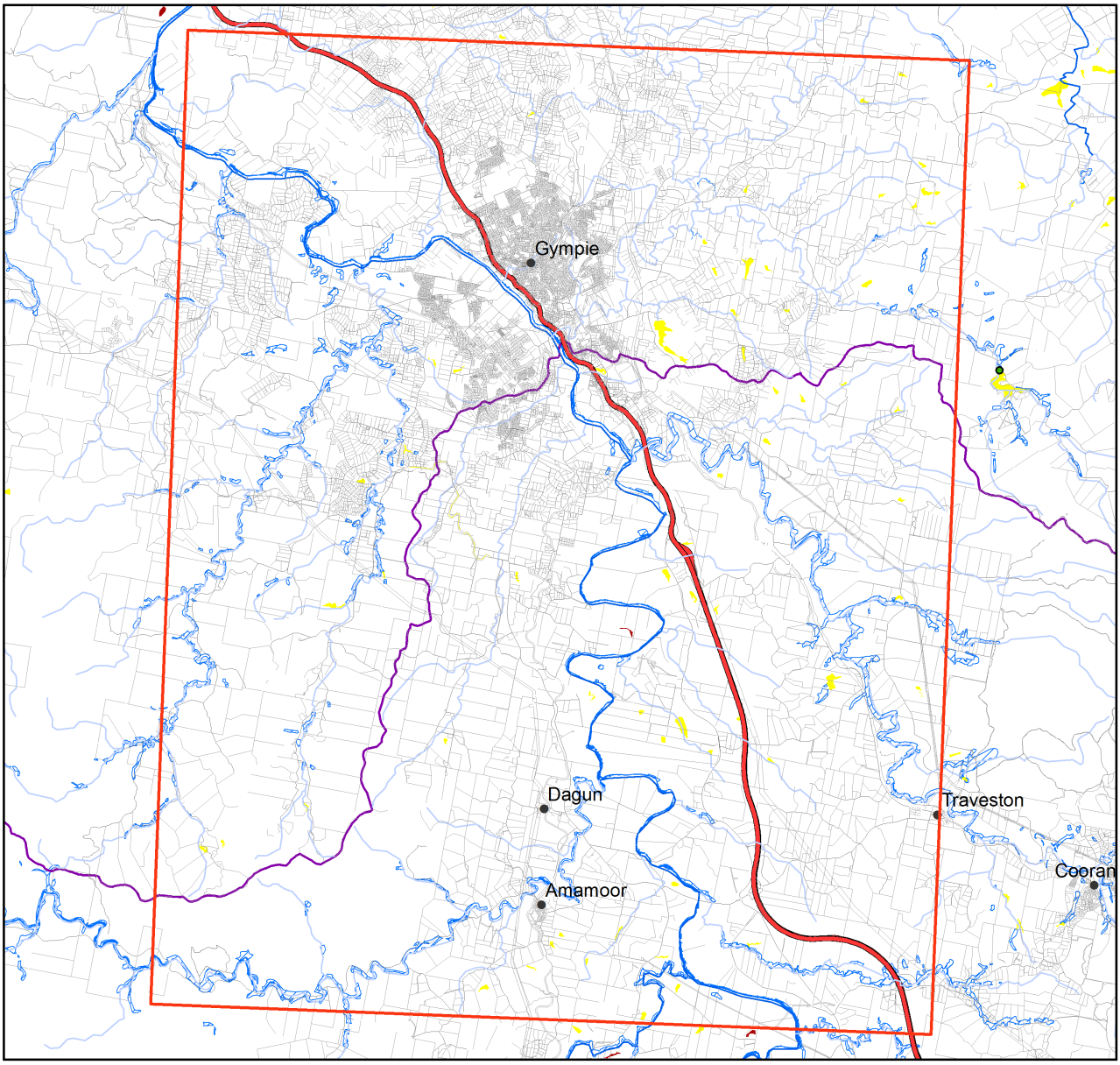
Environmental reports online: https://environment.ehp.qld.gov.au/report-request/environment/

Wetland on-line education modules: https://wetlandinfo.des.qld.gov.au/wetlands/resources/training/

Regional Ecosystem Mapping information: : https://www.qld.gov.au/environment/plants-animals/plants/herbarium/mapping-ecosystems

Aquatic Conservation Assessments: : https://wetlandinfo.des.qld.gov.au/wetlands/assessment/assessment-methods/aca/

Groundwater Dependant Ecosystems information: https://wetlandinfo.des.qld.gov.au/wetlands/ecology/aquatic-ecosystems-natural/groundwater-dependent/



Legend

- polygon
- Springs
- Dams and weirs
- Towns
- Highways
- Roads
- Cadastral boundaries
- Sub-basin

Wetland Mapping

Wetland System - Water Bodies

- Marine Waterbodies
- Estuarine Waterbodies
- Riverine Waterbodies
- Lacustrine Waterbodies
- Palustrine Waterbodies

Wetland System - Regional Ecosystems

- Marine RE
- Estuarine RE
- Riverine RE
- Lacustrine RE
- Palustrine RE
- RE 51_80% wetland (mosaic units)

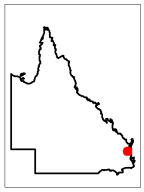
Riverine System Drainage Lines

- Major
- Minor

Queensland Wetland Map

Queensland Government
Australian Government

Queensland Wetlands Program



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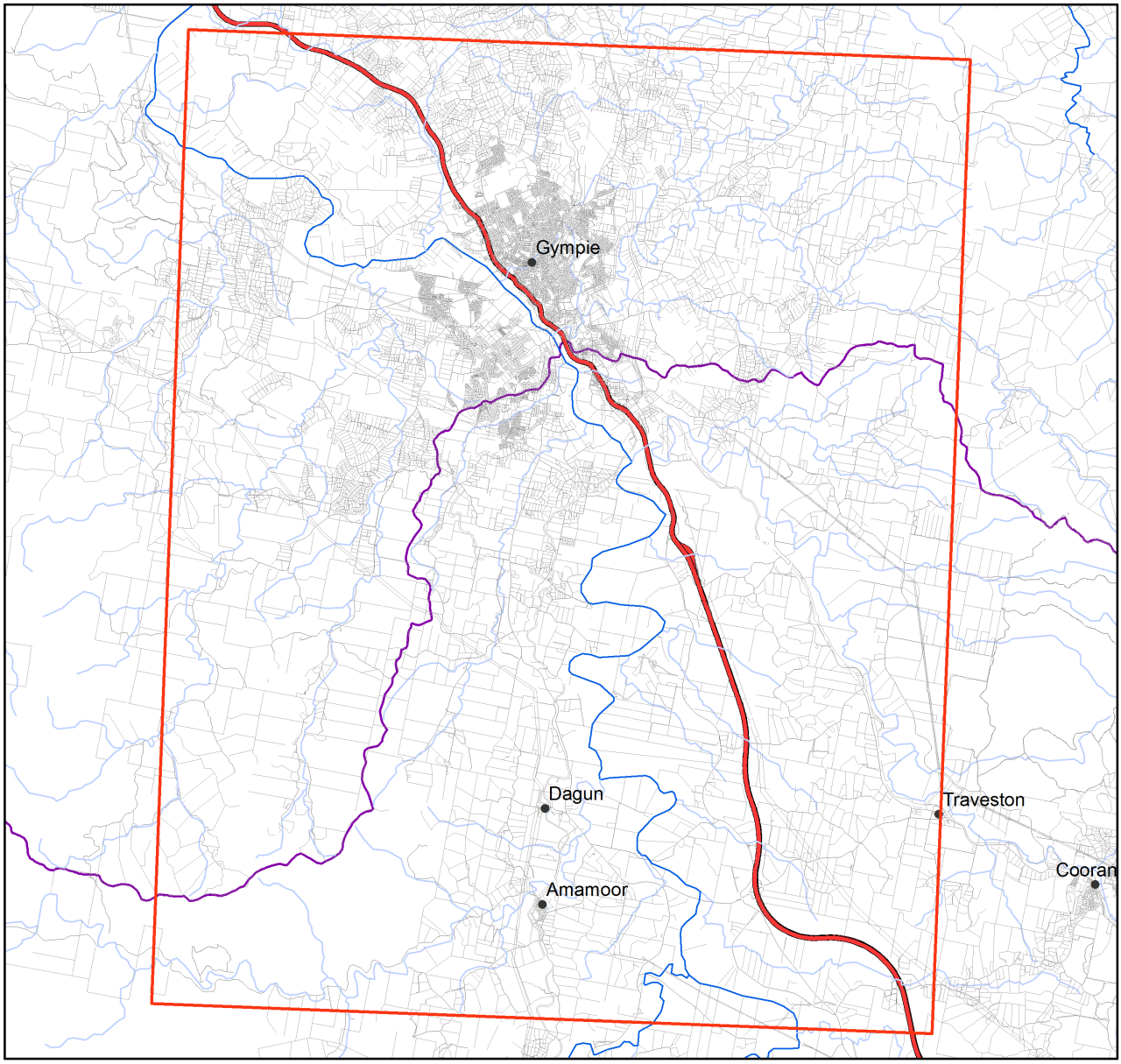
0 1600 3200 4800 6400 8000 m

Horizontal Datum: Geographic Datum of Australia 1994 (GDA94)

This map was produced by the Queensland Wetlands Program, Department of Environment and Science, July 2022.

For further information contact: wetlands@des.qld.gov.au

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Queensland Wetlands of Importance Map

Legend

- polygon
- Towns
- Cadastral boundaries
- Highways
- Roads
- Sub-basin
- Directory of Important Wetlands
- Ramsar Wetlands

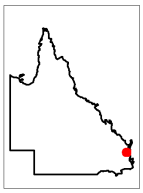
Riverine System Drainage Lines

- Major
- Minor

Queensland Government

Australian Government

Queensland Wetlands Program



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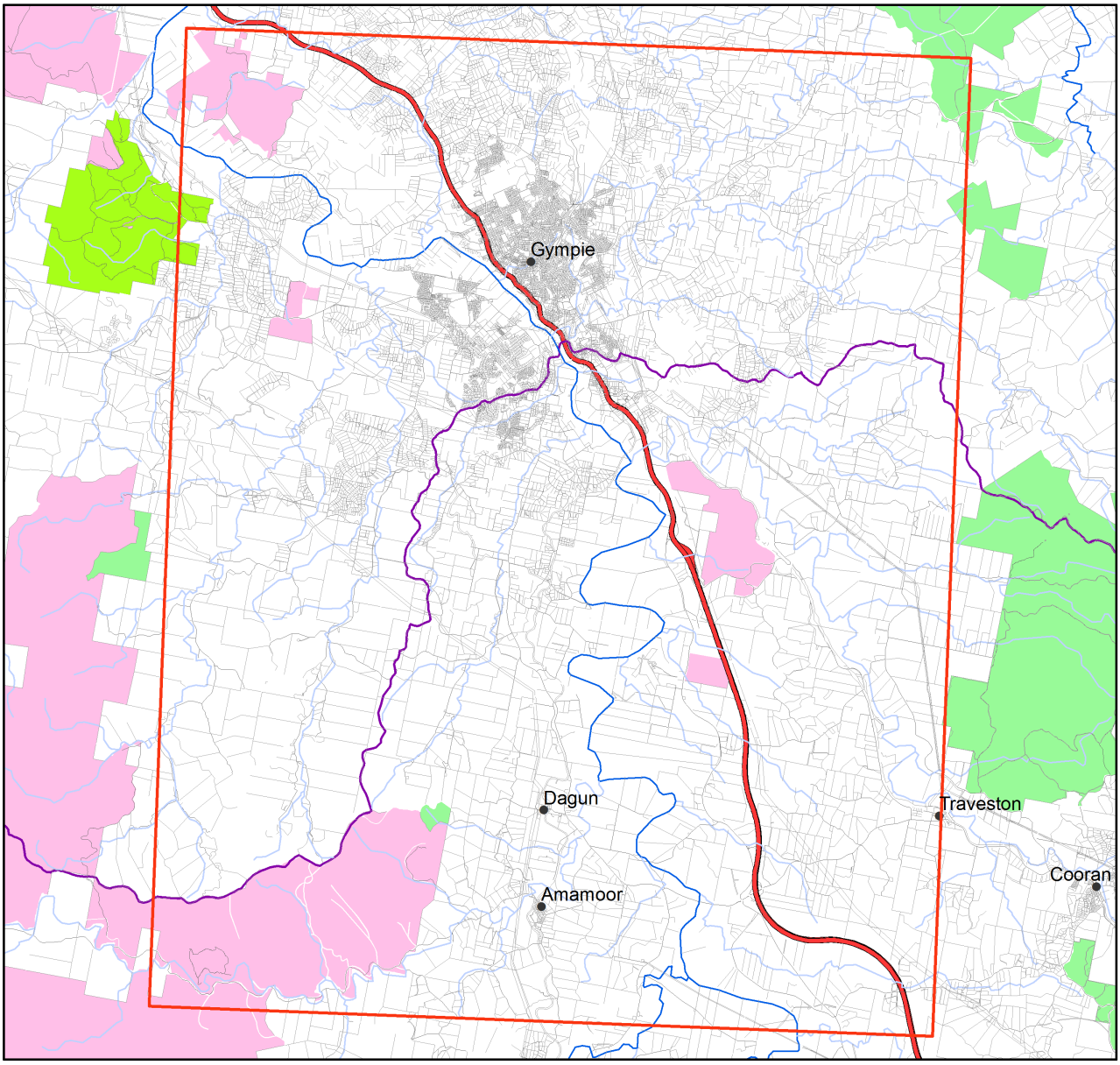
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Horizontal Datum: Geographic Datum of Australia 1994 (GDA94)

This map was produced by the Queensland Wetlands Program, Department of Environment and Science, July 2022.

For further information contact: wetlands@des.qld.gov.au

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Queensland Protected Area Map

Legend

- polygon
- Towns
- Cadastral boundaries
- Highways
- Roads
- Sub-basin

Riverine System Drainage Lines

- Major
- Minor

Protected Areas

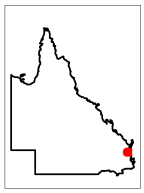
- National Park
- National Park (Scientific)
- National Park (CYPAL)
- Conservation Park
- Resources Reserve
- Forest Reserve
- State Forest
- Timber Reserve

Marine Parks

- General Use Zone
- Habitat Protection Zone
- Estuarine Conservation Zone
- Conservation Park Zone
- Buffer Zone
- Scientific Research Zone
- Marine National Park Zone
- Preservation Zone

Queensland Government
Australian Government

Queensland Wetlands Program



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0 1600 3200 4800 6400 8000 m

Horizontal Datum: Geographic Datum of Australia 1994 (GDA94)

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Wetland habitat types in the AOI. Total area: 3643.72ha

Wetland Class	Habitat type	Area (ha)
	Coastal/ Sub-coastal floodplain tree swamps (Melaleuca and Eucalypt)	1953.68
Riverine	Riverine	1276.66
	Coastal/ Sub-Coastal non-floodplain tree swamps (Melaleuca and Eucalypt)	264.52
Lacustrine	Artificial/ highly modified wetlands (dams, ring tanks, irrigation channel	147.38
Palustrine	Coastal/ Sub-coastal floodplain grass, sedge and herb swamps	1.48

Queensland wetland habitat typology: Major wetland habitat types for wetland conceptual models and wetland management profiles

Wetland name	Conceptual model	Wetland profile
Mangrove Wetlands	Not developed	Mangrove Wetlands
Saltmarsh Wetlands	Not developed	Saltmarsh Wetlands
Coastal and subcoastal saline swamps of all substrates, water regimes, topographic types and vegetation communities	Coastal and subcoastal saline swamps	Coastal grass-sedge wetlands
Coastal and subcoastal non-floodplain tree swamps (Melaleuca and Eucalypt) of all substrates and water regimes	Coastal and subcoastal non-floodplain tree swamps - melaleuca and eucalypt	Coastal and subcoastal tree swamps
Coastal and subcoastal non-floodplain wet heath swamps of all substrates and water regimes	Coastal and subcoastal non-floodplain wet heath swamps	Coastal and subcoastal wet heath swamps
Coastal and subcoastal non-floodplain grass, sedge and herb swamps of all substrates and water regimes	Coastal and subcoastal non-floodplain grass, sedge and herb swamps	Coastal grass-sedge wetlands
Coastal and subcoastal spring swamps of all substrates, water types, water regimes and vegetation communities	Coastal and subcoastal spring swamps	Great Artesian Basin spring wetlands
Coastal and subcoastal floodplain tree swamps - melaleuca and eucalypt of all substrates and water regimes	Coastal and subcoastal floodplain tree swamps - melaleuca and eucalypt	Coastal and subcoastal tree swamps
Coastal and subcoastal floodplain wet heath swamps of all substrates and water regimes	Coastal and subcoastal floodplain wet heath swamps	Coastal and subcoastal wet heath swamps
Coastal and subcoastal floodplain, grass, sedge herb swamps of all substrates and water regimes	Coastal and subcoastal floodplain grass, sedge, herb swamps	Coastal grass-sedge wetlands
Coastal and subcoastal tree swamps - palm of all substrates, topographic types and water regimes	Coastal and subcoastal floodplain tree swamps - palm	Coastal Palm Swamps
Coastal and subcoastal Floodplain Lakes of all substrates, water types and water regimes	Coastal and subcoastal Floodplain Lakes	Coastal and subcoastal floodplain lakes and non-floodplain soil lakes
Coastal and subcoastal non-floodplain rock lakes of all water types and water regimes	Coastal and subcoastal non-floodplain rock lakes	Coastal and subcoastal non-floodplain rock lakes
Coastal and subcoastal non-floodplain sand lakes (window) of all water types and water regimes	Coastal and subcoastal non-floodplain sand lakes - window	Coastal non-floodplain sand lakes
Coastal and subcoastal non-floodplain sand lakes (perched) of all water types and water regimes	Coastal and subcoastal non-floodplain sand lakes - perched	Coastal non-floodplain sand lakes

Wetland name	Conceptual model	Wetland profile
Coastal and subcoastal non-floodplain soil lakes of all water types and water regimes	Coastal and subcoastal non-floodplain soil lakes	Coastal and subcoastal floodplain lakes and non-floodplain soil lakes
Arid and semi-arid saline swamps of all substrates, water regimes, topographic types and vegetation communities	Arid and semi-arid saline swamps	Semi-arid swamps
Arid and semi-arid fresh tree swamps of all substrates, and water regimes and topographic types	Arid and semi-arid tree swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid lignum swamps of all substrates, and water regimes and topographic types	Arid and semi-arid lignum swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid grass, sedge, herb swamps of all substrates, water regimes and topographic types	Arid and semi-arid grass, sedge, herb swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid fresh non-floodplain tree swamps of all substrates and water regimes	Arid and semi-arid non-floodplain tree swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid fresh non-floodplain lignum swamps of all substrates and water regimes	Arid and semi-arid non-floodplain lignum swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid fresh non-floodplain grass, sedge, herb swamps of all substrates and water regimes	Arid and semi-arid non-floodplain grass, sedge, herb swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid, non-floodplain swamps - springs of all substrates, water regimes and vegetation communities	Arid and semi-arid spring swamps	Great Artesian Basin spring wetlands
Arid and semi-arid, saline lakes of all substrates, topographic types and water regimes	Arid and semi-arid saline lakes	Arid and semi-arid lakes
Arid and semi-arid, floodplain lakes of all, substrates and water regimes	Arid and semi-arid floodplain lakes	Arid and semi-arid lakes
Arid and semi-arid, non-floodplain Lakes of all substrates and water regimes	Arid and semi-arid non-floodplain lakes	Arid and semi-arid lakes
Arid/ semi-arid, non-floodplain (clay pans) lakes of all substrates and water regimes	Arid and semi-arid fresh non-floodplain lakes (clay pans)	Arid and semi-arid lakes
Arid and semi-arid, Permanent Lakes permanently inundated lakes of all substrates, water types, topographic types and vegetation communities	Arid and semi-arid permanent lakes	Arid and semi-arid lakes

WetlandMaps Report



For selected area of interest Custom Geometry

Current as at 05/07/2022

Environmental Reports - General Information

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is ot present within the Area of Interest(AOI) (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no matters of interest have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Important Note to User

Information presented in this report is based upon the mapping of water bodies and wetland regional ecosystems across Queensland. The Queensland wetland mapping was produced using existing information including water body mapping derived from Landsat satellite imagery, regional ecosystem mapping, topographic data, and a springs database. The result is a consistent wetland map for the whole of Queensland.

Ancillary data, such as higher resolution imagery (for example SPOT and aerial photographs), other vegetation and wetland mapping, geology, soil and land system mapping was also used in attributing and assessing the derived Queensland Wetlands Program wetland mapping products.

The wetland mapping was done in accordance with a detailed peer reviewed methodology which included quality assurance measures for all steps in the process. For more detailed information on how the Queensland Wetlands Program wetland mapping was produced, please see the Wetland Mapping and Classification Methodology.

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Summary Information

The following table provides an overview of the area of interest.

Table 1. Area of interest details

Size (ha)	92,615.68
Local Government(s)	Sunshine Coast Regional, Noosa Shire, Gympie Regional, Somerset Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Burringbar - Conondale Ranges, Gympie Block
Catchment(s)	Mary
Drainage sub-basin	Upper Mary River

NRM Regions

The following NRM region(s) are in the area of interest:

Burnett Mary Regional Group

Water Resource Plan Boundaries

The following Water Resource Plan(s) are in the area of interest:

Mary Basin

Learn more about how Wetlands are mapped in Queensland:

Queensland Wetlands Mapping Definitions

Wetlands are areas of permanent or periodic/intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed 6 metres. To be a wetland the area must have one or more of the following attributes:

- at least periodically the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or
- the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or
- the substratum is not soil and is saturated with water, or covered by water at some time.

Examples under this definition **include**:

- those areas shown as a river, stream, creek, swamp, lake, marsh, waterhole, wetland, billabong, pool or spring on the latest Sunmap 1:25,000, 1:50,000, 1:100,000 or 1:250,000 topographic map
- areas defined as wetlands on local or regional maps prepared with the aim of mapping wetlands
- wetland regional ecosystems (REs) as defined by the Queensland Herbarium (Environmental Protection Agency 2005a)
- areas containing recognised hydrophytes as provided by the Queensland Herbarium
- saturated parts of the riparian zone
- artificial wetlands such as farm dams
- water bodies not connected to rivers or flowing water such as billabongs and rock pools.

Examples under this definition **exclude**:

- areas that may be covered by water but are not wetlands according to the definition
- floodplains that are intermittently covered by flowing water but do not meet the hydrophytes and soil criteria
- riparian zone above the saturation level.

Wetland Systems

Riverine wetlands are all wetlands and deepwater habitats within a channel. The channels are naturally or artificially created, periodically or continuously contain moving water, or connecting two bodies of standing water.

Palustrine wetlands are primarily vegetated non-channel environments of less than 8 hectares. They include billabongs, swamps, bogs, springs, soaks etc, and have more than 30% emergent vegetation.

Lacustrine wetlands are large, open, water-dominated systems (for example, lakes) larger than 8ha. This definition also applies to modified systems (for example, dams), which are similar to lacustrine systems (for example, deep, standing or slow-moving waters).

Marine wetlands include the area of ocean from the coastline or estuary, extending to the jurisdictional limits of Queensland waters (3 nautical mile limit). This definition differs from that in Ramsar, as it includes waters deeper than 6m below the lowest astronomical tide.

Estuarine wetlands are those with oceanic water sometimes diluted with freshwater run-off from the land.

Subterranean wetlands are wetlands occurring below the surface of the ground and that are fed by groundwater i.e. caves and aquifers. These wetlands provide water to groundwater dependent ecosystems.

Methodology and Wetland Classification: https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/wetland-background/

Links and support

Other sites that deliver wetland related information include:

Wetland*Summary* tool: https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/

Queensland Spatial Catalogue: http://qldspatial.information.qld.gov.au/catalogue/custom/index.page

Queensland Globe: https://qldglobe.information.qld.gov.au/

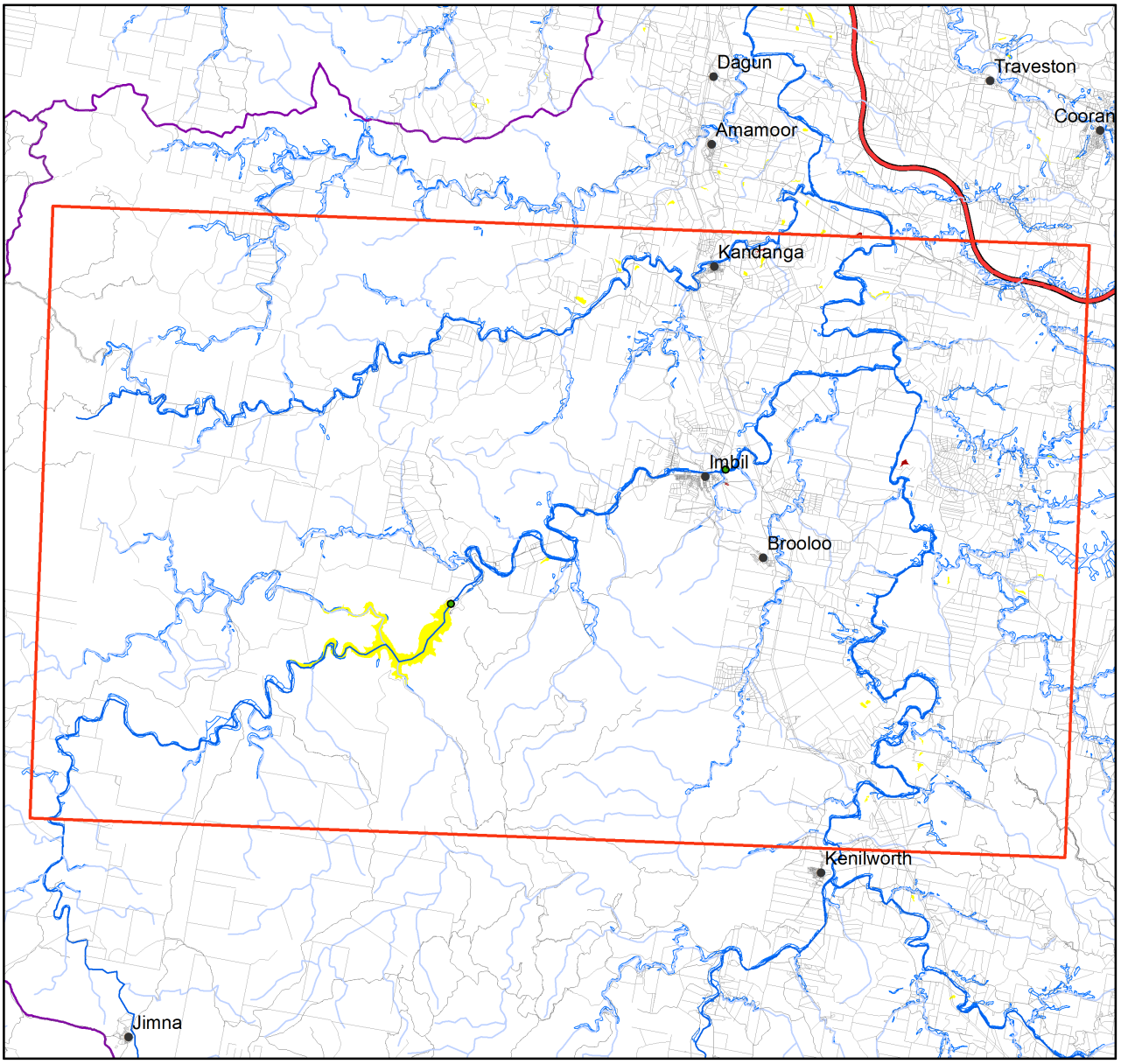
Environmental reports online: https://environment.ehp.qld.gov.au/report-request/environment/

Wetland on-line education modules: https://wetlandinfo.des.qld.gov.au/wetlands/resources/training/

Regional Ecosystem Mapping information: : https://www.qld.gov.au/environment/plants-animals/plants/herbarium/mapping-ecosystems

Aquatic Conservation Assessments: : https://wetlandinfo.des.qld.gov.au/wetlands/assessment/assessment-methods/aca/

Groundwater Dependant Ecosystems information: https://wetlandinfo.des.qld.gov.au/wetlands/ecology/aquatic-ecosystems-natural/groundwater-dependent/



Legend

- polygon
- Springs
- Dams and weirs
- Towns
- Highways
- Roads
- Cadastral boundaries
- Sub-basin

Wetland Mapping

Wetland System - Water Bodies

- Marine Waterbodies
- Estuarine Waterbodies
- Riverine Waterbodies
- Lacustrine Waterbodies
- Palustrine Waterbodies

Wetland System - Regional Ecosystems

- Marine RE
- Estuarine RE
- Riverine RE
- Lacustrine RE
- Palustrine RE
- RE 51_80% wetland (mosaic units)

Riverine System Drainage Lines

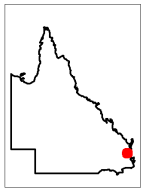
- Major
- Minor

Queensland Wetland Map

Queensland Government

Australian Government

Queensland Wetlands Program



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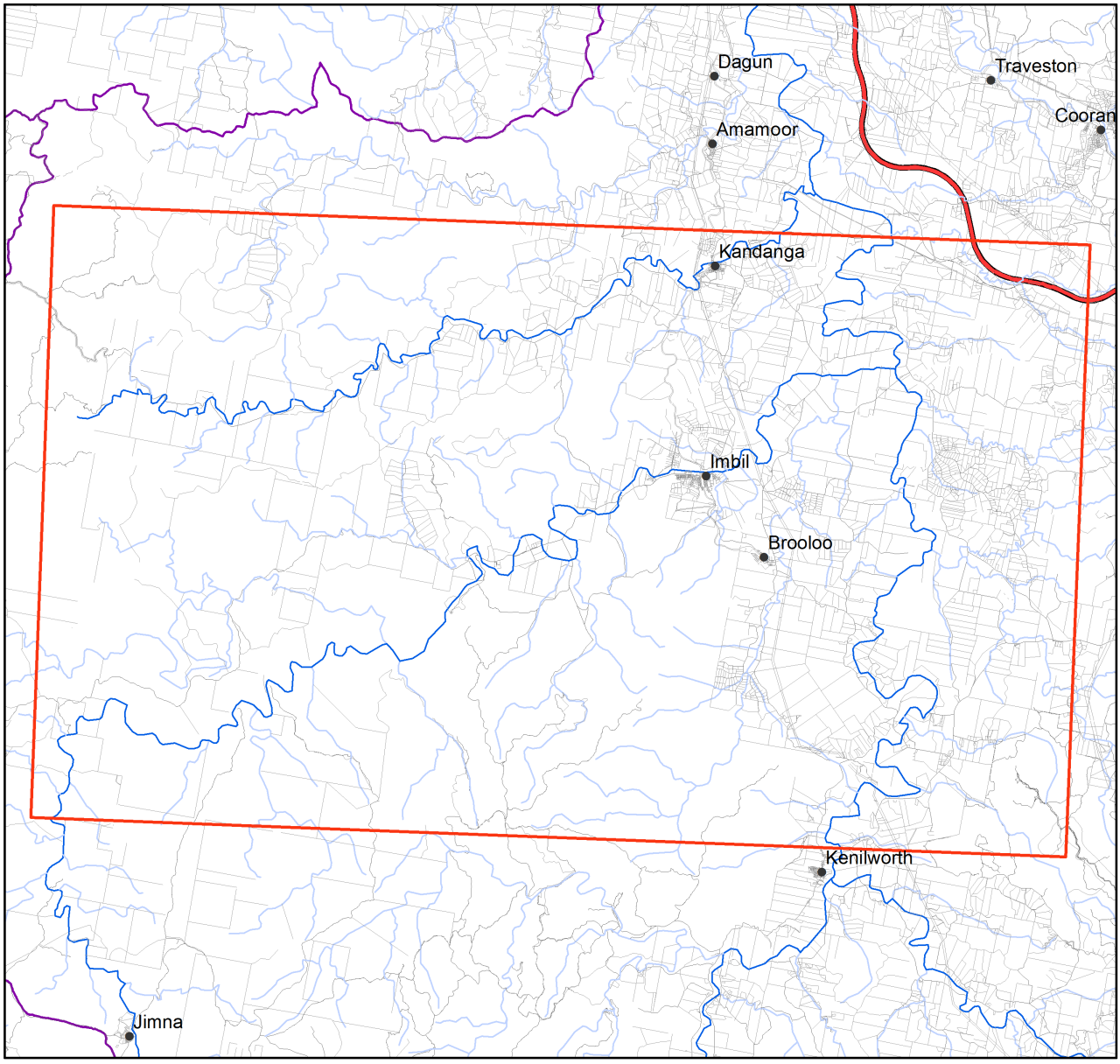
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Horizontal Datum: Geographic Datum of Australia 1994 (GDA94)

This map was produced by the Queensland Wetlands Program, Department of Environment and Science, July 2022.

For further information contact: wetlands@des.qld.gov.au

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Queensland Wetlands of Importance Map

Legend

- polygon
- Towns
- Cadastral boundaries
- Highways
- Roads
- Sub-basin
- Directory of Important Wetlands
- Ramsar Wetlands

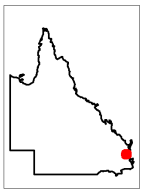
Riverine System Drainage Lines

- Major
- Minor

Queensland Government

Australian Government

Queensland Wetlands Program



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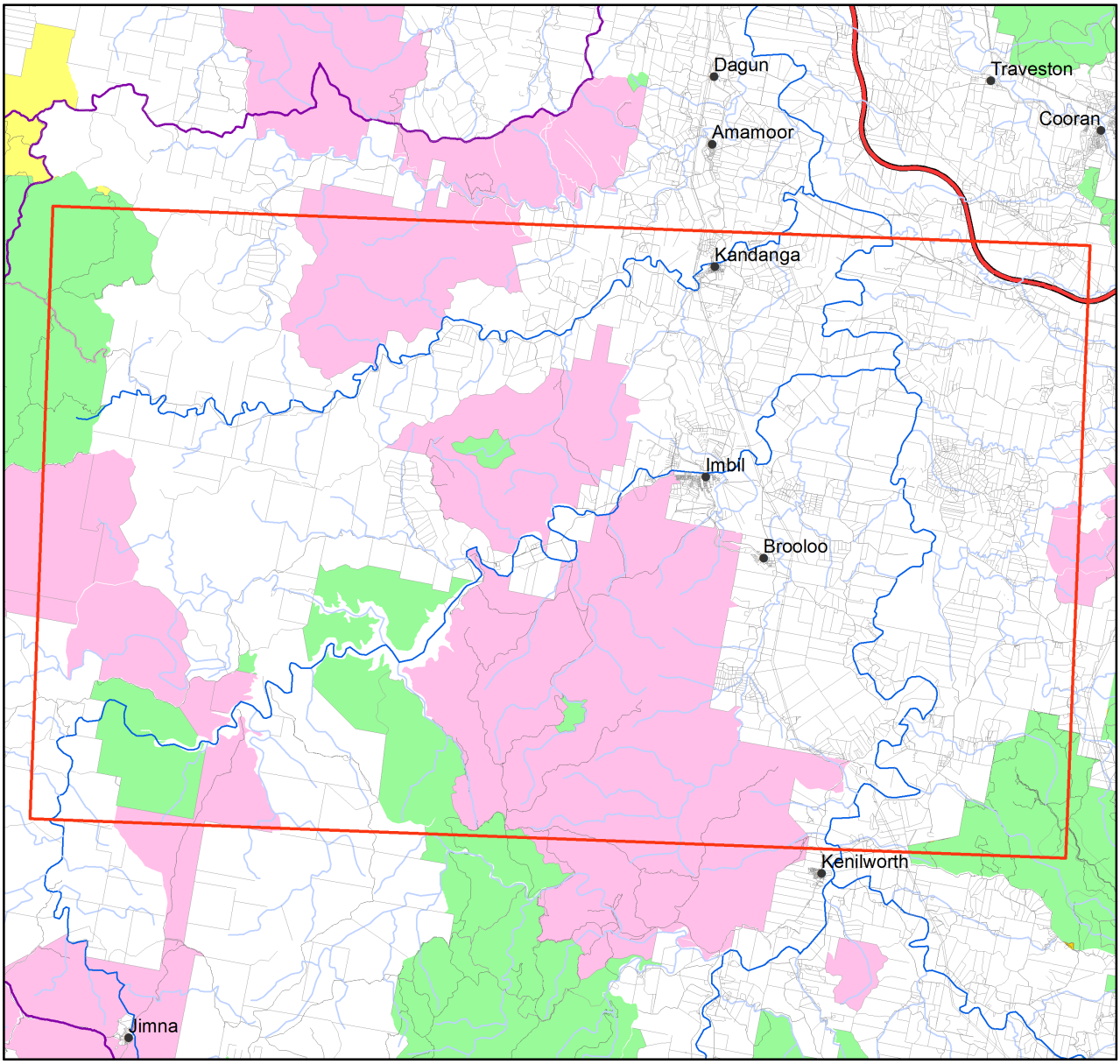
0 2300 4600 6900 9200 11500 m

Horizontal Datum: Geographic Datum of Australia 1994 (GDA94)

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Queensland Protected Area Map

Legend

- polygon
- Towns
- Cadastral boundaries
- Highways
- Roads
- Sub-basin

Riverine System Drainage Lines

- Major
- Minor

Protected Areas

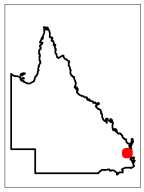
- National Park
- National Park (Scientific)
- National Park (CYPAL)
- Conservation Park
- Resources Reserve
- Forest Reserve
- State Forest
- Timber Reserve

Marine Parks

- General Use Zone
- Habitat Protection Zone
- Estuarine Conservation Zone
- Conservation Park Zone
- Buffer Zone
- Scientific Research Zone
- Marine National Park Zone
- Preservation Zone

Queensland Government
Australian Government

Queensland Wetlands Program



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0 2300 4600 6900 9200 11500 m

Horizontal Datum: Geographic Datum of Australia 1994 (GDA94)

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Wetland habitat types in the AOI. Total area: 4818.86ha

Wetland Class	Habitat type	Area (ha)
Riverine	Riverine	2978.15
	Coastal/ Sub-coastal floodplain tree swamps (Melaleuca and Eucalypt)	801.37
	Coastal/ Sub-Coastal non-floodplain tree swamps (Melaleuca and Eucalypt)	576.43
Lacustrine	Artificial/ highly modified wetlands (dams, ring tanks, irrigation channel	456.55
Palustrine	Coastal/ Sub-coastal floodplain grass, sedge and herb swamps	6.36

Queensland wetland habitat typology: Major wetland habitat types for wetland conceptual models and wetland management profiles

Wetland name	Conceptual model	Wetland profile
Mangrove Wetlands	Not developed	Mangrove Wetlands
Saltmarsh Wetlands	Not developed	Saltmarsh Wetlands
Coastal and subcoastal saline swamps of all substrates, water regimes, topographic types and vegetation communities	Coastal and subcoastal saline swamps	Coastal grass-sedge wetlands
Coastal and subcoastal non-floodplain tree swamps (Melaleuca and Eucalypt) of all substrates and water regimes	Coastal and subcoastal non-floodplain tree swamps - melaleuca and eucalypt	Coastal and subcoastal tree swamps
Coastal and subcoastal non-floodplain wet heath swamps of all substrates and water regimes	Coastal and subcoastal non-floodplain wet heath swamps	Coastal and subcoastal wet heath swamps
Coastal and subcoastal non-floodplain grass, sedge and herb swamps of all substrates and water regimes	Coastal and subcoastal non-floodplain grass, sedge and herb swamps	Coastal grass-sedge wetlands
Coastal and subcoastal spring swamps of all substrates, water types, water regimes and vegetation communities	Coastal and subcoastal spring swamps	Great Artesian Basin spring wetlands
Coastal and subcoastal floodplain tree swamps - melaleuca and eucalypt of all substrates and water regimes	Coastal and subcoastal floodplain tree swamps - melaleuca and eucalypt	Coastal and subcoastal tree swamps
Coastal and subcoastal floodplain wet heath swamps of all substrates and water regimes	Coastal and subcoastal floodplain wet heath swamps	Coastal and subcoastal wet heath swamps
Coastal and subcoastal floodplain, grass, sedge herb swamps of all substrates and water regimes	Coastal and subcoastal floodplain grass, sedge, herb swamps	Coastal grass-sedge wetlands
Coastal and subcoastal tree swamps - palm of all substrates, topographic types and water regimes	Coastal and subcoastal floodplain tree swamps - palm	Coastal Palm Swamps
Coastal and subcoastal Floodplain Lakes of all substrates, water types and water regimes	Coastal and subcoastal Floodplain Lakes	Coastal and subcoastal floodplain lakes and non-floodplain soil lakes
Coastal and subcoastal non-floodplain rock lakes of all water types and water regimes	Coastal and subcoastal non-floodplain rock lakes	Coastal and subcoastal non-floodplain rock lakes
Coastal and subcoastal non-floodplain sand lakes (window) of all water types and water regimes	Coastal and subcoastal non-floodplain sand lakes - window	Coastal non-floodplain sand lakes
Coastal and subcoastal non-floodplain sand lakes (perched) of all water types and water regimes	Coastal and subcoastal non-floodplain sand lakes - perched	Coastal non-floodplain sand lakes

Wetland name	Conceptual model	Wetland profile
Coastal and subcoastal non-floodplain soil lakes of all water types and water regimes	Coastal and subcoastal non-floodplain soil lakes	Coastal and subcoastal floodplain lakes and non-floodplain soil lakes
Arid and semi-arid saline swamps of all substrates, water regimes, topographic types and vegetation communities	Arid and semi-arid saline swamps	Semi-arid swamps
Arid and semi-arid fresh tree swamps of all substrates, and water regimes and topographic types	Arid and semi-arid tree swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid lignum swamps of all substrates, and water regimes and topographic types	Arid and semi-arid lignum swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid grass, sedge, herb swamps of all substrates, water regimes and topographic types	Arid and semi-arid grass, sedge, herb swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid fresh non-floodplain tree swamps of all substrates and water regimes	Arid and semi-arid non-floodplain tree swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid fresh non-floodplain lignum swamps of all substrates and water regimes	Arid and semi-arid non-floodplain lignum swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid fresh non-floodplain grass, sedge, herb swamps of all substrates and water regimes	Arid and semi-arid non-floodplain grass, sedge, herb swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid, non-floodplain swamps - springs of all substrates, water regimes and vegetation communities	Arid and semi-arid spring swamps	Great Artesian Basin spring wetlands
Arid and semi-arid, saline lakes of all substrates, topographic types and water regimes	Arid and semi-arid saline lakes	Arid and semi-arid lakes
Arid and semi-arid, floodplain lakes of all, substrates and water regimes	Arid and semi-arid floodplain lakes	Arid and semi-arid lakes
Arid and semi-arid, non-floodplain Lakes of all substrates and water regimes	Arid and semi-arid non-floodplain lakes	Arid and semi-arid lakes
Arid/ semi-arid, non-floodplain (clay pans) lakes of all substrates and water regimes	Arid and semi-arid fresh non-floodplain lakes (clay pans)	Arid and semi-arid lakes
Arid and semi-arid, Permanent Lakes permanently inundated lakes of all substrates, water types, topographic types and vegetation communities	Arid and semi-arid permanent lakes	Arid and semi-arid lakes

WildNet Records
Conservation Significant Species List



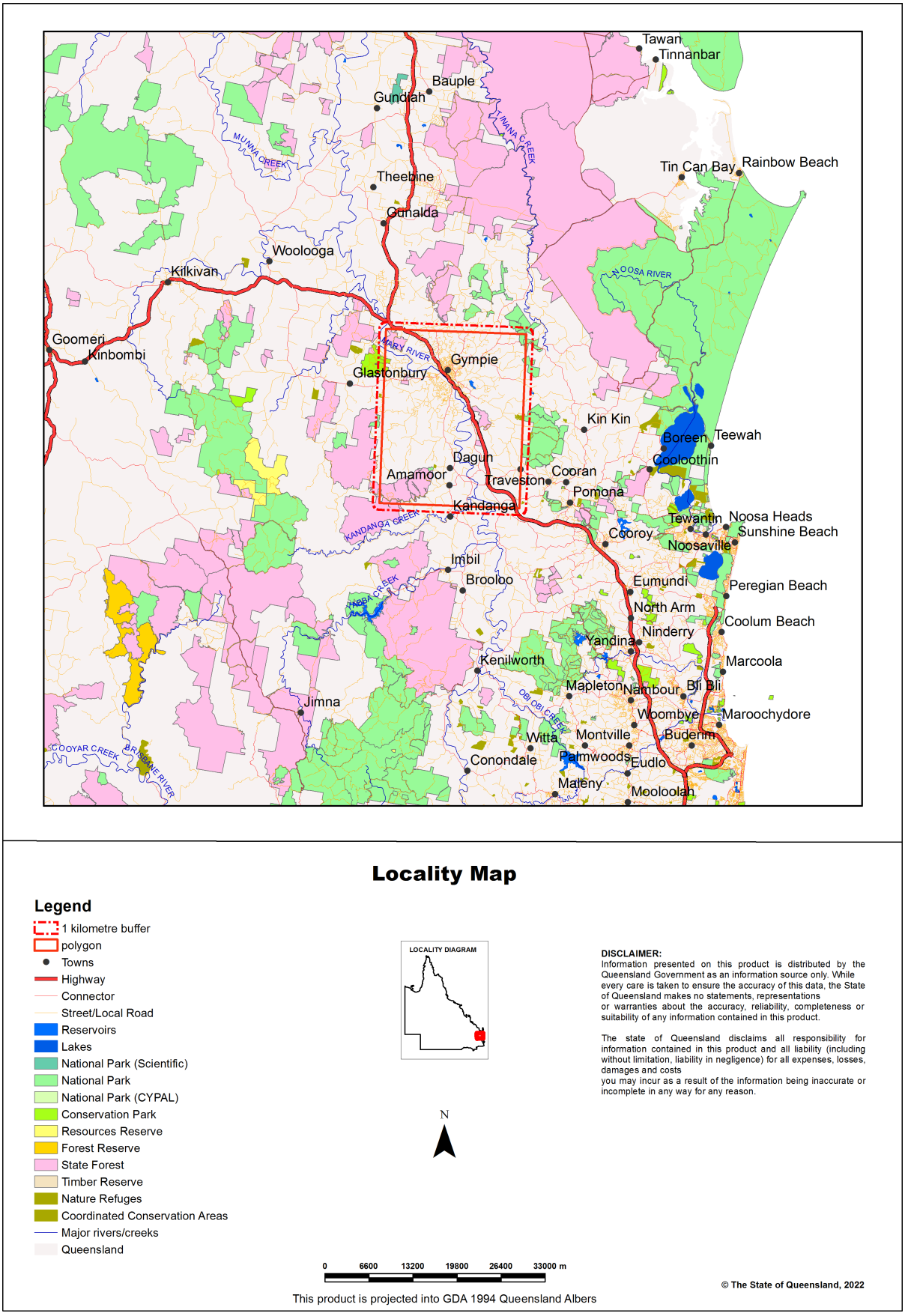
For the selected area of interest 54831.55ha Custom Geometry

Current as at 05/07/2022

WildNetCSSpeciesList

Queensland Government

Map 1. Locality Map



Locality Map

Legend

- 1 kilometre buffer
- polygon
- Towns
- Highway
- Connector
- Street/Local Road
- Reservoirs
- Lakes
- National Park (Scientific)
- National Park
- National Park (CYPAL)
- Conservation Park
- Resources Reserve
- Forest Reserve
- State Forest
- Timber Reserve
- Nature Refuges
- Coordinated Conservation Areas
- Major rivers/creeks
- Queensland

N

0 6600 13200 19800 26400 33000 m

This product is projected into GDA 1994 Queensland Albers

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Summary Information

The following table provides an overview of the area of interest Custom Geometry.

Table 1. Area of interest details

Size (ha)	54,831.55
Local Government(s)	Noosa Shire, Gympie Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Gympie Block
Catchment(s)	Mary

Protected Area(s)
The following estates and/or reserves are located in the area of interest:

Lynchs Hill State Forest

King Conservation Park

Goomboorian National Park

King State Forest

Fishermans Pocket State Forest

Woondum National Park

Woondum State Forest

Traveston State Forest

Amamoor State Forest

Amamoor National Park

World Heritage Area(s)
No World Heritage Areas are located within the area of interest.

Ramsar Area(s)
No Ramsar Areas are located within the area of interest.

Conservation Significant Species List

Introduction

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- as threatened or near threatened under the Nature Conservation Act 1992;
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Table 2 lists the species recorded within the area of interest and its one kilometre buffer.

Table 2. Conservation significant species recorded within the area of interest and its one kilometre buffer

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
18169	Animalia	Actinopterygii	Percichthyidae	*Maccullochella mariensis*	Mary River cod	None	E	4	13	30/06/2010
595	Animalia	Amphibia	Hylidae	*Litoria pearsoniana*	cascade treefrog	V	None	0	2	19/02/2021
706	Animalia	Amphibia	Limnodynastidae	*Adelotus brevis*	tusked frog	V	None	1	68	21/02/2020
686	Animalia	Amphibia	Myobatrachidae	*Crinia tinnula*	wallum froglet	V	None	3	3	30/09/1988
676	Animalia	Amphibia	Myobatrachidae	*Mixophyes iteratus*	giant barred frog	V	V	0	8	13/12/2013
1728	Animalia	Aves	Accipitridae	*Erythrotriorchis radiatus*	red goshawk	E	V	0	2	31/12/1990
1702	Animalia	Aves	Accipitridae	*Pandion cristatus*	eastern osprey	SL	None	0	1	02/01/1978
1971	Animalia	Aves	Apodidae	*Hirundapus caudacutus*	white-throated needletail	V	V	0	11	06/01/2012
22494	Animalia	Aves	Cacatuidae	*Calyptorhynchus lathami lathami*	glossy black-cockatoo (eastern)	V	None	0	2	08/09/1998
1944	Animalia	Aves	Charadriidae	*Pluvialis fulva*	Pacific golden plover	SL	None	1	1	24/11/1999
1736	Animalia	Aves	Cuculidae	*Cuculus optatus*	oriental cuckoo	SL	None	0	1	30/06/1993
1595	Animalia	Aves	Monarchidae	*Monarcha melanopsis*	black-faced monarch	SL	None	0	7	11/11/2007
1597	Animalia	Aves	Monarchidae	*Symposiachrus trivirgatus*	spectacled monarch	SL	None	0	31	01/07/2015
1952	Animalia	Aves	Podargidae	*Podargus ocellatus plumiferus*	plumed frogmouth	V	None	0	1	01/09/2008
1164	Animalia	Aves	Psittacidae	*Cyclopsitta diophthalma coxeni*	Coxen's fig-parrot	E	E	0	3	17/01/2003
1578	Animalia	Aves	Rhipiduridae	*Rhipidura rufifrons*	rufous fantail	SL	None	0	25	13/02/2018
1883	Animalia	Aves	Rostratulidae	*Rostratula australis*	Australian painted-snipe	E	E	2	2	24/11/1999
1857	Animalia	Aves	Scolopacidae	*Gallinago hardwickii*	Latham's snipe	SL	None	1	2	28/08/2003
1107	Animalia	Aves	Strigidae	*Ninox strenua*	powerful owl	V	None	0	4	27/04/2020
1092	Animalia	Aves	Turnicidae	*Turnix melanogaster*	black-breasted button-quail	V	V	0	7	06/01/2012
2008	Animalia	Insecta	Nymphalidae	*Argynnis hyperbius inconstans*	Australian fritillary	E	CE	0	20	31/12/1995
2014	Animalia	Insecta	Papilionidae	*Ornithoptera richmondia*	Richmond birdwing	V	None	0	3	31/12/1995
33603	Animalia	Malacostraca	Parastacidae	*Tenuibranchiurus glypticus*	swamp crayfish	E	None	0	1	27/06/2016
800	Animalia	Mammalia	Dasyuridae	*Dasyurus hallucatus*	northern quoll	C	E	0	2	31/12/1955
803	Animalia	Mammalia	Dasyuridae	*Dasyurus maculatus maculatus*	spotted-tailed quoll (southern subspecies)	E	E	0	2	26/08/2004
836	Animalia	Mammalia	Ornithorhynchidae	*Ornithorhynchus anatinus*	platypus	SL	None	0	47	01/01/2020
860	Animalia	Mammalia	Phascolarctidae	*Phascolarctos cinereus*	koala	E	E	0	573	28/09/2021

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
2455	Animalia	Mammalia	Pseudocheiridae	*Petauroides armillatus*	central greater glider	E	V	0	2	25/03/2015
962	Animalia	Mammalia	Pteropodidae	*Pteropus poliocephalus*	grey-headed flying-fox	C	V	0	43	19/12/2019
838	Animalia	Mammalia	Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna	SL	None	0	11	06/06/2020
30272	Animalia	Reptilia	Chelidae	*Elseya albagula*	southern snapping turtle	CR	CE	0	18	05/09/2017
56	Animalia	Reptilia	Chelidae	*Elusor macrurus*	Mary River turtle	E	E	0	183	18/11/2020
26926	Animalia	Sarcopterygii	Ceratodontidae	*Neoceratodus forsteri*	Australian lungfish	None	V	0	14	18/01/2020
11702	Plantae	Equisetopsida	Amaryllidaceae	*Proiphys cunninghamii*	Moreton Bay lily	SL	None	0	1	03/12/2018
41645	Plantae	Equisetopsida	Apocynaceae	*Leichhardtia coronata*	None	V	None	2	31	19/12/2019
29766	Plantae	Equisetopsida	Arecaceae	*Livistona decora*	None	SL	None	0	3	01/07/1995
7131	Plantae	Equisetopsida	Asteraceae	*Picris conyzoides*	None	V	None	1	1	25/11/2000
41723	Plantae	Equisetopsida	Blechnaceae	*Blechnum medium*	None	SL	None	0	1	03/08/2005
41590	Plantae	Equisetopsida	Blechnaceae	*Blechnum parrisiae*	None	SL	None	0	1	01/07/1995
41068	Plantae	Equisetopsida	Blechnaceae	*Blechnum rupestre*	None	SL	None	0	1	01/07/1995
41611	Plantae	Equisetopsida	Blechnaceae	*Telmatoblechnum indicum*	None	SL	None	0	2	12/03/2001
16764	Plantae	Equisetopsida	Campanulaceae	*Lobelia gibbosa*	native lobelia	SL	None	0	1	03/08/2005
16766	Plantae	Equisetopsida	Campanulaceae	*Lobelia purpurascens*	white root	SL	None	0	3	01/07/1995
14433	Plantae	Equisetopsida	Dryopteridaceae	*Lastreopsis marginans*	glossy shield fern	SL	None	0	1	19/04/1999
41585	Plantae	Equisetopsida	Dryopteridaceae	*Parapolystichum acuminatum*	None	SL	None	0	1	01/07/1995
41725	Plantae	Equisetopsida	Dryopteridaceae	*Parapolystichum microsorum*	None	SL	None	0	1	01/07/1995
34716	Plantae	Equisetopsida	Euphorbiaceae	*Croton lucens*	None	CR	None	1	1	17/06/2012
11303	Plantae	Equisetopsida	Euphorbiaceae	*Fontainea rostrata*	None	V	V	6	6	25/02/2015
11304	Plantae	Equisetopsida	Euphorbiaceae	*Fontainea venosa*	None	V	V	0	1	01/07/1995
18350	Plantae	Equisetopsida	Hydrocharitaceae	*Vallisneria annua*	None	SL	None	1	1	08/05/2001
18351	Plantae	Equisetopsida	Hydrocharitaceae	*Vallisneria nana*	None	SL	None	1	1	10/04/2002
34790	Plantae	Equisetopsida	Juncaginaceae	*Cycnogeton procerus*	None	SL	None	0	1	01/07/1995
34799	Plantae	Equisetopsida	Juncaginaceae	*Cycnogeton rheophilus*	None	SL	None	1	1	07/05/1976

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
13406	Plantae	Equisetopsida	Myrtaceae	*Rhodamnia dumicola*	rib-fruited malletwood	E	None	0	3	01/07/1995
14255	Plantae	Equisetopsida	Myrtaceae	*Rhodamnia rubescens*	scrub turpentine	CR	CE	2	6	31/01/2022
16290	Plantae	Equisetopsida	Myrtaceae	*Rhodomyrtus psidioides*	native guava	CR	CE	1	5	05/05/2020
15816	Plantae	Equisetopsida	Orchidaceae	*Arthrochilus irritabilis*	leafy elbow orchid	SL	None	0	1	01/07/1995
10323	Plantae	Equisetopsida	Orchidaceae	*Bulbophyllum schillerianum*	red rope orchid	SL	None	0	1	19/04/1999
14760	Plantae	Equisetopsida	Orchidaceae	*Calanthe triplicata*	christmas orchid	SL	None	0	1	19/04/1999
27542	Plantae	Equisetopsida	Orchidaceae	*Corunastylis pumila*	None	SL	None	0	1	01/07/1995
13963	Plantae	Equisetopsida	Orchidaceae	*Cymbidium madidum*	None	SL	None	0	2	03/08/2005
17506	Plantae	Equisetopsida	Orchidaceae	*Cymbidium suave*	None	SL	None	0	1	19/04/1999
13280	Plantae	Equisetopsida	Orchidaceae	*Dendrobium aemulum*	ironbark orchid	SL	None	0	1	19/04/1999
12834	Plantae	Equisetopsida	Orchidaceae	*Dendrobium gracilicaule*	slender orchid	SL	None	0	2	19/04/1999
14634	Plantae	Equisetopsida	Orchidaceae	*Dendrobium monophyllum*	None	SL	None	0	1	19/04/1999
12831	Plantae	Equisetopsida	Orchidaceae	*Dendrobium tetragonum*	tree spider orchid	SL	None	0	1	19/04/1999
14606	Plantae	Equisetopsida	Orchidaceae	*Dipodium punctatum*	None	SL	None	0	1	03/08/2005
5768	Plantae	Equisetopsida	Orchidaceae	*Dockrillia bowmanii*	scrub pencil orchid	SL	None	0	1	19/04/1999
5779	Plantae	Equisetopsida	Orchidaceae	*Dockrillia linguiformis*	tongue orchid	SL	None	2	3	01/07/1995
8197	Plantae	Equisetopsida	Orchidaceae	*Geodorum densiflorum*	pink nodding orchid	SL	None	0	1	01/07/1995
14320	Plantae	Equisetopsida	Orchidaceae	*Plectorrhiza tridentata*	tangle orchid	SL	None	0	1	19/04/1999
6689	Plantae	Equisetopsida	Orchidaceae	*Pterostylis sp. (Gundiah W.W.Abell AQ72188)*	None	NT	None	0	1	11/03/2013
12659	Plantae	Equisetopsida	Orchidaceae	*Sarcochilus dilatatus*	brown sarcochilus	SL	None	1	1	28/10/1950
41173	Plantae	Equisetopsida	Polypodiaceae	*Dendroconche scandens*	None	SL	None	0	1	01/07/1995
17354	Plantae	Equisetopsida	Polypodiaceae	*Drynaria rigidula*	None	SL	None	0	2	01/07/1995
11696	Plantae	Equisetopsida	Polypodiaceae	*Platycerium bifurcatum*	None	SL	None	0	4	19/04/1999
11697	Plantae	Equisetopsida	Polypodiaceae	*Platycerium superbum*	staghorn fern	SL	None	0	5	01/07/2015
6668	Plantae	Equisetopsida	Polypodiaceae	*Pyrrosia confluens*	None	SL	None	0	1	01/07/1995

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
16317	Plantae	Equisetopsida	Polypodiaceae	*Pyrrosia rupestris*	rock felt fern	SL	None	0	3	19/04/1999
14284	Plantae	Equisetopsida	Potamogetonaceae	*Potamogeton ochreatus*	blunt pondweed	SL	None	1	1	08/05/2001
14285	Plantae	Equisetopsida	Potamogetonaceae	*Potamogeton perfoliatus*	perfoliate pondweed	SL	None	2	2	08/05/2001
34205	Plantae	Equisetopsida	Potamogetonaceae	*Stuckenia pectinata*	None	SL	None	1	1	01/12/2003
13202	Plantae	Equisetopsida	Proteaceae	*Floydia praealta*	ball nut	V	V	2	4	28/01/2022
16746	Plantae	Equisetopsida	Proteaceae	*Macadamia integrifolia*	macadamia nut	V	V	17	19	28/01/2022
16747	Plantae	Equisetopsida	Proteaceae	*Macadamia ternifolia*	bopple nut	V	V	0	1	01/07/2015
16382	Plantae	Equisetopsida	Psilotaceae	*Psilotum nudum*	skeleton fork fern	SL	None	0	3	01/07/1995
18116	Plantae	Equisetopsida	Pteridaceae	*Adiantum aethiopicum*	None	SL	None	0	6	12/03/2001
21888	Plantae	Equisetopsida	Pteridaceae	*Adiantum atroviride*	None	SL	None	0	1	01/07/2015
18030	Plantae	Equisetopsida	Pteridaceae	*Adiantum diaphanum*	None	SL	None	0	8	01/07/1995
18031	Plantae	Equisetopsida	Pteridaceae	*Adiantum hispidulum*	None	SL	None	0	5	12/03/2001
14887	Plantae	Equisetopsida	Pteridaceae	*Adiantum silvaticum*	None	SL	None	0	2	19/04/1999
9723	Plantae	Equisetopsida	Pteridaceae	*Pellaea falcata*	None	SL	None	0	3	19/04/1999
21889	Plantae	Equisetopsida	Pteridaceae	*Pellaea nana*	None	SL	None	0	1	01/07/2015
13800	Plantae	Equisetopsida	Pteridaceae	*Pellaea paradoxa*	heart fern	SL	None	0	3	19/04/1999
11988	Plantae	Equisetopsida	Rutaceae	*Bosistoa transversa*	three-leaved bosistoa	C	V	1	2	28/01/2022
3296	Plantae	Equisetopsida	Rutaceae	*Zieria verrucosa*	None	V	V	1	1	05/06/1998
33391	Plantae	Equisetopsida	Simaroubaceae	*Samadera bidwillii*	None	V	V	1	1	26/03/2000
12643	Plantae	Equisetopsida	Sterculiaceae	*Brachychiton discolor*	None	SL	None	0	3	01/07/1995
7608	Plantae	Equisetopsida	Symplocaceae	*Symplocos harroldii*	hairy hazelwood	NT	None	0	1	19/04/1999
13998	Plantae	Equisetopsida	Thelypteridaceae	*Christella dentata*	creek fern	SL	None	0	6	01/07/2015
13999	Plantae	Equisetopsida	Thelypteridaceae	*Christella hispidula*	None	SL	None	2	2	10/12/2011
15934	Plantae	Equisetopsida	Xanthorrhoeaceae	*Xanthorrhoea johnsonii*	None	SL	None	0	5	11/12/2015
16708	Plantae	Equisetopsida	Zamiaceae	*Macrozamia pauli-guilielmi*	None	E	E	1	1	10/05/2020

Taxon Id: Unique identifier of the taxon from the WildNet database.

NCA: Queensland conservation status of the taxon under the *Nature Conservation Act 1992* (Least Concern (C), Critically Endangered (CR), Endangered (E), Extinct (EX), Near Threatened (NT), Extinct in the Wild (PE), Special Least Concern (SL), and Vulnerable (V)).

EPBC: Australian conservation status of the taxon under the *Environment Protection and Biodiversity Conservation Act 1999* (Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Vulnerable (V), and Extinct in the Wild (XW)).

Specimens: The number of specimen-backed records of the taxon.

Records: The total number of records of the taxon.

Last record: Date of latest record of the taxon.

Links and Support

Other sites that deliver species information from the WildNet database include:

- Species profile search - access species information approved for publication including species names, statuses, notes, images, distribution maps and records
- Species lists - generate species lists for Queensland protected areas, forestry areas, local governments and areas defined using coordinates
- Biomaps - view biodiversity information, including WildNet records approved for publication, and generate reports
- Queensland Globe - view spatial information, including WildNet records approved for publication
- Qld wildlife data API - access WildNet species information approved for publication such as notes, images and records etc.
- Wetland*Maps* - view species records, survey locations etc. approved for publication
- Wetland*Summary* - view wildlife statistics, species lists for a range of area types, and access WildNet species profiles
- WildNet wildlife records - published - Queensland - spatial layer of WildNet records approved for publication generated weekly
- Generalised distribution and densities of Queensland wildlife - Queensland species distributions and densities generalised to a 10 km grid resolution
- Conservation status of Queensland wildlife - access current lists of priority species for Queensland including nomenclature and status information
- Queensland Confidential Species - the list of species flagged as confidential in the WildNet database.

Please direct queries about this report to the WildNet Team.

Other useful sites for accessing Queensland biodiversity data include:

- Useful wildlife resources
- Queensland Government Data
- Atlas of Living Australia (ALA)
- Online Zoological Collections of Australian Museums (OZCAM)
- Australia's Virtual Herbarium (AVH)
- Protected Matters Search Tool

Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government, to the maximum extent permitted by law, makes no representations or warranties about its accuracy, reliability, completeness, or suitability, for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which the user may incur as a consequence of the information being inaccurate or incomplete in any way and for any reason.



WildNet Records
Conservation Significant Species List



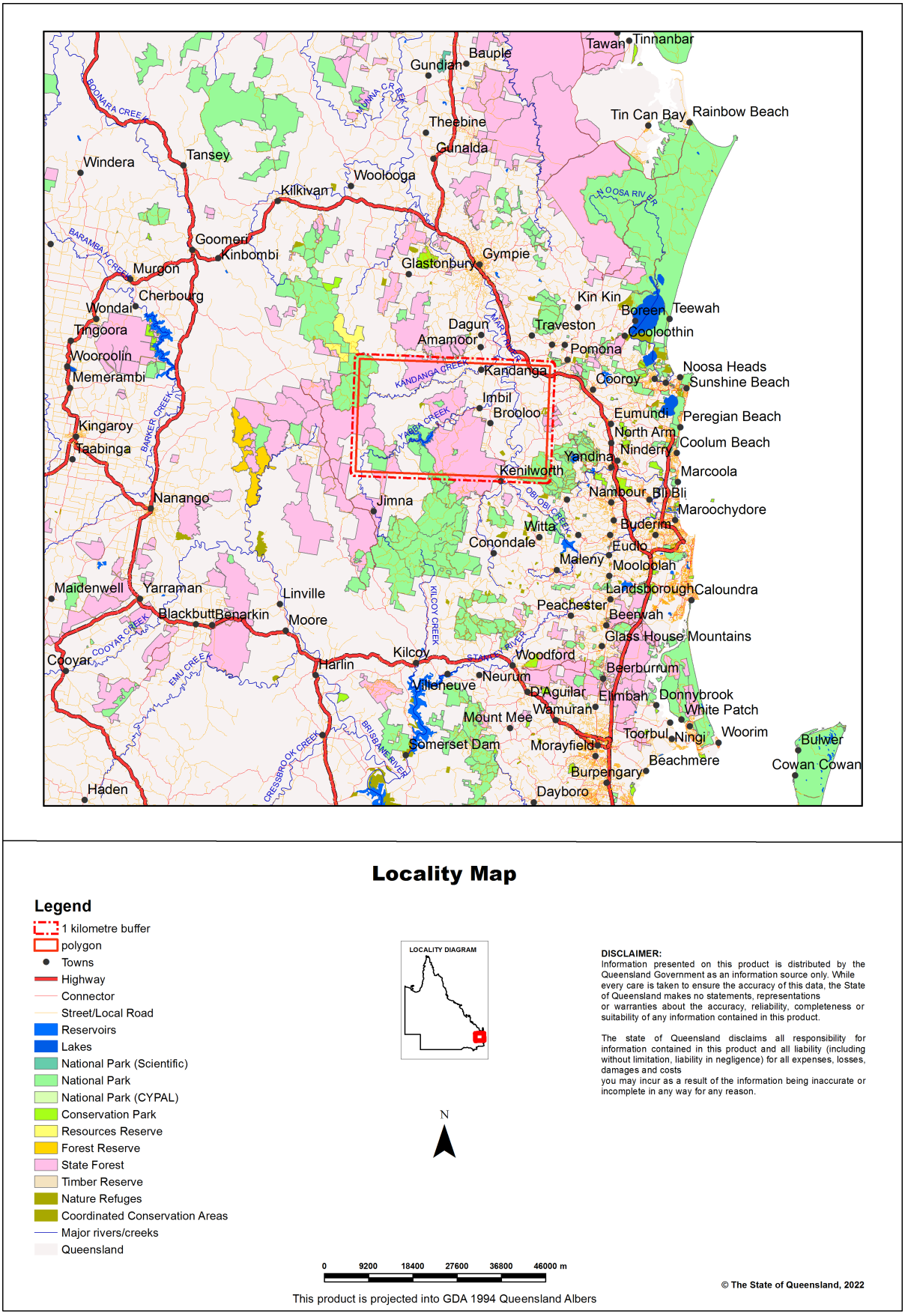
For the selected area of interest 92615.68ha Custom Geometry

Current as at 05/07/2022

WildNetCSSpeciesList

Queensland Government

Map 1. Locality Map



Summary Information

The following table provides an overview of the area of interest Custom Geometry.

Table 1. Area of interest details

Size (ha)	92,615.68
Local Government(s)	Sunshine Coast Regional, Noosa Shire, Gympie Regional, Somerset Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Burringbar - Conondale Ranges, Gympie Block
Catchment(s)	Mary

Protected Area(s)

The following estates and/or reserves are located in the area of interest:

West Cooroy State Forest

Imbil State Forest 2

Amamoor State Forest

Conondale National Park

Wrattens National Park

Upper Kandanga State Forest

Yabba State Forest

Mapleton National Park

Mapleton Forest Reserve

Imbil State Forest 1

World Heritage Area(s)

No World Heritage Areas are located within the area of interest.

Ramsar Area(s)

No Ramsar Areas are located within the area of interest.

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706	Animalia	Amphibia	Limnodynastidae	*Adelotus brevis*	tusked frog	V	None	0	99	22/02/2021
676	Animalia	Amphibia	Myobatrachidae	*Mixophyes iteratus*	giant barred frog	V	V	0	99	29/02/2020
648	Animalia	Amphibia	Myobatrachidae	*Rheobatrachus silus*	southern gastric brooding frog	PE	EX	7	7	23/09/1978
1728	Animalia	Aves	Accipitridae	*Erythrotriorchis radiatus*	red goshawk	E	V	0	6	31/08/1994
1702	Animalia	Aves	Accipitridae	*Pandion cristatus*	eastern osprey	SL	None	4	7	30/11/2006
1965	Animalia	Aves	Apodidae	*Apus pacificus*	fork-tailed swift	SL	None	0	2	28/02/2007
1971	Animalia	Aves	Apodidae	*Hirundapus caudacutus*	white-throated needletail	V	V	0	23	23/02/2008
1171	Animalia	Aves	Cacatuidae	*Calyptorhynchus lathami*	glossy black-cockatoo	V	None	0	2	23/10/2020
22494	Animalia	Aves	Cacatuidae	*Calyptorhynchus lathami lathami*	glossy black-cockatoo (eastern)	V	None	0	8	23/02/2008
1785	Animalia	Aves	Columbidae	*Geophaps scripta scripta*	squatter pigeon (southern subspecies)	V	V	0	1	30/11/1981
1736	Animalia	Aves	Cuculidae	*Cuculus optatus*	oriental cuckoo	SL	None	0	6	10/01/1999
1899	Animalia	Aves	Laridae	*Sterna hirundo*	common tern	SL	None	0	2	15/04/1988
1595	Animalia	Aves	Monarchidae	*Monarcha melanopsis*	black-faced monarch	SL	None	0	39	25/02/2018
1599	Animalia	Aves	Monarchidae	*Myiagra cyanoleuca*	satin flycatcher	SL	None	0	2	31/12/1989
1597	Animalia	Aves	Monarchidae	*Symposiachrus trivirgatus*	spectacled monarch	SL	None	0	170	27/11/2020
1952	Animalia	Aves	Podargidae	*Podargus ocellatus plumiferus*	plumed frogmouth	V	None	0	23	15/11/2012
1164	Animalia	Aves	Psittacidae	*Cyclopsitta diophthalma coxeni*	Coxen's fig-parrot	E	E	0	1	17/01/2003
1578	Animalia	Aves	Rhipiduridae	*Rhipidura rufifrons*	rufous fantail	SL	None	0	113	25/10/2020
1883	Animalia	Aves	Rostratulidae	*Rostratula australis*	Australian painted-snipe	E	E	1	2	24/11/1999
1874	Animalia	Aves	Scolopacidae	*Calidris acuminata*	sharp-tailed sandpiper	SL	None	0	2	05/02/1961
1857	Animalia	Aves	Scolopacidae	*Gallinago hardwickii*	Latham's snipe	SL	None	0	3	26/01/1991
1107	Animalia	Aves	Strigidae	*Ninox strenua*	powerful owl	V	None	0	36	10/03/2019
1825	Animalia	Aves	Threskiornithidae	*Plegadis falcinellus*	glossy ibis	SL	None	0	1	23/10/1977

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1092	Animalia	Aves	Turnicidae	*Turnix melanogaster*	black-breasted button-quail	V	V	0	8	25/10/2020
2014	Animalia	Insecta	Papilionidae	*Ornithoptera richmondia*	Richmond birdwing	V	None	0	1	14/10/1992
803	Animalia	Mammalia	Dasyuridae	*Dasyurus maculatus maculatus*	spotted-tailed quoll (southern subspecies)	E	E	0	1	31/12/1991
836	Animalia	Mammalia	Ornithorhynchidae	*Ornithorhynchus anatinus*	platypus	SL	None	0	43	10/07/2021
875	Animalia	Mammalia	Petauridae	*Petaurus australis australis*	yellow-bellied glider (southern subspecies)	V	V	0	4	29/08/1997
860	Animalia	Mammalia	Phascolarctidae	*Phascolarctos cinereus*	koala	E	E	0	444	25/09/2021
18794	Animalia	Mammalia	Potoroidae	*Potorous tridactylus tridactylus*	long-nosed potoroo	V	V	0	1	17/01/2003
2455	Animalia	Mammalia	Pseudocheiridae	*Petauroides armillatus*	central greater glider	E	V	0	3	08/08/1997
962	Animalia	Mammalia	Pteropodidae	*Pteropus poliocephalus*	grey-headed flying-fox	C	V	0	31	18/11/2011
838	Animalia	Mammalia	Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna	SL	None	0	7	25/10/2020
30272	Animalia	Reptilia	Chelidae	*Elseya albagula*	southern snapping turtle	CR	CE	0	49	30/10/2019
56	Animalia	Reptilia	Chelidae	*Elusor macrurus*	Mary River turtle	E	E	0	141	30/10/2019
511	Animalia	Reptilia	Elapidae	*Acanthophis antarcticus*	common death adder	V	None	1	2	29/08/1997
26926	Animalia	Sarcopterygii	Ceratodontidae	*Neoceratodus forsteri*	Australian lungfish	None	V	0	28	16/01/2020
11702	Plantae	Equisetopsida	Amaryllidaceae	*Proiphys cunninghamii*	Moreton Bay lily	SL	None	0	1	23/07/2013
41645	Plantae	Equisetopsida	Apocynaceae	*Leichhardtia coronata*	None	V	None	3	3	18/11/2006
12776	Plantae	Equisetopsida	Arecaceae	*Livistona australis*	cabbage tree palm	SL	None	0	1	23/07/2013
7131	Plantae	Equisetopsida	Asteraceae	*Picris conyzoides*	None	V	None	2	18	12/02/2021
41587	Plantae	Equisetopsida	Blechnaceae	*Blechnum doodianum*	None	SL	None	0	1	19/04/1999
41723	Plantae	Equisetopsida	Blechnaceae	*Blechnum medium*	None	SL	None	0	1	19/04/1999
6083	Plantae	Equisetopsida	Blechnaceae	*Blechnum patersonii subsp. queenslandicum*	None	SL	None	0	1	22/05/2003
41068	Plantae	Equisetopsida	Blechnaceae	*Blechnum rupestre*	None	SL	None	0	2	23/07/2013
16766	Plantae	Equisetopsida	Campanulaceae	*Lobelia purpurascens*	white root	SL	None	1	4	30/03/2016
36488	Plantae	Equisetopsida	Campanulaceae	*Wahlenbergia capillaris*	None	SL	None	1	1	13/03/1989
15918	Plantae	Equisetopsida	Campanulaceae	*Wahlenbergia gracilis*	sprawling bluebell	SL	None	0	1	05/05/2016

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
9895	Plantae	Equisetopsida	Corynocarpaceae	*Corynocarpus rupestris subsp. arborescens*	southern corynocarpus	V	None	1	1	29/03/2003
16586	Plantae	Equisetopsida	Cucurbitaceae	*Nothoalsomitra suberosa*	None	NT	None	2	2	20/03/1990
15806	Plantae	Equisetopsida	Dryopteridaceae	*Arachniodes aristata*	prickly shield fern	SL	None	0	2	19/04/1999
14433	Plantae	Equisetopsida	Dryopteridaceae	*Lastreopsis marginans*	glossy shield fern	SL	None	0	6	20/09/2019
41585	Plantae	Equisetopsida	Dryopteridaceae	*Parapolystichum acuminatum*	None	SL	None	0	1	30/06/2016
41725	Plantae	Equisetopsida	Dryopteridaceae	*Parapolystichum microsorum*	None	SL	None	1	3	30/06/2016
41602	Plantae	Equisetopsida	Dryopteridaceae	*Parapolystichum munitum*	None	SL	None	4	6	23/07/2013
22330	Plantae	Equisetopsida	Euphorbiaceae	*Mallotus megadontus*	None	V	None	2	2	17/11/2006
14088	Plantae	Equisetopsida	Euphorbiaceae	*Ricinocarpos speciosus*	None	V	None	3	3	16/09/2003
41041	Plantae	Equisetopsida	Lamiaceae	*Coleus torrenticola*	None	E	E	1	1	31/01/2007
13729	Plantae	Equisetopsida	Lamiaceae	*Westringia blakeana*	None	NT	None	1	1	22/10/1998
14327	Plantae	Equisetopsida	Menyanthaceae	*Nymphoides indica*	water snowflake	SL	None	0	1	23/07/2013
13406	Plantae	Equisetopsida	Myrtaceae	*Rhodamnia dumicola*	rib-fruited malletwood	E	None	1	6	31/08/2020
14255	Plantae	Equisetopsida	Myrtaceae	*Rhodamnia rubescens*	scrub turpentine	CR	CE	0	4	31/08/2020
16290	Plantae	Equisetopsida	Myrtaceae	*Rhodomyrtus psidioides*	native guava	CR	CE	1	2	10/01/2011
14366	Plantae	Equisetopsida	Najadaceae	*Najas tenuifolia*	water nymph	SL	None	1	1	11/04/2019
14087	Plantae	Equisetopsida	Orchidaceae	*Acianthus fornicatus*	pixie caps	SL	None	5	5	16/06/1999
15816	Plantae	Equisetopsida	Orchidaceae	*Arthrochilus irritabilis*	leafy elbow orchid	SL	None	1	1	27/02/1995
8527	Plantae	Equisetopsida	Orchidaceae	*Arthrochilus prolixus*	None	SL	None	1	1	06/01/1992
10323	Plantae	Equisetopsida	Orchidaceae	*Bulbophyllum schillerianum*	red rope orchid	SL	None	2	2	16/06/1999
13444	Plantae	Equisetopsida	Orchidaceae	*Caladenia carnea*	None	SL	None	1	1	10/09/1995
17790	Plantae	Equisetopsida	Orchidaceae	*Caladenia catenata*	None	SL	None	3	3	16/06/1999
9297	Plantae	Equisetopsida	Orchidaceae	*Caladenia picta*	None	SL	None	1	1	10/09/1995
14760	Plantae	Equisetopsida	Orchidaceae	*Calanthe triplicata*	christmas orchid	SL	None	0	3	10/01/2011
14140	Plantae	Equisetopsida	Orchidaceae	*Calochilus campestris*	copper beard orchid	SL	None	2	2	10/09/1995
36435	Plantae	Equisetopsida	Orchidaceae	*Cestichis swenssonii*	None	SL	None	2	2	16/06/1999

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
2163	Plantae	Equisetopsida	Orchidaceae	*Chiloglottis diphylla*	None	SL	None	1	2	22/03/1995
9260	Plantae	Equisetopsida	Orchidaceae	*Chiloglottis sylvestris*	None	SL	None	3	3	16/05/1995
27531	Plantae	Equisetopsida	Orchidaceae	*Corunastylis acuminata*	None	SL	None	1	1	06/01/1992
27535	Plantae	Equisetopsida	Orchidaceae	*Corunastylis cranei*	None	V	None	4	4	04/03/1992
9265	Plantae	Equisetopsida	Orchidaceae	*Corybas barbarae*	helmet orchid	SL	None	2	2	16/06/1999
13277	Plantae	Equisetopsida	Orchidaceae	*Cryptostylis erecta*	bonnet orchid	SL	None	1	1	09/01/1991
13278	Plantae	Equisetopsida	Orchidaceae	*Cryptostylis subulata*	large tongue orchid	SL	None	3	3	22/05/1999
17505	Plantae	Equisetopsida	Orchidaceae	*Cymbidium canaliculatum*	None	SL	None	0	1	30/03/2016
13963	Plantae	Equisetopsida	Orchidaceae	*Cymbidium madidum*	None	SL	None	1	4	23/07/2013
17506	Plantae	Equisetopsida	Orchidaceae	*Cymbidium suave*	None	SL	None	1	3	23/07/2013
13280	Plantae	Equisetopsida	Orchidaceae	*Dendrobium aemulum*	ironbark orchid	SL	None	3	4	19/04/1999
12834	Plantae	Equisetopsida	Orchidaceae	*Dendrobium gracilicaule*	slender orchid	SL	None	3	4	19/04/1999
14633	Plantae	Equisetopsida	Orchidaceae	*Dendrobium kingianum subsp. kingianum*	None	SL	None	4	5	19/04/1999
14634	Plantae	Equisetopsida	Orchidaceae	*Dendrobium monophyllum*	None	SL	None	1	3	19/04/1999
14631	Plantae	Equisetopsida	Orchidaceae	*Dendrobium speciosum*	None	SL	None	1	4	05/05/2016
9074	Plantae	Equisetopsida	Orchidaceae	*Dendrobium speciosum subsp. grandiflorum*	None	SL	None	2	2	24/10/1993
12831	Plantae	Equisetopsida	Orchidaceae	*Dendrobium tetragonum*	tree spider orchid	SL	None	3	5	10/01/2011
13976	Plantae	Equisetopsida	Orchidaceae	*Dendrobium x delicatum*	None	SL	None	1	1	23/08/1995
5768	Plantae	Equisetopsida	Orchidaceae	*Dockrillia bowmanii*	scrub pencil orchid	SL	None	1	2	19/04/1999
5779	Plantae	Equisetopsida	Orchidaceae	*Dockrillia linguiformis*	tongue orchid	SL	None	3	3	24/10/1993
5803	Plantae	Equisetopsida	Orchidaceae	*Dockrillia schoenina*	pencil orchid	SL	None	2	2	11/09/1995
5671	Plantae	Equisetopsida	Orchidaceae	*Dockrillia teretifolia*	rat's tail orchid	SL	None	2	3	19/04/1999
13952	Plantae	Equisetopsida	Orchidaceae	*Eriochilus cucullatus*	None	SL	None	2	2	15/04/1990
17287	Plantae	Equisetopsida	Orchidaceae	*Erythrorchis cassythoides*	climbing orchid	SL	None	2	2	14/08/1992
8197	Plantae	Equisetopsida	Orchidaceae	*Geodorum densiflorum*	pink nodding orchid	SL	None	1	2	30/01/2018

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
13203	Plantae	Equisetopsida	Orchidaceae	*Glossodia minor*	small wax lip orchid	SL	None	1	1	10/09/1995
12782	Plantae	Equisetopsida	Orchidaceae	*Lyperanthus suaveolens*	brown beaks	SL	None	1	1	10/09/1995
9455	Plantae	Equisetopsida	Orchidaceae	*Microtis rara*	scented onion orchid	SL	None	1	1	10/09/1995
12719	Plantae	Equisetopsida	Orchidaceae	*Peristeranthus hillii*	None	SL	None	1	3	23/07/2013
12734	Plantae	Equisetopsida	Orchidaceae	*Plectorrhiza brevilabris*	None	SL	None	2	2	16/05/1995
14320	Plantae	Equisetopsida	Orchidaceae	*Plectorrhiza tridentata*	tangle orchid	SL	None	2	4	19/04/1999
12690	Plantae	Equisetopsida	Orchidaceae	*Pterostylis acuminata*	sharp greenhood	SL	None	3	3	11/07/1992
16345	Plantae	Equisetopsida	Orchidaceae	*Pterostylis baptistii*	king greenhood	SL	None	2	2	17/06/1998
12693	Plantae	Equisetopsida	Orchidaceae	*Pterostylis erecta*	None	SL	None	1	1	16/06/1999
12694	Plantae	Equisetopsida	Orchidaceae	*Pterostylis grandiflora*	None	SL	None	2	2	26/06/2011
12703	Plantae	Equisetopsida	Orchidaceae	*Pterostylis hildae*	rainforest greenhood	SL	None	1	1	16/06/1999
9321	Plantae	Equisetopsida	Orchidaceae	*Pterostylis nutans*	None	SL	None	4	4	26/06/2011
9322	Plantae	Equisetopsida	Orchidaceae	*Pterostylis ophioglossa*	None	SL	None	2	2	16/06/1999
16347	Plantae	Equisetopsida	Orchidaceae	*Pterostylis parviflora*	tiny greenhood	SL	None	2	2	23/04/1990
9834	Plantae	Equisetopsida	Orchidaceae	*Pterostylis russellii*	None	SL	None	2	2	24/05/1995
9187	Plantae	Equisetopsida	Orchidaceae	*Sarcochilus ceciliae*	fairy bells	SL	None	2	3	19/04/1999
12659	Plantae	Equisetopsida	Orchidaceae	*Sarcochilus dilatatus*	brown sarcochilus	SL	None	2	2	16/05/1995
12709	Plantae	Equisetopsida	Orchidaceae	*Sarcochilus falcatus*	orange blossom orchid	SL	None	1	1	24/10/1993
12657	Plantae	Equisetopsida	Orchidaceae	*Sarcochilus hillii*	None	SL	None	1	1	24/10/1993
9840	Plantae	Equisetopsida	Orchidaceae	*Taeniophyllum muelleri*	None	SL	None	1	1	11/07/1992
7915	Plantae	Equisetopsida	Orchidaceae	*Thelymitra angustifolia*	None	SL	None	3	3	10/09/1995
17354	Plantae	Equisetopsida	Polypodiaceae	*Drynaria rigidula*	None	SL	None	1	5	05/05/2016
11696	Plantae	Equisetopsida	Polypodiaceae	*Platycerium bifurcatum*	None	SL	None	0	3	20/09/2019
11697	Plantae	Equisetopsida	Polypodiaceae	*Platycerium superbum*	staghorn fern	SL	None	0	7	31/08/2020
6668	Plantae	Equisetopsida	Polypodiaceae	*Pyrrosia confluens*	None	SL	None	0	3	19/04/1999
16314	Plantae	Equisetopsida	Polypodiaceae	*Pyrrosia confluens var. confluens*	None	SL	None	0	1	23/07/2013

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
16317	Plantae	Equisetopsida	Polypodiaceae	*Pyrrosia rupestris*	rock felt fern	SL	None	0	3	05/05/2016
13099	Plantae	Equisetopsida	Potamogetonaceae	*Potamogeton crispus*	curly pondweed	SL	None	1	1	04/11/1996
14285	Plantae	Equisetopsida	Potamogetonaceae	*Potamogeton perfoliatus*	perfoliate pondweed	SL	None	1	1	04/11/1996
13202	Plantae	Equisetopsida	Proteaceae	*Floydia praealta*	ball nut	V	V	3	3	03/02/2007
16746	Plantae	Equisetopsida	Proteaceae	*Macadamia integrifolia*	macadamia nut	V	V	16	17	28/01/2022
16747	Plantae	Equisetopsida	Proteaceae	*Macadamia ternifolia*	bopple nut	V	V	7	8	31/08/2020
16381	Plantae	Equisetopsida	Psilotaceae	*Psilotum complanatum*	flat fork fern	SL	None	1	1	31/03/1967
18116	Plantae	Equisetopsida	Pteridaceae	*Adiantum aethiopicum*	None	SL	None	0	2	19/04/1999
21888	Plantae	Equisetopsida	Pteridaceae	*Adiantum atroviride*	None	SL	None	0	1	05/05/2016
18030	Plantae	Equisetopsida	Pteridaceae	*Adiantum diaphanum*	None	SL	None	0	3	23/07/2013
18031	Plantae	Equisetopsida	Pteridaceae	*Adiantum hispidulum*	None	SL	None	0	6	23/07/2013
9284	Plantae	Equisetopsida	Pteridaceae	*Adiantum hispidulum var. hispidulum*	None	SL	None	0	2	31/08/2020
14887	Plantae	Equisetopsida	Pteridaceae	*Adiantum silvaticum*	None	SL	None	0	1	10/01/2011
9723	Plantae	Equisetopsida	Pteridaceae	*Pellaea falcata*	None	SL	None	0	2	19/04/1999
21889	Plantae	Equisetopsida	Pteridaceae	*Pellaea nana*	None	SL	None	1	2	23/07/2013
13800	Plantae	Equisetopsida	Pteridaceae	*Pellaea paradoxa*	heart fern	SL	None	1	5	19/04/1999
16342	Plantae	Equisetopsida	Pteridaceae	*Pteris tremula*	None	SL	None	1	3	10/01/2011
16344	Plantae	Equisetopsida	Pteridaceae	*Pteris vittata*	Chinese bracken	SL	None	1	1	29/11/1993
11988	Plantae	Equisetopsida	Rutaceae	*Bosistoa transversa*	three-leaved bosistoa	C	V	11	12	28/01/2022
13501	Plantae	Equisetopsida	Santalaceae	*Thesium australe*	toadflax	V	V	1	1	19/04/1993
13017	Plantae	Equisetopsida	Sterculiaceae	*Brachychiton acerifolius*	flame tree	SL	None	0	2	20/09/2019
12643	Plantae	Equisetopsida	Sterculiaceae	*Brachychiton discolor*	None	SL	None	0	3	23/07/2013
17802	Plantae	Equisetopsida	Sterculiaceae	*Brachychiton populneus subsp. populneus*	None	SL	None	0	1	20/07/1999
7608	Plantae	Equisetopsida	Symplocaceae	*Symplocos harroldii*	hairy hazelwood	NT	None	2	4	23/07/2013
13998	Plantae	Equisetopsida	Thelypteridaceae	*Christella dentata*	creek fern	SL	None	0	7	31/08/2020

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
11704	Plantae	Equisetopsida	Thelypteridaceae	*Christella parasitica*	None	SL	None	0	2	23/07/2013
17504	Plantae	Equisetopsida	Thelypteridaceae	*Cyclosorus interruptus*	None	SL	None	1	1	30/11/1993
15934	Plantae	Equisetopsida	Xanthorrhoeaceae	*Xanthorrhoea johnsonii*	None	SL	None	2	3	20/09/2019
9156	Plantae	Equisetopsida	Xanthorrhoeaceae	*Xanthorrhoea latifolia subsp. latifolia*	None	SL	None	1	5	25/09/2020
14429	Plantae	Equisetopsida	Zamiaceae	*Macrozamia lucida*	pineapple zamia	SL	None	0	3	13/09/2013
22414	Plantae	Equisetopsida	Zamiaceae	*Macrozamia macleayi*	None	SL	None	2	2	27/02/1993
16707	Plantae	Equisetopsida	Zamiaceae	*Macrozamia miquelii*	None	SL	None	0	1	19/04/1999

Taxon Id: Unique identifier of the taxon from the WildNet database.

NCA: Queensland conservation status of the taxon under the *Nature Conservation Act 1992* (Least Concern (C), Critically Endangered (CR), Endangered (E), Extinct (EX), Near Threatened (NT), Extinct in the Wild (PE), Special Least Concern (SL), and Vulnerable (V)).

EPBC: Australian conservation status of the taxon under the *Environment Protection and Biodiversity Conservation Act 1999* (Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Vulnerable (V), and Extinct in the Wild (XW)).

Specimens: The number of specimen-backed records of the taxon.

Records: The total number of records of the taxon.

Last record: Date of latest record of the taxon.

Links and Support

Other sites that deliver species information from the WildNet database include:

- Species profile search - access species information approved for publication including species names, statuses, notes, images, distribution maps and records
- Species lists - generate species lists for Queensland protected areas, forestry areas, local governments and areas defined using coordinates
- Biomaps - view biodiversity information, including WildNet records approved for publication, and generate reports
- Queensland Globe - view spatial information, including WildNet records approved for publication
- Qld wildlife data API - access WildNet species information approved for publication such as notes, images and records etc.
- Wetland*Maps* - view species records, survey locations etc. approved for publication
- Wetland*Summary* - view wildlife statistics, species lists for a range of area types, and access WildNet species profiles
- WildNet wildlife records - published - Queensland - spatial layer of WildNet records approved for publication generated weekly
- Generalised distribution and densities of Queensland wildlife - Queensland species distributions and densities generalised to a 10 km grid resolution
- Conservation status of Queensland wildlife - access current lists of priority species for Queensland including nomenclature and status information
- Queensland Confidential Species - the list of species flagged as confidential in the WildNet database.

Please direct queries about this report to the WildNet Team.

Other useful sites for accessing Queensland biodiversity data include:

- Useful wildlife resources
- Queensland Government Data
- Atlas of Living Australia (ALA)
- Online Zoological Collections of Australian Museums (OZCAM)
- Australia's Virtual Herbarium (AVH)
- Protected Matters Search Tool

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WildNet Records
Pest List



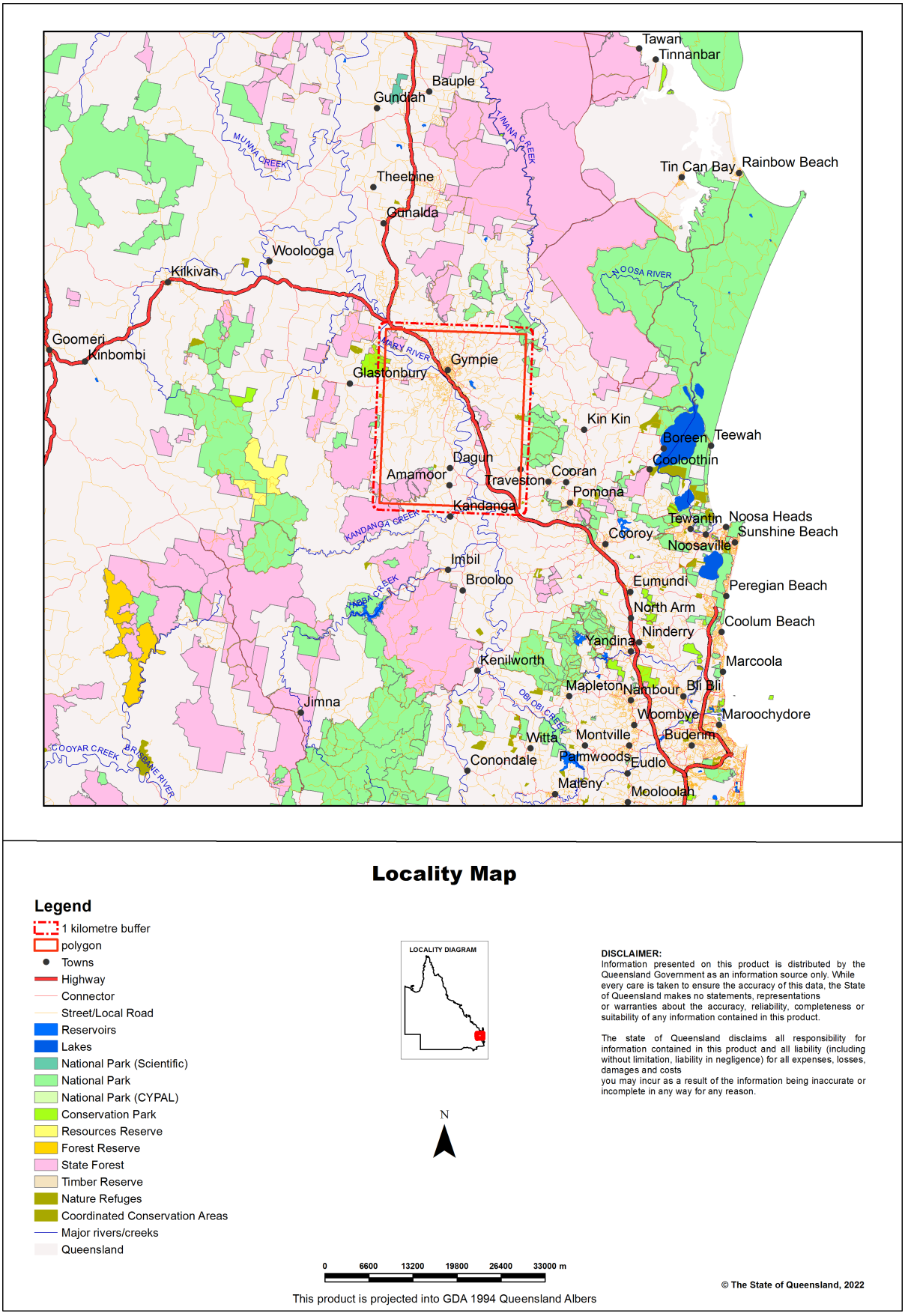
For the selected area of interest 54831.55ha Custom Geometry

Current as at 05/07/2022

WildNetPestList

Queensland Government

Map 1. Locality Map



Locality Map

Legend

- 1 kilometre buffer
- polygon
- Towns
- Highway
- Connector
- Street/Local Road
- Reservoirs
- Lakes
- National Park (Scientific)
- National Park
- National Park (CYPAL)
- Conservation Park
- Resources Reserve
- Forest Reserve
- State Forest
- Timber Reserve
- Nature Refuges
- Coordinated Conservation Areas
- Major rivers/creeks
- Queensland

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0 6600 13200 19800 26400 33000 m

This product is projected into GDA 1994 Queensland Albers

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Summary Information

The following table provides an overview of the area of interest Custom Geometry.

Table 1. Area of interest details

Size (ha)	54,831.55
Local Government(s)	Noosa Shire, Gympie Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Gympie Block
Catchment(s)	Mary

Protected Area(s)
The following estates and/or reserves are located in the area of interest:

Lynchs Hill State Forest

King Conservation Park

Goomboorian National Park

King State Forest

Fishermans Pocket State Forest

Woondum National Park

Woondum State Forest

Traveston State Forest

Amamoor State Forest

Amamoor National Park

World Heritage Area(s)
No World Heritage Areas are located within the area of interest.

Ramsar Area(s)
No Ramsar Areas are located within the area of interest.

Pest List

Introduction

This report is derived from a spatial layer generated from the WildNet database managed by the Department of Environment and Science. The layer which is generated weekly contains the WildNet wildlife records that are not classed as erroneous or duplicate, that have a location precision equal to or less than 10000 metres and do not have a count of zero.

The WildNet dataset is constantly being enhanced and the taxonomic and status information revised. If a species is not listed in this report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area. It is recommended that you also access other internal and external data sources for species information in your area of interest (Refer Links and Support).

Species Data

Contextual location information is presented in Map 1.

A summary of the pests recorded within the area of interest and its one kilometre buffer is presented in Table 2.

