

Appendix E

Species Observations and Habitat

Common name	Scientific name	Habitat categories	Mapping rules	Associated REs	Mapping criteria/justification	References
Australian Painted Snipe	<i>Rostrata australis</i>	Potential	Interrogate aerial and capture small drainage lines, buffered by 5m, farm dams and the backwaters of the main body of Burumba Dam.	Not associated with REs	The Australian painted snipe occurs in shallow freshwater (occasionally brackish) wetlands, both ephemeral and permanent, such as lakes, swamps and waterlogged grassland/saltmarsh, generally with a good cover of grasses, rushes and reeds and low scrub (Reader's Digest 1997; Marchant and Higgins 1993). It has been recorded at wetlands in all states and territories (Barrett et al. 2003; Blakers et al. 1989) but is more common in eastern Australia. Species requires shallow freshwater wetlands and prefers those with a mosaic of low subaerial vegetation, shallow water and exposed mud (DSEWPC 2019).	<ul style="list-style-type: none"> • Barrett, G., Silcock, A., Barry, S., Cunningham, R. and Poulter, R. (2003). The New Atlas of Australian Birds. Melbourne, Victoria: Birds Australia. • Blakers, M., Davies, S.J.F. and Reilly, P.N. (1984). The Atlas of Australian Birds. Melbourne, Victoria: Melbourne University Press. • Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) (2013). Approved Conservation Advice for <i>Rostrata australis</i> (Australian painted snipe). Canberra: Department of Sustainability, Environment, Water, Population and Communities. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/5917-conservation-advice.pdf. • Marchant, S. and Higgins, P.J. eds. (1993). Handbook of Australian, New Zealand and Antarctic Birds. Volume 2- Raptors to Lapwings. Melbourne, Victoria: Oxford University Press. • Reader's Digest (1997). Reader's Digest Complete Book of Australian Birds. Surry Hills, NSW: Reader's Digest Australia.
Coxen's Fig Parrot	<i>Cyclopsitta diophthalma coxi</i>	Potential	Mapped by relevant vegetation community	12.11.1, 12.11.10, 12.12.16, 12.3.1a	Coxen's fig parrot prefers lowland subtropical rainforests (DCEEW 2023). Within these forests, alluvial areas where figs and other fleshy-fruited trees are prevalent are probably preferred (Martindale 1986; Holmes 1990). Gallery rainforest are considered important habitat (Holmes 1990).	<ul style="list-style-type: none"> • Department of Climate Change, Energy, the Environment and Water (DCEEW) (2023). Conservation Advice for <i>Cyclopsitta diophthalma coxi</i> (Coxen's fig-parrot). Canberra: Department of Climate Change, Energy, the Environment and Water. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/5914-conservation-advice.pdf. • Holmes, G. (1990). The biology and ecology of Coxen's Fig-Parrot. RAOU Report Series. 65. • Martindale, J.D. (1986). A review of literature and the results of a search for Coxen's Fig Parrot in south-east Queensland and north-east New South Wales during 1985. RAOU Report.
Black-breasted button quail	<i>Turnix melanogaster</i>	Potential	Select all areas of remnant rainforest that have: 1) leaf litter score of =>5 (>0.5 cm depth); and 2) sites scoring >2 or more for nesting habitat; and 3) sites with a closed canopy (> canopy cover >70%); or 4) any other patches of vegetation where records are located.	12.11.1, 12.11.10, 12.12.16, 12.3.1a, 12.12.15b	REs selected for the Black-breasted Button-quail (BBBQ) are based on vegetation communities that support the species' required habitat requirements. This includes vine thickets, softwood scrubs, bottom of slopes and the canopy cover of the vegetation. The species is found in rainforest, rainforest plantations and Heaps Pine (<i>Acacia cunninghamii</i>), and Acacia and Acromyrmex scrubs on sandy coastal soils (DCEEW 2023). The species is found in rainforest vegetation type. BBBQ prefer to forage where there is well developed and deep leaf litter. BBBQ prefer to forage with closed canopy and dense mid-storey, providing concealment from predators, but little ground-covering vegetation, and a thick bed of leaf litter and soft fertile soil in which the birds forage for invertebrates. This is why at least 0.5 cm of leaf litter and a canopy of 70% have been used to determine BBBQ habitat.	<ul style="list-style-type: none"> • Department of Climate Change, Energy, the Environment and Water (DCEEW) (2023). National Recovery Plan for Black-breasted Button-quail (<i>Turnix melanogaster</i>). Department of Climate Change, Energy, the Environment and Water, Canberra. Available from: http://www.dceew.gov.au/environment/biodiversity/threatened/publications/recovery/black-breasted-button-quail.