Table 2. Pests recorded within the area of interest and its one kilometre buffer

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
26938	Animalia	Actinopterygii	Cichlidae	*Oreochromis mossambica*	Mozambique mouthbrooder	0	1	13/01/2020	II

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
27055	Animalia	Actinopterygii	Poeciliidae	*Gambusia holbrooki*	mosquitofish	0	4	13/01/2020	II
19548	Animalia	Actinopterygii	Poeciliidae	*Poecilia reticulata*	guppy	0	1	31/12/1991	II
19690	Animalia	Actinopterygii	Poeciliidae	*Xiphophorus hellerii*	swordtail	0	2	08/03/2015	II
19501	Animalia	Actinopterygii	Poeciliidae	*Xiphophorus maculatus*	platy	2	3	13/01/2020	II
716	Animalia	Amphibia	Bufonidae	*Rhinella marina*	cane toad	0	159	19/03/2021	II
1994	Animalia	Aves	Anatidae	*Anas platyrhynchos*	northern mallard	0	36	14/03/2006	II
21967	Animalia	Aves	Cacatuidae	*Cacatua tenuirostris*	long-billed corella	0	2	31/12/1996	IA
1804	Animalia	Aves	Columbidae	*Columba livia*	rock dove	0	12	11/09/2005	II
1774	Animalia	Aves	Columbidae	*Streptopelia chinensis*	spotted dove	0	38	25/02/2007	II
1360	Animalia	Aves	Passeridae	*Passer domesticus*	house sparrow	0	41	31/10/2002	II
1303	Animalia	Aves	Sturnidae	*Sturnus vulgaris*	common starling	1	3	19/06/1999	II
19177	Animalia	Insecta	Nymphalidae	*Danaus plexippus*	monarch	0	6	05/01/2012	II
1071	Animalia	Mammalia	Canidae	*Vulpes vulpes*	red fox	0	2	27/03/2015	II
814	Animalia	Mammalia	Equidae	*Equus caballus*	horse	0	1	31/12/1960	II
832	Animalia	Mammalia	Leporidae	*Lepus europaeus*	European brown hare	0	6	25/03/2001	II
411	Animalia	Reptilia	Gekkonidae	*Hemidactylus frenatus*	house gecko	0	1	07/11/2003	II
33640	Plantae	Equisetopsida	Acanthaceae	*Ruellia simplex*	None	2	2	25/11/2000	IU
14157	Plantae	Equisetopsida	Acanthaceae	*Thunbergia alata*	black-eyed Susan	1	1	14/05/2001	IU
11782	Plantae	Equisetopsida	Amaranthaceae	*Guilleminea densa*	small matweed	1	1	04/03/1969	IU
11645	Plantae	Equisetopsida	Amaryllidaceae	*Zephyranthes candida*	None	1	1	18/02/2001	IU
17173	Plantae	Equisetopsida	Anacardiaceae	*Euroschinus falcatus*	None	0	5	19/04/1999	XU
16720	Plantae	Equisetopsida	Anacardiaceae	*Mangifera indica*	mango	0	1	01/07/1995	IU
11769	Plantae	Equisetopsida	Anacardiaceae	*Schinus terebinthifolius*	None	7	10	13/08/2017	IU
8244	Plantae	Equisetopsida	Apocynaceae	*Araujia sericifera*	white moth vine	0	1	12/03/2001	IU
4710	Plantae	Equisetopsida	Apocynaceae	*Gymnema pleiadenium*	None	0	1	19/04/1999	XU
11202	Plantae	Equisetopsida	Apocynaceae	*Hoya australis*	None	0	5	19/04/1999	XU
17960	Plantae	Equisetopsida	Araucariaceae	*Araucaria cunninghamii*	hoop pine	0	7	01/07/2015	XU
17972	Plantae	Equisetopsida	Aristolochiaceae	*Aristolochia elegans*	calico-flower	1	5	12/03/2001	IU
19747	Plantae	Equisetopsida	Asparagaceae	*Asparagus aethiopicus*	ground asparagus	1	1	14/05/2001	XU
35428	Plantae	Equisetopsida	Asparagaceae	*Asparagus macowanii*	None	1	1	16/11/2006	IU
14816	Plantae	Equisetopsida	Asparagaceae	*Asparagus officinalis*	asparagus	1	1	21/11/2006	IU
7566	Plantae	Equisetopsida	Asparagaceae	*Asparagus plumosus*	feathered asparagus fern	0	5	01/07/1995	IU
9491	Plantae	Equisetopsida	Asphodelaceae	*Aloe parvibracteata*	None	1	1	14/05/2001	IU

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
15715	Plantae	Equisetopsida	Asteraceae	*Acanthospermum hispidum*	star burr	0	1	23/05/2018	IU
14051	Plantae	Equisetopsida	Asteraceae	*Ageratum houstonianum*	blue billygoat weed	1	10	24/02/2004	IU
15672	Plantae	Equisetopsida	Asteraceae	*Ambrosia artemisiifolia*	annual ragweed	1	1	26/01/1972	IU
15612	Plantae	Equisetopsida	Asteraceae	*Baccharis halimifolia*	groundsel bush	0	6	01/07/1995	IU
7691	Plantae	Equisetopsida	Asteraceae	*Bidens pilosa*	None	0	3	01/07/1995	IU
15570	Plantae	Equisetopsida	Asteraceae	*Calyptocarpus vialis*	creeping cinderella weed	1	2	04/05/2018	IU
15574	Plantae	Equisetopsida	Asteraceae	*Carduus thoermeri*	nodding thistle	3	3	21/10/1993	IU
14001	Plantae	Equisetopsida	Asteraceae	*Cirsium vulgare*	spear thistle	0	1	01/07/1995	IU
33971	Plantae	Equisetopsida	Asteraceae	*Dimorphotheca ecklonis*	None	1	1	14/05/2001	IU
15438	Plantae	Equisetopsida	Asteraceae	*Eclipta prostrata*	white eclipta	1	1	25/05/2013	IU
15401	Plantae	Equisetopsida	Asteraceae	*Emilia sonchifolia*	None	0	1	01/07/1995	IU
15285	Plantae	Equisetopsida	Asteraceae	*Hypochaeris radicata*	catsear	0	1	01/07/1995	IU
8407	Plantae	Equisetopsida	Asteraceae	*Praxelis clematidea*	None	3	3	27/12/2020	IU
31216	Plantae	Equisetopsida	Asteraceae	*Senecio angulatus*	None	1	1	24/06/2015	IU
10486	Plantae	Equisetopsida	Asteraceae	*Senecio madagascariensis*	fireweed	2	2	20/11/2017	IU
22236	Plantae	Equisetopsida	Asteraceae	*Soliva sessilis*	None	1	1	25/11/2000	IU
26362	Plantae	Equisetopsida	Asteraceae	*Sphagneticola trilobata*	None	0	1	15/06/2018	IU
35909	Plantae	Equisetopsida	Asteraceae	*Symphyotrichum subulatum*	None	1	1	14/05/2001	IU
5622	Plantae	Equisetopsida	Asteraceae	*Synedrellopsis grisebachii*	None	1	1	09/11/2021	IU
10450	Plantae	Equisetopsida	Asteraceae	*Tithonia diversifolia*	Japanese sunflower	1	1	13/05/2001	IU
34188	Plantae	Equisetopsida	Bignoniaceae	*Dolichandra unguis-cati*	cat's claw creeper	20	27	01/07/2015	IU
11152	Plantae	Equisetopsida	Bignoniaceae	*Jacaranda mimosifolia*	jacaranda	0	1	01/07/1995	IU
41068	Plantae	Equisetopsida	Blechnaceae	*Blechnum rupestre*	None	0	1	01/07/1995	XU
14570	Plantae	Equisetopsida	Boraginaceae	*Ehretia acuminata*	None	0	1	01/07/1995	XU
12221	Plantae	Equisetopsida	Brassicaceae	*Lepidium bonariense*	Argentine peppercress	2	2	25/10/2004	IU
15098	Plantae	Equisetopsida	Brassicaceae	*Raphanus raphanistrum*	wild radish	0	1	27/06/2018	IU
15101	Plantae	Equisetopsida	Brassicaceae	*Rorippa palustris*	marsh cress	1	1	07/10/1993	IU
11636	Plantae	Equisetopsida	Brassicaceae	*Sinapis alba*	white mustard	1	1	31/08/1984	IU
26358	Plantae	Equisetopsida	Cactaceae	*Opuntia monacantha*	None	1	1	06/05/2015	IU
19437	Plantae	Equisetopsida	Caryophyllaceae	*Silene gallica*	None	1	1	06/10/1971	IU
10494	Plantae	Equisetopsida	Convolvulaceae	*Ipomoea hederacea*	None	1	1	27/12/2017	IU
11029	Plantae	Equisetopsida	Convolvulaceae	*Ipomoea indica*	blue morning-glory	1	1	14/05/2001	IU

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
21934	Plantae	Equisetopsida	Crassulaceae	*Bryophyllum delagoense*	None	1	1	14/05/2001	IU
27801	Plantae	Equisetopsida	Crassulaceae	*Crassula sarmentosa*	None	1	1	14/05/2001	IU
14662	Plantae	Equisetopsida	Cyperaceae	*Cyperus eragrostis*	None	1	1	07/10/1993	IU
14657	Plantae	Equisetopsida	Cyperaceae	*Cyperus involucratus*	None	1	1	13/05/2001	IU
11617	Plantae	Equisetopsida	Ebenaceae	*Diospyros kaki*	persimmon	0	2	14/12/2018	IU
17162	Plantae	Equisetopsida	Euphorbiaceae	*Euphorbia heterophylla*	None	1	1	13/03/1973	IU
34392	Plantae	Equisetopsida	Euphorbiaceae	*Euphorbia ophthalmica*	None	1	1	21/02/2005	IU
18802	Plantae	Equisetopsida	Gentianaceae	*Centaurium tenuiflorum*	None	1	1	25/11/2000	IU
11859	Plantae	Equisetopsida	Lauraceae	*Cinnamomum camphora*	camphor laurel	3	8	14/05/2003	IU
14068	Plantae	Equisetopsida	Leguminosae	*Acacia saligna*	golden wreath wattle	1	1	22/08/1981	IU
30268	Plantae	Equisetopsida	Leguminosae	*Arachis pintoi*	None	0	1	24/10/2018	IU
36122	Plantae	Equisetopsida	Leguminosae	*Biancaea decapetala*	None	1	1	14/02/2007	IU
14805	Plantae	Equisetopsida	Leguminosae	*Cajanus cajan*	pigeon pea	1	1	30/04/2018	IU
35911	Plantae	Equisetopsida	Leguminosae	*Crotalaria beddomeana*	None	1	1	05/06/1996	IU
18779	Plantae	Equisetopsida	Leguminosae	*Crotalaria pallida*	None	0	1	01/07/1995	IU
13037	Plantae	Equisetopsida	Leguminosae	*Desmodium tortuosum*	Florida beggar-weed	1	1	25/11/2000	IU
13038	Plantae	Equisetopsida	Leguminosae	*Desmodium uncinatum*	None	1	1	14/05/2001	IU
12996	Plantae	Equisetopsida	Leguminosae	*Erythrina crista-galli*	None	2	2	14/05/2001	IU
14518	Plantae	Equisetopsida	Leguminosae	*Gleditsia triacanthos*	honey locust	1	1	11/01/2016	IU
22819	Plantae	Equisetopsida	Leguminosae	*Indigofera arrecta*	None	1	1	19/06/2018	IU
8865	Plantae	Equisetopsida	Leguminosae	*Leucaena leucocephala subsp. glabrata*	None	1	1	13/05/2001	IU
6280	Plantae	Equisetopsida	Leguminosae	*Leucaena leucocephala subsp. leucocephala*	None	1	1	14/05/2001	IU
15228	Plantae	Equisetopsida	Leguminosae	*Lotononis bainesii*	lotononis	0	1	04/09/2018	IU
15235	Plantae	Equisetopsida	Leguminosae	*Macroptilium atropurpureum*	siratro	0	1	01/07/1995	IU
15239	Plantae	Equisetopsida	Leguminosae	*Medicago lupulina*	black medic	2	2	25/11/2000	IU
15241	Plantae	Equisetopsida	Leguminosae	*Melilotus indicus*	hexham scent	1	1	07/10/1993	IU
18222	Plantae	Equisetopsida	Leguminosae	*Neonotonia wightii*	None	0	1	01/07/2015	IU
29406	Plantae	Equisetopsida	Leguminosae	*Pueraria montana var. lobata*	kudzu	1	1	04/04/2017	IU
15576	Plantae	Equisetopsida	Leguminosae	*Senna alata*	None	0	1	23/04/2018	IU
14733	Plantae	Equisetopsida	Leguminosae	*Senna didymobotrya*	None	1	1	09/05/1963	IU
14238	Plantae	Equisetopsida	Leguminosae	*Senna hirsuta*	None	1	1	21/09/2012	IU
14196	Plantae	Equisetopsida	Leguminosae	*Senna occidentalis*	coffee senna	2	2	14/07/2015	IU

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
15073	Plantae	Equisetopsida	Leguminosae	*Senna pendula var. glabrata*	Easter cassia	4	4	14/05/2001	IU
24648	Plantae	Equisetopsida	Leguminosae	*Senna septemtrionalis*	None	0	3	01/07/1995	IU
9418	Plantae	Equisetopsida	Leguminosae	*Vicia sativa subsp. nigra*	None	0	1	11/09/2018	IU
7791	Plantae	Equisetopsida	Leguminosae	*Vicia villosa subsp. eriocarpa*	None	1	1	27/09/1962	IU
12853	Plantae	Equisetopsida	Lythraceae	*Cuphea carthagenensis*	None	1	1	01/06/2010	IU
13006	Plantae	Equisetopsida	Malvaceae	*Gossypium barbadense*	None	2	2	14/05/2001	IU
12949	Plantae	Equisetopsida	Malvaceae	*Modiola caroliniana*	red-flowered mallow	1	1	07/11/2000	IU
16195	Plantae	Equisetopsida	Malvaceae	*Sida cordifolia*	None	1	4	23/06/2018	IU
12146	Plantae	Equisetopsida	Myrtaceae	*Eugenia uniflora*	Brazilian cherry tree	2	2	02/09/2020	IU
13400	Plantae	Equisetopsida	Myrtaceae	*Psidium guineense*	cherry guava	1	1	14/05/2001	IU
19941	Plantae	Equisetopsida	Nymphaeaceae	*Nymphaea caerulea*	None	1	1	10/02/1964	IU
13390	Plantae	Equisetopsida	Ochnaceae	*Ochna serrulata*	ochna	0	6	01/07/2015	IU
9461	Plantae	Equisetopsida	Oleaceae	*Jasminum simplicifolium*	None	0	3	01/07/1995	XU
13417	Plantae	Equisetopsida	Oleaceae	*Ligustrum lucidum*	large-leaved privet	2	2	14/05/2001	IU
16795	Plantae	Equisetopsida	Oleaceae	*Ligustrum sinense*	small-leaved privet	1	5	02/09/2020	IU
32786	Plantae	Equisetopsida	Onagraceae	*Oenothera lindheimeri*	None	1	1	31/01/1954	IU
9457	Plantae	Equisetopsida	Oxalidaceae	*Oxalis corniculata*	None	1	3	16/07/2013	IU
12715	Plantae	Equisetopsida	Passifloraceae	*Passiflora edulis*	None	0	2	01/07/1995	IU
16530	Plantae	Equisetopsida	Passifloraceae	*Passiflora foetida*	None	1	2	14/05/2001	IU
16532	Plantae	Equisetopsida	Passifloraceae	*Passiflora suberosa*	corky passion flower	0	9	01/07/2015	IU
16533	Plantae	Equisetopsida	Passifloraceae	*Passiflora subpeltata*	white passion flower	1	5	01/07/1995	IU
16302	Plantae	Equisetopsida	Petiveriaceae	*Rivina humilis*	None	1	9	01/07/2015	IU
16479	Plantae	Equisetopsida	Phytolaccaceae	*Phytolacca octandra*	inkweed	0	1	01/07/1995	IU
5286	Plantae	Equisetopsida	Piperaceae	*Peperomia leptostachya*	None	0	1	01/07/1995	XU
18225	Plantae	Equisetopsida	Plantaginaceae	*Mecardonia procumbens*	None	1	1	07/02/1991	IU
12730	Plantae	Equisetopsida	Plantaginaceae	*Plantago major*	greater plantain	1	1	25/11/2000	IU
33873	Plantae	Equisetopsida	Poaceae	*Cenchrus americanus*	None	1	1	13/04/1970	IU
15551	Plantae	Equisetopsida	Poaceae	*Chloris gayana*	rhodes grass	1	2	14/05/2001	IU
7812	Plantae	Equisetopsida	Poaceae	*Cynodon dactylon var. dactylon*	None	1	1	08/05/2001	IU
10386	Plantae	Equisetopsida	Poaceae	*Cynodon nlemfuensis var. nlemfuensis*	None	1	1	03/04/2000	IU

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
35353	Plantae	Equisetopsida	Poaceae	*Cynodon plectostachyus*	None	1	1	19/11/2013	IU
10391	Plantae	Equisetopsida	Poaceae	*Dactyloctenium australe*	sweet smother grass	2	2	08/03/1971	IU
15463	Plantae	Equisetopsida	Poaceae	*Dichanthium annulatum*	sheda grass	1	1	25/11/2000	IU
29093	Plantae	Equisetopsida	Poaceae	*Megathyrsus maximus*	None	0	5	19/04/2018	IU
28224	Plantae	Equisetopsida	Poaceae	*Megathyrsus maximus var. coloratus*	None	1	1	27/12/2017	IU
28420	Plantae	Equisetopsida	Poaceae	*Megathyrsus maximus var. maximus*	None	1	1	21/05/2003	IU
22783	Plantae	Equisetopsida	Poaceae	*Paspalum mandiocanum*	None	1	1	02/05/1995	IU
10820	Plantae	Equisetopsida	Poaceae	*Paspalum notatum*	bahia grass	1	1	08/05/2001	IU
9190	Plantae	Equisetopsida	Poaceae	*Setaria sphacelata*	None	2	2	27/12/2020	IU
22165	Plantae	Equisetopsida	Poaceae	*Sporobolus africanus*	Parramatta grass	1	1	11/12/1989	IU
22159	Plantae	Equisetopsida	Poaceae	*Sporobolus fertilis*	giant Parramatta grass	0	2	14/02/2017	IU
10158	Plantae	Equisetopsida	Poaceae	*Sporobolus natalensis*	None	1	1	07/11/1989	IU
10156	Plantae	Equisetopsida	Poaceae	*Sporobolus pyramidalis*	None	7	7	26/01/1994	IU
14973	Plantae	Equisetopsida	Poaceae	*Themeda quadrivalvis*	grader grass	1	1	03/03/1972	IU
2249	Plantae	Equisetopsida	Poaceae	*Urochloa decumbens*	None	1	1	14/05/2001	IU
13129	Plantae	Equisetopsida	Polygalaceae	*Polygala virgata*	None	1	1	04/10/1993	IU
19983	Plantae	Equisetopsida	Pontederiacea e	*Pontederia cordata*	None	1	1	20/12/2006	IU
22935	Plantae	Equisetopsida	Ranunculaceae	*Ranunculus sceleratus subsp. sceleratus*	None	0	1	16/08/2018	IU
12166	Plantae	Equisetopsida	Rosaceae	*Rhaphiolepis indica*	Indian hawthorn	1	1	14/05/2001	IU
16304	Plantae	Equisetopsida	Rosaceae	*Rosa laevigata*	cherokee rose	1	1	20/09/1967	IU
21837	Plantae	Equisetopsida	Rutaceae	*Murraya paniculata 'Exotica'*	None	0	1	01/07/1995	IU
14128	Plantae	Equisetopsida	Rutaceae	*Zieria minutiflora*	None	0	1	01/07/1995	XU
11945	Plantae	Equisetopsida	Salicaceae	*Salix babylonica*	weeping willow	2	2	14/05/2001	IU
31211	Plantae	Equisetopsida	Salicaceae	*Salix humboldtiana*	None	1	1	06/10/2017	IU
17738	Plantae	Equisetopsida	Sapindaceae	*Cardiospermum grandiflorum*	heart seed vine	2	2	13/05/2001	IU
9353	Plantae	Equisetopsida	Sapindaceae	*Cardiospermum halicacabum*	None	0	1	01/07/1995	IU
16157	Plantae	Equisetopsida	Solanaceae	*Solanum americanum*	None	1	1	07/02/1970	IU
16169	Plantae	Equisetopsida	Solanaceae	*Solanum linnaeanum*	apple of Sodom	0	1	15/08/2018	IU

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
16171	Plantae	Equisetopsida	Solanaceae	*Solanum mauritianum*	wild tobacco	1	9	12/08/2017	IU
16120	Plantae	Equisetopsida	Solanaceae	*Solanum seaforthianum*	Brazilian nightshade	1	8	01/07/1995	IU
16126	Plantae	Equisetopsida	Solanaceae	*Solanum torvum*	devil's fig	0	1	01/07/1995	IU
15983	Plantae	Equisetopsida	Sparrmanniaceae	*Triumfetta rhomboidea*	chinese burr	2	3	01/07/2015	IU
19756	Plantae	Equisetopsida	Sterculiaceae	*Brachychiton populneus*	None	0	1	01/07/1995	XU
12526	Plantae	Equisetopsida	Tropaeolaceae	*Tropaeolum majus*	garden nasturtium	1	1	25/11/2000	IU
12654	Plantae	Equisetopsida	Ulmaceae	*Celtis sinensis*	Chinese elm	2	4	14/05/2001	IU
19905	Plantae	Equisetopsida	Verbenaceae	*Lantana camara*	lantana	1	29	13/08/2017	IU
30780	Plantae	Equisetopsida	Verbenaceae	*Verbena rigida*	None	1	1	25/11/2000	IU

Species table headings and codes

Taxon Id: Unique identifier of the taxon from the WildNet database.

Specimens: The number of specimen-backed records of the taxon.

Records: The total number of records of the taxon.

Last record: Date of latest record of the taxon.

Endemicity: The endemicity code for the taxon (Introduced (Intranational) (IA), Introduced (International) (II), Introduced (Unknown), Exotic (Intranational) (XA), Exotic (International) (XI) and Exotic (Unknown) (XU)).

Links and Support

Other sites that deliver species information from the WildNet database include:

- Species profile search - access species information approved for publication including species names, statuses, notes, images, distribution maps and records
- Species lists - generate species lists for Queensland protected areas, forestry areas, local governments and areas defined using coordinates
- Biomaps - view biodiversity information, including WildNet records approved for publication, and generate reports
- Queensland Globe - view spatial information, including WildNet records approved for publication
- Qld wildlife data API - access WildNet species information approved for publication such as notes, images and records etc.
- Wetland*Maps* - view species records, survey locations etc. approved for publication
- Wetland*Summary* - view wildlife statistics, species lists for a range of area types, and access WildNet species profiles
- WildNet wildlife records - published - Queensland - spatial layer of WildNet records approved for publication generated weekly
- Generalised distribution and densities of Queensland wildlife - Queensland species distributions and densities generalised to a 10 km grid resolution
- Conservation status of Queensland wildlife - access current lists of priority species for Queensland including nomenclature and status information
- Queensland Confidential Species - the list of species flagged as confidential in the WildNet database.

Please direct queries about this report to the WildNet Team.

Other useful sites for accessing Queensland biodiversity data include:

- Useful wildlife resources
- Queensland Government Data
- Atlas of Living Australia (ALA)
- Online Zoological Collections of Australian Museums (OZCAM)
- Australia's Virtual Herbarium (AVH)
- Protected Matters Search Tool

Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government, to the maximum extent permitted by law, makes no representations or warranties about its accuracy, reliability, completeness, or suitability, for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which the user may incur as a consequence of the information being inaccurate or incomplete in any way and for any reason.



WildNet Records
Pest List



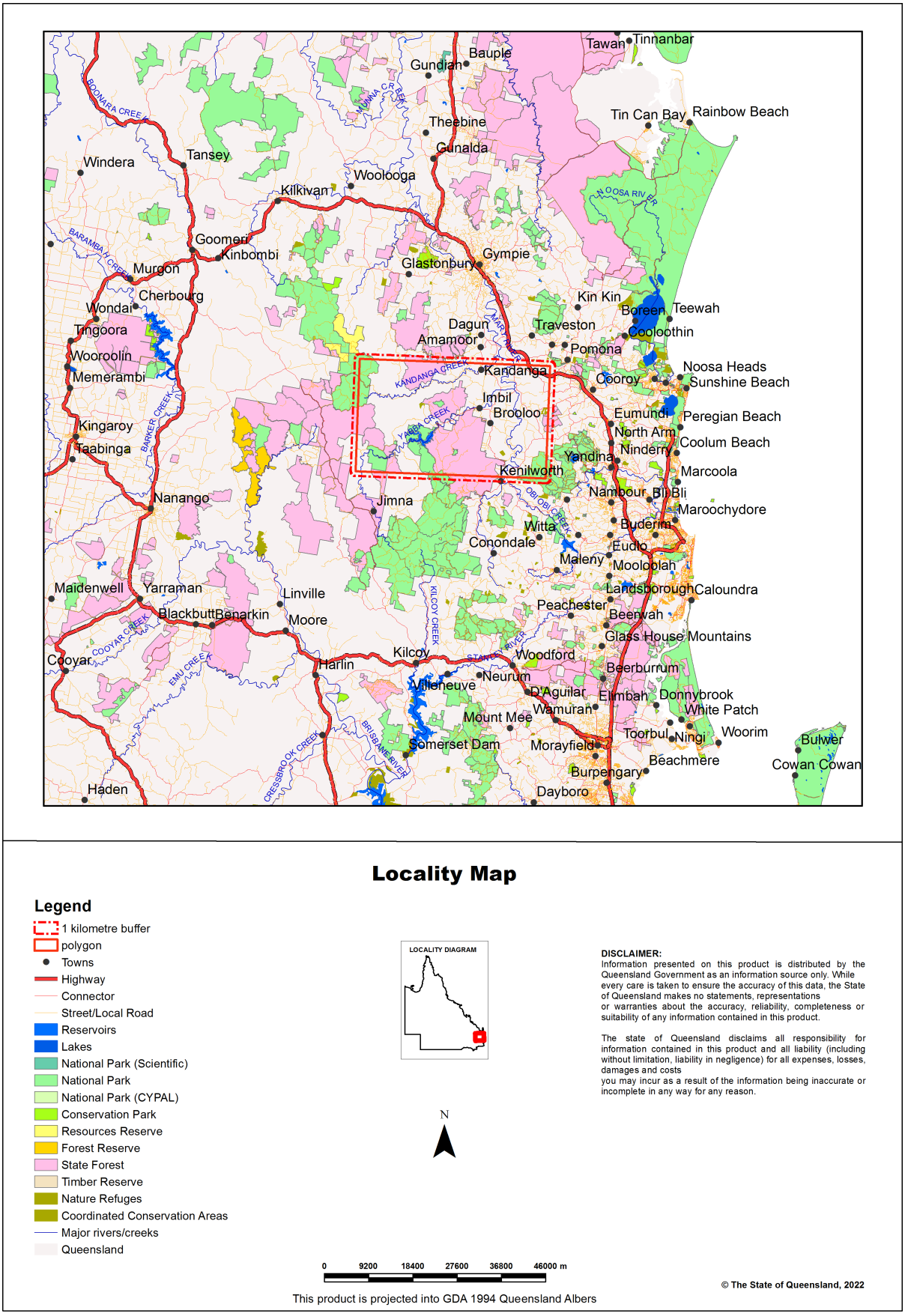
For the selected area of interest 92615.68ha Custom Geometry

Current as at 05/07/2022

WildNetPestList

Queensland Government

Map 1. Locality Map



Summary Information

The following table provides an overview of the area of interest Custom Geometry.

Table 1. Area of interest details

Size (ha)	92,615.68
Local Government(s)	Sunshine Coast Regional, Noosa Shire, Gympie Regional, Somerset Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Burringbar - Conondale Ranges, Gympie Block
Catchment(s)	Mary

Protected Area(s)

The following estates and/or reserves are located in the area of interest:

West Cooroy State Forest

Imbil State Forest 2

Amamoor State Forest

Conondale National Park

Wrattens National Park

Upper Kandanga State Forest

Yabba State Forest

Mapleton National Park

Mapleton Forest Reserve

Imbil State Forest 1

World Heritage Area(s)

No World Heritage Areas are located within the area of interest.

Ramsar Area(s)

No Ramsar Areas are located within the area of interest.

Pest List

Introduction

This report is derived from a spatial layer generated from the WildNet database managed by the Department of Environment and Science. The layer which is generated weekly contains the WildNet wildlife records that are not classed as erroneous or duplicate, that have a location precision equal to or less than 10000 metres and do not have a count of zero.

The WildNet dataset is constantly being enhanced and the taxonomic and status information revised. If a species is not listed in this report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area. It is recommended that you also access other internal and external data sources for species information in your area of interest (Refer Links and Support).

Species Data

Contextual location information is presented in Map 1.

A summary of the pests recorded within the area of interest and its one kilometre buffer is presented in Table 2.

Table 2. Pests recorded within the area of interest and its one kilometre buffer

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
26938	Animalia	Actinopterygii	Cichlidae	*Oreochromis mossambica*	Mozambique mouthbrooder	0	2	16/01/2020	II
27055	Animalia	Actinopterygii	Poeciliidae	*Gambusia holbrooki*	mosquitofish	0	7	16/01/2020	II
19501	Animalia	Actinopterygii	Poeciliidae	*Xiphophorus maculatus*	platy	0	2	13/01/2020	II
716	Animalia	Amphibia	Bufonidae	*Rhinella marina*	cane toad	0	112	22/02/2021	II
21967	Animalia	Aves	Cacatuidae	*Cacatua tenuirostris*	long-billed corella	0	1	16/10/2005	IA
1804	Animalia	Aves	Columbidae	*Columba livia*	rock dove	0	11	30/09/2007	II
1774	Animalia	Aves	Columbidae	*Streptopelia chinensis*	spotted dove	0	17	30/06/2007	II
1360	Animalia	Aves	Passeridae	*Passer domesticus*	house sparrow	0	10	16/10/2006	II
1314	Animalia	Aves	Sturnidae	*Acridotheres tristis*	common myna	0	2	25/02/2007	II
1303	Animalia	Aves	Sturnidae	*Sturnus vulgaris*	common starling	0	19	30/09/2007	II
19177	Animalia	Insecta	Nymphalidae	*Danaus plexippus*	monarch	0	12	10/05/2012	II
1084	Animalia	Mammalia	Bovidae	*Bos taurus*	European cattle	0	1	08/08/1997	II
1067	Animalia	Mammalia	Canidae	*Canis familiaris*	dog	0	8	25/10/2020	II
1056	Animalia	Mammalia	Felidae	*Felis catus*	cat	0	2	25/10/2020	II
832	Animalia	Mammalia	Leporidae	*Lepus europaeus*	European brown hare	0	3	21/02/1996	II
731	Animalia	Mammalia	Muridae	*Rattus rattus*	black rat	0	2	21/02/1996	II
1080	Animalia	Mammalia	Suidae	*Sus scrofa*	pig	0	1	28/05/1990	II
27952	Plantae	Equisetopsida	Acanthaceae	*Eranthemum pulchellum*	None	0	1	22/08/2018	IU
12491	Plantae	Equisetopsida	Amaranthaceae	*Amaranthus spinosus*	needle burr	1	1	04/11/2009	IU
17173	Plantae	Equisetopsida	Anacardiaceae	*Euroschinus falcatus*	None	0	4	19/04/1999	XU
8244	Plantae	Equisetopsida	Apocynaceae	*Araujia sericifera*	white moth vine	0	1	30/03/2016	IU
17050	Plantae	Equisetopsida	Apocynaceae	*Gomphocarpus physocarpus*	balloon cottonbush	1	2	30/03/2016	IU
4710	Plantae	Equisetopsida	Apocynaceae	*Gymnema pleiadenium*	None	0	1	30/06/2016	XU
11202	Plantae	Equisetopsida	Apocynaceae	*Hoya australis*	None	0	5	02/11/2018	XU
17960	Plantae	Equisetopsida	Araucariaceae	*Araucaria cunninghamii*	hoop pine	0	6	30/06/2016	XU
35428	Plantae	Equisetopsida	Asparagaceae	*Asparagus macowanii*	None	1	1	31/05/2013	IU
7566	Plantae	Equisetopsida	Asparagaceae	*Asparagus plumosus*	feathered asparagus fern	0	2	01/07/1995	IU
5997	Plantae	Equisetopsida	Asteraceae	*Ageratina adenophora*	crofton weed	1	1	24/11/1998	IU
5996	Plantae	Equisetopsida	Asteraceae	*Ageratina riparia*	mistflower	1	2	22/05/2003	IU
14051	Plantae	Equisetopsida	Asteraceae	*Ageratum houstonianum*	blue billygoat weed	1	3	30/03/2016	IU

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
15672	Plantae	Equisetopsida	Asteraceae	*Ambrosia artemisiifolia*	annual ragweed	1	2	24/01/2017	IU
15644	Plantae	Equisetopsida	Asteraceae	*Arctotheca calendula*	Cape weed	1	1	11/09/2005	IU
15612	Plantae	Equisetopsida	Asteraceae	*Baccharis halimifolia*	groundsel bush	0	2	31/08/2016	IU
7691	Plantae	Equisetopsida	Asteraceae	*Bidens pilosa*	None	0	1	30/03/2016	IU
15574	Plantae	Equisetopsida	Asteraceae	*Carduus thoermeri*	nodding thistle	8	8	29/12/1999	IU
14781	Plantae	Equisetopsida	Asteraceae	*Carthamus lanatus*	saffron thistle	1	1	20/12/1979	IU
14001	Plantae	Equisetopsida	Asteraceae	*Cirsium vulgare*	spear thistle	1	2	30/03/2016	IU
15438	Plantae	Equisetopsida	Asteraceae	*Eclipta prostrata*	white eclipta	1	2	23/07/2013	IU
15401	Plantae	Equisetopsida	Asteraceae	*Emilia sonchifolia*	None	0	4	05/05/2016	IU
35896	Plantae	Equisetopsida	Asteraceae	*Erigeron bonariensis*	None	0	1	30/03/2016	IU
35900	Plantae	Equisetopsida	Asteraceae	*Erigeron pusillus*	None	1	1	21/01/2004	IU
12254	Plantae	Equisetopsida	Asteraceae	*Galinsoga parviflora*	yellow weed	1	1	04/11/1996	IU
15285	Plantae	Equisetopsida	Asteraceae	*Hypochaeris radicata*	catsear	1	1	06/03/1989	IU
10007	Plantae	Equisetopsida	Asteraceae	*Lactuca saligna*	wild lettuce	1	1	21/01/2004	IU
29504	Plantae	Equisetopsida	Asteraceae	*Lactuca serriola forma serriola*	None	1	1	26/11/1993	IU
10959	Plantae	Equisetopsida	Asteraceae	*Parthenium hysterophorus*	parthenium weed	1	1	29/01/1997	IU
10486	Plantae	Equisetopsida	Asteraceae	*Senecio madagascariensis*	fireweed	0	11	24/01/2017	IU
22236	Plantae	Equisetopsida	Asteraceae	*Soliva sessilis*	None	1	1	10/10/1999	IU
35909	Plantae	Equisetopsida	Asteraceae	*Symphyotrichum subulatum*	None	1	1	29/01/1997	IU
13755	Plantae	Equisetopsida	Asteraceae	*Tagetes minuta*	stinking roger	1	3	30/03/2016	IU
11266	Plantae	Equisetopsida	Basellaceae	*Anredera cordifolia*	Madeira vine	1	1	15/03/2004	IU
34188	Plantae	Equisetopsida	Bignoniaceae	*Dolichandra unguis-cati*	cat's claw creeper	7	10	12/08/2017	IU
11152	Plantae	Equisetopsida	Bignoniaceae	*Jacaranda mimosifolia*	jacaranda	1	1	22/04/2005	IU
41068	Plantae	Equisetopsida	Blechnaceae	*Blechnum rupestre*	None	0	2	23/07/2013	XU
11191	Plantae	Equisetopsida	Boraginaceae	*Echium plantagineum*	Paterson's curse	1	1	09/11/1970	IU
11193	Plantae	Equisetopsida	Boraginaceae	*Heliotropium amplexicaule*	blue heliotrope	0	1	30/03/2016	IU
14438	Plantae	Equisetopsida	Brassicaceae	*Lepidium virginicum*	Virginian peppercress	1	1	04/11/2009	IU
15098	Plantae	Equisetopsida	Brassicaceae	*Raphanus raphanistrum*	wild radish	2	2	10/10/1999	IU
14260	Plantae	Equisetopsida	Brassicaceae	*Rorippa nasturtium-aquaticum*	watercress	2	2	04/11/1996	IU
15101	Plantae	Equisetopsida	Brassicaceae	*Rorippa palustris*	marsh cress	2	2	06/11/1996	IU

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
19394	Plantae	Equisetopsida	Bromeliaceae	*Tillandsia usneoides*	None	0	1	30/03/2016	IU
19443	Plantae	Equisetopsida	Caryophyllaceae	*Drymaria cordata*	None	1	1	11/09/2005	IU
17352	Plantae	Equisetopsida	Caryophyllaceae	*Drymaria cordata subsp. cordata*	None	1	1	26/11/1993	IU
16390	Plantae	Equisetopsida	Caryophyllaceae	*Polycarpon tetraphyllum*	None	1	1	10/10/1999	IU
33925	Plantae	Equisetopsida	Cleomaceae	*Tarenaya hassleriana*	None	1	1	15/01/1973	IU
6645	Plantae	Equisetopsida	Commelinaceae	*Tradescantia zebrina*	None	0	2	22/05/2003	IU
16907	Plantae	Equisetopsida	Convolvulaceae	*Ipomoea hederifolia*	None	1	1	15/05/1967	IU
17517	Plantae	Equisetopsida	Cyperaceae	*Cyperus esculentus*	yellow nutgrass	1	1	13/03/1970	IU
17160	Plantae	Equisetopsida	Euphorbiaceae	*Euphorbia cyathophora*	dwarf poinsettia	1	1	01/04/1995	IU
11288	Plantae	Equisetopsida	Euphorbiaceae	*Ricinus communis*	castor oil bush	0	1	12/08/2017	IU
14743	Plantae	Equisetopsida	Gentianaceae	*Centaurium erythraea*	common centaury	1	1	26/11/1993	IU
11773	Plantae	Equisetopsida	Lamiaceae	*Stachys arvensis*	stagger weed	1	1	11/09/2005	IU
11859	Plantae	Equisetopsida	Lauraceae	*Cinnamomum camphora*	camphor laurel	0	2	22/05/2003	IU
15468	Plantae	Equisetopsida	Leguminosae	*Crotalaria lanceolata subsp. lanceolata*	None	1	1	12/03/2004	IU
14672	Plantae	Equisetopsida	Leguminosae	*Dalbergia sissoo*	None	1	1	20/04/1993	IU
13038	Plantae	Equisetopsida	Leguminosae	*Desmodium uncinatum*	None	0	1	30/03/2016	IU
14518	Plantae	Equisetopsida	Leguminosae	*Gleditsia triacanthos*	honey locust	2	2	13/04/1987	IU
12967	Plantae	Equisetopsida	Leguminosae	*Indigofera suffruticosa*	None	1	1	14/11/2006	IU
15299	Plantae	Equisetopsida	Leguminosae	*Indigofera tinctoria*	None	1	1	09/05/2014	IU
14445	Plantae	Equisetopsida	Leguminosae	*Leucaena leucocephala*	None	0	1	12/08/2017	IU
15235	Plantae	Equisetopsida	Leguminosae	*Macroptilium atropurpureum*	siratro	0	1	30/03/2016	IU
18762	Plantae	Equisetopsida	Leguminosae	*Macrotyloma axillare var. axillare*	None	1	1	08/05/1991	IU
15576	Plantae	Equisetopsida	Leguminosae	*Senna alata*	None	0	1	23/04/2018	IU
24648	Plantae	Equisetopsida	Leguminosae	*Senna septemtrionalis*	None	1	1	01/04/1995	IU
12886	Plantae	Equisetopsida	Leguminosae	*Trifolium dubium*	yellow sucking clover	0	1	30/03/2016	IU
11688	Plantae	Equisetopsida	Lygodiaceae	*Lygodium japonicum*	None	1	1	26/11/1993	IU
14262	Plantae	Equisetopsida	Lythraceae	*Rotala rotundifolia*	None	1	1	26/09/2021	IU

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
12949	Plantae	Equisetopsida	Malvaceae	*Modiola caroliniana*	red-flowered mallow	1	1	10/10/1999	IU
16195	Plantae	Equisetopsida	Malvaceae	*Sida cordifolia*	None	0	1	30/03/2016	IU
16146	Plantae	Equisetopsida	Malvaceae	*Sida rhombifolia*	None	0	3	30/03/2016	IU
32684	Plantae	Equisetopsida	Meliaceae	*Cedrela odorata*	None	1	1	03/12/2007	IU
13390	Plantae	Equisetopsida	Ochnaceae	*Ochna serrulata*	ochna	0	3	30/03/2016	IU
31254	Plantae	Equisetopsida	Oleaceae	*Fraxinus griffithii*	None	1	1	16/03/2010	IU
9461	Plantae	Equisetopsida	Oleaceae	*Jasminum simplicifolium*	None	0	1	01/07/1995	XU
13417	Plantae	Equisetopsida	Oleaceae	*Ligustrum lucidum*	large-leaved privet	2	2	31/03/2001	IU
16795	Plantae	Equisetopsida	Oleaceae	*Ligustrum sinense*	small-leaved privet	0	1	22/05/2003	IU
9334	Plantae	Equisetopsida	Onagraceae	*Oenothera indecora subsp. bonariensis*	None	1	1	10/10/1999	IU
13391	Plantae	Equisetopsida	Onagraceae	*Oenothera rosea*	rose evening primrose	3	3	02/10/2021	IU
12715	Plantae	Equisetopsida	Passifloraceae	*Passiflora edulis*	None	0	1	22/05/2003	IU
16530	Plantae	Equisetopsida	Passifloraceae	*Passiflora foetida*	None	0	1	30/03/2016	IU
16532	Plantae	Equisetopsida	Passifloraceae	*Passiflora suberosa*	corky passion flower	0	3	30/03/2016	IU
16533	Plantae	Equisetopsida	Passifloraceae	*Passiflora subpeltata*	white passion flower	2	3	24/11/1998	IU
16302	Plantae	Equisetopsida	Petiveriaceae	*Rivina humilis*	None	1	4	01/07/1995	IU
14311	Plantae	Equisetopsida	Phytolaccaceae	*Phytolacca americana*	None	1	1	05/05/1979	IU
16479	Plantae	Equisetopsida	Phytolaccaceae	*Phytolacca octandra*	inkweed	1	1	11/12/1969	IU
5286	Plantae	Equisetopsida	Piperaceae	*Peperomia leptostachya*	None	0	3	23/07/2013	XU
8176	Plantae	Equisetopsida	Plantaginaceae	*Bacopa caroliniana*	None	1	1	20/12/2006	IU
32460	Plantae	Equisetopsida	Plantaginaceae	*Bacopa lanigera*	None	1	1	15/02/2017	IU
40893	Plantae	Equisetopsida	Plantaginaceae	*Linaria texana*	None	1	1	06/10/2020	IU
18225	Plantae	Equisetopsida	Plantaginaceae	*Mecardonia procumbens*	None	1	1	01/04/1995	IU
9973	Plantae	Equisetopsida	Poaceae	*Axonopus fissifolius*	None	1	1	29/01/1997	IU
15551	Plantae	Equisetopsida	Poaceae	*Chloris gayana*	rhodes grass	0	2	30/03/2016	IU
15552	Plantae	Equisetopsida	Poaceae	*Chloris inflata*	purpletop chloris	0	1	30/03/2016	IU
15527	Plantae	Equisetopsida	Poaceae	*Chloris virgata*	feathertop rhodes grass	0	1	30/03/2016	IU
7812	Plantae	Equisetopsida	Poaceae	*Cynodon dactylon var. dactylon*	None	1	1	06/11/1996	IU
15420	Plantae	Equisetopsida	Poaceae	*Digitaria ciliaris*	summer grass	2	2	29/01/1997	IU
14567	Plantae	Equisetopsida	Poaceae	*Echinochloa colona*	awnless barnyard grass	1	1	23/12/1996	IU

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
15378	Plantae	Equisetopsida	Poaceae	*Eragrostis tenuifolia*	elastic grass	0	1	30/03/2016	IU
29093	Plantae	Equisetopsida	Poaceae	*Megathyrsus maximus*	None	0	2	30/03/2016	IU
9154	Plantae	Equisetopsida	Poaceae	*Melinis repens*	red natal grass	0	1	30/03/2016	IU
10819	Plantae	Equisetopsida	Poaceae	*Paspalum conjugatum*	sourgrass	1	1	04/11/1996	IU
10818	Plantae	Equisetopsida	Poaceae	*Paspalum distichum*	water couch	1	1	29/01/1997	IU
27255	Plantae	Equisetopsida	Poaceae	*Schizachyrium microstachyum*	None	1	1	17/01/2012	IU
20011	Plantae	Equisetopsida	Poaceae	*Setaria pumila*	None	0	1	05/05/2016	IU
33794	Plantae	Equisetopsida	Poaceae	*Setaria pumila subsp. subtesselata*	None	1	1	23/12/1996	IU
9190	Plantae	Equisetopsida	Poaceae	*Setaria sphacelata*	None	0	1	30/03/2016	IU
15041	Plantae	Equisetopsida	Poaceae	*Sorghum x almum*	None	1	1	04/11/1996	IU
22165	Plantae	Equisetopsida	Poaceae	*Sporobolus africanus*	Parramatta grass	1	10	28/02/2017	IU
22159	Plantae	Equisetopsida	Poaceae	*Sporobolus fertilis*	giant Parramatta grass	0	3	28/02/2017	IU
10158	Plantae	Equisetopsida	Poaceae	*Sporobolus natalensis*	None	0	1	30/03/2016	IU
10156	Plantae	Equisetopsida	Poaceae	*Sporobolus pyramidalis*	None	1	1	25/06/1991	IU
14973	Plantae	Equisetopsida	Poaceae	*Themeda quadrivalvis*	grader grass	1	1	16/04/1973	IU
22288	Plantae	Equisetopsida	Polygonaceae	*Acetosa sagittata*	None	1	1	10/10/1999	IU
31001	Plantae	Equisetopsida	Rosaceae	*Potentilla indica*	None	1	1	01/04/1995	IU
16300	Plantae	Equisetopsida	Rubiaceae	*Richardia brasiliensis*	white eye	0	1	05/05/2016	IU
21837	Plantae	Equisetopsida	Rutaceae	*Murraya paniculata 'Exotica'*	None	0	1	01/07/1995	IU
12529	Plantae	Equisetopsida	Scrophulariaceae	*Verbascum virgatum*	twiggy mullein	1	1	10/11/2006	IU
17496	Plantae	Equisetopsida	Solanaceae	*Datura stramonium*	common thornapple	1	1	09/11/1970	IU
14375	Plantae	Equisetopsida	Solanaceae	*Nicandra physalodes*	apple of Peru	1	1	10/10/1999	IU
13557	Plantae	Equisetopsida	Solanaceae	*Physalis peruviana*	None	1	1	20/05/1994	IU
31395	Plantae	Equisetopsida	Solanaceae	*Physalis pubescens*	None	1	1	20/05/1994	IU
16157	Plantae	Equisetopsida	Solanaceae	*Solanum americanum*	None	0	1	01/07/1995	IU
16169	Plantae	Equisetopsida	Solanaceae	*Solanum linnaeanum*	apple of Sodom	1	1	14/06/2019	IU
16171	Plantae	Equisetopsida	Solanaceae	*Solanum mauritianum*	wild tobacco	0	7	12/08/2017	IU

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
16120	Plantae	Equisetopsida	Solanaceae	*Solanum seaforthianum*	Brazilian nightshade	1	3	29/03/2003	IU
16126	Plantae	Equisetopsida	Solanaceae	*Solanum torvum*	devil's fig	0	2	30/03/2016	IU
15983	Plantae	Equisetopsida	Sparrmanniaceae	*Triumfetta rhomboidea*	chinese burr	1	1	20/04/1993	IU
19905	Plantae	Equisetopsida	Verbenaceae	*Lantana camara*	lantana	3	41	12/08/2017	IU
14115	Plantae	Equisetopsida	Verbenaceae	*Verbena litoralis*	verbena	0	1	30/03/2016	IU
30780	Plantae	Equisetopsida	Verbenaceae	*Verbena rigida*	None	1	1	21/01/2004	IU

Species table headings and codes

Taxon Id: Unique identifier of the taxon from the WildNet database.

Specimens: The number of specimen-backed records of the taxon.

Records: The total number of records of the taxon.

Last record: Date of latest record of the taxon.

Endemicity: The endemicity code for the taxon (Introduced (Intranational) (IA), Introduced (International) (II), Introduced (Unknown), Exotic (Intranational) (XA), Exotic (International) (XI) and Exotic (Unknown) (XU)).

Links and Support

Other sites that deliver species information from the WildNet database include:

- Species profile search - access species information approved for publication including species names, statuses, notes, images, distribution maps and records
- Species lists - generate species lists for Queensland protected areas, forestry areas, local governments and areas defined using coordinates
- Biomaps - view biodiversity information, including WildNet records approved for publication, and generate reports
- Queensland Globe - view spatial information, including WildNet records approved for publication
- Qld wildlife data API - access WildNet species information approved for publication such as notes, images and records etc.
- Wetland*Maps* - view species records, survey locations etc. approved for publication
- Wetland*Summary* - view wildlife statistics, species lists for a range of area types, and access WildNet species profiles
- WildNet wildlife records - published - Queensland - spatial layer of WildNet records approved for publication generated weekly
- Generalised distribution and densities of Queensland wildlife - Queensland species distributions and densities generalised to a 10 km grid resolution
- Conservation status of Queensland wildlife - access current lists of priority species for Queensland including nomenclature and status information
- Queensland Confidential Species - the list of species flagged as confidential in the WildNet database.

Please direct queries about this report to the WildNet Team.

Other useful sites for accessing Queensland biodiversity data include:

- Useful wildlife resources
- Queensland Government Data
- Atlas of Living Australia (ALA)
- Online Zoological Collections of Australian Museums (OZCAM)
- Australia's Virtual Herbarium (AVH)
- Protected Matters Search Tool

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WildNet Records
Species List



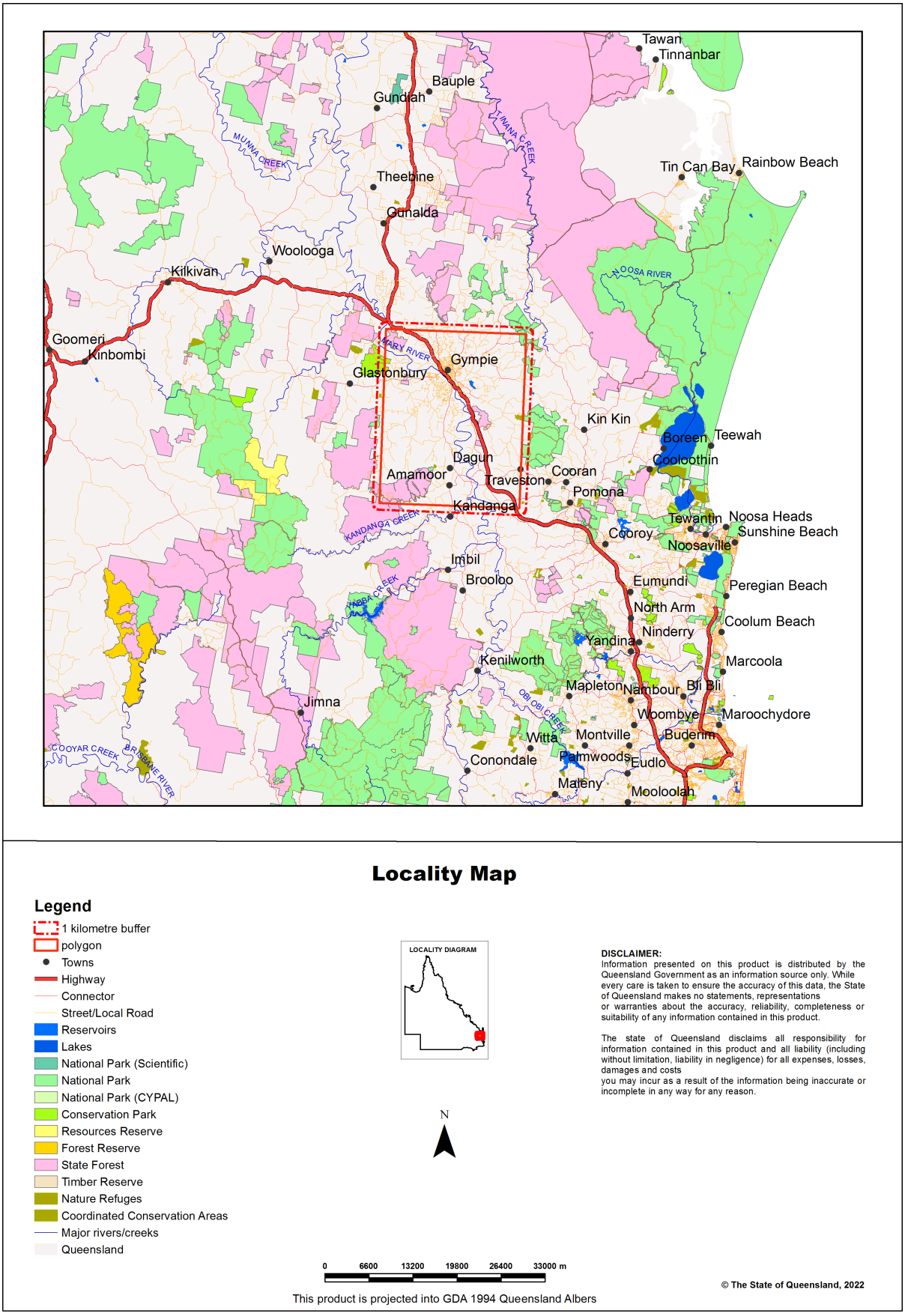
For the selected area of interest 54831.55ha Custom Geometry

Current as at 05/07/2022

WildNetSpeciesList

Queensland Government

Map 1. Locality Map



Locality Map

Legend

- 1 kilometre buffer
- polygon
- Towns
- Highway
- Connector
- Street/Local Road
- Reservoirs
- Lakes
- National Park (Scientific)
- National Park
- National Park (CYPAL)
- Conservation Park
- Resources Reserve
- Forest Reserve
- State Forest
- Timber Reserve
- Nature Refuges
- Coordinated Conservation Areas
- Major rivers/creeks
- Queensland

N

0 6600 13200 19800 26400 33000 m

This product is projected into GDA 1994 Queensland Albers

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Summary Information

The following table provides an overview of the area of interest Custom Geometry.

Table 1. Area of interest details

Size (ha)	54,831.55
Local Government(s)	Noosa Shire, Gympie Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Gympie Block
Catchment(s)	Mary

Protected Area(s)
The following estates and/or reserves are located in the area of interest:

Lynchs Hill State Forest

King Conservation Park

Goomboorian National Park

King State Forest

Fishermans Pocket State Forest

Woondum National Park

Woondum State Forest

Traveston State Forest

Amamoor State Forest

Amamoor National Park

World Heritage Area(s)
No World Heritage Areas are located within the area of interest.

Ramsar Area(s)
No Ramsar Areas are located within the area of interest.

Species List

Introduction

This report is derived from a spatial layer generated from the WildNet database managed by the Department of Environment and Science. The layer which is generated weekly contains the WildNet wildlife records that are not classed as erroneous or duplicate, that have a location precision equal to or less than 10000 metres and do not have a count of zero.

The WildNet dataset is constantly being enhanced and the taxonomic and status information revised. If a species is not listed in this report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area. It is recommended that you also access other internal and external data sources for species information in your area of interest (Refer Links and Support).

Table 2 lists the animals recorded within the area of interest and its one kilometre buffer.

Table 3 lists the plants recorded within the area of interest and its one kilometre buffer.

Table 4 lists the fungi recorded within the area of interest and its one kilometre buffer.

Table 5 lists the other species recorded within the area of interest and its one kilometre buffer.

Table 2. Animals recorded within the area of interest and its one kilometre buffer

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
26896	Actinopterygii	Ambassidae	*Ambassis agassizii*	Agassiz's glassfish	None	None	0	8	13/01/2020
26908	Actinopterygii	Anguillidae	*Anguilla australis*	southern shortfin eel	None	None	0	1	14/02/2014
26910	Actinopterygii	Anguillidae	*Anguilla reinhardtii*	longfin eel	None	None	0	23	17/01/2020
26912	Actinopterygii	Apogonidae	*Glossamia aprion*	mouth almighty	None	None	0	6	21/11/2010
26914	Actinopterygii	Ariidae	*Neoarius graeffei*	blue catfish	None	None	0	1	01/04/2009
26918	Actinopterygii	Atherinidae	*Craterocephalus marjoriae*	silverstreak hardyhead	None	None	0	5	13/01/2020
26920	Actinopterygii	Atherinidae	*Craterocephalus stercusmuscarum*	flyspecked hardyhead	None	None	0	2	18/06/2015
26938	Actinopterygii	Cichlidae	*Oreochromis mossambica*	Mozambique mouthbrooder	None	None	0	1	13/01/2020
26941	Actinopterygii	Clupeidae	*Nematalosa erebi*	bony bream	None	None	0	5	13/01/2020
26955	Actinopterygii	Eleotridae	*Hypseleotris galii*	firetail gudgeon	None	None	0	1	18/06/2015
26956	Actinopterygii	Eleotridae	*Hypseleotris klunzingeri*	western carp gudgeon	None	None	0	1	18/06/2015
33897	Actinopterygii	Eleotridae	*Hypseleotris sp.*	None	None	None	0	5	17/01/2020
18168	Actinopterygii	Eleotridae	*Mogurnda adspersa*	southern purplespotted gudgeon	None	None	0	2	05/03/1993
26968	Actinopterygii	Eleotridae	*Philypnodon grandiceps*	flathead gudgeon	None	None	0	4	17/01/2020
26969	Actinopterygii	Eleotridae	*Philypnodon macrostomus*	dwarf flathead gudgeon	None	None	0	1	17/01/2020
27003	Actinopterygii	Gobiidae	*Redigobius bikolanus*	speckled goby	None	None	0	1	31/12/1991
27024	Actinopterygii	Melanotaeniidae	*Melanotaenia duboulayi*	crimsonspotted rainbowfish	None	None	0	14	17/01/2020
27035	Actinopterygii	Mugilidae	*Mugil cephalus*	sea mullet	None	None	0	8	13/01/2020
18169	Actinopterygii	Percichthyidae	*Maccullochella mariensis*	Mary River cod	None	E	4	13	30/06/2010
27042	Actinopterygii	Percichthyidae	*Macquaria ambigua*	golden perch	None	None	0	3	13/01/2020
27043	Actinopterygii	Percichthyidae	*Macquaria novemaculeata*	Australian bass	None	None	0	2	30/06/2010
27053	Actinopterygii	Plotosidae	*Porochilus rendahli*	Rendahl's catfish	None	None	0	2	31/12/1990
27054	Actinopterygii	Plotosidae	*Tandanus tandanus*	freshwater catfish	None	None	0	11	17/01/2020
27055	Actinopterygii	Poeciliidae	*Gambusia holbrooki*	mosquitofish	None	None	0	4	13/01/2020
19548	Actinopterygii	Poeciliidae	*Poecilia reticulata*	guppy	None	None	0	1	31/12/1991
19690	Actinopterygii	Poeciliidae	*Xiphophorus hellerii*	swordtail	None	None	0	2	08/03/2015

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
19501	Actinopterygii	Poeciliidae	*Xiphophorus maculatus*	platy	None	None	2	3	13/01/2020
27059	Actinopterygii	Pseudomugilidae	*Pseudomugil signifer*	Pacific blue eye	None	None	0	7	17/01/2020
27061	Actinopterygii	Retropinnidae	*Retropinna semoni*	Australian smelt	None	None	0	7	13/01/2020
27076	Actinopterygii	Synbranchidae	*Ophisternon gutturale*	swamp eel	None	None	0	1	17/01/2020
27088	Actinopterygii	Terapontidae	*Hephaestus fuliginosus*	sooty grunter	None	None	0	1	13/01/2020
27089	Actinopterygii	Terapontidae	*Leiopotherapon unicolor*	spangled perch	None	None	0	4	13/01/2020
716	Amphibia	Bufonidae	*Rhinella marina*	cane toad	None	None	0	159	19/03/2021
624	Amphibia	Hylidae	*Cyclorana alboguttata*	greenstripe frog	C	None	0	1	16/11/2018
627	Amphibia	Hylidae	*Litoria caerulea*	common green treefrog	C	None	4	79	22/03/2021
608	Amphibia	Hylidae	*Litoria fallax*	eastern sedgefrog	C	None	0	283	22/03/2021
611	Amphibia	Hylidae	*Litoria gracilenta*	graceful treefrog	C	None	0	89	17/03/2021
614	Amphibia	Hylidae	*Litoria latopalmata*	broad palmed rocketfrog	C	None	0	23	16/02/2021
604	Amphibia	Hylidae	*Litoria nasuta*	striped rocketfrog	C	None	0	39	16/02/2019
595	Amphibia	Hylidae	*Litoria pearsoniana*	cascade treefrog	V	None	0	2	19/02/2021
596	Amphibia	Hylidae	*Litoria peronii*	emerald spotted treefrog	C	None	0	52	19/02/2021
599	Amphibia	Hylidae	*Litoria rothii*	northern laughing treefrog	C	None	0	28	21/02/2021
600	Amphibia	Hylidae	*Litoria rubella*	ruddy treefrog	C	None	1	42	22/03/2021
601	Amphibia	Hylidae	*Litoria sp.*	None	C	None	0	21	19/03/2021
589	Amphibia	Hylidae	*Litoria tyleri*	southern laughing treefrog	C	None	0	6	29/10/2020
29174	Amphibia	Hylidae	*Litoria wilcoxii*	eastern stony creek frog	C	None	0	227	19/02/2021
706	Amphibia	Limnodynastidae	*Adelotus brevis*	tusked frog	V	None	1	68	21/02/2020
678	Amphibia	Limnodynastidae	*Limnodynastes dumerilii*	grey bellied pobblebonk	C	None	0	1	09/11/2019
681	Amphibia	Limnodynastidae	*Limnodynastes peronii*	striped marshfrog	C	None	1	147	19/03/2021
684	Amphibia	Limnodynastidae	*Limnodynastes tasmaniensis*	spotted grassfrog	C	None	5	8	27/02/2018
673	Amphibia	Limnodynastidae	*Limnodynastes terraereginae*	scarlet sided pobblebonk	C	None	0	21	01/04/2021
680	Amphibia	Limnodynastidae	*Platyplectrum ornatum*	ornate burrowing frog	C	None	0	10	16/02/2021
696	Amphibia	Myobatrachidae	*Crinia parinsignifera*	beeping froglet	C	None	0	34	26/10/2020
698	Amphibia	Myobatrachidae	*Crinia signifera*	clicking froglet	C	None	0	2	15/06/2018
686	Amphibia	Myobatrachidae	*Crinia tinnula*	wallum froglet	V	None	3	3	30/09/1988

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
674	Amphibia	Myobatrachidae	*Mixophyes fasciolatus*	great barred frog	C	None	0	84	01/02/2021
676	Amphibia	Myobatrachidae	*Mixophyes iteratus*	giant barred frog	V	V	0	8	13/12/2013
659	Amphibia	Myobatrachidae	*Pseudophryne major*	great brown broodfrog	C	None	0	1	31/10/1892
661	Amphibia	Myobatrachidae	*Pseudophryne raveni*	copper backed broodfrog	C	None	0	3	06/01/2012
633	Amphibia	Myobatrachidae	*Uperoleia fusca*	dusky gungan	C	None	0	4	06/01/2012
635	Amphibia	Myobatrachidae	*Uperoleia laevigata*	eastern gungan	C	None	0	1	31/12/2006
1419	Aves	Acanthizidae	*Acanthiza chrysorrhoa*	yellow-rumped thornbill	C	None	0	13	11/09/2005
1421	Aves	Acanthizidae	*Acanthiza lineata*	striated thornbill	C	None	0	3	06/06/1997
1423	Aves	Acanthizidae	*Acanthiza pusilla*	brown thornbill	C	None	0	40	01/07/2015
1407	Aves	Acanthizidae	*Gerygone fusca*	western gerygone	C	None	1	2	30/06/1985
1410	Aves	Acanthizidae	*Gerygone mouki*	brown gerygone	C	None	1	33	07/11/2009
1396	Aves	Acanthizidae	*Gerygone olivacea*	white-throated gerygone	C	None	0	35	07/03/2015
1397	Aves	Acanthizidae	*Gerygone palpebrosa*	fairy gerygone	C	None	0	6	07/03/2015
1381	Aves	Acanthizidae	*Sericornis citreogularis*	yellow-throated scrubwren	C	None	0	3	12/12/2001
1382	Aves	Acanthizidae	*Sericornis frontalis*	white-browed scrubwren	C	None	0	58	01/07/2015
1384	Aves	Acanthizidae	*Sericornis magnirostra*	large-billed scrubwren	C	None	0	41	01/07/2015
1742	Aves	Accipitridae	*Accipiter cirrocephalus*	collared sparrowhawk	C	None	0	2	13/10/2007
1729	Aves	Accipitridae	*Accipiter fasciatus*	brown goshawk	C	None	0	5	25/10/2006
1730	Aves	Accipitridae	*Accipiter novae hollandiae*	grey goshawk	C	None	0	6	01/07/2015
1732	Aves	Accipitridae	*Aquila audax*	wedge-tailed eagle	C	None	1	23	06/01/2012
1721	Aves	Accipitridae	*Aviceda subcristata*	Pacific baza	C	None	0	15	06/01/2012
1723	Aves	Accipitridae	*Circus assimilis*	spotted harrier	C	None	0	2	17/10/2013
1725	Aves	Accipitridae	*Elanus axillaris*	black-shouldered kite	C	None	0	6	06/01/2012
1728	Aves	Accipitridae	*Erythrotriorchis radiatus*	red goshawk	E	V	0	2	31/12/1990
1718	Aves	Accipitridae	*Haliaeetus leucogaster*	white-bellied sea-eagle	C	None	1	7	03/03/2015
1720	Aves	Accipitridae	*Haliastur indus*	brahminy kite	C	None	0	1	30/03/1999
1707	Aves	Accipitridae	*Haliastur sphenurus*	whistling kite	C	None	0	3	27/03/2015

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1710	Aves	Accipitridae	*Hieraaetus morphnoides*	little eagle	C	None	0	4	27/08/2006
1712	Aves	Accipitridae	*Lophoictinia isura*	square-tailed kite	C	None	0	5	20/07/2005
1714	Aves	Accipitridae	*Milvus migrans*	black kite	C	None	0	1	12/03/2018
1702	Aves	Accipitridae	*Pandion cristatus*	eastern osprey	SL	None	0	1	02/01/1978
1305	Aves	Acrocephalidae	*Acrocephalus australis*	Australian reed-warbler	C	None	0	6	06/01/2008
1973	Aves	Aegothelidae	*Aegotheles cristatus*	Australian owlet-nightjar	C	None	0	7	02/05/2017
1776	Aves	Alcedinidae	*Ceyx azureus*	azure kingfisher	C	None	0	42	06/01/2012
1992	Aves	Anatidae	*Anas castanea*	chestnut teal	C	None	0	1	01/04/2007
1993	Aves	Anatidae	*Anas gracilis*	grey teal	C	None	0	8	03/03/2015
1994	Aves	Anatidae	*Anas platyrhynchos*	northern mallard	None	None	0	36	14/03/2006
1997	Aves	Anatidae	*Anas sp.*	None	C	None	0	2	21/02/2002
1998	Aves	Anatidae	*Anas superciliosa*	Pacific black duck	C	None	0	149	04/03/2015
1999	Aves	Anatidae	*Aythya australis*	hardhead	C	None	0	21	16/10/2007
2003	Aves	Anatidae	*Chenonetta jubata*	Australian wood duck	C	None	0	104	07/03/2015
2005	Aves	Anatidae	*Cygnus atratus*	black swan	C	None	0	64	03/03/2015
1977	Aves	Anatidae	*Dendrocygna arcuata*	wandering whistling-duck	C	None	0	11	06/01/2012
1978	Aves	Anatidae	*Dendrocygna eytoni*	plumed whistling-duck	C	None	0	8	06/01/2012
1985	Aves	Anatidae	*Oxyura australis*	blue-billed duck	C	None	0	1	27/10/2004
1996	Aves	Anatidae	*Spatula rhynchotis*	Australasian shoveler	C	None	0	1	05/09/1994
1279	Aves	Anhingidae	*Anhinga novae hollandiae*	Australasian darter	C	None	0	41	06/01/2012
1963	Aves	Anseranatidae	*Anseranas semipalmata*	magpie goose	C	None	0	30	04/02/2015
1971	Aves	Apodidae	*Hirundapus caudacutus*	white-throated needletail	V	V	0	11	06/01/2012
1829	Aves	Ardeidae	*Ardea alba modesta*	eastern great egret	C	None	0	29	06/01/2012
1831	Aves	Ardeidae	*Ardea intermedia*	intermediate egret	C	None	0	8	28/08/2003
1832	Aves	Ardeidae	*Ardea pacifica*	white-necked heron	C	None	0	6	06/01/2012
1830	Aves	Ardeidae	*Bubulcus ibis*	cattle egret	C	None	0	292	06/01/2012
1840	Aves	Ardeidae	*Egretta garzetta*	little egret	C	None	0	1	29/09/2006
1826	Aves	Ardeidae	*Egretta novaehollandiae*	white-faced heron	C	None	0	79	06/01/2012
1818	Aves	Ardeidae	*Nycticorax caledonicus*	nankeen night-heron	C	None	1	4	06/01/2012

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1659	Aves	Artamidae	*Artamus cyanopterus*	dusky woodswallow	C	None	1	4	10/08/2006
1660	Aves	Artamidae	*Artamus leucorynchus*	white-breasted woodswallow	C	None	0	20	05/03/2015
1654	Aves	Artamidae	*Cracticus nigrogularis*	pied butcherbird	C	None	0	117	01/07/2015
1656	Aves	Artamidae	*Cracticus torquatus*	grey butcherbird	C	None	0	73	07/03/2015
1644	Aves	Artamidae	*Gymnorhina tibicen*	Australian magpie	C	None	0	207	07/03/2015
1645	Aves	Artamidae	*Strepera graculina*	pied currawong	C	None	0	74	07/03/2015
1191	Aves	Cacatuidae	*Cacatua galerita*	sulphur-crested cockatoo	C	None	0	29	07/03/2015
1194	Aves	Cacatuidae	*Cacatua sanguinea*	little corella	C	None	0	5	29/09/2006
21967	Aves	Cacatuidae	*Cacatua tenuirostris*	long-billed corella	C	None	0	2	31/12/1996
1196	Aves	Cacatuidae	*Calyptorhynchus banksii*	red-tailed black-cockatoo	C	None	0	3	21/05/2000
1185	Aves	Cacatuidae	*Calyptorhynchus funereus*	yellow-tailed black-cockatoo	C	None	0	32	25/02/2007
22494	Aves	Cacatuidae	*Calyptorhynchus lathami lathami*	glossy black-cockatoo (eastern)	V	None	0	2	08/09/1998
1193	Aves	Cacatuidae	*Eolophus roseicapilla*	galah	C	None	0	55	07/03/2015
1636	Aves	Campephagidae	*Coracina novaehollandiae*	black-faced cuckoo-shrike	C	None	0	122	01/07/2015
1637	Aves	Campephagidae	*Coracina papuensis*	white-bellied cuckoo-shrike	C	None	0	9	06/01/2012
1639	Aves	Campephagidae	*Edolisoma tenuirostre*	common cicadabird	C	None	0	42	07/03/2015
1640	Aves	Campephagidae	*Lalage leucomela*	varied triller	C	None	1	30	01/07/2015
1642	Aves	Campephagidae	*Lalage tricolor*	white-winged triller	C	None	0	1	18/10/2001
1940	Aves	Charadriidae	*Elseyornis melanops*	black-fronted dotterel	C	None	0	5	08/10/2006
1942	Aves	Charadriidae	*Erythrogonys cinctus*	red-kneed dotterel	C	None	0	2	08/10/2006
1944	Aves	Charadriidae	*Pluvialis fulva*	Pacific golden plover	SL	None	1	1	24/11/1999
27774	Aves	Charadriidae	*Vanellus miles*	masked lapwing	C	None	0	30	07/03/2015
1933	Aves	Charadriidae	*Vanellus miles novaehollandiae*	masked lapwing (southern subspecies)	C	None	0	60	12/12/2001
18143	Aves	Charadriidae	*Vanellus tricolor*	banded lapwing	C	None	0	1	31/12/2000
1820	Aves	Ciconiidae	*Ephippiorhynchus asiaticus*	black-necked stork	C	None	0	2	23/05/1999
1294	Aves	Cisticolidae	*Cisticola exilis*	golden-headed cisticola	C	None	0	44	06/01/2012

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1617	Aves	Climacteridae	*Cormobates leucophaea*	white-throated treecreeper	C	None	0	5	01/07/2015
18293	Aves	Climacteridae	*Cormobates leucophaea metastasis*	white-throated treecreeper (southern)	C	None	0	47	07/03/2015
1801	Aves	Columbidae	*Chalcophaps longirostris*	Pacific emerald dove	C	None	1	21	01/07/2015
1803	Aves	Columbidae	*Columba leucomela*	white-headed pigeon	C	None	0	21	16/12/2007
1804	Aves	Columbidae	*Columba livia*	rock dove	None	None	0	12	11/09/2005
1809	Aves	Columbidae	*Geopelia cuneata*	diamond dove	C	None	1	1	31/12/1923
1810	Aves	Columbidae	*Geopelia humeralis*	bar-shouldered dove	C	None	1	80	01/07/2015
18323	Aves	Columbidae	*Geopelia placida*	peaceful dove	C	None	0	41	07/03/2015
1787	Aves	Columbidae	*Leucosarcia melanoleuca*	wonga pigeon	C	None	0	14	01/07/2015
1789	Aves	Columbidae	*Lopholaimus antarcticus*	topknot pigeon	C	None	1	16	06/01/2008
1791	Aves	Columbidae	*Macropygia amboinensis*	brown cuckoo-dove	C	None	0	98	01/07/2015
1793	Aves	Columbidae	*Ocyphaps lophotes*	crested pigeon	C	None	0	72	07/03/2015
1795	Aves	Columbidae	*Phaps chalcoptera*	common bronzewing	C	None	0	1	07/02/2002
1770	Aves	Columbidae	*Ptilinopus magnificus*	wompoo fruit-dove	C	None	1	25	07/11/2009
1771	Aves	Columbidae	*Ptilinopus regina*	rose-crowned fruit-dove	C	None	0	13	06/01/2008
1774	Aves	Columbidae	*Streptopelia chinensis*	spotted dove	None	None	0	38	25/02/2007
1779	Aves	Coraciidae	*Eurystomus orientalis*	dollarbird	C	None	0	43	05/03/2015
1603	Aves	Corcoracidae	*Corcorax mela norhamphos*	white-winged chough	C	None	0	2	31/03/2003
1605	Aves	Corcoracidae	*Struthidea cinerea*	apostlebird	C	None	0	3	18/06/1999
1608	Aves	Corvidae	*Corvus coronoides*	Australian raven	C	None	0	4	23/09/2007
1609	Aves	Corvidae	*Corvus orru*	Torresian crow	C	None	0	217	01/07/2015
1754	Aves	Cuculidae	*Cacomantis flabelliformis*	fan-tailed cuckoo	C	None	0	49	07/03/2015
1750	Aves	Cuculidae	*Cacomantis pallidus*	pallid cuckoo	C	None	1	5	10/10/1999
1743	Aves	Cuculidae	*Cacomantis variolosus*	brush cuckoo	C	None	0	18	06/01/2012
1751	Aves	Cuculidae	*Centropus phasianinus*	pheasant coucal	C	None	1	92	07/03/2015
1744	Aves	Cuculidae	*Chalcites basalis*	Horsfield's bronze-cuckoo	C	None	0	5	06/01/2012

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1745	Aves	Cuculidae	*Chalcites lucidus*	shining bronze-cuckoo	C	None	0	23	01/07/2015
1756	Aves	Cuculidae	*Chalcites minutillus barnardi*	Eastern little bronze-cuckoo	C	None	0	7	07/03/2015
1736	Aves	Cuculidae	*Cuculus optatus*	oriental cuckoo	SL	None	0	1	30/06/1993
1738	Aves	Cuculidae	*Eudynamys orientalis*	eastern koel	C	None	1	50	06/01/2012
1740	Aves	Cuculidae	*Scythrops novaehollandiae*	channel-billed cuckoo	C	None	0	22	06/01/2012
1601	Aves	Dicruridae	*Dicrurus bracteatus*	spangled drongo	C	None	0	75	07/03/2015
1366	Aves	Estrildidae	*Lonchura castaneothorax*	chestnut-breasted mannikin	C	None	0	13	05/03/2015
1359	Aves	Estrildidae	*Neochmia temporalis*	red-browed finch	C	None	1	53	07/03/2015
1342	Aves	Estrildidae	*Taeniopygia bichenovii*	double-barred finch	C	None	0	32	07/03/2015
1949	Aves	Eurostopodidae	*Eurostopodus mystacalis*	white-throated nightjar	C	None	0	13	08/04/2020
1716	Aves	Falconidae	*Falco berigora*	brown falcon	C	None	0	2	25/10/2006
1704	Aves	Falconidae	*Falco cenchroides*	nankeen kestrel	C	None	0	13	31/07/2002
1692	Aves	Falconidae	*Falco peregrinus*	peregrine falcon	C	None	1	4	03/03/2001
1766	Aves	Halcyonidae	*Dacelo leachii*	blue-winged kookaburra	C	None	1	1	31/12/1923
1767	Aves	Halcyonidae	*Dacelo novaeguineae*	laughing kookaburra	C	None	0	159	01/07/2015
1760	Aves	Halcyonidae	*Todiramphus macleayii*	forest kingfisher	C	None	0	42	18/10/2013
1761	Aves	Halcyonidae	*Todiramphus pyrrhopygius*	red-backed kingfisher	C	None	0	1	18/06/1999
1762	Aves	Halcyonidae	*Todiramphus sanctus*	sacred kingfisher	C	None	0	20	07/03/2015
1572	Aves	Hirundinidae	*Hirundo neoxena*	welcome swallow	C	None	0	119	01/07/2015
1585	Aves	Hirundinidae	*Petrochelidon ariel*	fairy martin	C	None	0	11	06/01/2012
1573	Aves	Hirundinidae	*Petrochelidon nigricans*	tree martin	C	None	0	10	27/08/2006
1928	Aves	Jacanidae	*Irediparra gallinacea*	comb-crested jacana	C	None	0	3	09/07/2006
1898	Aves	Laridae	*Onychoprion fuscatus*	sooty tern	C	None	1	1	01/12/1986
1570	Aves	Maluridae	*Malurus cyaneus*	superb fairy-wren	C	None	0	2	23/03/2000
18458	Aves	Maluridae	*Malurus lamberti*	variegated fairy-wren	C	None	0	39	05/03/2015
1558	Aves	Maluridae	*Malurus melanocephalus*	red-backed fairy-wren	C	None	0	79	07/03/2015

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1292	Aves	Megaluridae	*Cincloramphus mathewsi*	rufous songlark	C	None	0	1	12/10/1992
1289	Aves	Megaluridae	*Cincloramphus timoriensis*	tawny grassbird	C	None	1	27	04/03/2015
1287	Aves	Megaluridae	*Poodytes gramineus*	little grassbird	C	None	0	1	19/06/1999
1694	Aves	Megapodiidae	*Alectura lathami*	Australian brush-turkey	C	None	0	40	01/07/2015
1555	Aves	Meliphagidae	*Acanthorhynchus tenuirostris*	eastern spinebill	C	None	0	6	10/08/2006
1542	Aves	Meliphagidae	*Anthochaera chrysoptera*	little wattlebird	C	None	0	13	06/01/2008
1523	Aves	Meliphagidae	*Caligavis chrysops*	yellow-faced honeyeater	C	None	0	55	07/03/2015
1537	Aves	Meliphagidae	*Conopophila rufogularis*	rufous-throated honeyeater	C	None	0	1	31/12/1984
1539	Aves	Meliphagidae	*Entomyzon cyanotis*	blue-faced honeyeater	C	None	0	53	07/03/2015
1517	Aves	Meliphagidae	*Lichenostomus melanops*	yellow-tufted honeyeater	C	None	0	1	25/05/1997
1497	Aves	Meliphagidae	*Lichmera indistincta*	brown honeyeater	C	None	0	105	07/03/2015
1500	Aves	Meliphagidae	*Manorina melanocephala*	noisy miner	C	None	0	136	07/03/2015
1501	Aves	Meliphagidae	*Manorina melanophrys*	bell miner	C	None	0	14	06/01/2008
1504	Aves	Meliphagidae	*Meliphaga lewinii*	Lewin's honeyeater	C	None	0	195	01/07/2015
1507	Aves	Meliphagidae	*Melithreptus albogularis*	white-throated honeyeater	C	None	0	99	07/03/2015
1485	Aves	Meliphagidae	*Melithreptus lunatus*	white-naped honeyeater	C	None	0	13	16/12/2007
1488	Aves	Meliphagidae	*Myzomela obscura*	dusky honeyeater	C	None	0	8	06/01/2012
1489	Aves	Meliphagidae	*Myzomela sanguinolenta*	scarlet honeyeater	C	None	0	68	01/07/2015
1493	Aves	Meliphagidae	*Philemon citreogularis*	little friarbird	C	None	0	42	07/03/2015
1494	Aves	Meliphagidae	*Philemon corniculatus*	noisy friarbird	C	None	0	68	07/03/2015
1482	Aves	Meliphagidae	*Phylidonyris niger*	white-cheeked honeyeater	C	None	0	3	19/08/2001
1469	Aves	Meliphagidae	*Phylidonyris novaehollandiae*	New Holland honeyeater	C	None	0	8	07/11/2009
1471	Aves	Meliphagidae	*Plectorhyncha lanceolata*	striped honeyeater	C	None	0	1	09/07/2006
1764	Aves	Meropidae	*Merops ornatus*	rainbow bee-eater	C	None	1	64	07/03/2015
1594	Aves	Monarchidae	*Carterornis leucotis*	white-eared monarch	C	None	0	20	01/07/2015
1589	Aves	Monarchidae	*Grallina cyanoleuca*	magpie-lark	C	None	0	184	07/03/2015

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1595	Aves	Monarchidae	*Monarcha melanopsis*	black-faced monarch	SL	None	0	7	11/11/2007
1600	Aves	Monarchidae	*Myiagra inquieta*	restless flycatcher	C	None	1	24	06/01/2008
1586	Aves	Monarchidae	*Myiagra rubecula*	leaden flycatcher	C	None	0	35	07/03/2015
1597	Aves	Monarchidae	*Symposiachrus trivirgatus*	spectacled monarch	SL	None	0	31	01/07/2015
1455	Aves	Motacillidae	*Anthus novaes eelandiae*	Australasian pipit	C	None	0	1	25/03/2001
1611	Aves	Nectariniidae	*Dicaeum hirundinaceum*	mistletoebird	C	None	0	63	01/07/2015
1453	Aves	Neosittidae	*Daphoenositta chrysoptera*	varied sittella	C	None	1	8	26/10/2006
1442	Aves	Oriolidae	*Oriolus sagittatus*	olive-backed oriole	C	None	0	47	07/03/2015
1444	Aves	Oriolidae	*Sphecotheres vieilloti*	Australasian figbird	C	None	1	155	01/07/2015
1447	Aves	Orthonychidae	*Orthonyx temminckii*	Australian logrunner	C	None	0	5	02/12/2007
1680	Aves	Otididae	*Ardeotis australis*	Australian bustard	C	None	0	2	31/12/1993
1449	Aves	Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush	C	None	1	84	01/07/2015
1450	Aves	Pachycephalidae	*Colluricincla megarhyncha*	little shrike-thrush	C	None	0	55	01/07/2015
1429	Aves	Pachycephalidae	*Falcunculus frontatus*	crested shrike-tit	C	None	0	4	11/11/2007
1436	Aves	Pachycephalidae	*Pachycephala pectoralis*	golden whistler	C	None	1	105	01/07/2015
1437	Aves	Pachycephalidae	*Pachycephala rufiventris*	rufous whistler	C	None	0	72	07/03/2015
1415	Aves	Paradisaeidae	*Ptiloris paradiseus*	paradise riflebird	C	None	1	4	07/11/2009
1389	Aves	Pardalotidae	*Pardalotus punctatus*	spotted pardalote	C	None	1	43	01/07/2015
1392	Aves	Pardalotidae	*Pardalotus striatus*	striated pardalote	C	None	1	114	07/03/2015
1360	Aves	Passeridae	*Passer domesticus*	house sparrow	None	None	0	41	31/10/2002
1284	Aves	Pelecanidae	*Pelecanus conspicillatus*	Australian pelican	C	None	0	6	12/03/2006
1347	Aves	Petroicidae	*Eopsaltria australis*	eastern yellow robin	C	None	0	107	05/05/2020
1337	Aves	Petroicidae	*Melanodryas cucullata*	hooded robin	C	None	0	1	04/06/1991
1339	Aves	Petroicidae	*Microeca fascinans*	jacky winter	C	None	1	2	12/12/2001
1332	Aves	Petroicidae	*Petroica rosea*	rose robin	C	None	0	14	11/08/2007
1321	Aves	Petroicidae	*Tregellasia capito*	pale-yellow robin	C	None	0	7	10/08/2006

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1261	Aves	Phalacrocoracidae	*Microcarbo melanoleucos*	little pied cormorant	C	None	0	91	06/01/2012
1275	Aves	Phalacrocoracidae	*Phalacrocorax carbo*	great cormorant	C	None	0	6	06/01/2008
1263	Aves	Phalacrocoracidae	*Phalacrocorax sulcirostris*	little black cormorant	C	None	0	83	06/01/2012
1264	Aves	Phalacrocoracidae	*Phalacrocorax varius*	pied cormorant	C	None	0	2	27/10/2004
1699	Aves	Phasianidae	*Coturnix pectoralis*	stubble quail	C	None	0	2	12/12/2001
1698	Aves	Phasianidae	*Synoicus chinensis*	king quail	C	None	0	2	27/02/1988
1687	Aves	Phasianidae	*Synoicus ypsilophorus*	brown quail	C	None	0	29	06/01/2012
1326	Aves	Pittidae	*Pitta versicolor*	noisy pitta	C	None	0	7	12/08/2007
1952	Aves	Podargidae	*Podargus ocellatus plumiferus*	plumed frogmouth	V	None	0	1	01/09/2008
1955	Aves	Podargidae	*Podargus strigoides*	tawny frogmouth	C	None	0	27	29/07/2015
1249	Aves	Podicipedidae	*Tachybaptus novaehollandiae*	Australasian grebe	C	None	0	39	06/01/2012
1318	Aves	Pomatostomidae	*Pomatostomus temporalis*	grey-crowned babbler	C	None	0	14	07/03/2015
1180	Aves	Psittacidae	*Alisterus scapularis*	Australian king-parrot	C	None	0	59	07/03/2015
1182	Aves	Psittacidae	*Aprosmictus erythropterus*	red-winged parrot	C	None	1	3	31/12/1984
1164	Aves	Psittacidae	*Cyclopsitta diophthalma coxeni*	Coxen's fig-parrot	E	E	0	3	17/01/2003
1147	Aves	Psittacidae	*Parvipsitta pusilla*	little lorikeet	C	None	0	9	07/03/2015
1136	Aves	Psittacidae	*Platycercus adscitus*	pale-headed rosella	C	None	0	111	07/03/2015
1138	Aves	Psittacidae	*Platycercus elegans*	crimson rosella	C	None	0	1	28/02/1994
1118	Aves	Psittacidae	*Psephotus haematonotus*	red-rumped parrot	C	None	0	1	05/07/2000
1124	Aves	Psittacidae	*Trichoglossus chlorolepidotus*	scaly-breasted lorikeet	C	None	0	56	07/03/2015
1125	Aves	Psittacidae	*Trichoglossus moluccanus*	rainbow lorikeet	C	None	0	172	07/03/2015
1623	Aves	Psophodidae	*Psophodes olivaceus*	eastern whipbird	C	None	0	148	01/07/2015
1177	Aves	Ptilonorhynchidae	*Ailuroedus crassirostris*	green catbird	C	None	1	15	10/12/2008
1320	Aves	Ptilonorhynchidae	*Ptilonorhynchus violaceus*	satin bowerbird	C	None	2	6	17/01/2003
1308	Aves	Ptilonorhynchidae	*Sericulus chrysocephalus*	regent bowerbird	C	None	0	4	10/06/2006

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1682	Aves	Rallidae	*Amaurornis moluccana*	pale-vented bush-hen	C	None	0	15	06/01/2012
1686	Aves	Rallidae	*Fulica atra*	Eurasian coot	C	None	0	35	03/03/2015
1673	Aves	Rallidae	*Gallinula tenebrosa*	dusky moorhen	C	None	0	100	04/03/2015
1675	Aves	Rallidae	*Gallirallus philippensis*	buff-banded rail	C	None	2	20	07/10/2012
1670	Aves	Rallidae	*Lewinia pectoralis*	Lewin's rail	C	None	0	2	26/11/2000
1662	Aves	Rallidae	*Porphyrio melanotus*	purple swamphen	C	None	0	93	06/01/2012
1893	Aves	Recurvirostridae	*Himantopus himantopus*	black-winged stilt	C	None	0	3	29/09/2006
1575	Aves	Rhipiduridae	*Rhipidura albiscapa*	grey fantail	C	None	0	100	01/07/2015
1576	Aves	Rhipiduridae	*Rhipidura leucophrys*	willie wagtail	C	None	0	183	01/07/2015
1578	Aves	Rhipiduridae	*Rhipidura rufifrons*	rufous fantail	SL	None	0	25	13/02/2018
1883	Aves	Rostratulidae	*Rostratula australis*	Australian painted-snipe	E	E	2	2	24/11/1999
1857	Aves	Scolopacidae	*Gallinago hardwickii*	Latham's snipe	SL	None	1	2	28/08/2003
1102	Aves	Strigidae	*Ninox boobook*	southern boobook	C	None	0	35	08/04/2020
1107	Aves	Strigidae	*Ninox strenua*	powerful owl	V	None	0	4	27/04/2020
1303	Aves	Sturnidae	*Sturnus vulgaris*	common starling	None	None	1	3	19/06/1999
1822	Aves	Threskiornithidae	*Platalea flavipes*	yellow-billed spoonbill	C	None	0	3	13/10/2007
1823	Aves	Threskiornithidae	*Platalea regia*	royal spoonbill	C	None	0	17	13/10/2007
1812	Aves	Threskiornithidae	*Threskiornis molucca*	Australian white ibis	C	None	0	64	07/03/2015
1800	Aves	Threskiornithidae	*Threskiornis spinicollis*	straw-necked ibis	C	None	0	42	30/06/2008
1276	Aves	Timaliidae	*Zosterops lateralis*	silvereye	C	None	0	87	01/07/2015
1463	Aves	Turdidae	*Zoothera heinei*	russet-tailed thrush	C	None	0	2	27/03/2015
1464	Aves	Turdidae	*Zoothera lunulata*	Bassian thrush	C	None	0	7	30/06/2003
1092	Aves	Turnicidae	*Turnix melanogaster*	black-breasted button-quail	V	V	0	7	06/01/2012
1094	Aves	Turnicidae	*Turnix pyrrhothorax*	red-chested button-quail	C	None	0	2	06/01/2012
1081	Aves	Turnicidae	*Turnix varius*	painted button-quail	C	None	0	2	06/01/2012
1108	Aves	Tytonidae	*Tyto javanica*	eastern barn owl	C	None	0	6	22/07/2012
1098	Aves	Tytonidae	*Tyto sp.*	None	C	None	0	1	01/02/2012
35079	Insecta	Aeshnidae	*Anax gibbosulus*	green emperor	None	None	0	1	08/04/2010

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35081	Insecta	Aeshnidae	*Anax papuensis*	Australian Emperor	None	None	0	1	09/12/2011
35198	Insecta	Libellulidae	*Crocothemis nigrifrons*	black-headed skimmer	None	None	0	1	09/12/2011
35204	Insecta	Libellulidae	*Hydrobasileus brevistylus*	water prince	None	None	0	1	09/12/2011
35219	Insecta	Libellulidae	*Orthetrum caledonicum*	blue skimmer	None	None	0	1	09/12/2011
35229	Insecta	Libellulidae	*Rhyothemis graphiptera*	graphic flutterer	None	None	0	2	05/01/2012
35231	Insecta	Libellulidae	*Rhyothemis phyllis chloe*	yellow-striped flutterer	None	None	0	1	09/12/2011
2008	Insecta	Nymphalidae	*Argynnis hyperbius inconstans*	Australian fritillary	E	CE	0	20	31/12/1995
19179	Insecta	Nymphalidae	*Danaus petilia*	lesser wanderer	None	None	0	2	05/01/2012
19177	Insecta	Nymphalidae	*Danaus plexippus*	monarch	None	None	0	6	05/01/2012
19185	Insecta	Nymphalidae	*Euploea corinna*	common crow	None	None	0	1	04/01/2012
19122	Insecta	Nymphalidae	*Melanitis leda bankia*	evening brown	None	None	0	1	06/12/2011
19159	Insecta	Nymphalidae	*Phaedyma shepherdi shepherdi*	white-banded plane (southern subspecies)	None	None	0	1	05/01/2012
19176	Insecta	Nymphalidae	*Tirumala hamata hamata*	blue tiger	None	None	0	2	04/01/2012
19146	Insecta	Nymphalidae	*Ypthima arctous arctous*	dusky knight	None	None	0	1	05/12/2011
19075	Insecta	Papilionidae	*Cressida cressida cressida*	clearwing swallowtail	None	None	0	1	05/03/2001
19061	Insecta	Papilionidae	*Graphium choredon*	blue triangle	None	None	0	1	05/03/2001
19871	Insecta	Papilionidae	*Graphium eurypylus*	pale triangle	None	None	0	1	07/11/2009
2014	Insecta	Papilionidae	*Ornithoptera richmondia*	Richmond birdwing	V	None	0	3	31/12/1995
19961	Insecta	Papilionidae	*Papilio aegeus*	None	None	None	0	1	07/11/2009
33603	Malacostraca	Parastacidae	*Tenuibranchiurus glypticus*	swamp crayfish	E	None	0	1	27/06/2016
1068	Mammalia	Canidae	*Canis familiaris (dingo)*	dingo	None	None	0	1	04/06/2018
1071	Mammalia	Canidae	*Vulpes vulpes*	red fox	None	None	0	2	27/03/2015
22485	Mammalia	Dasyuridae	*Antechinus flavipes flavipes*	yellow-footed antechinus (south-east Queensland)	C	None	0	8	06/06/1997
818	Mammalia	Dasyuridae	*Antechinus flavipes sensu lato*	yellow-footed antechinus	C	None	0	6	06/03/2015
22415	Mammalia	Dasyuridae	*Antechinus subtropicus*	subtropical antechinus	C	None	0	1	06/06/1997

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800	Mammalia	Dasyuridae	*Dasyurus hallucatus*	northern quoll	C	E	0	2	31/12/1955
803	Mammalia	Dasyuridae	*Dasyurus maculatus maculatus*	spotted-tailed quoll (southern subspecies)	E	E	0	2	26/08/2004
808	Mammalia	Dasyuridae	*Phascogale tapoatafa tapoatafa*	brush-tailed phascogale	C	None	1	1	01/04/1972
814	Mammalia	Equidae	*Equus caballus*	horse	None	None	0	1	31/12/1960
832	Mammalia	Leporidae	*Lepus europaeus*	European brown hare	None	None	0	6	25/03/2001
901	Mammalia	Macropodidae	*Macropus giganteus*	eastern grey kangaroo	C	None	0	6	06/01/2012
914	Mammalia	Macropodidae	*Notamacropus dorsalis*	black-striped wallaby	C	None	0	1	25/05/1997
904	Mammalia	Macropodidae	*Notamacropus rufogriseus*	red-necked wallaby	C	None	0	3	06/01/2012
893	Mammalia	Macropodidae	*Petrogale sp.*	None	C	None	0	2	25/05/2020
884	Mammalia	Macropodidae	*Thylogale thetis*	red-necked pademelon	C	None	0	1	26/03/2015
885	Mammalia	Macropodidae	*Wallabia bicolor*	swamp wallaby	C	None	0	8	06/01/2012
954	Mammalia	Miniopteridae	*Miniopterus australis*	little bent-wing bat	C	None	0	24	03/03/2015
956	Mammalia	Miniopteridae	*Miniopterus sp.*	None	C	None	0	1	28/01/2010
989	Mammalia	Molossidae	*Austronomus australis*	white-striped freetail bat	C	None	0	9	04/03/2015
998	Mammalia	Molossidae	*Mormopterus lumsdenae*	northern free-tailed bat	C	None	0	4	28/02/2011
1000	Mammalia	Molossidae	*Mormopterus norfolkensis*	east coast freetail bat	C	None	0	10	16/02/2012
22061	Mammalia	Molossidae	*Mormopterus ridei*	eastern free-tailed bat	C	None	0	7	06/01/2012
988	Mammalia	Molossidae	*Mormopterus sp.*	None	C	None	0	1	22/02/2011
767	Mammalia	Muridae	*Hydromys chrysogaster*	water rat	C	None	0	5	02/11/2011
759	Mammalia	Muridae	*Melomys cervinipes*	fawn-footed melomys	C	None	0	2	06/01/2012
761	Mammalia	Muridae	*Melomys sp.*	None	C	None	0	3	15/02/2012
749	Mammalia	Muridae	*Pseudomys gracilicaudatus*	eastern chestnut mouse	C	None	0	1	06/01/2012
741	Mammalia	Muridae	*Rattus fuscipes*	bush rat	C	None	0	18	27/03/2015
733	Mammalia	Muridae	*Rattus sp.*	None	C	None	0	4	06/06/1997
836	Mammalia	Ornithorhynchidae	*Ornithorhynchus anatinus*	platypus	SL	None	0	47	01/01/2020
784	Mammalia	Peramelidae	*Isoodon macrourus*	northern brown bandicoot	C	None	0	10	29/02/2016
787	Mammalia	Peramelidae	*Perameles nasuta*	long-nosed bandicoot	C	None	0	4	27/03/2015

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877	Mammalia	Petauridae	*Petaurus breviceps sensu lato*	sugar glider	C	None	0	6	06/01/2012
879	Mammalia	Petauridae	*Petaurus norfolcensis*	squirrel glider	C	None	0	4	10/12/2009
880	Mammalia	Petauridae	*Petaurus sp.*	None	C	None	1	1	26/05/2004
857	Mammalia	Phalangeridae	*Trichosurus caninus*	short-eared possum	C	None	0	12	17/12/2012
859	Mammalia	Phalangeridae	*Trichosurus vulpecula*	common brushtail possum	C	None	3	9	13/08/2018
860	Mammalia	Phascolarctidae	*Phascolarctos cinereus*	koala	E	E	0	573	28/09/2021
2455	Mammalia	Pseudocheiridae	*Petauroides armillatus*	central greater glider	E	V	0	2	25/03/2015
851	Mammalia	Pseudocheiridae	*Pseudocheirus peregrinus*	common ringtail possum	C	None	0	5	05/12/2012
984	Mammalia	Pteropodidae	*Pteropus alecto*	black flying-fox	C	None	0	39	04/02/2019
962	Mammalia	Pteropodidae	*Pteropus poliocephalus*	grey-headed flying-fox	C	V	0	43	19/12/2019
963	Mammalia	Pteropodidae	*Pteropus scapulatus*	little red flying-fox	C	None	0	7	15/01/2010
964	Mammalia	Pteropodidae	*Pteropus sp.*	None	C	None	0	8	17/12/2012
968	Mammalia	Rhinolophidae	*Rhinolophus megaphyllus*	eastern horseshoe-bat	C	None	0	1	10/02/2010
838	Mammalia	Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna	SL	None	0	11	06/06/2020
972	Mammalia	Vespertilionidae	*Chalinolobus gouldii*	Gould's wattled bat	C	None	0	10	14/03/2012
973	Mammalia	Vespertilionidae	*Chalinolobus morio*	chocolate wattled bat	C	None	0	1	20/05/2009
961	Mammalia	Vespertilionidae	*Chalinolobus nigrogriseus*	hoary wattled bat	C	None	0	5	07/03/2011
22066	Mammalia	Vespertilionidae	*Myotis macropus*	large-footed myotis	C	None	0	11	14/03/2012
938	Mammalia	Vespertilionidae	*Nyctophilus sp.*	None	C	None	0	1	06/01/2012
931	Mammalia	Vespertilionidae	*Scotorepens greyii*	little broad-nosed bat	C	None	0	3	02/11/2011
19464	Mammalia	Vespertilionidae	*Scotorepens orion*	south-eastern broad-nosed bat	C	None	0	8	14/03/2012
933	Mammalia	Vespertilionidae	*Scotorepens sp.*	None	C	None	0	6	16/02/2012
923	Mammalia	Vespertilionidae	*Vespadelus darlingtoni*	large forest bat	C	None	0	1	28/01/2010
925	Mammalia	Vespertilionidae	*Vespadelus pumilus*	eastern forest bat	C	None	0	9	03/03/2015
574	Reptilia	Agamidae	*Chlamydosaurus kingii*	frilled lizard	C	None	1	1	31/12/1996
554	Reptilia	Agamidae	*Intellagama lesueurii*	eastern water dragon	C	None	0	101	13/12/2013

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
556	Reptilia	Agamidae	*Pogona barbata*	bearded dragon	C	None	1	4	06/01/2012
519	Reptilia	Boidae	*Morelia spilota*	carpet python	C	None	1	4	28/11/2013
30272	Reptilia	Chelidae	*Elseya albagula*	southern snapping turtle	CR	CE	0	18	05/09/2017
56	Reptilia	Chelidae	*Elusor macrurus*	Mary River turtle	E	E	0	183	18/11/2020
58	Reptilia	Chelidae	*Emydura macquarii krefftii*	Krefft's river turtle	C	None	0	4	25/01/2019
43	Reptilia	Chelidae	*Emydura macquarii macquarii*	Murray turtle	C	None	0	1	07/11/2009
54	Reptilia	Chelidae	*Wollumbinia latisternum*	saw-shelled turtle	C	None	0	3	27/02/2018
522	Reptilia	Colubridae	*Boiga irregularis*	brown tree snake	C	None	1	1	31/12/1996
512	Reptilia	Colubridae	*Dendrelaphis punctulatus*	green tree snake	C	None	1	9	29/01/2008
508	Reptilia	Colubridae	*Tropidonophis mairii*	freshwater snake	C	None	0	2	06/01/2012
501	Reptilia	Elapidae	*Cacophis harriettae*	white-crowned snake	C	None	3	4	18/10/2013
457	Reptilia	Elapidae	*Cryptophis nigrescens*	eastern small-eyed snake	C	None	0	3	07/11/2009
493	Reptilia	Elapidae	*Demansia psammophis*	yellow-faced whipsnake	C	None	0	2	31/10/1999
496	Reptilia	Elapidae	*Demansia vestigiata*	lesser black whipsnake	C	None	1	1	31/12/1956
470	Reptilia	Elapidae	*Oxyuranus scutellatus*	coastal taipan	C	None	0	1	10/10/2004
462	Reptilia	Elapidae	*Pseudechis porphyriacus*	red-bellied black snake	C	None	0	1	31/05/2000
454	Reptilia	Elapidae	*Pseudonaja textilis*	eastern brown snake	C	None	1	2	06/01/2012
411	Reptilia	Gekkonidae	*Hemidactylus frenatus*	house gecko	None	None	0	1	07/11/2003
321	Reptilia	Pygopodidae	*Delma plebeia*	common delma	C	None	1	1	31/12/1880
308	Reptilia	Scincidae	*Anomalopus verreauxii*	three-clawed worm-skink	C	None	0	4	06/01/2012
224	Reptilia	Scincidae	*Bellatorias major*	land mullet	C	None	0	1	31/12/1993
312	Reptilia	Scincidae	*Calyptotis scutirostrum*	scute-snouted calyptotis	C	None	1	2	31/12/1993
277	Reptilia	Scincidae	*Carlia vivax*	tussock rainbow-skink	C	None	0	1	24/10/2006
214	Reptilia	Scincidae	*Concinnia brachysoma*	northern bar-sided skink	C	None	0	1	24/04/2009
193	Reptilia	Scincidae	*Concinnia tenuis*	bar-sided skink	C	None	0	1	09/12/2011
31898	Reptilia	Scincidae	*Cryptoblepharus pulcher pulcher*	elegant snake-eyed skink	C	None	1	3	26/10/2006

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
216	Reptilia	Scincidae	*Cyclodomorphus gerrardii*	pink-tongued lizard	C	None	0	3	05/12/2013
209	Reptilia	Scincidae	*Eroticoscincus graciloides*	elf skink	C	None	0	4	06/01/2012
190	Reptilia	Scincidae	*Eulamprus quoyii*	eastern water skink	C	None	0	2	19/09/2013
189	Reptilia	Scincidae	*Karma murrayi*	Murray's skink	C	None	0	1	23/09/2012
180	Reptilia	Scincidae	*Lampropholis amicula*	friendly sunskink	C	None	1	10	06/01/2012
183	Reptilia	Scincidae	*Lampropholis couperi*	plain-backed sunskink	C	None	0	1	07/11/2009
184	Reptilia	Scincidae	*Lampropholis delicata*	dark-flecked garden sunskink	C	None	2	17	06/01/2012
170	Reptilia	Scincidae	*Lampropholis guichenoti*	pale-flecked garden sunskink	C	None	2	5	15/04/2001
150	Reptilia	Scincidae	*Lygisaurus foliorum*	tree-base litter-skink	C	None	0	2	06/01/2012
115	Reptilia	Scincidae	*Ophioscincus sp.*	None	C	None	0	1	01/10/1996
110	Reptilia	Scincidae	*Saproscincus rosei*	Rose's shadeskink	C	None	1	2	31/12/1993
104	Reptilia	Scincidae	*Tiliqua scincoides*	eastern blue-tongued lizard	C	None	0	1	06/03/2015
91	Reptilia	Typhlopidae	*Anilios ligatus*	robust blind snake	C	None	1	1	31/12/1996
61	Reptilia	Varanidae	*Varanus varius*	lace monitor	C	None	0	10	27/03/2015
26926	Sarcopterygii	Ceratodontidae	*Neoceratodus forsteri*	Australian lungfish	None	V	0	14	18/01/2020

Table 3. Plants recorded within the area of interest and its one kilometre buffer

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
8523	Charophyceae	Characeae	*Nitella*	None	None	None	1	1	30/11/1960
17768	Equisetopsida	Acanthaceae	*Brunoniella spiciflora*	None	C	None	0	1	19/04/1999
16375	Equisetopsida	Acanthaceae	*Pseuderanthemum variabile*	pastel flower	C	None	0	7	03/08/2005
33640	Equisetopsida	Acanthaceae	*Ruellia simplex*	None	None	None	2	2	25/11/2000
14157	Equisetopsida	Acanthaceae	*Thunbergia alata*	black-eyed Susan	None	None	1	1	14/05/2001
18026	Equisetopsida	Amaranthaceae	*Alternanthera denticulata*	lesser joyweed	C	None	2	3	08/05/2001
11782	Equisetopsida	Amaranthaceae	*Guilleminea densa*	small matweed	None	None	1	1	04/03/1969
11702	Equisetopsida	Amaryllidaceae	*Proiphys cunninghamii*	Moreton Bay lily	SL	None	0	1	03/12/2018
11645	Equisetopsida	Amaryllidaceae	*Zephyranthes candida*	None	None	None	1	1	18/02/2001
40242	Equisetopsida	Anacardiaceae	*Euroschinus falcata var. angustifolia*	None	C	None	0	1	03/08/2005
17173	Equisetopsida	Anacardiaceae	*Euroschinus falcatus*	None	C	None	0	5	19/04/1999
16720	Equisetopsida	Anacardiaceae	*Mangifera indica*	mango	None	None	0	1	01/07/1995

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
14256	Equisetopsida	Anacardiaceae	*Rhodosphaera rhodanthema*	tulip satinwood	C	None	0	4	19/04/1999
11769	Equisetopsida	Anacardiaceae	*Schinus terebinthifolius*	None	None	None	7	10	13/08/2017
41406	Equisetopsida	Annonaceae	*Huberantha nitidissima*	None	C	None	0	6	19/04/1999
8144	Equisetopsida	Annonaceae	*Melodorum leichhardtii*	None	C	None	1	8	02/09/2020
31548	Equisetopsida	Annonaceae	*Melodorum unguiculatum*	None	C	None	0	1	28/01/2011
15545	Equisetopsida	Apiaceae	*Centella asiatica*	None	C	None	0	1	01/07/1995
9484	Equisetopsida	Apocynaceae	*Alstonia constricta*	bitterbark	C	None	0	2	01/07/1995
5631	Equisetopsida	Apocynaceae	*Alyxia magnifolia*	None	C	None	0	2	03/08/2005
19732	Equisetopsida	Apocynaceae	*Alyxia ruscifolia*	None	C	None	0	14	01/07/2015
8244	Equisetopsida	Apocynaceae	*Araujia sericifera*	white moth vine	None	None	0	1	12/03/2001
9698	Equisetopsida	Apocynaceae	*Carissa ovata*	currantbush	C	None	0	11	03/08/2005
4710	Equisetopsida	Apocynaceae	*Gymnema pleiadenium*	None	C	None	0	1	19/04/1999
11202	Equisetopsida	Apocynaceae	*Hoya australis*	None	C	None	0	5	19/04/1999
41645	Equisetopsida	Apocynaceae	*Leichhardtia coronata*	None	V	None	2	31	19/12/2019
41661	Equisetopsida	Apocynaceae	*Leichhardtia lloydii*	None	C	None	1	3	01/07/1995
41666	Equisetopsida	Apocynaceae	*Leichhardtia micradenia*	None	C	None	0	1	19/04/1999
41656	Equisetopsida	Apocynaceae	*Leichhardtia racemosa*	None	C	None	0	1	01/07/1995
41642	Equisetopsida	Apocynaceae	*Leichhardtia rostrata*	None	C	None	0	1	03/08/2005
12361	Equisetopsida	Apocynaceae	*Melodinus australis*	southern melodinus	C	None	0	5	19/04/1999
16521	Equisetopsida	Apocynaceae	*Parsonsia lanceolata*	northern silkpod	C	None	0	1	19/04/1999
16524	Equisetopsida	Apocynaceae	*Parsonsia latifolia*	green-leaved silkpod	C	None	0	1	19/04/1999
16526	Equisetopsida	Apocynaceae	*Parsonsia straminea*	monkey rope	C	None	0	8	01/07/1995
16527	Equisetopsida	Apocynaceae	*Parsonsia velutina*	hairy silkpod	C	None	0	1	19/04/1999
16184	Equisetopsida	Apocynaceae	*Secamone elliptica*	None	C	None	0	7	03/08/2005
16059	Equisetopsida	Apocynaceae	*Tabernaemontana pandacaqui*	banana bush	C	None	0	12	01/07/2015
41259	Equisetopsida	Apocynaceae	*Vincetoxicum polyanthum*	None	C	None	0	1	19/04/1999
9788	Equisetopsida	Araceae	*Alocasia brisbanensis*	None	C	None	0	2	01/07/2015
12389	Equisetopsida	Araceae	*Gymnostachys anceps*	settler's flax	C	None	0	7	03/08/2005
14286	Equisetopsida	Araceae	*Pothos longipes*	None	C	None	0	3	01/07/2015
11223	Equisetopsida	Araliaceae	*Astrotricha latifolia*	None	C	None	0	3	01/07/1995
15280	Equisetopsida	Araliaceae	*Hydrocotyle peduncularis*	None	C	None	1	1	09/10/1972
8462	Equisetopsida	Araliaceae	*Polyscias elegans*	celery wood	C	None	0	13	19/04/1999
18040	Equisetopsida	Araucariaceae	*Agathis robusta*	kauri pine	C	None	0	1	19/04/1999
13706	Equisetopsida	Araucariaceae	*Araucaria bidwillii*	bunya pine	C	None	0	3	01/07/2015
17960	Equisetopsida	Araucariaceae	*Araucaria cunninghamii*	hoop pine	C	None	0	7	01/07/2015
14858	Equisetopsida	Arecaceae	*Archontophoenix cunninghamiana*	piccabeen palm	C	None	0	3	01/07/2015
12821	Equisetopsida	Arecaceae	*Calamus muelleri*	lawyer vine	C	None	0	7	01/07/2015

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29766	Equisetopsida	Arecaceae	*Livistona decora*	None	SL	None	0	3	01/07/1995
17972	Equisetopsida	Aristolochiaceae	*Aristolochia elegans*	calico-flower	None	None	1	5	12/03/2001
2215	Equisetopsida	Aristolochiaceae	*Aristolochia meridionalis subsp. meridionalis*	None	C	None	0	1	03/08/2005
19747	Equisetopsida	Asparagaceae	*Asparagus aethiopicus*	ground asparagus	None	None	1	1	14/05/2001
35428	Equisetopsida	Asparagaceae	*Asparagus macowanii*	None	None	None	1	1	16/11/2006
14816	Equisetopsida	Asparagaceae	*Asparagus officinalis*	asparagus	None	None	1	1	21/11/2006
7566	Equisetopsida	Asparagaceae	*Asparagus plumosus*	feathered asparagus fern	None	None	0	5	01/07/1995
8885	Equisetopsida	Asparagaceae	*Asparagus racemosus*	native asparagus	C	None	1	1	16/11/2006
9491	Equisetopsida	Asphodelaceae	*Aloe parvibracteata*	None	None	None	1	1	14/05/2001
9566	Equisetopsida	Aspleniaceae	*Asplenium attenuatum*	walking fern	C	None	0	3	03/08/2005
17937	Equisetopsida	Aspleniaceae	*Asplenium australasicum*	None	C	None	0	4	01/07/2015
17945	Equisetopsida	Aspleniaceae	*Asplenium polyodon*	mare's tail fern	C	None	0	1	19/04/1999
15715	Equisetopsida	Asteraceae	*Acanthospermum hispidum*	star burr	None	None	0	1	23/05/2018
14051	Equisetopsida	Asteraceae	*Ageratum houstonianum*	blue billygoat weed	None	None	1	10	24/02/2004
15672	Equisetopsida	Asteraceae	*Ambrosia artemisiifolia*	annual ragweed	None	None	1	1	26/01/1972
35061	Equisetopsida	Asteraceae	*Apowollastonia spilanthoides*	None	C	None	1	2	28/12/2020
15612	Equisetopsida	Asteraceae	*Baccharis halimifolia*	groundsel bush	None	None	0	6	01/07/1995
7691	Equisetopsida	Asteraceae	*Bidens pilosa*	None	None	None	0	3	01/07/1995
15570	Equisetopsida	Asteraceae	*Calyptocarpus vialis*	creeping cinderella weed	None	None	1	2	04/05/2018
15574	Equisetopsida	Asteraceae	*Carduus thoermeri*	nodding thistle	None	None	3	3	21/10/1993
14738	Equisetopsida	Asteraceae	*Cassinia laevis*	None	C	None	0	1	03/08/2005
13992	Equisetopsida	Asteraceae	*Cassinia subtropica*	None	C	None	0	1	03/08/2005
14001	Equisetopsida	Asteraceae	*Cirsium vulgare*	spear thistle	None	None	0	1	01/07/1995
22237	Equisetopsida	Asteraceae	*Cyanthillium cinereum*	None	C	None	0	3	03/08/2005
33971	Equisetopsida	Asteraceae	*Dimorphotheca ecklonis*	None	None	None	1	1	14/05/2001
15438	Equisetopsida	Asteraceae	*Eclipta prostrata*	white eclipta	None	None	1	1	25/05/2013
15401	Equisetopsida	Asteraceae	*Emilia sonchifolia*	None	None	None	0	1	01/07/1995
15285	Equisetopsida	Asteraceae	*Hypochaeris radicata*	catsear	None	None	0	1	01/07/1995
41827	Equisetopsida	Asteraceae	*Lordhowea amygdalifolia*	None	C	None	0	1	01/07/1995
8366	Equisetopsida	Asteraceae	*Ozothamnus diosmifolius*	white dogwood	C	None	0	4	03/08/2005
7131	Equisetopsida	Asteraceae	*Picris conyzoides*	None	V	None	1	1	25/11/2000
8407	Equisetopsida	Asteraceae	*Praxelis clematidea*	None	None	None	3	3	27/12/2020
31216	Equisetopsida	Asteraceae	*Senecio angulatus*	None	None	None	1	1	24/06/2015
10486	Equisetopsida	Asteraceae	*Senecio madagascariensis*	fireweed	None	None	2	2	20/11/2017

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12208	Equisetopsida	Asteraceae	*Sigesbeckia orientalis*	Indian weed	C	None	1	4	01/07/1995
22236	Equisetopsida	Asteraceae	*Soliva sessilis*	None	None	None	1	1	25/11/2000
26362	Equisetopsida	Asteraceae	*Sphagneticola trilobata*	None	None	None	0	1	15/06/2018
35909	Equisetopsida	Asteraceae	*Symphyotrichum subulatum*	None	None	None	1	1	14/05/2001
5622	Equisetopsida	Asteraceae	*Synedrellopsis grisebachii*	None	None	None	1	1	09/11/2021
10450	Equisetopsida	Asteraceae	*Tithonia diversifolia*	Japanese sunflower	None	None	1	1	13/05/2001
14959	Equisetopsida	Asteraceae	*Vittadinia sulcata*	native daisy	C	None	1	1	28/12/2020
3789	Equisetopsida	Atherospermataceae	*Daphnandra apatela*	None	C	None	1	1	31/08/2009
34188	Equisetopsida	Bignoniaceae	*Dolichandra unguis-cati*	cat's claw creeper	None	None	20	27	01/07/2015
11152	Equisetopsida	Bignoniaceae	*Jacaranda mimosifolia*	jacaranda	None	None	0	1	01/07/1995
3327	Equisetopsida	Bignoniaceae	*Pandorea floribunda*	None	C	None	1	1	27/08/2021
16569	Equisetopsida	Bignoniaceae	*Pandorea jasminoides*	None	C	None	0	4	19/04/1999
16570	Equisetopsida	Bignoniaceae	*Pandorea pandorana*	wonga vine	C	None	0	7	03/08/2005
17871	Equisetopsida	Blechnaceae	*Blechnum cartilagineum*	gristle fern	C	None	0	1	03/08/2005
41723	Equisetopsida	Blechnaceae	*Blechnum medium*	None	SL	None	0	1	03/08/2005
41600	Equisetopsida	Blechnaceae	*Blechnum neohollandicum*	None	C	None	0	9	03/08/2005
41590	Equisetopsida	Blechnaceae	*Blechnum parrisiae*	None	SL	None	0	1	01/07/1995
41068	Equisetopsida	Blechnaceae	*Blechnum rupestre*	None	SL	None	0	1	01/07/1995
41611	Equisetopsida	Blechnaceae	*Telmatoblechnum indicum*	None	SL	None	0	2	12/03/2001
14570	Equisetopsida	Boraginaceae	*Ehretia acuminata*	None	C	None	0	1	01/07/1995
12221	Equisetopsida	Brassicaceae	*Lepidium bonariense*	Argentine peppercress	None	None	2	2	25/10/2004
15098	Equisetopsida	Brassicaceae	*Raphanus raphanistrum*	wild radish	None	None	0	1	27/06/2018
15101	Equisetopsida	Brassicaceae	*Rorippa palustris*	marsh cress	None	None	1	1	07/10/1993
11636	Equisetopsida	Brassicaceae	*Sinapis alba*	white mustard	None	None	1	1	31/08/1984
17594	Equisetopsida	Byttneriaceae	*Commersonia bartramia*	brown kurrajong	C	None	1	6	03/08/2005
34146	Equisetopsida	Byttneriaceae	*Commersonia dasyphylla*	None	C	None	2	2	09/11/2018
26358	Equisetopsida	Cactaceae	*Opuntia monacantha*	None	None	None	1	1	06/05/2015
16764	Equisetopsida	Campanulaceae	*Lobelia gibbosa*	native lobelia	SL	None	0	1	03/08/2005
16766	Equisetopsida	Campanulaceae	*Lobelia purpurascens*	white root	SL	None	0	3	01/07/1995
13987	Equisetopsida	Capparaceae	*Capparis*	None	None	None	0	2	01/07/1995
17725	Equisetopsida	Capparaceae	*Capparis arborea*	brush caper berry	C	None	0	11	03/08/2005
17732	Equisetopsida	Capparaceae	*Capparis sarmentosa*	scrambling caper	C	None	1	8	03/08/2005
9280	Equisetopsida	Carpodetaceae	*Abrophyllum ornans*	None	C	None	0	1	19/04/1999

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19437	Equisetopsida	Caryophyllaceae	*Silene gallica*	None	None	None	1	1	06/10/1971
18014	Equisetopsida	Casuarinaceae	*Allocasuarina torulosa*	None	C	None	0	6	03/08/2005
13995	Equisetopsida	Casuarinaceae	*Casuarina cunninghamiana subsp. cunninghamiana*	None	C	None	2	2	11/05/2001
11097	Equisetopsida	Celastraceae	*Celastrus subspicata*	large-leaved staffvine	C	None	0	1	01/07/1995
34774	Equisetopsida	Celastraceae	*Denhamia bilocularis*	None	C	None	1	5	05/11/2012
14636	Equisetopsida	Celastraceae	*Denhamia celastroides*	broad-leaved boxwood	C	None	0	6	03/08/2005
22222	Equisetopsida	Celastraceae	*Elaeodendron australe var. australe*	None	C	None	0	1	03/08/2005
22226	Equisetopsida	Celastraceae	*Elaeodendron melanocarpum*	None	C	None	0	1	01/07/1995
16973	Equisetopsida	Celastraceae	*Hedraianthera porphyropetala*	hedrianthera	C	None	0	1	01/07/1995
16964	Equisetopsida	Celastraceae	*Hippocratea barbata*	knotvine	C	None	0	4	19/04/1999
16426	Equisetopsida	Celastraceae	*Pleurostylia opposita*	None	C	None	0	2	01/07/1995
15034	Equisetopsida	Celastraceae	*Siphonodon australis*	ivorywood	C	None	0	7	03/08/2005
9500	Equisetopsida	Chenopodiaceae	*Dysphania glomulifera subsp. glomulifera*	None	C	None	1	1	18/07/2001
17996	Equisetopsida	Commelinaceae	*Aneilema acuminatum*	None	C	None	0	3	12/03/2001
10494	Equisetopsida	Convolvulaceae	*Ipomoea hederacea*	None	None	None	1	1	27/12/2017
11029	Equisetopsida	Convolvulaceae	*Ipomoea indica*	blue morning-glory	None	None	1	1	14/05/2001
16395	Equisetopsida	Convolvulaceae	*Polymeria calycina*	pink bindweed	C	None	0	1	07/11/2018
40968	Equisetopsida	Cornaceae	*Alangium polyosmoides subsp. tomentosum*	None	C	None	0	3	01/07/2015
21934	Equisetopsida	Crassulaceae	*Bryophyllum delagoense*	None	None	None	1	1	14/05/2001
27801	Equisetopsida	Crassulaceae	*Crassula sarmentosa*	None	None	None	1	1	14/05/2001
18824	Equisetopsida	Cucurbitaceae	*Diplocyclos palmatus*	None	C	None	0	1	01/07/1995
16377	Equisetopsida	Cunoniaceae	*Pseudoweinmannia lachnocarpa*	rose marara	C	None	0	5	03/08/2005
41609	Equisetopsida	Cyatheaceae	*Alsophila australis*	None	C	None	0	1	03/08/2005
17686	Equisetopsida	Cyperaceae	*Carex appressa*	None	C	None	0	1	03/08/2005
11993	Equisetopsida	Cyperaceae	*Carex horsfieldii*	None	C	None	0	1	19/04/1999
14662	Equisetopsida	Cyperaceae	*Cyperus eragrostis*	None	None	None	1	1	07/10/1993
14656	Equisetopsida	Cyperaceae	*Cyperus exaltatus*	tall flatsedge	C	None	1	1	08/05/2001
17521	Equisetopsida	Cyperaceae	*Cyperus gracilis*	None	C	None	0	1	03/08/2005
14657	Equisetopsida	Cyperaceae	*Cyperus involucratus*	None	None	None	1	1	13/05/2001
17527	Equisetopsida	Cyperaceae	*Cyperus laevis*	None	C	None	0	1	01/07/1995
12420	Equisetopsida	Cyperaceae	*Cyperus polystachyos*	None	C	None	0	1	01/07/1995
17484	Equisetopsida	Cyperaceae	*Cyperus tetraphyllus*	None	C	None	0	2	03/08/2005
17485	Equisetopsida	Cyperaceae	*Cyperus trinervis*	None	C	None	1	1	08/05/2001

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17078	Equisetopsida	Cyperaceae	*Gahnia aspera*	None	C	None	0	5	03/08/2005
9381	Equisetopsida	Cyperaceae	*Lepidosperma laterale*	None	C	None	0	5	03/08/2005
34090	Equisetopsida	Cyperaceae	*Schoenoplectus subulatus*	None	C	None	1	1	25/11/2000
16224	Equisetopsida	Cyperaceae	*Scleria sphacelata*	None	C	None	0	1	03/08/2005
17497	Equisetopsida	Davalliaceae	*Davallia pyxidata*	None	C	None	0	1	01/07/1995
16340	Equisetopsida	Dennstaedtiaceae	*Pteridium esculentum*	common bracken	C	None	0	2	01/07/1995
17547	Equisetopsida	Dicksoniaceae	*Calochlaena dubia*	None	C	None	0	3	03/08/2005
21816	Equisetopsida	Dilleniaceae	*Hibbertia aspera subsp. aspera*	None	C	None	1	1	07/10/1993
16941	Equisetopsida	Dilleniaceae	*Hibbertia linearis*	None	C	None	0	1	01/07/1995
16940	Equisetopsida	Dilleniaceae	*Hibbertia linearis var. obtusifolia*	None	C	None	1	1	07/10/1993
13877	Equisetopsida	Dilleniaceae	*Hibbertia riparia*	None	C	None	1	1	07/10/1993
17438	Equisetopsida	Dioscoreaceae	*Dioscorea transversa*	native yam	C	None	0	6	03/08/2005
14433	Equisetopsida	Dryopteridaceae	*Lastreopsis marginans*	glossy shield fern	SL	None	0	1	19/04/1999
41585	Equisetopsida	Dryopteridaceae	*Parapolystichum acuminatum*	None	SL	None	0	1	01/07/1995
41725	Equisetopsida	Dryopteridaceae	*Parapolystichum microsorum*	None	SL	None	0	1	01/07/1995
17439	Equisetopsida	Ebenaceae	*Diospyros australis*	black plum	C	None	0	6	01/07/2015
17442	Equisetopsida	Ebenaceae	*Diospyros fasciculosa*	grey ebony	C	None	0	7	03/08/2005
17443	Equisetopsida	Ebenaceae	*Diospyros geminata*	scaly ebony	C	None	0	5	03/08/2005
11617	Equisetopsida	Ebenaceae	*Diospyros kaki*	persimmon	None	None	0	2	14/12/2018
17398	Equisetopsida	Ebenaceae	*Diospyros pentamera*	myrtle ebony	C	None	0	4	19/04/1999
17323	Equisetopsida	Elaeagnaceae	*Elaeagnus triflora*	None	C	None	0	1	19/04/1999
11584	Equisetopsida	Elaeagnaceae	*Elaeagnus triflora var. triflora*	None	C	None	1	1	06/06/2007
17327	Equisetopsida	Elaeocarpaceae	*Elaeocarpus eumundi*	Eumundi quandong	C	None	0	1	19/04/1999
17331	Equisetopsida	Elaeocarpaceae	*Elaeocarpus grandis*	blue quandong	C	None	0	2	01/07/1995
14574	Equisetopsida	Elaeocarpaceae	*Elaeocarpus kirtonii*	silver quandong	C	None	1	1	17/02/2000
14572	Equisetopsida	Elaeocarpaceae	*Elaeocarpus obovatus*	blueberry ash	C	None	0	5	03/08/2005
18111	Equisetopsida	Ericaceae	*Acrotriche aggregata*	red cluster heath	C	None	0	3	01/07/1995
16641	Equisetopsida	Ericaceae	*Monotoca scoparia*	prickly broom heath	C	None	0	2	03/08/2005
41532	Equisetopsida	Ericaceae	*Styphelia leptospermoides*	None	C	None	0	1	01/07/1995
41524	Equisetopsida	Ericaceae	*Styphelia sieberi*	None	C	None	1	6	03/08/2005
14163	Equisetopsida	Ericaceae	*Trochocarpa laurina*	tree heath	C	None	1	1	22/01/2004
17288	Equisetopsida	Erythroxylaceae	*Erythroxylum australe*	cocaine tree	C	None	0	1	01/07/1995

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18092	Equisetopsida	Euphorbiaceae	*Acalypha nemorum*	hairy acalypha	C	None	0	3	01/07/1995
18050	Equisetopsida	Euphorbiaceae	*Alchornea ilicifolia*	native holly	C	None	0	15	01/07/2015
14825	Equisetopsida	Euphorbiaceae	*Baloghia inophylla*	scrub bloodwood	C	None	0	6	12/03/2001
40337	Equisetopsida	Euphorbiaceae	*Bertya oleifolia var. glabrescens*	None	C	None	0	1	03/08/2005
17612	Equisetopsida	Euphorbiaceae	*Claoxylon australe*	brittlewood	C	None	0	3	19/04/1999
13956	Equisetopsida	Euphorbiaceae	*Croton acronychioides*	thick-leaved croton	C	None	0	1	12/03/2001
17561	Equisetopsida	Euphorbiaceae	*Croton insularis*	Queensland cascarilla	C	None	0	5	03/08/2005
34716	Equisetopsida	Euphorbiaceae	*Croton lucens*	None	CR	None	1	1	17/06/2012
11494	Equisetopsida	Euphorbiaceae	*Croton stigmatosus*	white croton	C	None	1	2	28/01/2022
17162	Equisetopsida	Euphorbiaceae	*Euphorbia heterophylla*	None	None	None	1	1	13/03/1973
34392	Equisetopsida	Euphorbiaceae	*Euphorbia ophthalmica*	None	None	None	1	1	21/02/2005
17166	Equisetopsida	Euphorbiaceae	*Euphorbia tannensis subsp. eremophila*	None	C	None	0	1	03/08/2005
17179	Equisetopsida	Euphorbiaceae	*Excoecaria dallachyana*	scrub poison tree	C	None	0	2	19/04/1999
11303	Equisetopsida	Euphorbiaceae	*Fontainea rostrata*	None	V	V	6	6	25/02/2015
11304	Equisetopsida	Euphorbiaceae	*Fontainea venosa*	None	V	V	0	1	01/07/1995
14334	Equisetopsida	Euphorbiaceae	*Homalanthus stillingiifolius*	None	C	None	0	3	03/08/2005
16753	Equisetopsida	Euphorbiaceae	*Macaranga tanarius*	macaranga	C	None	0	1	03/08/2005
11406	Equisetopsida	Euphorbiaceae	*Mallotus claoxyloides*	green kamala	C	None	1	10	03/08/2005
14380	Equisetopsida	Euphorbiaceae	*Mallotus discolor*	white kamala	C	None	0	2	19/04/1999
16715	Equisetopsida	Euphorbiaceae	*Mallotus philippensis*	red kamala	C	None	1	16	02/09/2020
11246	Equisetopsida	Euphorbiaceae	*Tragia novae-hollandiae*	stinging-vine	C	None	0	5	03/08/2005
17168	Equisetopsida	Eupomatiaceae	*Eupomatia bennettii*	small bolwarra	C	None	0	1	01/07/1995
17169	Equisetopsida	Eupomatiaceae	*Eupomatia laurina*	bolwarra	C	None	0	3	03/08/2005
17118	Equisetopsida	Flagellariaceae	*Flagellaria indica*	whip vine	C	None	0	7	01/07/1995
25600	Equisetopsida	Frullaniaceae	*Frullania monocera*	None	C	None	2	2	29/02/1984
18802	Equisetopsida	Gentianaceae	*Centaurium tenuiflorum*	None	None	None	1	1	25/11/2000
17062	Equisetopsida	Goodeniaceae	*Goodenia hederacea subsp. hederacea*	None	C	None	0	1	01/07/1995
17065	Equisetopsida	Goodeniaceae	*Goodenia rotundifolia*	None	C	None	0	3	01/07/1995
14714	Equisetopsida	Gyrostemonaceae	*Codonocarpus attenuatus*	None	C	None	0	1	03/08/2005
13239	Equisetopsida	Hemerocallidaceae	*Dianella brevipedunculata*	None	C	None	1	2	08/11/2006
17464	Equisetopsida	Hemerocallidaceae	*Dianella caerulea*	None	C	None	0	7	01/07/2015
10722	Equisetopsida	Hemerocallidaceae	*Dianella caerulea var. assera*	None	C	None	1	2	03/08/2005
11711	Equisetopsida	Hemerocallidaceae	*Dianella caerulea var. caerulea*	None	C	None	1	1	21/10/1993

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17463	Equisetopsida	Hemerocallidaceae	*Dianella caerulea var. vannata*	None	C	None	1	2	03/08/2005
17467	Equisetopsida	Hemerocallidaceae	*Dianella longifolia var. longifolia*	None	C	None	1	1	07/11/2006
17469	Equisetopsida	Hemerocallidaceae	*Dianella nervosa*	None	C	None	1	1	29/09/1954
15350	Equisetopsida	Hemerocallidaceae	*Geitonoplesium cymosum*	scrambling lily	C	None	0	12	19/04/1999
40443	Equisetopsida	Hemerocallidaceae	*Geitonoplesium cymosum forma album*	None	C	None	0	1	03/08/2005
18350	Equisetopsida	Hydrocharitaceae	*Vallisneria annua*	None	SL	None	1	1	08/05/2001
18351	Equisetopsida	Hydrocharitaceae	*Vallisneria nana*	None	SL	None	1	1	10/04/2002
34886	Equisetopsida	Hypnaceae	*Ectropothecium umbilicatum*	None	C	None	1	1	16/07/2013
29153	Equisetopsida	Hypopterygiaceae	*Hypopterygium tamarisci*	None	C	None	1	1	31/12/1827
16846	Equisetopsida	Juncaceae	*Juncus usitatus*	None	C	None	2	2	11/05/2001
34790	Equisetopsida	Juncaginaceae	*Cycnogeton procerus*	None	SL	None	0	1	01/07/1995
34799	Equisetopsida	Juncaginaceae	*Cycnogeton rheophilus*	None	SL	None	1	1	07/05/1976
15667	Equisetopsida	Lamiaceae	*Ajuga australis*	Australian bugle	C	None	0	1	03/08/2005
12453	Equisetopsida	Lamiaceae	*Callicarpa pedunculata*	velvet leaf	C	None	0	2	03/08/2005
17628	Equisetopsida	Lamiaceae	*Clerodendrum floribundum*	None	C	None	0	10	03/08/2005
12462	Equisetopsida	Lamiaceae	*Clerodendrum tomentosum*	None	C	None	0	3	01/07/1995
41035	Equisetopsida	Lamiaceae	*Coleus australis*	None	C	None	0	1	01/07/1995
17100	Equisetopsida	Lamiaceae	*Glossocarya hemiderma*	None	C	None	0	1	01/07/1995
12384	Equisetopsida	Lamiaceae	*Gmelina leichhardtii*	white beech	C	None	0	1	19/04/1999
15243	Equisetopsida	Lamiaceae	*Mentha satureioides*	native pennyroyal	C	None	1	1	07/02/1991
9076	Equisetopsida	Lamiaceae	*Teucrium argutum*	None	C	None	0	1	03/08/2005
15961	Equisetopsida	Lamiaceae	*Vitex acuminata*	None	C	None	0	2	01/07/1995
18814	Equisetopsida	Lamiaceae	*Vitex lignum-vitae*	None	C	None	0	8	01/07/2015
15964	Equisetopsida	Lamiaceae	*Vitex melicopea*	None	C	None	0	2	03/08/2005
17858	Equisetopsida	Lauraceae	*Beilschmiedia elliptica*	grey walnut	C	None	0	1	19/04/1999
17859	Equisetopsida	Lauraceae	*Beilschmiedia obtusifolia*	hard bolly gum	C	None	0	3	19/04/1999
17705	Equisetopsida	Lauraceae	*Cassytha pubescens*	downy devil's twine	C	None	0	1	01/07/1995
11859	Equisetopsida	Lauraceae	*Cinnamomum camphora*	camphor laurel	None	None	3	8	14/05/2003
17570	Equisetopsida	Lauraceae	*Cryptocarya bidwillii*	yellow laurel	C	None	0	3	03/08/2005
17580	Equisetopsida	Lauraceae	*Cryptocarya hypospodia*	north Queensland purple laurel	C	None	0	2	19/04/1999
17581	Equisetopsida	Lauraceae	*Cryptocarya laevigata*	None	C	None	0	7	01/07/2015
11866	Equisetopsida	Lauraceae	*Cryptocarya macdonaldii*	McDonald's laurel	C	None	0	1	01/07/1995

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11864	Equisetopsida	Lauraceae	*Cryptocarya obovata*	pepperberry	C	None	0	2	01/07/1995
17535	Equisetopsida	Lauraceae	*Cryptocarya onoprienkoana*	None	C	None	0	1	19/04/1999
11865	Equisetopsida	Lauraceae	*Cryptocarya sclerophylla*	totempole	C	None	1	11	01/07/2015
17541	Equisetopsida	Lauraceae	*Cryptocarya triplinervis*	None	C	None	0	8	03/08/2005
17303	Equisetopsida	Lauraceae	*Endiandra discolor*	domatia tree	C	None	0	2	01/07/1995
11820	Equisetopsida	Lauraceae	*Endiandra muelleri*	None	C	None	0	2	03/08/2005
9502	Equisetopsida	Lauraceae	*Endiandra muelleri subsp. muelleri*	None	C	None	0	1	01/07/1995
16760	Equisetopsida	Lauraceae	*Litsea leefeana*	None	C	None	0	2	19/04/1999
16619	Equisetopsida	Lauraceae	*Neolitsea dealbata*	white bolly gum	C	None	0	5	01/07/2015
14724	Equisetopsida	Laxmanniaceae	*Cordyline petiolaris*	large-leaved palm lily	C	None	0	5	01/07/2015
14725	Equisetopsida	Laxmanniaceae	*Cordyline rubra*	red-fruited palm lily	C	None	0	11	03/08/2005
15339	Equisetopsida	Laxmanniaceae	*Eustrephus latifolius*	wombat berry	C	None	0	6	01/07/1995
40458	Equisetopsida	Laxmanniaceae	*Eustrephus latifolius subforma fimbriatus*	None	C	None	0	1	03/08/2005
16770	Equisetopsida	Laxmanniaceae	*Lomandra filiformis subsp. filiformis*	None	C	None	0	1	03/08/2005
16772	Equisetopsida	Laxmanniaceae	*Lomandra hystrix*	None	C	None	0	2	01/07/1995
16773	Equisetopsida	Laxmanniaceae	*Lomandra laxa*	broad-leaved matrush	C	None	1	1	09/03/2003
16776	Equisetopsida	Laxmanniaceae	*Lomandra longifolia*	None	C	None	0	8	03/08/2005
16777	Equisetopsida	Laxmanniaceae	*Lomandra multiflora subsp. multiflora*	None	C	None	0	2	06/12/2018
18348	Equisetopsida	Laxmanniaceae	*Thysanotus tuberosus*	None	C	None	0	1	01/07/1995
15827	Equisetopsida	Leguminosae	*Acacia aulacocarpa*	None	C	None	0	13	19/04/1999
11888	Equisetopsida	Leguminosae	*Acacia bakeri*	marblewood	C	None	0	7	03/08/2005
15789	Equisetopsida	Leguminosae	*Acacia complanata*	flatstem wattle	C	None	1	7	11/12/2015
21915	Equisetopsida	Leguminosae	*Acacia disparrima subsp. disparrima*	None	C	None	0	1	03/08/2005
15799	Equisetopsida	Leguminosae	*Acacia falcata*	sickle wattle	C	None	1	2	03/08/2005
15745	Equisetopsida	Leguminosae	*Acacia fimbriata*	Brisbane golden wattle	C	None	2	6	07/11/2000
15765	Equisetopsida	Leguminosae	*Acacia leiocalyx*	None	C	None	0	1	01/07/1995
14066	Equisetopsida	Leguminosae	*Acacia leiocalyx subsp. leiocalyx*	None	C	None	2	8	11/09/2005
14865	Equisetopsida	Leguminosae	*Acacia longissima*	None	C	None	0	3	03/08/2005
15772	Equisetopsida	Leguminosae	*Acacia maidenii*	Maiden's wattle	C	None	0	6	03/08/2005
15720	Equisetopsida	Leguminosae	*Acacia melanoxylon*	blackwood	C	None	0	5	03/08/2005
11845	Equisetopsida	Leguminosae	*Acacia oshanesii*	None	C	None	0	4	01/07/1995

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14068	Equisetopsida	Leguminosae	*Acacia saligna*	golden wreath wattle	None	None	1	1	22/08/1981
15709	Equisetopsida	Leguminosae	*Acacia ulicifolia*	None	C	None	0	1	01/07/1995
11510	Equisetopsida	Leguminosae	*Albizia lebbeck*	Indian siris	C	None	1	1	14/05/2001
30268	Equisetopsida	Leguminosae	*Arachis pintoi*	None	None	None	0	1	24/10/2018
15638	Equisetopsida	Leguminosae	*Archidendron grandiflorum*	lace flower tree	C	None	0	1	19/04/1999
41273	Equisetopsida	Leguminosae	*Austrocallerya australis*	None	C	None	0	1	19/04/1999
41294	Equisetopsida	Leguminosae	*Austrocallerya megasperma*	None	C	None	0	1	03/08/2005
15609	Equisetopsida	Leguminosae	*Austrosteenisia blackii*	bloodvine	C	None	0	6	12/03/2001
18175	Equisetopsida	Leguminosae	*Austrosteenisia blackii var. blackii*	None	C	None	1	1	06/10/1993
14823	Equisetopsida	Leguminosae	*Austrosteenisia glabristyla*	giant blood vine	C	None	0	1	01/07/2015
36122	Equisetopsida	Leguminosae	*Biancaea decapetala*	None	None	None	1	1	14/02/2007
14805	Equisetopsida	Leguminosae	*Cajanus cajan*	pigeon pea	None	None	1	1	30/04/2018
41909	Equisetopsida	Leguminosae	*Cassia brewsteri subsp. (Gundiah C.T.White 3491)*	None	C	None	1	1	29/09/2021
41915	Equisetopsida	Leguminosae	*Cassia sp. (Como P.Grimshaw+ G507)*	None	C	None	3	3	28/05/2020
15539	Equisetopsida	Leguminosae	*Castanospermum australe*	black bean	C	None	0	5	01/07/2015
35911	Equisetopsida	Leguminosae	*Crotalaria beddomeana*	None	None	None	1	1	05/06/1996
18779	Equisetopsida	Leguminosae	*Crotalaria pallida*	None	None	None	0	1	01/07/1995
15444	Equisetopsida	Leguminosae	*Daviesia genistifolia*	broom bitter pea	C	None	0	1	03/08/2005
2105	Equisetopsida	Leguminosae	*Daviesia ulicifolia subsp. stenophylla*	None	C	None	1	1	27/12/2020
15460	Equisetopsida	Leguminosae	*Desmodium rhytidophyllum*	None	C	None	0	1	03/08/2005
13037	Equisetopsida	Leguminosae	*Desmodium tortuosum*	Florida beggar-weed	None	None	1	1	25/11/2000
13038	Equisetopsida	Leguminosae	*Desmodium uncinatum*	None	None	None	1	1	14/05/2001
2128	Equisetopsida	Leguminosae	*Dillwynia phylicoides*	None	C	None	0	1	01/07/1995
12996	Equisetopsida	Leguminosae	*Erythrina crista-galli*	None	None	None	2	2	14/05/2001
13000	Equisetopsida	Leguminosae	*Flemingia parviflora*	flemingia	C	None	0	1	01/07/1995
14518	Equisetopsida	Leguminosae	*Gleditsia triacanthos*	honey locust	None	None	1	1	11/01/2016
7603	Equisetopsida	Leguminosae	*Glycine clandestina*	None	C	None	0	1	03/08/2005
15356	Equisetopsida	Leguminosae	*Glycine tabacina*	glycine pea	C	None	1	2	01/07/1995
15309	Equisetopsida	Leguminosae	*Hardenbergia violacea*	None	C	None	0	6	03/08/2005
15323	Equisetopsida	Leguminosae	*Hovea acutifolia*	None	C	None	1	5	28/08/2014
22819	Equisetopsida	Leguminosae	*Indigofera arrecta*	None	None	None	1	1	19/06/2018
15291	Equisetopsida	Leguminosae	*Indigofera australis*	None	C	None	0	1	03/08/2005
15260	Equisetopsida	Leguminosae	*Jacksonia scoparia*	None	C	None	0	6	11/12/2015
8865	Equisetopsida	Leguminosae	*Leucaena leucocephala subsp. glabrata*	None	None	None	1	1	13/05/2001

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6280	Equisetopsida	Leguminosae	*Leucaena leucocephala subsp. leucocephala*	None	None	None	1	1	14/05/2001
15228	Equisetopsida	Leguminosae	*Lotononis bainesii*	lotononis	None	None	0	1	04/09/2018
15235	Equisetopsida	Leguminosae	*Macroptilium atropurpureum*	siratro	None	None	0	1	01/07/1995
15239	Equisetopsida	Leguminosae	*Medicago lupulina*	black medic	None	None	2	2	25/11/2000
15241	Equisetopsida	Leguminosae	*Melilotus indicus*	hexham scent	None	None	1	1	07/10/1993
36116	Equisetopsida	Leguminosae	*Mezoneuron brachycarpum*	None	C	None	0	2	01/07/1995
36115	Equisetopsida	Leguminosae	*Mezoneuron nitens*	None	C	None	0	1	01/07/2015
36129	Equisetopsida	Leguminosae	*Mezoneuron scortechinii*	None	C	None	0	3	19/04/1999
18222	Equisetopsida	Leguminosae	*Neonotonia wightii*	None	None	None	0	1	01/07/2015
9083	Equisetopsida	Leguminosae	*Pararchidendron pruinosum*	None	C	None	3	5	01/07/1995
6007	Equisetopsida	Leguminosae	*Podolobium aciculiferum*	None	C	None	1	2	07/11/2000
6008	Equisetopsida	Leguminosae	*Podolobium ilicifolium*	None	C	None	1	4	03/08/2005
6009	Equisetopsida	Leguminosae	*Podolobium scandens*	None	C	None	1	1	04/10/1993
29406	Equisetopsida	Leguminosae	*Pueraria montana var. lobata*	kudzu	None	None	1	1	04/04/2017
15087	Equisetopsida	Leguminosae	*Pultenaea petiolaris*	None	C	None	0	1	03/08/2005
15576	Equisetopsida	Leguminosae	*Senna alata*	None	None	None	0	1	23/04/2018
14244	Equisetopsida	Leguminosae	*Senna clavigera*	None	C	None	1	1	09/10/1993
14733	Equisetopsida	Leguminosae	*Senna didymobotrya*	None	None	None	1	1	09/05/1963
14238	Equisetopsida	Leguminosae	*Senna hirsuta*	None	None	None	1	1	21/09/2012
14196	Equisetopsida	Leguminosae	*Senna occidentalis*	coffee senna	None	None	2	2	14/07/2015
15073	Equisetopsida	Leguminosae	*Senna pendula var. glabrata*	Easter cassia	None	None	4	4	14/05/2001
24648	Equisetopsida	Leguminosae	*Senna septemtrionalis*	None	None	None	0	3	01/07/1995
36634	Equisetopsida	Leguminosae	*Solori involuta*	None	C	None	0	7	03/08/2005
14149	Equisetopsida	Leguminosae	*Tephrosia rufula*	None	C	None	0	1	03/08/2005
9418	Equisetopsida	Leguminosae	*Vicia sativa subsp. nigra*	None	None	None	0	1	11/09/2018
7791	Equisetopsida	Leguminosae	*Vicia villosa subsp. eriocarpa*	None	None	None	1	1	27/09/1962
13725	Equisetopsida	Leguminosae	*Vigna vexillata var. youngiana*	None	C	None	1	1	25/11/2000
25057	Equisetopsida	Lembophyllaceae	*Camptochaete excavata*	None	C	None	1	1	31/12/1887
15197	Equisetopsida	Loganiaceae	*Mitrasacme paludosa*	None	C	None	0	1	01/07/1995
7462	Equisetopsida	Loganiaceae	*Strychnos psilosperma*	strychnine tree	C	None	0	1	19/04/1999
25029	Equisetopsida	Lophocoleaceae	*Chiloscyphus*	None	None	None	1	1	29/02/1984
29512	Equisetopsida	Lophocoleaceae	*Chiloscyphus semiteres*	None	C	None	1	1	29/02/1984
14847	Equisetopsida	Loranthaceae	*Amyema cambagei*	None	C	None	0	1	03/08/2005
14849	Equisetopsida	Loranthaceae	*Amyema quandang var. bancroftii*	broad-leaved grey mistletoe	C	None	0	1	01/07/1995

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17454	Equisetopsida	Loranthaceae	*Dendrophthoe vitellina*	long-flowered mistletoe	C	None	1	1	25/11/2000
12853	Equisetopsida	Lythraceae	*Cuphea carthagenensis*	None	None	None	1	1	01/06/2010
13006	Equisetopsida	Malvaceae	*Gossypium barbadense*	None	None	None	2	2	14/05/2001
16955	Equisetopsida	Malvaceae	*Hibiscus heterophyllus*	None	C	None	0	7	03/08/2005
12943	Equisetopsida	Malvaceae	*Malvastrum americanum var. stellatum*	None	C	None	1	1	07/11/2000
12949	Equisetopsida	Malvaceae	*Modiola caroliniana*	red-flowered mallow	None	None	1	1	07/11/2000
16195	Equisetopsida	Malvaceae	*Sida cordifolia*	None	None	None	1	4	23/06/2018
15833	Equisetopsida	Meliaceae	*Anthocarapa nitidula*	incense cedar	C	None	0	4	01/07/2015
14620	Equisetopsida	Meliaceae	*Dysoxylum fraserianum*	rose mahogany	C	None	0	2	03/08/2005
8077	Equisetopsida	Meliaceae	*Dysoxylum mollissimum subsp. molle*	miva mahogany	C	None	0	1	01/07/1995
17367	Equisetopsida	Meliaceae	*Dysoxylum rufum*	None	C	None	0	2	01/07/1995
16661	Equisetopsida	Meliaceae	*Melia azedarach*	white cedar	C	None	0	9	01/07/2015
16559	Equisetopsida	Meliaceae	*Owenia venosa*	crow's apple	C	None	0	5	03/08/2005
14191	Equisetopsida	Meliaceae	*Synoum glandulosum subsp. glandulosum*	None	C	None	0	1	03/08/2005
16004	Equisetopsida	Meliaceae	*Toona ciliata*	red cedar	C	None	0	3	03/08/2005
15987	Equisetopsida	Meliaceae	*Turraea pubescens*	native honeysuckle	C	None	0	3	03/08/2005
16860	Equisetopsida	Menispermaceae	*Legnephora moorei*	None	C	None	0	1	01/07/2015
14323	Equisetopsida	Menispermaceae	*Pleogyne australis*	wiry grape	C	None	0	11	03/08/2005
14269	Equisetopsida	Menispermaceae	*Sarcopetalum harveyanum*	pearl vine	C	None	0	7	01/07/2015
9647	Equisetopsida	Menispermaceae	*Stephania japonica*	None	C	None	0	6	19/04/1999
16100	Equisetopsida	Menispermaceae	*Stephania japonica var. discolor*	None	C	None	0	1	03/08/2005
14131	Equisetopsida	Monimiaceae	*Wilkiea macrophylla*	large-leaved wilkiea	C	None	0	10	03/08/2005
17132	Equisetopsida	Moraceae	*Ficus coronata*	creek sandpaper fig	C	None	0	9	03/08/2005
17135	Equisetopsida	Moraceae	*Ficus fraseri*	white sandpaper fig	C	None	0	2	19/04/1999
19859	Equisetopsida	Moraceae	*Ficus macrophylla*	None	C	None	0	1	01/07/2015
8727	Equisetopsida	Moraceae	*Ficus macrophylla forma macrophylla*	Moreton Bay fig	C	None	0	4	03/08/2005
17143	Equisetopsida	Moraceae	*Ficus obliqua*	None	C	None	1	3	19/04/1999
17144	Equisetopsida	Moraceae	*Ficus opposita*	None	C	None	0	1	19/04/1999
17155	Equisetopsida	Moraceae	*Ficus virens*	None	C	None	0	1	01/07/1995
17154	Equisetopsida	Moraceae	*Ficus virens var. virens*	None	C	None	0	2	19/04/1999
17157	Equisetopsida	Moraceae	*Ficus watkinsiana*	green-leaved Moreton Bay fig	C	None	0	1	19/04/1999

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13825	Equisetopsida	Moraceae	*Maclura cochinchinensis*	cockspur thorn	C	None	0	12	01/07/2015
9118	Equisetopsida	Moraceae	*Streblus brunonianus*	whalebone tree	C	None	0	11	01/07/2015
6403	Equisetopsida	Moraceae	*Trophis scandens*	None	C	None	0	1	01/07/2015
6402	Equisetopsida	Moraceae	*Trophis scandens subsp. scandens*	None	C	None	2	15	02/09/2020
17344	Equisetopsida	Myrsinaceae	*Embelia australiana*	embelia	C	None	0	8	03/08/2005
30309	Equisetopsida	Myrsinaceae	*Myrsine variabilis*	None	C	None	0	6	03/08/2005
16063	Equisetopsida	Myrsinaceae	*Tapeinosperma pseudojambosa*	tapeinosperma	C	None	0	1	19/04/1999
18108	Equisetopsida	Myrtaceae	*Acmena smithii*	lillypilly satinash	C	None	0	1	03/08/2005
17999	Equisetopsida	Myrtaceae	*Angophora leiocarpa*	rusty gum	C	None	0	5	11/12/2015
17881	Equisetopsida	Myrtaceae	*Backhousia citriodora*	lemon ironwood	C	None	1	3	03/08/2005
17883	Equisetopsida	Myrtaceae	*Backhousia myrtifolia*	carrol	C	None	1	5	19/04/1999
34781	Equisetopsida	Myrtaceae	*Backhousia subargentea*	None	C	None	4	7	02/09/2020
6531	Equisetopsida	Myrtaceae	*Corymbia citriodora*	spotted gum	C	None	0	5	11/12/2015
26382	Equisetopsida	Myrtaceae	*Corymbia citriodora subsp. variegata*	None	C	None	0	1	03/08/2005
6445	Equisetopsida	Myrtaceae	*Corymbia intermedia*	pink bloodwood	C	None	0	6	11/12/2015
6572	Equisetopsida	Myrtaceae	*Corymbia tessellaris*	Moreton Bay ash	C	None	0	1	01/07/1995
15865	Equisetopsida	Myrtaceae	*Decaspermum humile*	silky myrtle	C	None	0	1	03/08/2005
17290	Equisetopsida	Myrtaceae	*Eucalyptus acmenoides*	None	C	None	3	11	03/08/2005
17250	Equisetopsida	Myrtaceae	*Eucalyptus cloeziana*	Gympie messmate	C	None	2	4	05/11/2012
17252	Equisetopsida	Myrtaceae	*Eucalyptus crebra*	narrow-leaved red ironbark	C	None	0	8	03/08/2005
17265	Equisetopsida	Myrtaceae	*Eucalyptus grandis*	flooded gum	C	None	1	2	01/07/1995
13902	Equisetopsida	Myrtaceae	*Eucalyptus major*	mountain grey gum	C	None	1	1	12/03/1982
17225	Equisetopsida	Myrtaceae	*Eucalyptus microcorys*	None	C	None	0	5	03/08/2005
17229	Equisetopsida	Myrtaceae	*Eucalyptus moluccana*	gum-topped box	C	None	0	4	01/07/1995
17240	Equisetopsida	Myrtaceae	*Eucalyptus pilularis*	blackbutt	C	None	0	1	11/12/2015
17189	Equisetopsida	Myrtaceae	*Eucalyptus propinqua*	small-fruited grey gum	C	None	0	8	01/07/1995
40417	Equisetopsida	Myrtaceae	*Eucalyptus propinqua var. major*	None	C	None	0	1	03/08/2005
40445	Equisetopsida	Myrtaceae	*Eucalyptus siderophloia forma decorticans*	None	C	None	0	1	03/08/2005
17204	Equisetopsida	Myrtaceae	*Eucalyptus tereticornis*	None	C	None	0	8	03/08/2005
26471	Equisetopsida	Myrtaceae	*Eucalyptus tereticornis subsp. tereticornis*	None	C	None	2	2	04/10/1993
12146	Equisetopsida	Myrtaceae	*Eugenia uniflora*	Brazilian cherry tree	None	None	2	2	02/09/2020
25908	Equisetopsida	Myrtaceae	*Gossia acmenoides*	None	C	None	2	4	19/04/1999

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27383	Equisetopsida	Myrtaceae	*Gossia bidwillii*	None	C	None	0	9	03/08/2005
27387	Equisetopsida	Myrtaceae	*Gossia hillii*	None	C	None	0	3	03/08/2005
25952	Equisetopsida	Myrtaceae	*Gossia punctata*	None	C	None	0	1	19/04/1999
16919	Equisetopsida	Myrtaceae	*Homoranthus virgatus*	twiggy homoranthus	C	None	0	1	01/07/1995
16827	Equisetopsida	Myrtaceae	*Leptospermum trinervium*	woolly tea-tree	C	None	0	1	11/12/2015
16780	Equisetopsida	Myrtaceae	*Lophostemon confertus*	brush box	C	None	1	11	11/12/2015
16730	Equisetopsida	Myrtaceae	*Lophostemon suaveolens*	swamp box	C	None	1	10	03/08/2005
16684	Equisetopsida	Myrtaceae	*Melaleuca bracteata*	None	C	None	1	1	04/11/1906
16695	Equisetopsida	Myrtaceae	*Melaleuca quinquenervia*	swamp paperbark	C	None	0	1	03/08/2005
31377	Equisetopsida	Myrtaceae	*Melaleuca salicina*	None	C	None	0	7	03/08/2005
13424	Equisetopsida	Myrtaceae	*Melaleuca styphelioides*	None	C	None	2	3	01/07/1995
16481	Equisetopsida	Myrtaceae	*Pilidiostigma rhytispermum*	None	C	None	2	6	03/08/2005
13400	Equisetopsida	Myrtaceae	*Psidium guineense*	cherry guava	None	None	1	1	14/05/2001
13402	Equisetopsida	Myrtaceae	*Rhodamnia argentea*	white myrtle	C	None	0	2	03/08/2005
13406	Equisetopsida	Myrtaceae	*Rhodamnia dumicola*	rib-fruited malletwood	E	None	0	3	01/07/1995
14255	Equisetopsida	Myrtaceae	*Rhodamnia rubescens*	scrub turpentine	CR	CE	2	6	31/01/2022
16290	Equisetopsida	Myrtaceae	*Rhodomyrtus psidioides*	native guava	CR	CE	1	5	05/05/2020
6212	Equisetopsida	Myrtaceae	*Syncarpia glomulifera subsp. glomulifera*	None	C	None	0	1	01/07/1995
16078	Equisetopsida	Myrtaceae	*Syzygium australe*	scrub cherry	C	None	0	2	01/07/1995
16047	Equisetopsida	Myrtaceae	*Syzygium luehmannii*	None	C	None	0	1	01/07/1995
16049	Equisetopsida	Myrtaceae	*Syzygium oleosum*	blue cherry	C	None	0	1	01/07/1995
15980	Equisetopsida	Myrtaceae	*Tristaniopsis laurina*	None	C	None	1	2	03/08/2005
15857	Equisetopsida	Myrtaceae	*Waterhousea floribunda*	weeping lilly pilly	C	None	1	5	03/08/2005
16571	Equisetopsida	Nephrolepidaceae	*Nephrolepis cordifolia*	fishbone fern	C	None	0	2	01/07/1995
16453	Equisetopsida	Nyctaginaceae	*Pisonia aculeata*	thorny pisonia	C	None	0	1	01/07/1995
19941	Equisetopsida	Nymphaeaceae	*Nymphaea caerulea*	None	None	None	1	1	10/02/1964
13390	Equisetopsida	Ochnaceae	*Ochna serrulata*	ochna	None	None	0	6	01/07/2015
13456	Equisetopsida	Oleaceae	*Jasminum dallachii*	soft jasmine	C	None	0	1	19/04/1999
16839	Equisetopsida	Oleaceae	*Jasminum didymum*	None	C	None	0	2	01/07/1995
16838	Equisetopsida	Oleaceae	*Jasminum didymum subsp. racemosum*	None	C	None	0	1	19/04/1999
9461	Equisetopsida	Oleaceae	*Jasminum simplicifolium*	None	C	None	0	3	01/07/1995
16840	Equisetopsida	Oleaceae	*Jasminum simplicifolium subsp. australiense*	None	C	None	0	3	03/08/2005
13417	Equisetopsida	Oleaceae	*Ligustrum lucidum*	large-leaved privet	None	None	2	2	14/05/2001
16795	Equisetopsida	Oleaceae	*Ligustrum sinense*	small-leaved privet	None	None	1	5	02/09/2020

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16579	Equisetopsida	Oleaceae	*Notelaea johnsonii*	veinless mock-olive	C	None	0	1	01/07/1995
13439	Equisetopsida	Oleaceae	*Notelaea longifolia*	None	C	None	0	8	01/07/2015
16594	Equisetopsida	Oleaceae	*Olea paniculata*	None	C	None	0	7	01/07/2015
13420	Equisetopsida	Onagraceae	*Ludwigia octovalvis*	willow primrose	C	None	0	1	01/07/1995
32786	Equisetopsida	Onagraceae	*Oenothera lindheimeri*	None	None	None	1	1	31/01/1954
15816	Equisetopsida	Orchidaceae	*Arthrochilus irritabilis*	leafy elbow orchid	SL	None	0	1	01/07/1995
10323	Equisetopsida	Orchidaceae	*Bulbophyllum schillerianum*	red rope orchid	SL	None	0	1	19/04/1999
14760	Equisetopsida	Orchidaceae	*Calanthe triplicata*	christmas orchid	SL	None	0	1	19/04/1999
27542	Equisetopsida	Orchidaceae	*Corunastylis pumila*	None	SL	None	0	1	01/07/1995
13963	Equisetopsida	Orchidaceae	*Cymbidium madidum*	None	SL	None	0	2	03/08/2005
17506	Equisetopsida	Orchidaceae	*Cymbidium suave*	None	SL	None	0	1	19/04/1999
13280	Equisetopsida	Orchidaceae	*Dendrobium aemulum*	ironbark orchid	SL	None	0	1	19/04/1999
12834	Equisetopsida	Orchidaceae	*Dendrobium gracilicaule*	slender orchid	SL	None	0	2	19/04/1999
14634	Equisetopsida	Orchidaceae	*Dendrobium monophyllum*	None	SL	None	0	1	19/04/1999
12831	Equisetopsida	Orchidaceae	*Dendrobium tetragonum*	tree spider orchid	SL	None	0	1	19/04/1999
12792	Equisetopsida	Orchidaceae	*Dipodium*	None	None	None	1	1	10/02/1992
14606	Equisetopsida	Orchidaceae	*Dipodium punctatum*	None	SL	None	0	1	03/08/2005
5768	Equisetopsida	Orchidaceae	*Dockrillia bowmanii*	scrub pencil orchid	SL	None	0	1	19/04/1999
5779	Equisetopsida	Orchidaceae	*Dockrillia linguiformis*	tongue orchid	SL	None	2	3	01/07/1995
8197	Equisetopsida	Orchidaceae	*Geodorum densiflorum*	pink nodding orchid	SL	None	0	1	01/07/1995
14320	Equisetopsida	Orchidaceae	*Plectorrhiza tridentata*	tangle orchid	SL	None	0	1	19/04/1999
6689	Equisetopsida	Orchidaceae	*Pterostylis sp. (Gundiah W.W.Abell AQ72188)*	None	NT	None	0	1	11/03/2013
12659	Equisetopsida	Orchidaceae	*Sarcochilus dilatatus*	brown sarcochilus	SL	None	1	1	28/10/1950
9457	Equisetopsida	Oxalidaceae	*Oxalis corniculata*	None	None	None	1	3	16/07/2013
15840	Equisetopsida	Pandanaceae	*Freycinetia scandens*	None	C	None	0	1	01/07/1995
12715	Equisetopsida	Passifloraceae	*Passiflora edulis*	None	None	None	0	2	01/07/1995
16530	Equisetopsida	Passifloraceae	*Passiflora foetida*	None	None	None	1	2	14/05/2001
16532	Equisetopsida	Passifloraceae	*Passiflora suberosa*	corky passion flower	None	None	0	9	01/07/2015
16533	Equisetopsida	Passifloraceae	*Passiflora subpeltata*	white passion flower	None	None	1	5	01/07/1995
16302	Equisetopsida	Petiveriaceae	*Rivina humilis*	None	None	None	1	9	01/07/2015
41378	Equisetopsida	Phyllanthaceae	*Actephila mooreana*	None	C	None	1	3	19/04/1999
17808	Equisetopsida	Phyllanthaceae	*Breynia oblongifolia*	None	C	None	0	12	03/08/2005

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11327	Equisetopsida	Phyllanthaceae	*Bridelia exaltata*	None	C	None	0	4	01/07/2015
17810	Equisetopsida	Phyllanthaceae	*Bridelia leichhardtii*	None	C	None	0	2	03/08/2005
14706	Equisetopsida	Phyllanthaceae	*Cleistanthus cunninghamii*	omega	C	None	1	8	02/09/2020
9378	Equisetopsida	Phyllanthaceae	*Glochidion ferdinandi*	None	C	None	0	1	19/04/1999
17093	Equisetopsida	Phyllanthaceae	*Glochidion ferdinandi var. ferdinandi*	None	C	None	0	6	03/08/2005
18266	Equisetopsida	Phyllanthaceae	*Phyllanthus microcladus*	None	C	None	0	1	01/07/1995
11276	Equisetopsida	Phyllanthaceae	*Phyllanthus similis*	None	C	None	0	1	19/04/1999
16409	Equisetopsida	Phyllanthaceae	*Poranthera microphylla*	small poranthera	C	None	0	1	01/07/1995
16479	Equisetopsida	Phytolaccaceae	*Phytolacca octandra*	inkweed	None	None	0	1	01/07/1995
17412	Equisetopsida	Picrodendraceae	*Dissiliaria baloghioides*	hauer	C	None	1	2	02/09/2020
14301	Equisetopsida	Picrodendraceae	*Petalostigma triloculare*	forest quinine	C	None	2	7	27/12/2020
5286	Equisetopsida	Piperaceae	*Peperomia leptostachya*	None	C	None	0	1	01/07/1995
30283	Equisetopsida	Piperaceae	*Piper hederaceum*	None	C	None	0	3	01/07/2015
31570	Equisetopsida	Piperaceae	*Piper hederaceum var. hederaceum*	None	C	None	0	1	03/08/2005
22219	Equisetopsida	Pittosporaceae	*Auranticarpa rhombifolia*	None	C	None	0	3	03/08/2005
16933	Equisetopsida	Pittosporaceae	*Hymenosporum flavum*	native frangipani	C	None	0	2	19/04/1999
26421	Equisetopsida	Pittosporaceae	*Pittosporum multiflorum*	None	C	None	0	2	01/07/2015
16459	Equisetopsida	Pittosporaceae	*Pittosporum revolutum*	yellow pittosporum	C	None	0	11	03/08/2005
22387	Equisetopsida	Pittosporaceae	*Pittosporum spinescens*	None	C	None	0	1	19/04/1999
16462	Equisetopsida	Pittosporaceae	*Pittosporum undulatum*	sweet pittosporum	C	None	0	1	19/04/1999
26420	Equisetopsida	Pittosporaceae	*Pittosporum viscidum*	black-fruited thornbush	C	None	0	3	01/07/1995
17884	Equisetopsida	Plantaginaceae	*Bacopa monnieri*	None	C	None	1	1	25/11/2000
18225	Equisetopsida	Plantaginaceae	*Mecardonia procumbens*	None	None	None	1	1	07/02/1991
12730	Equisetopsida	Plantaginaceae	*Plantago major*	greater plantain	None	None	1	1	25/11/2000
15670	Equisetopsida	Poaceae	*Alloteropsis semialata*	cockatoo grass	C	None	1	1	28/12/2020
33873	Equisetopsida	Poaceae	*Cenchrus americanus*	None	None	None	1	1	13/04/1970
33869	Equisetopsida	Poaceae	*Cenchrus purpurascens*	None	C	None	1	1	02/05/1975
15551	Equisetopsida	Poaceae	*Chloris gayana*	rhodes grass	None	None	1	2	14/05/2001
15485	Equisetopsida	Poaceae	*Cymbopogon refractus*	barbed-wire grass	C	None	0	1	03/08/2005

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7812	Equisetopsida	Poaceae	*Cynodon dactylon var. dactylon*	None	None	None	1	1	08/05/2001
10386	Equisetopsida	Poaceae	*Cynodon nlemfuensis var. nlemfuensis*	None	None	None	1	1	03/04/2000
35353	Equisetopsida	Poaceae	*Cynodon plectostachyus*	None	None	None	1	1	19/11/2013
10391	Equisetopsida	Poaceae	*Dactyloctenium australe*	sweet smother grass	None	None	2	2	08/03/1971
15463	Equisetopsida	Poaceae	*Dichanthium annulatum*	sheda grass	None	None	1	1	25/11/2000
15414	Equisetopsida	Poaceae	*Dichanthium tenue*	small bluegrass	C	None	1	1	06/09/1972
15411	Equisetopsida	Poaceae	*Entolasia stricta*	wiry panic	C	None	0	3	11/12/2015
10532	Equisetopsida	Poaceae	*Eragrostis*	None	None	None	0	2	01/07/1995
15380	Equisetopsida	Poaceae	*Eremochloa bimaculata*	poverty grass	C	None	1	1	28/12/2020
15332	Equisetopsida	Poaceae	*Eriochloa pseudoacrotricha*	None	C	None	1	1	31/12/1963
15290	Equisetopsida	Poaceae	*Imperata cylindrica*	blady grass	C	None	0	3	01/07/1995
29093	Equisetopsida	Poaceae	*Megathyrsus maximus*	None	None	None	0	5	19/04/2018
28224	Equisetopsida	Poaceae	*Megathyrsus maximus var. coloratus*	None	None	None	1	1	27/12/2017
28420	Equisetopsida	Poaceae	*Megathyrsus maximus var. maximus*	None	None	None	1	1	21/05/2003
15163	Equisetopsida	Poaceae	*Oplismenus aemulus*	creeping shade grass	C	None	0	5	01/07/1995
40379	Equisetopsida	Poaceae	*Oplismenus aemulus var. lasiorhachis*	None	C	None	0	1	03/08/2005
4207	Equisetopsida	Poaceae	*Oplismenus imbecillis*	None	C	None	0	1	01/07/1995
10637	Equisetopsida	Poaceae	*Ottochloa gracillima*	pademelon grass	C	None	0	7	01/07/1995
10638	Equisetopsida	Poaceae	*Ottochloa nodosa*	None	C	None	1	3	03/08/2005
14345	Equisetopsida	Poaceae	*Paspalidium distans*	shotgrass	C	None	2	2	08/05/2001
22783	Equisetopsida	Poaceae	*Paspalum mandiocanum*	None	None	None	1	1	02/05/1995
10820	Equisetopsida	Poaceae	*Paspalum notatum*	bahia grass	None	None	1	1	08/05/2001
36707	Equisetopsida	Poaceae	*Poa labillardierei*	None	C	None	0	1	03/08/2005
15104	Equisetopsida	Poaceae	*Sacciolepis indica*	Indian cupscale grass	C	None	0	1	01/07/1995
27800	Equisetopsida	Poaceae	*Sarga leiocladum*	None	C	None	0	1	03/08/2005
9190	Equisetopsida	Poaceae	*Setaria sphacelata*	None	None	None	2	2	27/12/2020
15004	Equisetopsida	Poaceae	*Sporobolus*	None	None	None	0	4	14/02/2017
22165	Equisetopsida	Poaceae	*Sporobolus africanus*	Parramatta grass	None	None	1	1	11/12/1989
14169	Equisetopsida	Poaceae	*Sporobolus elongatus*	None	C	None	2	2	11/12/1989
22159	Equisetopsida	Poaceae	*Sporobolus fertilis*	giant Parramatta grass	None	None	0	2	14/02/2017
10941	Equisetopsida	Poaceae	*Sporobolus laxus*	None	C	None	1	1	30/04/1994
10158	Equisetopsida	Poaceae	*Sporobolus natalensis*	None	None	None	1	1	07/11/1989
10156	Equisetopsida	Poaceae	*Sporobolus pyramidalis*	None	None	None	7	7	26/01/1994
14973	Equisetopsida	Poaceae	*Themeda quadrivalvis*	grader grass	None	None	1	1	03/03/1972

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14974	Equisetopsida	Poaceae	*Themeda triandra*	kangaroo grass	C	None	0	8	11/12/2015
2249	Equisetopsida	Poaceae	*Urochloa decumbens*	None	None	None	1	1	14/05/2001
16428	Equisetopsida	Podocarpaceae	*Podocarpus elatus*	she pine	C	None	0	4	19/04/1999
13129	Equisetopsida	Polygalaceae	*Polygala virgata*	None	None	None	1	1	04/10/1993
16495	Equisetopsida	Polygonaceae	*Persicaria hydropiper*	water pepper	C	None	3	4	11/05/2001
16496	Equisetopsida	Polygonaceae	*Persicaria lapathifolia*	pale knotweed	C	None	1	1	11/05/2001
13160	Equisetopsida	Polygonaceae	*Persicaria praetermissa*	None	C	None	1	1	08/05/2001
41173	Equisetopsida	Polypodiaceae	*Dendroconche scandens*	None	SL	None	0	1	01/07/1995
17354	Equisetopsida	Polypodiaceae	*Drynaria rigidula*	None	SL	None	0	2	01/07/1995
11696	Equisetopsida	Polypodiaceae	*Platycerium bifurcatum*	None	SL	None	0	4	19/04/1999
11697	Equisetopsida	Polypodiaceae	*Platycerium superbum*	staghorn fern	SL	None	0	5	01/07/2015
6668	Equisetopsida	Polypodiaceae	*Pyrrosia confluens*	None	SL	None	0	1	01/07/1995
16317	Equisetopsida	Polypodiaceae	*Pyrrosia rupestris*	rock felt fern	SL	None	0	3	19/04/1999
36016	Equisetopsida	Polytrichaceae	*Dawsonia superba*	None	C	None	1	1	22/09/2016
19983	Equisetopsida	Pontederiaceae	*Pontederia cordata*	None	None	None	1	1	20/12/2006
14284	Equisetopsida	Potamogetonaceae	*Potamogeton ochreatus*	blunt pondweed	SL	None	1	1	08/05/2001
14285	Equisetopsida	Potamogetonaceae	*Potamogeton perfoliatus*	perfoliate pondweed	SL	None	2	2	08/05/2001
34205	Equisetopsida	Potamogetonaceae	*Stuckenia pectinata*	None	SL	None	1	1	01/12/2003
9294	Equisetopsida	Proteaceae	*Banksia integrifolia*	None	C	None	0	2	11/12/2015
13202	Equisetopsida	Proteaceae	*Floydia praealta*	ball nut	V	V	2	4	28/01/2022
13206	Equisetopsida	Proteaceae	*Grevillea hilliana*	None	C	None	0	2	19/04/1999
13924	Equisetopsida	Proteaceae	*Grevillea robusta*	None	C	None	0	5	01/07/1995
16746	Equisetopsida	Proteaceae	*Macadamia integrifolia*	macadamia nut	V	V	17	19	28/01/2022
16747	Equisetopsida	Proteaceae	*Macadamia ternifolia*	bopple nut	V	V	0	1	01/07/2015
7897	Equisetopsida	Proteaceae	*Persoonia stradbrokensis*	None	C	None	1	1	10/01/1990
14173	Equisetopsida	Proteaceae	*Stenocarpus sinuatus*	wheel of fire	C	None	0	1	01/07/1995
16382	Equisetopsida	Psilotaceae	*Psilotum nudum*	skeleton fork fern	SL	None	0	3	01/07/1995
18116	Equisetopsida	Pteridaceae	*Adiantum aethiopicum*	None	SL	None	0	6	12/03/2001
21888	Equisetopsida	Pteridaceae	*Adiantum atroviride*	None	SL	None	0	1	01/07/2015
18030	Equisetopsida	Pteridaceae	*Adiantum diaphanum*	None	SL	None	0	8	01/07/1995
14886	Equisetopsida	Pteridaceae	*Adiantum formosum*	None	C	None	0	4	19/04/1999
18031	Equisetopsida	Pteridaceae	*Adiantum hispidulum*	None	SL	None	0	5	12/03/2001
14887	Equisetopsida	Pteridaceae	*Adiantum silvaticum*	None	SL	None	0	2	19/04/1999
8916	Equisetopsida	Pteridaceae	*Cheilanthes sieberi*	None	C	None	0	6	01/07/1995
9723	Equisetopsida	Pteridaceae	*Pellaea falcata*	None	SL	None	0	3	19/04/1999
21889	Equisetopsida	Pteridaceae	*Pellaea nana*	None	SL	None	0	1	01/07/2015
13800	Equisetopsida	Pteridaceae	*Pellaea paradoxa*	heart fern	SL	None	0	3	19/04/1999

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9557	Equisetopsida	Putranjivaceae	*Drypetes deplanchei*	grey boxwood	C	None	0	11	03/08/2005
17622	Equisetopsida	Ranunculaceae	*Clematis glycinoides*	None	C	None	0	8	03/08/2005
16323	Equisetopsida	Ranunculaceae	*Ranunculus lappaceus*	common buttercup	C	None	2	2	09/10/1993
22935	Equisetopsida	Ranunculaceae	*Ranunculus sceleratus subsp. sceleratus*	None	None	None	0	1	16/08/2018
9659	Equisetopsida	Rhamnaceae	*Alphitonia excelsa*	soap tree	C	None	0	15	03/08/2005
18016	Equisetopsida	Rhamnaceae	*Alphitonia petriei*	pink ash	C	None	0	1	01/07/1995
14584	Equisetopsida	Rhamnaceae	*Emmenosperma alphitonioides*	yellow ash	C	None	0	1	01/07/2015
16406	Equisetopsida	Rhamnaceae	*Pomaderris queenslandica*	None	C	None	1	1	28/08/2014
15949	Equisetopsida	Rhamnaceae	*Ventilago pubiflora*	None	C	None	0	2	19/04/1999
25727	Equisetopsida	Ricciaceae	*Ricciocarpos natans*	None	C	None	1	1	30/10/2018
15839	Equisetopsida	Ripogonaceae	*Ripogonum album*	white supplejack	C	None	0	3	01/07/1995
12848	Equisetopsida	Ripogonaceae	*Ripogonum brevifolium*	small-leaved supplejack	C	None	0	5	03/08/2005
12166	Equisetopsida	Rosaceae	*Rhaphiolepis indica*	Indian hawthorn	None	None	1	1	14/05/2001
16304	Equisetopsida	Rosaceae	*Rosa laevigata*	cherokee rose	None	None	1	1	20/09/1967
19436	Equisetopsida	Rosaceae	*Rubus moluccanus*	None	C	None	0	3	03/08/2005
22152	Equisetopsida	Rubiaceae	*Atractocarpus chartaceus*	None	C	None	0	8	01/07/2015
12298	Equisetopsida	Rubiaceae	*Coelospermum paniculatum var. paniculatum*	None	C	None	0	1	01/07/1995
27436	Equisetopsida	Rubiaceae	*Cyclophyllum coprosmoides*	None	C	None	0	8	12/03/2001
27440	Equisetopsida	Rubiaceae	*Cyclophyllum longipetalum*	None	C	None	0	1	03/08/2005
21793	Equisetopsida	Rubiaceae	*Everistia vacciniifolia*	None	C	None	0	1	01/07/1995
34578	Equisetopsida	Rubiaceae	*Gynochthodes canthoides*	None	C	None	0	2	03/08/2005
34588	Equisetopsida	Rubiaceae	*Gynochthodes jasminoides*	None	C	None	0	6	01/07/1995
14503	Equisetopsida	Rubiaceae	*Hodgkinsonia ovatiflora*	golden ash	C	None	0	3	19/04/1999
12270	Equisetopsida	Rubiaceae	*Ixora beckleri*	brown coffeewood	C	None	0	3	19/04/1999
12274	Equisetopsida	Rubiaceae	*Knoxia sumatrensis*	None	C	None	0	1	03/08/2005
7598	Equisetopsida	Rubiaceae	*Pavetta australiensis*	None	C	None	0	4	01/07/1995
16407	Equisetopsida	Rubiaceae	*Pomax umbellata*	None	C	None	0	1	01/07/1995
16334	Equisetopsida	Rubiaceae	*Psychotria daphnoides*	None	C	None	0	8	19/04/1999
14293	Equisetopsida	Rubiaceae	*Psychotria loniceroides*	hairy psychotria	C	None	0	7	01/07/2015
29827	Equisetopsida	Rubiaceae	*Psydrax lamprophylla*	None	C	None	0	4	12/03/2001
2399	Equisetopsida	Rubiaceae	*Psydrax odorata*	None	C	None	0	8	12/03/2001
29826	Equisetopsida	Rubiaceae	*Psydrax odorata forma buxifolia*	None	C	None	0	1	03/08/2005

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15870	Equisetopsida	Rutaceae	*Acronychia imperforata*	beach acronychia	C	None	0	4	12/03/2001
15871	Equisetopsida	Rutaceae	*Acronychia laevis*	glossy acronychia	C	None	0	8	12/03/2001
40398	Equisetopsida	Rutaceae	*Acronychia laevis var. leucocarpa*	None	C	None	0	1	03/08/2005
13739	Equisetopsida	Rutaceae	*Acronychia oblongifolia*	common acronychia	C	None	0	1	01/07/1995
15872	Equisetopsida	Rutaceae	*Acronychia pauciflora*	soft acronychia	C	None	0	6	19/04/1999
11988	Equisetopsida	Rutaceae	*Bosistoa transversa*	three-leaved bosistoa	C	V	1	2	28/01/2022
11990	Equisetopsida	Rutaceae	*Bouchardatia neurococca*	union nut	C	None	1	2	19/04/1999
18815	Equisetopsida	Rutaceae	*Citrus australasica*	None	C	None	0	1	12/03/2001
18816	Equisetopsida	Rutaceae	*Citrus australis*	None	C	None	1	6	19/04/1999
18946	Equisetopsida	Rutaceae	*Dinosperma erythrococcum*	None	C	None	0	1	19/04/1999
18945	Equisetopsida	Rutaceae	*Dinosperma melanophloium*	None	C	None	2	2	10/03/2021
11300	Equisetopsida	Rutaceae	*Flindersia australis*	crow's ash	C	None	0	8	03/08/2005
34928	Equisetopsida	Rutaceae	*Flindersia bennettii*	None	C	None	0	6	01/07/2015
13349	Equisetopsida	Rutaceae	*Flindersia collina*	broad-leaved leopard tree	C	None	1	3	19/04/1999
17125	Equisetopsida	Rutaceae	*Flindersia schottiana*	bumpy ash	C	None	0	6	19/04/1999
40411	Equisetopsida	Rutaceae	*Flindersia schottiana var. pubescens*	None	C	None	0	1	03/08/2005
11044	Equisetopsida	Rutaceae	*Flindersia xanthoxyla*	yellow-wood	C	None	0	3	01/07/1995
11430	Equisetopsida	Rutaceae	*Geijera salicifolia*	brush wilga	C	None	0	1	19/04/1999
17015	Equisetopsida	Rutaceae	*Halfordia kendack*	saffron heart	C	None	0	1	19/04/1999
12360	Equisetopsida	Rutaceae	*Medicosma cunninghamii*	pinkheart	C	None	1	4	02/09/2020
17211	Equisetopsida	Rutaceae	*Melicope micrococca*	white evodia	C	None	3	10	03/08/2005
16677	Equisetopsida	Rutaceae	*Micromelum minutum*	clusterberry	C	None	0	1	01/07/1995
21837	Equisetopsida	Rutaceae	*Murraya paniculata 'Exotica'*	None	None	None	0	1	01/07/1995
11938	Equisetopsida	Rutaceae	*Pentaceras australe*	bastard crow's ash	C	None	0	3	03/08/2005
16239	Equisetopsida	Rutaceae	*Sarcomelicope simplicifolia subsp. simplicifolia*	yellow aspen	C	None	0	2	19/04/1999
15899	Equisetopsida	Rutaceae	*Zanthoxylum brachyacanthum*	None	C	None	0	1	03/08/2005
41597	Equisetopsida	Rutaceae	*Zieria euthadenia*	None	C	None	1	2	28/07/2011
14128	Equisetopsida	Rutaceae	*Zieria minutiflora*	None	C	None	0	1	01/07/1995
15907	Equisetopsida	Rutaceae	*Zieria smithii*	None	C	None	2	7	03/08/2005
3296	Equisetopsida	Rutaceae	*Zieria verrucosa*	None	V	V	1	1	05/06/1998
17698	Equisetopsida	Salicaceae	*Casearia multinervosa*	casearia	C	None	0	6	19/04/1999
11945	Equisetopsida	Salicaceae	*Salix babylonica*	weeping willow	None	None	2	2	14/05/2001
31211	Equisetopsida	Salicaceae	*Salix humboldtiana*	None	None	None	1	1	06/10/2017
16182	Equisetopsida	Salicaceae	*Scolopia braunii*	flintwood	C	None	0	2	19/04/1999

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11250	Equisetopsida	Salicaceae	*Xylosma terrae-reginae*	xylosma	C	None	0	4	19/04/1999
17180	Equisetopsida	Santalaceae	*Exocarpos cupressiformis*	native cherry	C	None	0	1	01/07/1995
17181	Equisetopsida	Santalaceae	*Exocarpos latifolius*	None	C	None	0	2	01/07/1995
18052	Equisetopsida	Sapindaceae	*Alectryon connatus*	grey birds-eye	C	None	0	2	19/04/1999
18053	Equisetopsida	Sapindaceae	*Alectryon coriaceus*	beach alectryon	C	None	0	1	12/03/2001
18007	Equisetopsida	Sapindaceae	*Alectryon subcinereus*	None	C	None	0	2	01/07/1995
9489	Equisetopsida	Sapindaceae	*Alectryon subdentatus*	None	C	None	0	4	19/04/1999
19727	Equisetopsida	Sapindaceae	*Alectryon tomentosus*	None	C	None	0	1	03/08/2005
14815	Equisetopsida	Sapindaceae	*Arytera distylis*	twin-leaved coogera	C	None	1	5	02/09/2020
17930	Equisetopsida	Sapindaceae	*Arytera divaricata*	coogera	C	None	0	7	03/08/2005
14814	Equisetopsida	Sapindaceae	*Arytera foveolata*	pitted coogera	C	None	0	3	03/08/2005
17931	Equisetopsida	Sapindaceae	*Arytera microphylla*	None	C	None	1	4	01/07/1995
13711	Equisetopsida	Sapindaceae	*Atalaya multiflora*	broad-leaved whitewood	C	None	0	4	19/04/1999
17907	Equisetopsida	Sapindaceae	*Atalaya salicifolia*	None	C	None	0	2	01/07/2015
17738	Equisetopsida	Sapindaceae	*Cardiospermum grandiflorum*	heart seed vine	None	None	2	2	13/05/2001
9353	Equisetopsida	Sapindaceae	*Cardiospermum halicacabum*	None	None	None	0	1	01/07/1995
17548	Equisetopsida	Sapindaceae	*Cupaniopsis anacardioides*	tuckeroo	C	None	0	2	19/04/1999
13686	Equisetopsida	Sapindaceae	*Cupaniopsis parvifolia*	small-leaved tuckeroo	C	None	2	13	02/09/2020
13687	Equisetopsida	Sapindaceae	*Cupaniopsis serrata*	smooth tuckeroo	C	None	0	9	01/07/2015
6968	Equisetopsida	Sapindaceae	*Diploglottis australis*	native tamarind	C	None	0	3	01/07/2015
17383	Equisetopsida	Sapindaceae	*Dodonaea triangularis*	None	C	None	0	1	01/07/1995
17384	Equisetopsida	Sapindaceae	*Dodonaea triquetra*	large-leaved hop bush	C	None	0	4	03/08/2005
13662	Equisetopsida	Sapindaceae	*Elattostachys nervosa*	green tamarind	C	None	0	9	01/07/2015
17339	Equisetopsida	Sapindaceae	*Elattostachys xylocarpa*	white tamarind	C	None	0	1	01/07/1995
16996	Equisetopsida	Sapindaceae	*Guioa acutifolia*	northern guioa	C	None	0	3	01/07/1995
16998	Equisetopsida	Sapindaceae	*Guioa semiglauca*	guioa	C	None	1	5	03/08/2005
16968	Equisetopsida	Sapindaceae	*Harpullia hillii*	None	C	None	0	4	03/08/2005
16969	Equisetopsida	Sapindaceae	*Harpullia pendula*	None	C	None	0	5	03/08/2005
16885	Equisetopsida	Sapindaceae	*Jagera pseudorhus*	None	C	None	0	10	19/04/1999
6019	Equisetopsida	Sapindaceae	*Jagera pseudorhus var. pseudorhus*	None	C	None	0	1	03/08/2005
14356	Equisetopsida	Sapindaceae	*Mischocarpus anodontus*	veiny pearfruit	C	None	0	4	19/04/1999
14406	Equisetopsida	Sapindaceae	*Mischocarpus australis*	red pear-fruit	C	None	1	3	01/07/1995
14355	Equisetopsida	Sapindaceae	*Mischocarpus pyriformis*	None	C	None	0	4	19/04/1999
16637	Equisetopsida	Sapindaceae	*Mischocarpus pyriformis subsp. pyriformis*	None	C	None	1	2	03/08/2005

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16242	Equisetopsida	Sapindaceae	*Sarcopteryx stipata*	steelwood	C	None	0	3	01/07/2015
13503	Equisetopsida	Sapindaceae	*Toechima tenax*	pitted-leaf steelwood	C	None	0	3	03/08/2005
5422	Equisetopsida	Sapotaceae	*Amorphospermum antilogum*	None	C	None	0	2	01/07/1995
5289	Equisetopsida	Sapotaceae	*Planchonella australis*	None	C	None	0	1	03/08/2005
16415	Equisetopsida	Sapotaceae	*Planchonella cotinifolia var. pubescens*	None	C	None	0	5	19/04/1999
13125	Equisetopsida	Sapotaceae	*Planchonella pohlmaniana*	None	C	None	0	3	03/08/2005
34941	Equisetopsida	Sapotaceae	*Pleioluma queenslandica*	None	C	None	0	2	19/04/1999
8631	Equisetopsida	Scrophulariaceae	*Eremophila debilis*	winter apple	C	None	0	1	03/08/2005
16602	Equisetopsida	Scrophulariaceae	*Myoporum acuminatum*	coastal boobialla	C	None	0	1	01/07/1995
40408	Equisetopsida	Scrophulariaceae	*Myoporum acuminatum var. parviflorum*	None	C	None	0	1	03/08/2005
18047	Equisetopsida	Simaroubacea e	*Ailanthus triphysa*	white siris	C	None	0	7	01/07/2015
33391	Equisetopsida	Simaroubacea e	*Samadera bidwillii*	None	V	V	1	1	26/03/2000
15881	Equisetopsida	Smilacaceae	*Smilax australis*	barbed-wire vine	C	None	0	16	01/07/2015
17358	Equisetopsida	Solanaceae	*Duboisia myoporoides*	None	C	None	1	4	27/12/2020
16157	Equisetopsida	Solanaceae	*Solanum americanum*	None	None	None	1	1	07/02/1970
13790	Equisetopsida	Solanaceae	*Solanum corifolium*	straggling nightshade	C	None	0	4	19/04/1999
14208	Equisetopsida	Solanaceae	*Solanum densevestitum*	None	C	None	0	4	03/08/2005
6199	Equisetopsida	Solanaceae	*Solanum gympiense*	None	C	None	1	1	25/06/2020
16169	Equisetopsida	Solanaceae	*Solanum linnaeanum*	apple of Sodom	None	None	0	1	15/08/2018
16171	Equisetopsida	Solanaceae	*Solanum mauritianum*	wild tobacco	None	None	1	9	12/08/2017
16120	Equisetopsida	Solanaceae	*Solanum seaforthianum*	Brazilian nightshade	None	None	1	8	01/07/1995
16124	Equisetopsida	Solanaceae	*Solanum stelligerum*	devil's needles	C	None	1	2	08/11/2006
16126	Equisetopsida	Solanaceae	*Solanum torvum*	devil's fig	None	None	0	1	01/07/1995
15983	Equisetopsida	Sparrmanniaceae	*Triumfetta rhomboidea*	chinese burr	None	None	2	3	01/07/2015
7381	Equisetopsida	Sterculiaceae	*Argyrodendron sp. (Kin Kin W.D.Francis AQ81198)*	rusty tulip oak	C	None	1	4	01/07/2015
9660	Equisetopsida	Sterculiaceae	*Argyrodendron trifoliolatum*	booyong	C	None	2	7	01/07/2015
12643	Equisetopsida	Sterculiaceae	*Brachychiton discolor*	None	SL	None	0	3	01/07/1995
19756	Equisetopsida	Sterculiaceae	*Brachychiton populneus*	None	C	None	0	1	01/07/1995
16103	Equisetopsida	Sterculiaceae	*Sterculia quadrifida*	peanut tree	C	None	0	2	01/07/1995
15306	Equisetopsida	Surianaceae	*Guilfoylia monostylis*	guilfoylia	C	None	1	2	28/01/2022
7608	Equisetopsida	Symplocaceae	*Symplocos harroldii*	hairy hazelwood	NT	None	0	1	19/04/1999

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13753	Equisetopsida	Symplocaceae	*Symplocos thwaitesii*	buff hazelwood	C	None	0	1	03/08/2005
17927	Equisetopsida	Tectariaceae	*Arthropteris tenella*	climbing fern	C	None	0	4	19/04/1999
13998	Equisetopsida	Thelypteridaceae	*Christella dentata*	creek fern	SL	None	0	6	01/07/2015
13999	Equisetopsida	Thelypteridaceae	*Christella hispidula*	None	SL	None	2	2	10/12/2011
15926	Equisetopsida	Thymelaeaceae	*Wikstroemia indica*	tie bush	C	None	0	2	03/08/2005
12526	Equisetopsida	Tropaeolaceae	*Tropaeolum majus*	garden nasturtium	None	None	1	1	25/11/2000
17955	Equisetopsida	Ulmaceae	*Aphananthe philippinensis*	None	C	None	0	14	01/07/2015
17667	Equisetopsida	Ulmaceae	*Celtis paniculata*	native celtis	C	None	0	4	03/08/2005
12654	Equisetopsida	Ulmaceae	*Celtis sinensis*	Chinese elm	None	None	2	4	14/05/2001
16011	Equisetopsida	Ulmaceae	*Trema tomentosa*	None	C	None	1	1	27/12/2020
31416	Equisetopsida	Ulmaceae	*Trema tomentosa var. aspera*	None	C	None	0	6	03/08/2005
12615	Equisetopsida	Urticaceae	*Dendrocnide excelsa*	giant stinging tree	C	None	0	1	01/07/2015
12616	Equisetopsida	Urticaceae	*Dendrocnide moroides*	Gympie stinger	C	None	1	1	28/01/2022
14635	Equisetopsida	Urticaceae	*Dendrocnide photiniphylla*	shiny-leaved stinging tree	C	None	0	4	19/04/1999
15855	Equisetopsida	Urticaceae	*Pipturus argenteus*	white nettle	C	None	0	1	01/07/1995
19905	Equisetopsida	Verbenaceae	*Lantana camara*	lantana	None	None	1	29	13/08/2017
30780	Equisetopsida	Verbenaceae	*Verbena rigida*	None	None	None	1	1	25/11/2000
18917	Equisetopsida	Violaceae	*Viola hederacea*	None	C	None	0	2	01/07/1995
41432	Equisetopsida	Vitaceae	*Causonis clematidea*	None	C	None	0	2	01/07/1995
17660	Equisetopsida	Vitaceae	*Cayratia acris*	hairy grape	C	None	0	2	19/04/1999
14704	Equisetopsida	Vitaceae	*Cissus antarctica*	None	C	None	0	10	01/07/2015
17647	Equisetopsida	Vitaceae	*Cissus hypoglauca*	None	C	None	0	1	19/04/1999
31727	Equisetopsida	Vitaceae	*Clematicissus opaca*	None	C	None	0	8	03/08/2005
14151	Equisetopsida	Vitaceae	*Tetrastigma nitens*	shining grape	C	None	0	3	01/07/2015
15934	Equisetopsida	Xanthorrhoeaceae	*Xanthorrhoea johnsonii*	None	SL	None	0	5	11/12/2015
16708	Equisetopsida	Zamiaceae	*Macrozamia pauli-guilielmi*	None	E	E	1	1	10/05/2020
18019	Equisetopsida	Zingiberaceae	*Alpinia arundelliana*	None	C	None	0	2	19/04/1999
14844	Equisetopsida	Zingiberaceae	*Alpinia caerulea*	wild ginger	C	None	0	5	01/07/2015
40384	Equisetopsida	Zingiberaceae	*Alpinia caerulea var. arundelliana*	None	C	None	0	1	03/08/2005
7732	Florideophyceae	Delesseriaceae	*Caloglossa leprieurii var. angustata*	None	C	None	1	1	02/02/1983
8628	Incertae sedis	Incertae sedis Plantae	*Schizothrix calcicola*	None	C	None	1	1	30/04/1978

Table 4. Fungi recorded within the area of interest and its one kilometre buffer

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
27681	Agaricomycetes	Agaricaceae	*Cyathus*	None	None	None	2	2	17/05/2019
28107	Agaricomycetes	Agaricaceae	*Cyathus gracilis*	None	C	None	1	1	31/05/1982
25857	Agaricomycetes	Agaricaceae	*Cyathus stercoreus*	None	C	None	3	3	12/05/2016
28157	Agaricomycetes	Agaricaceae	*Lycoperdon glabrescens*	None	C	None	1	1	12/04/1952
33486	Agaricomycetes	Agaricaceae	*Lycoperdon lividum*	None	C	None	1	1	12/04/1952
27671	Agaricomycetes	Agaricaceae	*Macrolepiota*	None	None	None	1	1	08/01/1999
27190	Agaricomycetes	Aphelariaceae	*Aphelaria*	None	None	None	1	1	26/03/2016
28410	Agaricomycetes	Auriculariaceae	*Auricularia cornea*	None	C	None	1	1	26/03/2021
36705	Agaricomycetes	Clavariaceae	*Clavulinopsis sulcata*	None	C	None	1	1	12/03/2016
27345	Agaricomycetes	Clavulinaceae	*Clavulina*	None	C	None	1	1	02/06/2019
33484	Agaricomycetes	Coniophoraceae	*Gyrodontium sacchari*	None	C	None	1	2	12/02/2016
33036	Agaricomycetes	Corticiaceae	*Punctularia strigosozonata*	None	C	None	1	1	10/07/1980
25929	Agaricomycetes	Cortinariaceae	*Cortinarius*	None	None	None	1	1	26/05/2011
35458	Agaricomycetes	Cortinariaceae	*Gymnopilus junonius*	None	C	None	1	1	26/03/2016
35881	Agaricomycetes	Fomitopsidaceae	*Postia*	None	None	None	1	1	12/06/2016
25903	Agaricomycetes	Geastraceae	*Geastrum*	None	C	None	4	4	14/06/2019
26309	Agaricomycetes	Gomphaceae	*Ramaria*	None	C	None	1	1	12/06/2016
26291	Agaricomycetes	Hydnangiaceae	*Laccaria*	None	None	None	1	1	14/06/2019
33543	Agaricomycetes	Hymenochaetaceae	*Fomitiporella caryophylli*	None	C	None	1	1	18/11/1975
33547	Agaricomycetes	Hymenochaetaceae	*Fomitiporia robusta*	None	C	None	1	1	03/08/1977
33544	Agaricomycetes	Hymenochaetaceae	*Fulvifomes nilgheriensis*	None	C	None	1	1	03/02/1976
33211	Agaricomycetes	Hymenochaetaceae	*Inonotus lloydii*	None	C	None	1	1	03/08/1977
33494	Agaricomycetes	Hymenochaetaceae	*Inonotus pachyphloeus*	None	C	None	1	1	24/06/1974
25934	Agaricomycetes	Hymenochaetaceae	*Phellinus*	None	None	None	3	3	09/05/1984
33209	Agaricomycetes	Hymenochaetaceae	*Phellinus sublamaensis*	None	C	None	11	11	03/08/1977
33070	Agaricomycetes	Marasmiaceae	*Campanella*	None	None	None	1	2	05/02/2016
25758	Agaricomycetes	Marasmiaceae	*Marasmius*	None	None	None	1	2	05/02/2016
25933	Agaricomycetes	Polyporaceae	*Hexagonia*	None	None	None	1	1	30/09/1980
26294	Agaricomycetes	Polyporaceae	*Lenzites*	None	None	None	1	1	31/03/1976
29070	Agaricomycetes	Polyporaceae	*Polyporus badius*	None	C	None	1	1	23/04/2017
26696	Agaricomycetes	Polyporaceae	*Poria*	None	None	None	1	1	29/01/1981

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
27424	Agaricomycetes	Polyporaceae	*Trametes lactinea*	None	C	None	2	2	28/10/1975
29130	Agaricomycetes	Russulaceae	*Macowanites*	None	None	None	1	1	26/05/2011
34869	Agaricomycetes	Russulaceae	*Russula reddellii*	None	C	None	1	1	09/05/1988
33234	Agaricomycetes	Steccherinaceae	*Junghuhnia nitida*	None	C	None	1	1	25/07/1971
23245	Lecanoromycetes	Caliciaceae	*Buellia*	None	None	None	1	1	22/08/1986
23676	Lecanoromycetes	Caliciaceae	*Buellia demutans*	None	C	None	1	1	22/08/1986
33002	Lecanoromycetes	Caliciaceae	*Buellia spuria var. spuria*	None	C	None	1	1	22/08/1986
23096	Lecanoromycetes	Caliciaceae	*Dirinaria applanata*	None	C	None	3	3	22/08/1986
23077	Lecanoromycetes	Coccocarpiaceae	*Coccocarpia smaragdina*	None	C	None	1	1	09/06/2007
30064	Lecanoromycetes	Graphidaceae	*Glyphis cicatricosa*	None	C	None	1	1	22/08/1986
23141	Lecanoromycetes	Graphidaceae	*Graphis*	None	None	None	1	1	08/06/1983
23304	Lecanoromycetes	Graphidaceae	*Nadvornikia hawaiiensis*	None	C	None	1	1	09/06/2007
24557	Lecanoromycetes	Haematommataceae	*Haematomma persoonii*	None	C	None	1	1	22/08/1986
23215	Lecanoromycetes	Lecanoraceae	*Lecanora helva*	None	C	None	1	1	22/08/1986
23228	Lecanoromycetes	Lecanoraceae	*Lecanora pseudistera*	None	C	None	2	2	22/08/1986
23327	Lecanoromycetes	Ochrolechiaceae	*Ochrolechia*	None	None	None	1	1	22/08/1986
32058	Lecanoromycetes	Pannariaceae	*Pannaria tavaresii*	None	C	None	1	1	09/06/2007
23368	Lecanoromycetes	Parmeliaceae	*Parmotrema austrosinense*	None	C	None	1	1	22/08/1986
23807	Lecanoromycetes	Parmeliaceae	*Xanthoparmelia filsonii*	None	C	None	1	1	22/08/1986
23422	Lecanoromycetes	Pertusariaceae	*Pertusaria thiospoda*	None	C	None	1	1	22/08/1986
23413	Lecanoromycetes	Pertusariaceae	*Pertusaria xanthoplaca*	None	C	None	1	1	22/08/1986
23173	Lecanoromycetes	Physciaceae	*Hyperphyscia adglutinata*	None	C	None	1	1	22/08/1986
27426	Lecanoromycetes	Physciaceae	*Physcia jackii*	None	C	None	1	1	22/08/1986
31401	Lecanoromycetes	Stereocaulaceae	*Leproloma*	None	None	None	1	1	09/06/2007
31962	Lecanoromycetes	Teloschistaceae	*Caloplaca rexfilsonii*	None	C	None	1	1	22/08/1986
23783	Lecanoromycetes	Trapeliaceae	*Trapelia*	None	None	None	6	6	22/08/1986

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
26801	Pezizomycetes	Pyronemataceae	*Scutellinia*	None	None	None	1	1	28/05/2016
26303	Pezizomycetes	Sarcosomataceae	*Plectania campylospora*	None	C	None	1	1	02/06/2019
26790	Sordariomycetes	Xylariaceae	*Xylaria*	None	None	None	1	2	02/06/2019

Table 5. Other species recorded within the area of interest and its one kilometre buffer

No species found within the area of interest and its one kilometre buffer.

Species table headings and codes

Taxon Id: Unique identifier of the taxon from the WildNet database.

NCA: Queensland conservation status of the taxon under the *Nature Conservation Act 1992* (Least Concern (C), Critically Endangered (CR), Endangered (E), Extinct (EX), Near Threatened (NT), Extinct in the Wild (PE), Special Least Concern (SL), and Vulnerable (V)).

EPBC: Australian conservation status of the taxon under the *Environment Protection and Biodiversity Conservation Act 1999* (Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Vulnerable (V), and Extinct in the Wild (XW)).

Specimens: The number of specimen-backed records of the taxon.

Records: The total number of records of the taxon.

Last record: Date of latest record of the taxon.

Links and Support

Other sites that deliver species information from the WildNet database include:

- Species profile search - access species information approved for publication including species names, statuses, notes, images, distribution maps and records
- Species lists - generate species lists for Queensland protected areas, forestry areas, local governments and areas defined using coordinates
- Biomaps - view biodiversity information, including WildNet records approved for publication, and generate reports
- Queensland Globe - view spatial information, including WildNet records approved for publication
- Qld wildlife data API - access WildNet species information approved for publication such as notes, images and records etc.
- Wetland*Maps* - view species records, survey locations etc. approved for publication
- Wetland*Summary* - view wildlife statistics, species lists for a range of area types, and access WildNet species profiles
- WildNet wildlife records - published - Queensland - spatial layer of WildNet records approved for publication generated weekly
- Generalised distribution and densities of Queensland wildlife - Queensland species distributions and densities generalised to a 10 km grid resolution
- Conservation status of Queensland wildlife - access current lists of priority species for Queensland including nomenclature and status information
- Queensland Confidential Species - the list of species flagged as confidential in the WildNet database.

Please direct queries about this report to the WildNet Team.

Other useful sites for accessing Queensland biodiversity data include:

- Useful wildlife resources
- Queensland Government Data
- Atlas of Living Australia (ALA)
- Online Zoological Collections of Australian Museums (OZCAM)
- Australia's Virtual Herbarium (AVH)
- Protected Matters Search Tool

Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government, to the maximum extent permitted by law, makes no representations or warranties about its accuracy, reliability, completeness, or suitability, for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which the user may incur as a consequence of the information being inaccurate or incomplete in any way and for any reason.



WildNet Records
Species List



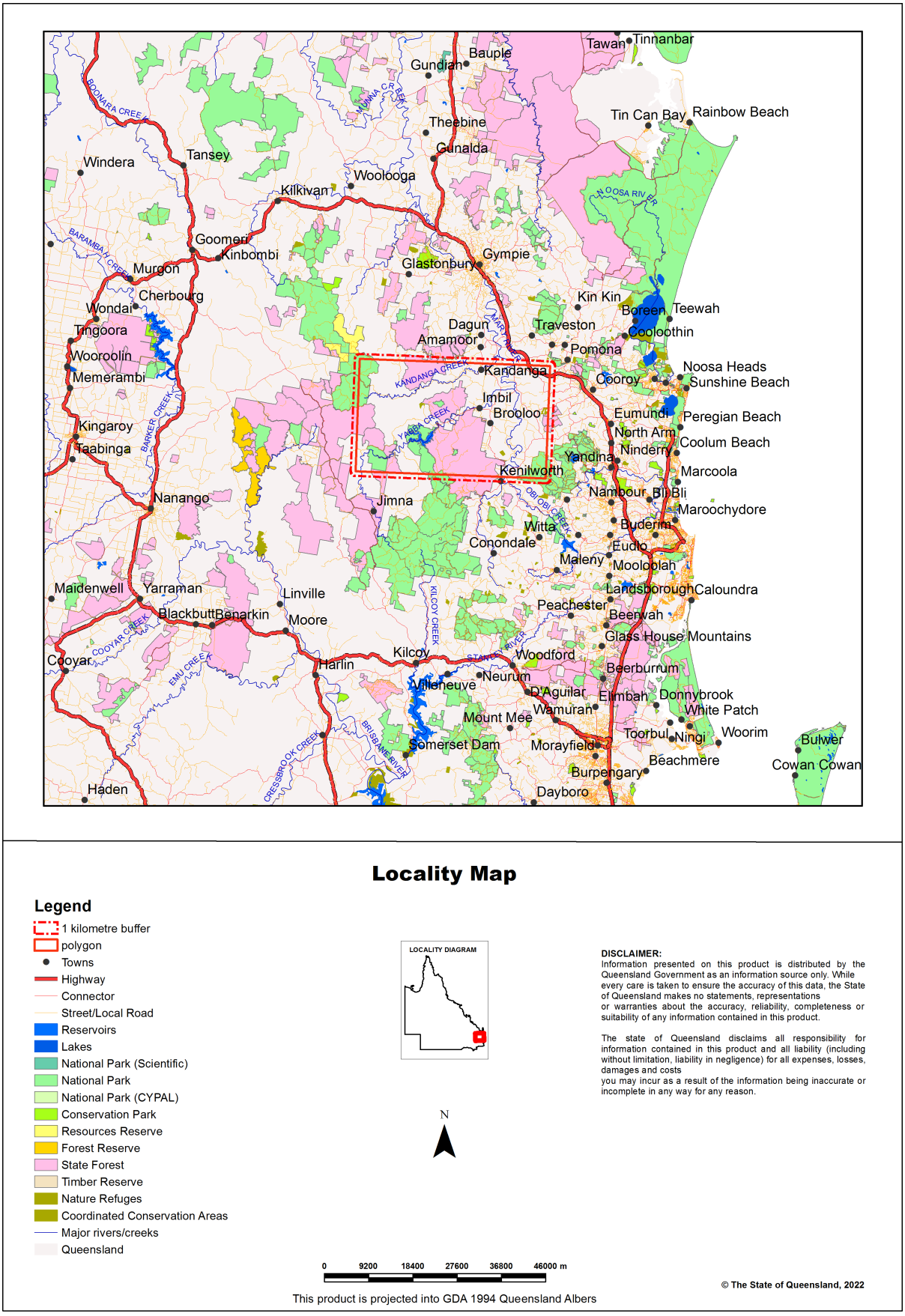
For the selected area of interest 92615.68ha Custom Geometry

Current as at 06/07/2022

WildNetSpeciesList

Queensland Government

Map 1. Locality Map



Summary Information

The following table provides an overview of the area of interest Custom Geometry.

Table 1. Area of interest details

Size (ha)	92,615.68
Local Government(s)	Sunshine Coast Regional, Noosa Shire, Gympie Regional, Somerset Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Burringbar - Conondale Ranges, Gympie Block
Catchment(s)	Mary

Protected Area(s)

The following estates and/or reserves are located in the area of interest:

West Cooroy State Forest

Imbil State Forest 2

Amamoor State Forest

Conondale National Park

Wrattens National Park

Upper Kandanga State Forest

Yabba State Forest

Mapleton National Park

Mapleton Forest Reserve

Imbil State Forest 1

World Heritage Area(s)

No World Heritage Areas are located within the area of interest.

Ramsar Area(s)

No Ramsar Areas are located within the area of interest.

Species List

Introduction

This report is derived from a spatial layer generated from the WildNet database managed by the Department of Environment and Science. The layer which is generated weekly contains the WildNet wildlife records that are not classed as erroneous or duplicate, that have a location precision equal to or less than 10000 metres and do not have a count of zero.

The WildNet dataset is constantly being enhanced and the taxonomic and status information revised. If a species is not listed in this report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area. It is recommended that you also access other internal and external data sources for species information in your area of interest (Refer Links and Support).

Table 2 lists the animals recorded within the area of interest and its one kilometre buffer.

Table 3 lists the plants recorded within the area of interest and its one kilometre buffer.

Table 4 lists the fungi recorded within the area of interest and its one kilometre buffer.

Table 5 lists the other species recorded within the area of interest and its one kilometre buffer.