Giant barred frog	<i>Mixophyes iteratus</i>	Potential	All shallow rocky streams with permanent flows in rainforest and other suitable forest communities (Associated REs).	12.3.1, 12.11.1, 12.11.10, 12.12.12, 12.12.16, 12.11.3, 12.11.9, 12.12.15, 12.12.23	Species resides in rainforest and wet sclerophyll forests. They require permanent flowing drainages (rocky streams to slow moving rivers with pools) and prefer deep, damp leaf litter for shelter and foraging (TSC 2021). Most movement is within 50m of stream however their movement can be up to 150m from water (Meyer et al. 2001)	<ul style="list-style-type: none"> • Meyer, E., Hines, H. and Hero, J.M. (2001). Giant Barred-Frog, <i>Mixophyes iteratus</i>. In: Wet Forest Frogs of South-east Queensland. Page(s) 30-31. Gold Coast, Queensland: Griffith University. • Threatened Species Scientific Committee (TSSC) (2021). Conservation Advice <i>Mixophyes iteratus</i> Giant Barred Frog. Canberra: Department of Agriculture, Water and the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/1944-conservation-advice-13112021.pdf.
Glossy black cockatoo	<i>Calyptorhynchus lathami lathami</i>	Breeding	All woodland or forest communities (excluding rainforest) that support large eucalypts and are within 15 km of areas supporting <i>Allocasuarina</i> or <i>Casuarina</i> spp (Foraging habitat). Remnant associated REs only.	12.11.14, 12.11.15, 12.11.3a, 12.11.9, 12.12.12, 12.12.15b, 12.23.23, 12.3.7, 12.16	South-eastern glossy black cockatoos (GBC) are hollow nesters, utilising large hollows in both living and dead eucalypt trees (Higgins 1999). As a surrogate for hollow-bearing trees, the presence of 'large trees' has been used similar to the approach for gliders. Breeding habitat only includes remnant vegetation as large hollow-bearing trees are mostly restricted to remnant communities. As such, breeding habitat is mapped as a 100m radius from the nearest tree between feeding and nesting areas without adversely affecting breeding success. Nesting areas are within 1km of their primary feed tree species, and 200m of permanent water. As such, areas of breeding habitat will only include those within 1km of potential foraging habitat. Individual paddock trees in otherwise cleared areas have been excluded as they are not known to be utilised for nesting by this subspecies. The remnant REs chosen are also those only dominated by eucalypts as rainforest communities will not support suitable hollow-bearing trees required for nesting, or preferred foraging resources.	<ul style="list-style-type: none"> • Department of Climate Change, Energy, the Environment and Water (DCEEW) (2022a). Conservation Advice for <i>Calyptorhynchus lathami lathami</i> (South-eastern Glossy Black Cockatoo). Canberra: Australian Government • Higgins, P. J. Ed. (1999). Handbook of Australian, New Zealand and Antarctic Birds. Volume 4: Parrots to Dollarbird. Oxford University Press, Melbourne.
		Foraging	All remaining vegetation areas (excluding rainforest) that support <i>Allocasuarina</i> and/or <i>Casuarina</i> spp. Remnant, HVR and regrowth Associated REs.	12.11.14, 12.11.15, 12.11.3a, 12.11.9, 12.12.12, 12.12.15b, 12.23.23, 12.3.7, 12.8.16	Foraging habitat for GBC has been determined based on REs that are known to support the presence of food trees, being <i>Allocasuarina</i> and <i>Casuarina</i> species. This has been determined using site based data in BioCondition transects or technical description of a RE in the absence of field data. Both remnant, HVR and regrowth using SLATS data has been used to map foraging habitat. South-eastern glossy black cockatoos feed almost exclusively on the seeds of sheoaks (<i>Allocasuarina</i> spp. and <i>Casuarina</i> spp.), usually relying on one or two species within a region (DCEEW 2022a; Higgins 1999).	<ul style="list-style-type: none"> • Department of Climate Change, Energy, the Environment and Water (DCEEW) (2022a). Conservation Advice for <i>Calyptorhynchus lathami lathami</i> (South-eastern Glossy Black Cockatoo). Canberra: Australian Government • Higgins, P. J. Ed. (1999). Handbook of Australian, New Zealand and Antarctic Birds. Volume 4: Parrots to Dollarbird. Oxford University Press, Melbourne.