Table 2. Animals recorded within the area of interest and its one kilometre buffer

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
26896	Actinopterygii	Ambassidae	*Ambassis agassizii*	Agassiz's glassfish	None	None	1	10	14/01/2020
26910	Actinopterygii	Anguillidae	*Anguilla reinhardtii*	longfin eel	None	None	0	24	16/01/2020
26912	Actinopterygii	Apogonidae	*Glossamia aprion*	mouth almighty	None	None	0	3	14/01/2020
26918	Actinopterygii	Atherinidae	*Craterocephalus marjoriae*	silverstreak hardyhead	None	None	0	6	13/01/2020
26920	Actinopterygii	Atherinidae	*Craterocephalus stercusmuscarum*	flyspecked hardyhead	None	None	0	4	17/11/1992
26938	Actinopterygii	Cichlidae	*Oreochromis mossambica*	Mozambique mouthbrooder	None	None	0	2	16/01/2020
26941	Actinopterygii	Clupeidae	*Nematalosa erebi*	bony bream	None	None	0	9	16/01/2020
26955	Actinopterygii	Eleotridae	*Hypseleotris galii*	firetail gudgeon	None	None	1	5	25/11/2009
26956	Actinopterygii	Eleotridae	*Hypseleotris klunzingeri*	western carp gudgeon	None	None	0	1	31/12/1967
33897	Actinopterygii	Eleotridae	*Hypseleotris sp.*	None	None	None	0	3	16/01/2020
18168	Actinopterygii	Eleotridae	*Mogurnda adspersa*	southern purplespotted gudgeon	None	None	1	5	18/01/1999
26968	Actinopterygii	Eleotridae	*Philypnodon grandiceps*	flathead gudgeon	None	None	0	8	13/01/2020
27011	Actinopterygii	Hemiramphidae	*Arrhamphus sclerolepis*	snubnose garfish	None	None	0	1	13/01/2020
27024	Actinopterygii	Melanotaeniidae	*Melanotaenia duboulayi*	crimsonspotted rainbowfish	None	None	2	32	16/01/2020
27032	Actinopterygii	Melanotaeniidae	*Rhadinocentrus ornatus*	ornate rainbowfish	None	None	0	1	31/12/1967
27035	Actinopterygii	Mugilidae	*Mugil cephalus*	sea mullet	None	None	0	14	16/01/2020
27036	Actinopterygii	Mugilidae	*Trachystoma petardi*	pinkeye mullet	None	None	0	1	31/12/1967
27039	Actinopterygii	Osteoglossidae	*Scleropages leichardti*	southern saratoga	None	None	0	4	16/01/2020
18169	Actinopterygii	Percichthyidae	*Maccullochella mariensis*	Mary River cod	None	E	3	27	16/01/2020
27042	Actinopterygii	Percichthyidae	*Macquaria ambigua*	golden perch	None	None	0	7	16/01/2020
27043	Actinopterygii	Percichthyidae	*Macquaria novemaculeata*	Australian bass	None	None	0	4	16/01/2020
27048	Actinopterygii	Plotosidae	*Neosilurus hyrtlii*	Hyrtl's catfish	None	None	0	1	31/12/1989
27054	Actinopterygii	Plotosidae	*Tandanus tandanus*	freshwater catfish	None	None	1	19	14/01/2020
27055	Actinopterygii	Poeciliidae	*Gambusia holbrooki*	mosquitofish	None	None	0	7	16/01/2020
19501	Actinopterygii	Poeciliidae	*Xiphophorus maculatus*	platy	None	None	0	2	13/01/2020
27059	Actinopterygii	Pseudomugilidae	*Pseudomugil signifer*	Pacific blue eye	None	None	1	13	14/01/2020
27061	Actinopterygii	Retropinnidae	*Retropinna semoni*	Australian smelt	None	None	0	13	14/01/2020
27088	Actinopterygii	Terapontidae	*Hephaestus fuliginosus*	sooty grunter	None	None	0	3	16/01/2020

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
27089	Actinopterygii	Terapontidae	*Leiopotherapon unicolor*	spangled perch	None	None	0	6	21/07/2017
716	Amphibia	Bufonidae	*Rhinella marina*	cane toad	None	None	0	112	22/02/2021
617	Amphibia	Hylidae	*Litoria balatus*	slender bleating tree frog	C	None	0	10	09/03/2021
627	Amphibia	Hylidae	*Litoria caerulea*	common green treefrog	C	None	0	47	28/02/2021
628	Amphibia	Hylidae	*Litoria chloris*	orange eyed treefrog	C	None	0	7	01/12/2015
608	Amphibia	Hylidae	*Litoria fallax*	eastern sedgefrog	C	None	0	173	27/02/2021
611	Amphibia	Hylidae	*Litoria gracilenta*	graceful treefrog	C	None	0	57	21/01/2021
614	Amphibia	Hylidae	*Litoria latopalmata*	broad palmed rocketfrog	C	None	1	50	12/10/2019
604	Amphibia	Hylidae	*Litoria nasuta*	striped rocketfrog	C	None	0	8	17/12/2018
595	Amphibia	Hylidae	*Litoria pearsoniana*	cascade treefrog	V	None	0	23	18/09/2017
596	Amphibia	Hylidae	*Litoria peronii*	emerald spotted treefrog	C	None	0	49	06/02/2021
600	Amphibia	Hylidae	*Litoria rubella*	ruddy treefrog	C	None	0	29	27/02/2021
601	Amphibia	Hylidae	*Litoria sp.*	None	C	None	0	12	06/02/2021
589	Amphibia	Hylidae	*Litoria tyleri*	southern laughing treefrog	C	None	0	5	06/02/2021
590	Amphibia	Hylidae	*Litoria verreauxii*	whistling treefrog	C	None	0	6	22/06/2019
29174	Amphibia	Hylidae	*Litoria wilcoxii*	eastern stony creek frog	C	None	0	196	27/02/2021
706	Amphibia	Limnodynastidae	*Adelotus brevis*	tusked frog	V	None	0	99	22/02/2021
681	Amphibia	Limnodynastidae	*Limnodynastes peronii*	striped marshfrog	C	None	0	127	22/02/2021
673	Amphibia	Limnodynastidae	*Limnodynastes terraereginae*	scarlet sided pobblebonk	C	None	0	31	29/02/2020
680	Amphibia	Limnodynastidae	*Platyplectrum ornatum*	ornate burrowing frog	C	None	0	14	05/02/2021
696	Amphibia	Myobatrachidae	*Crinia parinsignifera*	beeping froglet	C	None	0	66	28/08/2019
698	Amphibia	Myobatrachidae	*Crinia signifera*	clicking froglet	C	None	0	3	18/08/2019
674	Amphibia	Myobatrachidae	*Mixophyes fasciolatus*	great barred frog	C	None	0	41	20/03/2021
676	Amphibia	Myobatrachidae	*Mixophyes iteratus*	giant barred frog	V	V	0	99	29/02/2020
663	Amphibia	Myobatrachidae	*Mixophyes sp.*	None	C	None	0	5	07/02/2005
659	Amphibia	Myobatrachidae	*Pseudophryne major*	great brown broodfrog	C	None	1	1	31/12/1994
661	Amphibia	Myobatrachidae	*Pseudophryne raveni*	copper backed broodfrog	C	None	2	5	06/02/2019
648	Amphibia	Myobatrachidae	*Rheobatrachus silus*	southern gastric brooding frog	PE	EX	7	7	23/09/1978
633	Amphibia	Myobatrachidae	*Uperoleia fusca*	dusky gungan	C	None	0	27	12/10/2019
635	Amphibia	Myobatrachidae	*Uperoleia laevigata*	eastern gungan	C	None	0	2	31/12/2006

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1419	Aves	Acanthizidae	*Acanthiza chrysorrhoa*	yellow-rumped thornbill	C	None	0	5	07/05/2005
1421	Aves	Acanthizidae	*Acanthiza lineata*	striated thornbill	C	None	0	17	31/03/2006
1422	Aves	Acanthizidae	*Acanthiza nana*	yellow thornbill	C	None	0	7	15/09/2005
1423	Aves	Acanthizidae	*Acanthiza pusilla*	brown thornbill	C	None	0	82	10/06/2018
1425	Aves	Acanthizidae	*Acanthiza reguloides*	buff-rumped thornbill	C	None	0	3	15/09/2005
1410	Aves	Acanthizidae	*Gerygone mouki*	brown gerygone	C	None	0	44	07/11/2009
1396	Aves	Acanthizidae	*Gerygone olivacea*	white-throated gerygone	C	None	0	82	06/09/2020
1397	Aves	Acanthizidae	*Gerygone palpebrosa*	fairy gerygone	C	None	0	11	18/07/2020
1381	Aves	Acanthizidae	*Sericornis citreogularis*	yellow-throated scrubwren	C	None	0	15	25/10/2020
1382	Aves	Acanthizidae	*Sericornis frontalis*	white-browed scrubwren	C	None	0	159	25/10/2020
1384	Aves	Acanthizidae	*Sericornis magnirostra*	large-billed scrubwren	C	None	0	97	27/11/2020
1371	Aves	Acanthizidae	*Smicrornis brevirostris*	weebill	C	None	0	10	30/11/2007
1742	Aves	Accipitridae	*Accipiter cirrocephalus*	collared sparrowhawk	C	None	0	10	23/02/2008
1729	Aves	Accipitridae	*Accipiter fasciatus*	brown goshawk	C	None	0	21	10/10/2015
1730	Aves	Accipitridae	*Accipiter novaehollandiae*	grey goshawk	C	None	0	12	28/02/2007
1732	Aves	Accipitridae	*Aquila audax*	wedge-tailed eagle	C	None	0	50	23/02/2008
1721	Aves	Accipitridae	*Aviceda subcristata*	Pacific baza	C	None	0	30	24/09/2007
1722	Aves	Accipitridae	*Circus approximans*	swamp harrier	C	None	0	1	21/07/1985
1723	Aves	Accipitridae	*Circus assimilis*	spotted harrier	C	None	0	4	30/07/2007
1725	Aves	Accipitridae	*Elanus axillaris*	black-shouldered kite	C	None	0	30	29/12/2020
1726	Aves	Accipitridae	*Elanus scriptus*	letter-winged kite	C	None	0	1	28/08/2000
1728	Aves	Accipitridae	*Erythrotriorchis radiatus*	red goshawk	E	V	0	6	31/08/1994
1718	Aves	Accipitridae	*Haliaeetus leucogaster*	white-bellied sea-eagle	C	None	0	27	29/12/2020
1720	Aves	Accipitridae	*Haliastur indus*	brahminy kite	C	None	0	1	28/07/2003
1707	Aves	Accipitridae	*Haliastur sphenurus*	whistling kite	C	None	0	15	20/07/2007
1710	Aves	Accipitridae	*Hieraaetus morphnoides*	little eagle	C	None	0	6	20/04/2003
1714	Aves	Accipitridae	*Milvus migrans*	black kite	C	None	0	2	31/10/1978
1702	Aves	Accipitridae	*Pandion cristatus*	eastern osprey	SL	None	4	7	30/11/2006
1305	Aves	Acrocephalidae	*Acrocephalus australis*	Australian reed-warbler	C	None	0	12	09/02/2002
1973	Aves	Aegothelidae	*Aegotheles cristatus*	Australian owlet-nightjar	C	None	0	54	02/05/2017
1776	Aves	Alcedinidae	*Ceyx azureus*	azure kingfisher	C	None	0	57	14/03/2020

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1993	Aves	Anatidae	*Anas gracilis*	grey teal	C	None	0	39	10/07/2021
1998	Aves	Anatidae	*Anas superciliosa*	Pacific black duck	C	None	0	173	10/07/2021
1999	Aves	Anatidae	*Aythya australis*	hardhead	C	None	0	40	30/11/2007
2001	Aves	Anatidae	*Biziura lobata*	musk duck	C	None	0	1	16/10/2006
2003	Aves	Anatidae	*Chenonetta jubata*	Australian wood duck	C	None	0	100	10/05/2012
2005	Aves	Anatidae	*Cygnus atratus*	black swan	C	None	0	13	23/02/2008
1977	Aves	Anatidae	*Dendrocygna arcuata*	wandering whistling-duck	C	None	0	3	30/06/2007
1978	Aves	Anatidae	*Dendrocygna eytoni*	plumed whistling-duck	C	None	0	18	23/02/2008
1982	Aves	Anatidae	*Nettapus coromandelianus*	cotton pygmy-goose	C	None	0	3	20/07/2007
1985	Aves	Anatidae	*Oxyura australis*	blue-billed duck	C	None	0	1	02/10/1976
1279	Aves	Anhingidae	*Anhinga novaehollandiae*	Australasian darter	C	None	0	29	30/09/2007
1963	Aves	Anseranatidae	*Anseranas semipalmata*	magpie goose	C	None	0	4	11/03/2007
1965	Aves	Apodidae	*Apus pacificus*	fork-tailed swift	SL	None	0	2	28/02/2007
1971	Aves	Apodidae	*Hirundapus caudacutus*	white-throated needletail	V	V	0	23	23/02/2008
1829	Aves	Ardeidae	*Ardea alba modesta*	eastern great egret	C	None	0	25	10/07/2021
1831	Aves	Ardeidae	*Ardea intermedia*	intermediate egret	C	None	0	15	20/06/2007
1832	Aves	Ardeidae	*Ardea pacifica*	white-necked heron	C	None	0	13	23/10/2006
1830	Aves	Ardeidae	*Bubulcus ibis*	cattle egret	C	None	0	165	10/05/2012
1840	Aves	Ardeidae	*Egretta garzetta*	little egret	C	None	0	3	17/11/1999
1826	Aves	Ardeidae	*Egretta novaehollandiae*	white-faced heron	C	None	0	118	10/05/2012
1816	Aves	Ardeidae	*Ixobrychus dubius*	Australian little bittern	C	None	0	1	31/03/2006
1815	Aves	Ardeidae	*Ixobrychus flavicollis*	black bittern	C	None	0	1	07/09/1991
1818	Aves	Ardeidae	*Nycticorax caledonicus*	nankeen night-heron	C	None	0	2	05/02/1961
1659	Aves	Artamidae	*Artamus cyanopterus*	dusky woodswallow	C	None	0	17	20/07/2007
1660	Aves	Artamidae	*Artamus leucorynchus*	white-breasted woodswallow	C	None	0	33	23/02/2008
1646	Aves	Artamidae	*Artamus minor*	little woodswallow	C	None	0	3	15/07/2001
1647	Aves	Artamidae	*Artamus personatus*	masked woodswallow	C	None	0	1	31/01/2007
1649	Aves	Artamidae	*Artamus superciliosus*	white-browed woodswallow	C	None	0	1	18/07/1999
1654	Aves	Artamidae	*Cracticus nigrogularis*	pied butcherbird	C	None	0	183	10/07/2021
1656	Aves	Artamidae	*Cracticus torquatus*	grey butcherbird	C	None	0	155	23/02/2008

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1644	Aves	Artamidae	*Gymnorhina tibicen*	Australian magpie	C	None	0	278	29/12/2020
1645	Aves	Artamidae	*Strepera graculina*	pied currawong	C	None	0	159	25/10/2020
1956	Aves	Burhinidae	*Burhinus grallarius*	bush stone-curlew	C	None	0	7	17/06/2011
1191	Aves	Cacatuidae	*Cacatua galerita*	sulphur-crested cockatoo	C	None	0	72	29/12/2020
1194	Aves	Cacatuidae	*Cacatua sanguinea*	little corella	C	None	0	3	23/02/2008
21967	Aves	Cacatuidae	*Cacatua tenuirostris*	long-billed corella	C	None	0	1	16/10/2005
1196	Aves	Cacatuidae	*Calyptorhynchus banksii*	red-tailed black-cockatoo	C	None	0	14	31/10/2006
1185	Aves	Cacatuidae	*Calyptorhynchus funereus*	yellow-tailed black-cockatoo	C	None	0	64	23/02/2008
1171	Aves	Cacatuidae	*Calyptorhynchus lathami*	glossy black-cockatoo	V	None	0	2	23/10/2020
22494	Aves	Cacatuidae	*Calyptorhynchus lathami lathami*	glossy black-cockatoo (eastern)	V	None	0	8	23/02/2008
1193	Aves	Cacatuidae	*Eolophus roseicapilla*	galah	C	None	0	75	29/12/2020
1634	Aves	Campephagidae	*Coracina lineata*	barred cuckoo-shrike	C	None	0	15	10/11/2012
1636	Aves	Campephagidae	*Coracina novaehollandiae*	black-faced cuckoo-shrike	C	None	0	179	29/12/2020
1637	Aves	Campephagidae	*Coracina papuensis*	white-bellied cuckoo-shrike	C	None	0	22	23/02/2008
1639	Aves	Campephagidae	*Edolisoma tenuirostre*	common cicadabird	C	None	0	43	08/11/2009
1640	Aves	Campephagidae	*Lalage leucomela*	varied triller	C	None	0	71	19/07/2020
1089	Aves	Casuariidae	*Dromaius novaehollandiae*	emu	C	None	0	1	20/10/1910
1940	Aves	Charadriidae	*Elseyornis melanops*	black-fronted dotterel	C	None	0	13	20/07/2007
27774	Aves	Charadriidae	*Vanellus miles*	masked lapwing	C	None	0	60	10/07/2021
1933	Aves	Charadriidae	*Vanellus miles novaehollandiae*	masked lapwing (southern subspecies)	C	None	0	69	05/01/2002
18143	Aves	Charadriidae	*Vanellus tricolor*	banded lapwing	C	None	0	1	31/12/2000
1820	Aves	Ciconiidae	*Ephippiorhynchus asiaticus*	black-necked stork	C	None	0	4	28/02/1994
1294	Aves	Cisticolidae	*Cisticola exilis*	golden-headed cisticola	C	None	0	114	23/02/2008
1626	Aves	Climacteridae	*Climacteris erythrops*	red-browed treecreeper	C	None	0	4	29/08/1997
1628	Aves	Climacteridae	*Climacteris picumnus*	brown treecreeper	C	None	0	3	21/06/2003
1617	Aves	Climacteridae	*Cormobates leucophaea*	white-throated treecreeper	C	None	0	38	21/10/2018
18293	Aves	Climacteridae	*Cormobates leucophaea metastasis*	white-throated treecreeper (southern)	C	None	0	50	10/10/2015

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1801	Aves	Columbidae	*Chalcophaps longirostris*	Pacific emerald dove	C	None	0	46	25/10/2020
1803	Aves	Columbidae	*Columba leucomela*	white-headed pigeon	C	None	0	44	14/07/2010
1804	Aves	Columbidae	*Columba livia*	rock dove	None	None	0	11	30/09/2007
1810	Aves	Columbidae	*Geopelia humeralis*	bar-shouldered dove	C	None	0	151	10/07/2021
18323	Aves	Columbidae	*Geopelia placida*	peaceful dove	C	None	0	80	18/10/2020
1785	Aves	Columbidae	*Geophaps scripta scripta*	squatter pigeon (southern subspecies)	V	V	0	1	30/11/1981
1787	Aves	Columbidae	*Leucosarcia melanoleuca*	wonga pigeon	C	None	0	52	27/11/2020
1789	Aves	Columbidae	*Lopholaimus antarcticus*	topknot pigeon	C	None	0	29	18/12/2013
1791	Aves	Columbidae	*Macropygia amboinensis*	brown cuckoo-dove	C	None	0	152	17/10/2020
1793	Aves	Columbidae	*Ocyphaps lophotes*	crested pigeon	C	None	0	125	29/12/2020
1795	Aves	Columbidae	*Phaps chalcoptera*	common bronzewing	C	None	0	3	26/01/1991
1770	Aves	Columbidae	*Ptilinopus magnificus*	wompoo fruit-dove	C	None	0	57	07/11/2009
1771	Aves	Columbidae	*Ptilinopus regina*	rose-crowned fruit-dove	C	None	0	23	23/02/2008
1773	Aves	Columbidae	*Ptilinopus superbus*	superb fruit-dove	C	None	0	1	31/03/2006
1774	Aves	Columbidae	*Streptopelia chinensis*	spotted dove	None	None	0	17	30/06/2007
1779	Aves	Coraciidae	*Eurystomus orientalis*	dollarbird	C	None	0	64	23/02/2008
1603	Aves	Corcoracidae	*Corcorax melanorhamphos*	white-winged chough	C	None	0	1	31/12/1989
1605	Aves	Corcoracidae	*Struthidea cinerea*	apostlebird	C	None	0	1	31/10/1974
1608	Aves	Corvidae	*Corvus coronoides*	Australian raven	C	None	0	3	05/05/2003
1609	Aves	Corvidae	*Corvus orru*	Torresian crow	C	None	0	338	10/07/2021
1754	Aves	Cuculidae	*Cacomantis flabelliformis*	fan-tailed cuckoo	C	None	0	113	17/10/2020
1750	Aves	Cuculidae	*Cacomantis pallidus*	pallid cuckoo	C	None	0	5	20/07/2007
1743	Aves	Cuculidae	*Cacomantis variolosus*	brush cuckoo	C	None	0	29	10/11/2012
1751	Aves	Cuculidae	*Centropus phasianinus*	pheasant coucal	C	None	0	129	29/12/2020
1744	Aves	Cuculidae	*Chalcites basalis*	Horsfield's bronze-cuckoo	C	None	0	7	30/09/2007
1745	Aves	Cuculidae	*Chalcites lucidus*	shining bronze-cuckoo	C	None	0	82	21/10/2018
1756	Aves	Cuculidae	*Chalcites minutillus barnardi*	Eastern little bronze-cuckoo	C	None	0	14	06/09/2020
1736	Aves	Cuculidae	*Cuculus optatus*	oriental cuckoo	SL	None	0	6	10/01/1999

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1738	Aves	Cuculidae	*Eudynamys orientalis*	eastern koel	C	None	0	77	23/02/2008
1740	Aves	Cuculidae	*Scythrops novaehollandiae*	channel-billed cuckoo	C	None	0	51	29/12/2020
1601	Aves	Dicruridae	*Dicrurus bracteatus*	spangled drongo	C	None	0	115	17/10/2020
1366	Aves	Estrildidae	*Lonchura castaneothorax*	chestnut-breasted mannikin	C	None	0	29	04/12/2007
1359	Aves	Estrildidae	*Neochmia temporalis*	red-browed finch	C	None	0	215	29/12/2020
1342	Aves	Estrildidae	*Taeniopygia bichenovii*	double-barred finch	C	None	0	71	17/10/2020
1949	Aves	Eurostopodidae	*Eurostopodus mystacalis*	white-throated nightjar	C	None	0	62	01/09/2016
1716	Aves	Falconidae	*Falco berigora*	brown falcon	C	None	0	9	30/09/2007
1704	Aves	Falconidae	*Falco cenchroides*	nankeen kestrel	C	None	0	13	25/04/2007
1691	Aves	Falconidae	*Falco longipennis*	Australian hobby	C	None	0	3	30/06/2007
1692	Aves	Falconidae	*Falco peregrinus*	peregrine falcon	C	None	0	6	25/04/2007
1766	Aves	Halcyonidae	*Dacelo leachii*	blue-winged kookaburra	C	None	0	5	30/07/2007
1767	Aves	Halcyonidae	*Dacelo novaeguineae*	laughing kookaburra	C	None	0	263	10/07/2021
1760	Aves	Halcyonidae	*Todiramphus macleayii*	forest kingfisher	C	None	0	44	05/09/2020
1762	Aves	Halcyonidae	*Todiramphus sanctus*	sacred kingfisher	C	None	0	21	09/11/2011
1759	Aves	Halcyonidae	*Todiramphus sordidus*	Torresian kingfisher	C	None	0	1	02/09/1993
1583	Aves	Hirundinidae	*Cheramoeca leucosterna*	white-backed swallow	C	None	0	2	02/12/1999
1572	Aves	Hirundinidae	*Hirundo neoxena*	welcome swallow	C	None	0	202	10/07/2021
1585	Aves	Hirundinidae	*Petrochelidon ariel*	fairy martin	C	None	0	38	30/11/2007
1573	Aves	Hirundinidae	*Petrochelidon nigricans*	tree martin	C	None	0	39	20/07/2007
1928	Aves	Jacanidae	*Irediparra gallinacea*	comb-crested jacana	C	None	0	13	30/09/2007
1899	Aves	Laridae	*Sterna hirundo*	common tern	SL	None	0	2	15/04/1988
1570	Aves	Maluridae	*Malurus cyaneus*	superb fairy-wren	C	None	0	4	26/01/2004
18458	Aves	Maluridae	*Malurus lamberti*	variegated fairy-wren	C	None	0	84	20/10/2018
1558	Aves	Maluridae	*Malurus melanocephalus*	red-backed fairy-wren	C	None	0	208	29/12/2020
1291	Aves	Megaluridae	*Cincloramphus cruralis*	brown songlark	C	None	0	1	20/10/1910
1292	Aves	Megaluridae	*Cincloramphus mathewsi*	rufous songlark	C	None	0	2	05/02/1961
1289	Aves	Megaluridae	*Cincloramphus timoriensis*	tawny grassbird	C	None	0	51	04/11/2011
1287	Aves	Megaluridae	*Poodytes gramineus*	little grassbird	C	None	0	1	01/04/1988
1694	Aves	Megapodiidae	*Alectura lathami*	Australian brush-turkey	C	None	0	73	25/10/2020

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1555	Aves	Meliphagidae	*Acanthorhynchus tenuirostris*	eastern spinebill	C	None	0	27	25/04/2007
1542	Aves	Meliphagidae	*Anthochaera chrysoptera*	little wattlebird	C	None	0	7	18/07/2020
1523	Aves	Meliphagidae	*Caligavis chrysops*	yellow-faced honeyeater	C	None	0	99	17/10/2020
1539	Aves	Meliphagidae	*Entomyzon cyanotis*	blue-faced honeyeater	C	None	0	70	09/05/2015
1497	Aves	Meliphagidae	*Lichmera indistincta*	brown honeyeater	C	None	0	107	27/11/2020
1500	Aves	Meliphagidae	*Manorina melanocephala*	noisy miner	C	None	0	230	11/11/2012
1501	Aves	Meliphagidae	*Manorina melanophrys*	bell miner	C	None	0	46	05/05/2016
1504	Aves	Meliphagidae	*Meliphaga lewinii*	Lewin's honeyeater	C	None	1	533	27/11/2020
1507	Aves	Meliphagidae	*Melithreptus albogularis*	white-throated honeyeater	C	None	0	115	27/11/2020
1483	Aves	Meliphagidae	*Melithreptus gularis*	black-chinned honeyeater	C	None	0	3	08/05/2001
1485	Aves	Meliphagidae	*Melithreptus lunatus*	white-naped honeyeater	C	None	0	80	05/09/2020
1488	Aves	Meliphagidae	*Myzomela obscura*	dusky honeyeater	C	None	0	98	27/11/2020
1489	Aves	Meliphagidae	*Myzomela sanguinolenta*	scarlet honeyeater	C	None	0	137	18/10/2020
1493	Aves	Meliphagidae	*Philemon citreogularis*	little friarbird	C	None	0	49	17/10/2020
1494	Aves	Meliphagidae	*Philemon corniculatus*	noisy friarbird	C	None	0	140	05/09/2020
1482	Aves	Meliphagidae	*Phylidonyris niger*	white-cheeked honeyeater	C	None	0	8	06/10/2012
1469	Aves	Meliphagidae	*Phylidonyris novaehollandiae*	New Holland honeyeater	C	None	0	126	27/11/2020
1471	Aves	Meliphagidae	*Plectorhyncha lanceolata*	striped honeyeater	C	None	0	3	01/12/1999
1513	Aves	Meliphagidae	*Ptilotula fusca*	fuscous honeyeater	C	None	0	1	03/05/2004
1764	Aves	Meropidae	*Merops ornatus*	rainbow bee-eater	C	None	0	113	29/12/2020
1594	Aves	Monarchidae	*Carterornis leucotis*	white-eared monarch	C	None	0	38	14/03/2020
1589	Aves	Monarchidae	*Grallina cyanoleuca*	magpie-lark	C	None	0	206	29/12/2020
1595	Aves	Monarchidae	*Monarcha melanopsis*	black-faced monarch	SL	None	0	39	25/02/2018
1599	Aves	Monarchidae	*Myiagra cyanoleuca*	satin flycatcher	SL	None	0	2	31/12/1989
1600	Aves	Monarchidae	*Myiagra inquieta*	restless flycatcher	C	None	0	56	10/05/2012
1586	Aves	Monarchidae	*Myiagra rubecula*	leaden flycatcher	C	None	0	57	10/10/2015
1597	Aves	Monarchidae	*Symposiachrus trivirgatus*	spectacled monarch	SL	None	0	170	27/11/2020
1455	Aves	Motacillidae	*Anthus novaeseelandiae*	Australasian pipit	C	None	0	27	30/11/2007

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1611	Aves	Nectariniidae	*Dicaeum hirundinaceum*	mistletoebird	C	None	0	85	27/11/2020
1453	Aves	Neosittidae	*Daphoenositta chrysoptera*	varied sittella	C	None	0	29	23/04/2008
1442	Aves	Oriolidae	*Oriolus sagittatus*	olive-backed oriole	C	None	0	81	06/09/2020
1444	Aves	Oriolidae	*Sphecotheres vieilloti*	Australasian figbird	C	None	0	276	18/10/2020
1447	Aves	Orthonychidae	*Orthonyx temminckii*	Australian logrunner	C	None	0	5	01/03/2007
1449	Aves	Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush	C	None	0	182	25/10/2020
1450	Aves	Pachycephalidae	*Colluricincla megarhyncha*	little shrike-thrush	C	None	0	211	18/10/2020
1429	Aves	Pachycephalidae	*Falcunculus frontatus*	crested shrike-tit	C	None	0	14	20/10/2018
1436	Aves	Pachycephalidae	*Pachycephala pectoralis*	golden whistler	C	None	0	347	18/10/2020
1437	Aves	Pachycephalidae	*Pachycephala rufiventris*	rufous whistler	C	None	0	134	17/10/2020
1415	Aves	Paradisaeidae	*Ptiloris paradiseus*	paradise riflebird	C	None	0	19	13/09/2013
1389	Aves	Pardalotidae	*Pardalotus punctatus*	spotted pardalote	C	None	0	79	10/06/2018
1392	Aves	Pardalotidae	*Pardalotus striatus*	striated pardalote	C	None	0	179	10/05/2012
1360	Aves	Passeridae	*Passer domesticus*	house sparrow	None	None	0	10	16/10/2006
1284	Aves	Pelecanidae	*Pelecanus conspicillatus*	Australian pelican	C	None	0	21	30/11/2007
1347	Aves	Petroicidae	*Eopsaltria australis*	eastern yellow robin	C	None	0	436	29/12/2020
1339	Aves	Petroicidae	*Microeca fascinans*	jacky winter	C	None	0	31	10/05/2012
1330	Aves	Petroicidae	*Petroica boodang*	scarlet robin	C	None	0	1	28/03/1986
1332	Aves	Petroicidae	*Petroica rosea*	rose robin	C	None	0	27	09/06/2018
1321	Aves	Petroicidae	*Tregellasia capito*	pale-yellow robin	C	None	0	14	23/02/2008
1261	Aves	Phalacrocoracidae	*Microcarbo melanoleucos*	little pied cormorant	C	None	0	84	10/07/2021
1275	Aves	Phalacrocoracidae	*Phalacrocorax carbo*	great cormorant	C	None	0	10	24/03/2002
1263	Aves	Phalacrocoracidae	*Phalacrocorax sulcirostris*	little black cormorant	C	None	0	49	07/11/2009
1264	Aves	Phalacrocoracidae	*Phalacrocorax varius*	pied cormorant	C	None	0	12	30/11/2007
1699	Aves	Phasianidae	*Coturnix pectoralis*	stubble quail	C	None	0	2	05/02/1961
1698	Aves	Phasianidae	*Synoicus chinensis*	king quail	C	None	0	4	17/04/1987
1687	Aves	Phasianidae	*Synoicus ypsilophorus*	brown quail	C	None	0	58	23/02/2008

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1326	Aves	Pittidae	*Pitta versicolor*	noisy pitta	C	None	0	28	25/10/2020
1952	Aves	Podargidae	*Podargus ocellatus plumiferus*	plumed frogmouth	V	None	0	23	15/11/2012
1955	Aves	Podargidae	*Podargus strigoides*	tawny frogmouth	C	None	0	74	01/09/2016
1271	Aves	Podicipedidae	*Podiceps cristatus*	great crested grebe	C	None	0	3	30/06/2007
1249	Aves	Podicipedidae	*Tachybaptus novaehollandiae*	Australasian grebe	C	None	0	83	23/02/2008
1180	Aves	Psittacidae	*Alisterus scapularis*	Australian king-parrot	C	None	1	127	02/01/2015
1182	Aves	Psittacidae	*Aprosmictus erythropterus*	red-winged parrot	C	None	0	1	20/04/2003
1164	Aves	Psittacidae	*Cyclopsitta diophthalma coxeni*	Coxen's fig-parrot	E	E	0	1	17/01/2003
1147	Aves	Psittacidae	*Parvipsitta pusilla*	little lorikeet	C	None	0	27	07/10/2007
1136	Aves	Psittacidae	*Platycercus adscitus*	pale-headed rosella	C	None	0	184	10/05/2012
21976	Aves	Psittacidae	*Platycercus adscitus palliceps*	pale-headed rosella (southern form)	C	None	0	1	21/02/1996
1138	Aves	Psittacidae	*Platycercus elegans*	crimson rosella	C	None	0	18	15/09/2005
1124	Aves	Psittacidae	*Trichoglossus chlorolepidotus*	scaly-breasted lorikeet	C	None	0	116	17/10/2020
1125	Aves	Psittacidae	*Trichoglossus moluccanus*	rainbow lorikeet	C	None	0	220	08/11/2009
1619	Aves	Psophodidae	*Cinclosoma punctatum*	spotted quail-thrush	C	None	0	1	28/08/1960
1623	Aves	Psophodidae	*Psophodes olivaceus*	eastern whipbird	C	None	0	271	29/12/2020
1177	Aves	Ptilonorhynchidae	*Ailuroedus crassirostris*	green catbird	C	None	0	25	05/09/2020
1320	Aves	Ptilonorhynchidae	*Ptilonorhynchus violaceus*	satin bowerbird	C	None	0	37	03/07/2011
1308	Aves	Ptilonorhynchidae	*Sericulus chrysocephalus*	regent bowerbird	C	None	0	30	18/07/2020
1682	Aves	Rallidae	*Amaurornis moluccana*	pale-vented bush-hen	C	None	0	1	19/11/2000
1686	Aves	Rallidae	*Fulica atra*	Eurasian coot	C	None	0	27	04/12/2007
1673	Aves	Rallidae	*Gallinula tenebrosa*	dusky moorhen	C	None	0	54	10/07/2021
1675	Aves	Rallidae	*Gallirallus philippensis*	buff-banded rail	C	None	0	14	10/12/2011
1670	Aves	Rallidae	*Lewinia pectoralis*	Lewin's rail	C	None	0	3	16/07/1984
1662	Aves	Rallidae	*Porphyrio melanotus*	purple swamphen	C	None	0	51	29/12/2020
1664	Aves	Rallidae	*Porzana fluminea*	Australian spotted crake	C	None	0	1	19/11/2000

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1893	Aves	Recurvirostridae	*Himantopus himantopus*	black-winged stilt	C	None	0	3	20/07/2007
1881	Aves	Recurvirostridae	*Recurvirostra novaehollandiae*	red-necked avocet	C	None	0	1	21/06/2003
1575	Aves	Rhipiduridae	*Rhipidura albiscapa*	grey fantail	C	None	0	254	18/07/2020
1576	Aves	Rhipiduridae	*Rhipidura leucophrys*	willie wagtail	C	None	0	240	10/07/2021
1578	Aves	Rhipiduridae	*Rhipidura rufifrons*	rufous fantail	SL	None	0	113	25/10/2020
1883	Aves	Rostratulidae	*Rostratula australis*	Australian painted-snipe	E	E	1	2	24/11/1999
1874	Aves	Scolopacidae	*Calidris acuminata*	sharp-tailed sandpiper	SL	None	0	2	05/02/1961
1857	Aves	Scolopacidae	*Gallinago hardwickii*	Latham's snipe	SL	None	0	3	26/01/1991
1102	Aves	Strigidae	*Ninox boobook*	southern boobook	C	None	0	78	11/11/2018
1101	Aves	Strigidae	*Ninox connivens*	barking owl	C	None	0	2	28/03/1986
1107	Aves	Strigidae	*Ninox strenua*	powerful owl	V	None	0	36	10/03/2019
1314	Aves	Sturnidae	*Acridotheres tristis*	common myna	None	None	0	2	25/02/2007
1303	Aves	Sturnidae	*Sturnus vulgaris*	common starling	None	None	0	19	30/09/2007
1822	Aves	Threskiornithidae	*Platalea flavipes*	yellow-billed spoonbill	C	None	0	10	20/07/2007
1823	Aves	Threskiornithidae	*Platalea regia*	royal spoonbill	C	None	0	15	30/06/2007
1825	Aves	Threskiornithidae	*Plegadis falcinellus*	glossy ibis	SL	None	0	1	23/10/1977
1812	Aves	Threskiornithidae	*Threskiornis molucca*	Australian white ibis	C	None	0	59	29/12/2020
1800	Aves	Threskiornithidae	*Threskiornis spinicollis*	straw-necked ibis	C	None	0	106	29/12/2020
1276	Aves	Timaliidae	*Zosterops lateralis*	silvereye	C	None	0	210	18/10/2020
1463	Aves	Turdidae	*Zoothera heinei*	russet-tailed thrush	C	None	0	28	27/11/2020
1464	Aves	Turdidae	*Zoothera lunulata*	Bassian thrush	C	None	0	3	07/11/2009
1465	Aves	Turdidae	*Zoothera sp.*	None	C	None	1	3	26/01/1991
1092	Aves	Turnicidae	*Turnix melanogaster*	black-breasted button-quail	V	V	0	8	25/10/2020
1094	Aves	Turnicidae	*Turnix pyrrhothorax*	red-chested button-quail	C	None	0	1	28/01/1983
1081	Aves	Turnicidae	*Turnix varius*	painted button-quail	C	None	0	14	06/05/2011
1108	Aves	Tytonidae	*Tyto javanica*	eastern barn owl	C	None	0	9	11/12/2012
1109	Aves	Tytonidae	*Tyto longimembris*	eastern grass owl	C	None	0	3	28/03/1986
1096	Aves	Tytonidae	*Tyto novaehollandiae*	masked owl	C	None	0	1	29/08/1997
18292	Aves	Tytonidae	*Tyto novaehollandiae novaehollandiae*	masked owl (southern subspecies)	C	None	0	1	05/05/1979

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1099	Aves	Tytonidae	*Tyto tenebricosa tenebricosa*	sooty owl	C	None	0	1	29/08/1997
19945	Insecta	Hesperiidae	*Ocybadistes walkeri*	green grass-dart	None	None	0	1	08/11/2009
18981	Insecta	Hesperiidae	*Trapezites iacchus*	brown ochre	None	None	0	1	17/02/2005
19316	Insecta	Lycaenidae	*Zizina otis labradus*	common grass-blue (Australian subspecies)	None	None	0	1	26/10/1993
19149	Insecta	Nymphalidae	*Acraea andromacha andromacha*	glasswing	None	None	0	1	31/01/1994
19179	Insecta	Nymphalidae	*Danaus petilia*	lesser wanderer	None	None	0	5	10/05/2012
19177	Insecta	Nymphalidae	*Danaus plexippus*	monarch	None	None	0	12	10/05/2012
19185	Insecta	Nymphalidae	*Euploea corinna*	common crow	None	None	0	2	10/05/2012
19133	Insecta	Nymphalidae	*Hypocysta adiante adiante*	orange ringlet	None	None	0	1	04/10/1993
19131	Insecta	Nymphalidae	*Hypocysta metirius*	brown ringlet	None	None	0	2	08/11/2009
19173	Insecta	Nymphalidae	*Junonia orithya albicincta*	blue argus	None	None	0	1	10/05/2012
19172	Insecta	Nymphalidae	*Junonia villida villida*	meadow argus	None	None	0	2	26/10/1993
19122	Insecta	Nymphalidae	*Melanitis leda bankia*	evening brown	None	None	0	1	10/05/2012
19159	Insecta	Nymphalidae	*Phaedyma shepherdi shepherdi*	white-banded plane (southern subspecies)	None	None	0	1	08/11/2009
19176	Insecta	Nymphalidae	*Tirumala hamata hamata*	blue tiger	None	None	0	1	10/05/2012
19169	Insecta	Nymphalidae	*Vanessa kershawi*	Australian painted lady	None	None	0	1	26/10/1993
19075	Insecta	Papilionidae	*Cressida cressida cressida*	clearwing swallowtail	None	None	0	2	31/01/1994
19061	Insecta	Papilionidae	*Graphium choredon*	blue triangle	None	None	0	3	31/01/1994
2014	Insecta	Papilionidae	*Ornithoptera richmondia*	Richmond birdwing	V	None	0	1	14/10/1992
19961	Insecta	Papilionidae	*Papilio aegeus*	None	None	None	0	1	08/11/2009
19068	Insecta	Papilionidae	*Papilio aegeus aegeus*	orchard swallowtail (Australian subspecies)	None	None	0	3	31/01/1994
19110	Insecta	Pieridae	*Belenois java teutonia*	caper white	None	None	0	2	26/10/1993
19078	Insecta	Pieridae	*Catopsilia pomona*	lemon migrant	None	None	0	2	31/01/1994
19104	Insecta	Pieridae	*Delias aganippe*	spotted jezebel	None	None	0	1	24/11/1993
19098	Insecta	Pieridae	*Delias argenthona argenthona*	scarlet jezebel	None	None	0	5	31/01/1994
19107	Insecta	Pieridae	*Delias nigrina*	black jezebel	None	None	0	1	02/09/1993
19086	Insecta	Pieridae	*Eurema hecabe*	large grass-yellow	None	None	0	7	10/05/2012
19084	Insecta	Pieridae	*Eurema smilax*	small grass-yellow	None	None	0	5	10/05/2012

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
930	Mammalia	Acrobatidae	*Acrobates pygmaeus*	feathertail glider	C	None	0	1	31/10/2011
1084	Mammalia	Bovidae	*Bos taurus*	European cattle	None	None	0	1	08/08/1997
1067	Mammalia	Canidae	*Canis familiaris*	dog	None	None	0	8	25/10/2020
22485	Mammalia	Dasyuridae	*Antechinus flavipes flavipes*	yellow-footed antechinus (south-east Queensland)	C	None	5	16	26/05/2004
22415	Mammalia	Dasyuridae	*Antechinus subtropicus*	subtropical antechinus	C	None	0	7	29/08/1997
803	Mammalia	Dasyuridae	*Dasyurus maculatus maculatus*	spotted-tailed quoll (southern subspecies)	E	E	0	1	31/12/1991
804	Mammalia	Dasyuridae	*Dasyurus sp.*	None	C	None	0	2	31/12/1992
808	Mammalia	Dasyuridae	*Phascogale tapoatafa tapoatafa*	brush-tailed phascogale	C	None	0	3	25/10/2020
811	Mammalia	Dasyuridae	*Planigale maculata*	common planigale	C	None	1	3	16/01/2005
1006	Mammalia	Emballonuridae	*Saccolaimus flaviventris*	yellow-bellied sheathtail bat	C	None	0	1	08/01/2009
1056	Mammalia	Felidae	*Felis catus*	cat	None	None	0	2	25/10/2020
832	Mammalia	Leporidae	*Lepus europaeus*	European brown hare	None	None	0	3	21/02/1996
901	Mammalia	Macropodidae	*Macropus giganteus*	eastern grey kangaroo	C	None	0	1	29/08/1997
914	Mammalia	Macropodidae	*Notamacropus dorsalis*	black-striped wallaby	C	None	0	1	01/03/1992
902	Mammalia	Macropodidae	*Notamacropus parryi*	whiptail wallaby	C	None	0	2	29/08/1997
904	Mammalia	Macropodidae	*Notamacropus rufogriseus*	red-necked wallaby	C	None	0	1	10/05/2012
893	Mammalia	Macropodidae	*Petrogale sp.*	None	C	None	0	1	31/12/1997
884	Mammalia	Macropodidae	*Thylogale thetis*	red-necked pademelon	C	None	0	1	28/05/1990
885	Mammalia	Macropodidae	*Wallabia bicolor*	swamp wallaby	C	None	0	3	29/08/1997
954	Mammalia	Miniopteridae	*Miniopterus australis*	little bent-wing bat	C	None	0	9	01/12/2015
955	Mammalia	Miniopteridae	*Miniopterus schreibersii oceanensis*	eastern bent-wing bat	C	None	0	2	08/08/1997
956	Mammalia	Miniopteridae	*Miniopterus sp.*	None	C	None	0	1	25/02/2011
989	Mammalia	Molossidae	*Austronomus australis*	white-striped freetail bat	C	None	0	2	26/10/2011
1000	Mammalia	Molossidae	*Mormopterus norfolkensis*	east coast freetail bat	C	None	0	1	08/01/2009
22061	Mammalia	Molossidae	*Mormopterus ridei*	eastern free-tailed bat	C	None	0	1	01/03/1992
988	Mammalia	Molossidae	*Mormopterus sp.*	None	C	None	0	5	06/02/2015
767	Mammalia	Muridae	*Hydromys chrysogaster*	water rat	C	None	0	7	15/02/2012
772	Mammalia	Muridae	*Melomys burtoni*	grassland melomys	C	None	2	2	26/05/2004
759	Mammalia	Muridae	*Melomys cervinipes*	fawn-footed melomys	C	None	1	16	01/11/2005

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
761	Mammalia	Muridae	*Melomys sp.*	None	C	None	0	6	20/09/2012
749	Mammalia	Muridae	*Pseudomys gracilicaudatus*	eastern chestnut mouse	C	None	0	1	21/02/1996
741	Mammalia	Muridae	*Rattus fuscipes*	bush rat	C	None	4	62	25/10/2020
743	Mammalia	Muridae	*Rattus lutreolus*	swamp rat	C	None	4	4	26/05/2004
731	Mammalia	Muridae	*Rattus rattus*	black rat	None	None	0	2	21/02/1996
733	Mammalia	Muridae	*Rattus sp.*	None	C	None	0	2	29/08/1997
836	Mammalia	Ornithorhynchidae	*Ornithorhynchus anatinus*	platypus	SL	None	0	43	10/07/2021
784	Mammalia	Peramelidae	*Isoodon macrourus*	northern brown bandicoot	C	None	0	6	25/10/2020
787	Mammalia	Peramelidae	*Perameles nasuta*	long-nosed bandicoot	C	None	0	6	07/10/2003
875	Mammalia	Petauridae	*Petaurus australis australis*	yellow-bellied glider (southern subspecies)	V	V	0	4	29/08/1997
877	Mammalia	Petauridae	*Petaurus breviceps sensu lato*	sugar glider	C	None	0	5	29/11/2008
879	Mammalia	Petauridae	*Petaurus norfolcensis*	squirrel glider	C	None	0	5	12/12/2014
857	Mammalia	Phalangeridae	*Trichosurus caninus*	short-eared possum	C	None	0	11	18/12/2013
859	Mammalia	Phalangeridae	*Trichosurus vulpecula*	common brushtail possum	C	None	0	4	25/10/2020
860	Mammalia	Phascolarctidae	*Phascolarctos cinereus*	koala	E	E	0	444	25/09/2021
862	Mammalia	Potoroidae	*Aepyprymnus rufescens*	rufous bettong	C	None	0	1	01/12/2015
18794	Mammalia	Potoroidae	*Potorous tridactylus tridactylus*	long-nosed potoroo	V	V	0	1	17/01/2003
2455	Mammalia	Pseudocheiridae	*Petauroides armillatus*	central greater glider	E	V	0	3	08/08/1997
851	Mammalia	Pseudocheiridae	*Pseudocheirus peregrinus*	common ringtail possum	C	None	0	6	25/10/2020
980	Mammalia	Pteropodidae	*Nyctimene robinsoni*	eastern tube-nosed bat	C	None	0	1	18/01/1999
984	Mammalia	Pteropodidae	*Pteropus alecto*	black flying-fox	C	None	0	23	18/11/2011
962	Mammalia	Pteropodidae	*Pteropus poliocephalus*	grey-headed flying-fox	C	V	0	31	18/11/2011
963	Mammalia	Pteropodidae	*Pteropus scapulatus*	little red flying-fox	C	None	0	6	15/01/2010
964	Mammalia	Pteropodidae	*Pteropus sp.*	None	C	None	0	1	18/09/2009
968	Mammalia	Rhinolophidae	*Rhinolophus megaphyllus*	eastern horseshoe-bat	C	None	0	5	29/08/1997
1080	Mammalia	Suidae	*Sus scrofa*	pig	None	None	0	1	28/05/1990
838	Mammalia	Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna	SL	None	0	7	25/10/2020
972	Mammalia	Vespertilionidae	*Chalinolobus gouldii*	Gould's wattled bat	C	None	0	4	06/02/2015

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
973	Mammalia	Vespertilionidae	*Chalinolobus morio*	chocolate wattled bat	C	None	0	1	08/08/1997
961	Mammalia	Vespertilionidae	*Chalinolobus nigrogriseus*	hoary wattled bat	C	None	0	1	08/01/2009
22066	Mammalia	Vespertilionidae	*Myotis macropus*	large-footed myotis	C	None	0	1	08/01/2009
938	Mammalia	Vespertilionidae	*Nyctophilus sp.*	None	C	None	0	2	28/01/2010
931	Mammalia	Vespertilionidae	*Scotorepens greyii*	little broad-nosed bat	C	None	0	1	08/01/2009
925	Mammalia	Vespertilionidae	*Vespadelus pumilus*	eastern forest bat	C	None	0	9	28/01/2010
928	Mammalia	Vespertilionidae	*Vespadelus troughtoni*	eastern cave bat	C	None	0	2	01/12/2015
571	Reptilia	Agamidae	*Diporiphora sp.*	None	C	None	0	1	31/12/1976
554	Reptilia	Agamidae	*Intellagama lesueurii*	eastern water dragon	C	None	0	46	06/02/2015
556	Reptilia	Agamidae	*Pogona barbata*	bearded dragon	C	None	0	2	20/01/2017
534	Reptilia	Boidae	*Morelia sp.*	None	C	None	0	1	28/01/2010
519	Reptilia	Boidae	*Morelia spilota*	carpet python	C	None	0	8	13/09/2013
62	Reptilia	Chelidae	*Chelodina expansa*	broad-shelled river turtle	C	None	0	1	31/12/1998
30272	Reptilia	Chelidae	*Elseya albagula*	southern snapping turtle	CR	CE	0	49	30/10/2019
55	Reptilia	Chelidae	*Elseya sp.*	None	C	None	0	4	31/12/2005
56	Reptilia	Chelidae	*Elusor macrurus*	Mary River turtle	E	E	0	141	30/10/2019
58	Reptilia	Chelidae	*Emydura macquarii krefftii*	Krefft's river turtle	C	None	0	5	18/12/2013
54	Reptilia	Chelidae	*Wollumbinia latisternum*	saw-shelled turtle	C	None	0	8	20/02/2019
512	Reptilia	Colubridae	*Dendrelaphis punctulatus*	green tree snake	C	None	0	5	18/12/2013
508	Reptilia	Colubridae	*Tropidonophis mairii*	freshwater snake	C	None	0	2	31/10/1978
378	Reptilia	Diplodactylidae	*Oedura tryoni*	southern spotted velvet gecko	C	None	1	3	29/08/1997
511	Reptilia	Elapidae	*Acanthophis antarcticus*	common death adder	V	None	1	2	29/08/1997
457	Reptilia	Elapidae	*Cryptophis nigrescens*	eastern small-eyed snake	C	None	0	6	20/04/2015
493	Reptilia	Elapidae	*Demansia psammophis*	yellow-faced whipsnake	C	None	0	4	08/11/2009
486	Reptilia	Elapidae	*Furina diadema*	red-naped snake	C	None	0	1	31/12/1976
477	Reptilia	Elapidae	*Hemiaspis signata*	black-bellied swamp snake	C	None	0	2	31/10/1978
462	Reptilia	Elapidae	*Pseudechis porphyriacus*	red-bellied black snake	C	None	0	2	31/10/1978
454	Reptilia	Elapidae	*Pseudonaja textilis*	eastern brown snake	C	None	0	1	31/10/1978
442	Reptilia	Elapidae	*Tropidechis carinatus*	rough-scaled snake	C	None	0	2	05/05/2016

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
444	Reptilia	Elapidae	*Vermicella annulata*	bandy-bandy	C	None	0	2	24/02/2015
308	Reptilia	Scincidae	*Anomalopus verreauxii*	three-clawed worm-skink	C	None	0	4	13/07/1996
221	Reptilia	Scincidae	*Bellatorias frerei*	major skink	C	None	0	2	31/10/1978
224	Reptilia	Scincidae	*Bellatorias major*	land mullet	C	None	0	1	31/10/1978
312	Reptilia	Scincidae	*Calyptotis scutirostrum*	scute-snouted calyptotis	C	None	1	3	29/08/1997
34646	Reptilia	Scincidae	*Carlia pectoralis*	open-litter rainbow skink	C	None	0	1	20/01/2017
297	Reptilia	Scincidae	*Carlia pectoralis sensu lato*	None	C	None	1	4	29/08/1997
188	Reptilia	Scincidae	*Concinnia martini*	dark bar-sided skink	C	None	0	2	08/08/1997
193	Reptilia	Scincidae	*Concinnia tenuis*	bar-sided skink	C	None	0	3	25/10/2020
31898	Reptilia	Scincidae	*Cryptoblepharus pulcher pulcher*	elegant snake-eyed skink	C	None	0	7	29/08/1997
240	Reptilia	Scincidae	*Ctenotus spaldingi*	straight-browed ctenotus	C	None	0	2	31/10/1978
216	Reptilia	Scincidae	*Cyclodomorphus gerrardii*	pink-tongued lizard	C	None	0	1	31/10/1978
209	Reptilia	Scincidae	*Eroticoscincus graciloides*	elf skink	C	None	1	8	29/08/1997
190	Reptilia	Scincidae	*Eulamprus quoyii*	eastern water skink	C	None	0	2	08/11/2009
189	Reptilia	Scincidae	*Karma murrayi*	Murray's skink	C	None	0	4	22/11/2001
179	Reptilia	Scincidae	*Lampropholis adonis*	diamond-shielded sunskink	C	None	2	4	26/05/2004
180	Reptilia	Scincidae	*Lampropholis amicula*	friendly sunskink	C	None	1	2	13/07/1996
184	Reptilia	Scincidae	*Lampropholis delicata*	dark-flecked garden sunskink	C	None	2	18	08/11/2009
134	Reptilia	Scincidae	*Morethia boulengeri*	south-eastern morethia skink	C	None	0	1	31/10/1978
123	Reptilia	Scincidae	*Saproscincus challengeri*	orange-tailed shadeskink	C	None	0	1	31/10/1978
81	Reptilia	Typhlopidae	*Anilios sp.*	None	C	None	0	1	31/10/1978
61	Reptilia	Varanidae	*Varanus varius*	lace monitor	C	None	0	18	25/10/2020
26926	Sarcopterygii	Ceratodontidae	*Neoceratodus forsteri*	Australian lungfish	None	V	0	28	16/01/2020

Table 3. Plants recorded within the area of interest and its one kilometre buffer

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
8523	Charophyceae	Characeae	*Nitella*	None	None	None	4	4	30/11/1960
8090	Chlorophyceae	Chaetophoraceae	*Stigeoclonium*	None	None	None	2	2	26/01/1975
7641	Compsopogonophyceae	Compsopogonaceae	*Compsopogon coeruleus*	None	C	None	1	1	14/04/1963
17767	Equisetopsida	Acanthaceae	*Brunoniella australis*	blue trumpet	C	None	1	1	16/03/1989
17768	Equisetopsida	Acanthaceae	*Brunoniella spiciflora*	None	C	None	1	3	10/01/2011
27952	Equisetopsida	Acanthaceae	*Eranthemum pulchellum*	None	None	None	0	1	22/08/2018

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15853	Equisetopsida	Acanthaceae	*Graptophyllum spinigerum*	None	C	None	1	1	03/02/2007
5869	Equisetopsida	Acanthaceae	*Harnieria hygrophiloides*	white karambal	C	None	5	8	19/04/1999
16374	Equisetopsida	Acanthaceae	*Pseuderanthemum tenellum*	None	C	None	1	1	31/12/1943
16375	Equisetopsida	Acanthaceae	*Pseuderanthemum variabile*	pastel flower	C	None	4	10	23/07/2013
16257	Equisetopsida	Acanthaceae	*Rostellularia adscendens var. clementii*	None	C	None	1	1	05/11/1996
18026	Equisetopsida	Amaranthaceae	*Alternanthera denticulata*	lesser joyweed	C	None	2	2	29/01/1997
12491	Equisetopsida	Amaranthaceae	*Amaranthus spinosus*	needle burr	None	None	1	1	04/11/2009
11797	Equisetopsida	Amaranthaceae	*Nyssanthes diffusa*	barbed-wire weed	C	None	1	2	23/07/2013
11702	Equisetopsida	Amaryllidaceae	*Proiphys cunninghamii*	Moreton Bay lily	SL	None	0	1	23/07/2013
17173	Equisetopsida	Anacardiaceae	*Euroschinus falcatus*	None	C	None	0	4	19/04/1999
17172	Equisetopsida	Anacardiaceae	*Euroschinus falcatus var. falcatus*	None	C	None	0	3	20/09/2019
14256	Equisetopsida	Anacardiaceae	*Rhodosphaera rhodanthema*	tulip satinwood	C	None	0	11	20/09/2019
41406	Equisetopsida	Annonaceae	*Huberantha nitidissima*	None	C	None	2	9	20/09/2019
8144	Equisetopsida	Annonaceae	*Melodorum leichhardtii*	None	C	None	0	7	31/08/2020
9880	Equisetopsida	Aphanopetalaceae	*Aphanopetalum resinosum*	gumvine	C	None	0	2	05/05/2016
15545	Equisetopsida	Apiaceae	*Centella asiatica*	None	C	None	1	4	30/03/2016
14969	Equisetopsida	Apiaceae	*Xanthosia pilosa*	woolly xanthosia	C	None	1	1	13/09/1996
9484	Equisetopsida	Apocynaceae	*Alstonia constricta*	bitterbark	C	None	0	1	01/07/1995
5631	Equisetopsida	Apocynaceae	*Alyxia magnifolia*	None	C	None	0	1	23/07/2013
19732	Equisetopsida	Apocynaceae	*Alyxia ruscifolia*	None	C	None	0	9	31/08/2020
8244	Equisetopsida	Apocynaceae	*Araujia sericifera*	white moth vine	None	None	0	1	30/03/2016
9698	Equisetopsida	Apocynaceae	*Carissa ovata*	currantbush	C	None	1	10	25/09/2020
17050	Equisetopsida	Apocynaceae	*Gomphocarpus physocarpus*	balloon cottonbush	None	None	1	2	30/03/2016
4710	Equisetopsida	Apocynaceae	*Gymnema pleiadenium*	None	C	None	0	1	30/06/2016
11202	Equisetopsida	Apocynaceae	*Hoya australis*	None	C	None	0	5	02/11/2018
16922	Equisetopsida	Apocynaceae	*Hoya australis subsp. australis*	None	C	None	1	1	20/06/1986
41645	Equisetopsida	Apocynaceae	*Leichhardtia coronata*	None	V	None	3	3	18/11/2006
41663	Equisetopsida	Apocynaceae	*Leichhardtia fraseri*	None	C	None	0	1	02/11/2018
41666	Equisetopsida	Apocynaceae	*Leichhardtia micradenia*	None	C	None	1	1	02/12/1993
41642	Equisetopsida	Apocynaceae	*Leichhardtia rostrata*	None	C	None	0	3	20/09/2019
14396	Equisetopsida	Apocynaceae	*Melodinus acutiflorus*	bellbird vine	C	None	0	1	10/01/2011
12361	Equisetopsida	Apocynaceae	*Melodinus australis*	southern melodinus	C	None	0	5	30/06/2016

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16521	Equisetopsida	Apocynaceae	*Parsonsia lanceolata*	northern silkpod	C	None	0	2	23/07/2013
5945	Equisetopsida	Apocynaceae	*Parsonsia paulforsteri*	None	C	None	1	2	19/04/1999
16526	Equisetopsida	Apocynaceae	*Parsonsia straminea*	monkey rope	C	None	1	9	31/08/2020
16527	Equisetopsida	Apocynaceae	*Parsonsia velutina*	hairy silkpod	C	None	0	1	19/04/1999
14343	Equisetopsida	Apocynaceae	*Parsonsia ventricosa*	None	C	None	0	1	19/04/1999
16184	Equisetopsida	Apocynaceae	*Secamone elliptica*	None	C	None	1	6	23/07/2013
16059	Equisetopsida	Apocynaceae	*Tabernaemontana pandacaqui*	banana bush	C	None	0	10	31/08/2020
35914	Equisetopsida	Apocynaceae	*Vincetoxicum ovatum*	None	C	None	0	1	19/04/1999
9788	Equisetopsida	Araceae	*Alocasia brisbanensis*	None	C	None	0	2	23/07/2013
12389	Equisetopsida	Araceae	*Gymnostachys anceps*	settler's flax	C	None	1	5	23/07/2013
14286	Equisetopsida	Araceae	*Pothos longipes*	None	C	None	1	5	30/06/2016
11223	Equisetopsida	Araliaceae	*Astrotricha latifolia*	None	C	None	1	2	23/07/2013
12117	Equisetopsida	Araliaceae	*Hydrocotyle*	None	None	None	0	1	10/01/2011
15277	Equisetopsida	Araliaceae	*Hydrocotyle acutiloba*	None	C	None	1	1	26/11/1993
15279	Equisetopsida	Araliaceae	*Hydrocotyle laxiflora*	stinking pennywort	C	None	4	4	26/11/1993
13880	Equisetopsida	Araliaceae	*Hydrocotyle pedicellosa*	None	C	None	0	1	19/04/1999
8462	Equisetopsida	Araliaceae	*Polyscias elegans*	celery wood	C	None	2	12	20/09/2019
11375	Equisetopsida	Araliaceae	*Polyscias murrayi*	None	C	None	0	4	20/09/2019
13706	Equisetopsida	Araucariaceae	*Araucaria bidwillii*	bunya pine	C	None	1	8	31/08/2020
17960	Equisetopsida	Araucariaceae	*Araucaria cunninghamii*	hoop pine	C	None	0	6	30/06/2016
21842	Equisetopsida	Araucariaceae	*Araucaria cunninghamii var. cunninghamii*	None	C	None	1	3	20/09/2019
14858	Equisetopsida	Arecaceae	*Archontophoenix cunninghamiana*	piccabeen palm	C	None	0	2	13/09/2013
12821	Equisetopsida	Arecaceae	*Calamus muelleri*	lawyer vine	C	None	1	7	20/09/2019
14411	Equisetopsida	Arecaceae	*Linospadix monostachyos*	walking stick palm	C	None	0	2	13/09/2013
12776	Equisetopsida	Arecaceae	*Livistona australis*	cabbage tree palm	SL	None	0	1	23/07/2013
2215	Equisetopsida	Aristolochiaceae	*Aristolochia meridionalis subsp. meridionalis*	None	C	None	3	3	23/12/1996
35428	Equisetopsida	Asparagaceae	*Asparagus macowanii*	None	None	None	1	1	31/05/2013
7566	Equisetopsida	Asparagaceae	*Asparagus plumosus*	feathered asparagus fern	None	None	0	2	01/07/1995
9566	Equisetopsida	Aspleniaceae	*Asplenium attenuatum*	walking fern	C	None	0	4	30/06/2016
2088	Equisetopsida	Aspleniaceae	*Asplenium attenuatum var. indivisum*	None	C	None	2	2	06/11/1996
17937	Equisetopsida	Aspleniaceae	*Asplenium australasicum*	None	C	None	0	8	20/09/2019
17943	Equisetopsida	Aspleniaceae	*Asplenium paleaceum*	scaly asplenium	C	None	0	1	01/07/1995
17945	Equisetopsida	Aspleniaceae	*Asplenium polyodon*	mare's tail fern	C	None	0	1	19/04/1999
14883	Equisetopsida	Asteraceae	*Acomis acoma*	None	C	None	1	1	21/01/2004
5997	Equisetopsida	Asteraceae	*Ageratina adenophora*	crofton weed	None	None	1	1	24/11/1998
5996	Equisetopsida	Asteraceae	*Ageratina riparia*	mistflower	None	None	1	2	22/05/2003

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14051	Equisetopsida	Asteraceae	*Ageratum houstonianum*	blue billygoat weed	None	None	1	3	30/03/2016
15672	Equisetopsida	Asteraceae	*Ambrosia artemisiifolia*	annual ragweed	None	None	1	2	24/01/2017
15644	Equisetopsida	Asteraceae	*Arctotheca calendula*	Cape weed	None	None	1	1	11/09/2005
15612	Equisetopsida	Asteraceae	*Baccharis halimifolia*	groundsel bush	None	None	0	2	31/08/2016
7691	Equisetopsida	Asteraceae	*Bidens pilosa*	None	None	None	0	1	30/03/2016
35553	Equisetopsida	Asteraceae	*Brachyscome microcarpa subsp. microcarpa*	None	C	None	3	3	21/01/2004
15566	Equisetopsida	Asteraceae	*Calotis dentex*	white burr daisy	C	None	1	1	01/02/2018
15574	Equisetopsida	Asteraceae	*Carduus thoermeri*	nodding thistle	None	None	8	8	29/12/1999
14781	Equisetopsida	Asteraceae	*Carthamus lanatus*	saffron thistle	None	None	1	1	20/12/1979
15546	Equisetopsida	Asteraceae	*Centipeda minima subsp. minima*	None	C	None	1	1	23/12/1996
33042	Equisetopsida	Asteraceae	*Centratherum riparium*	None	C	None	1	1	10/03/1998
14001	Equisetopsida	Asteraceae	*Cirsium vulgare*	spear thistle	None	None	1	2	30/03/2016
22237	Equisetopsida	Asteraceae	*Cyanthillium cinereum*	None	C	None	1	4	02/11/2018
15438	Equisetopsida	Asteraceae	*Eclipta prostrata*	white eclipta	None	None	1	2	23/07/2013
15401	Equisetopsida	Asteraceae	*Emilia sonchifolia*	None	None	None	0	4	05/05/2016
35896	Equisetopsida	Asteraceae	*Erigeron bonariensis*	None	None	None	0	1	30/03/2016
35900	Equisetopsida	Asteraceae	*Erigeron pusillus*	None	None	None	1	1	21/01/2004
12254	Equisetopsida	Asteraceae	*Galinsoga parviflora*	yellow weed	None	None	1	1	04/11/1996
15285	Equisetopsida	Asteraceae	*Hypochaeris radicata*	catsear	None	None	1	1	06/03/1989
10007	Equisetopsida	Asteraceae	*Lactuca saligna*	wild lettuce	None	None	1	1	21/01/2004
29504	Equisetopsida	Asteraceae	*Lactuca serriola forma serriola*	None	None	None	1	1	26/11/1993
41827	Equisetopsida	Asteraceae	*Lordhowea amygdalifolia*	None	C	None	2	4	02/10/2021
14332	Equisetopsida	Asteraceae	*Olearia microphylla*	None	C	None	1	1	21/09/1996
15214	Equisetopsida	Asteraceae	*Olearia nernstii*	Ipswich daisy	C	None	2	2	01/09/2011
8366	Equisetopsida	Asteraceae	*Ozothamnus diosmifolius*	white dogwood	C	None	0	3	13/09/2013
10959	Equisetopsida	Asteraceae	*Parthenium hysterophorus*	parthenium weed	None	None	1	1	29/01/1997
7090	Equisetopsida	Asteraceae	*Picris angustifolia subsp. carolorum-henricorum*	None	C	None	1	1	25/11/1998
7131	Equisetopsida	Asteraceae	*Picris conyzoides*	None	V	None	2	18	12/02/2021
8419	Equisetopsida	Asteraceae	*Rhodanthe anthemoides*	white paper daisy	C	None	1	1	19/04/1993
10437	Equisetopsida	Asteraceae	*Senecio bipinnatisectus*	Commonwealth weed	C	None	1	1	21/01/2004
20007	Equisetopsida	Asteraceae	*Senecio hispidulus*	None	C	None	1	1	21/04/1993
10486	Equisetopsida	Asteraceae	*Senecio madagascariensis*	fireweed	None	None	0	11	24/01/2017
30179	Equisetopsida	Asteraceae	*Senecio pinnatifolius var. pinnatifolius*	None	C	None	1	1	13/04/1987
30173	Equisetopsida	Asteraceae	*Senecio pinnatifolius var. serratus*	None	C	None	1	1	21/04/1993

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10488	Equisetopsida	Asteraceae	*Senecio tenuiflorus*	None	C	None	1	1	07/03/1987
12208	Equisetopsida	Asteraceae	*Sigesbeckia orientalis*	Indian weed	C	None	1	1	08/05/1991
22236	Equisetopsida	Asteraceae	*Soliva sessilis*	None	None	None	1	1	10/10/1999
35909	Equisetopsida	Asteraceae	*Symphyotrichum subulatum*	None	None	None	1	1	29/01/1997
13755	Equisetopsida	Asteraceae	*Tagetes minuta*	stinking roger	None	None	1	3	30/03/2016
12078	Equisetopsida	Athyriaceae	*Deparia petersenii subsp. congrua*	Japanese lady fern	C	None	0	1	10/01/2011
14602	Equisetopsida	Athyriaceae	*Diplazium assimile*	None	C	None	1	2	17/11/2006
12081	Equisetopsida	Athyriaceae	*Diplazium australe*	austral lady fern	C	None	0	1	10/01/2011
11266	Equisetopsida	Basellaceae	*Anredera cordifolia*	Madeira vine	None	None	1	1	15/03/2004
34188	Equisetopsida	Bignoniaceae	*Dolichandra unguis-cati*	cat's claw creeper	None	None	7	10	12/08/2017
11152	Equisetopsida	Bignoniaceae	*Jacaranda mimosifolia*	jacaranda	None	None	1	1	22/04/2005
16569	Equisetopsida	Bignoniaceae	*Pandorea jasminoides*	None	C	None	0	9	31/08/2020
16570	Equisetopsida	Bignoniaceae	*Pandorea pandorana*	wonga vine	C	None	0	10	31/08/2020
17871	Equisetopsida	Blechnaceae	*Blechnum cartilagineum*	gristle fern	C	None	0	4	31/08/2020
41587	Equisetopsida	Blechnaceae	*Blechnum doodianum*	None	SL	None	0	1	19/04/1999
41723	Equisetopsida	Blechnaceae	*Blechnum medium*	None	SL	None	0	1	19/04/1999
41600	Equisetopsida	Blechnaceae	*Blechnum neohollandicum*	None	C	None	1	10	20/09/2019
6083	Equisetopsida	Blechnaceae	*Blechnum patersonii subsp. queenslandicum*	None	SL	None	0	1	22/05/2003
41068	Equisetopsida	Blechnaceae	*Blechnum rupestre*	None	SL	None	0	2	23/07/2013
11191	Equisetopsida	Boraginaceae	*Echium plantagineum*	Paterson's curse	None	None	1	1	09/11/1970
11193	Equisetopsida	Boraginaceae	*Heliotropium amplexicaule*	blue heliotrope	None	None	0	1	30/03/2016
9515	Equisetopsida	Brassicaceae	*Lepidium pseudohyssopifolium*	None	C	None	1	1	25/10/2007
14438	Equisetopsida	Brassicaceae	*Lepidium virginicum*	Virginian peppercress	None	None	1	1	04/11/2009
15098	Equisetopsida	Brassicaceae	*Raphanus raphanistrum*	wild radish	None	None	2	2	10/10/1999
14260	Equisetopsida	Brassicaceae	*Rorippa nasturtium-aquaticum*	watercress	None	None	2	2	04/11/1996
15101	Equisetopsida	Brassicaceae	*Rorippa palustris*	marsh cress	None	None	2	2	06/11/1996
19394	Equisetopsida	Bromeliaceae	*Tillandsia usneoides*	None	None	None	0	1	30/03/2016
14769	Equisetopsida	Burseraceae	*Canarium australasicum*	mango bark	C	None	0	4	20/09/2019
29210	Equisetopsida	Byttneriaceae	*Abroma molle*	None	C	None	0	1	06/02/2015
17594	Equisetopsida	Byttneriaceae	*Commersonia bartramia*	brown kurrajong	C	None	2	7	20/09/2019
34146	Equisetopsida	Byttneriaceae	*Commersonia dasyphylla*	None	C	None	1	1	21/09/1996
12549	Equisetopsida	Byttneriaceae	*Seringia arborescens*	None	C	None	0	1	10/01/2011
16766	Equisetopsida	Campanulaceae	*Lobelia purpurascens*	white root	SL	None	1	4	30/03/2016
36488	Equisetopsida	Campanulaceae	*Wahlenbergia capillaris*	None	SL	None	1	1	13/03/1989

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15918	Equisetopsida	Campanulaceae	*Wahlenbergia gracilis*	sprawling bluebell	SL	None	0	1	05/05/2016
13987	Equisetopsida	Capparaceae	*Capparis*	None	None	None	1	1	20/05/1994
17725	Equisetopsida	Capparaceae	*Capparis arborea*	brush caper berry	C	None	0	5	31/08/2020
17732	Equisetopsida	Capparaceae	*Capparis sarmentosa*	scrambling caper	C	None	0	6	23/07/2013
7346	Equisetopsida	Capparaceae	*Capparis sp. (Coen L.S.Smith 11862)*	None	C	None	0	1	19/04/1999
9280	Equisetopsida	Carpodetaceae	*Abrophyllum ornans*	None	C	None	0	3	20/09/2019
19443	Equisetopsida	Caryophyllaceae	*Drymaria cordata*	None	None	None	1	1	11/09/2005
17352	Equisetopsida	Caryophyllaceae	*Drymaria cordata subsp. cordata*	None	None	None	1	1	26/11/1993
16390	Equisetopsida	Caryophyllaceae	*Polycarpon tetraphyllum*	None	None	None	1	1	10/10/1999
18012	Equisetopsida	Casuarinaceae	*Allocasuarina littoralis*	None	C	None	1	4	20/09/2019
18014	Equisetopsida	Casuarinaceae	*Allocasuarina torulosa*	None	C	None	1	10	20/09/2019
9087	Equisetopsida	Casuarinaceae	*Casuarina cunninghamiana*	None	C	None	0	1	05/05/2016
13995	Equisetopsida	Casuarinaceae	*Casuarina cunninghamiana subsp. cunninghamiana*	None	C	None	1	1	11/05/2001
11097	Equisetopsida	Celastraceae	*Celastrus subspicata*	large-leaved staffvine	C	None	1	3	10/01/2011
34774	Equisetopsida	Celastraceae	*Denhamia bilocularis*	None	C	None	2	3	23/07/2013
14636	Equisetopsida	Celastraceae	*Denhamia celastroides*	broad-leaved boxwood	C	None	2	8	05/05/2016
34776	Equisetopsida	Celastraceae	*Denhamia disperma*	None	C	None	0	1	19/04/1999
34779	Equisetopsida	Celastraceae	*Denhamia silvestris*	None	C	None	1	1	19/04/1993
22223	Equisetopsida	Celastraceae	*Elaeodendron australe*	None	C	None	0	2	19/04/1999
22222	Equisetopsida	Celastraceae	*Elaeodendron australe var. australe*	None	C	None	0	1	23/07/2013
16973	Equisetopsida	Celastraceae	*Hedraianthera porphyropetala*	hedrianthera	C	None	1	2	19/04/1999
16426	Equisetopsida	Celastraceae	*Pleurostylia opposita*	None	C	None	1	2	25/11/1998
15034	Equisetopsida	Celastraceae	*Siphonodon australis*	ivorywood	C	None	0	3	19/04/1999
40390	Equisetopsida	Celastraceae	*Siphonodon australis var. keysii*	None	C	None	0	1	23/07/2013
25573	Equisetopsida	Cephaloziellaceae	*Cephaloziella exiliflora*	None	C	None	1	1	04/05/1985
17371	Equisetopsida	Chenopodiaceae	*Einadia hastata*	None	C	None	1	1	10/11/1933
33925	Equisetopsida	Cleomaceae	*Tarenaya hassleriana*	None	None	None	1	1	15/01/1973
15283	Equisetopsida	Clusiaceae	*Hypericum gramineum*	None	C	None	0	1	05/05/2016
17996	Equisetopsida	Commelinaceae	*Aneilema acuminatum*	None	C	None	3	7	29/03/2020
10033	Equisetopsida	Commelinaceae	*Commelina diffusa*	wandering jew	C	None	0	3	30/03/2016

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16431	Equisetopsida	Commelinaceae	*Pollia crispata*	pollia	C	None	0	1	19/04/1999
16432	Equisetopsida	Commelinaceae	*Pollia macrophylla*	None	C	None	1	1	03/02/2007
6645	Equisetopsida	Commelinaceae	*Tradescantia zebrina*	None	None	None	0	2	22/05/2003
17422	Equisetopsida	Convolvulaceae	*Dichondra repens*	kidney weed	C	None	1	1	02/04/2009
16907	Equisetopsida	Convolvulaceae	*Ipomoea hederifolia*	None	None	None	1	1	15/05/1967
16862	Equisetopsida	Convolvulaceae	*Ipomoea plebeia*	bellvine	C	None	1	1	30/11/1993
16395	Equisetopsida	Convolvulaceae	*Polymeria calycina*	pink bindweed	C	None	1	1	09/11/2006
40969	Equisetopsida	Cornaceae	*Alangium polyosmoides subsp. polyosmoides*	None	C	None	0	1	23/07/2013
40968	Equisetopsida	Cornaceae	*Alangium polyosmoides subsp. tomentosum*	None	C	None	1	4	19/04/1999
9895	Equisetopsida	Corynocarpaceae	*Corynocarpus rupestris subsp. arborescens*	southern corynocarpus	V	None	1	1	29/03/2003
33902	Equisetopsida	Cucurbitaceae	*Cucumis althaeoides*	None	C	None	1	1	19/04/1993
18824	Equisetopsida	Cucurbitaceae	*Diplocyclos palmatus*	None	C	None	0	2	01/07/1995
16586	Equisetopsida	Cucurbitaceae	*Nothoalsomitra suberosa*	None	NT	None	2	2	20/03/1990
14202	Equisetopsida	Cucurbitaceae	*Sicyos australis*	star cucumber	C	None	0	1	19/04/1999
9844	Equisetopsida	Cucurbitaceae	*Trichosanthes subvelutina*	silky cucumber	C	None	0	2	23/07/2013
14124	Equisetopsida	Cucurbitaceae	*Zehneria cunninghamii*	slender cucumber	C	None	1	1	20/04/1993
18675	Equisetopsida	Cunoniaceae	*Ackama paniculosa*	None	C	None	0	2	10/01/2011
16377	Equisetopsida	Cunoniaceae	*Pseudoweinmannia lachnocarpa*	rose marara	C	None	2	8	20/09/2019
16207	Equisetopsida	Cunoniaceae	*Schizomeria ovata*	white cherry	C	None	0	3	20/09/2019
41581	Equisetopsida	Cyatheaceae	*Sphaeropteris australis*	None	C	None	0	2	13/09/2013
41593	Equisetopsida	Cyatheaceae	*Sphaeropteris cooperi*	None	C	None	0	2	20/09/2019
9529	Equisetopsida	Cyperaceae	*Abildgaardia ovata*	None	C	None	1	1	16/03/1989
14785	Equisetopsida	Cyperaceae	*Bolboschoenus fluviatilis*	None	C	None	1	1	30/11/1993
17686	Equisetopsida	Cyperaceae	*Carex appressa*	None	C	None	1	1	30/11/1993
9945	Equisetopsida	Cyperaceae	*Carex fascicularis*	tassel sedge	C	None	1	1	04/11/1996
11993	Equisetopsida	Cyperaceae	*Carex horsfieldii*	None	C	None	0	1	23/07/2013
9439	Equisetopsida	Cyperaceae	*Carex maculata*	None	C	None	1	1	13/11/2006
14780	Equisetopsida	Cyperaceae	*Carex polyantha*	None	C	None	1	1	25/10/2008
17610	Equisetopsida	Cyperaceae	*Cladium procerum*	leafy twigrush	C	None	1	1	19/04/1993
14661	Equisetopsida	Cyperaceae	*Cyperus cyperoides*	None	C	None	2	2	21/01/2004
17516	Equisetopsida	Cyperaceae	*Cyperus enervis*	None	C	None	2	2	23/12/1996
17517	Equisetopsida	Cyperaceae	*Cyperus esculentus*	yellow nutgrass	None	None	1	1	13/03/1970
14656	Equisetopsida	Cyperaceae	*Cyperus exaltatus*	tall flatsedge	C	None	2	3	23/07/2013
17519	Equisetopsida	Cyperaceae	*Cyperus fulvus*	None	C	None	1	1	23/12/1996

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17521	Equisetopsida	Cyperaceae	*Cyperus gracilis*	None	C	None	0	2	23/07/2013
17527	Equisetopsida	Cyperaceae	*Cyperus laevis*	None	C	None	1	1	23/12/1996
17475	Equisetopsida	Cyperaceae	*Cyperus polystachyos var. polystachyos*	None	C	None	1	1	04/11/1996
17476	Equisetopsida	Cyperaceae	*Cyperus procerus*	None	C	None	0	1	30/03/2016
10327	Equisetopsida	Cyperaceae	*Cyperus sculptus*	None	C	None	1	1	10/11/2006
17484	Equisetopsida	Cyperaceae	*Cyperus tetraphyllus*	None	C	None	1	3	23/07/2013
17485	Equisetopsida	Cyperaceae	*Cyperus trinervis*	None	C	None	1	1	04/11/1996
17113	Equisetopsida	Cyperaceae	*Fimbristylis*	None	None	None	1	1	16/03/1989
9376	Equisetopsida	Cyperaceae	*Fimbristylis aestivalis*	None	C	None	1	1	23/12/1996
17107	Equisetopsida	Cyperaceae	*Fimbristylis dichotoma*	common fringe-rush	C	None	1	1	23/12/1996
17078	Equisetopsida	Cyperaceae	*Gahnia aspera*	None	C	None	0	7	25/09/2020
9381	Equisetopsida	Cyperaceae	*Lepidosperma laterale*	None	C	None	1	5	05/05/2016
35597	Equisetopsida	Cyperaceae	*Schoenoplectiella mucronata*	None	C	None	0	1	23/07/2013
34669	Equisetopsida	Cyperaceae	*Schoenoplectus tabernaemontani*	None	C	None	2	2	04/11/1996
14228	Equisetopsida	Cyperaceae	*Scleria mackaviensis*	None	C	None	2	2	23/12/1996
16224	Equisetopsida	Cyperaceae	*Scleria sphacelata*	None	C	None	0	2	23/07/2013
17497	Equisetopsida	Davalliaceae	*Davallia pyxidata*	None	C	None	0	2	23/07/2013
16894	Equisetopsida	Dennstaedtiaceae	*Hypolepis muelleri*	swamp bracken	C	None	0	3	31/08/2020
16340	Equisetopsida	Dennstaedtiaceae	*Pteridium esculentum*	common bracken	C	None	0	2	23/07/2013
17547	Equisetopsida	Dicksoniaceae	*Calochlaena dubia*	None	C	None	0	4	20/09/2019
24754	Equisetopsida	Dicranaceae	*Holomitrium perichaetiale*	None	C	None	1	1	12/02/1989
21816	Equisetopsida	Dilleniaceae	*Hibbertia aspera subsp. aspera*	None	C	None	1	1	04/09/1999
11599	Equisetopsida	Dilleniaceae	*Hibbertia scandens var. oxyphylla*	None	C	None	0	1	20/09/2019
9452	Equisetopsida	Dilleniaceae	*Hibbertia stricta*	None	C	None	1	1	04/09/1999
17438	Equisetopsida	Dioscoreaceae	*Dioscorea transversa*	native yam	C	None	1	9	02/11/2018
15806	Equisetopsida	Dryopteridaceae	*Arachniodes aristata*	prickly shield fern	SL	None	0	2	19/04/1999
14433	Equisetopsida	Dryopteridaceae	*Lastreopsis marginans*	glossy shield fern	SL	None	0	6	20/09/2019
41585	Equisetopsida	Dryopteridaceae	*Parapolystichum acuminatum*	None	SL	None	0	1	30/06/2016
41725	Equisetopsida	Dryopteridaceae	*Parapolystichum microsorum*	None	SL	None	1	3	30/06/2016
41602	Equisetopsida	Dryopteridaceae	*Parapolystichum munitum*	None	SL	None	4	6	23/07/2013
17439	Equisetopsida	Ebenaceae	*Diospyros australis*	black plum	C	None	0	4	13/09/2013
17442	Equisetopsida	Ebenaceae	*Diospyros fasciculosa*	grey ebony	C	None	0	6	23/07/2013
17443	Equisetopsida	Ebenaceae	*Diospyros geminata*	scaly ebony	C	None	0	4	23/07/2013
17398	Equisetopsida	Ebenaceae	*Diospyros pentamera*	myrtle ebony	C	None	0	4	10/01/2011

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35542	Equisetopsida	Ebenaceae	*Diospyros yandina*	None	C	None	0	2	23/07/2013
17323	Equisetopsida	Elaeagnaceae	*Elaeagnus triflora*	None	C	None	0	1	20/09/2019
17327	Equisetopsida	Elaeocarpaceae	*Elaeocarpus eumundi*	Eumundi quandong	C	None	0	2	04/05/2005
17331	Equisetopsida	Elaeocarpaceae	*Elaeocarpus grandis*	blue quandong	C	None	0	1	13/09/2013
14572	Equisetopsida	Elaeocarpaceae	*Elaeocarpus obovatus*	blueberry ash	C	None	0	5	31/08/2020
17335	Equisetopsida	Elaeocarpaceae	*Elaeocarpus reticulatus*	ash quandong	C	None	0	1	10/01/2011
21943	Equisetopsida	Elaeocarpaceae	*Sloanea australis*	None	C	None	0	1	13/09/2013
11567	Equisetopsida	Elaeocarpaceae	*Sloanea australis subsp. australis*	None	C	None	0	1	20/09/2019
16152	Equisetopsida	Elaeocarpaceae	*Sloanea australis subsp. parviflora*	None	C	None	0	1	07/02/2001
16155	Equisetopsida	Elaeocarpaceae	*Sloanea woollsii*	yellow carrabeen	C	None	0	4	13/09/2013
14577	Equisetopsida	Elatinaceae	*Elatine gratioloides*	waterwort	C	None	1	1	01/04/1995
18111	Equisetopsida	Ericaceae	*Acrotriche aggregata*	red cluster heath	C	None	2	6	25/09/2020
17268	Equisetopsida	Ericaceae	*Epacris obtusifolia*	common heath	C	None	1	1	13/09/1996
41528	Equisetopsida	Ericaceae	*Styphelia rupicola*	None	C	None	3	3	05/05/1989
41524	Equisetopsida	Ericaceae	*Styphelia sieberi*	None	C	None	0	4	20/09/2019
14163	Equisetopsida	Ericaceae	*Trochocarpa laurina*	tree heath	C	None	1	5	13/09/2013
18092	Equisetopsida	Euphorbiaceae	*Acalypha nemorum*	hairy acalypha	C	None	1	4	23/07/2013
18050	Equisetopsida	Euphorbiaceae	*Alchornea ilicifolia*	native holly	C	None	0	7	20/09/2019
14825	Equisetopsida	Euphorbiaceae	*Baloghia inophylla*	scrub bloodwood	C	None	0	5	23/07/2013
17612	Equisetopsida	Euphorbiaceae	*Claoxylon australe*	brittlewood	C	None	1	4	23/07/2013
13956	Equisetopsida	Euphorbiaceae	*Croton acronychioides*	thick-leaved croton	C	None	0	5	23/07/2013
17561	Equisetopsida	Euphorbiaceae	*Croton insularis*	Queensland cascarilla	C	None	0	3	23/07/2013
11494	Equisetopsida	Euphorbiaceae	*Croton stigmatosus*	white croton	C	None	2	2	01/04/1993
14699	Equisetopsida	Euphorbiaceae	*Croton verreauxii*	green cascarilla	C	None	2	3	10/01/2011
17160	Equisetopsida	Euphorbiaceae	*Euphorbia cyathophora*	dwarf poinsettia	None	None	1	1	01/04/1995
17179	Equisetopsida	Euphorbiaceae	*Excoecaria dallachyana*	scrub poison tree	C	None	0	1	19/04/1999
5284	Equisetopsida	Euphorbiaceae	*Homalanthus populifolius*	None	C	None	0	3	07/02/2001
14334	Equisetopsida	Euphorbiaceae	*Homalanthus stillingiifolius*	None	C	None	1	2	23/07/2013
16753	Equisetopsida	Euphorbiaceae	*Macaranga tanarius*	macaranga	C	None	0	4	20/09/2019
11406	Equisetopsida	Euphorbiaceae	*Mallotus claoxyloides*	green kamala	C	None	5	12	31/08/2020
14380	Equisetopsida	Euphorbiaceae	*Mallotus discolor*	white kamala	C	None	0	5	20/09/2019
22330	Equisetopsida	Euphorbiaceae	*Mallotus megadontus*	None	V	None	2	2	17/11/2006

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16715	Equisetopsida	Euphorbiaceae	*Mallotus philippensis*	red kamala	C	None	1	11	25/09/2020
14088	Equisetopsida	Euphorbiaceae	*Ricinocarpos speciosus*	None	V	None	3	3	16/09/2003
11288	Equisetopsida	Euphorbiaceae	*Ricinus communis*	castor oil bush	None	None	0	1	12/08/2017
11246	Equisetopsida	Euphorbiaceae	*Tragia novae-hollandiae*	stinging-vine	C	None	1	6	20/09/2019
17168	Equisetopsida	Eupomatiaceae	*Eupomatia bennettii*	small bolwarra	C	None	0	3	10/01/2011
17169	Equisetopsida	Eupomatiaceae	*Eupomatia laurina*	bolwarra	C	None	0	5	13/09/2013
24670	Equisetopsida	Fissidentaceae	*Fissidens*	None	None	None	1	1	04/05/1985
17118	Equisetopsida	Flagellariaceae	*Flagellaria indica*	whip vine	C	None	0	3	20/09/2019
25597	Equisetopsida	Frullaniaceae	*Frullania ericoides*	None	C	None	1	1	07/03/1987
25608	Equisetopsida	Frullaniaceae	*Frullania rubella*	None	C	None	1	1	04/05/1985
25611	Equisetopsida	Frullaniaceae	*Frullania squarrosula*	None	C	None	1	1	04/05/1985
25613	Equisetopsida	Frullaniaceae	*Frullania subtropica*	None	C	None	1	1	04/05/1985
14743	Equisetopsida	Gentianaceae	*Centaurium erythraea*	common centaury	None	None	1	1	26/11/1993
30324	Equisetopsida	Gentianaceae	*Schenkia australis*	None	C	None	0	1	10/01/2011
9247	Equisetopsida	Geraniaceae	*Geranium solanderi var. solanderi*	native geranium	C	None	1	1	26/11/1993
16106	Equisetopsida	Gleicheniaceae	*Sticherus flabellatus*	None	C	None	0	1	10/01/2011
10944	Equisetopsida	Gleicheniaceae	*Sticherus flabellatus var. flabellatus*	None	C	None	1	1	09/02/2001
17488	Equisetopsida	Goodeniaceae	*Dampiera stricta*	None	C	None	0	1	20/10/2018
17489	Equisetopsida	Goodeniaceae	*Dampiera sylvestris*	blue dampiera	C	None	1	1	04/09/1999
17065	Equisetopsida	Goodeniaceae	*Goodenia rotundifolia*	None	C	None	1	3	30/03/2016
17053	Equisetopsida	Haloragaceae	*Gonocarpus chinensis subsp. verrucosus*	None	C	None	1	1	13/04/1987
9771	Equisetopsida	Haloragaceae	*Myriophyllum variifolium*	None	C	None	1	1	04/03/1997
12249	Equisetopsida	Hemerocallidaceae	*Dianella*	None	None	None	1	1	29/01/1997
17464	Equisetopsida	Hemerocallidaceae	*Dianella caerulea*	None	C	None	1	7	25/09/2020
10722	Equisetopsida	Hemerocallidaceae	*Dianella caerulea var. assera*	None	C	None	0	2	23/07/2013
17467	Equisetopsida	Hemerocallidaceae	*Dianella longifolia var. longifolia*	None	C	None	1	1	07/11/2006
12843	Equisetopsida	Hemerocallidaceae	*Dianella rara*	None	C	None	0	2	02/11/2018
15350	Equisetopsida	Hemerocallidaceae	*Geitonoplesium cymosum*	scrambling lily	C	None	0	6	30/06/2016
40443	Equisetopsida	Hemerocallidaceae	*Geitonoplesium cymosum forma album*	None	C	None	0	5	31/08/2020
29153	Equisetopsida	Hypopterygiaceae	*Hypopterygium tamarisci*	None	C	None	2	2	14/02/1989
16536	Equisetopsida	Iridaceae	*Patersonia glabrata*	None	C	None	1	1	04/09/1999
16537	Equisetopsida	Iridaceae	*Patersonia sericea var. sericea*	None	C	None	1	1	04/09/1999

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9341	Equisetopsida	Johnsoniaceae	*Tricoryne anceps*	None	C	None	0	1	21/01/2015
15974	Equisetopsida	Johnsoniaceae	*Tricoryne elatior*	yellow autumn lily	C	None	1	1	16/03/1989
16845	Equisetopsida	Juncaceae	*Juncus prismatocarpus*	branching rush	C	None	1	1	30/11/1993
16846	Equisetopsida	Juncaceae	*Juncus usitatus*	None	C	None	2	4	23/07/2013
15667	Equisetopsida	Lamiaceae	*Ajuga australis*	Australian bugle	C	None	2	2	25/11/1998
12453	Equisetopsida	Lamiaceae	*Callicarpa pedunculata*	velvet leaf	C	None	4	10	20/09/2019
17628	Equisetopsida	Lamiaceae	*Clerodendrum floribundum*	None	C	None	0	6	02/11/2018
12462	Equisetopsida	Lamiaceae	*Clerodendrum tomentosum*	None	C	None	0	1	01/07/1995
41035	Equisetopsida	Lamiaceae	*Coleus australis*	None	C	None	1	2	19/04/1999
41023	Equisetopsida	Lamiaceae	*Coleus graveolens*	None	C	None	0	1	19/04/1999
3903	Equisetopsida	Lamiaceae	*Coleus scutellarioides*	None	C	None	2	2	01/04/1995
41041	Equisetopsida	Lamiaceae	*Coleus torrenticola*	None	E	E	1	1	31/01/2007
12384	Equisetopsida	Lamiaceae	*Gmelina leichhardtii*	white beech	C	None	0	2	10/01/2011
15243	Equisetopsida	Lamiaceae	*Mentha satureioides*	native pennyroyal	C	None	1	1	21/01/2004
11773	Equisetopsida	Lamiaceae	*Stachys arvensis*	stagger weed	None	None	1	1	11/09/2005
9076	Equisetopsida	Lamiaceae	*Teucrium argutum*	None	C	None	3	4	10/01/2011
36566	Equisetopsida	Lamiaceae	*Teucrium modestum*	None	C	None	1	1	31/07/1921
15961	Equisetopsida	Lamiaceae	*Vitex acuminata*	None	C	None	0	1	01/07/1995
18814	Equisetopsida	Lamiaceae	*Vitex lignum-vitae*	None	C	None	3	10	20/09/2019
15964	Equisetopsida	Lamiaceae	*Vitex melicopea*	None	C	None	1	2	19/04/1999
13729	Equisetopsida	Lamiaceae	*Westringia blakeana*	None	NT	None	1	1	22/10/1998
17858	Equisetopsida	Lauraceae	*Beilschmiedia elliptica*	grey walnut	C	None	0	2	10/01/2011
17859	Equisetopsida	Lauraceae	*Beilschmiedia obtusifolia*	hard bolly gum	C	None	0	3	20/09/2019
17703	Equisetopsida	Lauraceae	*Cassytha filiformis*	dodder laurel	C	None	0	1	20/10/2018
17704	Equisetopsida	Lauraceae	*Cassytha glabella forma glabella*	None	C	None	1	1	04/09/1999
11859	Equisetopsida	Lauraceae	*Cinnamomum camphora*	camphor laurel	None	None	0	2	22/05/2003
17645	Equisetopsida	Lauraceae	*Cinnamomum oliveri*	Oliver's sassafras	C	None	0	4	31/08/2020
17543	Equisetopsida	Lauraceae	*Cryptocarya*	None	None	None	0	2	30/06/2016
17570	Equisetopsida	Lauraceae	*Cryptocarya bidwillii*	yellow laurel	C	None	0	2	19/04/1999
17578	Equisetopsida	Lauraceae	*Cryptocarya glaucescens*	None	C	None	1	5	20/09/2019
17580	Equisetopsida	Lauraceae	*Cryptocarya hypospodia*	north Queensland purple laurel	C	None	0	1	19/04/1999
17581	Equisetopsida	Lauraceae	*Cryptocarya laevigata*	None	C	None	6	13	31/08/2020
11866	Equisetopsida	Lauraceae	*Cryptocarya macdonaldii*	McDonald's laurel	C	None	0	5	31/08/2020
14700	Equisetopsida	Lauraceae	*Cryptocarya microneura*	murrogun	C	None	0	3	20/09/2019
40348	Equisetopsida	Lauraceae	*Cryptocarya obovata var. tropica*	None	C	None	0	3	31/08/2020
11865	Equisetopsida	Lauraceae	*Cryptocarya sclerophylla*	totempole	C	None	2	7	30/06/2016

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17541	Equisetopsida	Lauraceae	*Cryptocarya triplinervis*	None	C	None	0	6	30/06/2016
17539	Equisetopsida	Lauraceae	*Cryptocarya triplinervis var. pubens*	None	C	None	0	3	20/09/2019
9129	Equisetopsida	Lauraceae	*Cryptocarya triplinervis var. triplinervis*	None	C	None	0	4	31/08/2020
17299	Equisetopsida	Lauraceae	*Endiandra compressa*	None	C	None	2	2	23/12/1996
17303	Equisetopsida	Lauraceae	*Endiandra discolor*	domatia tree	C	None	0	2	23/07/2013
11820	Equisetopsida	Lauraceae	*Endiandra muelleri*	None	C	None	0	1	10/01/2011
9502	Equisetopsida	Lauraceae	*Endiandra muelleri subsp. muelleri*	None	C	None	1	1	02/12/1993
11823	Equisetopsida	Lauraceae	*Endiandra pubens*	hairy walnut	C	None	2	3	13/09/2013
9765	Equisetopsida	Lauraceae	*Litsea australis*	brown bolly gum	C	None	0	1	10/01/2011
16760	Equisetopsida	Lauraceae	*Litsea leefeana*	None	C	None	0	4	20/09/2019
16761	Equisetopsida	Lauraceae	*Litsea reticulata*	None	C	None	1	4	23/07/2013
16618	Equisetopsida	Lauraceae	*Neolitsea australiensis*	green bolly gum	C	None	1	1	29/11/1993
16619	Equisetopsida	Lauraceae	*Neolitsea dealbata*	white bolly gum	C	None	0	7	20/09/2019
14724	Equisetopsida	Laxmanniaceae	*Cordyline petiolaris*	large-leaved palm lily	C	None	1	7	23/07/2013
14725	Equisetopsida	Laxmanniaceae	*Cordyline rubra*	red-fruited palm lily	C	None	0	11	31/08/2020
15339	Equisetopsida	Laxmanniaceae	*Eustrephus latifolius*	wombat berry	C	None	0	1	19/04/1999
40458	Equisetopsida	Laxmanniaceae	*Eustrephus latifolius subforma fimbriatus*	None	C	None	0	2	25/09/2020
13587	Equisetopsida	Laxmanniaceae	*Lomandra confertifolia*	None	C	None	0	1	10/01/2011
13869	Equisetopsida	Laxmanniaceae	*Lomandra confertifolia subsp. confertifolia*	None	C	None	1	1	21/09/1996
14415	Equisetopsida	Laxmanniaceae	*Lomandra confertifolia subsp. pallida*	None	C	None	1	2	23/07/2013
16770	Equisetopsida	Laxmanniaceae	*Lomandra filiformis subsp. filiformis*	None	C	None	1	2	23/07/2013
16772	Equisetopsida	Laxmanniaceae	*Lomandra hystrix*	None	C	None	1	4	31/08/2020
16773	Equisetopsida	Laxmanniaceae	*Lomandra laxa*	broad-leaved matrush	C	None	1	1	31/03/1967
16776	Equisetopsida	Laxmanniaceae	*Lomandra longifolia*	None	C	None	0	3	23/07/2013
16777	Equisetopsida	Laxmanniaceae	*Lomandra multiflora subsp. multiflora*	None	C	None	0	4	25/09/2020
14414	Equisetopsida	Laxmanniaceae	*Lomandra spicata*	jungle matrush	C	None	0	1	23/07/2013
15714	Equisetopsida	Leguminosae	*Acacia*	None	None	None	0	1	30/03/2016
15827	Equisetopsida	Leguminosae	*Acacia aulacocarpa*	None	C	None	0	5	11/06/2002
11888	Equisetopsida	Leguminosae	*Acacia bakeri*	marblewood	C	None	0	4	31/08/2020
21915	Equisetopsida	Leguminosae	*Acacia disparrima subsp. disparrima*	None	C	None	3	8	25/09/2020

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15799	Equisetopsida	Leguminosae	*Acacia falcata*	sickle wattle	C	None	0	2	17/08/2018
15758	Equisetopsida	Leguminosae	*Acacia implexa*	lightwood	C	None	0	1	02/11/2018
14914	Equisetopsida	Leguminosae	*Acacia irrorata*	None	C	None	0	1	05/05/2016
6372	Equisetopsida	Leguminosae	*Acacia juncifolia*	None	C	None	0	1	20/10/2018
14066	Equisetopsida	Leguminosae	*Acacia leiocalyx subsp. leiocalyx*	None	C	None	0	1	25/09/2020
14865	Equisetopsida	Leguminosae	*Acacia longissima*	None	C	None	0	1	23/07/2013
15772	Equisetopsida	Leguminosae	*Acacia maidenii*	Maiden's wattle	C	None	0	4	23/07/2013
15720	Equisetopsida	Leguminosae	*Acacia melanoxylon*	blackwood	C	None	2	15	25/09/2020
15726	Equisetopsida	Leguminosae	*Acacia myrtifolia*	None	C	None	1	1	04/09/1999
11845	Equisetopsida	Leguminosae	*Acacia oshanesii*	None	C	None	0	1	23/07/2013
11510	Equisetopsida	Leguminosae	*Albizia lebbeck*	Indian siris	C	None	1	1	22/04/2005
15638	Equisetopsida	Leguminosae	*Archidendron grandiflorum*	lace flower tree	C	None	0	1	10/01/2011
41294	Equisetopsida	Leguminosae	*Austrocallerya megasperma*	None	C	None	0	6	31/08/2020
15609	Equisetopsida	Leguminosae	*Austrosteenisia blackii*	bloodvine	C	None	0	4	19/04/1999
18175	Equisetopsida	Leguminosae	*Austrosteenisia blackii var. blackii*	None	C	None	0	3	31/08/2020
34546	Equisetopsida	Leguminosae	*Bossiaea dasycarpa*	None	C	None	1	1	21/09/1996
15539	Equisetopsida	Leguminosae	*Castanospermum australe*	black bean	C	None	1	3	30/06/2016
21834	Equisetopsida	Leguminosae	*Chamaecrista nomame*	None	C	None	0	1	30/03/2016
7678	Equisetopsida	Leguminosae	*Chamaecrista nomame var. nomame*	None	C	None	1	1	21/01/2004
15478	Equisetopsida	Leguminosae	*Crotalaria*	None	None	None	0	1	30/03/2016
14693	Equisetopsida	Leguminosae	*Crotalaria brevis*	None	C	None	1	1	16/03/1989
15468	Equisetopsida	Leguminosae	*Crotalaria lanceolata subsp. lanceolata*	None	None	None	1	1	12/03/2004
14672	Equisetopsida	Leguminosae	*Dalbergia sissoo*	None	None	None	1	1	20/04/1993
14623	Equisetopsida	Leguminosae	*Daviesia acicularis*	None	C	None	1	1	04/09/1999
15444	Equisetopsida	Leguminosae	*Daviesia genistifolia*	broom bitter pea	C	None	1	1	16/03/1989
21930	Equisetopsida	Leguminosae	*Daviesia ulicifolia subsp. ulicifolia*	None	C	None	1	1	16/09/2003
15449	Equisetopsida	Leguminosae	*Daviesia wyattiana*	long-leaved bitter pea	C	None	0	1	17/08/2018
14642	Equisetopsida	Leguminosae	*Desmodium gangeticum*	None	C	None	1	1	21/01/2004
15457	Equisetopsida	Leguminosae	*Desmodium gunnii*	None	C	None	0	2	02/11/2018
15460	Equisetopsida	Leguminosae	*Desmodium rhytidophyllum*	None	C	None	1	2	23/07/2013
13038	Equisetopsida	Leguminosae	*Desmodium uncinatum*	None	None	None	0	1	30/03/2016
15334	Equisetopsida	Leguminosae	*Erythrina vespertilio*	None	C	None	0	1	04/05/2005
14518	Equisetopsida	Leguminosae	*Gleditsia triacanthos*	honey locust	None	None	2	2	13/04/1987
7603	Equisetopsida	Leguminosae	*Glycine clandestina*	None	C	None	0	2	02/11/2018

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15352	Equisetopsida	Leguminosae	*Glycine clandestina var. clandestina*	None	C	None	1	1	16/03/1989
15355	Equisetopsida	Leguminosae	*Glycine microphylla*	None	C	None	1	1	29/01/1997
15356	Equisetopsida	Leguminosae	*Glycine tabacina*	glycine pea	C	None	1	1	23/12/1996
15303	Equisetopsida	Leguminosae	*Gompholobium pinnatum*	poor mans gold	C	None	1	2	17/08/2018
15309	Equisetopsida	Leguminosae	*Hardenbergia violacea*	None	C	None	3	7	17/08/2018
15323	Equisetopsida	Leguminosae	*Hovea acutifolia*	None	C	None	2	6	20/09/2019
22172	Equisetopsida	Leguminosae	*Hovea lorata*	None	C	None	1	1	01/09/2011
18672	Equisetopsida	Leguminosae	*Indigofera australis subsp. australis*	None	C	None	1	3	23/07/2013
12967	Equisetopsida	Leguminosae	*Indigofera suffruticosa*	None	None	None	1	1	14/11/2006
15299	Equisetopsida	Leguminosae	*Indigofera tinctoria*	None	None	None	1	1	09/05/2014
15260	Equisetopsida	Leguminosae	*Jacksonia scoparia*	None	C	None	0	3	25/09/2020
15220	Equisetopsida	Leguminosae	*Lespedeza juncea subsp. sericea*	perennial lespedeza	C	None	2	2	21/01/2004
14445	Equisetopsida	Leguminosae	*Leucaena leucocephala*	None	None	None	0	1	12/08/2017
15235	Equisetopsida	Leguminosae	*Macroptilium atropurpureum*	siratro	None	None	0	1	30/03/2016
18762	Equisetopsida	Leguminosae	*Macrotyloma axillare var. axillare*	None	None	None	1	1	08/05/1991
36116	Equisetopsida	Leguminosae	*Mezoneuron brachycarpum*	None	C	None	0	2	19/04/1999
36115	Equisetopsida	Leguminosae	*Mezoneuron nitens*	None	C	None	1	1	01/11/2003
36129	Equisetopsida	Leguminosae	*Mezoneuron scortechinii*	None	C	None	0	7	20/09/2019
15192	Equisetopsida	Leguminosae	*Mirbelia rubiifolia*	heathy mirbelia	C	None	1	1	13/09/1996
9083	Equisetopsida	Leguminosae	*Pararchidendron pruinosum*	None	C	None	1	3	10/10/1999
10824	Equisetopsida	Leguminosae	*Platylobium formosum*	flat pea	C	None	1	2	02/11/2018
6007	Equisetopsida	Leguminosae	*Podolobium aciculiferum*	None	C	None	0	1	23/07/2013
6008	Equisetopsida	Leguminosae	*Podolobium ilicifolium*	None	C	None	1	4	02/11/2018
15133	Equisetopsida	Leguminosae	*Pultenaea cunninghamii*	prickly pea	C	None	1	1	21/09/1996
15082	Equisetopsida	Leguminosae	*Pultenaea flexilis*	None	C	None	1	1	21/09/1996
15087	Equisetopsida	Leguminosae	*Pultenaea petiolaris*	None	C	None	1	1	21/09/1996
15088	Equisetopsida	Leguminosae	*Pultenaea retusa*	None	C	None	2	2	02/10/2021
15092	Equisetopsida	Leguminosae	*Pultenaea villosa*	hairy bush pea	C	None	1	1	04/09/1999
15099	Equisetopsida	Leguminosae	*Rhynchosia acuminatissima*	None	C	None	1	1	24/11/1998
14242	Equisetopsida	Leguminosae	*Senna acclinis*	None	C	None	0	2	23/07/2013
15576	Equisetopsida	Leguminosae	*Senna alata*	None	None	None	0	1	23/04/2018
14244	Equisetopsida	Leguminosae	*Senna clavigera*	None	C	None	1	1	18/11/2006
24648	Equisetopsida	Leguminosae	*Senna septemtrionalis*	None	None	None	1	1	01/04/1995
36634	Equisetopsida	Leguminosae	*Solori involuta*	None	C	None	1	4	23/07/2013
8135	Equisetopsida	Leguminosae	*Sphaerolobium minus*	None	C	None	1	1	27/10/1990
8254	Equisetopsida	Leguminosae	*Swainsona queenslandica*	None	C	None	2	2	13/09/2010