Greater glider	<i>Petaurus volans</i>	Denning/foraging	Preference of remnant and regrowth native vegetation that are dominated or sub-dominated by eucalypts. Both remnant and regrowth conditions have been included as denning and foraging habitat. REs that have been selected as Greater Glider denning and foraging habitat are: RE 12.11.14, 12.11.15, 12.11.3(a), 12.11.9, 12.12.12, 12.12.15b, 12.12.23, 12.3.7 and 12.8.16. • Patches of vegetation must be 1 ha minimum size. • The above patches of habitat are then buffered by 100m and within the buffered area, the REs that have been selected as denning habitat (determined by the use of SLATS 2021), that are associated with the above REs, will also be mapped as potential Greater Glider habitat.	12.11.14, 12.11.15, 12.11.3a, 12.11.9, 12.12.12, 12.12.15b, 12.12.23, 12.3.7, 12.8.16	Greater glider denning habitat requires the presence of hollow-bearing trees and greater gliders have a preference for large hollows >10m (DCEEW 2022b). Larger, mature trees are more likely found in remnant vegetation, however it is noted that regrowth vegetation may support trees with a dbh of 30 cm or greater. Therefore denning habitat includes the use of remnant and regrowth REs. REs chosen are those that are dominated by eucalypts and are listed in Appendix B of the Guide to greater glider habitat in Queensland (Eyre et al. 2022). Foraging habitat has been defined as areas of eucalypt dominated remnant and regrowth vegetation that are within 120m from denning habitat. Foraging areas haven't met the definition of denning habitat due to a lack of 'large trees'. They are most likely younger trees that have been hollowed out by the greater glider. These areas are often located near denning areas. There is large variation in methods used to determine home range, but most studies suggested small home ranges <3 ha (Eyre et al. 2022). Greater Glider Conservation Advice states home ranges are typically small between 1 to 4 ha (DCEEW 2022b). Using a 4ha home range, the maximum radius would be 112 metres. So to be conservative we have applied a dispersal distance of 120m from habitat classified as 'denning', assuming a greater glider is moving from the edge of denning habitat they could travel up to 120m from the denning habitat to forage. If there is a clear separation between denning habitat and the foraging distance is more than 100m the isolated patch won't be mapped. This is a very conservative distance, nothing the information outlined in a risk assessment for greater gliders by Department of Agriculture and Fisheries (DAF) which states greater glider being highly volatile and requiring trees for movement (Kavanagh & Lambert 1990), and that they are unable to cross areas of cleared habitat that are wider than 50m (Eyre et al. 2022).	<ul style="list-style-type: none"> • Department of Climate Change, Energy, the Environment and Water (DCEEW) (2022b). Conservation Advice for <i>Petaurus volans</i> (greater glider (southern and central)). Canberra: Australian Government • Eyre, T.J., Smith, G.C., Venz, M.F., Mathieson, M.T., Hogan, L.D., Starr, C., Winter, J. and McDonald, K. (2022). Guide to greater glider habitat in Queensland. Report prepared for DCEEW and Department of Environment and Science, Queensland. • Eyre, T.J., Koch, P. and Khurram, O. (2023). Greater Glider and Yellow-bellied Glider: Risk Assessment. Prepared for Department of Agriculture and Fisheries. • Kavanagh, R.P., Lambert, M.J. (1990). Food selection by the greater glider: is foliar nitrogen a determinant of habitat quality? Australian Wildlife Research 17, 285-299.
Grey-headed flying-fox	<i>Pteropus poliocephalus</i>	Foraging	Grey-headed Flying-fox camps buffered by 40 km and intersect applicable vegetation which comprises: 1) All remnant and high value regrowth (HVR) associated REs. 2) All additional areas of woody vegetation identified by Statewide Landcover And Trees Study (SLATS).	12.3.1a, 12.3.7, 12.8.16, 12.11.1, 12.11.3a, 12.11.9, 12.11.10, 12.11.14, 12.11.15, 12.12.12, 12.12.15b, 12.12.16, 12.12.23	The species is known to forage on a wide variety of tree species and will disperse large distances from their camp each night to find foraging resources. They have been known to fly up to 40 km to feed (Eby 1991). The Grey-headed Flying-fox feeds primarily on blossoms and fruit in canopy vegetation, and supplements its diet with leaves. Major food plants include the fruit and blossom of Eucalyptus, especially <i>Eucalyptus camaldulensis</i> , and <i>Eucalyptus</i> species such as <i>Eucalyptus</i> , <i> Corymbia</i> and <i>Angophora</i> , mulberry, banana, and the fruit and flowers of <i>Psychotria</i> (DAW 2021). All vegetation (remnant and woody regrowth) including all associated REs in the Project area (and within 40km of a known camp) were included as potential foraging habitat. These areas are all likely to support one or more important winter and spring flowering resources so are also considered to meet the definition of 'habitat critical to the survival of the species'. There are no camps in the Exploratory Works Project area. The closest known camp to the proposed exploratory works impact area is a camp to the north near Imbil taken from the national database (DCEEW 2022c).	<ul style="list-style-type: none"> • Department of Agriculture, Water and the Environment (DAW) (2021). National Recovery Plan for the Grey-headed Flying-fox <i>Pteropus poliocephalus</i>. Canberra: Commonwealth of Australia. Available from: http://www.environment.gov.au/biodiversity/threatened/publications/recovery/grey-headed-flying-fox • Department of Climate Change, Energy, the Environment and Water (DCEEW) (2022c). National Flying-fox monitoring viewer. Canberra: Australian Government. Available from: https://www.environment.gov.au/webgis-framework/apps/ffc-wide/ffc-wide.jf • Eby, P. (1991). Seasonal movements of Grey-headed flying foxes from two maternity camps in northern New South Wales. Wildlife Research 18: 547-559.