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12886	Equisetopsida	Leguminosae	*Trifolium dubium*	yellow sucking clover	None	None	0	1	30/03/2016
25629	Equisetopsida	Lejeuneaceae	*Lejeunea flava subsp. orientalis*	None	C	None	1	1	07/05/1984
17656	Equisetopsida	Leptaulaceae	*Citronella moorei*	churnwood	C	None	0	1	23/07/2013
13472	Equisetopsida	Linderniaceae	*Artanema fimbriatum*	None	C	None	0	1	10/01/2011
7462	Equisetopsida	Loganiaceae	*Strychnos psilosperma*	strychnine tree	C	None	0	3	23/07/2013
14847	Equisetopsida	Loranthaceae	*Amyema cambagei*	None	C	None	1	1	19/04/1993
13053	Equisetopsida	Loranthaceae	*Amyema congener subsp. congener*	None	C	None	0	2	20/09/2019
17454	Equisetopsida	Loranthaceae	*Dendrophthoe vitellina*	long-flowered mistletoe	C	None	1	1	16/09/2003
11688	Equisetopsida	Lygodiaceae	*Lygodium japonicum*	None	None	None	1	1	26/11/1993
14262	Equisetopsida	Lythraceae	*Rotala rotundifolia*	None	None	None	1	1	26/09/2021
18089	Equisetopsida	Malvaceae	*Abutilon oxycarpum*	None	C	None	0	2	10/01/2011
8340	Equisetopsida	Malvaceae	*Abutilon oxycarpum var. oxycarpum*	None	C	None	1	1	01/04/1993
16955	Equisetopsida	Malvaceae	*Hibiscus heterophyllus*	None	C	None	1	6	23/07/2013
12943	Equisetopsida	Malvaceae	*Malvastrum americanum var. stellatum*	None	C	None	3	3	15/03/2004
12949	Equisetopsida	Malvaceae	*Modiola caroliniana*	red-flowered mallow	None	None	1	1	10/10/1999
16195	Equisetopsida	Malvaceae	*Sida cordifolia*	None	None	None	0	1	30/03/2016
22197	Equisetopsida	Malvaceae	*Sida hackettiana*	None	C	None	0	1	30/03/2016
16146	Equisetopsida	Malvaceae	*Sida rhombifolia*	None	None	None	0	3	30/03/2016
15833	Equisetopsida	Meliaceae	*Anthocarapa nitidula*	incense cedar	C	None	6	11	30/06/2016
32684	Equisetopsida	Meliaceae	*Cedrela odorata*	None	None	None	1	1	03/12/2007
14620	Equisetopsida	Meliaceae	*Dysoxylum fraserianum*	rose mahogany	C	None	1	2	10/01/2011
8077	Equisetopsida	Meliaceae	*Dysoxylum mollissimum subsp. molle*	miva mahogany	C	None	1	2	23/07/2013
17367	Equisetopsida	Meliaceae	*Dysoxylum rufum*	None	C	None	0	2	23/07/2013
16661	Equisetopsida	Meliaceae	*Melia azedarach*	white cedar	C	None	0	9	25/09/2020
16559	Equisetopsida	Meliaceae	*Owenia venosa*	crow's apple	C	None	2	3	23/07/2013
14191	Equisetopsida	Meliaceae	*Synoum glandulosum subsp. glandulosum*	None	C	None	1	4	20/09/2019
16004	Equisetopsida	Meliaceae	*Toona ciliata*	red cedar	C	None	12	16	20/09/2019
15987	Equisetopsida	Meliaceae	*Turraea pubescens*	native honeysuckle	C	None	1	4	23/07/2013
13376	Equisetopsida	Menispermaceae	*Carronia multisepalea*	None	C	None	0	1	13/09/2013
16860	Equisetopsida	Menispermaceae	*Legnephora moorei*	None	C	None	2	7	05/05/2016
14323	Equisetopsida	Menispermaceae	*Pleogyne australis*	wiry grape	C	None	0	6	23/07/2013
14269	Equisetopsida	Menispermaceae	*Sarcopetalum harveyanum*	pearl vine	C	None	0	2	20/09/2019

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9647	Equisetopsida	Menispermaceae	*Stephania japonica*	None	C	None	0	5	23/07/2013
16100	Equisetopsida	Menispermaceae	*Stephania japonica var. discolor*	None	C	None	0	3	25/09/2020
3288	Equisetopsida	Menispermaceae	*Stephania renifolia*	None	C	None	1	1	25/11/1998
15998	Equisetopsida	Menispermaceae	*Tinospora smilacina*	snakevine	C	None	0	1	19/04/1999
14327	Equisetopsida	Menyanthaceae	*Nymphoides indica*	water snowflake	SL	None	0	1	23/07/2013
24877	Equisetopsida	Meteoriaceae	*Papillaria flexicaulis*	None	C	None	1	1	14/02/1989
14519	Equisetopsida	Molluginaceae	*Glinus oppositifolius*	None	C	None	1	1	23/12/1996
13320	Equisetopsida	Monimiaceae	*Wilkiea huegeliana*	veiny wilkiea	C	None	0	4	20/09/2019
14131	Equisetopsida	Monimiaceae	*Wilkiea macrophylla*	large-leaved wilkiea	C	None	3	11	20/09/2019
17132	Equisetopsida	Moraceae	*Ficus coronata*	creek sandpaper fig	C	None	1	7	31/08/2020
17135	Equisetopsida	Moraceae	*Ficus fraseri*	white sandpaper fig	C	None	0	4	20/09/2019
35581	Equisetopsida	Moraceae	*Ficus henneana*	None	C	None	0	1	19/04/1999
19859	Equisetopsida	Moraceae	*Ficus macrophylla*	None	C	None	0	1	10/01/2011
8727	Equisetopsida	Moraceae	*Ficus macrophylla forma macrophylla*	Moreton Bay fig	C	None	0	4	19/04/1999
17143	Equisetopsida	Moraceae	*Ficus obliqua*	None	C	None	0	3	23/07/2013
17144	Equisetopsida	Moraceae	*Ficus opposita*	None	C	None	0	1	19/04/1999
8827	Equisetopsida	Moraceae	*Ficus racemosa var. racemosa*	None	C	None	2	2	25/10/2008
13340	Equisetopsida	Moraceae	*Ficus rubiginosa*	Port Jackson fig	C	None	0	1	05/05/2016
27842	Equisetopsida	Moraceae	*Ficus rubiginosa forma rubiginosa*	None	C	None	0	2	23/07/2013
17154	Equisetopsida	Moraceae	*Ficus virens var. virens*	None	C	None	0	1	19/04/1999
17157	Equisetopsida	Moraceae	*Ficus watkinsiana*	green-leaved Moreton Bay fig	C	None	1	1	09/01/1990
13825	Equisetopsida	Moraceae	*Maclura cochinchinensis*	cockspur thorn	C	None	0	10	31/08/2020
9118	Equisetopsida	Moraceae	*Streblus brunonianus*	whalebone tree	C	None	0	7	31/08/2020
6402	Equisetopsida	Moraceae	*Trophis scandens subsp. scandens*	None	C	None	0	6	31/08/2020
17344	Equisetopsida	Myrsinaceae	*Embelia australiana*	embelia	C	None	0	7	20/09/2019
2324	Equisetopsida	Myrsinaceae	*Myrsine angusta*	None	C	None	1	3	23/07/2013
30867	Equisetopsida	Myrsinaceae	*Myrsine subsessilis*	None	C	None	0	1	19/04/1999
30315	Equisetopsida	Myrsinaceae	*Myrsine subsessilis subsp. subsessilis*	None	C	None	0	1	23/07/2013
30309	Equisetopsida	Myrsinaceae	*Myrsine variabilis*	None	C	None	0	4	25/09/2020
16063	Equisetopsida	Myrsinaceae	*Tapeinosperma pseudojambosa*	tapeinosperma	C	None	0	1	22/05/2003

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18108	Equisetopsida	Myrtaceae	*Acmena smithii*	lillypilly satinash	C	None	1	5	31/08/2020
17998	Equisetopsida	Myrtaceae	*Angophora floribunda*	rough-barked apple	C	None	0	2	04/05/2005
17999	Equisetopsida	Myrtaceae	*Angophora leiocarpa*	rusty gum	C	None	0	2	30/03/2016
18000	Equisetopsida	Myrtaceae	*Angophora woodsiana*	smudgee	C	None	0	1	30/03/2016
17961	Equisetopsida	Myrtaceae	*Archirhodomyrtus beckleri*	rose myrtle	C	None	0	1	23/07/2013
17881	Equisetopsida	Myrtaceae	*Backhousia citriodora*	lemon ironwood	C	None	1	1	30/11/1993
17883	Equisetopsida	Myrtaceae	*Backhousia myrtifolia*	carrol	C	None	2	5	05/05/2016
34781	Equisetopsida	Myrtaceae	*Backhousia subargentea*	None	C	None	1	5	31/08/2020
6531	Equisetopsida	Myrtaceae	*Corymbia citriodora*	spotted gum	C	None	0	1	30/03/2016
26382	Equisetopsida	Myrtaceae	*Corymbia citriodora subsp. variegata*	None	C	None	0	3	25/09/2020
6445	Equisetopsida	Myrtaceae	*Corymbia intermedia*	pink bloodwood	C	None	1	10	23/07/2013
6572	Equisetopsida	Myrtaceae	*Corymbia tessellaris*	Moreton Bay ash	C	None	0	1	30/03/2016
6443	Equisetopsida	Myrtaceae	*Corymbia trachyphloia subsp. trachyphloia*	None	C	None	0	4	20/07/1999
15865	Equisetopsida	Myrtaceae	*Decaspermum humile*	silky myrtle	C	None	0	4	20/09/2019
17207	Equisetopsida	Myrtaceae	*Eucalyptus*	None	None	None	0	1	30/03/2016
17290	Equisetopsida	Myrtaceae	*Eucalyptus acmenoides*	None	C	None	2	9	25/09/2020
12184	Equisetopsida	Myrtaceae	*Eucalyptus biturbinata*	None	C	None	2	6	04/05/2005
8935	Equisetopsida	Myrtaceae	*Eucalyptus carnea*	None	C	None	1	4	02/11/2018
17252	Equisetopsida	Myrtaceae	*Eucalyptus crebra*	narrow-leaved red ironbark	C	None	1	1	06/11/1996
17261	Equisetopsida	Myrtaceae	*Eucalyptus eugenioides*	None	C	None	1	1	21/01/2004
17262	Equisetopsida	Myrtaceae	*Eucalyptus exserta*	Queensland peppermint	C	None	1	2	18/08/2017
12500	Equisetopsida	Myrtaceae	*Eucalyptus fibrosa subsp. fibrosa*	None	C	None	1	2	18/11/2006
17265	Equisetopsida	Myrtaceae	*Eucalyptus grandis*	flooded gum	C	None	0	6	31/08/2020
17223	Equisetopsida	Myrtaceae	*Eucalyptus melliodora*	yellow box	C	None	0	1	07/02/2001
17225	Equisetopsida	Myrtaceae	*Eucalyptus microcorys*	None	C	None	0	10	25/09/2020
17229	Equisetopsida	Myrtaceae	*Eucalyptus moluccana*	gum-topped box	C	None	1	2	30/03/2016
17240	Equisetopsida	Myrtaceae	*Eucalyptus pilularis*	blackbutt	C	None	0	4	20/07/1999
17189	Equisetopsida	Myrtaceae	*Eucalyptus propinqua*	small-fruited grey gum	C	None	0	7	13/09/2013
40417	Equisetopsida	Myrtaceae	*Eucalyptus propinqua var. major*	None	C	None	0	4	25/09/2020
6513	Equisetopsida	Myrtaceae	*Eucalyptus racemosa subsp. racemosa*	scribbly gum	C	None	2	6	20/07/1999
17192	Equisetopsida	Myrtaceae	*Eucalyptus resinifera*	red mahogany	C	None	0	4	20/07/1999
17194	Equisetopsida	Myrtaceae	*Eucalyptus saligna subsp. saligna*	None	C	None	0	1	07/02/2001

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12465	Equisetopsida	Myrtaceae	*Eucalyptus siderophloia*	None	C	None	3	10	13/09/2013
40445	Equisetopsida	Myrtaceae	*Eucalyptus siderophloia forma decorticans*	None	C	None	0	5	25/09/2020
17204	Equisetopsida	Myrtaceae	*Eucalyptus tereticornis*	None	C	None	0	6	20/09/2019
26471	Equisetopsida	Myrtaceae	*Eucalyptus tereticornis subsp. tereticornis*	None	C	None	1	1	08/01/1973
12468	Equisetopsida	Myrtaceae	*Eucalyptus tindaliae*	Queensland white stringybark	C	None	1	1	26/08/1984
25908	Equisetopsida	Myrtaceae	*Gossia acmenoides*	None	C	None	2	6	30/06/2016
27383	Equisetopsida	Myrtaceae	*Gossia bidwillii*	None	C	None	0	7	30/06/2016
27387	Equisetopsida	Myrtaceae	*Gossia hillii*	None	C	None	0	2	10/01/2011
25952	Equisetopsida	Myrtaceae	*Gossia punctata*	None	C	None	2	2	20/05/1994
16821	Equisetopsida	Myrtaceae	*Leptospermum microcarpum*	small-fruited tea-tree	C	None	2	2	02/10/2021
16827	Equisetopsida	Myrtaceae	*Leptospermum trinervium*	woolly tea-tree	C	None	1	1	13/09/1996
16780	Equisetopsida	Myrtaceae	*Lophostemon confertus*	brush box	C	None	0	17	25/09/2020
16730	Equisetopsida	Myrtaceae	*Lophostemon suaveolens*	swamp box	C	None	0	5	05/05/2016
16684	Equisetopsida	Myrtaceae	*Melaleuca bracteata*	None	C	None	1	1	06/11/1996
35653	Equisetopsida	Myrtaceae	*Melaleuca flammea*	None	C	None	1	1	01/10/1984
18771	Equisetopsida	Myrtaceae	*Melaleuca linariifolia*	snow-in summer	C	None	0	1	18/01/1994
31377	Equisetopsida	Myrtaceae	*Melaleuca salicina*	None	C	None	0	4	20/09/2019
13424	Equisetopsida	Myrtaceae	*Melaleuca styphelioides*	None	C	None	1	1	30/11/1993
31375	Equisetopsida	Myrtaceae	*Melaleuca viminalis*	None	C	None	0	1	05/05/2016
14313	Equisetopsida	Myrtaceae	*Pilidiostigma glabrum*	plum myrtle	C	None	0	1	01/07/1995
16481	Equisetopsida	Myrtaceae	*Pilidiostigma rhytispermum*	None	C	None	2	7	31/08/2020
13401	Equisetopsida	Myrtaceae	*Rhodamnia acuminata*	cooloola ironwood	C	None	0	1	23/07/2013
13402	Equisetopsida	Myrtaceae	*Rhodamnia argentea*	white myrtle	C	None	1	2	01/07/1995
13406	Equisetopsida	Myrtaceae	*Rhodamnia dumicola*	rib-fruited malletwood	E	None	1	6	31/08/2020
14255	Equisetopsida	Myrtaceae	*Rhodamnia rubescens*	scrub turpentine	CR	CE	0	4	31/08/2020
16290	Equisetopsida	Myrtaceae	*Rhodomyrtus psidioides*	native guava	CR	CE	1	2	10/01/2011
31853	Equisetopsida	Myrtaceae	*Sannantha bidwillii*	None	C	None	0	1	20/09/2019
31851	Equisetopsida	Myrtaceae	*Sannantha collina*	None	C	None	1	1	13/04/1987
6212	Equisetopsida	Myrtaceae	*Syncarpia glomulifera subsp. glomulifera*	None	C	None	0	5	20/09/2019
6185	Equisetopsida	Myrtaceae	*Syncarpia verecunda*	None	C	None	1	1	19/04/1993
16078	Equisetopsida	Myrtaceae	*Syzygium australe*	scrub cherry	C	None	2	5	05/05/2016
14194	Equisetopsida	Myrtaceae	*Syzygium francisii*	giant watergum	C	None	0	6	31/08/2020
16049	Equisetopsida	Myrtaceae	*Syzygium oleosum*	blue cherry	C	None	0	2	23/07/2013
15980	Equisetopsida	Myrtaceae	*Tristaniopsis laurina*	None	C	None	0	2	05/05/2016

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15857	Equisetopsida	Myrtaceae	*Waterhousea floribunda*	weeping lilly pilly	C	None	2	5	20/09/2019
14366	Equisetopsida	Najadaceae	*Najas tenuifolia*	water nymph	SL	None	1	1	11/04/2019
16571	Equisetopsida	Nephrolepidaceae	*Nephrolepis cordifolia*	fishbone fern	C	None	0	1	19/04/1999
16453	Equisetopsida	Nyctaginaceae	*Pisonia aculeata*	thorny pisonia	C	None	1	1	01/04/1995
13390	Equisetopsida	Ochnaceae	*Ochna serrulata*	ochna	None	None	0	3	30/03/2016
31254	Equisetopsida	Oleaceae	*Fraxinus griffithii*	None	None	None	1	1	16/03/2010
16839	Equisetopsida	Oleaceae	*Jasminum didymum*	None	C	None	0	2	01/07/1995
16838	Equisetopsida	Oleaceae	*Jasminum didymum subsp. racemosum*	None	C	None	1	2	18/01/2001
9461	Equisetopsida	Oleaceae	*Jasminum simplicifolium*	None	C	None	0	1	01/07/1995
16840	Equisetopsida	Oleaceae	*Jasminum simplicifolium subsp. australiense*	None	C	None	0	1	19/04/1999
13417	Equisetopsida	Oleaceae	*Ligustrum lucidum*	large-leaved privet	None	None	2	2	31/03/2001
16795	Equisetopsida	Oleaceae	*Ligustrum sinense*	small-leaved privet	None	None	0	1	22/05/2003
16585	Equisetopsida	Oleaceae	*Notelaea*	None	None	None	0	1	30/03/2016
16579	Equisetopsida	Oleaceae	*Notelaea johnsonii*	veinless mock-olive	C	None	0	1	19/04/1999
13439	Equisetopsida	Oleaceae	*Notelaea longifolia*	None	C	None	0	1	10/01/2011
14378	Equisetopsida	Oleaceae	*Notelaea ovata*	forest olive	C	None	0	1	17/08/2018
16583	Equisetopsida	Oleaceae	*Notelaea punctata*	None	C	None	0	1	23/07/2013
16594	Equisetopsida	Oleaceae	*Olea paniculata*	None	C	None	0	4	23/07/2013
13420	Equisetopsida	Onagraceae	*Ludwigia octovalvis*	willow primrose	C	None	1	1	04/11/1996
9334	Equisetopsida	Onagraceae	*Oenothera indecora subsp. bonariensis*	None	None	None	1	1	10/10/1999
13391	Equisetopsida	Onagraceae	*Oenothera rosea*	rose evening primrose	None	None	3	3	02/10/2021
41727	Equisetopsida	Ophioglossaceae	*Ophioderma pendula*	None	C	None	0	1	10/01/2011
14087	Equisetopsida	Orchidaceae	*Acianthus fornicatus*	pixie caps	SL	None	5	5	16/06/1999
15816	Equisetopsida	Orchidaceae	*Arthrochilus irritabilis*	leafy elbow orchid	SL	None	1	1	27/02/1995
8527	Equisetopsida	Orchidaceae	*Arthrochilus prolixus*	None	SL	None	1	1	06/01/1992
10323	Equisetopsida	Orchidaceae	*Bulbophyllum schillerianum*	red rope orchid	SL	None	2	2	16/06/1999
13322	Equisetopsida	Orchidaceae	*Caladenia*	None	None	None	2	2	14/08/1992
13444	Equisetopsida	Orchidaceae	*Caladenia carnea*	None	SL	None	1	1	10/09/1995
17790	Equisetopsida	Orchidaceae	*Caladenia catenata*	None	SL	None	3	3	16/06/1999
9297	Equisetopsida	Orchidaceae	*Caladenia picta*	None	SL	None	1	1	10/09/1995
14760	Equisetopsida	Orchidaceae	*Calanthe triplicata*	christmas orchid	SL	None	0	3	10/01/2011
14140	Equisetopsida	Orchidaceae	*Calochilus campestris*	copper beard orchid	SL	None	2	2	10/09/1995
36435	Equisetopsida	Orchidaceae	*Cestichis swenssonii*	None	SL	None	2	2	16/06/1999

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2163	Equisetopsida	Orchidaceae	*Chiloglottis diphylla*	None	SL	None	1	2	22/03/1995
9260	Equisetopsida	Orchidaceae	*Chiloglottis sylvestris*	None	SL	None	3	3	16/05/1995
36427	Equisetopsida	Orchidaceae	*Corunastylis*	None	None	None	4	4	08/02/2006
27531	Equisetopsida	Orchidaceae	*Corunastylis acuminata*	None	SL	None	1	1	06/01/1992
27535	Equisetopsida	Orchidaceae	*Corunastylis cranei*	None	V	None	4	4	04/03/1992
9265	Equisetopsida	Orchidaceae	*Corybas barbarae*	helmet orchid	SL	None	2	2	16/06/1999
13277	Equisetopsida	Orchidaceae	*Cryptostylis erecta*	bonnet orchid	SL	None	1	1	09/01/1991
13278	Equisetopsida	Orchidaceae	*Cryptostylis subulata*	large tongue orchid	SL	None	3	3	22/05/1999
17505	Equisetopsida	Orchidaceae	*Cymbidium canaliculatum*	None	SL	None	0	1	30/03/2016
13963	Equisetopsida	Orchidaceae	*Cymbidium madidum*	None	SL	None	1	4	23/07/2013
17506	Equisetopsida	Orchidaceae	*Cymbidium suave*	None	SL	None	1	3	23/07/2013
13280	Equisetopsida	Orchidaceae	*Dendrobium aemulum*	ironbark orchid	SL	None	3	4	19/04/1999
12834	Equisetopsida	Orchidaceae	*Dendrobium gracilicaule*	slender orchid	SL	None	3	4	19/04/1999
14633	Equisetopsida	Orchidaceae	*Dendrobium kingianum subsp. kingianum*	None	SL	None	4	5	19/04/1999
14634	Equisetopsida	Orchidaceae	*Dendrobium monophyllum*	None	SL	None	1	3	19/04/1999
14631	Equisetopsida	Orchidaceae	*Dendrobium speciosum*	None	SL	None	1	4	05/05/2016
9074	Equisetopsida	Orchidaceae	*Dendrobium speciosum subsp. grandiflorum*	None	SL	None	2	2	24/10/1993
12831	Equisetopsida	Orchidaceae	*Dendrobium tetragonum*	tree spider orchid	SL	None	3	5	10/01/2011
13976	Equisetopsida	Orchidaceae	*Dendrobium x delicatum*	None	SL	None	1	1	23/08/1995
5768	Equisetopsida	Orchidaceae	*Dockrillia bowmanii*	scrub pencil orchid	SL	None	1	2	19/04/1999
5779	Equisetopsida	Orchidaceae	*Dockrillia linguiformis*	tongue orchid	SL	None	3	3	24/10/1993
5803	Equisetopsida	Orchidaceae	*Dockrillia schoenina*	pencil orchid	SL	None	2	2	11/09/1995
5671	Equisetopsida	Orchidaceae	*Dockrillia teretifolia*	rat's tail orchid	SL	None	2	3	19/04/1999
13952	Equisetopsida	Orchidaceae	*Eriochilus cucullatus*	None	SL	None	2	2	15/04/1990
17287	Equisetopsida	Orchidaceae	*Erythrorchis cassythoides*	climbing orchid	SL	None	2	2	14/08/1992
8197	Equisetopsida	Orchidaceae	*Geodorum densiflorum*	pink nodding orchid	SL	None	1	2	30/01/2018
13203	Equisetopsida	Orchidaceae	*Glossodia minor*	small wax lip orchid	SL	None	1	1	10/09/1995
12782	Equisetopsida	Orchidaceae	*Lyperanthus suaveolens*	brown beaks	SL	None	1	1	10/09/1995
14404	Equisetopsida	Orchidaceae	*Microtis*	None	None	None	1	1	13/09/1992
9455	Equisetopsida	Orchidaceae	*Microtis rara*	scented onion orchid	SL	None	1	1	10/09/1995
12719	Equisetopsida	Orchidaceae	*Peristeranthus hillii*	None	SL	None	1	3	23/07/2013
12734	Equisetopsida	Orchidaceae	*Plectorrhiza brevilabris*	None	SL	None	2	2	16/05/1995
14320	Equisetopsida	Orchidaceae	*Plectorrhiza tridentata*	tangle orchid	SL	None	2	4	19/04/1999
12704	Equisetopsida	Orchidaceae	*Pterostylis*	None	None	None	1	1	16/06/1999
12690	Equisetopsida	Orchidaceae	*Pterostylis acuminata*	sharp greenhood	SL	None	3	3	11/07/1992

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16345	Equisetopsida	Orchidaceae	*Pterostylis baptistii*	king greenhood	SL	None	2	2	17/06/1998
12693	Equisetopsida	Orchidaceae	*Pterostylis erecta*	None	SL	None	1	1	16/06/1999
12694	Equisetopsida	Orchidaceae	*Pterostylis grandiflora*	None	SL	None	2	2	26/06/2011
12703	Equisetopsida	Orchidaceae	*Pterostylis hildae*	rainforest greenhood	SL	None	1	1	16/06/1999
9321	Equisetopsida	Orchidaceae	*Pterostylis nutans*	None	SL	None	4	4	26/06/2011
9322	Equisetopsida	Orchidaceae	*Pterostylis ophioglossa*	None	SL	None	2	2	16/06/1999
16347	Equisetopsida	Orchidaceae	*Pterostylis parviflora*	tiny greenhood	SL	None	2	2	23/04/1990
9834	Equisetopsida	Orchidaceae	*Pterostylis russellii*	None	SL	None	2	2	24/05/1995
9187	Equisetopsida	Orchidaceae	*Sarcochilus ceciliae*	fairy bells	SL	None	2	3	19/04/1999
12659	Equisetopsida	Orchidaceae	*Sarcochilus dilatatus*	brown sarcochilus	SL	None	2	2	16/05/1995
12709	Equisetopsida	Orchidaceae	*Sarcochilus falcatus*	orange blossom orchid	SL	None	1	1	24/10/1993
12657	Equisetopsida	Orchidaceae	*Sarcochilus hillii*	None	SL	None	1	1	24/10/1993
9840	Equisetopsida	Orchidaceae	*Taeniophyllum muelleri*	None	SL	None	1	1	11/07/1992
7915	Equisetopsida	Orchidaceae	*Thelymitra angustifolia*	None	SL	None	3	3	10/09/1995
17777	Equisetopsida	Orobanchaceae	*Buchnera urticifolia*	None	C	None	1	1	21/01/2004
13315	Equisetopsida	Orobanchaceae	*Striga parviflora*	None	C	None	1	1	25/05/1988
24817	Equisetopsida	Orthotrichaceae	*Macromitrium*	None	None	None	1	1	14/02/1989
24821	Equisetopsida	Orthotrichaceae	*Macromitrium diaphanum*	None	C	None	3	3	14/02/1989
24835	Equisetopsida	Orthotrichaceae	*Macromitrium repandum*	None	C	None	1	1	10/05/2017
16529	Equisetopsida	Passifloraceae	*Passiflora aurantia*	None	C	None	0	1	19/04/1999
12715	Equisetopsida	Passifloraceae	*Passiflora edulis*	None	None	None	0	1	22/05/2003
16530	Equisetopsida	Passifloraceae	*Passiflora foetida*	None	None	None	0	1	30/03/2016
16531	Equisetopsida	Passifloraceae	*Passiflora herbertiana subsp. herbertiana*	native passionfruit	C	None	1	1	24/11/1998
16532	Equisetopsida	Passifloraceae	*Passiflora suberosa*	corky passion flower	None	None	0	3	30/03/2016
16533	Equisetopsida	Passifloraceae	*Passiflora subpeltata*	white passion flower	None	None	2	3	24/11/1998
16302	Equisetopsida	Petiveriaceae	*Rivina humilis*	None	None	None	1	4	01/07/1995
41378	Equisetopsida	Phyllanthaceae	*Actephila mooreana*	None	C	None	2	6	30/06/2016
17808	Equisetopsida	Phyllanthaceae	*Breynia oblongifolia*	None	C	None	0	6	20/09/2019
11327	Equisetopsida	Phyllanthaceae	*Bridelia exaltata*	None	C	None	4	7	23/07/2013
17810	Equisetopsida	Phyllanthaceae	*Bridelia leichhardtii*	None	C	None	0	1	19/04/1999
14706	Equisetopsida	Phyllanthaceae	*Cleistanthus cunninghamii*	omega	C	None	0	7	30/06/2016

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17127	Equisetopsida	Phyllanthaceae	*Flueggea virosa subsp. melanthesoides*	None	C	None	1	1	23/04/2021
9378	Equisetopsida	Phyllanthaceae	*Glochidion ferdinandi*	None	C	None	0	2	05/05/2016
17093	Equisetopsida	Phyllanthaceae	*Glochidion ferdinandi var. ferdinandi*	None	C	None	0	2	23/07/2013
17097	Equisetopsida	Phyllanthaceae	*Glochidion sumatranum*	umbrella cheese tree	C	None	0	1	10/01/2011
16474	Equisetopsida	Phyllanthaceae	*Phyllanthus*	None	None	None	1	1	13/04/1987
11273	Equisetopsida	Phyllanthaceae	*Phyllanthus gunnii*	None	C	None	0	2	23/07/2013
11281	Equisetopsida	Phyllanthaceae	*Phyllanthus subcrenulatus*	None	C	None	2	2	01/04/1995
16473	Equisetopsida	Phyllanthaceae	*Phyllanthus virgatus*	None	C	None	0	1	30/03/2016
30683	Equisetopsida	Phyllanthaceae	*Poranthera obovata*	None	C	None	1	1	04/09/1999
35882	Equisetopsida	Phyllanthaceae	*Synostemon albiflorus*	None	C	None	1	3	23/07/2013
14311	Equisetopsida	Phytolaccaceae	*Phytolacca americana*	None	None	None	1	1	05/05/1979
16479	Equisetopsida	Phytolaccaceae	*Phytolacca octandra*	inkweed	None	None	1	1	11/12/1969
17412	Equisetopsida	Picrodendraceae	*Dissiliaria baloghioides*	hauer	C	None	4	6	03/02/2007
12851	Equisetopsida	Picrodendraceae	*Micrantheum ericoides*	None	C	None	0	1	17/08/2018
14301	Equisetopsida	Picrodendraceae	*Petalostigma triloculare*	forest quinine	C	None	0	1	20/09/2019
5286	Equisetopsida	Piperaceae	*Peperomia leptostachya*	None	C	None	0	3	23/07/2013
30283	Equisetopsida	Piperaceae	*Piper hederaceum*	None	C	None	0	2	22/05/2003
31570	Equisetopsida	Piperaceae	*Piper hederaceum var. hederaceum*	None	C	None	0	1	30/06/2016
22219	Equisetopsida	Pittosporaceae	*Auranticarpa rhombifolia*	None	C	None	0	1	01/07/1995
22227	Equisetopsida	Pittosporaceae	*Bursaria spinosa subsp. spinosa*	None	C	None	2	4	05/05/2016
16933	Equisetopsida	Pittosporaceae	*Hymenosporum flavum*	native frangipani	C	None	0	2	23/07/2013
26421	Equisetopsida	Pittosporaceae	*Pittosporum multiflorum*	None	C	None	0	5	25/09/2020
16459	Equisetopsida	Pittosporaceae	*Pittosporum revolutum*	yellow pittosporum	C	None	1	6	25/09/2020
22387	Equisetopsida	Pittosporaceae	*Pittosporum spinescens*	None	C	None	0	5	13/09/2013
16462	Equisetopsida	Pittosporaceae	*Pittosporum undulatum*	sweet pittosporum	C	None	0	2	19/04/1999
26420	Equisetopsida	Pittosporaceae	*Pittosporum viscidum*	black-fruited thornbush	C	None	0	3	23/07/2013
8176	Equisetopsida	Plantaginaceae	*Bacopa caroliniana*	None	None	None	1	1	20/12/2006
32460	Equisetopsida	Plantaginaceae	*Bacopa lanigera*	None	None	None	1	1	15/02/2017

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17884	Equisetopsida	Plantaginaceae	*Bacopa monnieri*	None	C	None	1	1	19/04/1993
14764	Equisetopsida	Plantaginaceae	*Callitriche muelleri*	None	C	None	1	2	10/01/2011
40893	Equisetopsida	Plantaginaceae	*Linaria texana*	None	None	None	1	1	06/10/2020
18225	Equisetopsida	Plantaginaceae	*Mecardonia procumbens*	None	None	None	1	1	01/04/1995
16427	Equisetopsida	Plumbaginaceae	*Plumbago zeylanica*	native plumbago	C	None	1	1	20/05/1994
15670	Equisetopsida	Poaceae	*Alloteropsis semialata*	cockatoo grass	C	None	1	1	23/12/1996
15675	Equisetopsida	Poaceae	*Ancistrachne uncinulata*	hooky grass	C	None	0	1	30/03/2016
8934	Equisetopsida	Poaceae	*Aristida personata*	None	C	None	1	1	23/12/1996
9661	Equisetopsida	Poaceae	*Aristida ramosa*	purple wiregrass	C	None	1	1	29/01/1997
15658	Equisetopsida	Poaceae	*Aristida vagans*	None	C	None	1	1	23/12/1996
15634	Equisetopsida	Poaceae	*Arundinella nepalensis*	reedgrass	C	None	0	1	30/03/2016
9973	Equisetopsida	Poaceae	*Axonopus fissifolius*	None	None	None	1	1	29/01/1997
8843	Equisetopsida	Poaceae	*Bothriochloa decipiens*	None	C	None	0	1	30/03/2016
14773	Equisetopsida	Poaceae	*Capillipedium parviflorum*	scented top	C	None	0	1	23/07/2013
14774	Equisetopsida	Poaceae	*Capillipedium spicigerum*	spicytop	C	None	1	1	21/01/2004
14742	Equisetopsida	Poaceae	*Cenchrus caliculatus*	hillside burrgrass	C	None	1	1	20/04/1993
33869	Equisetopsida	Poaceae	*Cenchrus purpurascens*	None	C	None	1	1	16/03/1989
15551	Equisetopsida	Poaceae	*Chloris gayana*	rhodes grass	None	None	0	2	30/03/2016
15552	Equisetopsida	Poaceae	*Chloris inflata*	purpletop chloris	None	None	0	1	30/03/2016
15527	Equisetopsida	Poaceae	*Chloris virgata*	feathertop rhodes grass	None	None	0	1	30/03/2016
15485	Equisetopsida	Poaceae	*Cymbopogon refractus*	barbed-wire grass	C	None	0	2	30/03/2016
7812	Equisetopsida	Poaceae	*Cynodon dactylon var. dactylon*	None	None	None	1	1	06/11/1996
15467	Equisetopsida	Poaceae	*Dichanthium sericeum subsp. sericeum*	None	C	None	1	1	19/04/1993
15414	Equisetopsida	Poaceae	*Dichanthium tenue*	small bluegrass	C	None	1	1	29/01/1997
14595	Equisetopsida	Poaceae	*Dichelachne micrantha*	shorthair plumegrass	C	None	1	1	16/09/2003
15420	Equisetopsida	Poaceae	*Digitaria ciliaris*	summer grass	None	None	2	2	29/01/1997
34495	Equisetopsida	Poaceae	*Dinebra decipiens var. asthenes*	None	C	None	1	1	10/11/2006
14567	Equisetopsida	Poaceae	*Echinochloa colona*	awnless barnyard grass	None	None	1	1	23/12/1996
15436	Equisetopsida	Poaceae	*Echinochloa telmatophila*	swamp barnyard grass	C	None	2	2	30/11/1993
19839	Equisetopsida	Poaceae	*Echinopogon ovatus*	None	C	None	1	1	26/11/1993
15411	Equisetopsida	Poaceae	*Entolasia stricta*	wiry panic	C	None	0	2	23/07/2013
10532	Equisetopsida	Poaceae	*Eragrostis*	None	None	None	0	1	30/03/2016

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15390	Equisetopsida	Poaceae	*Eragrostis brownii*	Brown's lovegrass	C	None	1	1	23/12/1996
15371	Equisetopsida	Poaceae	*Eragrostis parviflora*	weeping lovegrass	C	None	1	1	23/12/1996
15378	Equisetopsida	Poaceae	*Eragrostis tenuifolia*	elastic grass	None	None	0	1	30/03/2016
15856	Equisetopsida	Poaceae	*Hyparrhenia filipendula*	tambookie grass	C	None	1	1	30/06/2018
15290	Equisetopsida	Poaceae	*Imperata cylindrica*	blady grass	C	None	0	5	25/09/2020
27493	Equisetopsida	Poaceae	*Lachnagrostis filiformis*	None	C	None	1	1	04/11/1996
29093	Equisetopsida	Poaceae	*Megathyrsus maximus*	None	None	None	0	2	30/03/2016
9154	Equisetopsida	Poaceae	*Melinis repens*	red natal grass	None	None	0	1	30/03/2016
9591	Equisetopsida	Poaceae	*Microlaena stipoides var. stipoides*	None	C	None	1	1	21/01/2004
15163	Equisetopsida	Poaceae	*Oplismenus aemulus*	creeping shade grass	C	None	0	2	22/05/2003
40379	Equisetopsida	Poaceae	*Oplismenus aemulus var. lasiorhachis*	None	C	None	0	2	23/07/2013
4207	Equisetopsida	Poaceae	*Oplismenus imbecillis*	None	C	None	0	3	23/07/2013
40329	Equisetopsida	Poaceae	*Oplismenus undulatifolius var. lanceolatus*	None	C	None	0	2	23/07/2013
10637	Equisetopsida	Poaceae	*Ottochloa gracillima*	pademelon grass	C	None	1	6	31/08/2020
10638	Equisetopsida	Poaceae	*Ottochloa nodosa*	None	C	None	0	1	22/05/2003
10957	Equisetopsida	Poaceae	*Panicum pygmaeum*	dwarf panic	C	None	1	1	29/01/1997
14345	Equisetopsida	Poaceae	*Paspalidium distans*	shotgrass	C	None	1	1	23/12/1996
10819	Equisetopsida	Poaceae	*Paspalum conjugatum*	sourgrass	None	None	1	1	04/11/1996
10818	Equisetopsida	Poaceae	*Paspalum distichum*	water couch	None	None	1	1	29/01/1997
15147	Equisetopsida	Poaceae	*Phragmites australis*	common reed	C	None	0	1	30/03/2016
10227	Equisetopsida	Poaceae	*Poa labillardierei var. labillardierei*	tussock grass	C	None	2	2	25/11/1998
27255	Equisetopsida	Poaceae	*Schizachyrium microstachyum*	None	None	None	1	1	17/01/2012
20011	Equisetopsida	Poaceae	*Setaria pumila*	None	None	None	0	1	05/05/2016
33794	Equisetopsida	Poaceae	*Setaria pumila subsp. subtesselata*	None	None	None	1	1	23/12/1996
9190	Equisetopsida	Poaceae	*Setaria sphacelata*	None	None	None	0	1	30/03/2016
15032	Equisetopsida	Poaceae	*Setaria surgens*	None	C	None	0	1	30/03/2016
15041	Equisetopsida	Poaceae	*Sorghum x almum*	None	None	None	1	1	04/11/1996
15004	Equisetopsida	Poaceae	*Sporobolus*	None	None	None	0	54	28/02/2017
22165	Equisetopsida	Poaceae	*Sporobolus africanus*	Parramatta grass	None	None	1	10	28/02/2017
22159	Equisetopsida	Poaceae	*Sporobolus fertilis*	giant Parramatta grass	None	None	0	3	28/02/2017
10941	Equisetopsida	Poaceae	*Sporobolus laxus*	None	C	None	1	1	21/01/2004
10158	Equisetopsida	Poaceae	*Sporobolus natalensis*	None	None	None	0	1	30/03/2016
10156	Equisetopsida	Poaceae	*Sporobolus pyramidalis*	None	None	None	1	1	25/06/1991

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14973	Equisetopsida	Poaceae	*Themeda quadrivalvis*	grader grass	None	None	1	1	16/04/1973
14974	Equisetopsida	Poaceae	*Themeda triandra*	kangaroo grass	C	None	0	7	25/09/2020
14995	Equisetopsida	Poaceae	*Tripogon loliiformis*	five minute grass	C	None	1	1	07/05/1987
16428	Equisetopsida	Podocarpaceae	*Podocarpus elatus*	she pine	C	None	0	2	30/06/2016
14715	Equisetopsida	Polygalaceae	*Comesperma hispidulum*	None	C	None	3	3	13/09/1996
13229	Equisetopsida	Polygalaceae	*Comesperma volubile*	love creeper	C	None	1	1	03/10/2015
33922	Equisetopsida	Polygalaceae	*Polygala triflora*	None	C	None	1	1	16/03/1989
22288	Equisetopsida	Polygonaceae	*Acetosa sagittata*	None	None	None	1	1	10/10/1999
13155	Equisetopsida	Polygonaceae	*Persicaria decipiens*	slender knotweed	C	None	2	2	29/01/1997
16495	Equisetopsida	Polygonaceae	*Persicaria hydropiper*	water pepper	C	None	2	3	10/01/2011
16496	Equisetopsida	Polygonaceae	*Persicaria lapathifolia*	pale knotweed	C	None	1	1	11/05/2001
17354	Equisetopsida	Polypodiaceae	*Drynaria rigidula*	None	SL	None	1	5	05/05/2016
11696	Equisetopsida	Polypodiaceae	*Platycerium bifurcatum*	None	SL	None	0	3	20/09/2019
11697	Equisetopsida	Polypodiaceae	*Platycerium superbum*	staghorn fern	SL	None	0	7	31/08/2020
6668	Equisetopsida	Polypodiaceae	*Pyrrosia confluens*	None	SL	None	0	3	19/04/1999
16314	Equisetopsida	Polypodiaceae	*Pyrrosia confluens var. confluens*	None	SL	None	0	1	23/07/2013
16317	Equisetopsida	Polypodiaceae	*Pyrrosia rupestris*	rock felt fern	SL	None	0	3	05/05/2016
13099	Equisetopsida	Potamogetonaceae	*Potamogeton crispus*	curly pondweed	SL	None	1	1	04/11/1996
14285	Equisetopsida	Potamogetonaceae	*Potamogeton perfoliatus*	perfoliate pondweed	SL	None	1	1	04/11/1996
6485	Equisetopsida	Proteaceae	*Banksia integrifolia subsp. compar*	None	C	None	1	1	16/03/1989
13202	Equisetopsida	Proteaceae	*Floydia praealta*	ball nut	V	V	3	3	03/02/2007
13924	Equisetopsida	Proteaceae	*Grevillea robusta*	None	C	None	0	4	05/05/2016
14537	Equisetopsida	Proteaceae	*Hakea florulenta*	three-nerved willow hakea	C	None	1	1	04/09/1999
13223	Equisetopsida	Proteaceae	*Helicia glabriflora*	pale oak	C	None	0	1	19/04/1999
16746	Equisetopsida	Proteaceae	*Macadamia integrifolia*	macadamia nut	V	V	16	17	28/01/2022
16747	Equisetopsida	Proteaceae	*Macadamia ternifolia*	bopple nut	V	V	7	8	31/08/2020
16500	Equisetopsida	Proteaceae	*Persoonia sericea*	silky geebung	C	None	1	3	02/11/2018
16506	Equisetopsida	Proteaceae	*Petrophile canescens*	None	C	None	1	1	13/09/1996
14173	Equisetopsida	Proteaceae	*Stenocarpus sinuatus*	wheel of fire	C	None	1	7	31/08/2020
16381	Equisetopsida	Psilotaceae	*Psilotum complanatum*	flat fork fern	SL	None	1	1	31/03/1967
18116	Equisetopsida	Pteridaceae	*Adiantum aethiopicum*	None	SL	None	0	2	19/04/1999
21888	Equisetopsida	Pteridaceae	*Adiantum atroviride*	None	SL	None	0	1	05/05/2016
18030	Equisetopsida	Pteridaceae	*Adiantum diaphanum*	None	SL	None	0	3	23/07/2013
14886	Equisetopsida	Pteridaceae	*Adiantum formosum*	None	C	None	1	1	19/04/1993
18031	Equisetopsida	Pteridaceae	*Adiantum hispidulum*	None	SL	None	0	6	23/07/2013
9284	Equisetopsida	Pteridaceae	*Adiantum hispidulum var. hispidulum*	None	SL	None	0	2	31/08/2020

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14887	Equisetopsida	Pteridaceae	*Adiantum silvaticum*	None	SL	None	0	1	10/01/2011
8916	Equisetopsida	Pteridaceae	*Cheilanthes sieberi*	None	C	None	0	1	30/03/2016
9723	Equisetopsida	Pteridaceae	*Pellaea falcata*	None	SL	None	0	2	19/04/1999
21889	Equisetopsida	Pteridaceae	*Pellaea nana*	None	SL	None	1	2	23/07/2013
13800	Equisetopsida	Pteridaceae	*Pellaea paradoxa*	heart fern	SL	None	1	5	19/04/1999
16342	Equisetopsida	Pteridaceae	*Pteris tremula*	None	SL	None	1	3	10/01/2011
16344	Equisetopsida	Pteridaceae	*Pteris vittata*	Chinese bracken	SL	None	1	1	29/11/1993
9557	Equisetopsida	Putranjivaceae	*Drypetes deplanchei*	grey boxwood	C	None	0	7	25/09/2020
17622	Equisetopsida	Ranunculaceae	*Clematis glycinoides*	None	C	None	0	3	23/07/2013
9659	Equisetopsida	Rhamnaceae	*Alphitonia excelsa*	soap tree	C	None	3	14	25/09/2020
18016	Equisetopsida	Rhamnaceae	*Alphitonia petriei*	pink ash	C	None	0	1	04/05/2005
14584	Equisetopsida	Rhamnaceae	*Emmenosperma alphitonioides*	yellow ash	C	None	0	1	19/04/1999
14282	Equisetopsida	Rhamnaceae	*Pomaderris argyrophylla*	None	C	None	1	1	02/10/2021
15949	Equisetopsida	Rhamnaceae	*Ventilago pubiflora*	None	C	None	1	4	23/07/2013
15839	Equisetopsida	Ripogonaceae	*Ripogonum album*	white supplejack	C	None	0	3	10/01/2011
12848	Equisetopsida	Ripogonaceae	*Ripogonum brevifolium*	small-leaved supplejack	C	None	0	5	20/09/2019
12849	Equisetopsida	Ripogonaceae	*Ripogonum elseyanum*	hairy supplejack	C	None	0	4	30/06/2016
31001	Equisetopsida	Rosaceae	*Potentilla indica*	None	None	None	1	1	01/04/1995
19436	Equisetopsida	Rosaceae	*Rubus moluccanus*	None	C	None	0	4	20/09/2019
18490	Equisetopsida	Rosaceae	*Rubus moluccanus var. trilobus*	None	C	None	3	3	01/04/1995
16266	Equisetopsida	Rosaceae	*Rubus parvifolius*	pink-flowered native raspberry	C	None	1	3	05/05/2016
19994	Equisetopsida	Rosaceae	*Rubus rosifolius*	None	C	None	0	5	20/09/2019
6219	Equisetopsida	Rosaceae	*Rubus rosifolius var. commersonii*	None	C	None	1	1	26/11/1993
22149	Equisetopsida	Rubiaceae	*Atractocarpus benthamianus*	None	C	None	0	1	19/04/1999
22152	Equisetopsida	Rubiaceae	*Atractocarpus chartaceus*	None	C	None	2	11	30/06/2016
2284	Equisetopsida	Rubiaceae	*Atractocarpus fitzalanii*	None	C	None	0	1	07/02/2001
40236	Equisetopsida	Rubiaceae	*Caelospermum paniculatum var. syncarpum*	None	C	None	0	1	23/07/2013
27436	Equisetopsida	Rubiaceae	*Cyclophyllum coprosmoides*	None	C	None	0	2	10/01/2011
27437	Equisetopsida	Rubiaceae	*Cyclophyllum coprosmoides var. coprosmoides*	None	C	None	0	1	23/07/2013
27440	Equisetopsida	Rubiaceae	*Cyclophyllum longipetalum*	None	C	None	0	1	10/01/2011
21793	Equisetopsida	Rubiaceae	*Everistia vacciniifolia*	None	C	None	0	1	01/07/1995

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21792	Equisetopsida	Rubiaceae	*Everistia vacciniifolia var. nervosa*	None	C	None	0	1	19/04/1999
29177	Equisetopsida	Rubiaceae	*Everistia vacciniifolia var. vacciniifolia*	None	C	None	0	1	23/07/2013
32446	Equisetopsida	Rubiaceae	*Galium leptogonium*	None	C	None	2	2	21/04/1993
34578	Equisetopsida	Rubiaceae	*Gynochthodes canthoides*	None	C	None	0	4	23/07/2013
34588	Equisetopsida	Rubiaceae	*Gynochthodes jasminoides*	None	C	None	0	6	13/09/2013
34590	Equisetopsida	Rubiaceae	*Gynochthodes umbellata*	None	C	None	0	1	23/07/2013
14503	Equisetopsida	Rubiaceae	*Hodgkinsonia ovatiflora*	golden ash	C	None	1	3	19/04/1999
12270	Equisetopsida	Rubiaceae	*Ixora beckleri*	brown coffeewood	C	None	0	3	19/04/1999
16544	Equisetopsida	Rubiaceae	*Opercularia hispida*	hairy stinkweed	C	None	2	2	25/11/1998
7598	Equisetopsida	Rubiaceae	*Pavetta australiensis*	None	C	None	0	2	19/04/1999
16538	Equisetopsida	Rubiaceae	*Pavetta australiensis var. australiensis*	None	C	None	1	3	23/07/2013
16407	Equisetopsida	Rubiaceae	*Pomax umbellata*	None	C	None	1	2	20/10/2018
16334	Equisetopsida	Rubiaceae	*Psychotria daphnoides*	None	C	None	1	5	23/07/2013
14293	Equisetopsida	Rubiaceae	*Psychotria loniceroides*	hairy psychotria	C	None	0	8	20/09/2019
9319	Equisetopsida	Rubiaceae	*Psychotria simmondsiana*	None	C	None	0	1	13/09/2013
29827	Equisetopsida	Rubiaceae	*Psydrax lamprophylla*	None	C	None	0	3	19/04/1999
29828	Equisetopsida	Rubiaceae	*Psydrax lamprophylla forma lamprophylla*	None	C	None	1	3	20/09/2019
2399	Equisetopsida	Rubiaceae	*Psydrax odorata*	None	C	None	0	3	23/07/2013
29826	Equisetopsida	Rubiaceae	*Psydrax odorata forma buxifolia*	None	C	None	0	1	19/04/1999
16300	Equisetopsida	Rubiaceae	*Richardia brasiliensis*	white eye	None	None	0	1	05/05/2016
16139	Equisetopsida	Rubiaceae	*Spermacoce multicaulis*	None	C	None	1	1	07/03/1987
30694	Equisetopsida	Rubiaceae	*Triflorensia cameronii*	None	C	None	0	2	30/06/2016
15870	Equisetopsida	Rutaceae	*Acronychia imperforata*	beach acronychia	C	None	1	1	20/05/1994
15871	Equisetopsida	Rutaceae	*Acronychia laevis*	glossy acronychia	C	None	1	4	19/04/1999
40398	Equisetopsida	Rutaceae	*Acronychia laevis var. leucocarpa*	None	C	None	0	2	23/07/2013
13739	Equisetopsida	Rutaceae	*Acronychia oblongifolia*	common acronychia	C	None	0	3	20/09/2019
15872	Equisetopsida	Rutaceae	*Acronychia pauciflora*	soft acronychia	C	None	5	10	23/07/2013
14135	Equisetopsida	Rutaceae	*Acronychia pubescens*	hairy acronychia	C	None	0	2	13/09/2013
12325	Equisetopsida	Rutaceae	*Acronychia wilcoxiana*	silver aspen	C	None	0	2	10/01/2011
11988	Equisetopsida	Rutaceae	*Bosistoa transversa*	three-leaved bosistoa	C	V	11	12	28/01/2022
11990	Equisetopsida	Rutaceae	*Bouchardatia neurococca*	union nut	C	None	1	3	19/04/1999
18816	Equisetopsida	Rutaceae	*Citrus australis*	None	C	None	2	9	20/09/2019

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17614	Equisetopsida	Rutaceae	*Clausena brevistyla*	clausena	C	None	1	2	23/07/2013
18946	Equisetopsida	Rutaceae	*Dinosperma erythrococcum*	None	C	None	1	2	23/07/2013
18945	Equisetopsida	Rutaceae	*Dinosperma melanophloium*	None	C	None	1	1	29/10/1982
11300	Equisetopsida	Rutaceae	*Flindersia australis*	crow's ash	C	None	1	10	25/09/2020
34928	Equisetopsida	Rutaceae	*Flindersia bennettii*	None	C	None	1	5	20/09/2019
17125	Equisetopsida	Rutaceae	*Flindersia schottiana*	bumpy ash	C	None	1	2	01/11/2003
40411	Equisetopsida	Rutaceae	*Flindersia schottiana var. pubescens*	None	C	None	0	5	25/09/2020
11044	Equisetopsida	Rutaceae	*Flindersia xanthoxyla*	yellow-wood	C	None	2	2	29/05/1989
11430	Equisetopsida	Rutaceae	*Geijera salicifolia*	brush wilga	C	None	2	3	23/07/2013
17015	Equisetopsida	Rutaceae	*Halfordia kendack*	saffron heart	C	None	0	1	10/01/2011
12360	Equisetopsida	Rutaceae	*Medicosma cunninghamii*	pinkheart	C	None	6	10	23/07/2013
34885	Equisetopsida	Rutaceae	*Medicosma forsteri*	None	C	None	0	1	30/06/2016
26466	Equisetopsida	Rutaceae	*Melicope bonwickii*	None	C	None	0	2	04/05/2005
17211	Equisetopsida	Rutaceae	*Melicope micrococca*	white evodia	C	None	1	3	23/07/2013
16677	Equisetopsida	Rutaceae	*Micromelum minutum*	clusterberry	C	None	0	1	01/07/1995
21837	Equisetopsida	Rutaceae	*Murraya paniculata 'Exotica'*	None	None	None	0	1	01/07/1995
11938	Equisetopsida	Rutaceae	*Pentaceras australe*	bastard crow's ash	C	None	2	7	31/08/2020
21799	Equisetopsida	Rutaceae	*Philotheca difformis subsp. smithiana*	None	C	None	1	1	13/04/1987
16239	Equisetopsida	Rutaceae	*Sarcomelicope simplicifolia subsp. simplicifolia*	yellow aspen	C	None	2	6	23/07/2013
15899	Equisetopsida	Rutaceae	*Zanthoxylum brachyacanthum*	None	C	None	0	2	23/07/2013
14127	Equisetopsida	Rutaceae	*Zieria minutiflora subsp. minutiflora*	None	C	None	0	3	25/09/2020
15907	Equisetopsida	Rutaceae	*Zieria smithii*	None	C	None	2	3	13/09/2013
40402	Equisetopsida	Rutaceae	*Zieria smithii var. fraseri*	None	C	None	0	2	23/07/2013
17698	Equisetopsida	Salicaceae	*Casearia multinervosa*	casearia	C	None	1	7	23/07/2013
16914	Equisetopsida	Salicaceae	*Homalium alnifolium*	homalium	C	None	1	1	31/12/1929
16182	Equisetopsida	Salicaceae	*Scolopia braunii*	flintwood	C	None	1	3	23/07/2013
11250	Equisetopsida	Salicaceae	*Xylosma terrae-reginae*	xylosma	C	None	1	1	29/03/2003
14267	Equisetopsida	Samolaceae	*Samolus valerandi*	brookweed	C	None	1	1	04/11/1996
17640	Equisetopsida	Santalaceae	*Choretrum candollei*	white sour bush	C	None	1	1	19/04/1993
17181	Equisetopsida	Santalaceae	*Exocarpos latifolius*	None	C	None	0	2	19/04/1999
13501	Equisetopsida	Santalaceae	*Thesium australe*	toadflax	V	V	1	1	19/04/1993
18052	Equisetopsida	Sapindaceae	*Alectryon connatus*	grey birds-eye	C	None	0	1	19/04/1999
9286	Equisetopsida	Sapindaceae	*Alectryon reticulatus*	wild quince	C	None	0	1	19/04/1999
18007	Equisetopsida	Sapindaceae	*Alectryon subcinereus*	None	C	None	0	4	20/09/2019
9489	Equisetopsida	Sapindaceae	*Alectryon subdentatus*	None	C	None	0	3	30/06/2016
19727	Equisetopsida	Sapindaceae	*Alectryon tomentosus*	None	C	None	0	4	23/07/2013

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14815	Equisetopsida	Sapindaceae	*Arytera distylis*	twin-leaved coogera	C	None	1	8	20/09/2019
17930	Equisetopsida	Sapindaceae	*Arytera divaricata*	coogera	C	None	2	9	23/07/2013
14814	Equisetopsida	Sapindaceae	*Arytera foveolata*	pitted coogera	C	None	0	4	23/07/2013
13711	Equisetopsida	Sapindaceae	*Atalaya multiflora*	broad-leaved whitewood	C	None	1	4	23/07/2013
17907	Equisetopsida	Sapindaceae	*Atalaya salicifolia*	None	C	None	0	1	19/04/1999
17548	Equisetopsida	Sapindaceae	*Cupaniopsis anacardioides*	tuckeroo	C	None	0	2	01/07/1995
13686	Equisetopsida	Sapindaceae	*Cupaniopsis parvifolia*	small-leaved tuckeroo	C	None	0	7	31/08/2020
13687	Equisetopsida	Sapindaceae	*Cupaniopsis serrata*	smooth tuckeroo	C	None	4	13	31/08/2020
6968	Equisetopsida	Sapindaceae	*Diploglottis australis*	native tamarind	C	None	1	6	31/08/2020
17384	Equisetopsida	Sapindaceae	*Dodonaea triquetra*	large-leaved hop bush	C	None	2	4	05/05/2016
31862	Equisetopsida	Sapindaceae	*Elattostachys bidwillii*	None	C	None	1	1	03/02/2007
13662	Equisetopsida	Sapindaceae	*Elattostachys nervosa*	green tamarind	C	None	0	6	20/09/2019
17339	Equisetopsida	Sapindaceae	*Elattostachys xylocarpa*	white tamarind	C	None	0	2	19/04/1999
16996	Equisetopsida	Sapindaceae	*Guioa acutifolia*	northern guioa	C	None	0	4	23/07/2013
16998	Equisetopsida	Sapindaceae	*Guioa semiglauca*	guioa	C	None	0	5	25/09/2020
16968	Equisetopsida	Sapindaceae	*Harpullia hillii*	None	C	None	0	4	23/07/2013
16969	Equisetopsida	Sapindaceae	*Harpullia pendula*	None	C	None	0	6	30/06/2016
16885	Equisetopsida	Sapindaceae	*Jagera pseudorhus*	None	C	None	0	6	05/05/2016
6019	Equisetopsida	Sapindaceae	*Jagera pseudorhus var. pseudorhus*	None	C	None	0	5	25/09/2020
6175	Equisetopsida	Sapindaceae	*Mischarytera lautereriana*	corduroy tamarind	C	None	1	3	13/09/2013
14356	Equisetopsida	Sapindaceae	*Mischocarpus anodontus*	veiny pearfruit	C	None	2	6	23/07/2013
14355	Equisetopsida	Sapindaceae	*Mischocarpus pyriformis*	None	C	None	0	2	13/09/2013
16637	Equisetopsida	Sapindaceae	*Mischocarpus pyriformis subsp. pyriformis*	None	C	None	0	3	31/08/2020
16242	Equisetopsida	Sapindaceae	*Sarcopteryx stipata*	steelwood	C	None	0	3	31/08/2020
13503	Equisetopsida	Sapindaceae	*Toechima tenax*	pitted-leaf steelwood	C	None	1	4	19/04/1999
5422	Equisetopsida	Sapotaceae	*Amorphospermum antilogum*	None	C	None	0	1	19/04/1999
5289	Equisetopsida	Sapotaceae	*Planchonella australis*	None	C	None	0	3	20/09/2019
5471	Equisetopsida	Sapotaceae	*Planchonella chartacea*	None	C	None	0	1	19/04/1999
16415	Equisetopsida	Sapotaceae	*Planchonella cotinifolia var. pubescens*	None	C	None	0	4	19/04/1999
41186	Equisetopsida	Sapotaceae	*Planchonella myrsinifolia subsp. myrsinifolia*	None	C	None	1	2	23/07/2013
13125	Equisetopsida	Sapotaceae	*Planchonella pohlmaniana*	None	C	None	0	2	10/01/2011
34941	Equisetopsida	Sapotaceae	*Pleioluma queenslandica*	None	C	None	0	3	20/09/2019

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12529	Equisetopsida	Scrophulariaceae	*Verbascum virgatum*	twiggy mullein	None	None	1	1	10/11/2006
18047	Equisetopsida	Simaroubaceae	*Ailanthus triphysa*	white siris	C	None	0	5	23/07/2013
15881	Equisetopsida	Smilacaceae	*Smilax australis*	barbed-wire vine	C	None	0	10	25/09/2020
17496	Equisetopsida	Solanaceae	*Datura stramonium*	common thornapple	None	None	1	1	09/11/1970
17358	Equisetopsida	Solanaceae	*Duboisia myoporoides*	None	C	None	1	2	10/01/2011
14375	Equisetopsida	Solanaceae	*Nicandra physalodes*	apple of Peru	None	None	1	1	10/10/1999
7222	Equisetopsida	Solanaceae	*Nicotiana forsteri*	None	C	None	1	1	20/05/1994
13557	Equisetopsida	Solanaceae	*Physalis peruviana*	None	None	None	1	1	20/05/1994
31395	Equisetopsida	Solanaceae	*Physalis pubescens*	None	None	None	1	1	20/05/1994
16157	Equisetopsida	Solanaceae	*Solanum americanum*	None	None	None	0	1	01/07/1995
16158	Equisetopsida	Solanaceae	*Solanum aviculare*	kangaroo apple	C	None	0	1	13/09/2013
13790	Equisetopsida	Solanaceae	*Solanum corifolium*	straggling nightshade	C	None	0	3	19/04/1999
14208	Equisetopsida	Solanaceae	*Solanum densevestitum*	None	C	None	2	3	10/01/2011
6199	Equisetopsida	Solanaceae	*Solanum gympiense*	None	C	None	0	1	23/07/2013
16169	Equisetopsida	Solanaceae	*Solanum linnaeanum*	apple of Sodom	None	None	1	1	14/06/2019
16171	Equisetopsida	Solanaceae	*Solanum mauritianum*	wild tobacco	None	None	0	7	12/08/2017
16120	Equisetopsida	Solanaceae	*Solanum seaforthianum*	Brazilian nightshade	None	None	1	3	29/03/2003
26435	Equisetopsida	Solanaceae	*Solanum shirleyanum*	None	C	None	1	1	03/02/2007
16124	Equisetopsida	Solanaceae	*Solanum stelligerum*	devil's needles	C	None	2	4	17/11/2006
40401	Equisetopsida	Solanaceae	*Solanum stelligerum var. procumbens*	None	C	None	0	3	20/09/2019
16126	Equisetopsida	Solanaceae	*Solanum torvum*	devil's fig	None	None	0	2	30/03/2016
17049	Equisetopsida	Sparrmanniaceae	*Grewia latifolia*	dysentery plant	C	None	0	1	19/04/1999
15983	Equisetopsida	Sparrmanniaceae	*Triumfetta rhomboidea*	chinese burr	None	None	1	1	20/04/1993
16092	Equisetopsida	Stackhousiaceae	*Stackhousia viminea*	slender stackhousia	C	None	1	1	16/03/1989
9288	Equisetopsida	Sterculiaceae	*Argyrodendron actinophyllum*	None	C	None	1	4	13/09/2013
7381	Equisetopsida	Sterculiaceae	*Argyrodendron sp. (Kin Kin W.D.Francis AQ81198)*	rusty tulip oak	C	None	1	3	23/07/2013
9660	Equisetopsida	Sterculiaceae	*Argyrodendron trifoliolatum*	booyong	C	None	2	11	31/08/2020
13017	Equisetopsida	Sterculiaceae	*Brachychiton acerifolius*	flame tree	SL	None	0	2	20/09/2019
12643	Equisetopsida	Sterculiaceae	*Brachychiton discolor*	None	SL	None	0	3	23/07/2013
17802	Equisetopsida	Sterculiaceae	*Brachychiton populneus subsp. populneus*	None	SL	None	0	1	20/07/1999
16103	Equisetopsida	Sterculiaceae	*Sterculia quadrifida*	peanut tree	C	None	0	6	23/07/2013
15306	Equisetopsida	Surianaceae	*Guilfoylia monostylis*	guilfoylia	C	None	1	1	20/12/1978

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
7608	Equisetopsida	Symplocaceae	*Symplocos harroldii*	hairy hazelwood	NT	None	2	4	23/07/2013
17927	Equisetopsida	Tectariaceae	*Arthropteris tenella*	climbing fern	C	None	2	7	30/06/2016
13998	Equisetopsida	Thelypteridaceae	*Christella dentata*	creek fern	SL	None	0	7	31/08/2020
11704	Equisetopsida	Thelypteridaceae	*Christella parasitica*	None	SL	None	0	2	23/07/2013
17504	Equisetopsida	Thelypteridaceae	*Cyclosorus interruptus*	None	SL	None	1	1	30/11/1993
13171	Equisetopsida	Thymelaeaceae	*Pimelea latifolia*	None	C	None	0	1	05/05/2016
16439	Equisetopsida	Thymelaeaceae	*Pimelea linifolia*	None	C	None	0	1	20/10/2018
15926	Equisetopsida	Thymelaeaceae	*Wikstroemia indica*	tie bush	C	None	0	6	20/09/2019
17955	Equisetopsida	Ulmaceae	*Aphananthe philippinensis*	None	C	None	1	10	31/08/2020
17667	Equisetopsida	Ulmaceae	*Celtis paniculata*	native celtis	C	None	0	2	23/07/2013
16011	Equisetopsida	Ulmaceae	*Trema tomentosa*	None	C	None	0	3	30/03/2016
31416	Equisetopsida	Ulmaceae	*Trema tomentosa var. aspera*	None	C	None	0	3	23/07/2013
12615	Equisetopsida	Urticaceae	*Dendrocnide excelsa*	giant stinging tree	C	None	1	4	13/09/2013
12616	Equisetopsida	Urticaceae	*Dendrocnide moroides*	Gympie stinger	C	None	0	2	23/07/2013
14635	Equisetopsida	Urticaceae	*Dendrocnide photiniphylla*	shiny-leaved stinging tree	C	None	0	7	20/09/2019
15855	Equisetopsida	Urticaceae	*Pipturus argenteus*	white nettle	C	None	1	3	03/02/2007
19905	Equisetopsida	Verbenaceae	*Lantana camara*	lantana	None	None	3	41	12/08/2017
14115	Equisetopsida	Verbenaceae	*Verbena litoralis*	verbena	None	None	0	1	30/03/2016
30780	Equisetopsida	Verbenaceae	*Verbena rigida*	None	None	None	1	1	21/01/2004
15080	Equisetopsida	Viburnaceae	*Sambucus australasica*	native elderberry	C	None	1	1	03/02/2007
11947	Equisetopsida	Viburnaceae	*Sambucus gaudichaudiana*	white elder	C	None	1	1	10/10/1999
41612	Equisetopsida	Violaceae	*Pigea enneasperma*	None	C	None	0	1	23/07/2013
41630	Equisetopsida	Violaceae	*Pigea stellarioides*	None	C	None	0	1	30/03/2016
18917	Equisetopsida	Violaceae	*Viola hederacea*	None	C	None	0	3	23/07/2013
15861	Equisetopsida	Viscaceae	*Notothixos cornifolius*	kurrajong mistletoe	C	None	2	2	17/11/2006
40404	Equisetopsida	Viscaceae	*Notothixos subaureus var. cinereus*	None	C	None	0	1	10/01/2011
41432	Equisetopsida	Vitaceae	*Causonis clematidea*	None	C	None	0	5	23/07/2013
17660	Equisetopsida	Vitaceae	*Cayratia acris*	hairy grape	C	None	0	2	23/07/2013
14704	Equisetopsida	Vitaceae	*Cissus antarctica*	None	C	None	0	12	31/08/2020
17647	Equisetopsida	Vitaceae	*Cissus hypoglauca*	None	C	None	0	5	20/09/2019
17648	Equisetopsida	Vitaceae	*Cissus oblonga*	None	C	None	1	1	04/11/1996
31727	Equisetopsida	Vitaceae	*Clematicissus opaca*	None	C	None	1	5	23/07/2013
14151	Equisetopsida	Vitaceae	*Tetrastigma nitens*	shining grape	C	None	0	3	23/07/2013

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
15934	Equisetopsida	Xanthorrhoeaceae	*Xanthorrhoea johnsonii*	None	SL	None	2	3	20/09/2019
9156	Equisetopsida	Xanthorrhoeaceae	*Xanthorrhoea latifolia subsp. latifolia*	None	SL	None	1	5	25/09/2020
33772	Equisetopsida	Zamiaceae	*Macrozamia longispina - Macrozamia macleayi*	None	C	None	1	1	07/11/2009
14429	Equisetopsida	Zamiaceae	*Macrozamia lucida*	pineapple zamia	SL	None	0	3	13/09/2013
22414	Equisetopsida	Zamiaceae	*Macrozamia macleayi*	None	SL	None	2	2	27/02/1993
16707	Equisetopsida	Zamiaceae	*Macrozamia miquelii*	None	SL	None	0	1	19/04/1999
18019	Equisetopsida	Zingiberaceae	*Alpinia arundelliana*	None	C	None	0	2	23/07/2013
14844	Equisetopsida	Zingiberaceae	*Alpinia caerulea*	wild ginger	C	None	0	6	30/06/2016
40384	Equisetopsida	Zingiberaceae	*Alpinia caerulea var. arundelliana*	None	C	None	0	3	20/09/2019
7766	Florideophyceae	Acrochaetiaceae	*Audouinella*	None	None	None	1	1	26/01/1975
8525	Incertae sedis	Incertae sedis Plantae	*Schizothrix rubella*	None	C	None	1	1	14/04/1963

Table 4. Fungi recorded within the area of interest and its one kilometre buffer

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
25511	Agaricomycetes	Amanitaceae	*Amanita vaginata*	None	C	None	1	1	04/04/2017
28410	Agaricomycetes	Auriculariaceae	*Auricularia cornea*	None	C	None	2	2	03/11/1982
26685	Agaricomycetes	Boletaceae	*Boletellus*	None	None	None	1	1	16/03/2013
34893	Agaricomycetes	Bondarzewiaceae	*Heterobasidion araucariae*	None	C	None	1	1	29/04/1982
26700	Agaricomycetes	Corticiaceae	*Corticium*	None	C	None	9	9	03/11/1982
25929	Agaricomycetes	Cortinariaceae	*Cortinarius*	None	None	None	1	1	04/04/2017
29085	Agaricomycetes	Crepidotaceae	*Simocybe*	None	None	None	1	1	16/03/2013
33206	Agaricomycetes	Entolomataceae	*Entoloma virescens*	None	C	None	1	1	16/03/2013
33723	Agaricomycetes	Fomitopsidaceae	*Postia tephroleuca*	None	C	None	1	1	03/02/1981
25904	Agaricomycetes	Ganodermataceae	*Ganoderma*	None	None	None	1	1	04/04/1979
26476	Agaricomycetes	Ganodermataceae	*Ganoderma australe*	None	C	None	2	2	27/08/1981
32350	Agaricomycetes	Hymenochaetaceae	*Cyclomyces*	None	None	None	1	1	03/11/1982
33547	Agaricomycetes	Hymenochaetaceae	*Fomitiporia robusta*	None	C	None	1	1	31/08/1975
32354	Agaricomycetes	Hymenochaetaceae	*Fuscoporia*	None	None	None	1	1	01/04/1970

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
28289	Agaricomycetes	Hymenochaetaceae	*Fuscoporia contigua*	None	C	None	3	3	11/05/1981
33522	Agaricomycetes	Hymenochaetaceae	*Fuscoporia wahlbergii*	None	C	None	1	1	09/09/1970
33211	Agaricomycetes	Hymenochaetaceae	*Inonotus lloydii*	None	C	None	2	2	12/10/1983
25934	Agaricomycetes	Hymenochaetaceae	*Phellinus*	None	None	None	2	2	03/02/1982
28621	Agaricomycetes	Hymenochaetaceae	*Phellinus lamaensis*	None	C	None	1	1	26/01/1977
33209	Agaricomycetes	Hymenochaetaceae	*Phellinus sublamaensis*	None	C	None	1	1	10/03/1998
36505	Agaricomycetes	Inocybaceae	*Inocybe nobilissima*	None	C	None	1	1	01/04/1972
25758	Agaricomycetes	Marasmiaceae	*Marasmius*	None	None	None	1	1	09/04/1988
25476	Agaricomycetes	Marasmiaceae	*Marasmius crinisequi*	None	C	None	1	1	17/07/1930
33517	Agaricomycetes	Meripilaceae	*Rigidoporus vinctus*	None	C	None	3	3	27/08/1981
25499	Agaricomycetes	Physalacriaceae	*Armillaria hinnulea*	None	C	None	1	1	16/03/2013
28249	Agaricomycetes	Polyporaceae	*Coriolopsis floccosa*	None	C	None	2	2	27/08/1981
27960	Agaricomycetes	Polyporaceae	*Coriolopsis strumosa*	None	C	None	3	3	30/08/1994
27727	Agaricomycetes	Polyporaceae	*Hexagonia tenuis*	None	C	None	1	1	21/01/1993
25931	Agaricomycetes	Polyporaceae	*Lentinus*	None	None	None	1	1	18/12/1996
26294	Agaricomycetes	Polyporaceae	*Lenzites*	None	None	None	1	1	03/02/1982
28181	Agaricomycetes	Polyporaceae	*Lenzites acuta*	None	C	None	6	6	11/03/1993
32387	Agaricomycetes	Polyporaceae	*Lopharia*	None	None	None	1	1	03/11/1982
28229	Agaricomycetes	Polyporaceae	*Loweporus tephroporus*	None	C	None	1	1	26/05/1974
28584	Agaricomycetes	Polyporaceae	*Macrohyporia dictyopora*	None	C	None	1	1	01/04/1970
26678	Agaricomycetes	Polyporaceae	*Microporus*	None	None	None	2	2	29/01/1981
28837	Agaricomycetes	Polyporaceae	*Panus fasciatus*	None	C	None	2	2	03/02/1982
33504	Agaricomycetes	Polyporaceae	*Panus lecomtei*	None	C	None	4	4	03/02/1981
27152	Agaricomycetes	Polyporaceae	*Perenniporia*	None	None	None	1	1	28/02/1993
25639	Agaricomycetes	Polyporaceae	*Polyporus*	None	None	None	5	5	14/01/1985
26696	Agaricomycetes	Polyporaceae	*Poria*	None	None	None	3	3	03/02/1982

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
26680	Agaricomycetes	Polyporaceae	*Pycnoporus coccineus*	None	C	None	4	4	03/11/1982
28686	Agaricomycetes	Polyporaceae	*Pycnoporus sanguineus*	None	C	None	1	1	26/08/1981
25927	Agaricomycetes	Polyporaceae	*Trametes*	None	None	None	8	8	03/11/1983
27901	Agaricomycetes	Polyporaceae	*Trametes elegans*	None	C	None	1	1	18/01/1933
27881	Agaricomycetes	Polyporaceae	*Trametes hirsuta*	None	C	None	4	4	09/07/1993
27424	Agaricomycetes	Polyporaceae	*Trametes lactinea*	None	C	None	5	5	22/05/1979
25770	Agaricomycetes	Polyporaceae	*Trametes versicolor*	None	C	None	1	1	12/05/1981
28942	Agaricomycetes	Rhizopogonaceae	*Rhizopogon vulgaris*	None	C	None	1	1	01/01/1989
26313	Agaricomycetes	Russulaceae	*Russula*	None	C	None	1	1	26/03/2011
33817	Agaricomycetes	Russulaceae	*Russula iterika*	None	C	None	1	1	16/03/2013
33457	Agaricomycetes	Schizoporaceae	*Hyphodontia radula*	None	C	None	1	1	25/06/1974
28208	Agaricomycetes	Sclerodermataceae	*Calostoma fuscum*	None	C	None	1	1	05/01/2021
28879	Agaricomycetes	Serpulaceae	*Serpula lacrymans*	None	C	None	1	1	31/03/1994
28203	Agaricomycetes	Steccherinaceae	*Flavodon flavus*	None	C	None	1	1	01/09/1994
25930	Agaricomycetes	Stereaceae	*Stereum*	None	None	None	2	2	03/11/1982
22945	Arthoniomycetes	Arthoniaceae	*Arthonia*	None	None	None	2	2	02/09/1981
26855	Arthoniomycetes	Roccellaceae	*Melampilidium*	None	None	None	2	2	05/05/1979
23008	Coniocybomycetes	Coniocybaceae	*Chaenotheca*	None	None	None	3	3	02/09/1981
24115	Coniocybomycetes	Coniocybaceae	*Chaenotheca brunneola*	None	C	None	1	1	30/09/1981
26637	Dothideomycetes	Trypetheliaceae	*Polymeridium sulphurescens*	None	C	None	1	1	02/09/1981
25432	Eurotiomycetes	Pyrenulaceae	*Pyrenula cruenta*	None	C	None	1	1	02/09/1981
23512	Eurotiomycetes	Pyrenulaceae	*Pyrenula quassiaecola*	None	C	None	2	2	02/09/1981
23309	Eurotiomycetes	Verrucariaceae	*Normandina pulchella*	None	C	None	1	1	02/09/1981
22966	Lecanoromycetes	Brigantiaeaceae	*Brigantiaea tricolor*	None	C	None	4	4	02/09/1981
23245	Lecanoromycetes	Caliciaceae	*Buellia*	None	None	None	1	1	02/09/1981
35492	Lecanoromycetes	Caliciaceae	*Cratiria amphorea*	None	C	None	1	1	05/05/1979

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
23096	Lecanoromycetes	Caliciaceae	*Dirinaria applanata*	None	C	None	1	1	01/09/1982
34907	Lecanoromycetes	Cladoniaceae	*Cladia muelleri*	None	C	None	1	1	05/05/1979
23075	Lecanoromycetes	Coccocarpiaceae	*Coccocarpia palmicola*	None	C	None	4	4	02/09/1981
23062	Lecanoromycetes	Collemataceae	*Collema glaucophthalmum*	None	C	None	2	2	05/05/1979
23067	Lecanoromycetes	Collemataceae	*Collema rugosum*	None	C	None	4	4	05/05/1979
23263	Lecanoromycetes	Collemataceae	*Leptogium*	None	None	None	2	2	25/04/1981
30142	Lecanoromycetes	Collemataceae	*Leptogium chloromelum*	None	C	None	1	1	05/05/1979
23257	Lecanoromycetes	Collemataceae	*Leptogium coralloideum*	None	C	None	1	1	02/09/1981
23258	Lecanoromycetes	Collemataceae	*Leptogium cyanescens*	None	C	None	2	2	02/09/1981
26753	Lecanoromycetes	Collemataceae	*Leptogium gelatinosum*	None	C	None	1	1	02/09/1981
23261	Lecanoromycetes	Collemataceae	*Leptogium marginellum*	None	C	None	1	1	05/05/1979
32774	Lecanoromycetes	Graphidaceae	*Chapsa pulchra*	None	C	None	1	1	02/09/1981
29909	Lecanoromycetes	Graphidaceae	*Diorygma circumfusum*	None	C	None	2	2	02/09/1981
30064	Lecanoromycetes	Graphidaceae	*Glyphis cicatricosa*	None	C	None	1	1	02/09/1981
26587	Lecanoromycetes	Graphidaceae	*Graphis desquamescens*	None	C	None	1	1	02/09/1981
23135	Lecanoromycetes	Graphidaceae	*Graphis elegans*	None	C	None	1	1	25/04/1981
26593	Lecanoromycetes	Graphidaceae	*Graphis stenotera*	None	C	None	1	1	02/09/1981
27104	Lecanoromycetes	Graphidaceae	*Reimnitzia santensis*	None	C	None	2	2	02/09/1981
32924	Lecanoromycetes	Graphidaceae	*Thelotrema pachysporum*	None	C	None	1	1	02/09/1981
24558	Lecanoromycetes	Haematommataceae	*Haematomma flexuosum*	None	C	None	2	2	05/05/1979
23154	Lecanoromycetes	Haematommataceae	*Haematomma stevensiae*	None	C	None	1	1	02/09/1981
23232	Lecanoromycetes	Lecanoraceae	*Lecanora*	None	None	None	1	1	05/05/1979
23190	Lecanoromycetes	Lecanoraceae	*Lecanora alba*	None	C	None	1	1	02/09/1981
23218	Lecanoromycetes	Lecanoraceae	*Lecanora interjecta*	None	C	None	1	1	05/05/1979
23744	Lecanoromycetes	Lobariaceae	*Lobaria plurimiseptata*	None	C	None	3	3	30/09/1981
34984	Lecanoromycetes	Ochrolechiaceae	*Varicellaria velata*	None	C	None	1	1	05/05/1979

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
23335	Lecanoromycetes	Pannariaceae	*Pannaria lurida*	None	C	None	1	1	05/05/1979
24479	Lecanoromycetes	Pannariaceae	*Parmeliella mariana*	None	C	None	1	1	02/09/1981
31026	Lecanoromycetes	Pannariaceae	*Parmeliella nigrocincta*	None	C	None	1	1	02/09/1981
34341	Lecanoromycetes	Parmeliaceae	*Austroparmelina conlabrosa*	None	C	None	3	3	02/09/1981
23207	Lecanoromycetes	Parmeliaceae	*Hypotrachyna osseoalba*	None	C	None	3	3	02/09/1981
23363	Lecanoromycetes	Parmeliaceae	*Parmelinopsis spumosa*	None	C	None	2	2	02/09/1981
23370	Lecanoromycetes	Parmeliaceae	*Parmotrema crinitum*	None	C	None	2	2	02/09/1981
23376	Lecanoromycetes	Parmeliaceae	*Parmotrema permutatum*	None	C	None	1	1	05/05/1979
30862	Lecanoromycetes	Parmeliaceae	*Parmotrema reticulatum*	None	C	None	5	5	05/05/1979
23448	Lecanoromycetes	Parmeliaceae	*Parmotrema tinctorum*	None	C	None	1	1	05/05/1979
23573	Lecanoromycetes	Parmeliaceae	*Relicina limbata*	None	C	None	1	1	05/05/1979
24011	Lecanoromycetes	Parmeliaceae	*Usnea angulata*	None	C	None	4	4	16/03/1989
24050	Lecanoromycetes	Parmeliaceae	*Usnea baileyi*	None	C	None	11	11	16/03/1989
24053	Lecanoromycetes	Parmeliaceae	*Usnea bismolliuscula*	None	C	None	6	6	04/01/1986
29480	Lecanoromycetes	Parmeliaceae	*Usnea dasaea*	None	C	None	13	13	16/06/1989
24060	Lecanoromycetes	Parmeliaceae	*Usnea himantodes*	None	C	None	8	8	16/03/1989
24062	Lecanoromycetes	Parmeliaceae	*Usnea mekista*	None	C	None	1	1	02/09/1981
24064	Lecanoromycetes	Parmeliaceae	*Usnea molliuscula subsp. queenslandica*	None	C	None	1	1	05/05/1979
24065	Lecanoromycetes	Parmeliaceae	*Usnea nidifica*	None	C	None	1	1	02/09/1981
29477	Lecanoromycetes	Parmeliaceae	*Usnea pectinata*	None	C	None	1	1	04/01/1986
29478	Lecanoromycetes	Parmeliaceae	*Usnea rubicunda*	None	C	None	10	10	16/03/1989
29481	Lecanoromycetes	Parmeliaceae	*Usnea rubrotincta*	None	C	None	4	4	16/03/1989
24078	Lecanoromycetes	Parmeliaceae	*Usnea trichodeoides*	None	C	None	4	4	04/01/1986
23428	Lecanoromycetes	Pertusariaceae	*Pertusaria*	None	None	None	4	4	02/09/1981
23401	Lecanoromycetes	Pertusariaceae	*Pertusaria commutata*	None	C	None	1	1	25/04/1981

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
27462	Lecanoromycetes	Physciaceae	*Heterodermia japonica*	None	C	None	1	1	02/09/1981
23167	Lecanoromycetes	Physciaceae	*Heterodermia leucomela*	None	C	None	2	2	05/05/1979
23170	Lecanoromycetes	Physciaceae	*Heterodermia obscurata*	None	C	None	3	3	02/09/1981
23844	Lecanoromycetes	Physciaceae	*Rinodina xanthomelana*	None	C	None	1	1	27/03/2017
24496	Lecanoromycetes	Pilocarpaceae	*Micarea*	None	None	None	1	1	02/09/1981
22958	Lecanoromycetes	Ramalinaceae	*Bacidia*	None	None	None	1	1	02/09/1981
23440	Lecanoromycetes	Ramalinaceae	*Phyllopsora*	None	None	None	2	2	02/09/1981
23436	Lecanoromycetes	Ramalinaceae	*Phyllopsora foliata var. foliata*	None	C	None	1	1	25/04/1981
23438	Lecanoromycetes	Ramalinaceae	*Phyllopsora parvifolia var. parvifolia*	None	C	None	1	1	25/04/1981
23553	Lecanoromycetes	Ramalinaceae	*Ramalina inflata subsp. perpusilla*	None	C	None	1	1	16/03/1989
31980	Lecanoromycetes	Ramboldiaceae	*Ramboldia haematites*	None	C	None	1	1	05/05/1979
28734	Leotiomycetes	Vibrisseaceae	*Vibrissea*	None	None	None	1	1	03/11/1982
26289	Sordariomycetes	Xylariaceae	*Hypoxylon*	None	None	None	6	6	03/11/1982
28943	Sordariomycetes	Xylariaceae	*Hypoxylon bovei*	None	C	None	1	1	26/05/1974
26790	Sordariomycetes	Xylariaceae	*Xylaria*	None	None	None	1	1	04/04/1979

Table 5. Other species recorded within the area of interest and its one kilometre buffer

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
8706	Cyanophyceae	Scytonemataceae	*Scytonema*	None	None	None	1	1	31/12/1963

Species table headings and codes

Taxon Id: Unique identifier of the taxon from the WildNet database.

NCA: Queensland conservation status of the taxon under the *Nature Conservation Act 1992* (Least Concern (C), Critically Endangered (CR), Endangered (E), Extinct (EX), Near Threatened (NT), Extinct in the Wild (PE), Special Least Concern (SL), and Vulnerable (V)).

EPBC: Australian conservation status of the taxon under the *Environment Protection and Biodiversity Conservation Act 1999* (Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Vulnerable (V), and Extinct in the Wild (XW)).

Specimens: The number of specimen-backed records of the taxon.

Records: The total number of records of the taxon.

Last record: Date of latest record of the taxon.

Links and Support

Other sites that deliver species information from the WildNet database include:

- Species profile search - access species information approved for publication including species names, statuses, notes, images, distribution maps and records
- Species lists - generate species lists for Queensland protected areas, forestry areas, local governments and areas defined using coordinates
- Biomaps - view biodiversity information, including WildNet records approved for publication, and generate reports
- Queensland Globe - view spatial information, including WildNet records approved for publication
- Qld wildlife data API - access WildNet species information approved for publication such as notes, images and records etc.
- Wetland*Maps* - view species records, survey locations etc. approved for publication
- Wetland*Summary* - view wildlife statistics, species lists for a range of area types, and access WildNet species profiles
- WildNet wildlife records - published - Queensland - spatial layer of WildNet records approved for publication generated weekly
- Generalised distribution and densities of Queensland wildlife - Queensland species distributions and densities generalised to a 10 km grid resolution
- Conservation status of Queensland wildlife - access current lists of priority species for Queensland including nomenclature and status information
- Queensland Confidential Species - the list of species flagged as confidential in the WildNet database.

Please direct queries about this report to the WildNet Team.

Other useful sites for accessing Queensland biodiversity data include:

- Useful wildlife resources
- Queensland Government Data
- Atlas of Living Australia (ALA)
- Online Zoological Collections of Australian Museums (OZCAM)
- Australia's Virtual Herbarium (AVH)
- Protected Matters Search Tool

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WildNet Records
Weed List



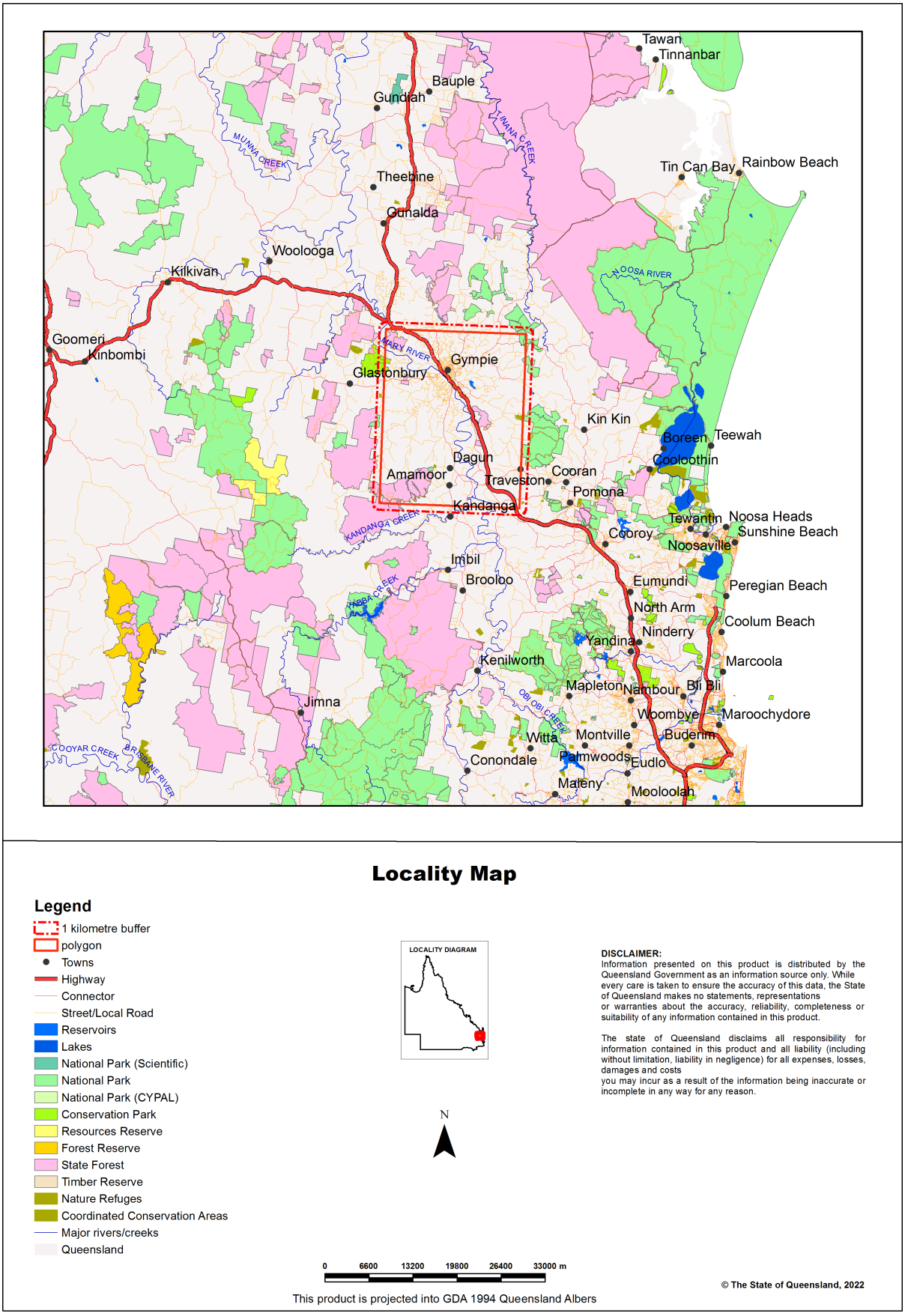
For the selected area of interest 54831.55ha Custom Geometry

Current as at 05/07/2022

WildNetWeedList

Queensland Government

Map 1. Locality Map



Locality Map

Legend

- 1 kilometre buffer
- polygon
- Towns
- Highway
- Connector
- Street/Local Road
- Reservoirs
- Lakes
- National Park (Scientific)
- National Park
- National Park (CYPAL)
- Conservation Park
- Resources Reserve
- Forest Reserve
- State Forest
- Timber Reserve
- Nature Refuges
- Coordinated Conservation Areas
- Major rivers/creeks
- Queensland

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0 6600 13200 19800 26400 33000 m

This product is projected into GDA 1994 Queensland Albers

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Summary Information

The following table provides an overview of the area of interest Custom Geometry.

Table 1. Area of interest details

Size (ha)	54,831.55
Local Government(s)	Noosa Shire, Gympie Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Gympie Block
Catchment(s)	Mary

Protected Area(s)
The following estates and/or reserves are located in the area of interest:

Lynchs Hill State Forest

King Conservation Park

Goomboorian National Park

King State Forest

Fishermans Pocket State Forest

Woondum National Park

Woondum State Forest

Traveston State Forest

Amamoor State Forest

Amamoor National Park

World Heritage Area(s)
No World Heritage Areas are located within the area of interest.

Ramsar Area(s)
No Ramsar Areas are located within the area of interest.

Weed List

Introduction

This report is derived from a spatial layer generated from the WildNet database managed by the Department of Environment and Science. The layer which is generated weekly contains the WildNet wildlife records that are not classed as erroneous or duplicate, that have a location precision equal to or less than 10000 metres and do not have a count of zero.

The WildNet dataset is constantly being enhanced and the taxonomic and status information revised. If a species is not listed in this report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area. It is recommended that you also access other internal and external data sources for species information in your area of interest (Refer Links and Support).

Species Data

Contextual location information is presented in Map 1.

A summary of the weeds recorded within the area of interest and its one kilometre buffer is presented in Table 2.

Table 2. Weeds recorded within the area of interest and its one kilometre buffer

Taxon Id	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
33640	Acanthaceae	*Ruellia simplex*	None	2	2	25/11/2000	IU
14157	Acanthaceae	*Thunbergia alata*	black-eyed Susan	1	1	14/05/2001	IU
11782	Amaranthaceae	*Guilleminea densa*	small matweed	1	1	04/03/1969	IU

Taxon Id	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
11645	Amaryllidaceae	*Zephyranthes candida*	None	1	1	18/02/2001	IU
17173	Anacardiaceae	*Euroschinus falcatus*	None	0	5	19/04/1999	XU
16720	Anacardiaceae	*Mangifera indica*	mango	0	1	01/07/1995	IU
11769	Anacardiaceae	*Schinus terebinthifolius*	None	7	10	13/08/2017	IU
8244	Apocynaceae	*Araujia sericifera*	white moth vine	0	1	12/03/2001	IU
4710	Apocynaceae	*Gymnema pleiadenium*	None	0	1	19/04/1999	XU
11202	Apocynaceae	*Hoya australis*	None	0	5	19/04/1999	XU
17960	Araucariaceae	*Araucaria cunninghamii*	hoop pine	0	7	01/07/2015	XU
17972	Aristolochiaceae	*Aristolochia elegans*	calico-flower	1	5	12/03/2001	IU
19747	Asparagaceae	*Asparagus aethiopicus*	ground asparagus	1	1	14/05/2001	XU
35428	Asparagaceae	*Asparagus macowanii*	None	1	1	16/11/2006	IU
14816	Asparagaceae	*Asparagus officinalis*	asparagus	1	1	21/11/2006	IU
7566	Asparagaceae	*Asparagus plumosus*	feathered asparagus fern	0	5	01/07/1995	IU
9491	Asphodelaceae	*Aloe parvibracteata*	None	1	1	14/05/2001	IU
15715	Asteraceae	*Acanthospermum hispidum*	star burr	0	1	23/05/2018	IU
14051	Asteraceae	*Ageratum houstonianum*	blue billygoat weed	1	10	24/02/2004	IU
15672	Asteraceae	*Ambrosia artemisiifolia*	annual ragweed	1	1	26/01/1972	IU
15612	Asteraceae	*Baccharis halimifolia*	groundsel bush	0	6	01/07/1995	IU
7691	Asteraceae	*Bidens pilosa*	None	0	3	01/07/1995	IU
15570	Asteraceae	*Calyptocarpus vialis*	creeping cinderella weed	1	2	04/05/2018	IU
15574	Asteraceae	*Carduus thoermeri*	nodding thistle	3	3	21/10/1993	IU
14001	Asteraceae	*Cirsium vulgare*	spear thistle	0	1	01/07/1995	IU
33971	Asteraceae	*Dimorphotheca ecklonis*	None	1	1	14/05/2001	IU
15438	Asteraceae	*Eclipta prostrata*	white eclipta	1	1	25/05/2013	IU
15401	Asteraceae	*Emilia sonchifolia*	None	0	1	01/07/1995	IU
15285	Asteraceae	*Hypochaeris radicata*	catsear	0	1	01/07/1995	IU
8407	Asteraceae	*Praxelis clematidea*	None	3	3	27/12/2020	IU
31216	Asteraceae	*Senecio angulatus*	None	1	1	24/06/2015	IU
10486	Asteraceae	*Senecio madagascariensis*	fireweed	2	2	20/11/2017	IU
22236	Asteraceae	*Soliva sessilis*	None	1	1	25/11/2000	IU
26362	Asteraceae	*Sphagneticola trilobata*	None	0	1	15/06/2018	IU
35909	Asteraceae	*Symphyotrichum subulatum*	None	1	1	14/05/2001	IU
5622	Asteraceae	*Synedrellopsis grisebachii*	None	1	1	09/11/2021	IU
10450	Asteraceae	*Tithonia diversifolia*	Japanese sunflower	1	1	13/05/2001	IU
34188	Bignoniaceae	*Dolichandra unguis-cati*	cat's claw creeper	20	27	01/07/2015	IU
11152	Bignoniaceae	*Jacaranda mimosifolia*	jacaranda	0	1	01/07/1995	IU
41068	Blechnaceae	*Blechnum rupestre*	None	0	1	01/07/1995	XU
14570	Boraginaceae	*Ehretia acuminata*	None	0	1	01/07/1995	XU
12221	Brassicaceae	*Lepidium bonariense*	Argentine peppercress	2	2	25/10/2004	IU
15098	Brassicaceae	*Raphanus raphanistrum*	wild radish	0	1	27/06/2018	IU
15101	Brassicaceae	*Rorippa palustris*	marsh cress	1	1	07/10/1993	IU

Taxon Id	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
11636	Brassicaceae	*Sinapis alba*	white mustard	1	1	31/08/1984	IU
26358	Cactaceae	*Opuntia monacantha*	None	1	1	06/05/2015	IU
19437	Caryophyllaceae	*Silene gallica*	None	1	1	06/10/1971	IU
10494	Convolvulaceae	*Ipomoea hederacea*	None	1	1	27/12/2017	IU
11029	Convolvulaceae	*Ipomoea indica*	blue morning-glory	1	1	14/05/2001	IU
21934	Crassulaceae	*Bryophyllum delagoense*	None	1	1	14/05/2001	IU
27801	Crassulaceae	*Crassula sarmentosa*	None	1	1	14/05/2001	IU
14662	Cyperaceae	*Cyperus eragrostis*	None	1	1	07/10/1993	IU
14657	Cyperaceae	*Cyperus involucratus*	None	1	1	13/05/2001	IU
11617	Ebenaceae	*Diospyros kaki*	persimmon	0	2	14/12/2018	IU
17162	Euphorbiaceae	*Euphorbia heterophylla*	None	1	1	13/03/1973	IU
34392	Euphorbiaceae	*Euphorbia ophthalmica*	None	1	1	21/02/2005	IU
18802	Gentianaceae	*Centaurium tenuiflorum*	None	1	1	25/11/2000	IU
11859	Lauraceae	*Cinnamomum camphora*	camphor laurel	3	8	14/05/2003	IU
14068	Leguminosae	*Acacia saligna*	golden wreath wattle	1	1	22/08/1981	IU
30268	Leguminosae	*Arachis pintoi*	None	0	1	24/10/2018	IU
36122	Leguminosae	*Biancaea decapetala*	None	1	1	14/02/2007	IU
14805	Leguminosae	*Cajanus cajan*	pigeon pea	1	1	30/04/2018	IU
35911	Leguminosae	*Crotalaria beddomeana*	None	1	1	05/06/1996	IU
18779	Leguminosae	*Crotalaria pallida*	None	0	1	01/07/1995	IU
13037	Leguminosae	*Desmodium tortuosum*	Florida beggar-weed	1	1	25/11/2000	IU
13038	Leguminosae	*Desmodium uncinatum*	None	1	1	14/05/2001	IU
12996	Leguminosae	*Erythrina crista-galli*	None	2	2	14/05/2001	IU
14518	Leguminosae	*Gleditsia triacanthos*	honey locust	1	1	11/01/2016	IU
22819	Leguminosae	*Indigofera arrecta*	None	1	1	19/06/2018	IU
8865	Leguminosae	*Leucaena leucocephala subsp. glabrata*	None	1	1	13/05/2001	IU
6280	Leguminosae	*Leucaena leucocephala subsp. leucocephala*	None	1	1	14/05/2001	IU
15228	Leguminosae	*Lotononis bainesii*	lotononis	0	1	04/09/2018	IU
15235	Leguminosae	*Macroptilium atropurpureum*	siratro	0	1	01/07/1995	IU
15239	Leguminosae	*Medicago lupulina*	black medic	2	2	25/11/2000	IU
15241	Leguminosae	*Melilotus indicus*	hexham scent	1	1	07/10/1993	IU
18222	Leguminosae	*Neonotonia wightii*	None	0	1	01/07/2015	IU
29406	Leguminosae	*Pueraria montana var. lobata*	kudzu	1	1	04/04/2017	IU
15576	Leguminosae	*Senna alata*	None	0	1	23/04/2018	IU
14733	Leguminosae	*Senna didymobotrya*	None	1	1	09/05/1963	IU
14238	Leguminosae	*Senna hirsuta*	None	1	1	21/09/2012	IU
14196	Leguminosae	*Senna occidentalis*	coffee senna	2	2	14/07/2015	IU
15073	Leguminosae	*Senna pendula var. glabrata*	Easter cassia	4	4	14/05/2001	IU
24648	Leguminosae	*Senna septemtrionalis*	None	0	3	01/07/1995	IU
9418	Leguminosae	*Vicia sativa subsp. nigra*	None	0	1	11/09/2018	IU

Taxon Id	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
7791	Leguminosae	*Vicia villosa subsp. eriocarpa*	None	1	1	27/09/1962	IU
12853	Lythraceae	*Cuphea carthagenensis*	None	1	1	01/06/2010	IU
13006	Malvaceae	*Gossypium barbadense*	None	2	2	14/05/2001	IU
12949	Malvaceae	*Modiola caroliniana*	red-flowered mallow	1	1	07/11/2000	IU
16195	Malvaceae	*Sida cordifolia*	None	1	4	23/06/2018	IU
12146	Myrtaceae	*Eugenia uniflora*	Brazilian cherry tree	2	2	02/09/2020	IU
13400	Myrtaceae	*Psidium guineense*	cherry guava	1	1	14/05/2001	IU
19941	Nymphaeaceae	*Nymphaea caerulea*	None	1	1	10/02/1964	IU
13390	Ochnaceae	*Ochna serrulata*	ochna	0	6	01/07/2015	IU
9461	Oleaceae	*Jasminum simplicifolium*	None	0	3	01/07/1995	XU
13417	Oleaceae	*Ligustrum lucidum*	large-leaved privet	2	2	14/05/2001	IU
16795	Oleaceae	*Ligustrum sinense*	small-leaved privet	1	5	02/09/2020	IU
32786	Onagraceae	*Oenothera lindheimeri*	None	1	1	31/01/1954	IU
9457	Oxalidaceae	*Oxalis corniculata*	None	1	3	16/07/2013	IU
12715	Passifloraceae	*Passiflora edulis*	None	0	2	01/07/1995	IU
16530	Passifloraceae	*Passiflora foetida*	None	1	2	14/05/2001	IU
16532	Passifloraceae	*Passiflora suberosa*	corky passion flower	0	9	01/07/2015	IU
16533	Passifloraceae	*Passiflora subpeltata*	white passion flower	1	5	01/07/1995	IU
16302	Petiveriaceae	*Rivina humilis*	None	1	9	01/07/2015	IU
16479	Phytolaccaceae	*Phytolacca octandra*	inkweed	0	1	01/07/1995	IU
5286	Piperaceae	*Peperomia leptostachya*	None	0	1	01/07/1995	XU
18225	Plantaginaceae	*Mecardonia procumbens*	None	1	1	07/02/1991	IU
12730	Plantaginaceae	*Plantago major*	greater plantain	1	1	25/11/2000	IU
33873	Poaceae	*Cenchrus americanus*	None	1	1	13/04/1970	IU
15551	Poaceae	*Chloris gayana*	rhodes grass	1	2	14/05/2001	IU
7812	Poaceae	*Cynodon dactylon var. dactylon*	None	1	1	08/05/2001	IU
10386	Poaceae	*Cynodon nlemfuensis var. nlemfuensis*	None	1	1	03/04/2000	IU
35353	Poaceae	*Cynodon plectostachyus*	None	1	1	19/11/2013	IU
10391	Poaceae	*Dactyloctenium australe*	sweet smother grass	2	2	08/03/1971	IU
15463	Poaceae	*Dichanthium annulatum*	sheda grass	1	1	25/11/2000	IU
29093	Poaceae	*Megathyrsus maximus*	None	0	5	19/04/2018	IU
28224	Poaceae	*Megathyrsus maximus var. coloratus*	None	1	1	27/12/2017	IU
28420	Poaceae	*Megathyrsus maximus var. maximus*	None	1	1	21/05/2003	IU
22783	Poaceae	*Paspalum mandiocanum*	None	1	1	02/05/1995	IU
10820	Poaceae	*Paspalum notatum*	bahia grass	1	1	08/05/2001	IU
9190	Poaceae	*Setaria sphacelata*	None	2	2	27/12/2020	IU
22165	Poaceae	*Sporobolus africanus*	Parramatta grass	1	1	11/12/1989	IU
22159	Poaceae	*Sporobolus fertilis*	giant Parramatta grass	0	2	14/02/2017	IU
10158	Poaceae	*Sporobolus natalensis*	None	1	1	07/11/1989	IU

Taxon Id	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
10156	Poaceae	*Sporobolus pyramidalis*	None	7	7	26/01/1994	IU
14973	Poaceae	*Themeda quadrivalvis*	grader grass	1	1	03/03/1972	IU
2249	Poaceae	*Urochloa decumbens*	None	1	1	14/05/2001	IU
13129	Polygalaceae	*Polygala virgata*	None	1	1	04/10/1993	IU
19983	Pontederiaceae	*Pontederia cordata*	None	1	1	20/12/2006	IU
22935	Ranunculaceae	*Ranunculus sceleratus subsp. sceleratus*	None	0	1	16/08/2018	IU
12166	Rosaceae	*Rhaphiolepis indica*	Indian hawthorn	1	1	14/05/2001	IU
16304	Rosaceae	*Rosa laevigata*	cherokee rose	1	1	20/09/1967	IU
21837	Rutaceae	*Murraya paniculata 'Exotica'*	None	0	1	01/07/1995	IU
14128	Rutaceae	*Zieria minutiflora*	None	0	1	01/07/1995	XU
11945	Salicaceae	*Salix babylonica*	weeping willow	2	2	14/05/2001	IU
31211	Salicaceae	*Salix humboldtiana*	None	1	1	06/10/2017	IU
17738	Sapindaceae	*Cardiospermum grandiflorum*	heart seed vine	2	2	13/05/2001	IU
9353	Sapindaceae	*Cardiospermum halicacabum*	None	0	1	01/07/1995	IU
16157	Solanaceae	*Solanum americanum*	None	1	1	07/02/1970	IU
16169	Solanaceae	*Solanum linnaeanum*	apple of Sodom	0	1	15/08/2018	IU
16171	Solanaceae	*Solanum mauritianum*	wild tobacco	1	9	12/08/2017	IU
16120	Solanaceae	*Solanum seaforthianum*	Brazilian nightshade	1	8	01/07/1995	IU
16126	Solanaceae	*Solanum torvum*	devil's fig	0	1	01/07/1995	IU
15983	Sparrmanniaceae	*Triumfetta rhomboidea*	chinese burr	2	3	01/07/2015	IU
19756	Sterculiaceae	*Brachychiton populneus*	None	0	1	01/07/1995	XU
12526	Tropaeolaceae	*Tropaeolum majus*	garden nasturtium	1	1	25/11/2000	IU
12654	Ulmaceae	*Celtis sinensis*	Chinese elm	2	4	14/05/2001	IU
19905	Verbenaceae	*Lantana camara*	lantana	1	29	13/08/2017	IU
30780	Verbenaceae	*Verbena rigida*	None	1	1	25/11/2000	IU

Species table headings and codes

Taxon Id: Unique identifier of the taxon from the WildNet database.