Common name	Scientific name	Habitat categories	Mapping rules	Associated REs	Mapping criteria/justification	References
Koala		Breeding/Foraging	Habitat comprises the following: <ul style="list-style-type: none"> 1) Regional ecosystems dominated or subdominated by eucalypts (remnant and regrowth) 2) Areas of woody vegetation (e.g. identified by SLATS) that conform to a woodland (>5% cover and >10 trees) associated with REs. 	12.11.14, 12.11.15, 12.11.16, 12.11.19a, 12.11.9, 12.12.12, 12.12.15b, 12.12.23, 12.3.7, 12.8.16	Koalas have a large distribution across eastern Australia, predominantly associated with eucalypt forests containing locally preferred browse tree species. The koala is a specialist folivore with a diet that consists primarily of eucalypt foliage, although it may occasionally browse from other tree genera (Youngentob et al. 2021). Foraging habitat has been defined using REs that are known to provide foraging resources, including highly important koala food trees (UKFT) and areas dominated by eucalypt. Remnant and regrowth areas have been included to map breeding and foraging habitat as koala habitat can include non-remnant areas, and they can forage on younger vegetation. When including non-remnant areas the patch needs to show an estimated >5% canopy cover and more than 10 trees to be considered an area of habitat for 'breeding and foraging' purposes. DCCCEW guidance has been if an area supports group of 10+ more trees, or there is a small area of habitat loss such as 1ha, this may be important to koalas and require a referral (DCCCEW 2024). Other cleared areas, including those that may support individual paddock trees have been included into the 'shelter and dispersal' category.	<ul style="list-style-type: none"> • Department of Climate Change, Energy, the Environment and Water (DCCCEW) (2024). Referral guidance for the endangered koala. Canberra: Australian Government. https://www.dcccew.gov.au/environment/biodiversity/threatened/publications/referral-guidelines-endangered-koala • Youngentob, K.N., Marsh, K.F., Skewes, J. (2021). A review of koala habitat assessment criteria and methods. Report prepared for the Department of Agriculture, Water and the Environment.
		Sheltering/Dispersal	Breeding/Foraging habitat buffered by 5 km and intersect/include all non-remnant areas of vegetation where records are located while excluding: <ul style="list-style-type: none"> 1) Areas of open water (>100m wide in any direction) 2) Large artificial structures such as buildings, fenced compounds or areas with impermeable substrates 3) Areas of dense vegetation (e.g. remnant and regrowth rainforest communities) that do not support eucalypts. 	12.11.14, 12.11.15, 12.11.16, 12.11.9, 12.12.12, 12.12.15b, 12.12.23, 12.3.7, 12.8.16	Koalas can utilise cleared ground between trees and patches to forage, shelter and reproduce. Koalas have been recorded in areas of cleared land, including a 5km buffer around matrix for travelling between trees and patches to forage and shelter, and resources and access to vegetated corridors or paddock trees to facilitate movement between patches. These resources fall within individual koala's home ranges and allow for interaction with adjacent individuals (DAWE 2022). For shelter and dispersal habitat all areas within 5 km of mapped 'breeding and foraging' habitat including cleared land were included. As noted in the review of koala habitat assessment criteria (Youngentob et al. 2021), Koalas make regular movements of between 1 and 3 km, with movements of up to 10km. The adoption of a 5km buffer to capture dispersed koala movement is considered appropriate. A 5km buffer around a koala's home range has captured all woody vegetation in the area which is not already mapped as foraging/breeding habitat. The only areas removed from that are those which are not conducive to koala movement such as large bodies of water, a highly developed/modified area they could not pass through such as a fenced compound or dense vegetation communities they are not considered koala habitat.	<ul style="list-style-type: none"> • Department of Agriculture, Water and the Environment (DAWE) (2022). Conservation Advice for <i>Phascogale cinererea</i> (koala) combined populations of Queensland, New South Wales and Tasmania. Canberra: Department of Agriculture, Water and the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/85104-conservation-advice-koala.pdf • Department of Agriculture, Water and the Environment (DAWE) (2022). National Recovery Plan for the Koala <i>Phascogale cinererea</i> (combined populations of Queensland, New South Wales and the Australian Capital Territory). Department of Agriculture, Water and the Environment. Canberra. Available from: http://www.dcccew.gov.au/environment/biodiversity/threatened/publications/recovery/koala-2022 • Department of Climate Change, Energy, the Environment and Water (DCCCEW) (2024). Referral guidance for the endangered koala. Canberra: Australian Government. https://www.dcccew.gov.au/environment/biodiversity/threatened/publications/referral-guidelines-endangered-koala • Youngentob, K.N., Marsh, K.F., Skewes, J. (2021). A review of koala habitat assessment criteria and methods. Report prepared for the Department of Agriculture, Water and the Environment.
Long-Nosed Potoroo (Northern)	<i>Potorous tridactylus tridactylus</i>	Potential	All woodland and forest communities with a dense understorey (Associated REs), which is essential for shelter and breeding. These areas also support eucalyptus trees, which are associated with the fungi that form an important part of the Long-nosed potoroos diet.	12.3.7, 12.11.1, 12.11.3, 12.11.13, 12.11.9, 12.11.10, 12.11.14, 12.12.12, 12.12.15b, 12.12.16, 12.12.19b, 12.12.23, 12.3.1a	The northern long-nosed potoroos inhabits a range of vegetation types, including rainforest and wet and dry woodland (DAWE 2022), the selected REs are based on these communities which support the species preferred habitat. The species is matrix-sensitive and requires woody habitat with dense vegetation in the shrub or ground layer to provide cover; at a local scale areas of lower vegetation density increase feeding opportunities (Bennett 1990a; Bennett 1990b; Bennett 1993). Due to this, all forest and woodland communities with dense understorey have been used to determine the species habitat.	<ul style="list-style-type: none"> • Bennett, A.F. (1990a). Habitat corridors and the conservation of small mammals in a fragmented forest environment. <i>Landscape Ecology</i> 4, 109–122. • Bennett, A.F. (1990b). Land use, forest fragmentation and the mammalian fauna at Narungga, South-western Victoria. <i>Australian Wildlife Research</i> 17, 325–347. • Bennett, A.F. (1993). Microhabitat use by the long-nosed potoro, <i>Potorous tridactylus</i>, and other small mammals in remnant forest vegetation of south-western Victoria. <i>Wildlife Research</i> 20, 267–285. • Department of Agriculture, Water and the Environment (DAWE) (2022). Conservation Advice for <i>Potorous tridactylus tridactylus</i> (northern long-nosed potoro). Canberra: Department of Agriculture, Water and the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/66645-conservation-advice-1902022.pdf.
Northern Quoll	<i>Dasyurus hallucatus</i>	Potential	12.3.7, 12.11.1, 12.11.3, 12.11.13, 12.11.9, 12.11.10, 12.11.14, 12.12.12, 12.12.15b, 12.12.16, 12.12.19b, 12.12.23, 12.8.16, 12.3.1a	Can occur in almost any wooded habitat	Northern quolls occur in a variety of habitats across their range including almost any wooded habitat (Hill & Ward 2010). Daytime den sites provide important shelter where rocky outcrops, tree hollows, termite mounds, goanna burrows and human dwellings have all been recorded (Dixon & Huxley 1985; Brathwaite 1990; Woodward 2002). The selected REs for the species include many vegetation communities due to their ability to occur within variety of wooded habitats.	<ul style="list-style-type: none"> • Braithwaite, R.W. (1990). Australia's unique biota: implications for ecological processes. <i>Journal of Biogeography</i> 17, 347–354. • Dixon, J.M. and Huxley L. (1985). <i>Donald Thompson's Mammals and Fishes of Northern Australia</i>. Thomas Nelson: Melbourne. • Hill, B.M. & S.J. Ward (2010). National Recovery Plan for the Northern Quoll <i>Dasyurus hallucatus</i>. Department of Natural Resources, Environment, The Arts and Sport, Darwin. Available from: http://www.environment.gov.au/resource/national-recovery-plan-northern-quoll-dasyurus-hallucatus. • Oakwood, M. (2002). Spatial and social organization of a carnivorous marsupial, <i>Dasyurus hallucatus</i>. <i>Journal of Zoology</i>, London, 257:237–248.
Spotted-Tail Quoll	<i>Dasyurus maculatus maculatus</i>	Potential	12.3.7, 12.11.1, 12.11.3, 12.11.13, 12.11.9, 12.11.10, 12.11.14, 12.12.12, 12.12.15b, 12.12.16, 12.12.19b, 12.12.23, 12.8.16, 12.3.1a	Critical habitat associated with rugged terrain (potential dens) which will only occur on land zones 8-12	The Spotted-tailed Quoll is a mainly forest dependent species but occurs in a variety of habitats including closed forests (including temperate and sub-tropical rainforest), tall eucalypt forests, open woodlands, open forests, drier rainforest woodlands and coastal heathlands (Oakwood et al. 2007; TSSC 2020a). The highest densities of the species have been recorded from both wet and dry forest habitats (Watt 1993; Mansergh 1995; Jones & Rose 1996; Belcher 2000; Dawson 2005; Glen & Dickman 2006). During the day Spotted-tailed Quolls sleep in fallen logs, boulder piles, burrows, tree hollows and occasionally under dwellings (Woinarski et al. 2014). The REs selected for the species cover a large range of vegetation communities due to their ability to inhabit a variety of habitats. Critical habitat for the species includes opportunity for dens which occur in land zone 8-12 due to the rugged terrain.	<ul style="list-style-type: none"> • Belcher, C.A. (2000). <i>The Ecology of the Tiger Quoll, Dasyurus maculatus, in south-eastern Australia</i>. Ph.D. Thesis, Melbourne, Victoria: Deakin University. • Dawson, J.P. (2005). Impact of wildfire on the spotted-tailed quoll <i>Dasyurus maculatus</i> in Kosciuszko National Park. M.Sc. Thesis, University College (Australian Defence Force Academy), University of New South Wales. • Glen, A.S. and Dickman, C.R. (2006). Home range, denning behavior and microhabitat use of the carnivorous marsupial <i>Dasyurus maculatus</i> in eastern Australia. <i>Journal of Zoology</i> 268, 347–354. • Glen, M.E. and Rose, R.K. (1996). Preliminary assessment of distribution and habitat associations of the spotted-tailed quoll (<i>Dasyurus maculatus maculatus</i>) and eastern quoll (<i>D. viverrinus</i>) in Tasmania to inform conservation and research status. <i>Nature Conservation Branch, Parks and Wildlife Service</i>. Report to the Tasmanian RFA Environment and Heritage Technical Committee, Hobart, Tasmania. • Mansergh, J.M. (1995). <i>Spotted-tailed Quoll, Dasyurus maculatus</i>. Pp. 51–52 in <i>Mammals of Victoria</i>. Ed. P. W. Menkhorst. Oxford University Press, Melbourne. • Oakwood, M., Foster, P., and Cardoso, M. (2007). Refining the regional habitat model for the Spotted-tailed Quoll <i>Dasyurus maculatus</i>, in the Gosford Local Government Area, New South Wales. Envirotek, Nana Glen. • Threatened Species Scientific Committee (TSSC) (2020a). Conservation Advice <i>Dasyurus maculatus maculatus</i> (southeastern mainland population) Spotted-tailed Quoll, south eastern mainland. Canberra: Department of Agriculture, Water and the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/75184-conservation-advice-01092020.pdf. • Rose, R.K. (1993). Conservation status and draft management plan for <i>Dasyurus maculatus</i> and <i>D. hallucatus</i> in southern Queensland. Department of Environment and Heritage, Queensland.