Specimens: The number of specimen-backed records of the taxon.

Records: The total number of records of the taxon.

Last record: Date of latest record of the taxon.

Endemicity: The endemicity code for the taxon (Introduced (Intranational) (IA), Introduced (International) (II), Introduced (Unknown), Exotic (Intranational) (XA), Exotic (International) (XI) and Exotic (Unknown) (XU)).

Links and Support

Other sites that deliver species information from the WildNet database include:

- Species profile search - access species information approved for publication including species names, statuses, notes, images, distribution maps and records
- Species lists - generate species lists for Queensland protected areas, forestry areas, local governments and areas defined using coordinates
- Biomaps - view biodiversity information, including WildNet records approved for publication, and generate reports
- Queensland Globe - view spatial information, including WildNet records approved for publication
- Qld wildlife data API - access WildNet species information approved for publication such as notes, images and records etc.

- WetlandMaps - view species records, survey locations etc. approved for publication
- WetlandSummary - view wildlife statistics, species lists for a range of area types, and access WildNet species profiles
- WildNet wildlife records - published - Queensland - spatial layer of WildNet records approved for publication generated weekly
- Generalised distribution and densities of Queensland wildlife - Queensland species distributions and densities generalised to a 10 km grid resolution
- Conservation status of Queensland wildlife - access current lists of priority species for Queensland including nomenclature and status information
- Queensland Confidential Species - the list of species flagged as confidential in the WildNet database.

Please direct queries about this report to the WildNet Team.

Other useful sites for accessing Queensland biodiversity data include:

- Useful wildlife resources
- Queensland Government Data
- Atlas of Living Australia (ALA)
- Online Zoological Collections of Australian Museums (OZCAM)
- Australia's Virtual Herbarium (AVH)
- Protected Matters Search Tool

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WildNet Records
Weed List



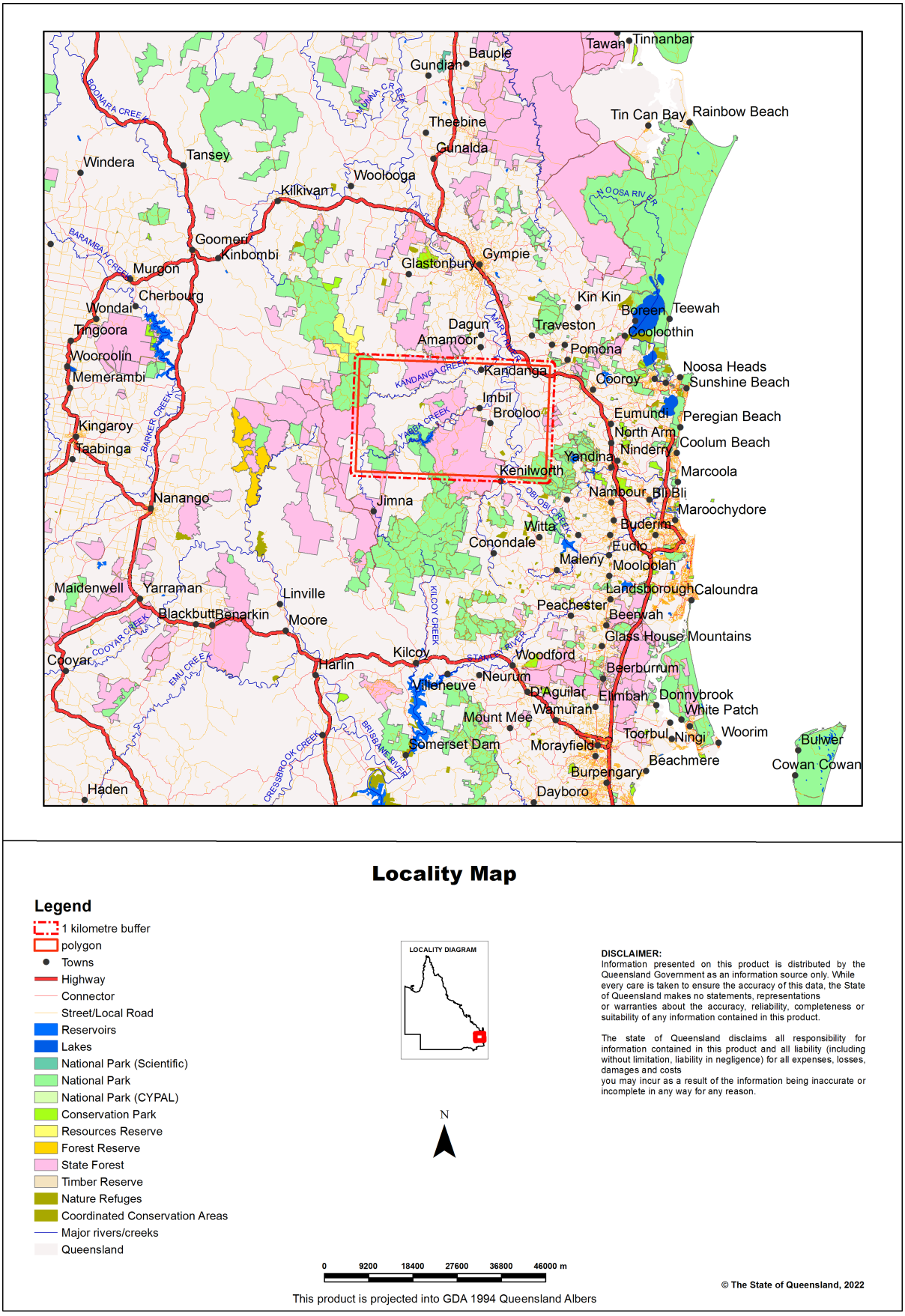
For the selected area of interest 92615.68ha Custom Geometry

Current as at 05/07/2022

WildNetWeedList

Queensland Government

Map 1. Locality Map



Summary Information

The following table provides an overview of the area of interest Custom Geometry.

Table 1. Area of interest details

Size (ha)	92,615.68
Local Government(s)	Sunshine Coast Regional, Noosa Shire, Gympie Regional, Somerset Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Burringbar - Conondale Ranges, Gympie Block
Catchment(s)	Mary

Protected Area(s)

The following estates and/or reserves are located in the area of interest:

West Cooroy State Forest

Imbil State Forest 2

Amamoor State Forest

Conondale National Park

Wrattens National Park

Upper Kandanga State Forest

Yabba State Forest

Mapleton National Park

Mapleton Forest Reserve

Imbil State Forest 1

World Heritage Area(s)

No World Heritage Areas are located within the area of interest.

Ramsar Area(s)

No Ramsar Areas are located within the area of interest.

Weed List

Introduction

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A summary of the weeds recorded within the area of interest and its one kilometre buffer is presented in Table 2.

Table 2. Weeds recorded within the area of interest and its one kilometre buffer

Taxon Id	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
27952	Acanthaceae	*Eranthemum pulchellum*	None	0	1	22/08/2018	IU

Taxon Id	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
12491	Amaranthaceae	*Amaranthus spinosus*	needle burr	1	1	04/11/2009	IU
17173	Anacardiaceae	*Euroschinus falcatus*	None	0	4	19/04/1999	XU
8244	Apocynaceae	*Araujia sericifera*	white moth vine	0	1	30/03/2016	IU
17050	Apocynaceae	*Gomphocarpus physocarpus*	balloon cottonbush	1	2	30/03/2016	IU
4710	Apocynaceae	*Gymnema pleiadenium*	None	0	1	30/06/2016	XU
11202	Apocynaceae	*Hoya australis*	None	0	5	02/11/2018	XU
17960	Araucariaceae	*Araucaria cunninghamii*	hoop pine	0	6	30/06/2016	XU
35428	Asparagaceae	*Asparagus macowanii*	None	1	1	31/05/2013	IU
7566	Asparagaceae	*Asparagus plumosus*	feathered asparagus fern	0	2	01/07/1995	IU
5997	Asteraceae	*Ageratina adenophora*	crofton weed	1	1	24/11/1998	IU
5996	Asteraceae	*Ageratina riparia*	mistflower	1	2	22/05/2003	IU
14051	Asteraceae	*Ageratum houstonianum*	blue billygoat weed	1	3	30/03/2016	IU
15672	Asteraceae	*Ambrosia artemisiifolia*	annual ragweed	1	2	24/01/2017	IU
15644	Asteraceae	*Arctotheca calendula*	Cape weed	1	1	11/09/2005	IU
15612	Asteraceae	*Baccharis halimifolia*	groundsel bush	0	2	31/08/2016	IU
7691	Asteraceae	*Bidens pilosa*	None	0	1	30/03/2016	IU
15574	Asteraceae	*Carduus thoermeri*	nodding thistle	8	8	29/12/1999	IU
14781	Asteraceae	*Carthamus lanatus*	saffron thistle	1	1	20/12/1979	IU
14001	Asteraceae	*Cirsium vulgare*	spear thistle	1	2	30/03/2016	IU
15438	Asteraceae	*Eclipta prostrata*	white eclipta	1	2	23/07/2013	IU
15401	Asteraceae	*Emilia sonchifolia*	None	0	4	05/05/2016	IU
35896	Asteraceae	*Erigeron bonariensis*	None	0	1	30/03/2016	IU
35900	Asteraceae	*Erigeron pusillus*	None	1	1	21/01/2004	IU
12254	Asteraceae	*Galinsoga parviflora*	yellow weed	1	1	04/11/1996	IU
15285	Asteraceae	*Hypochaeris radicata*	catsear	1	1	06/03/1989	IU
10007	Asteraceae	*Lactuca saligna*	wild lettuce	1	1	21/01/2004	IU
29504	Asteraceae	*Lactuca serriola forma serriola*	None	1	1	26/11/1993	IU
10959	Asteraceae	*Parthenium hysterophorus*	parthenium weed	1	1	29/01/1997	IU
10486	Asteraceae	*Senecio madagascariensis*	fireweed	0	11	24/01/2017	IU
22236	Asteraceae	*Soliva sessilis*	None	1	1	10/10/1999	IU
35909	Asteraceae	*Symphyotrichum subulatum*	None	1	1	29/01/1997	IU
13755	Asteraceae	*Tagetes minuta*	stinking roger	1	3	30/03/2016	IU
11266	Basellaceae	*Anredera cordifolia*	Madeira vine	1	1	15/03/2004	IU
34188	Bignoniaceae	*Dolichandra unguis-cati*	cat's claw creeper	7	10	12/08/2017	IU
11152	Bignoniaceae	*Jacaranda mimosifolia*	jacaranda	1	1	22/04/2005	IU
41068	Blechnaceae	*Blechnum rupestre*	None	0	2	23/07/2013	XU
11191	Boraginaceae	*Echium plantagineum*	Paterson's curse	1	1	09/11/1970	IU
11193	Boraginaceae	*Heliotropium amplexicaule*	blue heliotrope	0	1	30/03/2016	IU

Taxon Id	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
14438	Brassicaceae	*Lepidium virginicum*	Virginian peppercress	1	1	04/11/2009	IU
15098	Brassicaceae	*Raphanus raphanistrum*	wild radish	2	2	10/10/1999	IU
14260	Brassicaceae	*Rorippa nasturtium-aquaticum*	watercress	2	2	04/11/1996	IU
15101	Brassicaceae	*Rorippa palustris*	marsh cress	2	2	06/11/1996	IU
19394	Bromeliaceae	*Tillandsia usneoides*	None	0	1	30/03/2016	IU
19443	Caryophyllaceae	*Drymaria cordata*	None	1	1	11/09/2005	IU
17352	Caryophyllaceae	*Drymaria cordata subsp. cordata*	None	1	1	26/11/1993	IU
16390	Caryophyllaceae	*Polycarpon tetraphyllum*	None	1	1	10/10/1999	IU
33925	Cleomaceae	*Tarenaya hassleriana*	None	1	1	15/01/1973	IU
6645	Commelinaceae	*Tradescantia zebrina*	None	0	2	22/05/2003	IU
16907	Convolvulaceae	*Ipomoea hederifolia*	None	1	1	15/05/1967	IU
17517	Cyperaceae	*Cyperus esculentus*	yellow nutgrass	1	1	13/03/1970	IU
17160	Euphorbiaceae	*Euphorbia cyathophora*	dwarf poinsettia	1	1	01/04/1995	IU
11288	Euphorbiaceae	*Ricinus communis*	castor oil bush	0	1	12/08/2017	IU
14743	Gentianaceae	*Centaurium erythraea*	common centaury	1	1	26/11/1993	IU
11773	Lamiaceae	*Stachys arvensis*	stagger weed	1	1	11/09/2005	IU
11859	Lauraceae	*Cinnamomum camphora*	camphor laurel	0	2	22/05/2003	IU
15468	Leguminosae	*Crotalaria lanceolata subsp. lanceolata*	None	1	1	12/03/2004	IU
14672	Leguminosae	*Dalbergia sissoo*	None	1	1	20/04/1993	IU
13038	Leguminosae	*Desmodium uncinatum*	None	0	1	30/03/2016	IU
14518	Leguminosae	*Gleditsia triacanthos*	honey locust	2	2	13/04/1987	IU
12967	Leguminosae	*Indigofera suffruticosa*	None	1	1	14/11/2006	IU
15299	Leguminosae	*Indigofera tinctoria*	None	1	1	09/05/2014	IU
14445	Leguminosae	*Leucaena leucocephala*	None	0	1	12/08/2017	IU
15235	Leguminosae	*Macroptilium atropurpureum*	siratro	0	1	30/03/2016	IU
18762	Leguminosae	*Macrotyloma axillare var. axillare*	None	1	1	08/05/1991	IU
15576	Leguminosae	*Senna alata*	None	0	1	23/04/2018	IU
24648	Leguminosae	*Senna septemtrionalis*	None	1	1	01/04/1995	IU
12886	Leguminosae	*Trifolium dubium*	yellow sucking clover	0	1	30/03/2016	IU
11688	Lygodiaceae	*Lygodium japonicum*	None	1	1	26/11/1993	IU
14262	Lythraceae	*Rotala rotundifolia*	None	1	1	26/09/2021	IU
12949	Malvaceae	*Modiola caroliniana*	red-flowered mallow	1	1	10/10/1999	IU
16195	Malvaceae	*Sida cordifolia*	None	0	1	30/03/2016	IU
16146	Malvaceae	*Sida rhombifolia*	None	0	3	30/03/2016	IU
32684	Meliaceae	*Cedrela odorata*	None	1	1	03/12/2007	IU
13390	Ochnaceae	*Ochna serrulata*	ochna	0	3	30/03/2016	IU
31254	Oleaceae	*Fraxinus griffithii*	None	1	1	16/03/2010	IU
9461	Oleaceae	*Jasminum simplicifolium*	None	0	1	01/07/1995	XU

Taxon Id	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
13417	Oleaceae	*Ligustrum lucidum*	large-leaved privet	2	2	31/03/2001	IU
16795	Oleaceae	*Ligustrum sinense*	small-leaved privet	0	1	22/05/2003	IU
9334	Onagraceae	*Oenothera indecora subsp. bonariensis*	None	1	1	10/10/1999	IU
13391	Onagraceae	*Oenothera rosea*	rose evening primrose	3	3	02/10/2021	IU
12715	Passifloraceae	*Passiflora edulis*	None	0	1	22/05/2003	IU
16530	Passifloraceae	*Passiflora foetida*	None	0	1	30/03/2016	IU
16532	Passifloraceae	*Passiflora suberosa*	corky passion flower	0	3	30/03/2016	IU
16533	Passifloraceae	*Passiflora subpeltata*	white passion flower	2	3	24/11/1998	IU
16302	Petiveriaceae	*Rivina humilis*	None	1	4	01/07/1995	IU
14311	Phytolaccaceae	*Phytolacca americana*	None	1	1	05/05/1979	IU
16479	Phytolaccaceae	*Phytolacca octandra*	inkweed	1	1	11/12/1969	IU
5286	Piperaceae	*Peperomia leptostachya*	None	0	3	23/07/2013	XU
8176	Plantaginaceae	*Bacopa caroliniana*	None	1	1	20/12/2006	IU
32460	Plantaginaceae	*Bacopa lanigera*	None	1	1	15/02/2017	IU
40893	Plantaginaceae	*Linaria texana*	None	1	1	06/10/2020	IU
18225	Plantaginaceae	*Mecardonia procumbens*	None	1	1	01/04/1995	IU
9973	Poaceae	*Axonopus fissifolius*	None	1	1	29/01/1997	IU
15551	Poaceae	*Chloris gayana*	rhodes grass	0	2	30/03/2016	IU
15552	Poaceae	*Chloris inflata*	purpletop chloris	0	1	30/03/2016	IU
15527	Poaceae	*Chloris virgata*	feathertop rhodes grass	0	1	30/03/2016	IU
7812	Poaceae	*Cynodon dactylon var. dactylon*	None	1	1	06/11/1996	IU
15420	Poaceae	*Digitaria ciliaris*	summer grass	2	2	29/01/1997	IU
14567	Poaceae	*Echinochloa colona*	awnless barnyard grass	1	1	23/12/1996	IU
15378	Poaceae	*Eragrostis tenuifolia*	elastic grass	0	1	30/03/2016	IU
29093	Poaceae	*Megathyrsus maximus*	None	0	2	30/03/2016	IU
9154	Poaceae	*Melinis repens*	red natal grass	0	1	30/03/2016	IU
10819	Poaceae	*Paspalum conjugatum*	sourgrass	1	1	04/11/1996	IU
10818	Poaceae	*Paspalum distichum*	water couch	1	1	29/01/1997	IU
27255	Poaceae	*Schizachyrium microstachyum*	None	1	1	17/01/2012	IU
20011	Poaceae	*Setaria pumila*	None	0	1	05/05/2016	IU
33794	Poaceae	*Setaria pumila subsp. subtesselata*	None	1	1	23/12/1996	IU
9190	Poaceae	*Setaria sphacelata*	None	0	1	30/03/2016	IU
15041	Poaceae	*Sorghum x almum*	None	1	1	04/11/1996	IU
22165	Poaceae	*Sporobolus africanus*	Parramatta grass	1	10	28/02/2017	IU
22159	Poaceae	*Sporobolus fertilis*	giant Parramatta grass	0	3	28/02/2017	IU
10158	Poaceae	*Sporobolus natalensis*	None	0	1	30/03/2016	IU
10156	Poaceae	*Sporobolus pyramidalis*	None	1	1	25/06/1991	IU

Taxon Id	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
14973	Poaceae	*Themeda quadrivalvis*	grader grass	1	1	16/04/1973	IU
22288	Polygonaceae	*Acetosa sagittata*	None	1	1	10/10/1999	IU
31001	Rosaceae	*Potentilla indica*	None	1	1	01/04/1995	IU
16300	Rubiaceae	*Richardia brasiliensis*	white eye	0	1	05/05/2016	IU
21837	Rutaceae	*Murraya paniculata 'Exotica'*	None	0	1	01/07/1995	IU
12529	Scrophulariaceae	*Verbascum virgatum*	twiggy mullein	1	1	10/11/2006	IU
17496	Solanaceae	*Datura stramonium*	common thornapple	1	1	09/11/1970	IU
14375	Solanaceae	*Nicandra physalodes*	apple of Peru	1	1	10/10/1999	IU
13557	Solanaceae	*Physalis peruviana*	None	1	1	20/05/1994	IU
31395	Solanaceae	*Physalis pubescens*	None	1	1	20/05/1994	IU
16157	Solanaceae	*Solanum americanum*	None	0	1	01/07/1995	IU
16169	Solanaceae	*Solanum linnaeanum*	apple of Sodom	1	1	14/06/2019	IU
16171	Solanaceae	*Solanum mauritianum*	wild tobacco	0	7	12/08/2017	IU
16120	Solanaceae	*Solanum seaforthianum*	Brazilian nightshade	1	3	29/03/2003	IU
16126	Solanaceae	*Solanum torvum*	devil's fig	0	2	30/03/2016	IU
15983	Sparrmanniaceae	*Triumfetta rhomboidea*	chinese burr	1	1	20/04/1993	IU
19905	Verbenaceae	*Lantana camara*	lantana	3	41	12/08/2017	IU
14115	Verbenaceae	*Verbena litoralis*	verbena	0	1	30/03/2016	IU
30780	Verbenaceae	*Verbena rigida*	None	1	1	21/01/2004	IU

Species table headings and codes

Taxon Id: Unique identifier of the taxon from the WildNet database.

Specimens: The number of specimen-backed records of the taxon.

Records: The total number of records of the taxon.

Last record: Date of latest record of the taxon.

Endemicity: The endemicity code for the taxon (Introduced (Intranational) (IA), Introduced (International) (II), Introduced (Unknown), Exotic (Intranational) (XA), Exotic (International) (XI) and Exotic (Unknown) (XU)).

Links and Support

Other sites that deliver species information from the WildNet database include:

- Species profile search - access species information approved for publication including species names, statuses, notes, images, distribution maps and records
- Species lists - generate species lists for Queensland protected areas, forestry areas, local governments and areas defined using coordinates
- Biomaps - view biodiversity information, including WildNet records approved for publication, and generate reports
- Queensland Globe - view spatial information, including WildNet records approved for publication
- Qld wildlife data API - access WildNet species information approved for publication such as notes, images and records etc.
- Wetland*Maps* - view species records, survey locations etc. approved for publication
- Wetland*Summary* - view wildlife statistics, species lists for a range of area types, and access WildNet species profiles
- WildNet wildlife records - published - Queensland - spatial layer of WildNet records approved for publication generated weekly
- Generalised distribution and densities of Queensland wildlife - Queensland species distributions and densities generalised to a 10 km grid resolution
- Conservation status of Queensland wildlife - access current lists of priority species for Queensland including nomenclature and status information
- Queensland Confidential Species - the list of species flagged as confidential in the WildNet database.

Please direct queries about this report to the WildNet Team.

Other useful sites for accessing Queensland biodiversity data include:

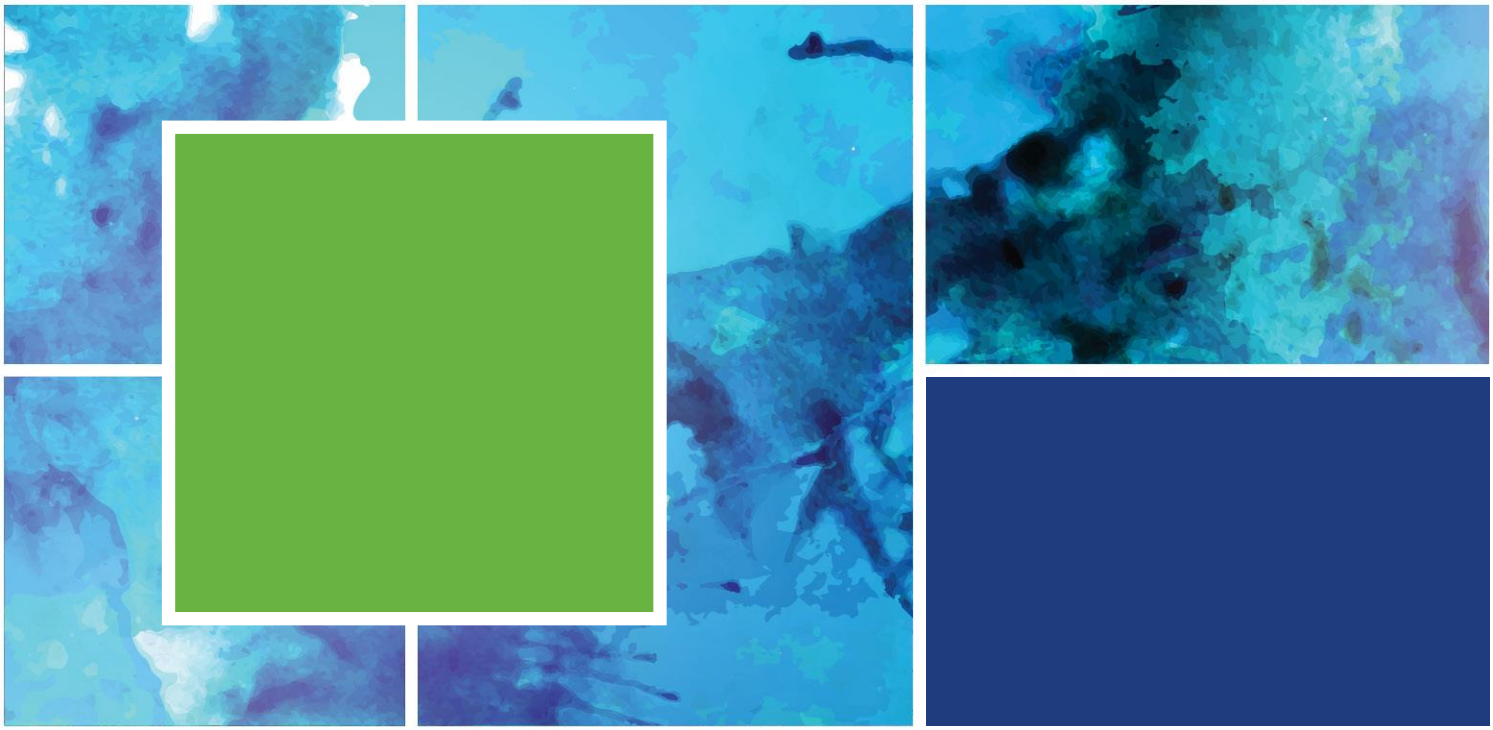
- Useful wildlife resources
- Queensland Government Data
- Atlas of Living Australia (ALA)
- Online Zoological Collections of Australian Museums (OZCAM)
- Australia's Virtual Herbarium (AVH)
- Protected Matters Search Tool

Disclaimer

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APPENDIX B. METHODS



HABITAT

DATA COLLECTION

Creek and River Sites

Modified State of the River-style and DNRM (2001) – AusRivAS protocols for Queensland streams habitat and Parsons et al., (2001) – Australian River Assessment System: AusRivAS Physical Assessment Protocol descriptions of bed, banks, and riparian zones were completed along a 100 m reach at each site which was considered to be a defined watercourse. This included descriptions of:

- Macro and microhabitat;
- Bed and bank conditions as well as the identification of the major types of instability (eroding, slumping and aggrading). Information relating to the slope and shape of the banks.
- Bed substrate composition and embeddedness;
- Adjacent land use and the condition that prevailed at the time of sampling;
- Riparian cover and composition, noting percentage cover of trees, shrubs, grasses/herbs/sedges and bare areas; and
- Channel alteration, including presence of scouring and/or deposition.

Additional notes regarding the level and types of disturbance evident (human habitation, activity, feral animals, etc), diversity and abundance of weeds and the general bank morphology were made at each site. Site information sheets were compiled (Appendix D) for each monitoring site, which describe the above listed features.

To assist with interpreting habitat classification, Parsons et al., (2001) – Australian River Assessment System: AusRivAS Physical Assessment Protocol scores (bioassessment scores) (out of 135) were calculated for all sites based on nine AusRivAS categories, including: habitat availability (pool/riffle, run/bend ratio); bank stability; streamside cover; bed substrate composition and embeddedness; channel alteration; and presence of scouring and/or deposition. From these scores, an aquatic habitat condition rating was calculated and categorised into poor, fair, good or excellent habitat conditions.

Lake Sites

There is a single available State or Commonwealth adopted guidelines for the assessment of habitat condition in lacustrine and palustrine habitats in Australia. The AquaBAMM method used to score wetlands and riverine systems in Australia is used to assesses natural and near natural wetlands and cannot be applied to Lake Borumba. Additionally, the assessment focuses on conservation significant species presence and priority species in its scoring rather than the assessment of macro and microhabitat variables and items affecting such variables (i.e. deposition, scouring, etc.). Many defined guidelines for such assessments are drafted overseas but assess similar variables to AquaBAMM.

In order to maintain consistency with the EIS guidelines DES, (2022), an adapted Parsons et al., (2001) – Australian River Assessment System: AusRivAS Physical Assessment Protocol scores was adapted by Hydrobiology for the assessment of Lake Borumba sites. This provided a rudimentary assessment of habitat condition across Lake Borumba.

The bioassessment scores method was adapted with sites being based on 8 of the 9 categories, including: habitat availability (pool/riffle, run/bend ratio); bank stability; streamside cover; bed substrate composition and embeddedness; and presence of scouring and/or deposition. These were assessed for all sites with the category for channel alteration being removed from the assessment with condition rating brackets also being adjusted leading to a scoring out of 120 being calculated for

all sites. From these scores, an aquatic habitat condition rating was calculated and categorised into poor, fair, good or excellent habitat conditions.

To assist with characterising habitat within Lake Borumba, high-resolution side-scan sonar data were collected using a Hummingbird Helix-9 MEGA with combined GPS, side-scan, down-imaging and down-beam data sources. The down-beam data were collected at 200 khz to enable bottom hardness, bottom roughness and depth information to be obtained. Side-scan and down-imaging data were collected at 1200 kHz which provided high-resolution imagery suitable for visual interpretation of bottom habitat types and geomorphic bed forms. Collected data via this method assisted with the condition assessment for lake sites.

The underwater habitat transect at each site was imported to the Reefmaster software where the sonar viewer capabilities were used to record/generate the following information:

- Distance (m) of each screen view;
- Mark a waypoint at the start of each screen view;
- Record the percentage of each habitat type (see list below) within each screen view. This was done visually using standard percent cover visual aids as a guide. These data are considered semi-quantitative due to the potential differences between operator estimation of percentage cover and the difficulty defining distinct habitat types where in nature gradients and complex mixtures of habitats may occur; and
- Take screen shots of any notable habitat features.

The underwater habitats were categorised as follows for analysis:

- Smooth sand/mud;
- Sand ripples to small sand dunes <3m;
- Small rocks;
- Boulders;
- Rock outcrop;
- Hole/pool;
- Woody debris;
- Fish nests; and
- Artificial structure.

DATA ANALYSIS

Qualitative habitat assessment sheets were digitised and along with photos and field observations, supported a narrative assessment of aquatic and riparian habitat types. This information is used to contextualise results of the aquatic fauna sampling and also provide a basis of monitoring.

AERIAL IMAGERY CAPTURE

DATA COLLECTION

An un-manned Aerial Vehicle (UAV) [DJI Mavic Pro] was flown at a height of 60 m over a 400 m transect where possible (generally mid-stream) at each site with the exception of S1, S2, S3, and S11 due to high elevations creating unsuitable conditions for safe drone piloting.

DATA ANALYSIS

Data Processing Artificial intelligence powered drone data processing service provided by DroneDeploy was used to create mosaic and 3D images of the study site.

MICROALGAE

DATA COLLECTION

Creek and River Sites

A single benthic microalgae sample was collected from each site. Each sample consisted of three surface (biofilm) sediment scrapes from depositional microhabitats (e.g. backwaters, downstream side of rocks where organic sediment accumulates and/or recently deposited sediment). Biofilm scrapes were obtained using a small spoon (vol. 0.5 ml), and then placed in a small 5 ml plastic vial with 1% Lugol solution added as a preservative. Sample processing and identification to species level was completed by senior taxonomists at Ecoscope Laboratory.

Lake Sites

Benthic algae samples in deep water sites using a benthic sampler were carried out within Lake Borumba. Biofilm scrapes were obtained using a small spoon (vol. 0.5 ml), and then placed in a small 5 ml plastic vial with 1% Lugol solution added as a preservative. Scrapes were taken from the top layer of the benthic grab. Sample processing and identification to species level was completed by senior taxonomists at Ecoscope Laboratory.

DATA ANALYSIS

UNIVARIATE

Collected microalgae were used to calculate several diversity indices including:

- Taxonomic richness (the number of individual taxa recorded at each site); and
- Total abundances (abundances of diatoms at each site represent cell counts from ten microscope transects).

Differences in calculated diversity index values were compared between sites. There are no defined biological quality objectives (BQOs) for the Upper Mary River catchment for comparison.

MULTIVARIATE

Multivariate statistical analyses were also carried out on the microalgal assemblage data. Differences in microalgal community composition (presence/absence) were presented using non-parametric multi-dimensional scaling (nMDS), based on Bray-Curtis similarity matrices, which graphically present community composition from different treatments (habitats) in a two- or three-dimensional space. Pairwise comparison for differences in community assemblages among treatments were also tested with a one-way (habitat) analysis of similarity (ANOSIM) test based on Bray-Curtis.

Prior to testing, all data were log (x+1) transformed to improve normality and reduce heteroscedasticity.

DIATOM WATER QUALITY DESCRIPTORS

Indices which reflect responses of individual diatom species to parameters of water quality were analysed by site and habitat, including sensitivity to acidification, nutrients, and salinity and oxygen requirements. Proportions of each indicator was graphed and compared visually by sites and habitat.

MACROINVERTEBRATES

DATA COLLECTION

Creek and River Sites

Sampling was based upon DNRM (2001) AusRivAS protocols for Queensland streams and DES (2018) Monitoring and sampling manual. Standard sized dip nets with 250 µm mesh were used to collect macroinvertebrate samples at each site. To address habitat variation within a site, samples were obtained from a number of locations in the study reach from two distinct aquatic habitats:

- Edge habitat – sampling for this habitat involved sweeping a dip-net along bank habitat in an upstream direction over an aggregate distance of 10 m, proportionally incorporating the spatial occurrence of key microhabitats present within the sampled stream reach (i.e. including backwaters and undercuts, tree roots, trailing bank vegetation, where there is little or no flow, macrophytes, etc.).
- Bed habitat – samples were obtained using the kick-sampling method, which consisted of kicking and disturbing the bed and sweeping the disturbance with a dip-net to capture dislodged macroinvertebrates over an aggregate distance of 10 m.

Collected samples were field picked in accordance with AusRivAS (DNRM 2001) methods, preserved in ethanol (70%) and returned to the laboratory for identification and enumeration. Taxonomic identification was to Family level, with the exception of lower Phyla (Porifera, Nematoda, Nemertea), Oligochaeta (freshwater worms) and Acarina (mites). Chironomids were identified to sub-family level.

Specific QA/QC procedures implemented during macroinvertebrate identification included:

- All sampling and macroinvertebrate enumeration and identification were undertaken by AusRivAS accredited taxonomists; and
- 10% of all samples were cross checked to assess the accuracy of identification and enumeration of the samples collected. Compliance was within the 90% similarity level for all checked samples.

Lake Sites

In accordance with DES (2018), benthic invertebrate samples were collected at each site via the use of a 5.3 L Van Veen grab. Collected material was sieved through a 250 µm sieve. The remaining contents on the sieve were transferred to sample jars and preserved using 70% ethanol and transported to the laboratory for identification and enumeration.

Specific QA/QC procedures implemented during benthic invertebrate identification included:

- All sampling and macroinvertebrate enumeration and identification were undertaken by AusRivAS accredited taxonomists; and
- 10% of all samples were cross checked to assess the accuracy of identification and enumeration of the samples collected. Compliance was within the 90% similarity level for all checked samples.

DATA ANALYSIS

UNIVARIATE STATISTICAL ANALYSES

Macroinvertebrate data collected were used to calculate several diversity indices, including:

- Taxonomic richness;
- Plecoptera, Ephemeroptera and Trichoptera (PET) richness;
- SIGNAL 2; and
- % tolerant taxa.

Calculated diversity indices described above were compared between sites. There are no defined biological quality objectives (BQOs) for the Upper Mary River catchment for comparison.

MULTIVARIATE STATISTICAL ANALYSES

Differences in macroinvertebrate communities (presence/absence) were tested similarly as described for microalgae above.

AUSRIVAS PREDICTIVE MODELLING

For samples collected at creek and river sites, the macroinvertebrate and predictor variable (habitat) data were analysed using the AusRivAS macroinvertebrate predictive modelling program, version 3.2.2 (Ransom and Blackman 2003). Based on the period of sampling and the habitat in which macroinvertebrates were collected, the autumn (post-wet) edge and pool predictive models were used to provide an indication of water quality and/or habitat condition.

AusRivAS predictive model produces various outputs, of which the most valuable for interpretation is the observed to expected ratio (OE50) score. It provides a measure of biological impairment at each site (Coysh et al. 2000). The OE50 scores are assigned to band sections provided by the model, ranging from Band X (better than AUSRIVAS database reference condition) to Band D (extremely impaired).

VERTEBRATES

DATA COLLECTION

Vertebrate surveys were conducted in accordance with Hydrobiology's current General Fisheries Permit (no. 206951), Animal Ethics approval (CA 2021/02/1462) and Research Permit (WA0047340), as described below. In order to capture the range of species present, both active (electrofishing and angling) and passive (fykes, box traps, spotlighting , eDNA) sampling techniques were employed. Employed methods varied between sites (Table A1) depending on the local habitat features and prevailing flow and water depths. The selected range of gear is suitable and commonly used apparatus for the survey of fish (small and large bodies species), aquatic reptiles and platypus (DES, 2018a). The below methods are also efficient methods for the capture of macrocrustaceans, and while not specifically used for this reason, were commonly caught as by-catch.

All native species were released after identification and measurement near to where they were captured. All exotic and voucher specimens were euthanised via a lethal dose of Aqui-S® solution in accordance with Hydrobiology's Animal Ethics approval. Exotics were disposed of in accordance with current State legislative requirements.

Electrofishing

Creek and River sites

Backpack electrofishing was in wadable areas using a Smith-root APEX backpack electrofisher fitted with a 28 cm anode ring and a tightly covered dip net (10 mm stretched mesh). Both frequency (300 Hz) and duty cycle (~50%) was fixed to maintain a constant pulse width, with voltage varying according to conductivity levels. Sampling effort aimed to be consistent across habitats, with approximately 1200 seconds 'on time' at sites. Backpack electrofishing sampling were undertaken by senior electrofishing operators. Due to prevailing depths, backpack electrofishing was not undertaken at Lake Borumba.

Lake Sites

Boat electrofishing was undertaken via the use of a 5 m boat fitted with a 5 KVA generator and Smith–Root control box.

Each standard boat electrofishing shot was completed in a structured fashion over a fixed area of 50 m by 15 m for a defined period of power–on time of approximately 300 seconds (± 5%). Where adequate sampling area was available this was repeated five times. Applied voltage varied according to the prevailing conductivity and temperature conditions. Stunned fish were blind sweep-netted from the water with a 3 mm open–mesh dip net fitted to a fibreglass pole.

Table A1 Implemented fish survey techniques at each site

Method	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19
Backpack electrofishing	✓	✓	✓	✓	✓				Could not access			✓	✓	✓			✓	Could not access	✓
Boat electrofishing						✓	✓	✓		✓	✓								
Fyke nets			✓		✓							✓	✓		✓	✓	✓		✓
Cathedral traps			✓		✓	✓	✓	✓			✓			✓		✓	✓		✓
Gill netting						✓	✓				✓								
eDNA		✓	✓	✓		✓	✓	✓				✓	✓	✓		✓	✓		✓
Angling			✓	✓		✓	✓				✓	✓		✓			✓		✓
Spotlighting			✓									✓		✓	✓	✓			✓
Snorkelling	Could not undertake – high water flow and unsafe velocities																		

FYKE NETTING

Where sufficient water levels were present, two paired fyke nets were deployed at each waterway site, with entrances facing downstream. Two fyke net sizes were used in this study. One had two 5 m wings, with a 0.9 m drop and the other with a single 5 m wing and a 0.6 m drop. Both nets had 2 mm mesh. A float was placed in the cod end of each fyke net to provide an air space for air breathing fauna (turtles, platypus etc). Fyke nets were set in the afternoon and cleared the following morning.

CATHEDRAL TRAPS

Cathedral traps were deployed overnight. Two vertically-set traps (small and large sizes) were baited with a combination of fruit (apple and banana) and meat (beef heart and washed sardines) to target herbivorous, carnivorous and omnivorous fish and turtles. Traps were deployed to ensure sufficient basking room was available the upper sections of the net for any air breathing fauna that might be captured.

GILL NETS

Finnish gill nets of mesh sizes 13mm, 19mm and 25mm were deployed. Nets were checked every 20 minutes to ensure that air-breathing fauna had not become entangled. Nets were retrieved and catch collected after 1 hour.

ANGLING

Angling was undertaken at dawn and dusk during peak cod activity. Angling techniques can be particularly useful for catching larger, predatory threatened fishes such as freshwater cod (Faragher et al. 1993; Douglas et al. 1994). Angling methods included actively fishing with a rod and reel using live and dead baits, and lures.

Angling occurred for approximately 30 minutes.

SPOTLIGHTING

Nocturnal spotlighting involved searching suitable substrates for reptiles and platypus, using spotlights or head torches with a bright focussed beam. Suitable habitat was the primary focus of spotlighting efforts including, fallen logs and branches, rock outcrops and tree trunks, especially along roads and tracks. Other areas assessed were targeted including downstream of riffles in pool habitat and where macrophytes were noted.

EDNA

The use of eDNA for species detection has been found to be far more efficient than typical tradition methods for the detection of platypus (Lugg et al. 2017), threatened species of fish (Piggiot et al. 2020) but also a complimentary approach to traditional survey techniques (Golpur et al. 2022)

Sample Collection

Samples were collected using a Smith-Root eDNA sampler with 5 µm Smith-Root self-preserving filters following Smith-Root protocol (Smith-Root, 2022) Three filters were processed at each site, approximately 2L per filter. Samples were collected from areas of likely fish and platypus habitat (amongst snags, large woody debris, macrophytes, downstream of riffles and boulders, undercut banks, etc.). Filtration was undertaken on-site to reduce DNA degradation during transport of whole water samples (Yamanaka et al. 2016).

Clean sampling protocols were employed to minimise contamination between samples/ sites including new sampling equipment at each site, and taking care not to transfer soil, water or vegetation between sites. Filters were stored out of sunlight and at ambient temperature before being transported to the laboratory for processing. Quality control sampling was also undertaken in the form of blank samples. Blank samples were collected for every tenth site sampled. This meant that two blank samples were collected over the survey period. Blank samples returned no fish DNA as such potential contamination during field sampling was considered minimal.

Fish DNA extraction, purification and quantification are detailed below. Laboratory analysis was undertaken at enviroDNA laboratories.

Analysis – Platypus

DNA was extracted from the filters using a commercially available DNA extraction kit (Qiagen DNeasy Blood and Tissue Kit). Real-time quantitative Polymerase Chain Reaction (qPCR) assays were used to amplify the target DNA, using a species-specific probe targeting a small region of the mitochondrial DNA of the target species (platypus). Assays were performed in triplicate on each sample. Positive and negative controls were included for all assays as well as an Internal Positive Control (IPC) to detect inhibition (Goldberg et al. 2016). At least two positive PCR's (out of three assays undertaken for each

site) were required to classify the site as positive for the presence of the target species. To minimise false positives, sites were considered equivocal if only one assay returned a positive result, indicating very low levels of target DNA. While trace amounts of DNA may indicate the target species is actually present in low abundance, it may also arise from sample contamination through the sampling or laboratory screening process (minimised through strict protocols and negative controls), facilitated movement of DNA between waterbodies (i.e. water birds, recreational anglers, water transfers, predator scats), or dispersal from further upstream. If greater confidence is required, further sampling is recommended at equivocal sites to confirm the presence or absence of the target species. Repeat sampling is also recommended to help determine the tenure of the species at a site (i.e. resident or transient).

Analysis – Fish

Biodiversity assessments were also performed with a universal "fish" assay targeting a small region of the 12S mitochondrial DNA (McColl-Gausden et al. 2020). Library construction involved two rounds of PCR whereby the first round employed gene-specific primers to amplify the target region and the second round incorporated sequencing adapters and unique barcodes for each sample-amplicon combination included in the library. Negative controls were also included during library construction.

Negative controls consisted of the extraction negative as well as PCR negatives where nuclease-free water was used in place of DNA during both rounds of PCR. Sequencing was carried out on an Illumina iSeq machine.

Following quality control filtering to remove primer sequences, truncated reads and low-frequency reads, DNA sequences were clustered into Operational Taxonomic Units (OTUs) on the basis of sequence similarity. Taxonomic assignment was performed with VSEARCH software (Rognes et al. 2016) whereby each OTU cluster was assigned a species identity using a threshold of 95% by comparing against a reference sequence database. Where a species could not be assigned (i.e. reference database was deficient and/or taxa were poorly-characterised), taxonomic assignments were manually vetted by first obtaining a list of possible species through BLASTN searches against the public repository Genbank (www.ncbi.nlm.nih.gov), then eliminating species on the basis of their geographic distribution using information from the Atlas of Living Australia (ALA). In cases where an OTU could not be adequately resolved to a single species (due to shared haplotypes for instance), either a list of multiple species was included, or it was assigned to the lowest taxonomic rank without further classification.

VERTEBRATE PROCESSING

The following vertebrate processing methods were employed at all sites:

- Fish, macrocrustaceans, and turtles were identified to species level, enumerated, and assessed for obvious wounds, lesions, or deformities;
- Carapace length was taken for each turtle collected; and
- Each fish specimen was measured for total length until 20 individuals of the species were recorded for the particular site and capture method. Following this, the individuals would be counted.

DATA ANALYSIS

Total species richness and abundances was summarised from all methods and all sites. The conservation significance of collected fauna was assessed by reference to State and Federal databases and in-house knowledge of the distribution of species from previous studies in the area.

CONSERVATION SIGNIFICANT SPECIES

Within each study region habitat assessments were undertaken for conservation significant (State and/or Federally listed endangered, vulnerable, near threatened, and MNES species identified during the desktop assessment which included the classification of the likelihood of any one species occurring at each site. The likelihood of species occurring was considered under four categories; (i) unlikely; (ii) possible; (iii) likely; and (iv) Known. The criterion used to define each category is provided in Table A2.

Table A2. Criteria used for assigning likelihood of occurrences relevant to EVNT and special least concern species.

Likelihood of occurrence category	Criteria
Unlikely	• No suitable habitat present.
Possible	• Suitable species habitat present.
Likely	• Suitable species habitat present and; • A record occurs nearby (10 km) in similar habitat.
Known	• Species recorded during field surveys or previous past records.

APPENDIX C. MACROPHYTES

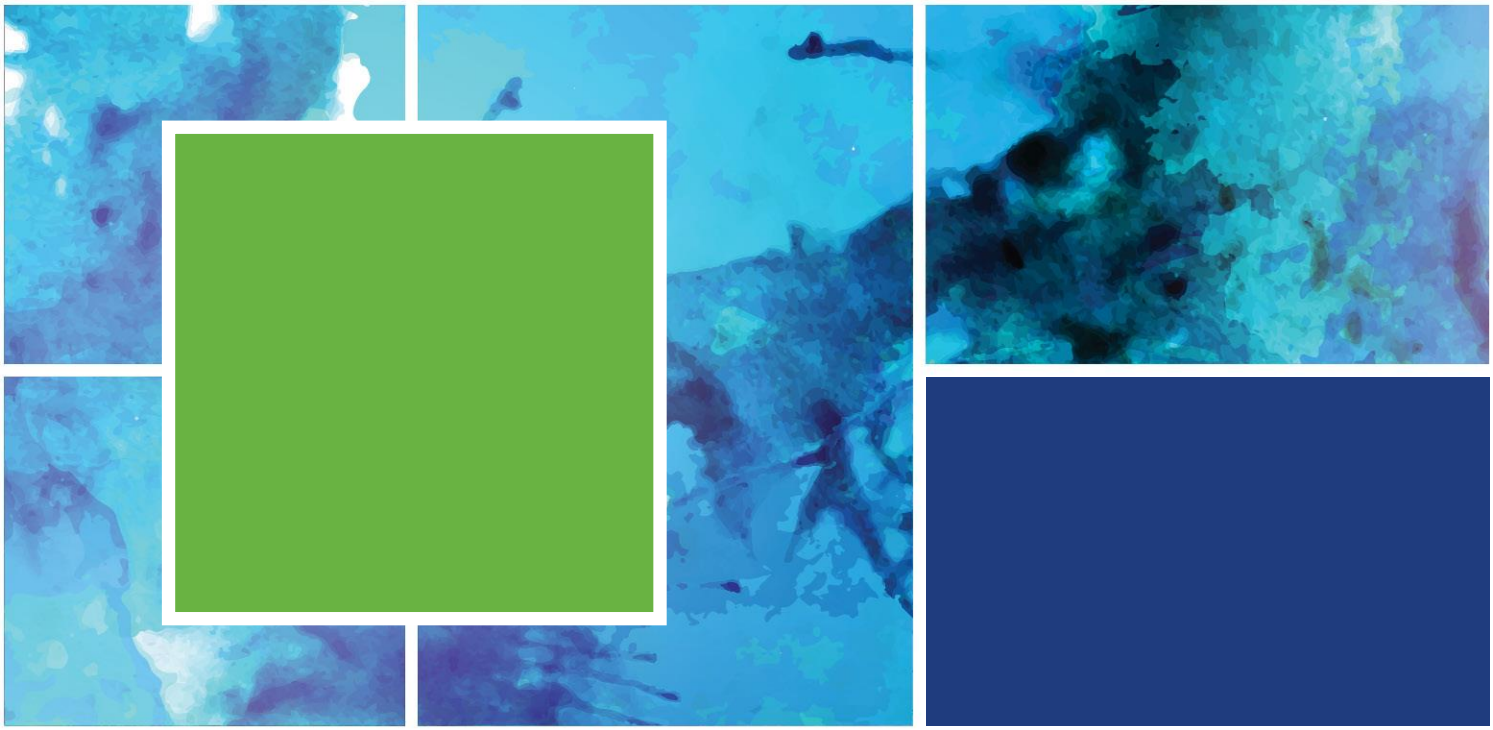


Table A3. Macrophytes recorded within the Upper Mary River drainage sub-basin.

Species	Common Name	Status NC Act	Within Mary River	Within Yabba Creek
Aponogeton elongatus	Queensland Lace	Near Threatened		
Avicennia marina				
Azolla pinnata	ferny azolla		X	X
Bacopa caroliniana				
Bacopa lanigera				
Bacopa monnieri			X	
Baeckea frutescens				
Baloskion tetraphyllum				
Banksia robur	broad-leaved banksia			
Bolboschoenus caldwellii				
Bolboschoenus fluviatilis				
Boronia falcifolia	wallum boronia			
Bruguiera gymnorhiza	large-fruited orange mangrove			
Burchardia umbellata				
Cabomba caroliniana	cabomba			
Callitriche muelleri				
Callitriche sonderi				
Callitriche stagnalis				
Carex fascicularis	tassel sedge			
Carex gaudichaudiana				
Casuarina cunninghamiana				
Casuarina glauca	swamp she-oak			
Ceratophyllum demersum	Coontail		X	X
Cladium procerum	leafy twigrush			
Cycnogeton procerus		Special Least Concern		

Species	Common Name	Status NC Act	Within Mary River	Within Yabba Creek
Cycnogeton rheophilus		Special Least Concern		
Cynometra iripa				
Cyperus aquatilis				
Cyperus difformis	rice sedge		X	X
Cyperus enervis				
Cyperus eragrostis			X	X
Cyperus esculentus	yellow nutgrass			
Cyperus exaltatus	tall flatsedge		X	X
Cyperus involucratus			X	
Cyperus lucidus				
Cyperus papyrus	papyrus			
Cyperus pilosus				
Cyperus polystachyos				
Cyperus procerus				
Cyperus prolifer	dwarf papyrus			
Echinochloa colona	awnless barnyard grass			
Echinochloa crus-galli	barnyard grass			
Echinochloa telmatophila	swamp barnyard grass			
Eclipta prostrata	white eclipta			
Egeria densa			X	
Eichhornia crassipes	water hyacinth		X	
Elatine gratioloides				
Eleocharis cylindrostachys				
Eleocharis equisetina				
Eleocharis sphacelata	tall spikerush		X	

Species	Common Name	Status NC Act	Within Mary River	Within Yabba Creek
Eleocharis tetraquetra				
Empodisma minus	spreading rope rush			
Enydra fluctuans				
Eriocaulon australe				
Eriocaulon nanum				
Eriocaulon scariosum				
Eucalyptus robusta	swamp mahogany			
Eurychorda complanata				
Excoecaria agallocha				
Fimbristylis ferruginea				
Fimbristylis nutans				
Fimbristylis schoenoides				
Fuirena umbellata				
Gahnia clarkei	tall sawsedge			
Gahnia sieberiana	sword grass			
Heteranthera reniformis				
Hydrilla verticillata		Special Least Concern	X	X
Hydrocotyle verticillata	shield pennywort			
Hygrophila angustifolia				
Hygrophila costata				
Ipomoea aquatica				
Isachne globosa	swamp millet			
Ischaemum australe var. australe				
Isolepis inundata	swamp club rush			
Juncus bufonius				
Juncus continuus				

Species	Common Name	Status NC Act	Within Mary River	Within Yabba Creek
Juncus mollis				
Juncus planifolius				
Juncus prismatocarpus	branching rush			
Juncus usitatus			X	X
Leersia hexandra	swamp rice grass			
Lepironia articulata				
Leptocarpus tenax				
Leptochloa digitata	umbrella canegrass		X	X
Leptospermum liversidgei				
Leptospermum semibaccatum	wallum tea-tree			
Lepyrodia imitans				
Lomandra hystrix			X	X
Lophostemon suaveolens	swamp box			
Ludwigia octovalvis	willow primrose			
Ludwigia peploides			X	X
Ludwigia repens				
Lygodium microphyllum	snake fern			
Lythrum salicaria	purple loosestrife			
Marsilea hirsuta	hairy nardoo		X	
Melaleuca bracteata				
Melaleuca linariifolia	snow-in summer			
Melaleuca pachyphylla				
Melaleuca quinquenervia	swamp paperbark			
Melaleuca viminalis				
Melastoma malabathricum				
Myriophyllum aquaticum				

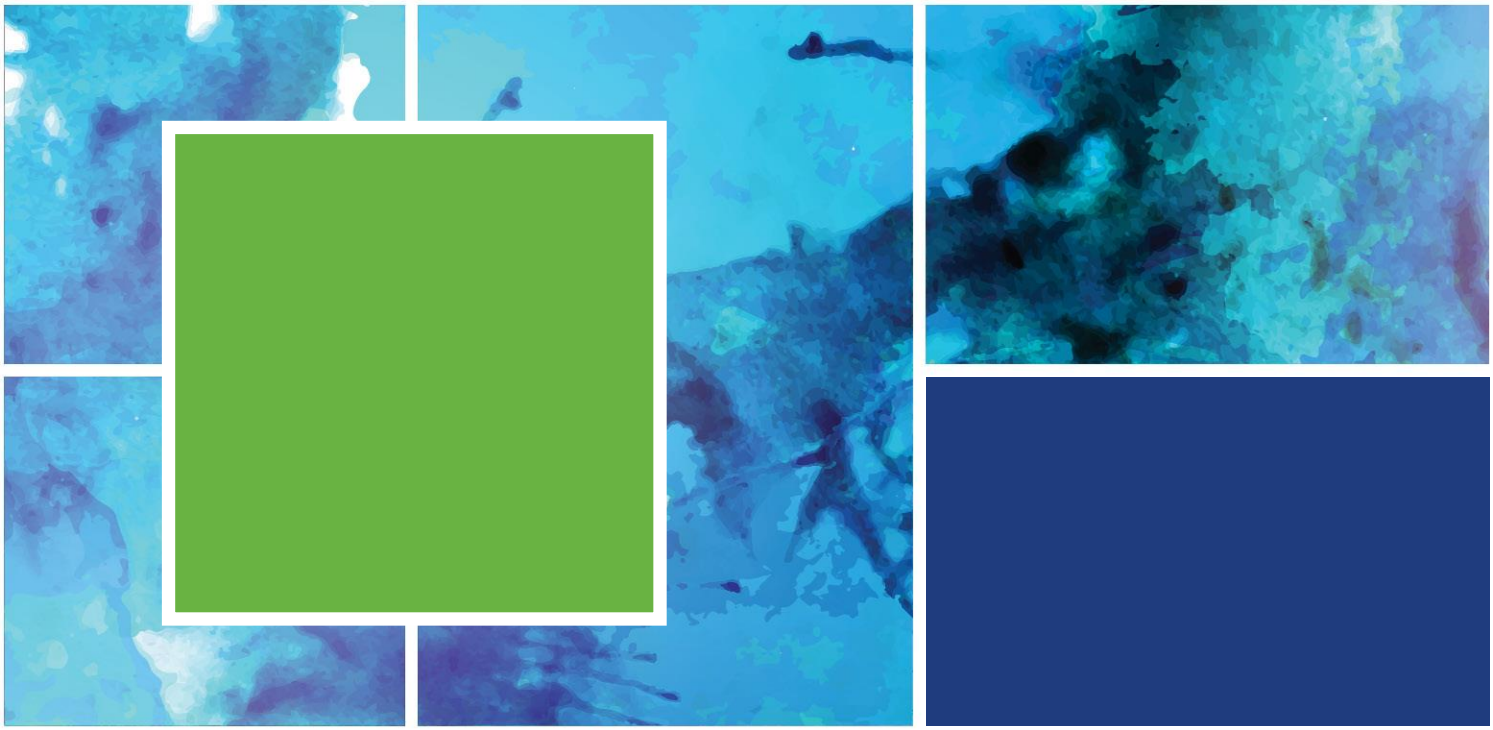
Species	Common Name	Status NC Act	Within Mary River	Within Yabba Creek
Myriophyllum variifolium				
Myriophyllum verrucosum			X	
Najas tenuifolia	water nymph	Special Least Concern		
Nauclea orientalis	Leichhardt tree			
Nitella myriotricha				
Nymphaea caerulea				X
Nymphoides indica	water snowflake	Special Least Concern	X	X
Ottelia ovalifolia		Special Least Concern		
Paspalum distichum	water couch			
Paspalum vaginatum	saltwater couch			
Persicaria attenuata				
Persicaria decipiens	slender knotweed		X	X
Persicaria dichotoma				
Persicaria hydropiper	water pepper			
Persicaria lapathifolia	pale knotweed			
Persicaria orientalis	princes feathers			
Persicaria praetermissa				
Persicaria strigosa				
Persicaria subsessilis	hairy knotweed			
Philydrum lanuginosum	frogsmouth			
Phragmites australis	common reed			X
Pistia stratiotes	water lettuce			
Polypogon monspeliensis	annual beardgrass		X	X
Pontederia cordata				
Potamogeton crispus	curly pondweed	Special Least Concern	X	X

Species	Common Name	Status NC Act	Within Mary River	Within Yabba Creek
Potamogeton ochreatus	blunt pondweed	Special Least Concern		
Potamogeton perfoliatus	perfoliate pondweed	Special Least Concern	X	X
Potamogeton tricarinatus	floating pondweed	Special Least Concern		
Ranunculus inundatus	river buttercup			
Rhynchospora brownii	beak rush			
Rhynchospora corymbosa				
Rhynchospora rubra				
Ricciocarpos natans				
Rorippa nasturtium-aquaticum	watercress		X	X
Rotala rotundifolia				
Sacciolepis indica	Indian cupscale grass			
Sagittaria platyphylla	sagittaria			
Salix babylonica	weeping willow			
Salvinia molesta	salvinia		X	X
Samolus valerandi	brookweed			
Schoenoplectus subulatus			X	
Schoenoplectus tabernaemontani			X	X
Schoenus brevifolius				
Sowerbaea juncea	vanilla plant			
Sparganium subglobosum	floating bur-reed			
Sporobolus virginicus	sand couch			
Sprengelia sprengelioides				
Stuckenia pectinata		Special Least Concern		
Triglochin striata	streaked arrowgrass	Special Least Concern		
Tristaniopsis laurina				

Species	Common Name	Status NC Act	Within Mary River	Within Yabba Creek
Typha orientalis	broad-leaved cumbungi		X	
Urochloa mutica				
Utricularia aurea	golden bladderwort	Special Least Concern		
Utricularia subulata		Special Least Concern		
Utricularia uliginosa	asian bladderwort	Special Least Concern		
Vallisneria annua		Special Least Concern		
Vallisneria nana		Special Least Concern	X	X
Waterhousea floribunda	weeping lilly pilly			
Xyris complanata	yellow-eye			

X = detected within the respective watercourse in the SKM (2007) survey

APPENDIX D.
SITE PROFILES



Site code	S1	Watercourse:	Creek	Date:	02/07/22	Latitude:	-26.548	Longitude:	152.5284

Watercourse Description	
Watercourse Type (river, tributary, wetland)	Creek
Water presence	Low-level
Flow Level (m/s)	Low
Macrohabitat (%)	
Riffle (%)	0
Run (%)	10
Pool (rocky) (%)	90
Pool (sandy/silt) (%)	0
Dry (%)	0
Water Quality	
Clear or turbid	Clear
Water Surface	-
Water temperature (°C)	10.07
Water Odour	None
pH	7.74
Electrical Conductivity (µS/cm)	259.6
Dissolved Oxygen (mg/L)	10.09
Dissolved Oxygen (% Saturation)	91.0
Turbidity (NTU)	4.58
Chlorophyll A(µ/L)	1.65
Substratum (%)	
Bedrock	55
Boulders	10
Cobbles	10
Pebbles	10
Gravel	10
Sand	5
Silt / Clay	0
Bed compaction	
Tightly packed, armoured – array of sizes tightly packed overlapping hard to dislodge.	

Microhabitat (%)	
Logs (>15cm Ø)	20
Sticks & branches (<15cm Ø)	10
Detritus (leaves, twigs)	10
Periphyton (fine algae on rocks)	5
Blanketing silt	0
Undercut banks	0
Moss	0
Filamentous algae	5
Macrophytes	10
Bank overhang veg.	0
Bank trailing veg.	0
Substrate anoxia	0
Shading	30
Canopy cover	30

Habitat bioassessment		
Habitat variable	**Condition**	**Notes**
Bottom substrate/available cover	Good	30-50% rubble, gravel or other stable habitat. Adequate habitat
Embeddedness	Excellent	Gravel, cobble and boulder particles are between 0 & 25% surrounded by fine sediment
Velocity/depth category	Fair	Only two of the four habitat categories present (missing riffles/runs receive lower score).
Channel alteration	Excellent	Little or no enlargement of islands or point bars and/or no channelisation.
Bottom scouring and deposition	Excellent	Less than 5% of the bottom affected by scouring and deposition
Pool/riffle, run/bend ratio	Good	7-15 Adequate depth in pools and riffles. Bends provide habitat
Bank stability	Excellent	Stable. No evidence of erosion or bank failure. Side slopes generally <30%. Little potential for future problem
Bank vegetative stability	Excellent	Over 80% of the streambank surfaces covered by vegetation or boulders and cobble
Streamside cover	Excellent	Dominant vegetation is of tree form.

EVNT species	
Australian lungfish (*neoceratodus forsteri*)	Unlikely
Mary River Cod (Maccullochella mariensis)	Unlikely
Mary River turtle (Elusor macrurus)	Unlikely
White-throated snapping turtle (Elseya albagula)	Unlikely
Platypus (Ornithorhynchus anatinus)	Unlikely

Bank/riparian structure	Left	Right
Bank land use	Native	Native
Bank erosion (%)	0	0
Bare (%)	10	10
Grasses (%)	90	10
Shrubs (%)	20	20
Trees <10m (%)	30	20
Trees >10m (%)	40	40
Exotics (%)	0	0

Macrophytes	
Species list	**Proportion (%)**
Lomanda longifolia	100

Comments
Cascades mostly bedrock

Site code	S2	Watercourse:	Creek	Date:	03/07/2022	Latitude:	-26.548	Longitude:	152.5284

Watercourse Description	
Watercourse Type (river, tributary, wetland)	Creek
Water presence	Low-level
Flow Level (m/s)	Low
Macrohabitat (%)	
Riffle (%)	0
Run (%)	20
Pool (rocky) (%)	40
Pool (sandy/silt) (%)	40
Dry (%)	0
Water Quality	
Clear or turbid	Turbid
Water Surface	-
Water temperature (°C)	12.0
Water Odour	None
pH	6.86
Electrical Conductivity (µS/cm)	1167
Dissolved Oxygen (mg/L)	7.07
Dissolved Oxygen (% Saturation)	65.7
Turbidity (NTU)	19.61
Chlorophyll A(µ/L)	4.58
Substratum (%)	
Bedrock	0
Boulders	20
Cobbles	10
Pebbles	10
Gravel	2
Sand	40
Silt / Clay	0
Bed compaction	
Moderate Compaction- array of sizes some packing little overlapping can be dislodged.	

Microhabitat (%)	
Logs (>15cm Ø)	10
Sticks & branches (<15cm Ø)	10
Detritus (leaves, twigs)	10
Periphyton (fine algae on rocks)	5
Blanketing silt	0
Undercut banks	5
Moss	0
Filamentous algae	10
Macrophytes	25
Bank overhang veg.	40
Bank trailing veg.	10
Substrate anoxia	0
Shading	30
Canopy cover	30

Habitat bioassessment		
Habitat variable	**Condition**	**Notes**
Bottom substrate/available cover	Good	30-50% rubble, gravel or other stable habitat. Adequate habitat
Embeddedness	Good	Gravel, cobble and boulder particles are between 25 & 50% surrounded by fine sediment
Velocity/depth category	Fair	Only two of the four habitat categories present (missing riffles/runs receive lower score).
Channel alteration	Good	Some new increase in bar formation, mostly from coarse gravel; and/or some channelisation present.
Bottom scouring and deposition	Good	5-30% affected. Scours at constrictions and where grades steepen, some deposition in pools.
Pool/riffle, run/bend ratio	Fair	15-25 Occasional riffle or bend. Bottom contours provide some habitat.
Bank stability	Good	Moderately stable. Infrequent, small areas of erosion mostly healed over. Side slopes up to 40% on one bank. Slight potential in extreme floods.
Bank vegetative stability	Excellent	Over 80% of the streambank surfaces covered by vegetation or boulders and cobble
Streamside cover	Excellent	Dominant vegetation is of tree form.
EVNT species		
Australian lungfish (*neoceratodus forsteri*)	Unlikely	
Mary River Cod (Maccullochella mariensis)	Unlikely	
Mary River turtle (Elusor macrurus)	Unlikely	
White-throated snapping turtle (Elseya albagula)	Unlikely	
Platypus (Ornithorhynchus anatinus)	Unlikely	

Bank/riparian structure	Left	Right
Bank land use	Native	Native
Bank erosion (%)	0	0
Bare (%)	5	5
Grasses (%)	20	30
Shrubs (%)	10	10
Trees <10m (%)	25	25
Trees >10m (%)	30	30
Exotics (%)	0	0

Macrophytes	
Species list	**Proportion (%)**
Lomandra Longifolia	50
Persicaria spp.	10
Hydrilla spp.	5
Eleocharis palustris	35

Comments

Small stream. Very turbid channel snakes midway.

Site code	S3	Watercourse:	Creek	Date:	30/06/2022	Latitude:	-26.5452	Longitude:	152.502

Watercourse Description	
Watercourse Type (river, tributary, wetland)	Creek
Water presence	Mid-level
Flow Level (m/s)	Moderate-High
Macrohabitat (%)	
Riffle (%)	30
Run (%)	40
Pool (rocky) (%)	30
Pool (sandy/silt) (%)	0
Dry (%)	0
Water Quality	
Clear or turbid	Clear
Water Surface	-
Water temperature (°C)	13.5
Water Odour	None
pH	8.3
Electrical Conductivity (µS/cm)	539
Dissolved Oxygen (mg/L)	10.74
Dissolved Oxygen (% Saturation)	102.8
Turbidity (NTU)	1.0
Chlorophyll A(µ/L)	0.9
Substratum (%)	
Bedrock	0
Boulders	20
Cobbles	25
Pebbles	30
Gravel	20
Sand	5
Silt / Clay	0
Bed compaction	
Tightly packed, armoured – array of sizes tightly packed overlapping hard to dislodge.	

Microhabitat (%)	
Logs (>15cm Ø)	10
Sticks & branches (<15cm Ø)	10
Detritus (leaves, twigs)	10
Periphyton (fine algae on rocks)	10
Blanketing silt	0
Undercut banks	5
Moss	0
Filamentous algae	10
Macrophytes	5
Bank overhang veg.	0
Bank trailing veg.	0
Substrate anoxia	0
Shading	0
Canopy cover	5

Habitat bioassessment		
Habitat variable	**Condition**	**Notes**
Bottom substrate/available cover	Excellent	Greater than 50% rubble, gravel, submerged logs, undercut banks or other stable habitat.
Embeddedness	Excellent	Gravel, cobble and boulder particles are between 0 & 25% surrounded by fine sediment.
Velocity/depth category	Excellent	Slow deep (<0.3 m/s & >0.5 m); slow shallow; fast deep; fast shallow' habitats all present.
Channel alteration	Excellent	Little or no enlargement of islands or point bars and/or no channelisation.
Bottom scouring and deposition	Excellent	Less than 5% of the bottom affected by scouring and deposition
Pool/riffle, run/bend ratio	Good	7-15 Adequate depth in pools and riffles. Bends provide habitat
Bank stability	Excellent	Stable. No evidence of erosion or bank failure. Side slopes generally <30%. Little potential for future problem
Bank vegetative stability	Excellent	Over 80% of the streambank surfaces covered by vegetation or boulders and cobble
Streamside cover	Excellent	Dominant vegetation is of tree form.
EVNT species		
Australian lungfish (*neoceratodus forsteri*)	Likely	
Mary River Cod (Maccullochella mariensis)	Known	
Mary River turtle (Elusor macrurus)	Likely	
White-throated snapping turtle (Elseya albagula)	Likely	
Platypus (Ornithorhynchus anatinus)	Known	

Bank/riparian structure	Left	Right
Bank land use	Native	Native
Bank erosion (%)	5	5
Bare (%)	20	30
Grasses (%)	20	10
Shrubs (%)	10	10
Trees <10m (%)	20	35
Trees >10m (%)	40	20
Exotics (%)	0	0

Macrophytes	
Species list	**Proportion (%)**
Vallisneria nana	10
Lomandra longifolia	90

Comments
High steep cliff on left bank, most habitat washed away. Rocks everywhere

Site code	S4	Watercourse:	Creek	Date:	30/06/2022	Latitude:	-26.5085	Longitude:	152.4992

Watercourse Description	
Watercourse Type (river, tributary, wetland)	Creek
Water presence	Mid-level
Flow Level (m/s)	Moderate-High
Macrohabitat (%)	
Riffle (%)	20
Run (%)	40
Pool (rocky) (%)	40
Pool (sandy/silt) (%)	0
Dry (%)	0
Water Quality	
Clear or turbid	Clear
Water Surface	-
Water temperature (°C)	13.93
Water Odour	None
pH	7.69
Electrical Conductivity (µS/cm)	475
Dissolved Oxygen (mg/L)	8.4
Dissolved Oxygen (% Saturation)	81.5
Turbidity (NTU)	1.3
Chlorophyll A(µ/L)	1.4
Substratum (%)	
Bedrock	0
Boulders	0
Cobbles	30
Pebbles	20
Gravel	20
Sand	30
Silt / Clay	0
Bed compaction	
Tightly packed, armoured – array of sizes tightly packed overlapping hard to dislodge. Moderate Compaction- array of sizes some packing little overlapping can be dislodged.	

Microhabitat (%)	
Logs (>15cm Ø)	30
Sticks & branches (<15cm Ø)	10
Detritus (leaves, twigs)	5
Periphyton (fine algae on rocks)	5
Blanketing silt	0
Undercut banks	30
Moss	0
Filamentous algae	10
Macrophytes	5
Bank overhang veg.	0
Bank trailing veg.	0
Substrate anoxia	0
Shading	30
Canopy cover	30

Habitat bioassessment		
Habitat variable	**Condition**	**Notes**
Bottom substrate/available cover	Excellent	Greater than 50% rubble, gravel, submerged logs, undercut banks or other stable habitat.
Embeddedness	Excellent	Gravel, cobble and boulder particles are between 0 & 25% surrounded by fine sediment.
Velocity/depth category	Excellent	Slow deep (<0.3 m/s & >0.5 m); slow shallow; fast deep; fast shallow' habitats all present.
Channel alteration	Good	Some new increase in bar formation, mostly from coarse gravel; and/or some channelisation present.
Bottom scouring and deposition	Good	5-30% affected. Scours at constrictions and where grades steepen, some deposition in pools.
Pool/riffle, run/bend ratio	Good	7-15 Adequate depth in pools and riffles. Bends provide habitat
Bank stability	Good	Moderately stable. Infrequent, small areas of erosion mostly healed over. Side slopes up to 40% on one bank. Slight potential in extreme floods.
Bank vegetative stability	Good	50-79% of the streambank surfaces covered by vegetation, gravel or larger material.
Streamside cover	Excellent	Dominant vegetation is of tree form.
EVNT species		
Australian lungfish (*neoceratodus forsteri*)	Likely	
Mary River Cod (Maccullochella mariensis)	Likely	
Mary River turtle (Elusor macrurus)	Likely	
White-throated snapping turtle (Elseya albagula)	Known	
Platypus (Ornithorhynchus anatinus)	Known	

Bank/riparian structure	Left	Right
Bank land use	Agricultural/Native	Native
Bank erosion (%)	30	30
Bare (%)	5	5
Grasses (%)	20	10
Shrubs (%)	20	20
Trees <10m (%)	30	3
Trees >10m (%)	35	35
Exotics (%)	0	0

Macrophytes	
Species list	**Proportion (%)**
Vallisneria nana	30
Lomandra longifolia	70

Comments

Road crossing, small patches of Vallisenria. Deep pools, low vegetation on banks, high erosion.

Site code	S5	Watercourse:	Creek	Date:	01/07/2022	Latitude:	-26.5392	Longitude:	152.513

Watercourse Description	
Watercourse Type (river, tributary, wetland)	Creek
Water presence	Mid-level
Flow Level (m/s)	Low-High
Macrohabitat (%)	
Riffle (%)	40
Run (%)	40
Pool (rocky) (%)	15
Pool (sandy/silt) (%)	5
Dry (%)	0
Water Quality	
Clear or turbid	Clear
Water Surface	-
Water temperature (°C)	13.4
Water Odour	None
pH	7.98
Electrical Conductivity (µS/cm)	465
Dissolved Oxygen (mg/L)	10.09
Dissolved Oxygen (% Saturation)	96.8
Turbidity (NTU)	1.76
Chlorophyll A(µ/L)	1.35
Substratum (%)	
Bedrock	0
Boulders	0
Cobbles	15
Pebbles	25
Gravel	40
Sand	20
Silt / Clay	0
Bed compaction	
Tightly packed, armoured – array of sizes tightly packed overlapping hard to dislodge.	

Microhabitat (%)	
Logs (>15cm Ø)	30
Sticks & branches (<15cm Ø)	15
Detritus (leaves, twigs)	5
Periphyton (fine algae on rocks)	5
Blanketing silt	0
Undercut banks	30
Moss	10
Filamentous algae	15
Macrophytes	10
Bank overhang veg.	15
Bank trailing veg.	10
Substrate anoxia	0
Shading	10
Canopy cover	10

Habitat bioassessment		
Habitat variable	**Condition**	**Notes**
Bottom substrate/available cover	Excellent	Greater than 50% rubble, gravel, submerged logs, undercut banks or other stable habitat.
Embeddedness	Excellent	Gravel, cobble and boulder particles are between 0 & 25% surrounded by fine sediment.
Velocity/depth category	Excellent	Slow deep (<0.3 m/s & >0.5 m); slow shallow; fast deep; fast shallow' habitats all present.
Channel alteration	Excellent	Little or no enlargement of islands or point bars and/or no channelisation.
Bottom scouring and deposition	Excellent	Less than 5% of the bottom affected by scouring and deposition
Pool/riffle, run/bend ratio	Excellent	0-7 Variety of habitat. Deep riffles and pools.
Bank stability	Excellent	Stable. No evidence of erosion or bank failure. Side slopes generally <30%. Little potential for future problem
Bank vegetative stability	Good	50-79% of the streambank surfaces covered by vegetation, gravel or larger material.
Streamside cover	Excellent	Dominant vegetation is of tree form.

EVNT species	
Australian lungfish (*neoceratodus forsteri*)	Likely
Mary River Cod (Maccullochella mariensis)	Likely
Mary River turtle (Elusor macrurus)	Likely
White-throated snapping turtle (Elseya albagula)	Likely
Platypus (Ornithorhynchus anatinus)	Known

Bank/riparian structure	Left	Right
Bank land use	Grazing	Native
Bank erosion (%)	5	5
Bare (%)	5	5
Grasses (%)	20	5
Shrubs (%)	20	20
Trees <10m (%)	30	30
Trees >10m (%)	40	40
Exotics (%)	0	0

Macrophytes	
Species list	**Proportion (%)**
Vallisneria nana	10
Lomandra longifolia	70
Aponogeton elongatus	15
Juncus spp.	5

Comments

Braided stream with two main channels

Site code	S6	Watercourse:	Lake	Date:	25/06/2022	Latitude:	-26.5224	Longitude:	152.5438

Watercourse Description	
Watercourse Type (river, tributary, wetland)	Lake
Water presence	High-level
Flow Level (m/s)	None
Macrohabitat (%)	
Riffle (%)	0
Run (%)	0
Pool (rocky) (%)	0
Pool (sandy/silt) (%)	100
Dry (%)	0
Water Quality	
Clear or turbid	-
Water Surface	-
Water temperature (°C)	17
Water Odour	None
pH	7.3
Electrical Conductivity (µS/cm)	167.6
Dissolved Oxygen (mg/L)	6.38
Dissolved Oxygen (% Saturation)	65.6
Turbidity (NTU)	20.5
Chlorophyll A(µ/L)	5.45
Substratum (%)	
Bedrock	0
Boulders	0
Cobbles	0
Pebbles	0
Gravel	0
Sand	5
Silt / Clay	95
Bed compaction	
Low compaction – poor grading, some packing and structure, little overlap and can be dislodged easily.	

Microhabitat (%)	
Logs (>15cm Ø)	5
Sticks & branches (<15cm Ø)	5
Detritus (leaves, twigs)	5
Periphyton (fine algae on rocks)	5
Blanketing silt	0
Undercut banks	0
Moss	0
Filamentous algae	5
Macrophytes	0
Bank overhang veg.	0
Bank trailing veg.	0
Substrate anoxia	0
Shading	0
Canopy cover	0

Habitat bioassessment		
Habitat variable	**Condition**	**Notes**
Not Applicable		

EVNT species	
Australian lungfish (*neoceratodus forsteri*)	Known
Mary River Cod (Maccullochella mariensis)	Likely
Mary River turtle (Elusor macrurus)	Known
White-throated snapping turtle (Elseya albagula)	Known
Platypus (Ornithorhynchus anatinus)	Likely

Bank/riparian structure	Left	Right
Bank land use	Native	Native
Bank erosion (%)	5	5
Bare (%)	0	0
Grasses (%)	0	5
Shrubs (%)	5	5
Trees <10m (%)	10	10
Trees >10m (%)	80	80
Exotics (%)	0	0

Macrophytes	
Species list	**Proportion (%)**
Vallisneria sp.	20
Nymphoides sp.	40
Azolla pinnata	20
Hydrilla sp.	15
Cyperus sp.	5

Comments

Site code	S7	Watercourse:	Lake	Date:	25/06/2022	Latitude:	-26.5085	Longitude:	152.5514

Watercourse Description	
Watercourse Type (river, tributary, wetland)	Lake
Water presence	High-level
Flow Level (m/s)	None
Macrohabitat (%)	
Riffle (%)	0
Run (%)	0
Pool (rocky) (%)	0
Pool (sandy/silt) (%)	100
Dry (%)	0
Water Quality	
Clear or turbid	-
Water Surface	-
Water temperature (°C)	16
Water Odour	None
pH	7.3
Electrical Conductivity (µS/cm)	176.3
Dissolved Oxygen (mg/L)	5.83
Dissolved Oxygen (% Saturation)	58.5
Turbidity (NTU)	19.4
Chlorophyll A(µ/L)	5.83
Substratum (%)	
Bedrock	0
Boulders	0
Cobbles	5
Pebbles	0
Gravel	5
Sand	0
Silt / Clay	90
Bed compaction	
Low compaction – poor grading, some packing and structure, little overlap and can be dislodged easily.	

Microhabitat (%)	
Logs (>15cm Ø)	40
Sticks & branches (<15cm Ø)	5
Detritus (leaves, twigs)	0
Periphyton (fine algae on rocks)	0
Blanketing silt	0
Undercut banks	0
Moss	0
Filamentous algae	5
Macrophytes	5
Bank overhang veg.	0
Bank trailing veg.	0
Substrate anoxia	0
Shading	0
Canopy cover	0

Habitat bioassessment		
Habitat variable	**Condition**	**Notes**
Not Applicable		
EVNT species		
Australian lungfish (*neoceratodus forsteri*)	Known	
Mary River Cod (Maccullochella mariensis)	Likely	
Mary River turtle (Elusor macrurus)	Known	
White-throated snapping turtle (Elseya albagula)	Known	
Platypus (Ornithorhynchus anatinus)	Likely	

Bank/riparian structure	Left	Right
Bank land use	Native	Native
Bank erosion (%)	5	5
Bare (%)	0	5
Grasses (%)	0	5
Shrubs (%)	5	0
Trees <10m (%)	10	10
Trees >10m (%)	80	80
Exotics (%)	0	5

Macrophytes	
Species list	**Proportion (%)**
Azolea pinpata	5
Eleocharus sp.	5
Nymphoides sp.	5
Hydrilla sp.	70
Ludwigia peploides	15

Comments

Site code	S8	Watercourse:	Lake	Date:	25/06/2022	Latitude:	-26.5312	Longitude:	152.5626

Watercourse Description	
Watercourse Type (river, tributary, wetland)	Lake
Water presence	High-level
Flow Level (m/s)	None
Macrohabitat (%)	
Riffle (%)	0
Run (%)	0
Pool (rocky) (%)	0
Pool (sandy/silt) (%)	100
Dry (%)	0
Water Quality	
Clear or turbid	-
Water Surface	-
Water temperature (°C)	16
Water Odour	Yes
pH	7.3
Electrical Conductivity (µS/cm)	162.9
Dissolved Oxygen (mg/L)	6.44
Dissolved Oxygen (% Saturation)	65.9
Turbidity (NTU)	21.8
Chlorophyll A(µ/L)	5.63
Substratum (%)	
Bedrock	0
Boulders	0
Cobbles	0
Pebbles	0
Gravel	0
Sand	5
Silt / Clay	95
Bed compaction	
Low compaction – poor grading, some packing and structure, little overlap and can be dislodged easily.	

Microhabitat (%)	
Logs (>15cm Ø)	15
Sticks & branches (<15cm Ø)	10
Detritus (leaves, twigs)	10
Periphyton (fine algae on rocks)	5
Blanketing silt	0
Undercut banks	5
Moss	0
Filamentous algae	5
Macrophytes	10
Bank overhang veg.	0
Bank trailing veg.	0
Substrate anoxia	0
Shading	0
Canopy cover	0

Habitat bioassessment		
Habitat variable	**Condition**	**Notes**
Not Applicable		

EVNT species	
Australian lungfish (*neoceratodus forsteri*)	Known
Mary River Cod (Maccullochella mariensis)	Likely
Mary River turtle (Elusor macrurus)	Known
White-throated snapping turtle (Elseya albagula)	Known
Platypus (Ornithorhynchus anatinus)	Likely

Bank/riparian structure	Left	Right
Bank land use	Dam	Dam
Bank erosion (%)	5	5
Bare (%)	5	5
Grasses (%)	0	10
Shrubs (%)	20	20
Trees <10m (%)	60	60
Trees >10m (%)	0	0
Exotics (%)	5	5

Macrophytes	
Species list	**Proportion (%)**
Azolea sp.	5
Nymphoides sp.	5
Ludwigia peploides	90

Comments

Site code	S10	Watercourse:	Lake	Date:	25/06/2022	Latitude:	-26.5219	Longitude:	152.5727

Watercourse Description	
Watercourse Type (river, tributary, wetland)	Lake
Water presence	High-level
Flow Level (m/s)	Low
Macrohabitat (%)	
Riffle (%)	0
Run (%)	0
Pool (rocky) (%)	0
Pool (sandy/silt) (%)	100
Dry (%)	0
Water Quality	
Clear or turbid	-
Water Surface	-
Water temperature (°C)	16
Water Odour	Yes
pH	7.3
Electrical Conductivity (µS/cm)	165.1
Dissolved Oxygen (mg/L)	6.75
Dissolved Oxygen (% Saturation)	69.1
Turbidity (NTU)	21.9
Chlorophyll A(µ/L)	5.1
Substratum (%)	
Bedrock	0
Boulders	0
Cobbles	0
Pebbles	0
Gravel	0
Sand	5
Silt / Clay	95
Bed compaction	
Loose compaction –loose array no packaging or structure, no overlap, easily moved.	

Microhabitat (%)	
Logs (>15cm Ø)	0
Sticks & branches (<15cm Ø)	5
Detritus (leaves, twigs)	5
Periphyton (fine algae on rocks)	5
Blanketing silt	0
Undercut banks	0
Moss	0
Filamentous algae	0
Macrophytes	0
Bank overhang veg.	0
Bank trailing veg.	0
Substrate anoxia	Yes
Shading	0
Canopy cover	0

Habitat bioassessment		
Habitat variable	**Condition**	**Notes**
Not Applicable		
EVNT species		
Australian lungfish (*neoceratodus forsteri*)	Known	
Mary River Cod (Maccullochella mariensis)	Likely	
Mary River turtle (Elusor macrurus)	Known	
White-throated snapping turtle (Elseya albagula)	Known	
Platypus (Ornithorhynchus anatinus)	Likely	

Bank/riparian structure	Left	Right
Bank land use	Native	Native
Bank erosion (%)	5	0
Bare (%)	0	5
Grasses (%)	0	5
Shrubs (%)	5	5
Trees <10m (%)	5	85
Trees >10m (%)	85	0
Exotics (%)	0	0

Macrophytes	
Species list	**Proportion (%)**

Comments

Site code	S11	Watercourse:	Lake	Date:	25/06/2022	Latitude:	-26.5096	Longitude:	152.5727

Watercourse Description	
Watercourse Type (river, tributary, wetland)	Lake
Water presence	High-level
Flow Level (m/s)	none
Macrohabitat (%)	
Riffle (%)	0
Run (%)	0
Pool (rocky) (%)	0
Pool (sandy/silt) (%)	100
Dry (%)	0
Water Quality	
Clear or turbid	-
Water Surface	-
Water temperature (°C)	17
Water Odour	Yes
pH	7.5
Electrical Conductivity (µS/cm)	162.3
Dissolved Oxygen (mg/L)	7.14
Dissolved Oxygen (% Saturation)	79.9
Turbidity (NTU)	21.7
Chlorophyll A(µ/L)	6.51
Substratum (%)	
Bedrock	0
Boulders	0
Cobbles	0
Pebbles	0
Gravel	5
Sand	5
Silt / Clay	90
Bed compaction	
Loose compaction –loose array no packaging or structure, no overlap, easily moved.	

Microhabitat (%)	
Logs (>15cm Ø)	20
Sticks & branches (<15cm Ø)	10
Detritus (leaves, twigs)	5
Periphyton (fine algae on rocks)	5
Blanketing silt	0
Undercut banks	5
Moss	0
Filamentous algae	5
Macrophytes	10
Bank overhang veg.	0
Bank trailing veg.	0
Substrate anoxia	0
Shading	0
Canopy cover	0

Habitat bioassessment		
Habitat variable	**Condition**	**Notes**
Not Applicable		
EVNT species		
Australian lungfish (*neoceratodus forsteri*)	Known	
Mary River Cod (Maccullochella mariensis)	Likely	
Mary River turtle (Elusor macrurus)	Known	
White-throated snapping turtle (Elseya albagula)	Known	
Platypus (Ornithorhynchus anatinus)	Likely	

Bank/riparian structure	Left	Right
Bank land use	Native	Native
Bank erosion (%)	5	5
Bare (%)	5	5
Grasses (%)	5	5
Shrubs (%)	10	10
Trees <10m (%)	20	20
Trees >10m (%)	60	60
Exotics (%)	0	0

Macrophytes	
Species list	**Proportion (%)**
Ludwigia peploides	80
Azola sp.	10
Nymphoides sp.	10

Comments

Site code	S12	Watercourse:	Creek	Date:	20/06/2022	Latitude:	-26.5051	Longitude:	152.5829

Watercourse Description	
Watercourse Type (river, tributary, wetland)	Creek
Water presence	Mid-level
Flow Level (m/s)	High
Macrohabitat (%)	
Riffle (%)	15
Run (%)	70
Pool (rocky) (%)	15
Pool (sandy/silt) (%)	0
Dry (%)	0
Water Quality	
Clear or turbid	turbid
Water Surface	-
Water temperature (°C)	17.4
Water Odour	None
pH	7.82
Electrical Conductivity (µS/cm)	156.1
Dissolved Oxygen (mg/L)	7.66
Dissolved Oxygen (% Saturation)	100.9
Turbidity (NTU)	23.1
Chlorophyll A (µ/L)	6.95
Substratum (%)	
Bedrock	1
Boulders	10
Cobbles	60
Pebbles	10
Gravel	10
Sand	10
Silt / Clay	0
Bed compaction	
Tightly packed, armoured – array of sizes tightly packed overlapping hard to dislodge. Moderate Compaction- array of sizes some packing little overlapping can be dislodged.	

Microhabitat (%)	
Logs (>15cm Ø)	15
Sticks & branches (<15cm Ø)	5
Detritus (leaves, twigs)	5
Periphyton (fine algae on rocks)	5
Blanketing silt	0
Undercut banks	0
Moss	2
Filamentous algae	35
Macrophytes	0
Bank overhang veg.	0
Bank trailing veg.	0
Substrate anoxia	0
Shading	40
Canopy cover	0

Habitat bioassessment		
Habitat variable	**Condition**	**Notes**
Bottom substrate/available cover	Good	30-50% rubble, gravel or other stable habitat. Adequate habitat
Embeddedness	Good	Gravel, cobble and boulder particles are between 25% & 50% surrounded by fine sediment.
Velocity/depth category	Good	Only 3 of the four habitat categories present (missing riffles or runs receive lower score than missing pools)
Channel alteration	Fair	Moderate deposition of new gravel, coarse sand, on old and new bars; pools partly filled with silt; and/or embarkments on both banks.
Bottom scouring and deposition	Good	5-30% affected. Sours at constrictions and where grades steepen, some deposition in pools.
Pool/riffle, run/bend ratio	Good	7-15 Adequate depth in pools and riffles. Bends provide habitat.
Bank stability	Excellent	Stable. No evidence of erosion or bank failure. Side slopes generally <30%. Little potential for future problem
Bank vegetative stability	Fair	25-49% of the streambank covered by vegetation, gravel or larger material.
Streamside cover	Poor	Over 50% of the streambank has no vegetation and dominant material is soil, rock, bridge materials, culverts or mine tailings.

EVNT species	
Australian lungfish (*neoceratodus forsteri*)	Known
Mary River Cod (Maccullochella mariensis)	Known
Mary River turtle (Elusor macrurus)	Likely
White-throated snapping turtle (Elseya albagula)	Known
Platypus (Ornithorhynchus anatinus)	Likely

Bank/riparian structure	Left	Right
Bank land use	Camp/Native	Native
Bank erosion (%)	0	0
Bare (%)	50	50
Grasses (%)	10	0
Shrubs (%)	10	0
Trees <10m (%)	10	30
Trees >10m (%)	20	20
Exotics (%)	0	0

Macrophytes	
Species list	**Proportion (%)**

Comments

Few trees on waters' edge. All rocky, contiguous treeline. Past rock boundary most trees toppled.

Site code	S13	Watercourse:	Creek	Date:	20/06/2022	Latitude:	-26.4913	Longitude:	152.5876

Watercourse Description	
Watercourse Type (river, tributary, wetland)	Creek
Water presence	Mid-level
Flow Level (m/s)	Low-Moderate
Macrohabitat (%)	
Riffle (%)	40
Run (%)	30
Pool (rocky) (%)	10
Pool (sandy/silt) (%)	20
Dry (%)	0
Water Quality	
Clear or turbid	Clear
Water Surface	-
Water temperature (°C)	14.5
Water Odour	None
pH	8.11
Electrical Conductivity (µS/cm)	462
Dissolved Oxygen (mg/L)	9.16
Dissolved Oxygen (% Saturation)	90
Turbidity (NTU)	0.20
Chlorophyll A(µ/L)	1.15
Substratum (%)	
Bedrock	0
Boulders	0
Cobbles	0
Pebbles	20
Gravel	30
Sand	40
Silt / Clay	10
Bed compaction	
Low compaction – poor grading, some packing and structure, little overlap and can be dislodged easily. Moderate Compaction- array of sizes some packing little overlapping can be dislodged.	

Microhabitat (%)	
Logs (>15cm Ø)	25
Sticks & branches (<15cm Ø)	15
Detritus (leaves, twigs)	20
Periphyton (fine algae on rocks)	0
Blanketing silt	0
Undercut banks	20
Moss	0
Filamentous algae	10
Macrophytes	0
Bank overhang veg.	30
Bank trailing veg.	30
Substrate anoxia	No
Shading	80
Canopy cover	80

Habitat bioassessment		
Habitat variable	**Condition**	**Notes**
Bottom substrate/available cover	Good	30-50% rubble, gravel or other stable habitat. Adequate habitat
Embeddedness	Fair	Gravel, cobble and boulder particles are between 50% & 75% surrounded by fine sediment.
Velocity/depth category	Excellent	Slow deep (<0.3 m/s & >0.5 m); slow shallow; fast deep; fast shallow' habitats all present.
Channel alteration	Good	Some new increase in bar formation, mostly from coarse gravel; and/or some channelisation present.
Bottom scouring and deposition	Fair	30-50% affected. Deposits and scours obstructions and bends. Some deposition in pools.
Pool/riffle, run/bend ratio	Good	7-15 Adequate depth in pools and riffles. Bends provide habitat.
Bank stability	Fair	Moderately unstable. Moderate frequency and size of erosional areas. Side slopes up to 60% on some banks, High erosion potential during extreme/high flows.
Bank vegetative stability	Fair	25-49% of the streambank covered by vegetation, gravel or larger material.
Streamside cover	Good	Dominant vegetation shrub.
EVNT species		
Australian lungfish (*neoceratodus forsteri*)	Likely	
Mary River Cod (Maccullochella mariensis)	Likely	
Mary River turtle (Elusor macrurus)	Likely	
White-throated snapping turtle (Elseya albagula)	Likely	
Platypus (Ornithorhynchus anatinus)	Likely	

Bank/riparian structure	Left	Right
Bank land use	Native	Road crossing/Pasture
Bank erosion (%)	50	50
Bare (%)	10	50
Grasses (%)	30	15
Shrubs (%)	35	5
Trees <10m (%)	10	15
Trees >10m (%)	15	15
Exotics (%)	0	0

Macrophytes	
Species list	**Proportion (%)**

Comments

Upstream is of much better habitat- intact. Coarse substrates and contiguous treeline. Downstream of the crossing is poor and eroded. Pig activity/tracks.

Site code	S14	Watercourse:	Creek	Date:	21/06/2022	Latitude:	-26.4736	Longitude:	152.6349

Watercourse Description	
Watercourse Type (river, tributary, wetland)	Creek
Water presence	Mid-level
Flow Level (m/s)	Moderate-High
Macrohabitat (%)	
Riffle (%)	40
Run (%)	50
Pool (rocky) (%)	5
Pool (sandy/silt) (%)	5
Dry (%)	0
Water Quality	
Clear or turbid	Turbid
Water Surface	-
Water temperature (°C)	15.6
Water Odour	None
pH	7.51
Electrical Conductivity (µS/cm)	276.9
Dissolved Oxygen (mg/L)	8.69
Dissolved Oxygen (% Saturation)	87.3
Turbidity (NTU)	16.19
Chlorophyll A(µ/L)	4.84
Substratum (%)	
Bedrock	0
Boulders	0
Cobbles	1
Pebbles	30
Gravel	40
Sand	20
Silt / Clay	0
Bed compaction	
Tightly packed, armoured – array of sizes tightly packed overlapping hard to dislodge. Packed, but not armoured – array of sizes, tightly packed, overlapping, can be dislodged.	

Microhabitat (%)	
Logs (>15cm Ø)	40
Sticks & branches (<15cm Ø)	10
Detritus (leaves, twigs)	15
Periphyton (fine algae on rocks)	0
Blanketing silt	0
Undercut banks	40
Moss	0
Filamentous algae	10
Macrophytes	0
Bank overhang veg.	20
Bank trailing veg.	0
Substrate anoxia	0
Shading	10
Canopy cover	20

Habitat bioassessment		
Habitat variable	**Condition**	**Notes**
Bottom substrate/available cover	Excellent	Greater than 50% rubble, gravel, submerged logs, undercut banks or other stable habitat.
Embeddedness	Excellent	Gravel, cobble and boulder particles are between 0 & 25% surrounded by fine sediment.
Velocity/depth category	Excellent	Slow deep (<0.3 m/s & >0.5 m); slow shallow; fast deep; fast shallow' habitats all present.
Channel alteration	Fair	Moderate deposition of new gravel, coarse sand, on old and new bars; pools partly filled with silt; and/or embarkments on both banks.
Bottom scouring and deposition	Fair	30-50% affected. Deposits and scours obstructions and bends. Some deposition in pools.
Pool/riffle, run/bend ratio	Good	7-15 Adequate depth in pools and riffles. Bends provide habitat.
Bank stability	Fair	Moderately unstable. Moderate frequency and size of erosional areas. Side slopes up to 60% on some banks, High erosion potential during extreme/high flows.
Bank vegetative stability	Fair	25-49% of the streambank covered by vegetation, gravel or larger material.
Streamside cover	Fair	Over 50% of the streambank has no vegetation and dominant material is soil, rock, bridge materials, culverts or mine tailings.
EVNT species		
Australian lungfish (*neoceratodus forsteri*)	Known	
Mary River Cod (Maccullochella mariensis)	Likely	
Mary River turtle (Elusor macrurus)	Known	
White-throated snapping turtle (Elseya albagula)	Known	
Platypus (Ornithorhynchus anatinus)	Likely	

Bank/riparian structure	Left	Right	Macrophytes	
Bank land use	Farm	Farm	**Species list**	**Proportion(%)**
Bank erosion (%)	70	70		
Bare (%)	30	15		
Grasses (%)	10	15		
Shrubs (%)	10	20		
Trees <10m (%)	20	30		
Trees >10m (%)	30	20		
Exotics (%)	0	0		

Comments

High flow, Large woody debris throughout, Undercut banks throughout. Cows on site. Low washed-out banks downstream of bridge, very rocky habitat.

Site code	S15	Watercourse:	Creek	Date:	21/06/2022	Latitude:	-26.4571	Longitude:	152.6847

Watercourse Description	
Watercourse Type (river, tributary, wetland)	Creek
Water presence	Mid-level
Flow Level (m/s)	Low-Moderate
Macrohabitat (%)	
Riffle (%)	30
Run (%)	40
Pool (rocky) (%)	30
Pool (sandy/silt) (%)	0
Dry (%)	0
Water Quality	
Clear or turbid	Turbid
Water Surface	-
Water temperature (°C)	18.2
Water Odour	None
pH	7.6
Electrical Conductivity (µS/cm)	295
Dissolved Oxygen (mg/L)	9.24
Dissolved Oxygen (% Saturation)	97.7
Turbidity (NTU)	14.1
Chlorophyll A(µ/L)	11.7
Substratum (%)	
Bedrock	30
Boulders	0
Cobbles	0
Pebbles	0
Gravel	20
Sand	20
Silt / Clay	30
Bed compaction	

Microhabitat (%)	
Logs (>15cm Ø)	30
Sticks & branches (<15cm Ø)	10
Detritus (leaves, twigs)	15
Periphyton (fine algae on rocks)	0
Blanketing silt	0
Undercut banks	50
Moss	
Filamentous algae	10
Macrophytes	0
Bank overhang veg.	
Bank trailing veg.	
Substrate anoxia	
Shading	
Canopy cover	

Habitat bioassessment		
Habitat variable	**Condition**	**Notes**
Bottom substrate/available cover	Good	30-50% rubble, gravel or other stable habitat. Adequate habitat
Embeddedness	Fair	Gravel, cobble and boulder particles are between 50% & 75% surrounded by fine sediment.
Velocity/depth category	Fair	Only two of the four habitat categories present (missing riffles/runs receive lower score).
Channel alteration	Fair	Moderate deposition of new gravel, coarse sand, on old and new bars; pools partly filled with silt; and/or embarkments on both banks.
Bottom scouring and deposition	Fair	30-50% affected. Deposits and scours obstructions and bends. Some deposition in pools.
Pool/riffle, run/bend ratio	Fair	15-25 Occasional riffle or bend. Bottom contours provide some habitat.
Bank stability	Poor	Unstable. Many eroded areas. Side slopes >60% common. 'Raw' areas frequent along straight sections and bends.
Bank vegetative stability	Fair	25-49% of the streambank covered by vegetation, gravel or larger material.
Streamside cover	Fair	Over 50% of the streambank has no vegetation and dominant material is soil, rock, bridge materials, culverts or mine tailings.
EVNT species		
Australian lungfish (*neoceratodus forsteri*)	Known	
Mary River Cod (Maccullochella mariensis)	Known	
Mary River turtle (Elusor macrurus)	Known	
White-throated snapping turtle (Elseya albagula)	Known	
Platypus (Ornithorhynchus anatinus)	Known	

Bank/riparian structure	Left	Right
Bank land use	Farm/Cleared	Farm/Cleared
Bank erosion (%)	90	90
Bare (%)	20	60
Grasses (%)	40	15
Shrubs (%)	10	5
Trees <10m (%)	20	10
Trees >10m (%)	10	10
Exotics (%)	0	0

Macrophytes	
Species list	**Proportion (%)**

Comments

Very eroded undercut banks and large woody debris throughout. Steep banks, no sampleable areas for macros and fish. Cows on site.

Site code	S16	Watercourse:	Creek	Date:	21/06/2022	Latitude:	-26.4574	Longitude:	152.6864

Watercourse Description	
Watercourse Type (river, tributary, wetland)	Creek
Water presence	Mid-level
Flow Level (m/s)	High
Macrohabitat (%)	
Riffle (%)	50
Run (%)	30
Pool (rocky) (%)	10
Pool (sandy/silt) (%)	10
Dry (%)	0
Water Quality	
Clear or turbid	Turbid
Water Surface	-
Water temperature (°C)	15.5
Water Odour	None
pH	7.78
Electrical Conductivity (µS/cm)	24.77
Dissolved Oxygen (mg/L)	10.02
Dissolved Oxygen (% Saturation)	100.6
Turbidity (NTU)	1529
Chlorophyll A(µ/L)	4.93
Substratum (%)	
Bedrock	40
Boulders	0
Cobbles	0
Pebbles	0
Gravel	30
Sand	30
Silt / Clay	0
Bed compaction	

Tightly packed, armoured – array of sizes tightly packed overlapping hard to dislodge.
Packed, but not armoured – array of sizes, tightly packed, overlapping, can be dislodged.
Low compaction – poor grading, some packing and structure, little overlap and can be dislodged easily

Microhabitat (%)	
Logs (>15cm Ø)	15
Sticks & branches (<15cm Ø)	5
Detritus (leaves, twigs)	5
Periphyton (fine algae on rocks)	0
Blanketing silt	0
Undercut banks	60
Moss	0
Filamentous algae	5
Macrophytes	0
Bank overhang veg.	0
Bank trailing veg.	0
Substrate anoxia	0
Shading	20
Canopy cover	20

Habitat bioassessment		
Habitat variable	**Condition**	**Notes**
Bottom substrate/available cover	Good	30-50% rubble, gravel or other stable habitat. Adequate habitat
Embeddedness	Good	Gravel, cobble and boulder particles are between 25% & 50% surrounded by fine sediment.
Velocity/depth category	Good	Only 3 of the four habitat categories present (missing riffles or runs receive lower score than missing pools)
Channel alteration	Good	Some new increase in bar formation, mostly from coarse gravel; and/or some channelisation present.
Bottom scouring and deposition	Poor	More tan 50% of the bottom changing nearly year long. Pools almost absent due to deposition. Only large rocks in riffle exposed.
Pool/riffle, run/bend ratio	Fair	15-25 Occasional riffle or bend. Bottom contours provide some habitat.
Bank stability	Poor	Unstable. Many eroded areas. Side slopes >60% common. 'Raw' areas frequent along straight sections and bends.
Bank vegetative stability	Fair	25-49% of the streambank covered by vegetation, gravel or larger material.
Streamside cover	Fair	Over 50% of the streambank has no vegetation and dominant material is soil, rock, bridge materials, culverts or mine tailings.

EVNT species	
Australian lungfish (*neoceratodus forsteri*)	Known
Mary River Cod (Maccullochella mariensis)	Known
Mary River turtle (Elusor macrurus)	Known
White-throated snapping turtle (Elseya albagula)	Known
Platypus (Ornithorhynchus anatinus)	Known

Bank/riparian structure	Left	Right	Macrophytes	
Bank land use	Farm	Native	**Species list**	**Proportion (%)**
Bank erosion (%)	90	80		
Bare (%)	40	30		
Grasses (%)	20	10		
Shrubs (%)	10	30		
Trees <10m (%)	15	25		
Trees >10m (%)	15	15		
Exotics (%)	0	0		

Comments

Heavy erosion. Large woody debris throughout. Undercut banks throughout. Riffle eroded to bedrock. Large pool downstream. Extremely high flow.

Site code	S17	Watercourse:	River	Date:	22/06/2022	Latitude:	-26.5129	Longitude:	152.7442

Watercourse Description	
Watercourse Type (river, tributary, wetland)	River
Water presence	Mid-level
Flow Level (m/s)	Moderate-High
Macrohabitat (%)	
Riffle (%)	20
Run (%)	45
Pool (rocky) (%)	15
Pool (sandy/silt) (%)	20
Dry (%)	0
Water Quality	
Clear or turbid	Clear
Water Surface	-
Water temperature (°C)	16.1
Water Odour	None
pH	7.68
Electrical Conductivity (µS/cm)	262.3
Dissolved Oxygen (mg/L)	10.75
Dissolved Oxygen (% Saturation)	109.3
Turbidity (NTU)	1.2
Chlorophyll A (µ/L)	2.85
Substratum (%)	
Bedrock	0
Boulders	0
Cobbles	0
Pebbles	10
Gravel	40
Sand	40
Silt / Clay	10
Bed compaction	
Tightly packed, armoured – array of sizes tightly packed overlapping hard to dislodge. Low compaction – poor grading, some packing and structure, little overlap and can be dislodged easily	

Microhabitat (%)	
Logs (>15cm Ø)	30
Sticks & branches (<15cm Ø)	10
Detritus (leaves, twigs)	10
Periphyton (fine algae on rocks)	10
Blanketing silt	0
Undercut banks	15
Moss	0
Filamentous algae	15
Macrophytes	0
Bank overhang veg.	5
Bank trailing veg.	5
Substrate anoxia	0
Shading	20
Canopy cover	10

Habitat bioassessment		
Habitat variable	**Condition**	**Notes**
Bottom substrate/available cover	Excellent	Greater than 50% rubble, gravel, submerged logs, undercut banks or other stable habitat.
Embeddedness	Excellent	Gravel, cobble and boulder particles are between 0 & 25% surrounded by fine sediment.
Velocity/depth category	Good	Only 3 of the four habitat categories present (missing riffles or runs receive lower score than missing pools)
Channel alteration	Fair	Moderate deposition of new gravel, coarse sand, on old and new bars; pools partly filled with silt; and/or embarkments on both banks.
Bottom scouring and deposition	Fair	30-50% affected. Deposits and scours obstructions and bends. Some deposition in pools.
Pool/riffle, run/bend ratio	Good	7-15 Adequate depth in pools and riffles. Bends provide habitat.
Bank stability	Fair	Moderately unstable. Moderate frequency and size of erosional areas. Side slopes up to 60% on some banks, High erosion potential during extreme/high flows.
Bank vegetative stability	Good	50-79% of the streambank surfaces covered by vegetation, gravel or larger material.
Streamside cover	Excellent	Dominant vegetation is of tree form.

EVNT species	
Australian lungfish (*neoceratodus forsteri*)	Known
Mary River Cod (Maccullochella mariensis)	Known
Mary River turtle (Elusor macrurus)	Known
White-throated snapping turtle (Elseya albagula)	Known
Platypus (Ornithorhynchus anatinus)	Known

Bank/riparian structure	Left	Right
Bank land use	Farm/Native	Farm/Native
Bank erosion (%)	60	70
Bare (%)	5	20
Grasses (%)	10	5
Shrubs (%)	25	20
Trees <10m (%)	30	30
Trees >10m (%)	30	25
Exotics (%)	0	0

Macrophytes	
Species list	**Proportion (%)**

Comments

Road crossing, large woody debris throughout. High erosion with high deposition in pools.

Site code	S19	Watercourse:	River	Date:	23/06/2022	Latitude:	-26.3347	Longitude:	152.7048

Watercourse Description	
Watercourse Type (river, tributary, wetland)	River
Water presence	Mid-level
Flow Level (m/s)	High
Macrohabitat (%)	
Riffle (%)	25
Run (%)	45
Pool (rocky) (%)	20
Pool (sandy/silt) (%)	10
Dry (%)	0
Water Quality	
Clear or turbid	--
Water Surface	-
Water temperature (°C)	16
Water Odour	None
pH	7.2
Electrical Conductivity (µS/cm)	308.7
Dissolved Oxygen (mg/L)	9.8
Dissolved Oxygen (% Saturation)	99.2
Turbidity (NTU)	7.8
Chlorophyll A (µ/L)	5.6
Substratum (%)	
Bedrock	0
Boulders	0
Cobbles	0
Pebbles	20
Gravel	40
Sand	30
Silt / Clay	10
Bed compaction	
Packed, but not armoured – array of sizes, tightly packed, overlapping, can be dislodged. Moderate Compaction- array of sizes some packing little overlapping can be dislodged. Low compaction – poor grading, some packing and structure, little overlap and can be dislodged easily	

Microhabitat (%)	
Logs (>15cm Ø)	35
Sticks & branches (<15cm Ø)	15
Detritus (leaves, twigs)	5
Periphyton (fine algae on rocks)	0
Blanketing silt	0
Undercut banks	15
Moss	0
Filamentous algae	10
Macrophytes	0
Bank overhang veg.	10
Bank trailing veg.	0
Substrate anoxia	0
Shading	40
Canopy cover	10

Habitat bioassessment		
Habitat variable	**Condition**	**Notes**
Bottom substrate/available cover	Good	30-50% rubble, gravel or other stable habitat. Adequate habitat
Embeddedness	Good	Gravel, cobble and boulder particles are between 25% & 50% surrounded by fine sediment.
Velocity/depth category	Good	Only 3 of the four habitat categories present (missing riffles or runs receive lower score than missing pools)
Channel alteration	Fair	Moderate deposition of new gravel, coarse sand, on old and new bars; pools partly filled with silt; and/or embarkments on both banks.
Bottom scouring and deposition	Fair	30-50% affected. Deposits and scours obstructions and bends. Some deposition in pools.
Pool/riffle, run/bend ratio	Good	7-15 Adequate depth in pools and riffles. Bends provide habitat.
Bank stability	Fair	Moderately unstable. Moderate frequency and size of erosional areas. Side slopes up to 60% on some banks, High erosion potential during extreme/high flows.
Bank vegetative stability	Fair	25-49% of the streambank covered by vegetation, gravel or larger material.
Streamside cover	Poor	Over 50% of the streambank has no vegetation and dominant material is soil, rock, bridge materials, culverts or mine tailings.
EVNT species		
Australian lungfish (*neoceratodus forsteri*)	Known	
Mary River Cod (Maccullochella mariensis)	Known	
Mary River turtle (Elusor macrurus)	Known	
White-throated snapping turtle (Elseya albagula)	Known	
Platypus (Ornithorhynchus anatinus)	Known	

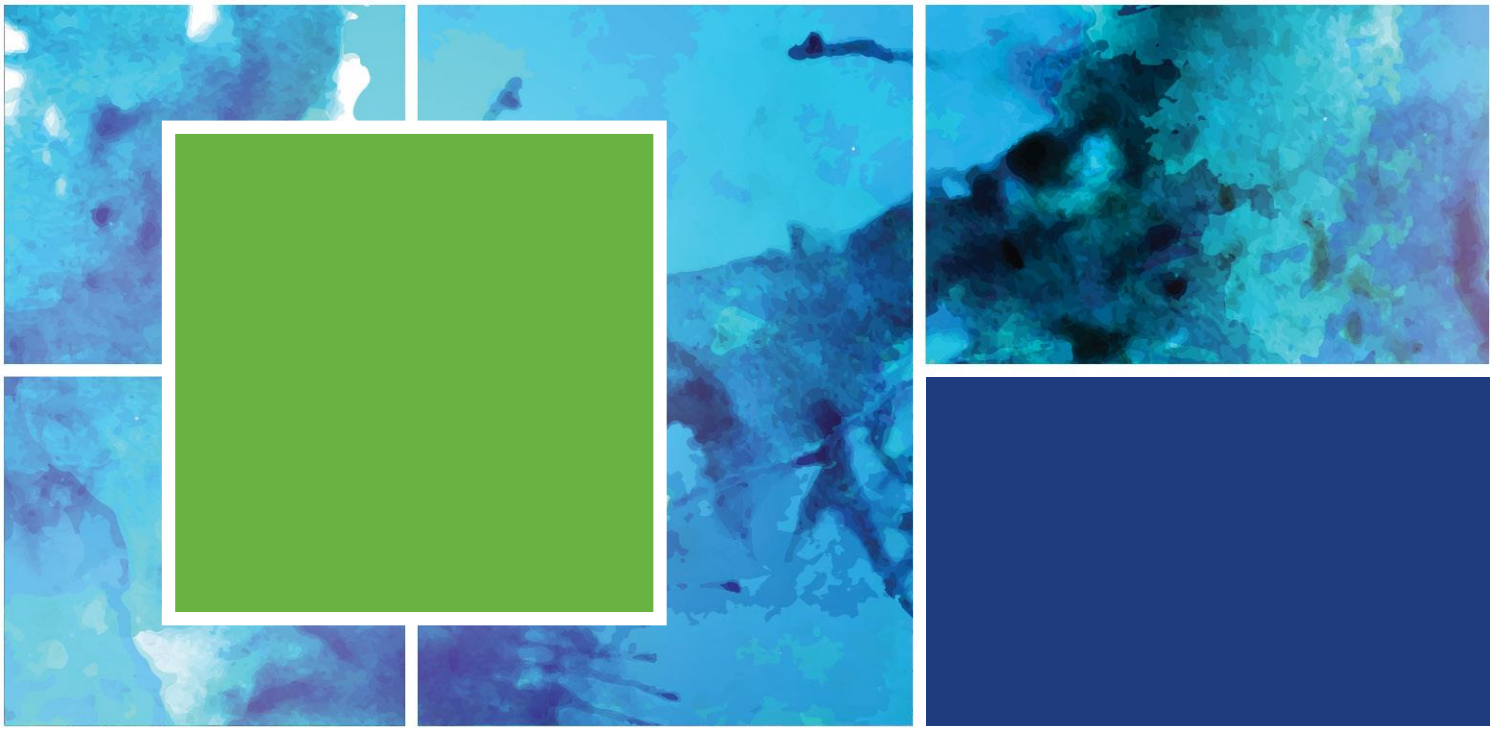
Bank/riparian structure	Left	Right
Bank land use	Native/Road crossing	Native/Road crossing
Bank erosion (%)	70	70
Bare (%)	30	25
Grasses (%)	10	5
Shrubs (%)	15	15
Trees <10m (%)	20	20
Trees >10m (%)	25	35
Exotics (%)	0	0

Macrophytes	
Species list	**Proportion (%)**

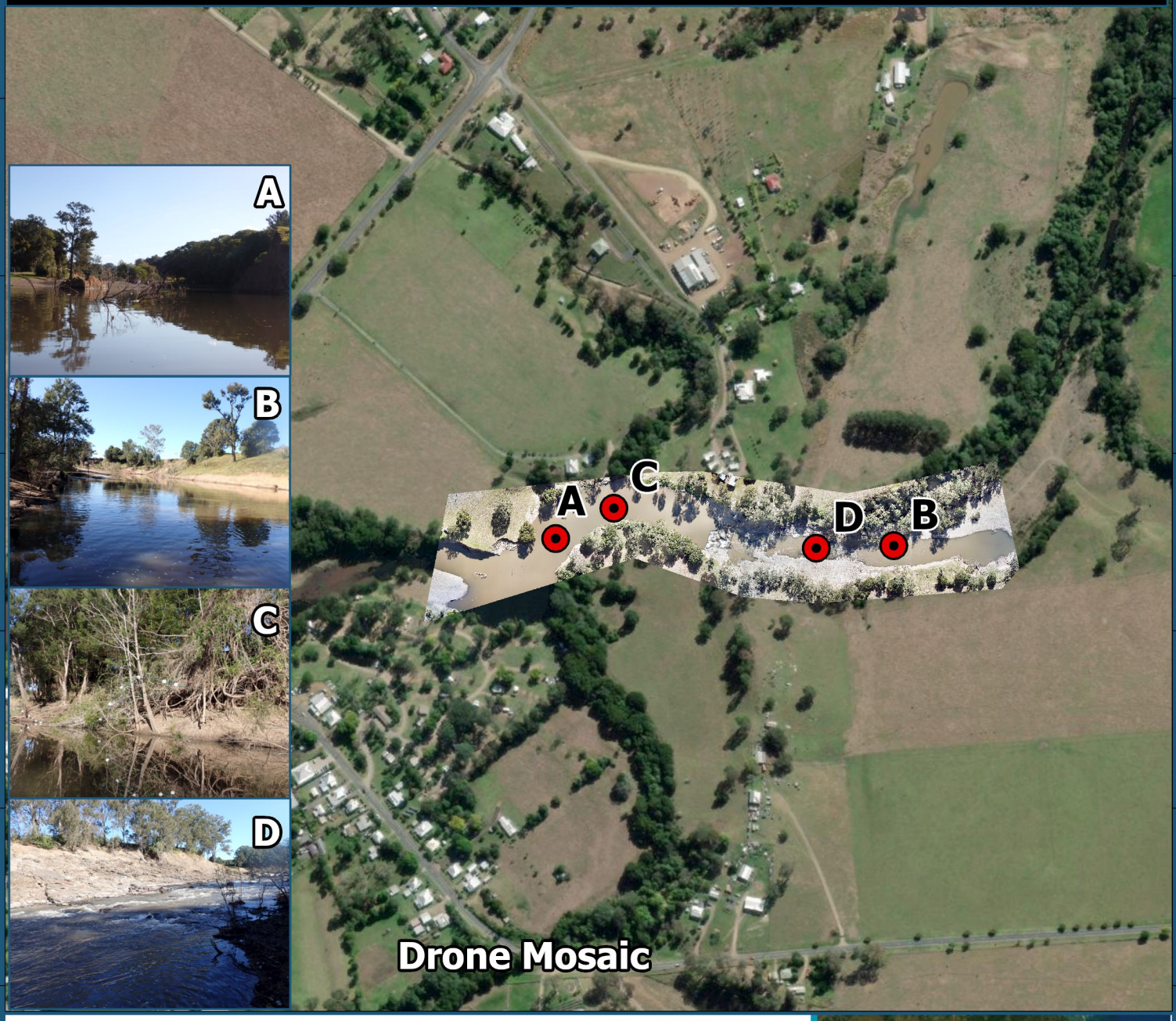
Comments

Road crossing, large woody debris throughout. High flow.

APPENDIX E.
DRONE MOSAICS







Legend

Field Images

Site S15 & S16

Site Profiles and associated Imagery



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Kilometers

Scale: 1:6,645

Projection: Transverse Mercator

Datum: GDA2020

Grid: GDA2020 MGA Zone 55

N

Hydrobiology

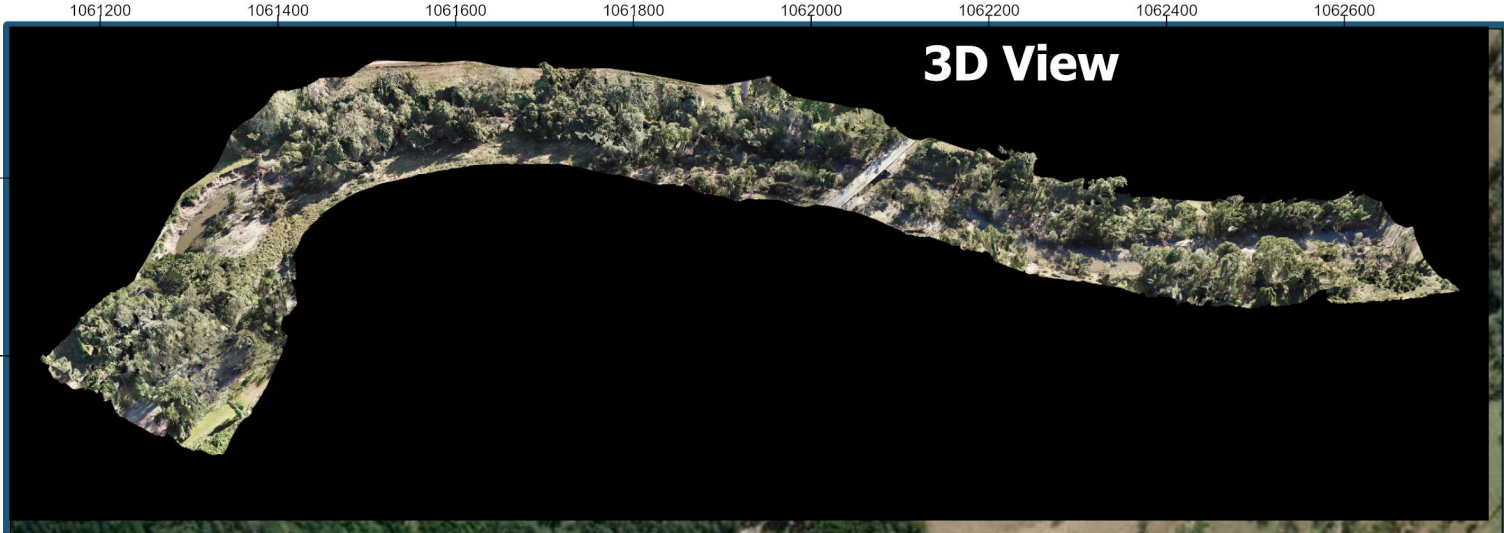
Prepared by:	MS
Checked by:	
Revision No:	1-0
Publication Date:	12/09/2022
Project No:	B22017

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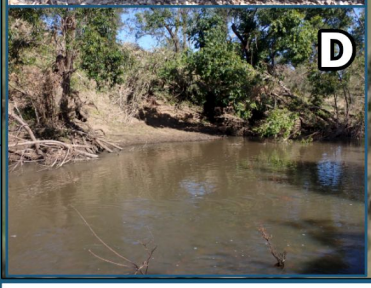
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Legend

Field Images

Site S14

Site Profiles and associated Imagery



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Kilometers

Scale: 1:8,478

Projection: Transverse Mercator

Datum: GDA2020

Grid: GDA2020 MGA Zone 55

N

Hydrobiology

Prepared by:	MS
Checked by:	
Revision No:	1-0
Publication Date:	12/09/2022
Project No:	B22017

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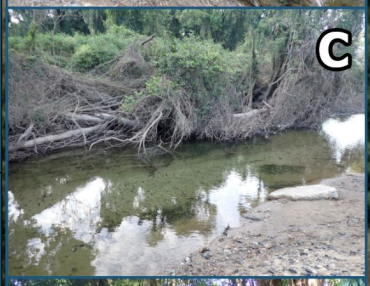
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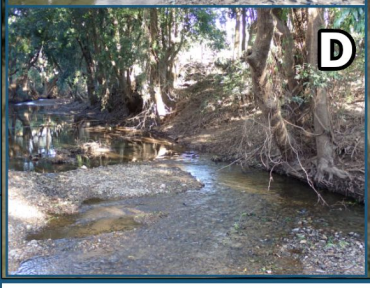
3D View













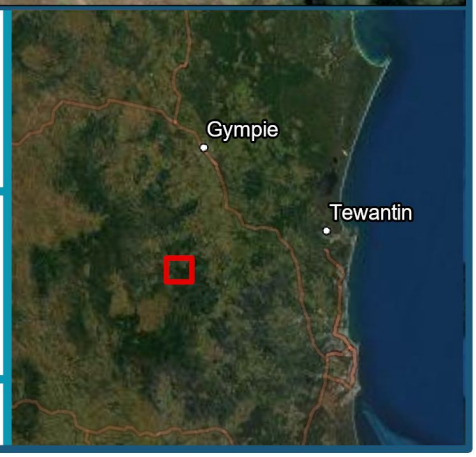
Drone Mosaic

Legend

Field Images

Site S13

Site Profiles and associated Imagery



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Kilometers

Scale: 1:5,136

Projection: Transverse Mercator

Datum: GDA2020

Grid: GDA2020 MGA Zone 55

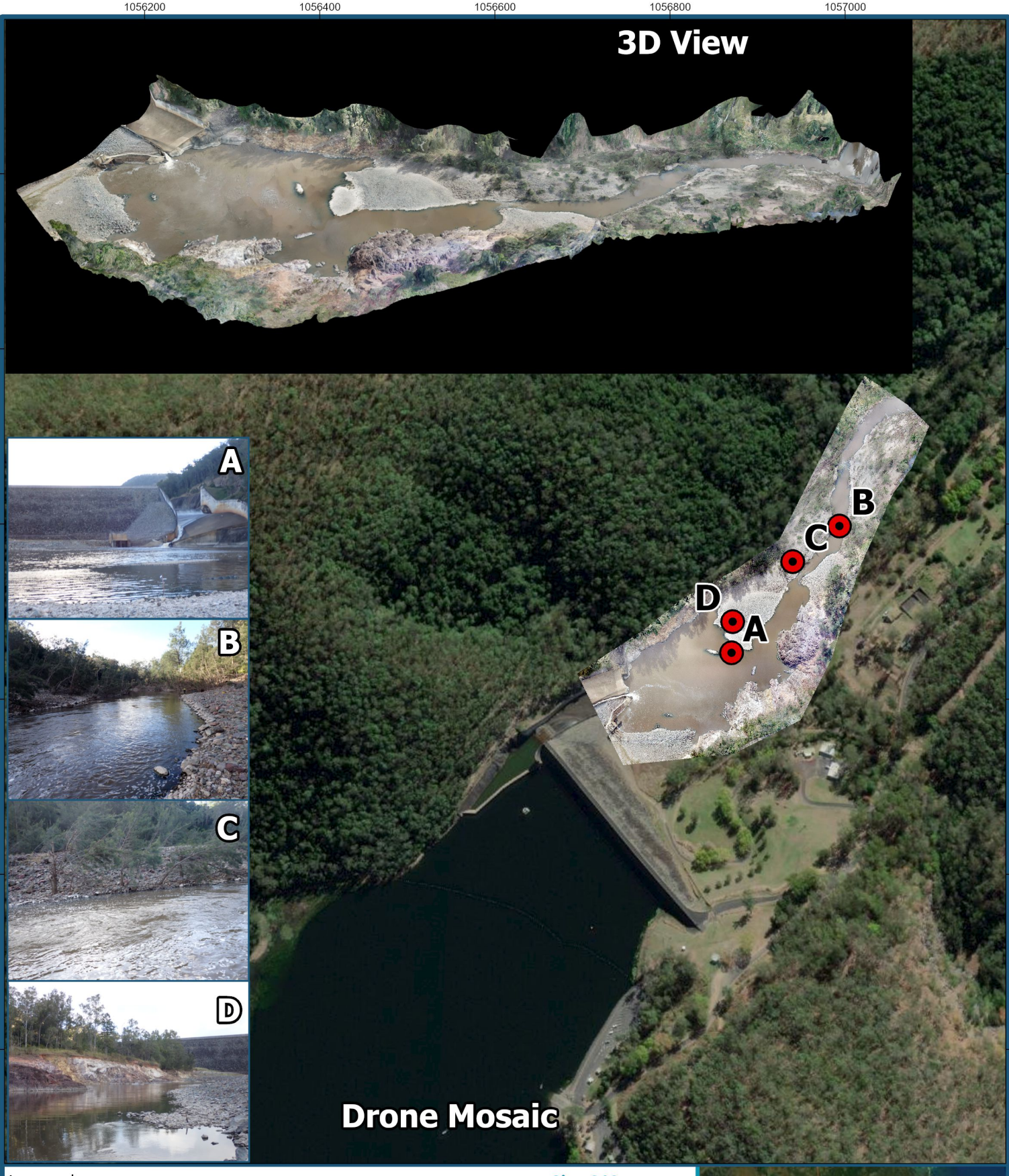
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Hydrobiology

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Revision No:	1-0
Publication Date:	12/09/2022
Project No:	B22017

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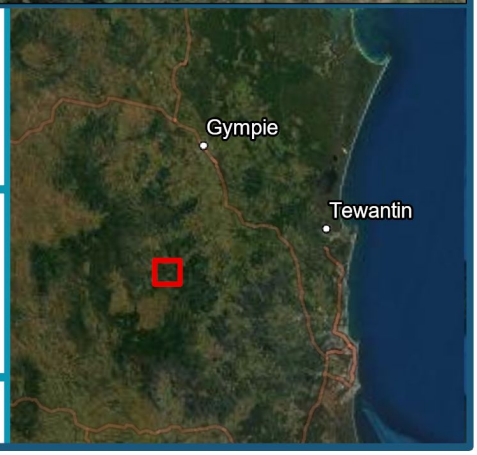


Legend

Field Images

Site S12

Site Profiles and associated Imagery



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Kilometers

Scale: 1:5,776

Projection: Transverse Mercator

Datum: GDA2020

Grid: GDA2020 MGA Zone 55

N

Hydrobiology

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Legend

Field Images

Site S7

Site Profiles and associated Imagery

0 0.1 0.2 0.3 0.4

Kilometers

Scale: 1:14,707

Projection: Transverse Mercator

Datum: GDA2020

Grid: GDA2020 MGA Zone 55

N

Hydrobiology

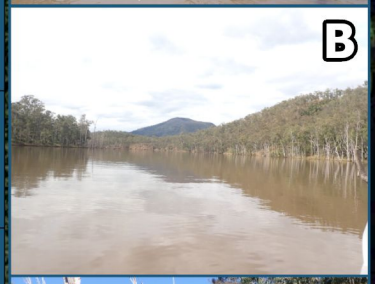
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Checked by:	
Revision No:	1-0
Publication Date:	12/09/2022
Project No:	B22017

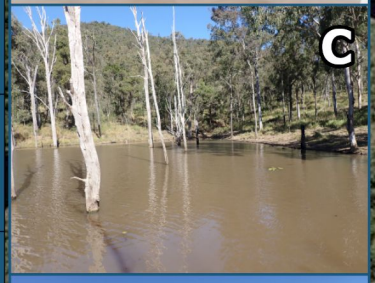
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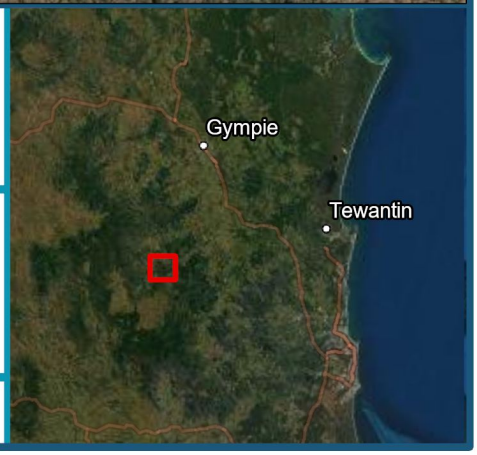


Legend

Field Images

Site S6

Site Profiles and associated Imagery



0 0.1 0.19 0.29 0.38

Kilometers

Scale: 1:10,984

Projection: Transverse Mercator

Datum: GDA2020

Grid: GDA2020 MGA Zone 55

N

Hydrobiology

Prepared by:	MS
Checked by:	
Revision No:	1-0
Publication Date:	12/09/2022
Project No:	B22017

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Legend

Field Images

Site S5

Site Profiles and associated Imagery



0 0.07 0.15 0.22 0.3

Kilometers

Scale: 1:8,741

Projection: Transverse Mercator

Datum: GDA2020

Grid: GDA2020 MGA Zone 55

N

Hydrobiology

Prepared by:	MS
Checked by:	
Revision No:	1-0
Publication Date:	12/09/2022
Project No:	B22017

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Legend

Site S10

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0 1.5 3 4.5 6

Kilometers

Scale: 1:170,000

Projection: Transverse Mercator

Datum: GDA2020

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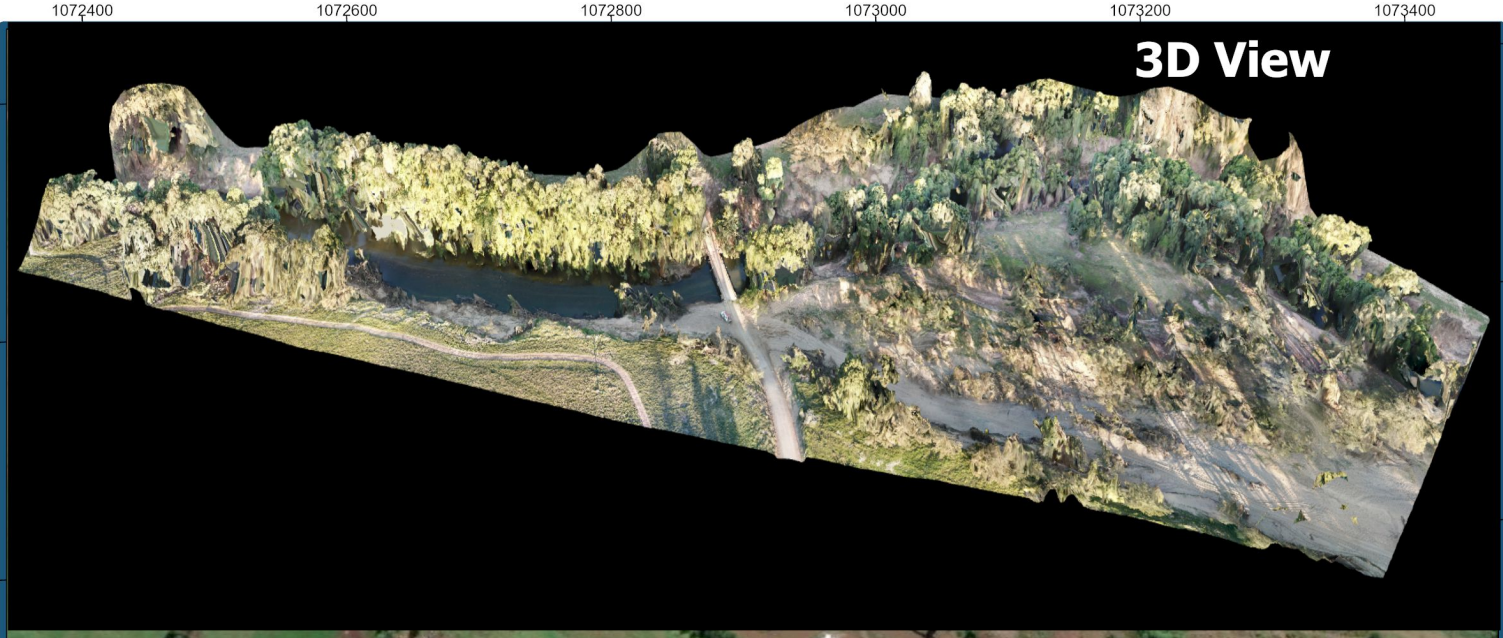
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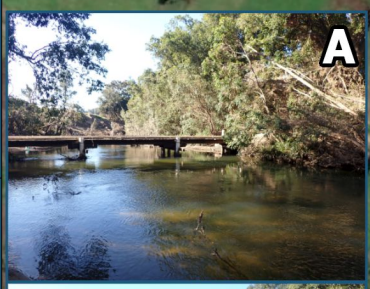
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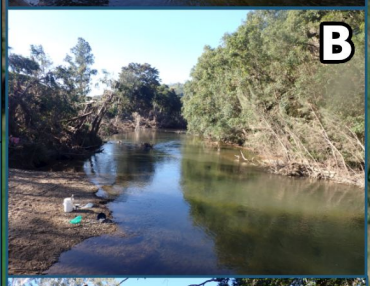
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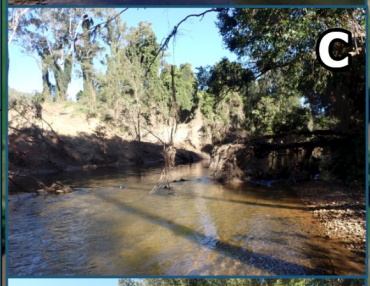
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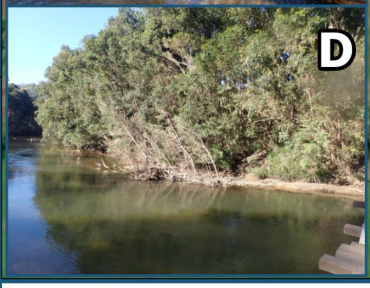
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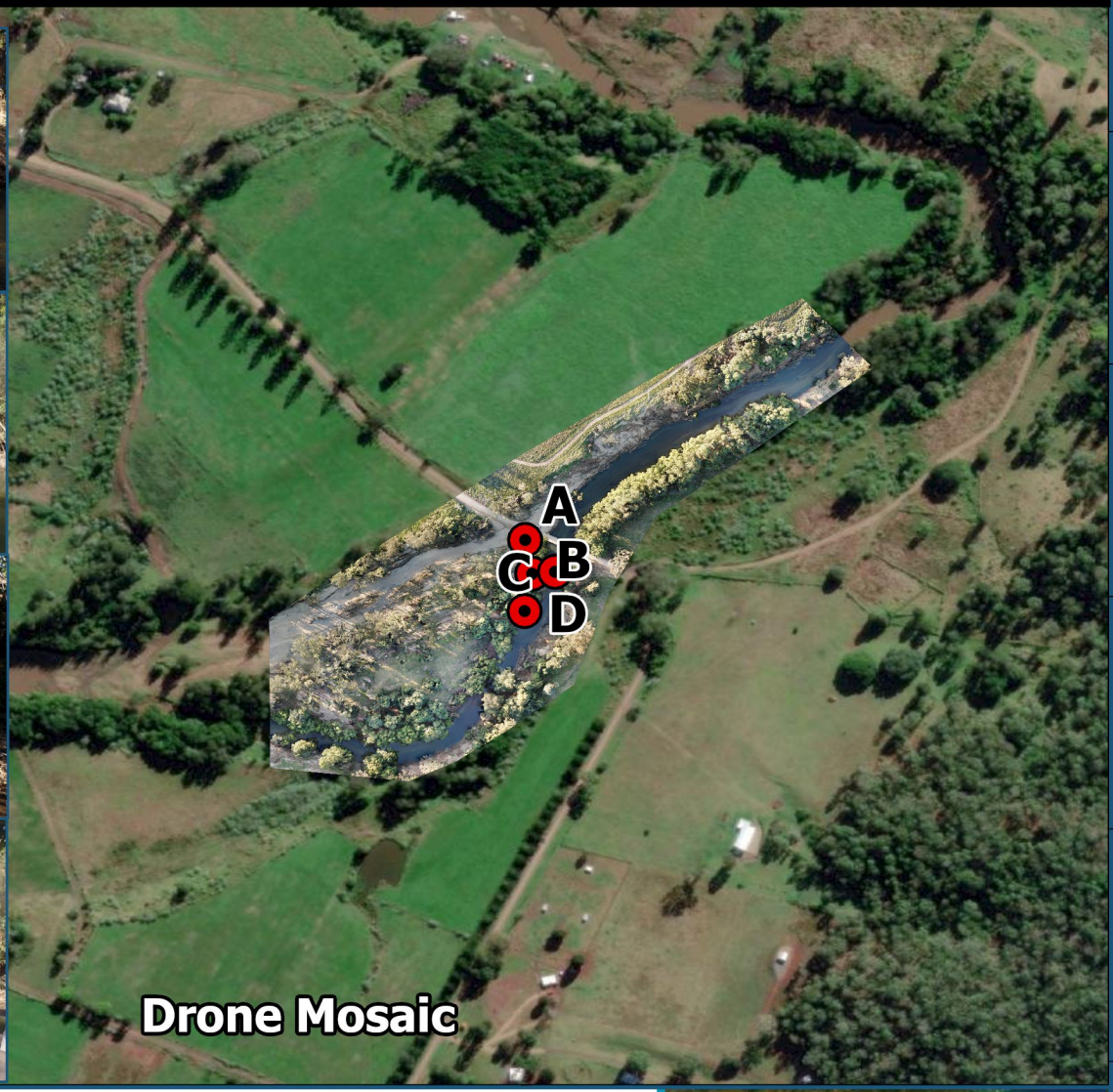












Legend

Field Images

Site S17

Site Profiles and associated Imagery



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Datum: WGS 1984

Grid: GCS WGS 1984

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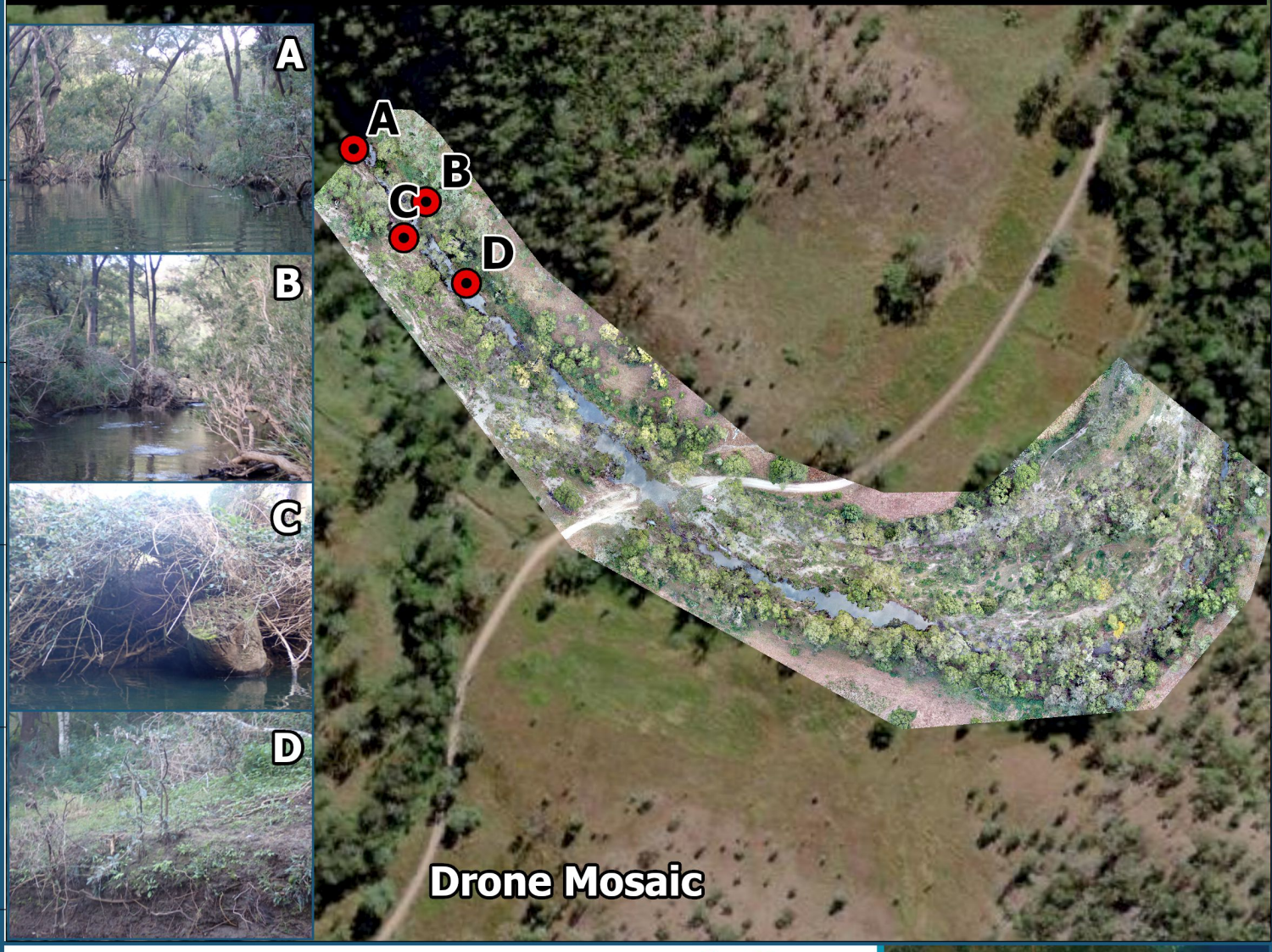
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3D View



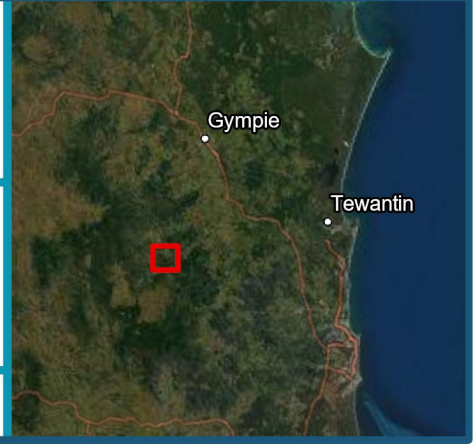


Legend

Field Images

Site S4

Site Profiles and associated Imagery



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Kilometers

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Projection: Transverse Mercator

Datum: GDA2020

Grid: GDA2020 MGA Zone 55

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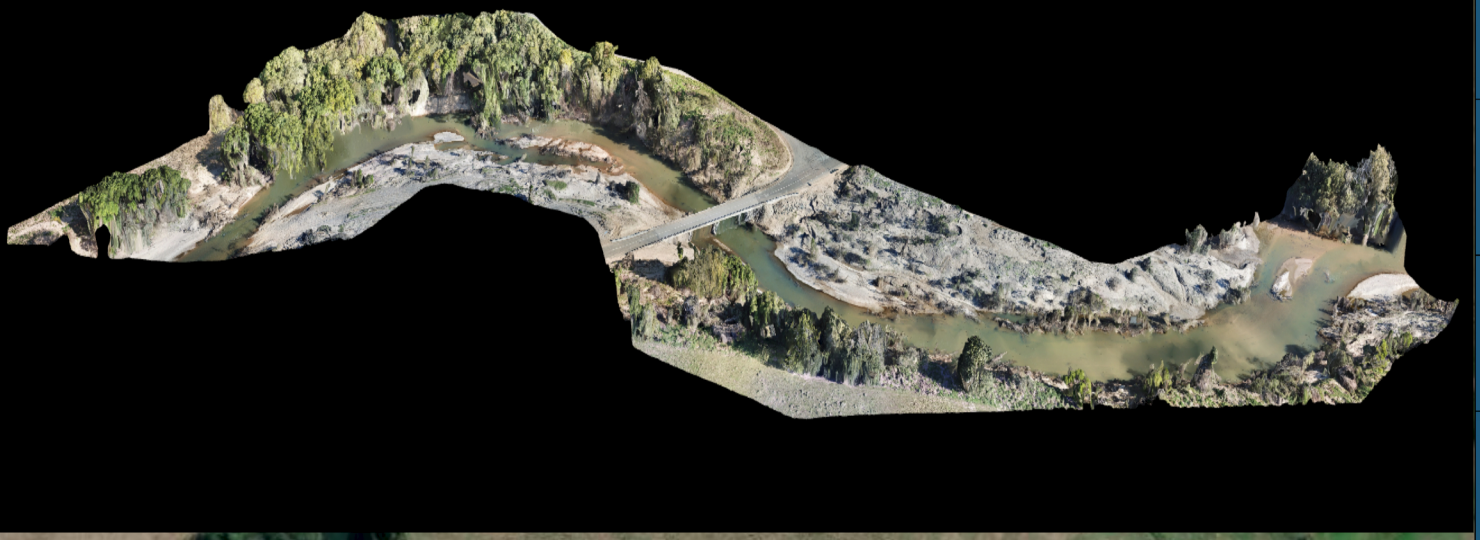
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3D View













Legend

Field Images

Site S19

Site Profiles and associated Imagery



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Kilometers

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Projection: Transverse Mercator

Datum: GDA2020

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S1





S2





S3





S10





APPENDIX F. CAPTURED FISH LENGTHS

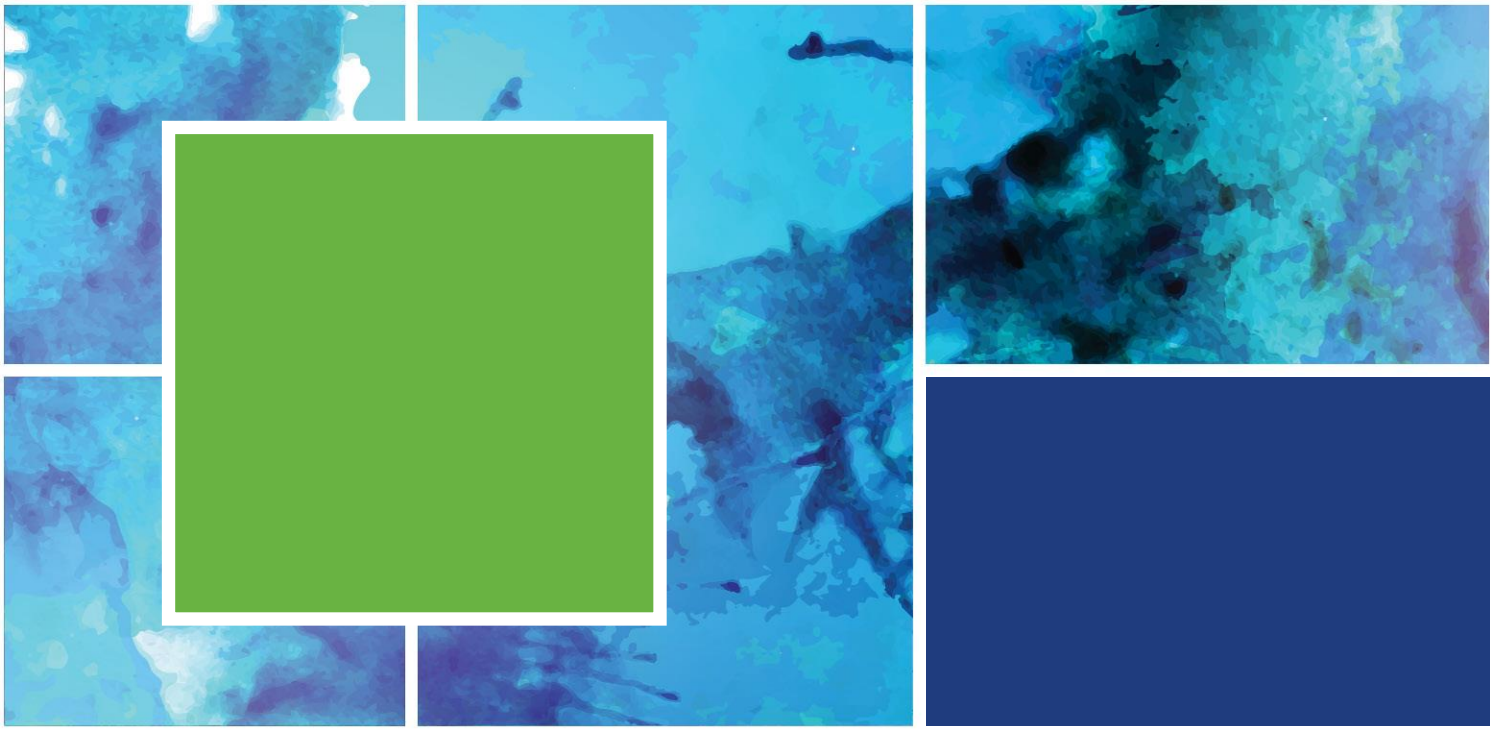


Table 8-1 Length (mm) frequencies of caught fish.

Species	Common name	Upstream of Lake Borumba			Lake Borumba			Downstream of Lake Borumba		
		Min	Average	Max	Min	Average	Max	Min	Average	Max
Ambassidae										
Ambassis agassizii	Agassiz's glassfish	30	36	40	3	32	45	5	38	60
Anguillidae										
Anguilla reinhardtii	long-finned eel							135	198	600
Atherinidae										
Craterocephalus marjoriae	Marjorie's hardyhead							30	45	65
Craterocephalus stercusmuscarum	Flyspecked hardyhead							30	41	60
Clupeidae										
Nematalosa erebi	bony bream				8	78	300	55	134	210
Eleotridae										
Hypseleotris galii	firetail Gudgeon							5	28	45
Hypseleotris klunzingeri	western carp gudgeon	30	39	45				20	35	50
Mogurnda adspersa	Southern Purplespotted Gudgeon	40	66	100				60	60	60
Philypnodon grandiceps	Flathead Gudgeon	55	55	55						
Melanotaeniidae										

Species	Common name	Upstream of Lake Borumba			Lake Borumba			Downstream of Lake Borumba		
		Min	Average	Max	Min	Average	Max	Min	Average	Max
Melanotaenia duboulayi	Crimsonspotted Rainbowfish	30	51	90	13	33	50	5	59	98
Pseudomugil signifer	Pacific Blue Eye	30	30	30				10	28	40
Neoceratodontidae										
Neoceratodus forsteri	Australian Lungfish							800	981	1200
Osteoglossidae										
Scleropages leichardti	Southern Saratoga				800	800	800	630	630	630
Percichthyidae										
Macquaria ambigua	Yellow belly				55	192	385			
Percalates novemaculeata	Australian Bass	320	320	320	200	286	380	190	230	260
Plotosidae										
Neosilurus hyrtlii	Hyrtl's catfish							100	100	100
Tandanus tandanus	Tandan Catfish	10	161	420	65	126	240	60	225	500
Retropinnidae										
Retropinna semoni	Australian smelt	30	45	60				20	44	65
Terapontidae										
Leiopotherapon unicolour	Spangled perch							60	83	110

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Nirvana Searle
Environmental Lead, Borumba
Queensland Hydro

01/08/2023

SUMMARY OF RESULTS CONCERNING EDNA DETECTION OF FISH RELEVANT TO THE UPPER STORAGE

Dear Nirvana,

Further to our discussion, please find herein a summary of our eDNA and traditional fish survey results for the Upper Storage and immediate downstream extent of the proposed Borumba Pumped Hydro Project (BPHP).

BACKGROUND

Hydrobiology has undertaken three separate surveys concerning fish within and downstream of the Upper Storage for the proposed BPHP (Table 1), including:

- June/July 2022 – which included a single site within the proposed Upper Storage and a single site immediately downstream;
- December 2022 to January 2023 – which included two sites within the Upper Storage and a single site immediately downstream; and.
- May 2023 – which included a single site within the Upper Storage.

At each site fish were surveyed via a range of traditional (e-fishing, box traps, fyke netting) and modern (eDNA) survey techniques. Fish have also been visually surveyed simultaneously during habitat and crayfish surveys. Habitat surveys included traversing the extent of all mapped waterways for waterway barrier works of the Upper Storage (Figure 1). Detailed survey methods can be viewed in the Detailed Analytical Report (DAR) (Hydrobiology, 2022) and Field Survey Summary report (Hydrobiology, 2023).

Table 1 Summary of implemented fishing techniques by site and survey.

Site	Fish Survey Methods
June/July 2022 survey	
S2	• Paired fyke nets • Backpack electrofishing for 600 seconds on time • eDNA triplicate water samples

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Site	Fish Survey Methods
S1	• Paired fyke nets • Backpack electrofishing for 600 seconds on time • eDNA triplicate water samples
December 2022/ January 2023*	
S2	• Paired fyke nets • X5 box traps • Backpack electrofishing for 600 seconds on time • eDNA triplicate water samples • Spotlighting during crayfish surveys
S22	• Paired fyke nets • X5 box traps • Backpack electrofishing for 600 seconds on time • eDNA triplicate water samples • Spotlighting during crayfish surveys
S1	• Paired fyke nets • X5 box traps • Backpack electrofishing for 600 seconds on time • eDNA triplicate water samples • Spotlighting during crayfish surveys
May 2023	
S22	• Paired fyke nets • X5 box traps • Backpack electrofishing for 600 seconds on time • eDNA triplicate water samples

* Fish were also visually surveyed simultaneously during habitat assessment of the mapped waterways for waterway barrier works.

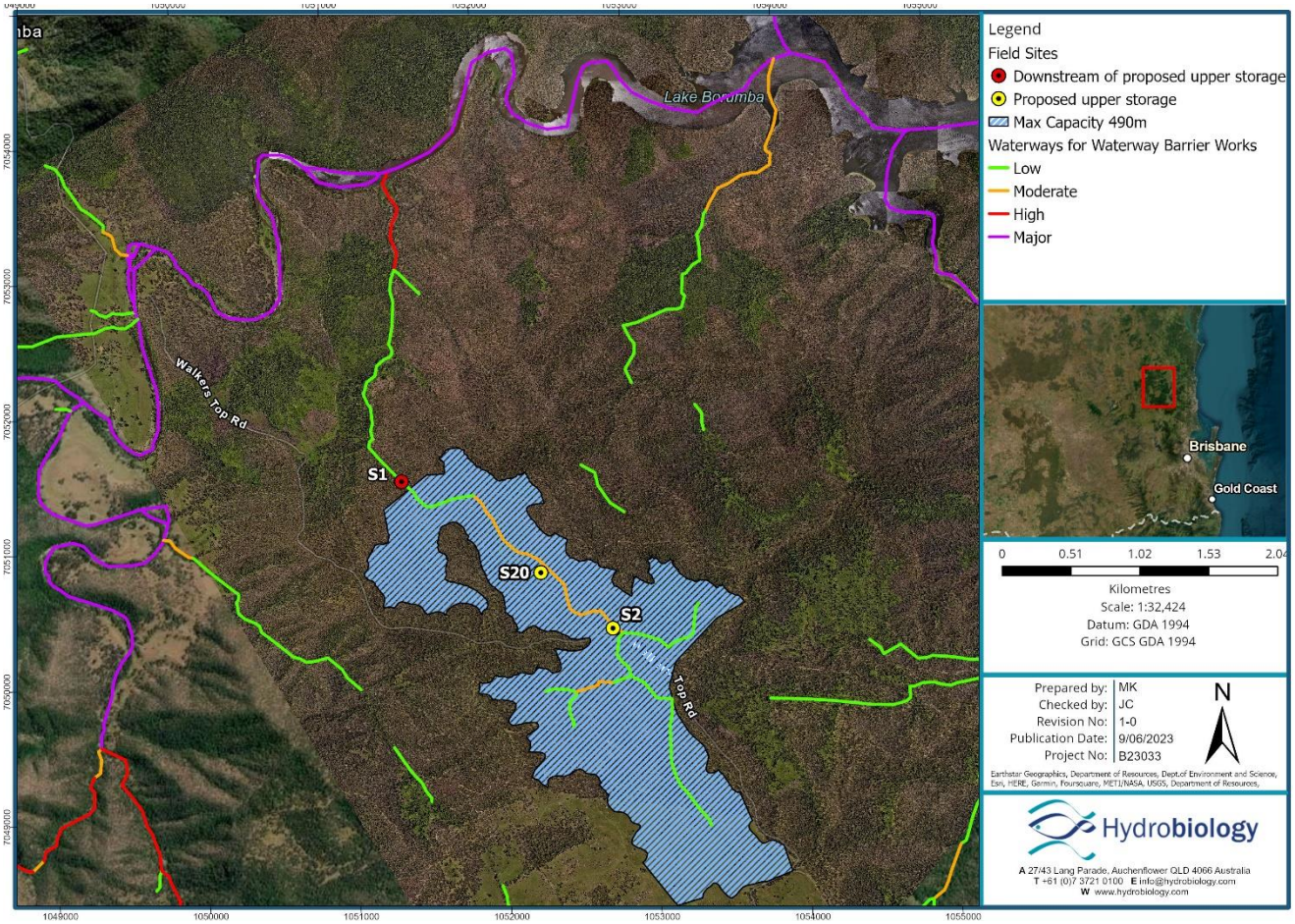


Figure 1 Survey points and reaches.

RESULTS

The initial survey results in June/July 2022 yielded no fish catch via traditional survey techniques; however, eDNA results detected six species, three of which were exotic. No threatened species of fish were detected in the Upper Storage. eDNA read counts were notably low in the Upper Storage for all species detected (Table 2) and notably lower than all other sites in the Study Area (i.e. S2 eDNA read counts were more than 10 fold lower than the next lowest site). Due to the high sensitivity of eDNA testing, low eDNA read counts in samples should be considered a tentative detection with subsequent sampling to confirm presence/absence (WILDERLAB, 2022).

The subsequent surveys in December 2022/January 2023 and May 2023 yielded no fish catch or detections via traditional or eDNA survey techniques, respectively. It is also worth noting that no fish were visually observed during the habitat assessments (traversing the extent of all mapped waterways for waterway barrier works) or during crayfish spotlighting efforts in the Upper Storage.

Table 2 eDNA read counts at S2.

Species	Common Name	eDNA Read Counts		
		Replicate 1	Replicate 2	Replicate 3
***Carassius auratus** *	goldfish	501	0	51
***Gambusia holbrooki** *	mosquitofish	668	0	60
***Cyprinus carpio** *	common carp	420	0	62
Hypseleotris sp.	gudgeon	278	54	0
Nematalosa erebi	bony bream	853	0	120
Philypnodon grandiceps	flathead gudgeon	0	51	0

*non-native

DISCUSSION

Despite traversing the waterways of the Upper Storage and using a variety of survey methods, including eDNA, traditional survey techniques, and visual observations, no fish were detected in either the December 2022/2023 or May 2023 sampling efforts. Relevant to fish passage, it is evident that there are a number of natural barriers including waterfalls with drops of up to 15 m and continuous cascade networks which would limit fish passage into the Upper Storage. Therefore, the noted fish detections via eDNA in June/July 2022 of small-bodied natives and exotics are false positives and are attributed to one or more of the following:

- Potential sample contamination during sampling. Field blanks taken during the survey yielded no fish DNA; however potential contamination from field gear or collectors cannot be ruled out;
- Potential lab contamination, including cross-contamination between samples; and/or
- Animal faeces, including predatory birds which may have defecated within the sampled waters. Fish DNA can persist when excreted from birds for up to a month (Merkes et al. 2014).

I trust that the provided information meets your requirements. If you have any questions or require any clarification, please do not hesitate to contact me.

Kind Regards,



Justin Cutajar
Principal Scientist and Team Leader

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Hydrobiology

AQUATIC ECOLOGY INTERIM DATA REPORT

BRISBANE | PERTH | SINGAPORE | PAPUA NEW GUINEA

BORUMBA DAM PUMPED HYDRO



B22091

—

MARCH 2023

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EXECUTIVE SUMMARY

This interim data report provides the results of the summer pre-wet aquatic ecological baseline study completed by Hydrobiology for the proposed Borumba Pumped Hydro Project (BPHP). It is the subsequent survey undertaken for the Detailed Analytical Report (DAR) (Hydrobiology, 2022), which occurred under post-wet winter conditions in June/July 2022. The collected dataset builds on the previous survey and historical information to further characterise the aquatic ecological values relevant to the BPHP for the preparation of an Environmental Impact Statement (EIS). In addition to repeating the survey methods undertaken during the DAR, several other items were also scoped, including:

- Ground-truthed habitat (macro and micro habitat) mapping upstream of Lake Borumba (current FSL) along Yabba, Kingaham, Sandy and Borumba Creeks. In addition to these areas, the Upper storage and Borumba Dam downstream extent along Yabba Creek was also ground-truthed and mapped;
- Implementation of several additional sites across the Study Area including those in Borumba Creek, Yabba Creek (both upstream and downstream of Lake Borumba), Sandy Creek, Kingaham Creek, (upstream of Lake Borumba) and within the proposed Upper Storage;
- Inclusion of edge habitat sampling of macroinvertebrates within Lake Borumba; and
- Threatened species surveys for crayfish in the proposed Upper Storage.

The current survey built upon our existing knowledge of the aquatic ecological values of the Study Area, particularly regarding the distribution of threatened species. Many findings were consistent with the previous survey, though the following findings are of note as they change some conceptual understandings of the aquatic ecological values of the BPHP:

- Macroinvertebrates in edge habitats within Lake Borumba included taxa richness, abundances, and sensitive taxa percentages within ranges of other regions of the Study Area; however, PET richness was typically lower.
- Despite traversing the entire proposed Upper Storage area and using a variety of survey methods, including eDNA, traditional survey techniques, and visual observation, no fish were detected. In the previous survey, eDNA detected a number of small bodied natives and exotics in the proposed Upper Storage. It is now evident that this was likely laboratory contamination during processing of filters for analysis. All blank filters for assessment of infield contamination have returned no fish DNA during either survey, therefore sample contamination is unlikely during sample collection.
- Relevant to threatened species:
  - Lungfish are restricted to Lake Borumba and downstream extents along Yabba Creek. Recruitment through the Study Area is limited with no juvenile species caught;
  - Mary River cod are distributed throughout the Study Area. Recruitment in the Study Area is evident, with a juvenile caught in the Mary River. A fingerling was also caught in Lake Borumba; however this individual is likely a result of restocking efforts undertaken by the Lake Borumba Fish Stocking Association in conjunction with QLD Hydro. The Lake Borumba survey occurred three weeks post release of Mary River cod fingerling;
  - Mary River turtles are distributed throughout the Study Area with the exception of Lake Borumba. Evident recruitment occurs in Yabba Creek upstream of Lake Borumba;
  - White-throated snapping turtles are distributed throughout the Study Area. Recruitment in the Study Area is limited with no juvenile species detected;
  - Platypus are distributed throughout the Study Area with the exception of Lake Borumba. While no juvenile platypus have been caught, burrow sites likely also represent nesting burrows;
  - Conondale spiny crayfish have not been detected in the proposed Upper Storage or the wider Study Area, however following from the crayfish survey, areas of more suitable habitat and burrows were detected during habitat ground-truthing surveys of the Upper Storage. These areas were not included in the initial crayfish surveys due to prior canopy observations from aerial imagery and their accessibility (i.e. allowance of camping site for spotlighting), highlighting a gap in the crayfish survey.

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1. INTRODUCTION

1.1 BACKGROUND

Borumba Dam, located near Imbil and southwest of Gympie, was identified in the Queensland Hydro Study as one of the best potential sites for long duration pumped hydro. The project will comprise of an Upper Storage, Lower Reservoir, intake structures, underground power generation, switch yard, transmission lines, and access roads to the powerhouse and dam site.

Hydrobiology undertook a preliminary assessment of the "Aquatic Fauna and Flora" for the BPHP (Hydrobiology, 2022). This assessment utilised existing data supplemented by field surveys (June/July 2022), to describe the existing aquatic ecological values of the Study Area. A preliminary impact and mitigation assessment was also undertaken as part of the Detailed Analytical Report (DAR), which will be updated through the EIS process.

Hydrobiology have been subsequently commissioned to undertake a successive seasonal survey to further characterise the aquatic ecological values relevant to the BPHP for the preparation of an Environmental Impact Statement (EIS).

1.2 LOCATION

The proposed BPHP is within the region of Lake Borumba, the water storage area of Borumba Dam, a rock filled embankment dam situated across Yabba Creek, in South-East Queensland (Figure 1-1). Borumba Dam was constructed in 1963 and is owned by seqwater. The dam is at 31.1 km AMTD (Adopted Middle Thread Distance) on Yabba Creek and Yabba Creek joins Mary River 226.7 km AMTD from the mouth of the river (and 167.4 km upstream of the barrage).

The "Local Study Area" for this component of work was equivalent to the Yabba Creek sub-catchment as shown in Schedule 3 of the Water Plan (Mary Basin) 2006 (Queensland Government, 2006). The "Broader Study Area' included the Upper Mary River drainage sub-basin prior to Gympie as defined in DES (2013b).

The field survey encapsulated the freshwater aquatic habitats (riverine, lacustrine and palustrine waterbodies) upstream and downstream of Lake Borumba, along with an adjacent tributary. These included:

- Tributaries upstream of Lake Borumba (Kingaham Creek, Yabba Creek, Sandy and Borumba Creek);
- Lake Borumba (existing and proposed raised full storage level (FSL));
- Proposed Upper Storage and its catchment;
- Yabba Creek downstream of Lake Borumba;
- Mary River (downstream to Traveston Crossing Road, Amamoor and upstream to Moy Pocket); and
- Bella Creek, an adjacent stream which will not be impacted by dam related works.

1.3 SCOPE AND OBJECTIVES

To fulfill the requirements of an EIS (DES, 2022), Hydrobiology were subsequently commissioned to undertake a second seasonal survey. This built on the existing aquatic ecological information relevant to the BPHP, which will in turn support the EIS and the assessment of impacts, potential mitigation strategies and need for offsets.

This report presents the data collected during the December 2022/January 2023 aquatic ecology field assessment, including:

- Ground-truthed habitat mapping of macro and microhabitats;
- Habitat and riparian condition assessments;
- Macroinvertebrate collection from edge and bed habitats;
- Microalgae collection;
- Macrocrustacean collection;
- Fish collection;
- Aquatic reptile collection; and
- Aquatic mammal collection.

Key findings regarding threatened species, fish and macrocrustacean communities, platypus and any changes to the conceptual understanding of the aquatic ecological values of the BPHP are also discussed. Relevant to seasonal changes, they are in some instance raised. It is anticipated that more detailed analysis of the current dataset along with comparison to previous surveys will be undertaken as part of the EIS.

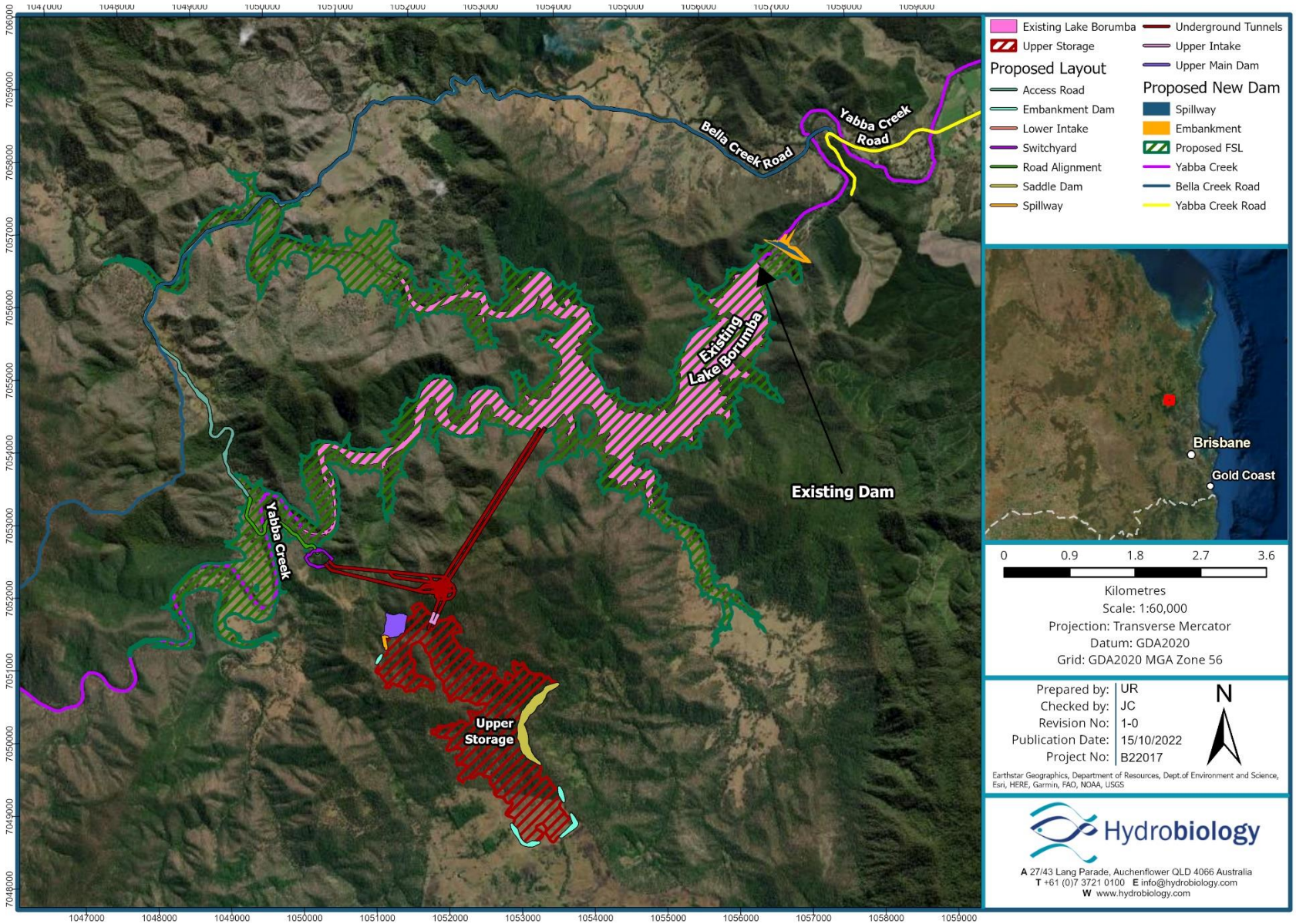


Figure 1-1 Proposed BPHP and its associated infrastructure.

2. METHODOLGY

2.1 APPROACH

Based on the outcomes of the DAR, a field program was developed to address identified knowledge gaps relevant to freshwater aquatic ecosystem values as defined in the Aquatic Ecology EIS guideline (DES, 2022). This included:

- Seasonal survey requirements for macroinvertebrates, macrocrustaceans, microalgae, aquatic flora, freshwater turtles, fish and conservation significant fauna (fish, turtles, and platypus) and aquatic flora;
- Habitat (macro and micro habitat) mapping for reaches:
  - Proposed raised FSL of the Upper Storage and downstream extent to Yabba Creek. This included mapped waterways for waterway barrier works as defined in the *Fisheries Act 1994*;
  - Proposed raised FSL area of the Lower Reservoir (i.e. newly inundated areas) including Kingaham, Yabba, Borumba and Sandy Creeks; and
  - Downstream extent of the Borumba Dam along Yabba Creek to the confluence with the Mary River.

2.2 SURVEY DESIGN AND SITE SELECTION

Survey design and site selection (Table 2-1 and Figure 2-1) remained relatively similar between surveys, with the exception of:

- S9, which was relocated to an accessible area along Borumba Creek;

- S13, which was replaced by S26 in the current survey. It was evident that during the previous survey preferred habitat features for threatened species (fish and turtles) were limited at S13;
- S23, which was added to the current survey for definition of aquatic values further upstream of the proposed raised FSL of the Lower Reservoir along Yabba Creek;
- S24, which was added to the current survey for definition of aquatic values further upstream of the proposed raised FSL of the Lower Reservoir along Kingaham Creek;
- S25, which was added to the current survey for definition of aquatic values upstream of the proposed raised FSL of the Lower Reservoir along Borumba Creek;
- S20, which was added to the current survey for further definition of aquatic values within the proposed raised FSL of the Upper Storage;
- S21, which was added to the current survey for further definition of aquatic values within the proposed raised FSL of the Lower Reservoir along Kingaham Creek;
- S22, which was added to the current survey for definition of aquatic values within the proposed raised FSL of the Lower Reservoir along Sandy Creek;
- S27, which was added to the current survey for further definition of aquatic values downstream of the proposed raised FSL of the Lower Reservoir along Yabba Creek.
- S10, which was removed from the current survey. This site was located within the mid-dam area with little diversity noted during the previous survey;
- S16, which was removed from the current survey. This site was located downstream of the Imbil weir. The current survey just sampled upstream of the weir at S15, as no further information was required relevant to fish passage;
- S28, was added during the field survey based on discussions with the relevant landholder who indicated threatened fish and turtles had been caught and visually observed 2 km downstream of S5: and
- S18, which was removed from the current survey due to limited access. S18 was not sampled in either survey event.

It should be noted that sites for the previous field surveys were selected based on an earlier version of the project layout. Since the previous field survey were undertaken, a new version of the project layout was released and the original intent of site locations to support later impact assessment changed, though their purpose in describing the existing environment remains valid. The current survey allocation of new sites, particularly upstream extents of the proposed raised FSL of the Lower Reservoir along Yabba and Kingaham Creeks address identified gaps in the DAR. Site justification for all other surveyed sites is detailed in Hydrobiology (2022).

All surveys were undertaken in accordance with relevant permits, including:

- Department of Agriculture and Fisheries (DAF) Animal Ethics Approval - #CA 2021/02/1462;
- General Fisheries Permit - #206951;
- Research permit issued under the provisions of the *Nature Conservation Act 1992*- # P-PTUKI-100325946; and
- Research permit issued under the provisions of the *Forestry Act 1959*- # P-PTC-100325951.

Table 2-1 Sample sites and assessed parameters.

Site	Surveyed June 2022	To survey - November 2022	Locality	Watercourse or wetland	Latitude	Longitude	Survey Method
Upper Reservoir							
S2	Yes	Yes	Within proposed raise FSL - Upper Storage	Unnamed Creek	-26.5601	152.5447	ED, E, B, F, CR, H, S, W, M, P
S20	No	Yes	Within proposed raise FSL - Upper Storage	Unnamed Creek	-26.5564	152.5399	ED, E, B, F, CR, H, S, W, M
S1	Yes	Yes	Downstream of proposed raised FSL - Upper Storage	Unnamed Creek	-26.5480	152.5284	ED, E, B, F, CR, H, S, W, M, P
Lower Reservoir							
S23	No	Yes	Upstream of the proposed raised FSL – Lower Reservoir	Yabba Creek	-26.6378	152.4503	ED, E, F, C, H, W, M, SN, A, P
S24	No	Yes	Upstream of the proposed raised FSL – Lower Reservoir	Kingaham Creek	-26.5361	152.4382	ED, E, F, C, H, W, M, SN, A, P
S25	No	Yes	Upstream of the proposed raised FSL – Lower Reservoir	Borumba Creek	-26.5547	152.5859	ED, H, M, W, P
S28	No	Yes	Within proposed raise FSL - Lower Reservoir	Yabba Creek	-26.5367	152.5163	F, C, SN, M
S5	Yes	Yes	Within proposed raise FSL - Lower Reservoir	Yabba Creek	-26.5392	152.5130	ED, E, F, C, H, W, M, SN, M, A, P
S3	Yes	Yes	Within proposed raise FSL - Lower Reservoir	Yabba Creek	-26.5452	152.5020	ED, E, F, H, W, M, SN, M, A, P
S22	No	Yes	Within proposed raise FSL - Lower Reservoir	Sandy Creek	-26.5494	152.5066	ED, E, F, C, H, W, M, SN, M, A
S21	No	Yes	Within proposed raise FSL - Lower Reservoir	Kingaham Creek	-26.5006	152.5104	ED, E, F, H, W, M, SN, M, A
S4	Yes	Yes	Within proposed raise FSL - Lower Reservoir	Kingaham Creek	-26.5085	152.4992	ED, E, F, C, H, W, M, SN, M, A, P
S9	no access	Yes (moved to accessible area)	Within proposed raise FSL - Lower Reservoir	Borumba Creek	-26.5386	152.5700	ED, E, F, C, H, W, M, A, P
S6	Yes	Yes	Within current FSL – Borumba Dam	Lake Borumba	-26.5224	152.5438	ED, EB, C, W, M, A, H, P
S7	Yes	Yes	Within current FSL – Borumba Dam	Lake Borumba	-26.5085	152.5514	ED, EB, C, W, M, A, H, P
S8	Yes	Yes	Within current FSL – Borumba Dam	Lake Borumba	-26.5312	152.5626	ED, EB, C, W, M, A, H, P
S10	Yes	No – mid dam area with little diversity	Within current FSL – Borumba Dam	Lake Borumba	-26.5219	152.5727	-
S11	Yes	Yes	Within current FSL – Borumba Dam	Lake Borumba	-26.5096	152.5730	ED, EB, C, W, M, A, H, P
S12	Yes	Yes	Downstream of current FSL, though within the proposed raised FSL - Lower Reservoir	Yabba Creek	-26.5051	152.5829	E, F, C, H, W, M, P
S27	No	Yes	Downstream of proposed raised FSL - Lower Reservoir	Yabba Creek	-26.4951	152.5926	E, F, H, W, M, P
S14	Yes	Yes	Downstream of proposed raised FSL - Lower Reservoir	Yabba Creek	-26.4736	152.6349	E, F, H, W, M, P
S15	Yes	Yes	Downstream of proposed raised FSL - Lower Reservoir	Yabba Creek	-26.4571	152.6847	E, F, C, H, W, M, P

Site	Surveyed June 2022	To survey - November 2022	Locality	Watercourse or wetland	Latitude	Longitude	Survey Method
S16	Yes	No	Downstream of proposed raised FSL - Lower Reservoir	Yabba Creek	-26.4574	152.6864	-
S18	Cannot access this site	No – removed	Downstream of proposed raised FSL - Lower Reservoir	Mary River	-26.409	152.7316	-
S19	Yes	Yes	Downstream of proposed raised FSL - Lower Reservoir	Mary River	-26.3347	152.7048	E, F, C, H, W, M, P
Reference							
S13	Yes	No – site moved further upstream to S26	Reference tributary	Bella Creek	-26.4913	152.5876	-
S26	No	Yes	Reference tributary	Bella Creek	-26.4889	152.5713	ED, F, C, SN, E, H, W, M, P
S17	Yes	Yes	Reference river	Mary River	-26.5129	152.7442	E, F, H, W, M, P

ED: eDNA; E: backpack electrofishing; EB: boat based electrofishing; B: Box traps; SP: Spotlighting; SN: Snorkelling; F: Fyke net; CR: Crab pots; H: Habitat (subset of AusRivAS and State of the Rivers); W: Water (insitu); M: Macroinvertebrates (single bed and edge); P: Periphyton (single composite sample); A: Angling

eDNA crayfish primer for upper reservoir areas

eDNA fish primer for all areas where eDNA is a specified method

eDNA platypus primer for all areas except the upper reservoir as they are unlikely to occur in this area (Hydrobiology, 2022).

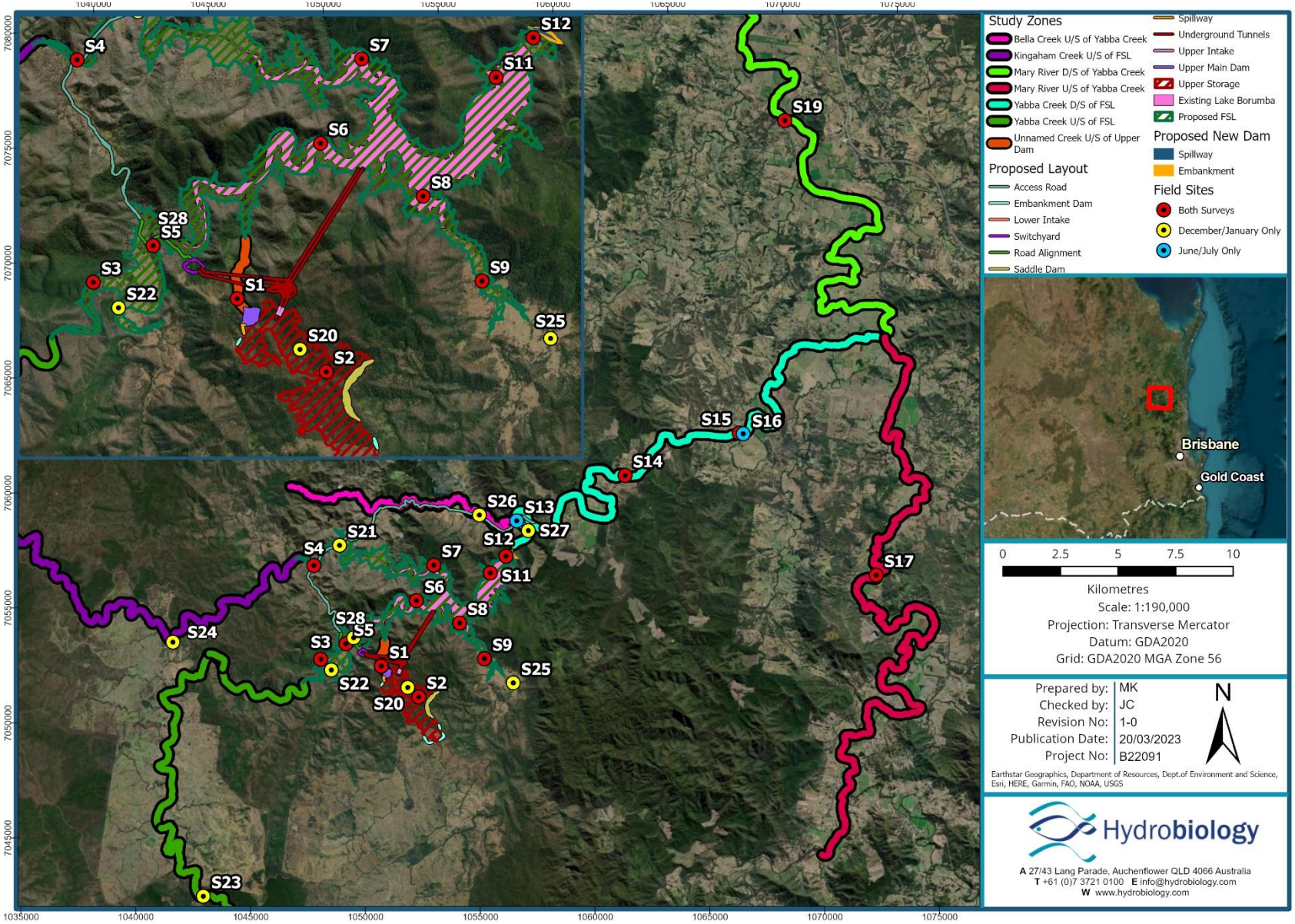


Figure 2-1 Field monitoring sites for surveys in June-July 2022 and December-January 2022-2023 within the Study Area.

2.3 FIELD SAMPLING METHODS

Aquatic ecological surveys were undertaken from 1 December 2022 to 25 January 2023. An overview of assessed parameters and implemented methods is detailed in Table 2-2. Method implementation was consistent with the previous survey (Hydrobiology, 2022), with the following exceptions:

- Ground-truthed habitat mapping;
- Sampling of edge habitat within Lake Borumba via AusRivAS protocols;
- Kayak surveys (visual observations) for threatened fish, turtles and platypus. Visual surveys of fish and turtles via kayaking were undertaken within the proposed raised FSL (not including areas within the current FSL) of the Lower Reservoir. This included Kingaham, Yabba and Sandy Creeks;
- Snorkelling and muddling survey methods for turtles, including threatened species; and
- Spotlighting, crab pots, and eDNA surveys for the threatened crustacean. During the habitat ground-truthing surveys of the Upper Storage, preferred habitat features for threatened crustaceans were also assessed.

Method implementation for the above variations can be viewed in Appendix A. Details relevant to all other survey methods are defined in Hydrobiology (2022).

The reporting and field sampling was undertaken and prepared by degree qualified ecologists with backgrounds in field ecology alongside sufficient expertise relevant to the issues of the Project. The team also has relevant experience implementing the selected survey methods, consistent with State and National guidelines, as well as considerable expertise concerning the threatened species known or considered to possibly occur within the Study Area.

The team comprised:

• Dr. Ross Smith	Director	Technical Review
• Justin Cutajar	Principal Scientist	Field Studies and Reporting
• Joshua Hatton	Senior Scientist	Field Studies and Reporting
• Umair Rana	Scientist	Field Studies and Reporting
• Gracie Twidale	Scientist	Field Studies
• Olly Scully	Crayfish Scientist	Field Studies

Table 2-2 Sampling method breakdown and guidelines/subject matter advice guiding each method.

Species	Method	Guideline or Subject Matter Expert Advice
Fish		
Fish community in general including threatened species	• eDNA • Fyke netting • Cathedral traps • Electrofishing – backpack and boat based electrofishing • Snorkelling • Angling • kayaking • Box traps	• DES (2018) – Monitoring and sampling manual • DSEWPC (2011a) – Survey guidelines for Australia's Threatened Fish • Guidance from subject matter experts at EnviroDNA, concerning eDNA sample collection and analysis
Turtles		

Species	Method	Guideline or Subject Matter Expert Advice
Turtle community in general including threatened species	• Fyke netting • Cathedral traps • Snorkelling • Muddling • kayaking • Boat based electrofishing	• DSEWPC (2011b) – Survey guidelines for Australia's threatened reptiles • Advice from subject matter expert – Dr. Col Limpus (Chief Scientist at DES) • DES (2018) – Monitoring and sampling manual
Mammals		
Platypus	• eDNA • fyke netting • Burrow searches • Kayaking	• DES (2018) – Monitoring and sampling manual • Lugg (2017) - Optimal survey designs for environmental DNA sampling • Guidance from subject matter experts at EnviroDNA, concerning eDNA sample collection and analysis
Habitat - mapping		
In-stream Macro and Microhabitat	• Ground truthing • Kayaking • Aerial imagery interpretation	• In house experience from various projects including Traveston Dam Crossing
Aquatic flora	• Ground truthing • Kayaking • Aerial imagery interpretation	• In house experience from various projects including Traveston Dam Crossing
Habitat – generic at each survey site as per the DAR		
In-stream and Riparian Habitat	• Systematic habitat and condition assessments	• Parsons et al., (2001) – Australian River Assessment System: AusRivAS Physical Assessment Protocol • DNRM (2001) – AusRivAS protocols for Queensland streams
Aquatic flora	• Survey aquatic plants at each site and identify them to species level	• Use of available literature and taxonomic keys to assist with identification where required. • Cover estimate methods implemented as per DNRM (2001) – AusRivAS protocols for Queensland streams
Microalgae		

Species	Method	Guideline or Subject Matter Expert Advice
Microalgae	• Surface sediment scrapes of biofilm in depositional microhabitats within watercourses • Deep water benthic grab samples within Lake Borumba	• DES (2018) – Monitoring and Sampling manual for collecting microalage from shallow and deep waters.
Macroinvertebrates and Macrocrustaceans		
Macroinvertebrates	• Watercourse - AusRivAS sampling of both bed & edge habitats • Borumba Dam - AusRivAS sampling of edge habitats. Van veen grab collection from bed samples.	• DNRM (2001) – AusRivAS protocols for Queensland streams • DES (2018) – Monitoring and sampling manual
Macrocrustaceans	• Passive and active macrocrustacean surveys through electrofishing, fyke netting, box traps, crab pots (double ring pots – turtle and platypus safe), and macroinvertebrate sampling. • eDNA • Spotlighting	• DNRM (2001) – AusRivAS protocols for Queensland streams • DES (2018) – Monitoring and sampling manual • Smith et al. 1998 • Guidance from subject matter experts at EnviroDNA, concerning eDNA sample collection and analysis

2.4 SURVEY TIMING

Sampling was undertaken in December 2023 – to late January 2023. Seasonal peak catchment discharges occurred prior to the DAR survey in May 2022, which represented a post-wet, winter sampling period. Despite the current survey occurring in December 2022/January 2023, it presents a pre-wet summer survey given the context catchment discharges over the prevailing year (Figure 2-2).

The current EIS survey guideline for aquatic ecological matters (DES, 2022) requires seasonal sampling to assess the full range of aquatic habitats and productivity. The two surveys undertaken thus address pre and post wet seasonal survey requirements. Additionally, the pre-wet survey, fulfills sampling requirements for:

- AusRivAS sampling;
- Threatened species surveys, in that the surveys overlaps with major movement periods for fish and turtles, regarding spawning and nesting, respectively, as detailed in the Hydrobiology (2022); and
- Threatened species surveys, in that the survey overlaps with threatened crayfish activity periods. (night surveys). Information regarding key movement or migration periods with respect to seasonality for the threatened Conondale spiny crayfish is limited (McCormack, 2009).

While seasonal surveys have been carried out, several sites were added to the current survey and therefore seasonal variability at these sites is yet to be described.

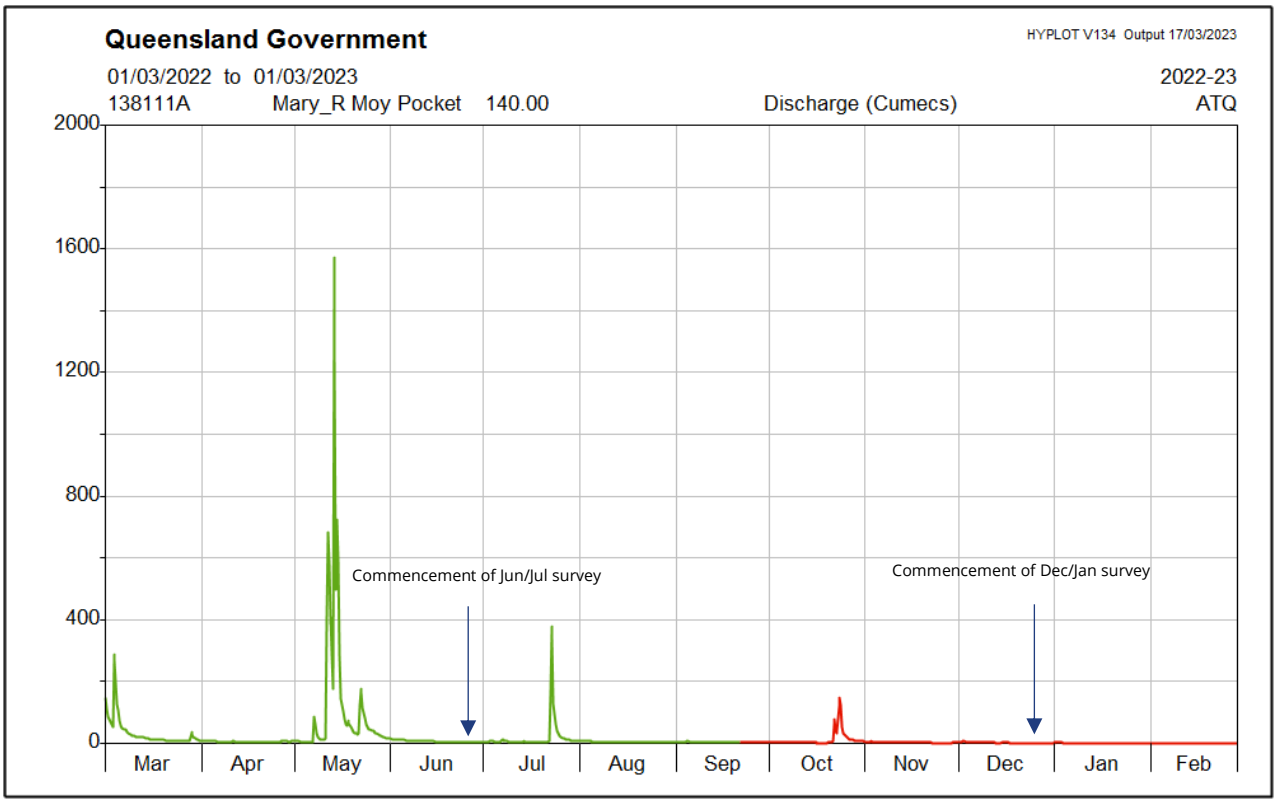


Figure 2-2 Daily peak discharge within Mary River upstream of the confluence with Yabba Creek, (Moy Pocket station (138111A) (DNRM, 2023). Time series presented is from March 2022 to February 2023.

2.5 LIMITATIONS

The following survey limitations were noted:

- Habitat mapping downstream of the proposed Upper Storage to Yabba Creek could not be undertaken. The field team attempted to survey this area and found it too dangerous when wet and were not certain they could traverse back. It's not clear if the entire way down maintains the same cascading bedrock morphology. A variation has been submitted which included added controls, largely a boat will be ready for collection once the survey team traverse to the adjoining Lower Reservoir (Yabba Creek portion). Approval for this variation is pending;
- Habitat mapping downstream of Borumba Dam along Yabba Creek was undertaken via aerial imagery interpretation. Two time-stamps (May 2021 pre-flood and August 2022) were interpreted. The May 2021 time-stamp included imagery from S14 (Yabba Creek Crossing) to the confluence with the Mary River. The August 2022 time-stamp included imagery from directly downstream of Borumba Dam along Yabba Creek to the confluence with the Mary River.
- Digital elevation models (DEM) were used to define left and right banks. This delineation is based on data collected in June 2022. We note that considerable flooding and erosion occurred after this date. Where possible recent aerials imagery was used to define the new high bank marks;
- A lack of access due to landowner restrictions resulted in the reallocation of S23 to Peach Trees Camping Ground. This is some 9 km upstream of the original intended site, which was located within grazing land uses. The surveyed S23 was located within camping and plantation land uses;
- Insufficient depth along Sandy Creek (S22) limited snorkelling efforts. In this instance, the survey reach was assessed visually on foot for the same transect distance as snorkel efforts; and

- Subsequent habitat mapping conducted following the Conondale spiny crayfish surveys within the Upper Storage identified a number of reaches that were deemed more suitable spiny crayfish habitat. These areas were observed to have large burrows, indicative of spiny crayfish however, their creation could not be conclusively attributed to any specific species. These areas were not included in the initial crayfish surveys due to prior canopy observations from aerial imagery and their accessibility (i.e. allowance of camping site for spotlighting), highlighting a gap in the crayfish survey.

3. FIELD SURVEY RESULTS

3.1 HABITAT – GROUND-TRUTHED

3.1.1 OVERVIEW

Mapped macro and microhabitat features are displayed in Appendix B. Tabulated mapped habitat values are displayed in Appendix C and summarised in the following sections.

3.1.2 MACROHABITAT

The Upper Storage was largely dry and where water was present the habitat was generally limited to shallow pool (Figure 3-1). Water depth was notably low in Borumba Creek and the reach was characterised by just two macrohabitats; shallow glide and shallow riffle. Macrohabitat at Kingaham Creek and Yabba Creek U/S was dominated by deep pool, with a minor component of shallow pool, riffle and run (Figure 3-1). The macrohabitat at Yabba Creek D/S showed a high degree of seasonal variation, with May 2021 comprising entirely of deep pool with no visible flow. This changed to deep pool, shallow run, and shallow riffle in August 2022 period. This variation is unsurprising as the flooding events experienced in the region from February to May 2022. Flooding events also resulted in overtopping events from Borumba dam.

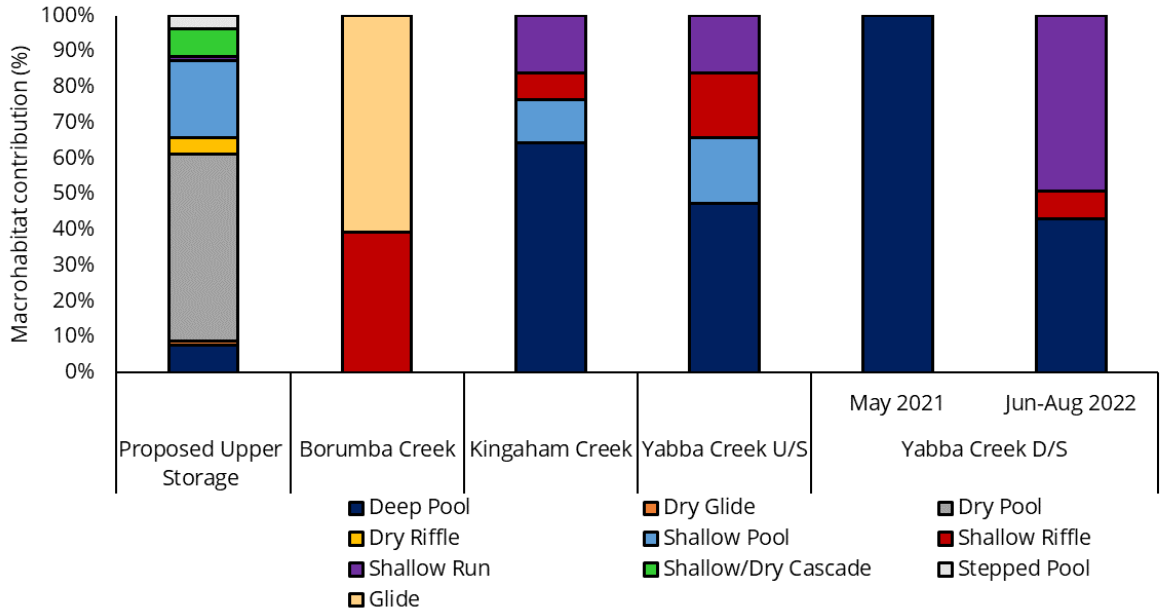


Figure 3-1 Macrohabitat contribution within each area.

3.1.3 MICROHABITAT

UNDERCUT BANKS

Undercut banks occurred throughout much of the proposed Upper Storage and were most dominant in highly sinuous meandering reaches. Undercut banks were generally absent or less common in straighter reaches, such as those dominated by a bedrock geology (cascades, stepped pools, and glides) and smaller tributaries of the main channel that received less flow.

Within the Proposed FSL upstream of Lake Borumba, Kingaham Creek was almost entirely comprised of undercut banks, generally being only absent in areas comprised of bedrock and sandy banks. Yabba Creek maintained a similar structure, dominated by undercut banks, however a greater proportion of sandy and bedrock banks was present with undercut banks also being absent along less sinuous, straighter reaches.

LARGE WOODY DEBRIS

Yabba Creek downstream of Borumba Dam contained the most large woody debris, with a steep increase evident between May 2021 and Jun-August 2022 (Figure 3-2). This increase was due to the large 2022 flood events that uprooted and damaged large areas of riparian trees, providing a considerable input of woody debris into the system. Occurrences of large woody debris was notably low in Borumba Creek, likely due to the high degree of riparian clearing in this catchment. It should be noted that the number of woody debris recorded was influenced by the total length of creek surveyed within each region.

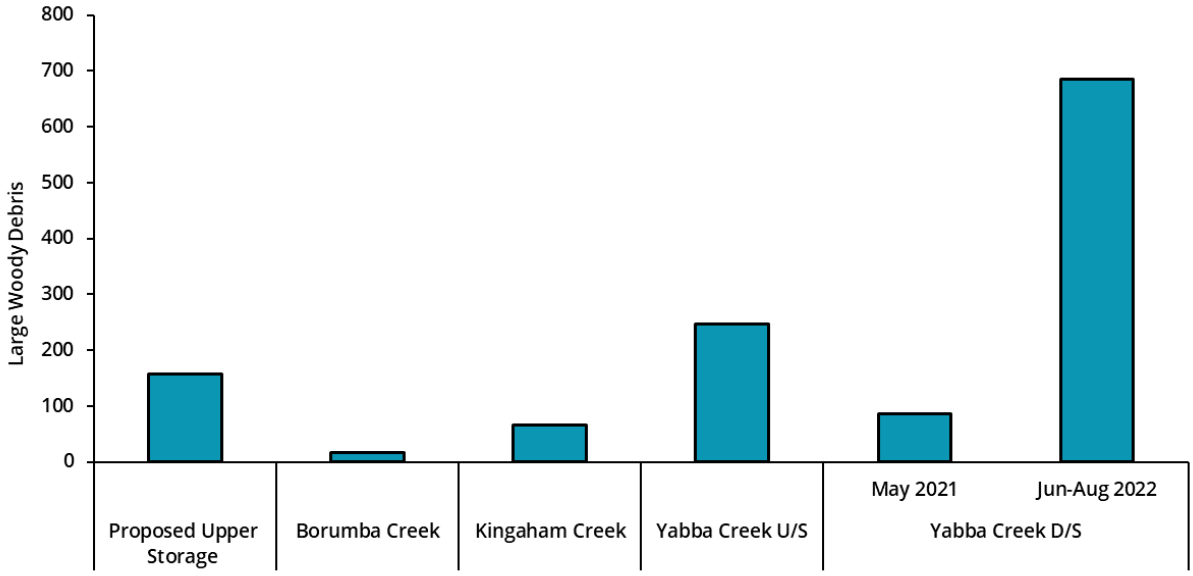


Figure 3-2 Large woody debris counts recorded from each region.

3.1.4 MACROPHYTES

The highest taxonomic richness of macrophytes was recorded at Kingaham Creek (n=11), followed by Yabba Creek U/S (n=7) (Table 3-1). Low taxonomic richness was recorded at Yabba Creek downstream of Borumba Dam (n=2); however it should be noted that the identification of macrophytes in this section was limited to those visible from aerial imagery, which was restricted to those floating or above (semi-emergent forms) at the water's surface. No macrophytes were recorded in the Upper Storage or Borumba Creek.

Macrophyte communities were comprised equally of *Ludwigia peploides*, *Nymphoides* and Characeae in Kingaham Creek, whereas Yabba Creek upstream of Lake Borumba was dominated by *Aponogeton elongatus* and *Vallisneria nana*, followed by *Myriophyllum verrucosum* and *Potomogeton crispus* (Figure 3-3). It should be noted that the vast majority of macrophyte coverage recorded in Kingaham Creek were located within the region where the creek merged into the current Lake Borumba FSL. This region had increased water availability and decreased water flow, being characterised largely by floating macrophyte forms. Relatively extensive beds of *A. elongatus* (a total of approximately 1200 m) were recorded along Yabba Creek upstream of Lake Borumba but this species was not recorded in Kingaham Creek. *A. elongatus* is listed as near threatened under the *Nature Conservation Act 1992*.

The macrophytes visible from satellite imagery along Yabba Creek downstream of Borumba Dam included floating forms such as *Azolla sp.*, *Nymphoides sp.* and *Nymphaea sp*. As noted previously this reach was not ground truthed, therefore other species may be present (e.g., submerged forms) that were not visible in the aerial imagery. The percentage coverage has been divided equally for each species to allow visual representation; however accurate separation of each species based on imagery was not possible in this reach. No macrophytes were recorded along Yabba Creek downstream of Borumba Dam in the imagery collected in August 2022 period, likely due to any plants being uprooted, scoured out and flushed downstream during the 2022 flooding events.

Table 3-1 Macrophytes recorded via habitat mapping.

Species	Kingaham Creek	Yabba Creek U/S	Upper Storage	Borumba Creek	Yabba Creek D/S	
					May 2021	August 2022
Aponogeton elongatus		✓				
Azolla sp.					✓	
Bacopa sp.	✓					
Characeae	✓	✓				
Cycnogeton sp.	✓					
Hydrocotyle sp.	✓	✓				
Ludwigia peploides	✓	✓				
Myriophyllum verrucosum	✓	✓				
Nymphaea sp.	✓					
Nymphoides sp.	✓				✓	
Persicaria sp.	✓					
Potamogeton crispus	✓	✓				
Vallisneria nana	✓	✓				

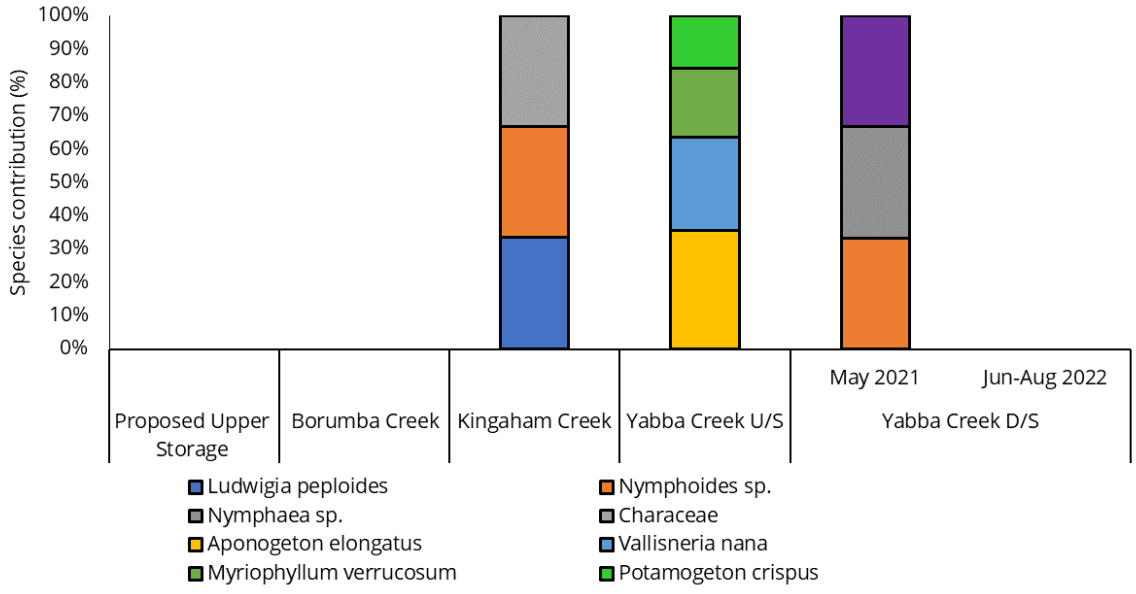


Figure 3-3 Macrophyte contribution based on reach coverage. Species represent those contributing 90% of the community.