Yellow bellied glider	<i>Petaurus australis</i>	Denning	Eucalypt dominated vegetation supporting large eucalypts (remnant and regrowth Associated REs). Patches forming a contiguous area of more than 30 ha despite gaps >50 m.	12.11.14, 12.11.15, 12.11.16, 12.11.19a, 12.11.9, 12.12.12, 12.12.15b, 12.12.23, 12.3.7, 12.8.16	A similar approach has been taken as that for greater glider to map denning habitat (Eyre et al. 2022). Both species have similar geographic distributions and occupy similar habitat types throughout eastern Australia (Eyre et al. 2023). Because of its large home range and communal nesting behaviour, the Yellow-bellied Glider (YBG) habitat selection is less driven by the availability of hollow-bearing trees. They have been shown to select in the type of trees they use for nesting, preferring live, smooth barked species, and dead hollow-bearing trees only when live hollow-bearing trees are not available (Eyre et al. 2023). YBGs are found in the rainforests of Queensland and YBGs select habitat with available hollow-bearing trees that are larger than 50 cm DBH (Wormington et al. 2002). YBGs require presence of hollow-bearing trees for denning habitat and these are most likely found in remnant vegetation. However, conservatively denning habitat has widened to include the use of remnant and regrowth REs. REs chosen are those that are dominated by eucalypts and this may include smooth barked species. Patch size has been introduced for YBG as they have a larger home range.	<ul style="list-style-type: none"> • Eyre, T.J., Koch, P., and Khurram, O. (2023). <i>Greater Glider and Yellow-bellied Glider: Risk Assessment</i>. Prepared for Department of Agriculture and Fisheries. and Department of Environment and Science, Queensland. • Goldingay, R.L. (1989). <i>Time Budget and Related Aspects of the Foraging Behavior of the Yellow-bellied Glider, Petaurus australis</i>. Wildlife Research, 16(4): 105–112. CSIRO Publishing: South Clayton, VIC. • Goldingay, R.L. (1994). <i>Loud Calls of the yellow-bellied glider, Petaurus australis</i>-Territorial Behavior by an Arboreal Marsupial. <i>Australian Journal of Zoology</i> 32, 279–293. • Goldingay, R.L. (2012). <i>Characteristics of tree hollows used by Australian arboreal and scarnorial mammals</i>. Australian Journal of Zoology 50, 277–284. • Wormington, K.R., Lamb, D., McCallum, H.J. and Moloney, D.J. (2002). <i>Habitat requirements for the conservation of arboreal marsupials in the dry sclerophyll forests of southeast Queensland</i>. <i>Australian Forest Science</i> 46, 217–227.
		Foraging	All remaining areas of remnant and regrowth vegetation dominated or subdominated by eucalypts (Associated REs) that are: <ul style="list-style-type: none"> 1) Directly connected to Denning habitat, or 2) Have areas of cleared gaps less than 50 m, or 3) Is contiguous with known habitat and includes a record of the species. 3) Where there is a known record in a contiguous area of vegetation adjacent to an area of known habitat this polygon will be mapped 	12.11.14, 12.11.15, 12.11.16, 12.11.19a, 12.11.9, 12.12.12, 12.12.15b, 12.12.23, 12.3.7, 12.8.16	YBG are exudivores with a far more varied diet, but primarily rely on nectar and sap from eucalypts. The YBG has a highly varied diet consisting of a range of food types. Plant and insect exudates (nectar, sap, manna and honeydew) generally form the major components of YBG diet, and these satisfy carbohydrate requirements (Goldingay and Kavanagh 1994; Carthew et al. 1996). Arthropods are also consumed, providing protein (Kavanagh 1987; Goldingay 1994; Quin et al. 1996; Carthew 1999). The widely distributed but locally concentrated nature of glidescitory items often means that YBG traverse large distances when searching for food (Eyre et al. 2023). While nectar resources from eucalypt flowers (especially winter flowering species) tends to be selected most for foraging, it is a highly ephemeral resource and therefore not always available. During times when nectar resources are limited, sap trees become an essential resource (Eyre and Goldingay 2003). Only a small number of trees are selected for sap feeding by YBG and are used repeatedly (Eyre et al. 2023). YBGs are territorial, with home ranges of between 30–40 ha (Goldingay 1994), which are territorially defended by a small family group of individuals. As such, a minimum patch size of 50 ha has been applied.	<ul style="list-style-type: none"> • Carthew, S.M., Goldingay, R.L., and Funnel, D.L. (1999). Feeding behaviour of the yellow-bellied glider (<i>Petaurus australis</i>) at the western edge of its range. <i>Wildlife Research</i> 26, 199–208. • Eyre, T.J. and Goldingay, R.L. (2003). Use of sap trees by the yellow-bellied glider near Maryborough in south-east Queensland. <i>Wildlife Research</i> 30, 229–236. • Eyre, T.J., Koch, P., and Khurram, O. (2023). <i>Greater Glider and Yellow-bellied Glider: Risk Assessment</i>. Prepared for Department of Agriculture and Fisheries. • Goldingay, R.L. (1989). <i>Time Budget and Related Aspects of the Foraging Behavior of the Yellow-bellied Glider, Petaurus australis</i>. Wildlife Research, 16(4): 105–112. CSIRO Publishing: South Clayton, VIC. • Goldingay, R.L. and Kavanagh, R.P. (1991). The yellow-bellied glider: a review of its ecology, and management considerations. In: <i>Conservation of Australia's Forest Fauna</i> (Ed Lunney, Ed Royal Zoological Society of New South Wales, 365–375. • Kavanagh, R.P. (1987). <i>Forest phenology and its effect on foraging behavior and selection of habitat by the yellow-bellied glider, Petaurus australis</i>. <i>Wildlife Research</i> 14, 371–384. • Quin, D., Goldingay, R., Churchill, S., and Engel, D. (1996). Feeding behaviour and food availability of the yellow-bellied glider in North Queensland. <i>Wildlife Research</i> 23: 637–646.

Common name	Scientific name	Habitat categories	Mapping rules	Mapping criteria justification	References
Australian Lungfish	<i>Neoceratodus forsteri</i>	<i>Foraging</i>	<ul style="list-style-type: none"> Deep pool Shallow pool Riffle Large woody debris (must overlap with either deep or shallow pool, or riffle) Overhanging vegetation (must overlap with either deep or shallow pool, or riffle) 	<p>Structural complexity is an important habitat characteristic for both juvenile and adult life stages (Kemp 1995; Brooks & Kind 2002; Kind 2002). Submerged aquatic plants are an important habitat feature for breeding grounds, nursery areas and adult foraging zones (Kind 2002). Australian lungfish (<i>Neoceratodus forsteri</i>) are reported to show a particular preference for shallow, dense macrophyte beds of species including <i>Vallisneria spiralis</i>, <i>Vallisneria gigantea</i>, <i>Hydrilla verticillata</i>, <i>Ludwigia peploides</i>, <i>Nymphaea</i> and <i>Nymphaeoides</i> (Kind 2002; Merrick & Schmida 1984). Woody debris is also believed to be important to Australian lungfish, particularly sub-adult individuals (Kind 2002), though are not utilized as extensively as macrophytes habitats (DAF 2017). Based on the identified records (Figure 1 - attached) and associated habitat attributes for each record, the following order of habitat preferences were identified:</p> <ol style="list-style-type: none"> 1 - 51% of records - Open water dominant, pool habitat with overhanging vegetation and LWD; 2 - 21% of records - Submerged vegetation (macrophyte) dominant, pool habitat with overhanging vegetation, undercut banks and LWD; 3 - 18% of records - Open water dominant, pool habitat with rocky outcrops; and 4 - 10% of records - Riffles. 	<ul style="list-style-type: none"> • Brooks, S.G. and Kind, P.K. (2002). Ecology and demography of the Queensland lungfish (<i>Neoceratodus forsteri</i>) in the Burnett River, Queensland with reference to the impacts of Walla Weir and future water infrastructure development. Queensland Department of Primary Industries. Queensland, Queensland Agency for Food and Fibre Services. • DAF (2017) Paradise Dam – Lungfish and aquatic ecosystem monitoring 2006-2016. Biennial Summary Report 5 and Final Report. • Kemp, A. (1995). Threatened fishes of the world- <i>Neoceratodus forsteri</i> (Krefft 1870) (<i>Neoceratodontidae</i>). Environmental Biology of Fishes. 43:310. • Kind, P. (2002) 'Movement patterns and habitat use in the Queensland lungfish <i>Neoceratodus forsteri</i>', PhD Thesis, University of Queensland. • Merrick, J. and Schmida, G. (1984) Australian freshwater fishes: biology and management. North Ryde.