3.1.5 SUBSTRATE

Kingaham Creek largely comprised of sandy banks and large boulders, whereas Yabba Creek U/S comprised of a larger proportion of sandy banks, large boulders, in addition to bedrock banks. It was noted that the furthest upstream reaches of Yabba Creek were particularly rocky, reflecting the elevated position in the catchment and the higher degree of channel confinement, governed by the local geology.

Stream substrates varied throughout the proposed Upper Storage, generally being dominated by bedrock, boulders, coarser substrates (pebbles, cobbles, and gravel), and soft sediments (sand, silt, and clay).

The watercourse system contrasts greatly between substrate types with respect to the upper reach, which plateaus upstream of S2 and is defined by low gradient, mostly dry, incised stream comprised almost entirely sand, silt, and clay. Reaches of water were rare, generally only observed in intermittent bedrock reaches and the uppermost extent, dominated by clay.

The remaining extent of the watercourse downstream of S2, was generally dominated by bedrock and coarser substrates which were associated with increased water permanency leading to shallow and deep pools found throughout. Finer substrates, generally sand and silt contributed to compositions throughout and when dominant, often constituted breaks between reaches of pools. The most downstream extent of the watercourse was completely characterised by a bedrock geology of cascades and stepped pools.

With reference to tributaries outside of the main channel, sand and periodic boulders were often the dominant substate of the small and incised streams, as such these tributaries were often almost entirely dry. However, some extents were dominated by bedrock which supported shallow pools.

3.2 HABITAT – SITE ASSESSMENT

Data collected from each site including habitat condition are presented in Appendix D.

3.3 MICROALGAE

Species and counts collected from each site are presented in Appendix E

3.4 MACROINVERTEBRATES

The macroinvertebrate and macrocrustacean communities as assessed via AusRivAS survey methods across the Study Area recorded in the present survey were broadly similar to the those recorded in the previous survey and in other sampling events (SKM, 2007). The additional sample collection in this survey of edge habitats within Lake Borumba included taxa richness, abundances and sensitive taxa percentages within ranges recorded across the Study Area (Table 3-2); however, PET richness was typically lower. When compared to the previous survey, Lake Borumba recorded higher taxa richness and abundances within bed habitats.

Data collected from each site are presented in Appendix F.

Table 3-2 Macroinvertebrate community metrics summary.

Waterway/region		Site	Habitat	Count	Abundance	Taxonomic Richness	PET Richness	SIGNAL2	% tolerant taxa
Kingaham Creek	Upstream of Lake Borumba	S21	Bed	22	3006	21	8	4.91	23
			Edge	26	814	25	8	4.71	22
		S4	Bed	26	760	26	10	5.02	29
			Edge	21	1425	21	8	5.12	6
		S24	Bed	29	750	26	8	4.38	30
			Edge	32	576	29	7	3.99	41
Yabba Creek U/S	Upstream of Lake Borumba	S3	Bed	17	555	15	4	4.31	37
			Edge	18	394	16	3	3.45	72
		S5	Bed	23	5584	23	9	4.97	15
			Edge	22	914	22	5	4.65	8
		S23	Bed	21	1184	18	5	4.42	18
			Edge	28	4524	26	7	4.24	46
Sandy Creek	Upstream of Lake Borumba	S22	Bed	27	3372	27	10	5.10	9
			Edge	22	1443	21	6	4.36	24
Unnamed Creek	Proposed Upper Storage	S1	Bed	16	130	14	5	4.30	31
			Edge	24	240	21	7	4.01	29
		S20	Bed	21	499	19	5	4.69	35
			Edge	35	993	32	6	3.91	35
	U/S of proposed Upper Storage	S2	Bed	22	343	22	6	3.92	45
			Edge	21	434	21	4	3.90	22
Borumba Creek	Upstream of Lake Borumba	S25	Bed	24	10500	22	6	3.89	55
			Edge	26	2101	23	6	3.90	72
		S9	Bed	14	181	14	4	4.05	22

Waterway/region			Site	Habitat	Count	Abundance	Taxonomic Richness	PET Richness	SIGNAL2	% tolerant taxa
				Edge	29	1257	28	7	4.13	21
Lake Borumba			S6	Bed	4	78	4	0	3.88	1
				Edge	22	397	20	3	3.09	61
			S7	Bed	5	55	5	0	3.33	35
				Edge	19	928	19	2	3.02	71
			S8	Bed	2	131	2	0	3.50	37
				Edge	26	1437	24	5	4.10	48
			S11	Bed	3	146	3	0	3.60	11
				Edge	22	991	20	2	3.37	66
Bella Creek	Yabba Creek Tributary		S26	Bed	23	9300	21	6	4.60	4
				Edge	20	497	18	5	4.33	31
D/S of Borumba Dam	Yabba Creek D/S		S12	Bed	14	654	11	4	3.98	40
				Edge	7	484	7	1	2.80	87
			S27	Bed	16	1749	14	6	4.69	9
				Edge	20	851	20	5	4.05	46
			S14	Bed	24	2027	24	9	5.03	19
				Edge	18	385	17	5	3.85	66
			S15	Bed	19	908	16	4	3.80	44
				Edge	9	448	7	3	3.28	82
	Mary River	U/S of Yabba Creek Confluence	S17	Bed	21	504	21	5	3.73	63
				Edge	21	623	19	5	4.03	47
		D/S of Yabba Creek Confluence	S19	Bed	14	1158	14	5	4.86	20
				Edge	8	62	8	0	2.44	95

3.5 MACROCRUSTACEANS

The same four macrocrustacean species were caught in the December/January survey as per the DAR survey (Table 3-3). Again, freshwater shrimps (Atyidae) and prawns (*Macrobrachium spp*.) were most common and widespread. At S23 upstream of Lake Borumba along Yabba Creek and at S20 within the Unnamed Creek of the Upper Storage, juvenile freshwater shrimps were in high abundances. Unlike the June/July survey these taxa were present within Lake Borumba and the Unnamed Creek at the location of the proposed Upper Storage.

Redclaw crayfish (*Cherax quadricarinatus*) were slightly more abundant and widespread within the Study Area than previously recorded. Redclaw crayfish (*C. quadricarinatus*) are native to northern Queensland so those recorded within the Study Area represent a translocated population (they are commonly used in aquaculture). An additional species of yabby, orange-fingered yabby (*Cherax depressus*), was detected via eDNA and electrofishing within the proposed Upper Storage.

No threatened macrocrustaceans such as Conondale spiny crayfish (*Euastacus hystricosus*) were recorded in the Study Area through either traditional survey methods or eDNA detection.

Ground-truthing habitat surveys, which occurred after the crayfish surveys, revealed several additional areas with more suitable spiny crayfish habitat, these areas include the majority of the downstream reaches from S20 to the bedrock cascades prior to S1. These areas are characterised by cool water streams with greater water permanence (as indicated by aerial imagery interpretation) and dense Picabeen Palm forests which are known to provide what is considered to be preferred habitat for the Conondale spiny crayfish. Furthermore, numerous large burrows were noted along the watercourse banks however, these burrows are not necessarily indicative of spiny crayfish, and other species may be responsible for their creation.

Further investigations were conducted into the previously identified *Euastacus hystricosus* record (#W735) upstream of Borumba Dam. Consultation with the Queensland Museum, which provided the specimen, confirmed that it was collected by a local ranger in 1951, just prior to the dam's construction. Aerial photography from before the dam's construction revealed that the area was a tributary of Yabba Creek, covered by a dense rainforest canopy that still exists today. The Hydrobiology team and the Queensland Museum Crustacean Collection Manager believe that the record is accurate. While *Euastacus hystricosus* is rarely found at lower elevations, spiny crayfish have been known to move into lower reaches following high flooding events or during dry periods. This may explain the record of interest, as it was collected during a period of lower rainfall.

Table 3-3 Macrocrustacean abundances over the Study Area. Tick marks represent species detected using eDNA.

				Kingaham Creek			Yabba Creek U/S				Sandy Creek	Unnamed Creek			Borumba Creek		Lake Borumba				Bella Creek	Downstream of Borumba Dam					
				Upstream of Lake Borumba			Upstream of Lake Borumba				U/S of Lake Borumba	Proposed Upper Storage		U/S of proposed Upper Storage	U/S of Lake Borumba						Yabba Creek Tributary	Yabba Creek D/S			Mary River Yabba Creek Confluence	
																									U/S	D/S
Species	Common name	EPBC Listing	NCA Listing	S21	S4	S24	S3	S5	S28	S23	S22	S1	S20	S2	S25	S9	S6	S7	S8	S11	S26	S12	S27	S14	S15	S17	S19
Atyidae	freshwater shrimp				5	500	7	4	3	600			1000		40		4		11	32	12		56	7	14	21	71
Cherax sp.	crayfish/yabby											✓	✓	✓													
Cherax quadricarinatus	Redclaw yabby											✓	✓	✓													
Cherax depressus	orange-fingered yabby											✓	✓ 20	✓													
Cherax destructor	common yabby			2		2	1	1		10					7					1				2			
Macrobrachium spp.	freshwater prawn			S, 16	168	370	81	32	7	314	96		20		60		12	2		25	18	71	174	257	17	370	46

S = Observed while snorkelling

✓ - eDNA detection

3.6 FISH

3.6.1 COMPOSITION

OVERVIEW

In the December/January 2022-2023 sampling event a total of 26 native and 5 exotic fish species were recorded over the Study Area (Table 3-4). In addition to the species recorded during the June/July 2022 sampling event, three new species, snubnose garfish (*Arrhamphus sclerolepis*), blue catfish (*Neoarius graeffei)* and dwarf flathead gudgeon (*Philypnodon macrostomus*) were recorded (Table 3-5).

Snubnose garfish were caught within Lake Borumba at S6 and S7 and have been recorded historically in the Mary River Upper Catchment. This family of species was also detected via eDNA within Lake Borumba. This species has historically been observed as an anadromous species spawning in estuaries from October to January. However, there have been recorded instances of this species able to self-sustain within dams such as Awonga Dam on the Boyne River and Wivenhoe Dam on the Brisbane River (Midgley 1979). Therefore, it is possible this population is spawning in the freshwaters above the dam wall.

Blue catfish were recorded at S17 within the Mary River have been found in the area historically. Dwarf flathead gudgeon was detected via eDNA at S26 within Bella Creek, a tributary of Yabba Creek, and has been recorded historically in the area.

Only one fish species, empire gudgeon was not recorded in this sampling event though present in the previous (Table 3-5). They were caught previously at S13 within Bella Creek. This site was not sampled during the current survey event; however other areas of Bella Creek were surveyed.

Despite traversing the entire proposed Upper Storage area and using a variety of survey methods, including eDNA, traditional survey techniques, and visual observation, no fish were detected. In the previous survey, eDNA detected a number of small bodied natives and exotics in the proposed Upper Storage. It is now evident that this was likely laboratory contamination during processing of filters for analysis. All blank filters for assessment of infield contamination have returned no fish DNA during either survey, therefore sample contamination is unlikely during sample collection. Despite this, considerable overlap between eDNA and captured species in the remaining Study Area is evident and therefore further provide relevant information pertaining to fish community assemblages.

THREATENED SPECIES

As for threatened species, Mary River cod (*Maccullochella mariensis*) was previously recorded at four sites (S3, S8, S14 and S17) across a large distribution of the Study Area, during the current survey a juvenile was caught in Mary River upstream of the Yabba Creek confluence at S17 and a fingerling within Lake Borumba dam at S11 and another detected via eDNA at site S8 within Lake Borumba. It is important to note that a release of fingerlings had occurred within Lake Borumba shortly prior to the current survey. Therefore, the noted fingerling in Lake Borumba is likely an individual from restocking efforts.

Lungfish (*Neoceratodus forsteri*) was recorded at one less site in this survey, though their distribution was consistent between surveys. To date they have not been recorded upstream of Lake Borumba in either Yabba or Kingaham Creeks.

EXOTICS

Five exotic species were caught/detected in the Study Area:

- Mozambique tilapia (*Oreochromis mossambicus*);

- Common carp (*Cyprinus carpio*);
- Swordtail (*Xiphophorus helleri*);
- Platy (*Xiphophorus maculatus*); and
- Mosquitofish (*Gambusia holbrooki*).

As found in the previous survey, common carp (*C. auratus/C. carpio*) appear to be restricted to sites above the dam wall, while Mozambique tilapia (*O. mossambicus*) were restricted to below the dam wall along the Mary River. Background information and detection across the Study Area for each exotic species are discussed below.

Carp (*Cyprinus carpio)*

Carp have not been recorded in Mary River Basin (DES, 2013a). Common carp were only recorded at site S8 within Lake Borumba, consistent with the previous survey.

Mozambique tilapia (*Oreochromis mossambicus*)

In the current survey Mozambique tilapia were only noted along the Mary River at site S19, but in high abundance with 420 individuals caught. These were all juveniles. No record of this species has yet to be noted within Yabba Creek and it is likely Borumba Dam remains a barrier to their distribution.

Platy (*Xiphophorus maculatus*)

In the current survey this species was noted at sites within Borumba Creek, downstream of Borumba Dam along Yabba Creek and the Mary River upstream of the confluence with Yabba Creek. Platys were detected via eDNA at sites S25 within Borumba Creek and within Lake Borumba at S6 and S8. In conjunction with the distribution of this species in the previous survey, these results again suggest it is the most widely distributed exotic in the Study Area.

Swordtail (*Xiphophorus helleri*)

Swordtails detected in the previous survey via eDNA at S17 along the Mary River were caught in the present survey at site S25 within Borumba Creek.

Mosquitofish (*Gambusia holbrooki*)

This species was detected via eDNA again within Lake Borumba at S8 and S11. In this survey, mosquitofish were also caught within Borumba creek upstream of Lake Borumba at sites S25 and S9, as well as downstream of Borumba Dam along the Mary River at sites S17 and S19. The abundance of this species was particularly high within Borumba Creek with a total of 363 individuals caught.

Table 3-4 Total fish species abundances among sites, regions and systems.

				Kingaham Creek			Yabba Creek				Sandy Creek	Unnamed Creek			Borumba Creek		Lake Borumba				Bella Creek	Downstream of Borumba Dam						
				U/S of Lake Borumba			U/S of Lake Borumba				U/S of Lake Borumba	Proposed Upper Storage		U/S of proposed Upper Storage	U/S of Lake Borumba						Yabba Creek Tributary	Yabba Creek D/S				Mary River Yabba Creek Confluence		Total
																											U/S	D/S	
Species	Common name	EPBC Listing	NCA Listing	S21	S4	S24	S3	S5	S28	S23	S22	S1	S20	S2	S25	S9	S6	S7	S8	S11	S26	S12	S27	S14	S15	S17	S19	
Ambassidae																												
Ambassis agassizii	Agassiz's glassfish			✓	✓ 114		✓ 481	✓ 2	54		✓ 68						4	10	✓ 6	✓ 24	✓ 11		9	3	44		34	864
Anguillidae																												
Anguilla reinhardtii	longfin eel			✓		✓				1									2		✓ 3	14	6	1	2	6	4	38
Apogonidae																												
Glossamia aprion	mouth almighty																						1					1
Ariidae																												
Neoarius graeffei	blue catfish																									1		1
Atherinidae																												
Craterocephalus sp.	hardyhead			✓	✓	✓	✓	✓		✓	✓				✓		✓	✓	✓	✓	✓							
Craterocephalus marjoriae	Marjorie's hardyhead				66		O	1			O, 16				10	1			2		21			50			10	177
Craterocephalus stercusmuscarum	fly-specked hardyhead				14		13	✓	12		✓						✓	✓ 1	1	✓ 4	✓	1	1	3		6		56
Cichlidae																												
*Oreochromis mossambicus**	Mozambique tilapia																										420	420
Clupeidae																												
Nematalosa erebi	bony bream			✓	1		✓	✓	12								✓	✓	✓	✓				1				1785

Species	Common name	EPBC Listing	NCA Listing	Kingaham Creek			Yabba Creek				Sandy Creek	Unnamed Creek			Borumba Creek		Lake Borumba				Bella Creek	Downstream of Borumba Dam						Total
				U/S of Lake Borumba			U/S of Lake Borumba				U/S of Lake Borumba	Proposed Upper Storage		U/S of proposed Upper Storage	U/S of Lake Borumba						Yabba Creek Tributary	Yabba Creek D/S				Mary River Yabba Creek Confluence		
																										U/S	D/S	
				S21	S4	S24	S3	S5	S28	S23	S22	S1	S20	S2	S25	S9	S6	S7	S8	S11	S26	S12	S27	S14	S15	S17	S19	
							1										593	489	348	340								
Cyprinidae																												
*Cyprinus carpio**	common carp																		✓									
Eleotridae																												
Hypseleotris sp.	Carp gudgeon			✓, s	✓	✓	✓	✓, s		✓	✓				✓	✓		✓	✓	✓								
Hypseleotris gali	firetail gudgeon					1170	7		1	549	12				6						13		398	8	16	9	10	1949
Hypseleotris klunzingeri	western carp gudgeon				281		208	25	100							17	7		12	9	4				2	16	3	666
Mogurnda adspersa	southern purplespotted gudgeon			✓ 12	✓ 5		✓ 1	✓ 8			✓ 18				✓ 6	✓ 3					✓ 10			50				113
Philypnodon grandiceps	flathead gudgeon			✓	✓			✓	8		✓						✓ 1		✓ 1	✓					1			11
Philypnodon macrostomus	dwarf flathead gudgeon																				✓							
Hemiramphidae																												
*Hyporhamphus^*	Garfish																	✓	✓	✓								
Arrhamphus sclerolepis	snubnose garfish																1	2										3
Melanotaeniidae																												
Melanotaenia duboulayi	crimsonspotted rainbowfish			✓ 1	✓ 226		✓ O, 207	✓ 10	45		✓ O, 239				✓ 4			1	✓ 6	✓ 3	✓ 22	3	5	15	262	18	40	1102

Species	Common name	EPBC Listing	NCA Listing	Kingaham Creek			Yabba Creek				Sandy Creek	Unnamed Creek			Borumba Creek		Lake Borumba				Bella Creek	Downstream of Borumba Dam						Total
				U/S of Lake Borumba			U/S of Lake Borumba				U/S of Lake Borumba	Proposed Upper Storage		U/S of proposed Upper Storage	U/S of Lake Borumba						Yabba Creek Tributary	Yabba Creek D/S				Mary River Yabba Creek Confluence		
																										U/S	D/S	
				S21	S4	S24	S3	S5	S28	S23	S22	S1	S20	S2	S25	S9	S6	S7	S8	S11	S26	S12	S27	S14	S15	S17	S19	
Pseudomugil signifer	Pacific blue-eye			2	✓ 11		1	✓ 7			✓ 21										✓ 29		28	64	5	60	77	305
Neoceratodontidae																												
Neoceratodus forsteri	Australian lungfish	V															2								3			5
Osteoglossidae																												
Scleropages leichardti	southern saratoga																✓ 6	✓ 4	✓ 15	✓ 2					1			28
Percicthyidae																												
Maccullochella mariensis	Mary River cod	E																	✓	1					1			2
Macquaria ambigua	golden perch																2	✓		✓ 1	✓							3
Percalates novemaculeata	Australian Bass			✓			✓	✓									✓ 16	5	✓ 11	✓ 11	✓		2					45
Plotosidae																												
Neosilurus hyrtlii	Hyrtl's Catfish																								2			2
Tandanus tandanus	tandan catfish			✓ 3	19		✓ 1	✓ 2	15	✓ 40	O, 1						18	4	6	✓ 20	✓ 4	1	3	2	4	2	5	150
Poeciliidae																												
*Gambusia holbrooki**	mosquitofish														320	43			✓ 3	✓					1	4		371
*Xiphophorus hellerii**	swordtail														1													1

Species	Common name	EPBC Listing	NCA Listing	Kingaham Creek			Yabba Creek				Sandy Creek	Unnamed Creek			Borumba Creek		Lake Borumba				Bella Creek	Downstream of Borumba Dam						Total
				U/S of Lake Borumba			U/S of Lake Borumba				U/S of Lake Borumba	Proposed Upper Storage		U/S of proposed Upper Storage	U/S of Lake Borumba						Yabba Creek Tributary	Yabba Creek D/S				Mary River Yabba Creek Confluence		
																										U/S	D/S	
				S21	S4	S24	S3	S5	S28	S23	S22	S1	S20	S2	S25	S9	S6	S7	S8	S11	S26	S12	S27	S14	S15	S17	S19	
*Xiphophorus maculatus**	platy														✓ 7	20	✓		✓				1			3		31
Retropinnidae																												
Retropinna semoni	Australian smelt			✓	✓, S 8		✓ 3	✓ 2	S,8	✓ 2	✓						✓	✓ 1	✓ 1	✓ 2	✓ 18			4	4	5	8	66
Terapontidae																												
Hephaestus fuliginosus	sooty grunter																									1	1	2
Leiopotherapon unicolor	spangled perch																				✓ 45							45
Total Count				18	745	1170	923	57	255	592	375				354	67	650	517	414	416	180	19	198	201	346	129	616	8242
Total Native Species				18	745	1170	923	57	255	592	375				26	4	650	517	411	416	180	19	197	201	346	125	192	7419
Total Exotic Species				0	0	0	0	0	0	0	0				328	63	0	0	3	0	0	0	1	0	0	4	424	823

* = Exotic introduced
^ = Family is poorly represented in the reference library, therefore species could not be confidently assigned. Likely species based on ALA records in the region are snubnosed garfish (*Arrhamphus sclerolepis*) or river garfish (*Hyporhamphus regularis*).
^ ^= record may represent field contamination as species was used for bait in low flow areas.
V = Vulnerable
E = Endangered
O = Observed
S = Observed while snorkelling
✓ - detected via eDNA survey methods

Table 3-5 Comparison between historical fish records of Mary River Upper Catchment area, records from the previous survey in June-July of 2022 and records from the present field survey. Borumba and Sandy Creeks were not surveyed in June/July 2022. Note the previous records in Upper Storage area and downstream extent are removed due to suspected lab contamination during lab filter processing for analysis. Cells with no contents indicate that they were no previously surveyed.

Species	Common name	Recorded Historically	Total		Upstream of Lake Borumba								Proposed Upper Storage		U/S of Proposed Upper Storage		Lake Borumba		Yabba Creek Tributary		Downstream of Borumba Dam					
					Kingaham Creek		Yabba Creek		Sandy Creek		Borumba Creek		Unnamed Creek						Bella Creek		Yabba Creek		Mary River U/S of Yabba Creek Confluence		Mary River D/S of Yabba Creek Confluence	
			June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan
Ambassidae																										
Ambassis agassizii	Agassiz's Glassfish	✓	✓	✓	✓	✓	✓	✓		✓							✓	✓	✓	✓	✓	✓	✓		✓	✓
Ambassis marianus	estuary glassfish	✓																								
Anguillidae																										
Anguilla reinhardtii	longfin eel	✓	✓	✓		✓	✓	✓									✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anguilla australis	southern shortfin eel	✓																								
Apogonidae																										
Glossamia aprion	Mouth almighty	✓	✓	✓																		✓			✓	
Ariidae																										
Neoarius graeffei	blue catfish	✓		✓																				✓		
Atherinidae																										
Craterocephalus sp.	Hardyhead		✓	✓		✓		✓		✓		✓						✓	✓	✓		✓				
Craterocephalus marjoriae	Marjorie's hardyhead	✓	✓	✓		✓		✓		✓		✓						✓		✓	✓	✓			✓	✓
Craterocephalus stercusmuscarum	flyspecked hardyhead	✓	✓	✓		✓		✓		✓							✓	✓	✓		✓	✓	✓	✓	✓	
Cichlidae																										
*Oreochromis mossambicus**	Mozambique mouthbrooder	✓	✓	✓																			✓		✓	✓
Clupeidae																										
Nematalosa erebi	bony bream	✓	✓	✓	✓	✓	✓	✓									✓	✓			✓	✓	✓		✓	
Cyprinidae																										

Species	Common name	Recorded Historically	Total		Upstream of Lake Borumba								Proposed Upper Storage		U/S of Proposed Upper Storage		Lake Borumba		Yabba Creek Tributary		Downstream of Borumba Dam					
					Kingaham Creek		Yabba Creek		Sandy Creek		Borumba Creek		Unnamed Creek						Bella Creek		Yabba Creek		Mary River U/S of Yabba Creek Confluence		Mary River D/S of Yabba Creek Confluence	
			June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan
*Cyprinus carpio**	common carp		✓	✓			✓										✓					✓				
Eleotridae																										
Hypseleotris sp.	Carp gudgeon		✓	✓		✓		✓		✓		✓					✓		✓			✓				
Gobiomorphus australis	striped gudgeon	✓																								
Gobiomorphus coxii	cox gudgeon	✓																								
Oxyeleotris lineolata	sleepy cod	✓			✓		✓														✓		✓		✓	
Hypseleotris compressa	empire gudgeon	✓	✓																✓							
Hypseleotris gali	firetail gudgeon	✓	✓	✓		✓		✓		✓		✓								✓	✓	✓		✓		✓
Hypseleotris klunzingeri	western carp gudgeon	✓	✓	✓	✓	✓	✓	✓				✓						✓	✓	✓	✓	✓	✓	✓	✓	✓
Mogurnda adspersa	southern purplespotted gudgeon	✓	✓	✓	✓	✓	✓	✓		✓		✓					✓		✓	✓	✓	✓	✓		✓	
Philypnodon grandiceps	flathead gudgeon	✓	✓	✓		✓	✓	✓		✓								✓			✓	✓				
Philypnodon macrostomus	dwarf flathead gudgeon	✓		✓														✓				✓				
Gobiidae																										
Afurcagobius tamarensis	Tamar goby	✓																								
Awaous acritosus	roman-nose goby	✓																								
Redigobius bikolanus	speckled goby	✓																								
Redigobius macrostoma	largemouth goby	✓																								

Species	Common name	Recorded Historically	Total		Upstream of Lake Borumba								Proposed Upper Storage		U/S of Proposed Upper Storage		Lake Borumba		Yabba Creek Tributary		Downstream of Borumba Dam					
					Kingaham Creek		Yabba Creek		Sandy Creek		Borumba Creek		Unnamed Creek						Bella Creek		Yabba Creek		Mary River U/S of Yabba Creek Confluence		Mary River D/S of Yabba Creek Confluence	
			June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan
Hemiramphidae																										
*Hyporhamphus^*	garfish			✓														✓				✓				
Arrhamphus sclerolepis	snubnose garfish	✓		✓														✓				✓				
Kuhliidae																										
Kuhlia rupestris	jungle perch	✓																								
Melanotaeniidae																										
Melanotaenia duboulayi	crimson spotted rainbowfish	✓	✓	✓	✓	✓	✓	✓		✓		✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rhadinocentrus ornatus	ornate rainbowfish	✓																								
Pseudomugil signifer	Pacific Blue Eye	✓	✓	✓		✓	✓	✓		✓									✓	✓	✓	✓	✓	✓	✓	✓
Mugilidae																										
Mugil cephalus	sea mullet	✓	✓																		✓		✓		✓	
Trachystoma petardi	pinkeye mullet	✓																								
Neoceratodontidae																										
Neoceratodus forsteri	Australian Lungfish	✓	✓	✓														✓			✓	✓				
Osteoglossidae																										
Scleropages leichardti (T)	southern sarartoga	✓	✓	✓													✓				✓	✓				
Percicthyidae																										
Maccullochella mariensis	Mary River Cod	✓	✓	✓			✓										✓	✓			✓	✓	✓	✓		

Species	Common name	Recorded Historically	Total		Upstream of Lake Borumba								Proposed Upper Storage		U/S of Proposed Upper Storage		Lake Borumba		Yabba Creek Tributary		Downstream of Borumba Dam					
					Kingaham Creek		Yabba Creek		Sandy Creek		Borumba Creek		Unnamed Creek						Bella Creek		Yabba Creek		Mary River U/S of Yabba Creek Confluence		Mary River D/S of Yabba Creek Confluence	
			June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan	June-July	Dec-Jan
Macquaria ambigua (T)	golden perch	✓	✓	✓													✓		✓	✓	✓	✓				
Percalates novemaculeata	Australian bass	✓	✓	✓	✓	✓	✓	✓									✓	✓	✓	✓	✓	✓			✓	
Plotosidae																										
Neosilurus hyrtlii	Hyrtl's catfish	✓	✓	✓																	✓	✓				
Porochilus rendahli	Rendahl's catfish	✓																								
Tandanus tandanus	freshwater catfish	✓	✓	✓	✓	✓	✓	✓		✓							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Poeciliidae																										
*Gambusia affinis**	mosquitofish	✓	✓	✓								✓					✓					✓		✓		✓
*Poecilia reticulata**	guppy																									
*Xiphophorus helleri**	swordtail	✓	✓	✓								✓											✓			
*Xiphophorus maculatus**	platy		✓	✓								✓					✓	✓	✓			✓		✓	✓	
Retropinnidae																										
Retropinna semoni	Australian smelt	✓	✓	✓	✓	✓	✓	✓		✓							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Scorpaenidae																										
Notesthes robusta	bullrout	✓																								
Terapontidae																										
Hephaestus fuliginosus (T)	sooty grunter		✓	✓																			✓	✓	✓	✓
Leiopotherapon unicolor	spangled perch	✓	✓	✓			✓													✓	✓	✓			✓	
Bidyanus bidyanus (T)	silver perch	✓																								

Historical records include: (SKM, 2007; Kelly et al., 2004; Ecotone, 2007; DES, 2013b)

* = exotic species

T = translocated species

^ = Family is poorly represented in the reference library, therefore species could not be confidently assigned. Likely species based on ALA records in the region are snubnosed garfish (Arrhamphus sclerolepis) or river garfish (Hyporhamphus regularis).

3.7 AQUATIC REPTILES

Six species of freshwater turtle, a higher diversity than recorded during the June/July survey, were caught in this survey event. The higher diversity is likely a results of greater turtle activity during the summer period (i.e. higher water temperatures) (Table 3-6).

Most widespread were Krefft's river turtle (*Emydura krefftii)* and saw-shelled turtles (*Wollumbinia latisternum)* which were recorded at eight sites each, the latter not caught at any site in the previous survey. Juvenile saw-shelled turtles were caught at S27 and juvenile Krefft's river turtles were recorded downstream of Borumba Dam along Yabba Creek at S12 and S15, and at S7 and S11 within Lake Borumba. Broad-shelled river turtles (*Chelodina expansa)* were caught at one site upstream of Lake Borumba within the proposed FSL at site S3. An Eastern long-necked turtle (*Chelodina longicollis*) was caught a single site upstream of Lake Borumba along Yabba Creek at S23.

With respect to threatened species, the white-throated snapping turtle (*Elseya albagula*) was caught at two sites. This included a single individual close to where it was previously recorded within Lake Borumba at S6 and at a second site (S27) along Yabba Creek downstream of Borumba Dam. All white-throated snapping turtles caught were adults.

Mary River turtles were recorded at two sites upstream of Lake Borumba at S22 (Sandy Creek) and S28 (Yabba Creek), as well as downstream of Borumba Dam along Yabba Creek at S15. The individual recorded at site S28 was a juvenile indicating recruitment along this reach. Sandy unconsolidated sediments suitable for nesting were also identified along the S28 reach. There are no previous records either from the DAR survey or other investigations which have recorded Mary River turtles upstream of Lake Borumba.

Table 3-6 Turtles recorded over the Study Area.

				Kingaham Creek			Yabba Creek U/S				Sandy Creek	Unnamed Creek			Borumba Creek		Lake Borumba				Bella Creek	Downstream of Borumba Dam					
				U/S of Lake Borumba			U/S of Lake Borumba				U/S of Lake Borumba	Proposed Upper Storage		U/S of proposed Upper Storage	U/S of Lake Borumba						Yabba Creek Tributary	Yabba Creek D/S				Mary River Yabba Creek Confluence	
																										U/S	D/S
Species	**Common name**	**EPBC Listing**	**NCA Listing**	S21	S4	S24	S3	S5	S28	S23	S22	S1	S20	S2	S25	S9	S6	S7	S8	S11	S26	S12	S27	S14	S15	S17	S19
Chelodina expansa	broad-shelled river turtle						2																				
Elseya albagula	White-throated snapping turtle	CE	CR														1						2				
Elusor macrurus	Mary River turtle	E	E					1	1		1														1		
Emydura krefftii	Krefft's river turtle						S,6			11							2	9	1		14	1			7		1
Wollumbinia latisternum	saw-shelled turtle				O,2	1				3	1									2			3	1		3	
Chelodina longicollis	Eastern long-necked turtle										2																

O = Observed

CE: Critically endangered

CR: Critically endangered

E: Endangered

3.8 PLATYPUS

eDNA detected platypus (*Ornithorhynchus anatinus*) at seven sites. The combined results from both surveys therefore show records of platypus upstream and downstream of Lake Borumba (Table 3-7). Burrow sightings in this event were noted upstream of Lake Borumba where platypus were also detected via eDNA. Despite fyke net deployments at many sites and kayak surveys, platypuses were only caught at S27 downstream of Lake Borumba along Yabba Creek and observed at S23 along Yabba Creek upstream of Lake Borumba.

Table 3-7 Platypus detection.

Waterway/region			Site	Platypus eDNA detection		Platypuses caught or sighted		Burrow Sighting	
				June/July Survey	Present Survey	June/July Survey	Present Survey	June/July Survey	Present Survey
Kingaham Creek	Upstream of Lake Borumba		S21		✓				
			S4		✓			✓	
			S24		✓				✓
Yabba Creek U/S	Upstream of Lake Borumba		S3	✓	✓			✓	
			S5					✓	
			S28						
			S23		✓		✓		✓
Sandy Creek	Upstream of Lake Borumba		S22		✓				
Unnamed Creek	Proposed Upper Storage		S20						
			S1						
	Upstream of proposed Upper Storage		S2						
Borumba Creek	Upstream Lake Borumba		S25						
			S9						
Lake Borumba			S6						
			S7						
			S8						
			S11						
Bella Creek	Yabba Creek Tributary		S26		✓				
			S13	✓					
Downstream of Borumba Dam	Yabba Creek D/S		S12						
			S27				✓		
			S14	✓					
			S15						
			S16						
	Mary River	U/S of Yabba Creek Confluence	S17					✓	
		D/S of Yabba Creek Confluence	S19	✓					

3.9 OTHER AQUATIC ANIMALS

The water-rat (*Hydromys chrysogaster*) was observed upstream of Lake Borumba along Sandy (S22) and Yabba Creeks (S5). There is no threatened status assigned to this species under State or National legislation.

4. CONCLUSION

The current survey built upon our existing knowledge of the aquatic ecological values of the Study Area, particularly regarding the distribution of threatened species. Many findings were consistent with the previous survey, though the following findings are of note as they change some conceptual understandings of the aquatic ecological values of the BPHP:

- Macroinvertebrates in edge habitats within Lake Borumba included taxa richness, abundances, and sensitive taxa percentages within ranges of other regions of the Study Area; however, PET richness was typically lower.
- Despite traversing the entire proposed Upper Storage area and using a variety of survey methods, including eDNA, traditional survey techniques, and visual observation, no fish were detected. In the previous survey, eDNA detected a number of small bodied natives and exotics in the proposed Upper Storage. It is now evident that this was likely laboratory contamination during processing of filters for analysis. All blank filters for assessment of infield contamination have returned no fish DNA during either survey, therefore sample contamination is unlikely during sample collection.
- Relevant to threatened species:
  - Lungfish are restricted to Lake Borumba and downstream extents along Yabba Creek. Recruitment through the Study Area is limited with no juvenile species caught;
  - Mary River cod are distributed throughout the Study Area. Recruitment in the Study Area is evident, with a juvenile caught in the Mary River. A fingerling was also caught in Lake Borumba; however this individual is likely a result of restocking efforts undertaken by the Lake Borumba Fish Stocking Association in conjunction with QLD Hydro. The Lake Borumba survey occurred three weeks post release of Mary River cod fingerling;

- Mary River turtles are distributed throughout the Study Area with the exception of Lake Borumba. Evident recruitment occurs in Yabba Creek upstream of Lake Borumba;
- White-throated snapping turtles are distributed throughout the Study Area. Recruitment in the Study Area is limited with no juvenile species detected;
- Platypus are distributed throughout the Study Area with the exception of Lake Borumba. While no juvenile platypus have been caught, burrow sites likely also represent nesting burrows;
- Conondale spiny crayfish have not been detected in the proposed Upper Storage or the wider Study Area, however following from the crayfish survey, areas of more suitable habitat and burrows were detected during habitat ground-truthing surveys of the Upper Storage. These areas were not included in the initial crayfish surveys due to prior canopy observations from aerial imagery and their accessibility (i.e. allowance of camping site for spotlighting), highlighting a gap in the crayfish survey.

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APPENDIX A. METHODS



The below defines the detailed methods for the additional survey items that were not implemented during the DAR field surveys. Details on the repeated survey methods (habitat condition, passive and active fish, turtles, platypus surveys, macroinvertebrates, microalgae, etc), as per the DAR survey efforts, can be viewed in Hydrobiology (2022).

HABITAT MAPPING

DATA COLLECTION

Ground Truthing

Ground truthing of habitat features were undertaken for the following areas:

- The proposed raised FSL area of the Lower Reservoir (i.e. newly inundated areas) including Kingaham, Yabba and Sandy Creeks; and
- The proposed raised FSL of the Upper Storage.

Active mapping software (AVENZA System) was used to obtain and mark (GPS fix) habitat features while traversing (either on foot or via kayak) each watercourse. An individual was responsible for marking macrohabitat while another was responsible for marking microhabitat. Marked habitat features are detailed in Table 5-1.

Table 5-1 Macro and microhabitat features identified during ground truthing efforts.

Macro habitat	Micro habitat
• Shallow pool (≤0.5 m) - zones of relatively deep, stationary or very slow flowing water over silty, sandy, stony or rocky beds. • Deep pool (>0.5 m) – As per shallow pool, but with greater depth. • Dry pool – as per shallow and dry pool, but without water. • Stepped pool – Such features are dominated by boulders and cobbles that interact to help lock the bed in place. The interlocking of grains results in the formation of steps over which water plunges, enhancing the formation of downstream pools. • Run - a reach of relatively deep (>0.5 m) and fast flowing, unbroken water over a sandy, stony or rocky bed • Shallow run – as per run, though with less depth (≤0.5 m) • Riffle - A reach of relatively steep, shallow (<0.3 m), fast flowing (0.2 m/s) and broken water over stony beds. • Dry riffle – As per rifle, but without water. Bed elevation and evident substrate would limit features such as pool and glides. • Glide - slow-moving, nonturbulent water. A glide is too shallow to be a pool, but the water velocity is too slow to be a run. • Dry glide – as per glide, but without water. Elevation of the bed was too high for pools of any considerable depth to form. • Shallow/dry cascade - a small waterfall, typically one of several that fall in stages down a steep rocky slope	• Large wood debris (LWD) – logs of >15 cm diameter within the instream section of a watercourse. • Undercut banks - a bank that rises vertically or overhangs the watercourse. • Macrophytes - Macrophyte habitats are areas where submergent, semi-emergent and floating aquatic plants are present and can occur in slow to fast flowing areas.

Aerial Imagery Interpretation

Downstream of the Borumba Dam along Yabba Creek and the proposed raised FSL area of the Lower Reservoir along Borumba Creek were mapped via aerial imagery interpretation. Ground truthing of habitats on foot for these areas was not necessary as canopy cover did not prohibit identification of macro and micro habitat features. Two time stamps were used to map macro and micro habitat features downstream of Borumba Dam along Yabba Creek. It was evident that macrophyte distribution and macrohabitat (namely runs and riffles) varied in time, particularly post flood in February 2022. For this reach a pre and post-flood map was produced based on aerial imagery collected in May 2021 and August 2022, respectively. A single time stamp (August 2022) was only available for Borumba Creek.

MAPPING

A digital elevation model (DEM) was used to initially map the high bank margins to define each watercourse. Macro and microhabitat features that were marked in the field were superimposed over the developed watercourse and aerial imagery in ArcPro, polyline, polygon, and point features of the captured features produced. In most instances, mapping of habitat features was consistent, with the following exceptions:

- The downstream reach of Borumba Dam along Yabba Creek was not traversed. Macrophyte mapping along Yabba Creek downstream of Borumba Dam was limited in that species identification was not always possible from aerial imagery. Only floating and semi-emergent forms could be identified from aerial imagery for this reach. In some instance they had to be grouped, due to aquatic plant forms overlapping at the same locality;
- Borumba Creek was not traversed, due to the incised streambanks, the identification of microhabitat and macrophytes was limited given the resolution of the imagery available; and
- In some instances, LWD was present as a conglomerate and was allocated a single point mark.

AQUATIC FAUNA SURVEYS

FISH

KAYAKING

Visual surveys of fish via kayaking were undertaken within the proposed raised FSL (not including areas within the current FSL) of the Lower Reservoir. This included Kingaham, Yabba and Sandy Creeks. These survey methods have been implemented previously by Hydrobiology for Mary River cod and Australian lungfish.

GROUND TRUTHED

In the proposed raised FSL of the Upper Storage, visual inspections for fish were carried out within wetted extents simultaneously with macro and microhabitat mapping.

TURTLES

KAYAKING

Visual surveys of turtles via kayaks were undertaken within the proposed raised FSL (not including areas within the current FSL) of the Lower Reservoir. This included Kingaham, Yabba and Sandy Creeks.

SNORKELLING

Turtles were located visually by snorkelling (500 m transect) along the sides and bottom of streams and captured by hand. Instances where turtles were not captured were also recorded, with species level allocation where possible.

Snorkelling was undertaken during the day.

MUDDLING

In shallow pool (<0.5 m) extents, undercut banks and edge habitats were disturbed to retrieve turtles.

CRAYFISH

Between December 12th to 14th, 2022, a spiny crayfish survey was conducted in the Upper Storage, with a specific emphasis on threatened *Euastacus hystricosus* (Conondale spiny crayfish) and *Euastacus urospinosus* (blackall spiny crayfish). The blackall spiny crayfish is not threatened under NC and EPBC Acts. The survey was carried out by two aquatic ecologists, which included an experienced local spiny crayfish specialist. Several detection techniques were utilised to identify spiny crayfish within the study area, which are described in detail below.

SUITABLE HABITAT GROUND TRUTHING

Prior to ground-based surveys, a desktop assessment was performed using aerial imagery to assess habitat suitability for spiny crayfish in the proposed Upper Storage. The assessment focused on identifying suitable watercourses located above 450 m elevation and enclosed by dense rainforest canopies. Ground truthing surveys were then conducted in the identified areas to locate cool and clear flowing streams with abundant refugia, including crevices, logs, large rocky substrates, and soft sediment banks that are favourable for burrowing. The main objective of these surveys was to identify potential high-occurrence areas of spiny crayfish habitats.

SPOTLIGHTING

Spotlighting surveys were conducted upon dusk and throughout the night within the previously identified suitable habitats. The surveys involved traversing the creek while using high-powered headtorches to illuminate the watercourse and target features such as crevices and burrows. Additionally, small boulders were displaced to inspect for individuals seeking refuge underneath. The spotlighting method was employed to detect spiny crayfish, as they are nocturnal and emerge during the night.

CRAB POTS

During the spotlighting surveys, a total of three crab pots baited with pilchards were deployed within the previously identified areas of interest, usually around 7-8 pm, over a period of three nights. The traps were left in place for four hours and monitored hourly, though some were retrieved early due to the high abundance *of Mixophyes sp*. tadpoles present in the watercourse. These tadpoles quickly consumed the bait, rendering the traps ineffective.

EDNA

Sample collection

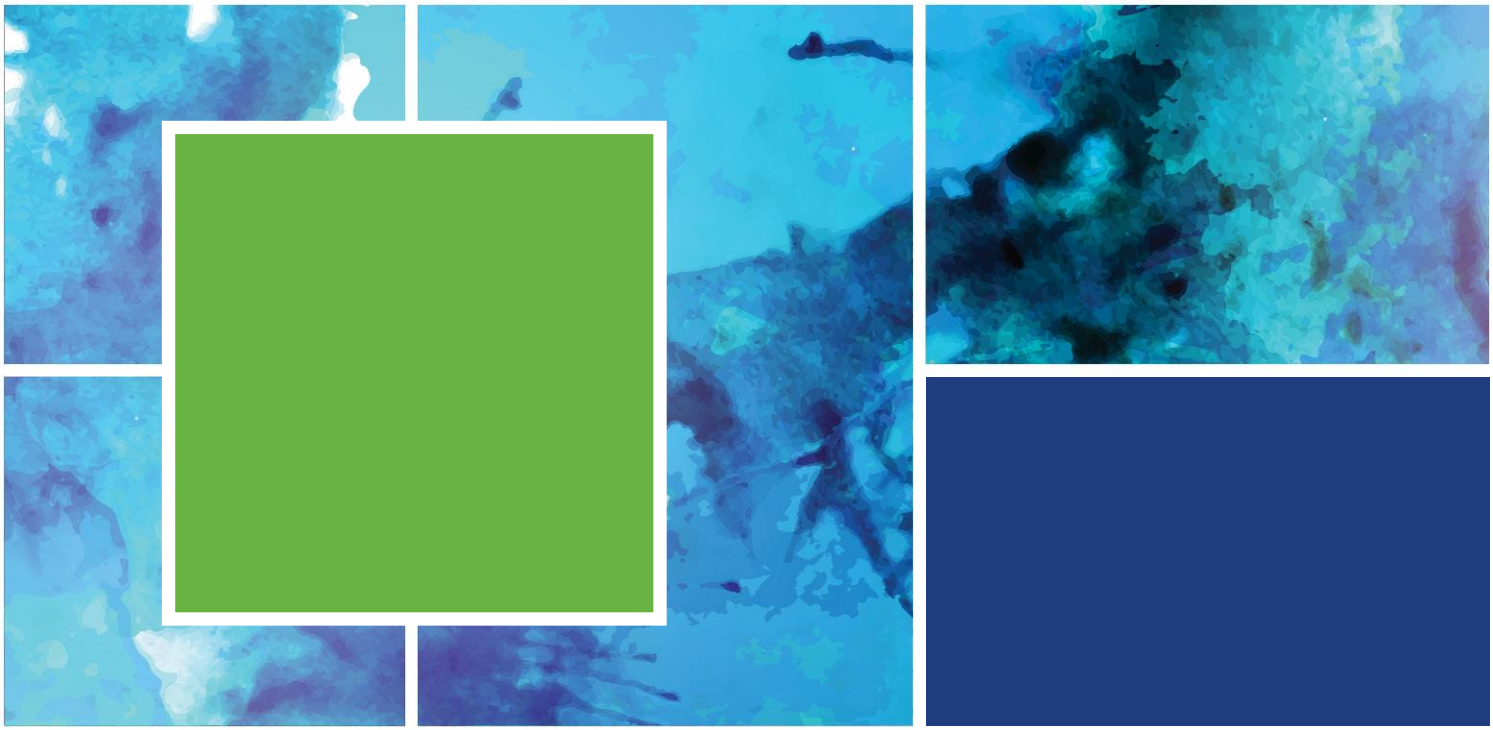
In December 2022 and January 2023, 9 water samples were collected from three sites by Hydrobiology following sampling protocols developed by EnviroDNA. At each site, three samples were taken, using a Smith-Root™ eDNA Sampler (Smith-Root Inc, Vancouver WA, US), by passing up to 5.8 L water through a 5.0 µm Smith-Root self-preserving filter. Four field negatives were also taken for quality control purposes. Filtration was conducted on site to reduce DNA degradation. Clean sampling protocols were

employed to minimise contamination including new sampling equipment at each site, not entering water, and taking care not to transfer soil, water or vegetation between sites. Filters were stored out of sunlight and at ambient temperature before being transported to the laboratory for processing.

DNA was extracted from filters using a commercially available DNA extraction kit (Qiagen Power Soil Pro Kit). Two technical replicates were extracted from each sample and biodiversity assessments were performed on all replicates with a universal and 'MiDeca' (decapod) assay targeting a small region of the 12S mitochondrial. Importantly this assay includes Conondale Spiny Crayfish. Library construction involved two rounds of PCR whereby the first round employed gene-specific primers to amplify the target region and the second round incorporated sequencing adapters and unique barcodes for each sample-amplicon combination included in the library. Negative controls were also included during library construction. Negative controls consisted of the extraction negative as well as PCR negatives where nuclease-free water was used in place of DNA during both rounds of PCR. Sequencing was carried out on an Illumina sequencing platform.

Following quality control filtering to remove primer sequences, truncated reads and low-frequency reads, DNA sequences were clustered into Operational Taxonomic Units (OTUs) on the basis of sequence similarity. Taxonomic assignment was performed with VSEARCH software whereby each OTU cluster was assigned a species identity using a threshold of 95% by comparing against a reference sequence database. Where a species could not be assigned (i.e. reference database was deficient and/or taxa were poorly-characterised), taxonomic assignments were manually vetted by first obtaining a list of possible species through BLASTN searches against the public repository Genbank (www.ncbi.nlm.nih.gov), then eliminating species on the basis of their geographic distribution using information from the Atlas of Living Australia (ALA). In cases where an OTU could not be adequately resolved to a single species (due to shared haplotypes for instance), either a list of multiple species was included, or it was assigned to the lowest taxonomic rank without further classification.

APPENDIX B. HABITAT MAPPING



APPENDIX C. HABITAT STATISTICS

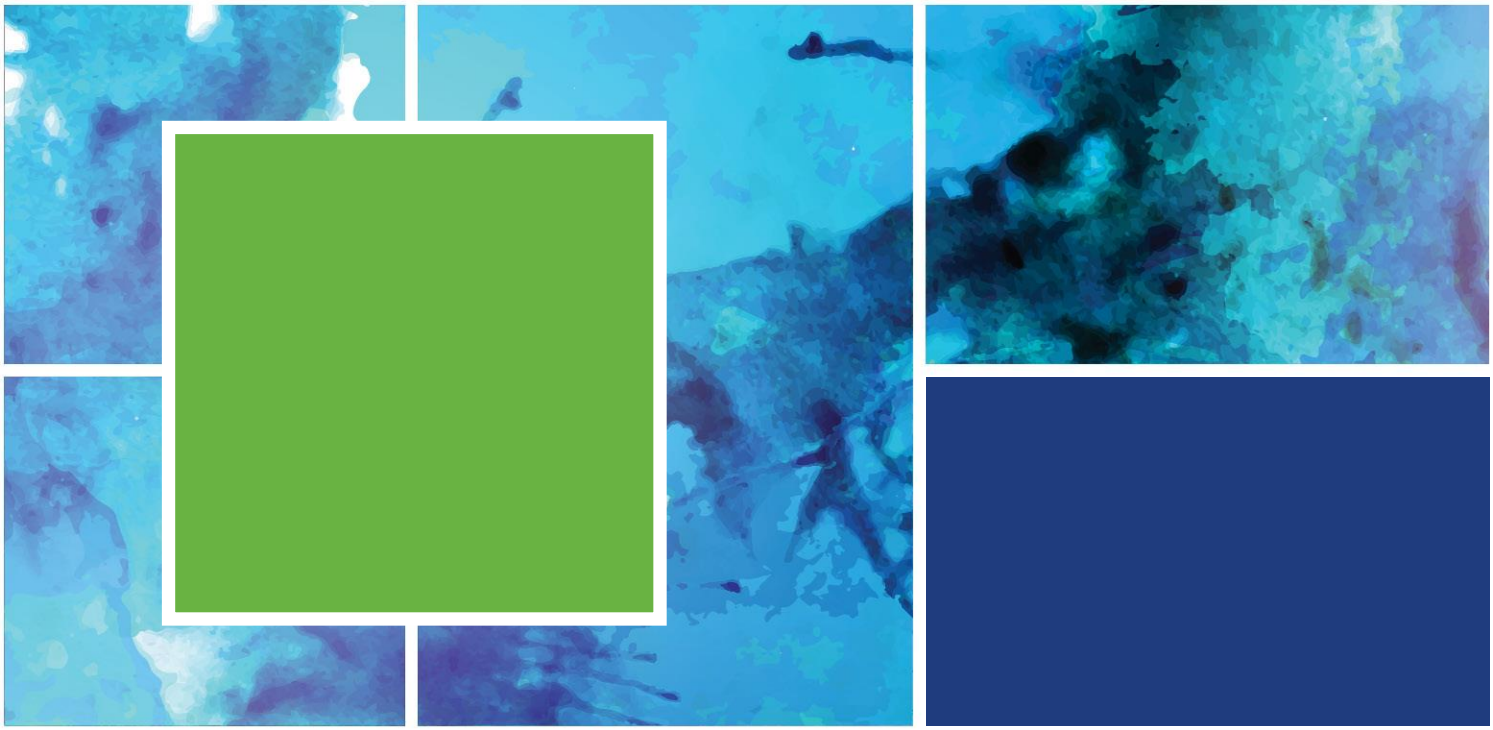


Table 5-2 Macrohabitat recorded from each region. Aerial imagery used to calculate values were collected in June 2022 unless otherwise Units are in m².

Macrohabitat	Proposed Upper Storage	Borumba Creek	Kingaham Creek	Yabba Creek U/S	Yabba Creek D/S	
					May 2021	Jun-Aug 2022
Deep Pool	3306.7	-	95906.1	68125.5	343262.5	346569.4
Dry Glide	503.1	-	-	-	-	-
Dry Pool	22585.6	-	-	-	-	-
Dry Riffle	2056.2	-	-	-	-	-
Shallow Pool	9322.4	-	17979.4	26369.0	-	-
Shallow Riffle	-	7250.1	11461.0	26445.1	-	63419.3
Shallow Run	486.0	-	23806.9	22985.4	-	397316.7
Shallow/Dry Cascade	3334.2	-	-	-	-	-
Stepped Pool	1584.1	-	-	-	-	-
Glide	-	11153.1	-	-	-	-

Table 5-3 Undercut banks recorded from each region. Units are in m².

Microhabitat	Proposed Upper Storage	Borumba Creek	Kingaham Creek	Yabba Creek U/S	Yabba Creek D/S	
					May 2021	Jun-Aug 2022
Undercut Bank	1749.6	*	5972.2	3958.9	*	*

*Could not assess via aerial imagery

Table 5-4 Large Woody Debris points recorded in each region.

	Proposed Upper Storage	Borumba Creek	Kingaham Creek	Yabba Creek U/S	Yabba Creek D/S	
					May 2021	Jun-Aug 2022
Large Woody Debris	158	17	66	247	87	686

Table 5-5 Macrophyte extent recorded in each region. Units are in m.

Species	Proposed Upper Storage	Borumba Creek	Kingaham Creek	Yabba Creek U/S	Yabba Creek D/S	
					May 2021	Jun-Aug 2022
Aponogeton elongatus	-	-	-	1265.8	-	-
Azolla sp.	-	-	-	-	6935.2	-
Bacopa sp.	-	-	3.6	-	-	-
Characeae	-	-	785.4	37.0	-	-
Cycnogeton sp.	-	-	7.2		-	-
Hydrocotyle sp.	-	-	18.9	3.6	-	-
Ludwigia peploides	-	-	787.2	154.7	-	-
Myriophyllum verrucosum	-	-	1.8	732.0	-	-
Nymphaea sp.	-	-	1.8		6935.2	-
Nymphoides sp.	-	-	785.4		6935.2	-
Persicaria sp.	-	-	1.8		-	-
Potamogeton crispus	-	-	1.8	568.0	-	-
Vallisneria nana	-	-	29.5	1004.6	-	-

APPENDIX D. SITE SPECIFIC HABITAT DATA

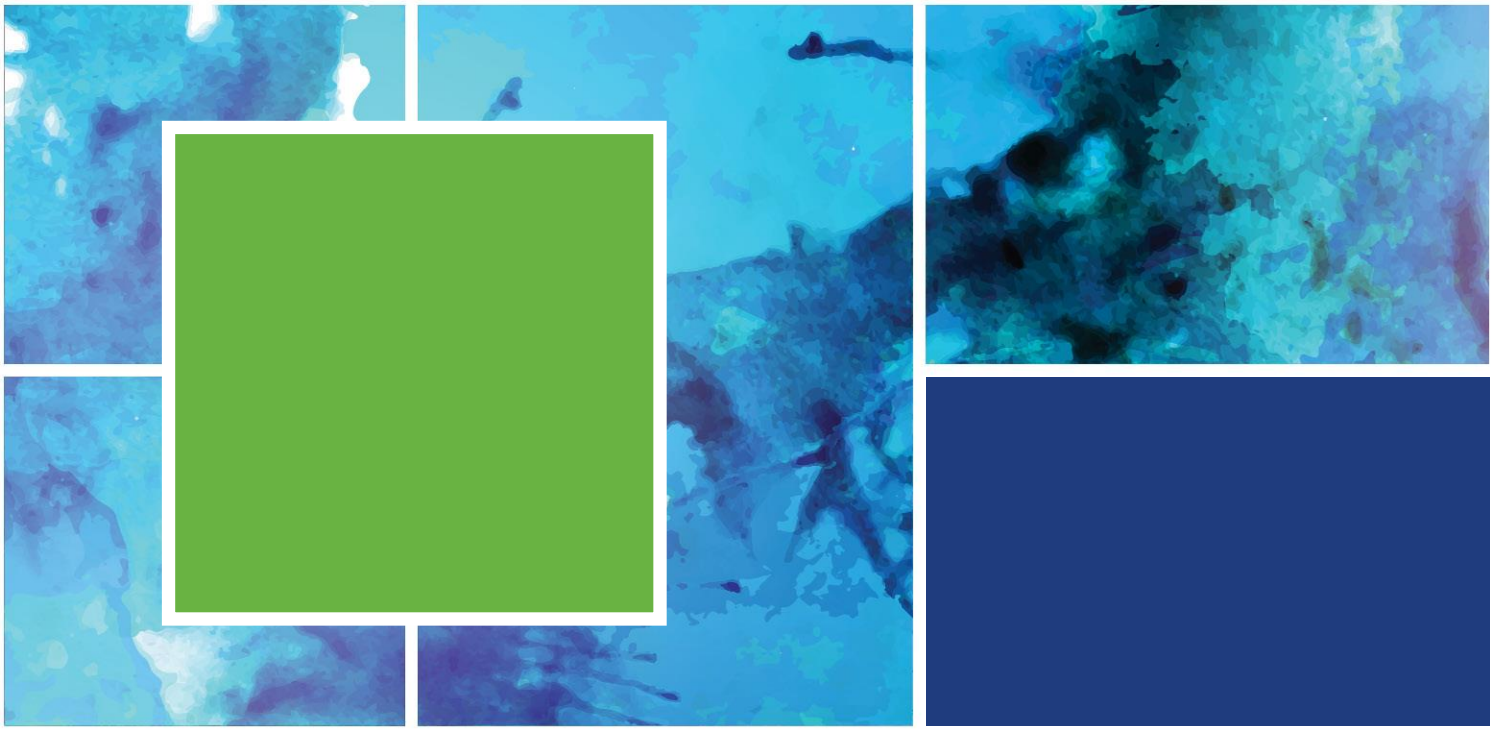


Table 5-6 Habitat reach observations.

Watercourse	Kingaham Creek			Yabba Creek U/S			Sandy Creek	Unnamed Creek	Borumba Creek		Lake Borumba				Bella Creek	Downstream Lake Borumba					
	Upstream of Lake Borumba			Upstream of Lake Borumba			Upstream of Lake Borumba	Proposed Upper Storage	Upstream Lake Borumba						Yabba Creek Tributary	Yabba Creek D/S				Mary River Yabba Creek Confluence U/S	Mary River Yabba Creek Confluence D/S
Site Number	S21	S4	S24	S3	S5	S23	S22	S1	S25	S9	S6	S7	S8	S11	S26	S12	S27	S14	S15	S17	S19
Macrohabitat																					
Riffle (%)	50	30	30	15	80	15	30	0	40	0	0	0	0	0	10	10	10	40	0	30	20
Run (%)	40	40	20	10	0	40	40	0	20	100	0	0	0	0	40	75	30	30	30	50	60
Pool (rocky) (%)	10	20	40	50	10	30	10	60	20	0	0	0	0	0	35	10	50	20	40	10	10
Pool (sandy/silt)(%)	0	10	10	25	10	15	20	20	20	0	100	100	100	100	15	5	20	10	30	10	10
Dry (%)	0		0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0
Microhabitat																					
LWD (>15cm dia)	20	25	25	15	40	15	40	10	0	10	20	20	20	35	10	10	25	30	30	40	20
SWD (<15cm dia)	10	20	15	10	30	10	20	5	5	5	0	0	5	5	25	5	20	10	10	15	15
Detritus	5	20	30	15	15	20	5	15	10	5	0	10	5	15	40		15	10	15	15	10
Periphyton	20	10	5	10	40	5	20	10	5	0	0	0	0	0	10	30	10	5	0	5	5
Blanketing Silt	0	5	5	5	10	5	5	0	5	0	0	0	0	0	5	5	10	5	0	0	0
Undercut Banks	5	15	10	45	10	5	15	0	5	0	0	0	0	0	30	10	35	30	50	25	10
Moss	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0	0	0	0	0
Filamentous algae	30	40	5	20	40		30	15		40	20	20	20	0	10	5	15	25	15	25	35
Macrophytes	0	0	0	10	10		10	0		0	0	80	110	30	40	35	75	75	35	40	0
Bank overhang veg	90	90	20	20	20		10	20		0	0	0	0	0	0	0	0	0	0	0	0
Trailing bank	6	6	20	20	25		10	20		30	35	5	0	0	0	0	0	0	0	0	0
Substrate anoxia	0	0	0	0	0		0	0		0	0	0	0	0	0	0	Yes	0	0	0	0
Canopy Cover (%)	0	0	30	60	70		20	0		10	5	5	0	0	0	5	5	25	0	25	0
Shading (%)	0	0	30	20	60		20	0		20	15	5	0	0	30	5	20	5	0	5	0
Substrate Description																					

Watercourse	Kingaham Creek			Yabba Creek U/S			Sandy Creek	Unnamed Creek	Borumba Creek		Lake Borumba				Bella Creek	Downstream Lake Borumba					
	Upstream of Lake Borumba			Upstream of Lake Borumba			Upstream of Lake Borumba	Proposed Upper Storage	Upstream Lake Borumba						Yabba Creek Tributary	Yabba Creek D/S				Mary River Yabba Creek Confluence	
																				U/S	D/S
Site Number	S21	S4	S24	S3	S5	S23	S22	S1	S25	S9	S6	S7	S8	S11	S26	S12	S27	S14	S15	S17	S19
Bedrock	0	0	15	0	0	30	0	60	0	0	0	0	0	0	0	0	0	0	30	0	0
Boulder (>256mm)		5	10	5	0	5	5	10	0	0	0	0	0	0	15	0	5	5	0	0	5
Cobble (64-256mm)	40	5	10	20	60	5	65	10	10	0	0	0	0	0	15	75	20	10	0	10	10
Pebble (4-64mm)	40	30	15	30	10	10	5	5	30	0	0	0	0	0	25	10	40	20	0	30	10
Gravel (2-4mm)	10	30	35	20	10	25	5	5	20	0	0	0	0	0	20	5	15	40	20	30	30
Sand (0.05-2mm)	10	15	5	5	10	5	15	5	30	95	0	0	0	0	5	5	5	20	20	20	50
Silt/Clay (<0.05mm)	0	15	10	20	10	20	5	5	10	5	100	100	100	100	20	5	15	5	30	10	5
Macrophytes & Algae																					
Macrophyte (%)	20	10	15	10	40	30	15	25	0	10	50	25	25	30	5	0	0	0	0	0	0
Edge (%)	95	70	100	90	80	20	100	100	0	95	30	90	90	90	100	0	0	0	0	0	0
Run (%)	0	0	0	0	0	30	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0
Riffle (%)	5	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pool (rocky) (%)	0	30	0	10	10	40	0	0	0	0	70	10	10	10	0	0	0	0	0	0	0
Algae (%)	30	60	5	10	30	15	20	10	90	5	5	5	5	5	0	90	25	5	10	20	0
Edge (%)	20	20	0	0	0	10	0	50	20	100	0	100	90	100	0	40	30	60	100	100	0
Run (%)	40	10	0	0	50	10	50	0	20	0	0	0	0	0	0	40	30	0	0	0	0
Riffle (%)	40	0	100	0	0	60	0	0	40	0	0	0	0	0	0	10	10	0	0	0	0
Pool (rocky) (%)	0	70	0	100	50	20	50	50	20	0	100	0	10	0	0	10	30	40	0	0	0
Macrophytes																					
Aponogeton elongatus				0	1	40															
Lomandra longifolia	90	70	100	20	75	30	10	100													
Fimbristylis sp.					5																
Cyperus sp.	5				5		20			45	1	5		10							

Watercourse	Kingaham Creek			Yabba Creek U/S			Sandy Creek	Unnamed Creek	Borumba Creek						Bella Creek	Downstream Lake Borumba						
	Upstream of Lake Borumba			Upstream of Lake Borumba			Upstream of Lake Borumba	Proposed Upper Storage	Upstream Lake Borumba		Lake Borumba				Yabba Creek Tributary	Yabba Creek D/S				Mary River Yabba Creek Confluence U/S		Mary River Yabba Creek Confluence D/S
Site Number	S21	S4	S24	S3	S5	S23	S22	S1	S25	S9	S6	S7	S8	S11	S26	S12	S27	S14	S15	S17		S19
Persicaria sp.					1		10															
Juncus sp.					5		10			40	10	10	10									
Ludwigia peploides				20			15			5	20	60	40	60								
Characeae				20	8		10															
Potamogeton crispus				20			10							2								
Potamogeton tricarinatus																						
Schoenoplectus sp.														10								
Lemnoideae										10					100							
Nymphoides indica											30	10	20	10								
Azolla sp.											10	10	10									
Marsilea sp.											20											
Hydrilla verticulata						5					4	5	20	2								
Valisenaria nana		30				20					5			2								
Najas tenuifolia														2								
Bacopa monnieri														2								
Hydrocotyle sp.	5																					
Myriophyllum verrucosum						5																
Riparian Zone Structure																						
Left Bank																						
Width (m)	0	0	0	0	0	0	0	0	0	5	10	10	0	10	0	0	0	0	0	0	0	0
Bare (%)	10	15	0	0	10	0	10	0	50	0	0	0	0	0	30	70	10	30	20	20		30
Grasses (%)	10	5	10	0	20	5	10	0	30	40	40	40	0	10	20	5	5	20	40	15		20

Watercourse	Kingaham Creek			Yabba Creek U/S			Sandy Creek	Unnamed Creek	Borumba Creek		Lake Borumba				Bella Creek	Downstream Lake Borumba					
	Upstream of Lake Borumba			Upstream of Lake Borumba			Upstream of Lake Borumba	Proposed Upper Storage	Upstream Lake Borumba						Yabba Creek Tributary	Yabba Creek D/S				Mary River Yabba Creek Confluence	
																				U/S	D/S
Site Number	S21	S4	S24	S3	S5	S23	S22	S1	S25	S9	S6	S7	S8	S11	S26	S12	S27	S14	S15	S17	S19
Shrubs (%)	5	10	20	10	30	20	10	20	10	30	20	20	0	20	10	5	5	10	1	20	10
Trees <10m high (%)	10	30	40	40	30	35	40	20	5	0	0	0	0	0	20	20	20	20	20	20	20
Trees >10m high (%)	20	40	30	40	10	40	30	60	5	10	40	40	0	60	20	0	60	30	10	25	10
Exotics (%)	55	0	0	0	5	0	10	0	0	20	0	0	0	10	0	10	0	0	0	0	0
Right Bank																					
Width (m)	10	0	0	0	0	0	0	0	0	5	10	10	0	10	0	0	0	0	0	0	0
Bare (%)	10	15	0	5	10	0	10	0	50	0	0	0	0	0	30	80	15	30	60	20	30
Grasses (%)	5	5	10	25	20	5	10	0	30	40	40	40	0	10	20	10	5	20	15	15	20
Shrubs (%)	10	10	20	25	30	20	10	20	10	30	20	20	0	20	10	0	5	10	5	20	10
Trees <10m high (%)	20	30	40	30	30	35	40	20	5	0	0	0	0	0	20	5	20	20	10	20	30
Trees >10m high (%)	55	40	30	20	10	40	30	60	5	10	40	40	0	60	20	5	50	30	10	25	10
Exotics (%)	0	0	0	40	5	0	10	0	0	20	0	0	0	10	0	20	0	0	0	0	0

Table 5-7 Habitat bioassessment results.

Watercourse	Kingaham Creek			Yabba Creek U/S			Sandy Creek	Unnamed Creek	Borumba Creek		Bella Creek	Downstream of Lake Borumba					
	Upstream of Lake Borumba			Upstream of Lake Borumba			Upstream of Lake Borumba	Proposed Upper Storage	Upstream of Lake Borumba		Yabba Creek Tributary	Yabba Creek D/S				Mary River Yabba Creek Confluence	
																U/S	D/S
Site Number	S21	S4	S24	S3	S5	S23	S22	S1	S25	S9	S26	S12	S27	S14	S15	S17	S19
Date	9/12/2022	4/12/2022	24/01/2023	7/12/2022	7/12/2022	23/01/2023	8/12/2022	20/01/2023	24/01/2023	10/12/2022	1/12/2022	30/11/2012	30/11/2012	2/12/2022	1/12/2022	3/12/2022	3/12/2022
Time	10:30	11:00	11:30	14:40	17:00		8:30	11:00	15:00	10:30	12:30	10:00	3:00	1:40		8:30	9:30
Bottom substrate/available cover	18	18	15	16	18	17	17	13	6	5	11	14	19	16	11	17	15
Embeddedness	18	19	17	10	18	17	16	17	11	5	12	10	17	19	10	17	14
Velocity/depth category	12	20	16	14	12	16	14	9	6	3	16	14	11	16	10	16	11
Channel alteration	10	11	13	13	13	11	11	13	4	5	3	12	11	7	7	11	8
Bottom scouring and deposition	8	11	11	13	14	11	12	15	3	10	5	14	6	9	6	12	8
Pool/riffle, run/bend ratio	9	14	13	12	10	12	9	8	2	6	7	10	10	12	7	12	8
Bank stability	10	8	9	7	7	8	6	10	1	6	5	9	6	5	2	6	5
Bank vegeative stability	9	8	9	9	6	9	6	10	0	9	5	2	8	5	3	7	6
Streamside cover	9	10	9	9	7	9	9	10	0	5	5	2	10	5	3	9	9
Total Score	103	119	112	103	105	110	100	105	33	54	69	87	98	94	59	107	84

APPENDIX E. MICROALGAE DATA

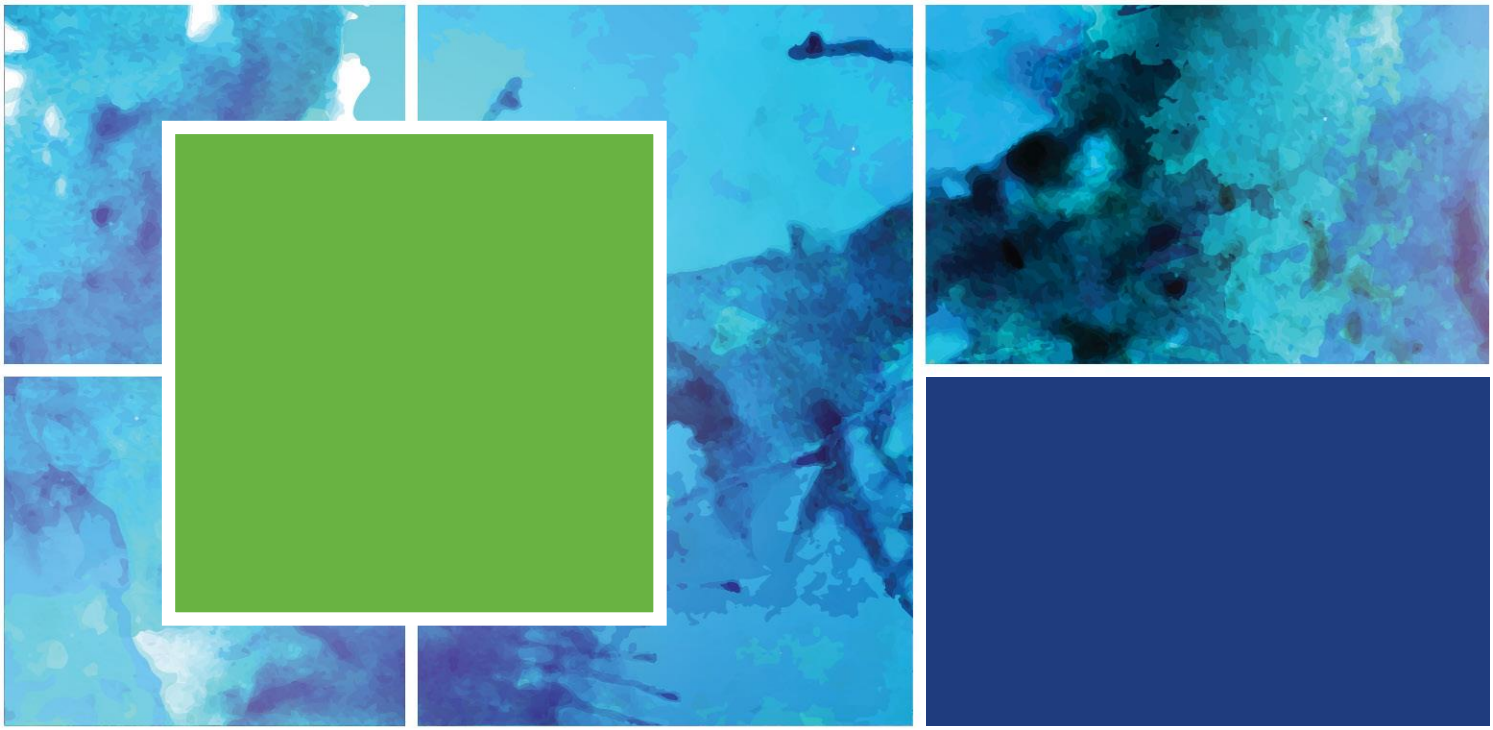


Table 5-8 Microalgae taxa cell counts.

Waterway/region	Kingaham Creek			Yabba Creek U/S			Sandy Creek U/S	Unnamed Creek			Borumba Creek		Lake Borumba				Bella Creek	Downstream of Borumba Dam				Mary River Yabba Creek Confluence	
	Upstream of Lake Borumba			Upstream of Lake Borumba			Upstream of Lake Borumba	Proposed Upper Storage		U/S of proposed Upper Storage	Upstream of Lake Borumba						Yabba Creek Tributary	Yabba Creek D/S				U/S	D/S
Taxa	S21	S4	S24	S3	S5	S23	S22	S2	S20	S1	S25	S9	S6	S7	S8	S11	S26	S12	S27	S14	S15	S17	S19
Achnanthes exigua	18900	13100		16500	34100		11700			10560			8900	7780			9660	23600	13500			15100	
Achnanthes minutissima		26900			26700	48900	23800				11260	17300	10580	10940	13800	13700	22600		37900	9180			
Achnanthes oblongella	6580			11260		29800								6840				18900	15100				
Achnanthes spp	8780	2650	1560	5380	8060	14400	11380		190	1330	2330	6960	6380	4510	7620	9780	2090	12800		7320	3770	7540	750
Achnanthidium minutissimum		8180				19800											7560	57700					
Amphora libyca	9660	15100		850	25900	31700	37400			2030	6720						2760	45300	10740				
Amphora spp																1440				1170	650	2010	
Aulacoseira ambigua		5980								450													
Aulacoseira spp											2670												
Bacillaria spp														150					230				
Caloneis bacillaris	4220			1350				510							520			6640		470	740		
Caloneis spp					2010							2190											820
Cocconeis placentula						2430																	
Cyclotella meneghiniana				1890	1450						2110											3450	
Cymbella aspera																		490					
Cymbella tumida	450	1430		480		8780	3010			390	3050				330			13800				270	
Encyonema spp																		3290					

Waterway/region	Kingaham Creek			Yabba Creek U/S			Sandy Creek U/S	Unnamed Creek			Borumba Creek						Bella Creek	Downstream of Borumba Dam					
	Upstream of Lake Borumba			Upstream of Lake Borumba			Upstream of Lake Borumba	Proposed Upper Storage		U/S of proposed Upper Storage	Upstream of Lake Borumba		Lake Borumba				Yabba Creek Tributary	Yabba Creek D/S				Mary River Yabba Creek Confluence	
Taxa	S21	S4	S24	S3	S5	S23	S22	S2	S20	S1	S25	S9	S6	S7	S8	S11	S26	S12	S27	S14	S15	U/S S17	D/S S19
Entomoneis spp								50															630
Eunotia spp			230	1050								190				880		3710					
Fragilaria construens															370								
Fragilaria spp			2160						140			1340						1130					
Frustulia spp						970																	
Gomphonema spp	650		190																				
Gomphonema truncatum		8760			970	1380					2880				230		630						
Gyrosigma acuminatum	370							180		1930		1880											
Gyrosigma attenuatum	2190	970	930	990	1150	4110	5280	410		4590		5260	510		610				1530	480		680	
Gyrosigma spp												1010		270					620				
Hantzschia amphioxys	11220			2830					270			2980								1380	890	1820	
Hantzschia spp															160								
Hippodonta capitata										1120													
Kobayasiella spp																	240						110
Mastogloia elliptica									210		610												
Melosira spp		560		140		250												510					
Melosira varians																					320		
Navicula erifuga						13100					3690			4460		3890			6180				

Waterway/region	Kingaham Creek			Yabba Creek U/S			Sandy Creek U/S	Unnamed Creek			Borumba Creek		Lake Borumba				Bella Creek	Downstream of Borumba Dam					
	Upstream of Lake Borumba			Upstream of Lake Borumba			Upstream of Lake Borumba	Proposed Upper Storage		U/S of proposed Upper Storage	Upstream of Lake Borumba						Yabba Creek Tributary	Yabba Creek D/S				Mary River Yabba Creek Confluence	
																						U/S	D/S
Taxa	S21	S4	S24	S3	S5	S23	S22	S2	S20	S1	S25	S9	S6	S7	S8	S11	S26	S12	S27	S14	S15	S17	S19
Navicula exigua					9780									1410									
Navicula gregaria																		750					
Navicula radiosa	9560		9540	4830			4370		320	1620			4370	2110				9320	7540	4510	1130	3250	
Navicula spp	3020	3320		1570	5760	7980	3320			1110	1050	2150	2090	1450	1770	2030	450	2430	1820	3320			460
Navicula viridula																250							
Neidium productum							3910															730	
Nitzschia acula										2090													
Nitzschia capitellata														1390									
Nitzschia filiformis						22500	9060								2090			14100	8960				
Nitzschia frustulum													870										
Nitzschia linearis	12700	10900	1790	6780	18800	44300	10900			3710	7760	10720	8220	9160	16600	9180	16100	29800	20900	7980		9380	
Nitzschia sigmoidea				230																			
Nitzschia spp	7840	2860	3940	4020	7780	10700	5680	610	610	1800	2010	3190	3980	3150	3180	6760	3270	9440		2670	2280	7620	2610
Nitzschia subacicularis																							4590
Pinnularia braunii												1670	730		780		3150	1890	850		1280		
Pinnularia spp					1130								250	320									
Placoneis elginensis	2130		470		770	4370				3380											660		
Planothidium rostratum											790												

Waterway/region	Kingaham Creek			Yabba Creek U/S			Sandy Creek U/S	Unnamed Creek			Borumba Creek		Lake Borumba				Bella Creek	Downstream of Borumba Dam				Mary River Yabba Creek Confluence	
	Upstream of Lake Borumba			Upstream of Lake Borumba			Upstream of Lake Borumba	Proposed Upper Storage		U/S of proposed Upper Storage	Upstream of Lake Borumba						Yabba Creek Tributary	Yabba Creek D/S				U/S	D/S
Taxa	S21	S4	S24	S3	S5	S23	S22	S2	S20	S1	S25	S9	S6	S7	S8	S11	S26	S12	S27	S14	S15	S17	S19
Planothidium spp												240									460		
Pleurosigma spp	550	90			290							4590		350					150	290		90	70
Rhoicosphenia abbreviata										2990													
Rhoicosphenia spp																	930			770			
Rhopalodia brebissonii		1050																					
Rhopalodia gibba	15600	45100			11600	11600	22800				9760			1890					12400				
Rhopalodia spp		5620			1270						1850	890								630			
Stephanodiscus minutulus																					850		
Stephanodiscus spp											4930												
Surirella minuta			3510									1070											1050
Surirella spp					550			70									880		1190			950	
Tryblionella coarctata																							490
Tryblionella spp																						430	
Ulnaria acus	110					3510			60		780									370			
Ulnaria ulna	820	1710	640		3870	23900	8720	40	30		3550	3350	440	410	690	950	670	5860	950				410
Total	115350	154280	24960	60150	161940	304480	161330	1870	1830	39100	67800	66980	47320	56590	48750	48860	70990	261460	140560	40540	13030	53320	11990

APPENDIX F. MACROINVERTEBRATE DATA

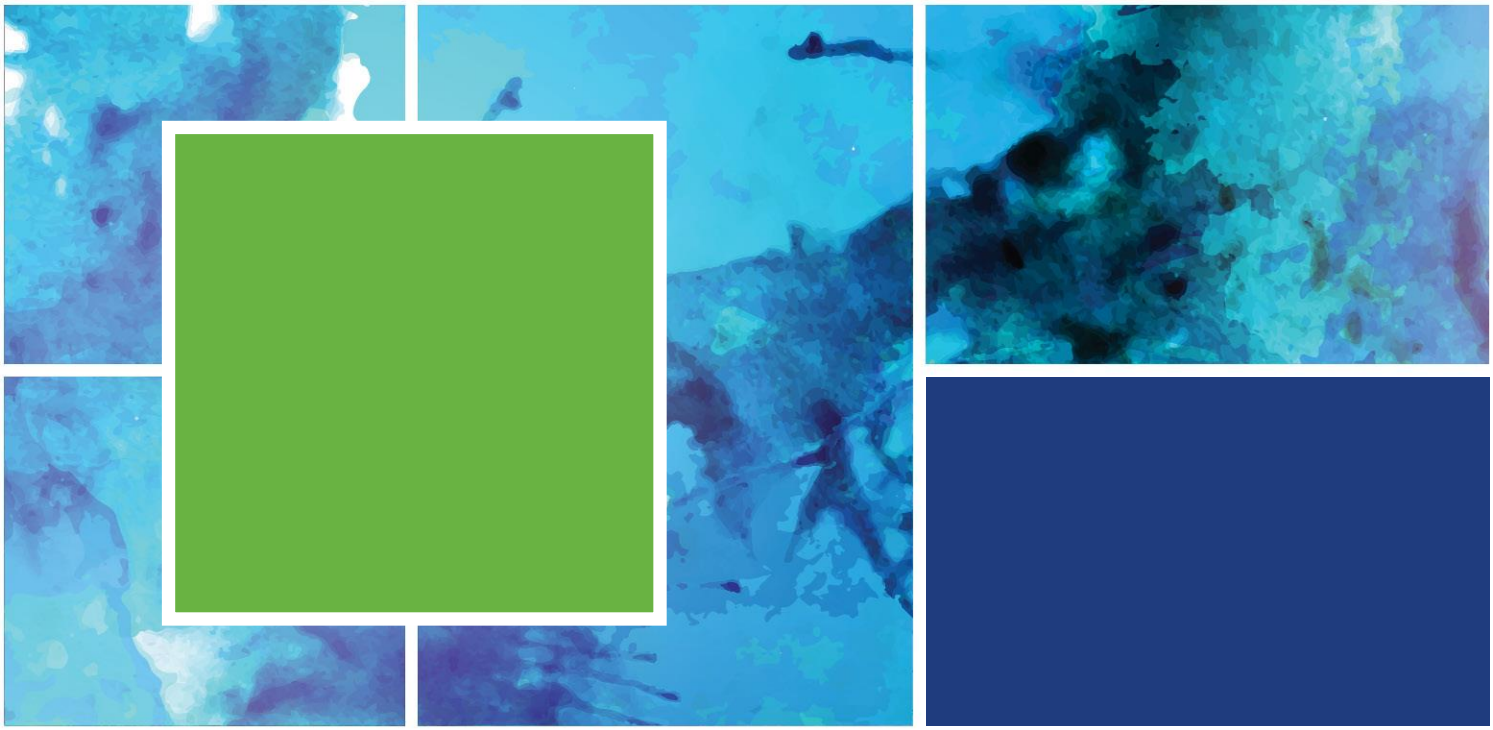


Table 5-9 Macroinvertebrate and microcrustacean family records by site for bed (B) and edge (E) habitats.

Waterway/region	Kingaham Creek						Yabba Creek U/S						Sandy Creek		Unnamed Creek						Borumba Creek				Lake Borumba								Bella Creek		Downstream of Borumba Dam,											
	Upstream of Lake Borumba						Upstream of Lake Borumba						Upstream of Lake Borumba		Proposed Upper Storage				U/S of proposed Upper Storage		Upstream of Lake Borumba												Yabba Creek Tributary		Yabba Creek D/S						Mary River Yabba Creek Confluence U/S		Mary River Yabba Creek Confluence D/S			
Site	S21		S4		S24		S3		S5		S23		S22		S1		S20		S2		S25		S9		S6		S7		S8		S11		S26		S12		S27		S14		S15		S17		S19	
Habitat	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
Acarina	16			16	17		16				46		16	32	48		32	80	5	1									160		16		32	32				1			49			16		
Aeolosomatidae																																														
Araneae	1	5		3						9						5		40			1		23				1		4		16														
Amphipoda																																														
Chiltoniidae																																														
Eusiridae																																														
Melitidae																																														
Neoniphargidae																																														
Paracalliopiidae																																														
Paramelitidae																																														
Perthiidae																																														
Anostraca																																														
Bivalvia																																														
Corbiculidae																																														
Cyrenidae (formerly part of Corbiculiidae)																																														

Waterway/region	Kingaham Creek						Yabba Creek U/S						Sandy Creek		Unnamed Creek						Borumba Creek				Lake Borumba						Bella Creek		Downstream of Borumba Dam,								Mary River Yabba Creek Confluence			
	Upstream of Lake Borumba						Upstream of Lake Borumba						Upstream of Lake Borumba		Proposed Upper Storage				U/S of proposed Upper Storage		Upstream of Lake Borumba										Yabba Creek Tributary		Yabba Creek D/S								U/S		D/S	
Site	S21		S4		S24		S3		S5		S23		S22		S1		S20		S2		S25		S9		S6		S7		S8		S11		S26		S12		S27		S14		S15		S17		S19	
Habitat	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
Hyriidae																																													
Sphaeriidae					4		2	2				352		1				1	1	3																96	32	16				2		16	
Argulidae																																													
Plumatellida																																													
Coleoptera																																													
Carabidae																		1												2															
Chrysomelidae																		2																											
Curculionidae																																								1					
Dytiscidae		18						2			1				2	2	2	5		4	3	5	1	1		18		1			3	1	2	1	1			1	1			11	3		1
Elmidae	180	16	67	96	15	1	18		250	16	113	17	147		16																	501				81	1	53				32	66	195	
Georissidae																																													
Gyrinidae		5	2				1			1					1		9	1						16									9						1					1
Haliplidae																																													
Heteroceridae																																													1
Hydraenidae						2								1		1							1																					
Hydrochidae																																													

Waterway/region	Kingaham Creek						Yabba Creek U/S						Sandy Creek		Unnamed Creek						Borumba Creek				Lake Borumba								Bella Creek		Downstream of Borumba Dam,												Mary River Yabba Creek Confluence			
	Upstream of Lake Borumba						Upstream of Lake Borumba						Upstream of Lake Bormba		Proposed Upper Storage				U/S of proposed Upper Storage		Upstream of Lake Borumba												Yabba Creek Tributary		Yabba Creek D/S												U/S		D/S	
Site	S21		S4		S24		S3		S5		S23		S22		S1		S20		S2		S25		S9		S6		S7		S8		S11		S26		S12		S27		S14		S15		S17		S19	
Habitat	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
Hydrophilidae		3	18		8	8		2	57	6		45	2	1		22	16	17		14	92	3				1		1				21	90	16	4	4	1		1	5	2	14	15	18	4	27
Hygrobiidae																																																
Limnichidae						2																																										
Nanophyidae																																															
Noteridae																																															
Psephenidae	50	52	1	16	1				3		1	19		16			4	1				1											4	4				1										
Ptilodactylidae	1																																														
Scirtidae		16	34	1									8		18	76		1																			2										
Spercheidae																																															
Sphaeriusidae																																															
Staphylinidae		34																																			104			16							1	
Sminthurididae																																															
Decapoda																																															
Atyidae		2		1	26	84		1		1	8	21			2		11	25	11	6						1		10		19		12			1	2		3	1		8	2				
Hymenosomatidae																																															

Waterway/region	Kingaham Creek						Yabba Creek U/S						Sandy Creek		Unnamed Creek						Borumba Creek				Lake Borumba						Bella Creek		Downstream of Borumba Dam,											
	Upstream of Lake Borumba						Upstream of Lake Borumba						Upstream of Lake Borumba		Proposed Upper Storage				U/S of proposed Upper Storage		Upstream of Lake Borumba										Yabba Creek Tributary		Yabba Creek D/S						Mary River Yabba Creek Confluence U/S		Mary River Yabba Creek Confluence D/S			
Site	S21		S4		S24		S3		S5		S23		S22		S1		S20		S2		S25		S9		S6		S7		S8		S11		S26		S12		S27		S14		S15		S17		S19	
Habitat	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
Kakaducarididae																																														
Palaemonidae			1		10							5			1														1		2						1		3		14		5		1			
Parastacidae					3						1	5		2				1	1				1				4		2		2														
Parathelphusidae																																														
Trogloplacidae																																														
Diptera																																														
s-f Aphroteniinae																																														
Athericidae																																	3													
Blephariceridae																																														
Ceratopogonidae			4		10	6	16	33		1		66	51	49		32		16			16	3	16	193	1	37	18	138		1	1	21	53		16		49		7	19			17	48	2	
Chaoboridae																																														
Chironomidae																	85																													
s-f Chironominae	626	108	186	75	142	67	125	78	699	44	152	1460	217	142	82	26		57	9	9	5606	1394	20	118	1	72	3	376	48	522	16	441	17	85	224	291	132	91	393	187	246	176	115	182	232	
Corethrellidae																																														
Culicidae						3									1	57		2																												

Waterway/region	Kingaham Creek						Yabba Creek U/S						Sandy Creek		Unnamed Creek						Borumba Creek		Lake Borumba						Bella Creek		Downstream of Borumba Dam,								Mary River Yabba Creek Confluence			
	Upstream of Lake Borumba						Upstream of Lake Borumba						Upstream of Lake Borumba		Proposed Upper Storage				U/S of proposed Upper Storage		Upstream of Lake Borumba								Yabba Creek Tributary		Yabba Creek D/S								U/S		D/S	
Site	S21		S4		S24		S3		S5		S23		S22		S1		S20		S2		S25		S9		S6		S7		S8		S11		S26		S12		S27		S14		S15		S17		S19	
Habitat	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
s-f Diamesinae																																										
Dixidae						5									17	18																												
Dolichopodidae									71			2	9			1						2																			16			
Empididae													29																														
Ephydridae																						67																					
Muscidae																19										2					1 6									1 6					
s-f Orthocladiinae	1 2 6	3	3	1 7 4	5	1 3	1		60 2	1 9				2	1	16	1	1			11 1	41	1	1	1	5	1	2		1		1 6	1	1	1 6			2 3	1 2 3				17	35	2	
s-f Podonominae																																											
Psychodidae																																						1					
Sciaridae																																											
Sciomyzidae																																											
Simuliidae			1 8	1 6	1 4	8			32 0	5 5 3			34 1										32	19									16				3	6 2					48		
Stratiomyidae														1										16																			
Syrphidae																																											
Tabanidae			1						1				1																										1 6					

Waterway/region	Kingaham Creek						Yabba Creek U/S						Sandy Creek		Unnamed Creek						Borumba Creek				Lake Borumba								Bella Creek		Downstream of Borumba Dam,											
	Upstream of Lake Borumba						Upstream of Lake Borumba						Upstream of Lake Borumba		Proposed Upper Storage				U/S of proposed Upper Storage		Upstream of Lake Borumba												Yabba Creek Tributary		Yabba Creek D/S						Mary River Yabba Creek Confluence U/S		Mary River Yabba Creek Confluence D/S			
Site	S21		S4		S24		S3		S5		S23		S22		S1		S20		S2		S25		S9		S6		S7		S8		S11		S26		S12		S27		S14		S15		S17		S19	
Habitat	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
Tanyderidae																																														
s-f Tanypodinae	51	33	41	5	105	52	112	20	38	4	184	402	62	279	39	66	64	220	19	32	1037	347	32	152	75	85	17	107	83	261	129	20	675	64	68		277	245	3	11	104		37	54	15	
Thaumaleidae																																														
Tipulidae	16	16	4	1	5	1			2		2	35	7			1					2	4	3	5		3											2						50	1		
Ephemeroptera																																														
Ameletopsidae																																														
Baetidae	178	68	151	386	79	86	18		1002	56		169	576	34	33	3	16	32	3	1	64	16	49	259						81		128	65	16			48	32	706	2	16		1	6	352	
Caenidae	290	34	48	237	13	35	116	16	547	96	201	360	115	136	1		1	32	14	6	3029	43	3	161		16		1		34			6612	1	96		50	32	80	4	273	64	64	49	188	
Coloburiscidae																																														
Leptophlebiidae	299	52	58	71	134	90	17		605	21	255	613	620	193	39	32	163	33	15	120	49	53		20						16			586	67	49		703	2	443	3	33		1	2	2	
Nesameletidae																																														
Oniscigastridae																																														
Prosopistomatidae																																														

Waterway/region	Kingaham Creek						Yabba Creek U/S						Sandy Creek		Unnamed Creek						Borumba Creek				Lake Borumba								Bella Creek		Downstream of Borumba Dam,											
	Upstream of Lake Borumba						Upstream of Lake Borumba						Upstream of Lake Borumba		Proposed Upper Storage				U/S of proposed Upper Storage		Upstream of Lake Borumba												Yabba Creek Tributary		Yabba Creek D/S						Mary River Yabba Creek Confluence			
																																					U/S		D/S			
Site	S21		S4		S24		S3		S5		S23		S22		S1		S20		S2		S25		S9		S6		S7		S8		S11		S26		S12		S27		S14		S15		S17		S19	
Habitat	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
Teloganodidae																																														
Gastropoda																																														
Ampullariidae																																														
Ancylidae																																														
Bithyniidae																																														
Glacidorbidae																																														
Hydrobiidae																																														
Lymnaeidae																													1 2 6																	
Neritidae																																														
Physidae																									8																					
Planorbidae																											1		1		1 8		6 4													
Thiaridae							1		2																																					
Viviparidae																																														
Hemiptera																																														
Aphelocheiridae																																														
Belostomatidae																											3		2		2															

Waterway/region	Kingaham Creek						Yabba Creek U/S						Sandy Creek		Unnamed Creek						Borumba Creek				Lake Borumba								Bella Creek		Downstream of Borumba Dam,											
	Upstream of Lake Borumba						Upstream of Lake Borumba						Upstream of Lake Borumba		Proposed Upper Storage				U/S of proposed Upper Storage		Upstream of Lake Borumba												Yabba Creek Tributary		Yabba Creek D/S						Mary River Yabba Creek Confluence			
																																			U/S		D/S									
Site	S21		S4		S24		S3		S5		S23		S22		S1		S20		S2		S25		S9		S6		S7		S8		S11		S26		S12		S27		S14		S15		S17		S19	
Habitat	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
Corixidae (split from Micronectidae)								4																		2								2											
Micronectidae		18	16		24	39	32	177	1	1	46	470	19	151	1			1	30	6	5	4		1		36		39		1		16	257			121	32	125		58	25	177	133	64		29
Dipsocoridae																																													
Gelastocoridae		1																																		1									
Gerridae		20				16				2	1	34			1					2	1			1												2								1
Hebridae																																													
Hydrometridae																		1						1												1									
Leptopodidae																																													
Mesoveliidae																																													
Naucoridae					14																	1							1															
Nepidae																	1	5		1		1												1											
Notonectidae						4		2				54			17	12	9	28	9	7	2	6		1										8							1	3			
Ochteridae																																													
Pleidae																																													
Saldidae																		1					1																							

Waterway/region	Kingaham Creek						Yabba Creek U/S						Sandy Creek		Unnamed Creek						Borumba Creek				Lake Borumba								Bella Creek		Downstream of Borumba Dam,													
	Upstream of Lake Borumba						Upstream of Lake Borumba						Upstream of Lake Borumba		Proposed Upper Storage				U/S of proposed Upper Storage		Upstream of Lake Borumba												Yabba Creek Tributary		Yabba Creek D/S								Mary River Yabba Creek Confluence U/S				Mary River Yabba Creek Confluence D/S			
Site	S21		S4		S24		S3		S5		S23		S22		S1		S20		S2		S25		S9		S6		S7		S8		S11		S26		S12		S27		S14		S15		S17		S19			
Habitat	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
Veliidae						25				2		17	50	50		10		80		3	17	35		16				16		1		35				1		16					17	18				
Hirudinea																																	1								65									
Erpobdellidae																																																	
Glossiphoniidae																																																	
Hirudinidae																																																	
Ornithobdellidae																																																	
Ozobranchidae																																																	
Clavidae																																																	
Hydridae																																																	
Olindiidae																																																	
Isopoda																																																	
Aegidae																																																	
Amphisopidae																																																	
Corallanidae																																																	
Hypsimetopodidae																																																	
Janiridae																																																	
Microparasellidae																																																	

Waterway/region	Kingaham Creek						Yabba Creek U/S						Sandy Creek		Unnamed Creek						Borumba Creek				Lake Borumba								Bella Creek		Downstream of Borumba Dam,											
	Upstream of Lake Borumba						Upstream of Lake Borumba						Upstream of Lake Borumba		Proposed Upper Storage				U/S of proposed Upper Storage		Upstream of Lake Borumba												Yabba Creek Tributary		Yabba Creek D/S						Mary River Yabba Creek Confluence U/S		Mary River Yabba Creek Confluence D/S			
Site	S21		S4		S24		S3		S5		S23		S22		S1		S20		S2		S25		S9		S6		S7		S8		S11		S26		S12		S27		S14		S15		S17		S19	
Habitat	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
Phreatoicidae																																														
Phreatoicopsidae																																														
Ponderellidae																																														
Scyphacidae														1																																
Crambidae	34																1								2		3		5		4															
Nannochoristidae																																														
Corydalidae								1				1					16																	16				1								
Sialidae																																														
Nematoda																																														
Nemertea																																														
Gordiidae																																														
Nevrorthidae																																														
Osmylidae																																														
Sisyridae																																														
Notostraca																																														
Odonata																																														
Aeshnidae																																														

Waterway/region	Kingaham Creek						Yabba Creek U/S						Sandy Creek		Unnamed Creek						Borumba Creek				Lake Borumba								Bella Creek		Downstream of Borumba Dam,											
	Upstream of Lake Borumba						Upstream of Lake Borumba						Upstream of Lake Borumba		Proposed Upper Storage				U/S of proposed Upper Storage		Upstream of Lake Borumba												Yabba Creek Tributary		Yabba Creek D/S						Mary River Yabba Creek Confluence U/S		Mary River Yabba Creek Confluence D/S			
Site	S21		S4		S24		S3		S5		S23		S22		S1		S20		S2		S25		S9		S6		S7		S8		S11		S26		S12		S27		S14		S15		S17		S19	
Habitat	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
Archipetaliidae																																														
Austrocorduliidae																																														
Austropetaliidae																																														
Brachytronidae						2																																								
Calopterygidae																																														
Chorismagrionidae																																														
Coenagrionidae																										6																					
Cordulephyidae																																												1			
Corduliidae																																														
Diphlebiidae																																														
Gomphidae	1		3			2	1	1	1	16		17	2								1	4		32					16								2	2							
Gomphomacromiidae																																														
Hemicorduliidae																																														
Hemiphlebiidae																																														
Hypolestidae																																														
Isostictidae																																														
Lestidae																																														

Waterway/region	Kingaham Creek						Yabba Creek U/S						Sandy Creek		Unnamed Creek						Borumba Creek				Lake Borumba								Bella Creek		Downstream of Borumba Dam,											
	Upstream of Lake Borumba						Upstream of Lake Borumba						Upstream of Lake Borumba		Proposed Upper Storage				U/S of proposed Upper Storage		Upstream of Lake Borumba												Yabba Creek Tributary		Yabba Creek D/S						Mary River Yabba Creek Confluence U/S		Mary River Yabba Creek Confluence D/S	
Site	S21		S4		S24		S3		S5		S23		S22		S1		S20		S2		S25		S9		S6		S7		S8		S11		S26		S12		S27		S14		S15		S17		S19	
Habitat	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
Libellaginidae																																														
Libellulidae	10	68	3	1		1			1	1		17	5	49		1		1	2		88	48		17		2				33		34						1				1	2		
Lindeniidae																																														
Macromiidae																																														
Argiolestidae (formerly Megapodagrionidae)																																														
Oxygastridae																																														
Petaluridae																																														
Platycnemididae																																														
Pseudocorduliidae																																														
Synlestidae																	2	7																												
Synthemistidae																																														
Telephlebiidae																																														
S.O. Epiproctiphora																																														
S.O. Zygoptera					1	1					3	16						64		1	16			1		16		1					1			56			13						
Oligochaeta	32			16	8	3	48	16		16	8				16		32			1	64		16	97		82	16	96		128		33	32	32	32										

Waterway/region	Kingaham Creek						Yabba Creek U/S						Sandy Creek		Unnamed Creek						Borumba Creek				Lake Borumba								Bella Creek		Downstream of Borumba Dam,											
	Upstream of Lake Borumba						Upstream of Lake Borumba						Upstream of Lake Borumba		Proposed Upper Storage				U/S of proposed Upper Storage		Upstream of Lake Borumba												Yabba Creek Tributary		Yabba Creek D/S						Mary River Yabba Creek Confluence U/S		Mary River Yabba Creek Confluence D/S			
Site	S21		S4		S24		S3		S5		S23		S22		S1		S20		S2		S25		S9		S6		S7		S8		S11		S26		S12		S27		S14		S15		S17		S19	
Habitat	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
Plecoptera																																														
Austroperlidae																																														
Eustheniidae																																														
Gripopterygidae			7	16					8				88																																	
Notonemouridae																																														
Polychaeta																																														
Spongillidae																																														
Trichoptera																																														
Antipodoeciidae																																														
Atriplectididae																																														
Calamoceratidae					4	1							19				1				2		2				3								16								1			
Calocidae																																														
Conoesucidae																																														
Dipseudopsidae																																														
Ecnomidae	121	1	1	52	96	9			560		152	48	104	51	3	1	32	2	10	10	151	1		36									113	32	132	64	1		39	5			1	20		
Glossosomatidae																																														

Waterway/region	Kingaham Creek						Yabba Creek U/S						Sandy Creek		Unnamed Creek						Borumba Creek				Lake Borumba								Bella Creek		Downstream of Borumba Dam,											
	Upstream of Lake Borumba						Upstream of Lake Borumba						Upstream of Lake Borumba		Proposed Upper Storage				U/S of proposed Upper Storage		Upstream of Lake Borumba												Yabba Creek Tributary		Yabba Creek D/S						Mary River Yabba Creek Confluence			
																																					U/S		D/S			
Site	S21		S4		S24		S3		S5		S23		S22		S1		S20		S2		S25		S9		S6		S7		S8		S11		S26		S12		S27		S14		S15		S17		S19	
Habitat	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
Helicophidae																																														
Helicopsychidae																							4																							
Hydrobiosidae		17	4		1				75				20										1														1									
Hydropsychidae	542	90	52	36	2				578	13			655										5													1	39						3			
Hydroptilidae	166	54	18	129		1	32	1	32		5	80	21	51					1	4	127	3				1				17					16		1		32							
Kokiriidae																																													
Leptoceridae	116	80	16	77	9	9		38	130	34	5	181	196	201	3	33	3	233		7	18	19		54		7		12		120		84	224	99			277	81	18	81	30	2	9	34	49	
Limnephilidae																																													
Odontoceridae																																													
Oeconesidae																																													
Philopotamidae	3		3										10																								1									
Philorheithridae																																													
Plectrotarsidae																																													
Polycentropodidae																																													
Psychomyiidae																																													

Waterway/region	Kingaham Creek						Yabba Creek U/S						Sandy Creek		Unnamed Creek						Borumba Creek				Lake Borumba								Bella Creek		Downstream of Borumba Dam,								Mary River Yabba Creek Confluence			
	Upstream of Lake Borumba						Upstream of Lake Borumba						Upstream of Lake Borumba		Proposed Upper Storage				U/S of proposed Upper Storage		Upstream of Lake Borumba												Yabba Creek Tributary		Yabba Creek D/S						U/S		D/S	
Site	S21		S4		S24		S3		S5		S23		S22		S1		S20		S2		S25		S9		S6		S7		S8		S11		S26		S12		S27		S14		S15		S17		S19	
Habitat	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E
Stenopsychidae																																														
Tasimiidae																																														
Dugesiidae																																														
Temnocephalidae																																														
Microcrustaceans																																														
Cladocera					2	12					5							16		1		16													16						80						
Conchostraca																																														
Copepoda		16			19	2	80	16			24	64					16	64	80	50	192	49				128			160		368	32	16	32		32			16	561	16		32			
Ostracoda	64				63	7	16	64			25	96		16			240	1328	11	10	16	32		64		144			288		80	16	240	16		432			273	16		16			

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