Mary River Cod	<i>Maccullochella peelii mariensis</i>	<i>Foraging</i>	<ul style="list-style-type: none"> • Deep pool • Shallow pool The following must overlap with either deep or shallow pool, or riffle: <ul style="list-style-type: none"> • <i>Hydrilla</i> sp. beds • <i>Vallisneria</i> sp. beds • Macrophytes (instream submerged and semi-emergent forms) • Boulders 	<p>Submerged aquatic plants are an important habitat feature for breeding grounds and nursery areas. It has been noted that Australian lungfish (<i>Neoceratodus forsteri</i>) spawning is largely restricted to submerged plants (Kemp 1984). Subsequent studies (Brooks & Kind 2002) have demonstrated that Australian lungfish spawning occurs in a diverse range of aquatic, semi-aquatic and submerged plant species. Ribbon weed (<i>Vallisneria</i> sp.) was still the preferred spawning media in flowing conditions and eggs were generally laid in the root systems (Kind 2002).</p> <p>Based on the results of multiple studies (Simpson 1994; Simpson & Mapleston 2002), large individual logs and log piles are favoured, but smaller branches and undercutts are also used. In Obi Obi Creek, where Mary River cod (<i>Maccullochella mariensis</i>) are relatively abundant, undercutts are believed to be utilised as a preferred habitat because snags are largely absent. Juvenile cod tend to use both undercutts and fringing macrophytes for shelter and tend to use shallower habitats compared with adult cod (Simpson & Mapleston 2002). The 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 includes deep and rocky, with little instream timber or overhanging vegetation. Based on the identified records (Figure 2 - attached) and associated habitat attributes (where provided) for each record, the following order of habitat preferences were identified:</p> <ol style="list-style-type: none"> 1 - 54% of records - open water dominant, pool habitat, with overhanging vegetation and LWD; 2 - 23% of records - open water dominant, pool habitat, with overhanging vegetation, rocky outcrops and LWD; and 3 - 23% of records - macrophyte dominant, pool habitat, LWD. 	<ul style="list-style-type: none"> • Brooks, S.G. and Kind, P.K. (2002). Ecology and demography of the Queensland lungfish (<i>Neoceratodus forsteri</i>) in the Burnett River, Queensland with reference to the impacts of Walla Weir and future water infrastructure development. Queensland Department of Primary Industries. Queensland, Queensland Agency for Food and Fibre Services. • Kemp, A. (1984). Spawning of the Australian lungfish, <i>Neoceratodus forsteri</i> (Krefft) in the Brisbane River and in Enoggera Reservoir, Queensland. Mem. Queensl. Mus. 21(2): 391-399. • Kind, P. (2002) 'Movement patterns and habitat use in the Queensland lungfish <i>Neoceratodus forsteri</i>', PhD Thesis, University of Queensland. • Simpson, R. (1994) An investigation into the habitat preferences and population status of the endangered Mary River Cod (<i>Maccullochella peelii mariensis</i>) in Mary River systems, south-eastern Queensland. • Simpson, R. and Mapleston, A. (2002) 'Movements and habitat use by the endangered Australian freshwater Mary River cod, <i>Maccullochella peelii mariensis</i>', Environmental Biology of Fishes, 65(4). doi: 10.1023/A:1021129021451.
Mary River Turtle	<i>Elusor macrurus</i>	<i>Foraging</i>	<ul style="list-style-type: none"> • Deep pool • Shallow pool • Riffle • Undercut banks (must overlap with either deep or shallow pool) The following must overlap with either deep or shallow pool, or riffle: <ul style="list-style-type: none"> • Large woody debris • Overhanging vegetation • Macrophytes (instream submerged and semi-emergent forms) 	<p>The preferred 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 substrates 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 (Collett 2017; Connell 2018). The Mary River Threatened Species Recovery Plan (Australian Government 2016) lists the following to be key habitat substrates and macro and microhabitats that are critical to the survival.</p> <ul style="list-style-type: none"> • In-stream basking rocks and logs; • Deep pools between 1.5 m or above within rivers alongside instream macrohabitat of riffles and shallow stretches; • A variety of instream microhabitat including macrophytes, submerged woody debris. Based on the identified records (Figure 3) and associated habitat attributes for each record, the following order of habitat preferences were identified: <ol style="list-style-type: none"> 1 - 37% of records - Run pool dominant, overhanging vegetation, submerged macrophytes and LWD; 2 - 29% of records - Pool dominant, overhanging vegetation with submerged macrophytes and LWD; 3 - 24% of records - Run riffle dominant, undercut banks, submerged macrophytes and LWD; and 4 - 10% of records - pool riffle dominant. 	<ul style="list-style-type: none"> • Australian Government (2016). Mary River Threatened Species Recovery Plan. Canberra: Australian Government 2016. • Collett, S. (2017) 'Understanding the environmental conditions that dictate the abundance and distribution of two threatened freshwater turtles of South-East Queensland', in. Available at: https://api.semanticscholar.org/CorpusID:230523274. • Connell, M. (2018) Freshwater turtle assemblages of the Mary River (Queensland, Australia), with a focus on the population of the endangered. Charles Darwin University. • Flakus, S. (2002). Ecology of the Mary River Turtle, <i>Elusor macrurus</i>. M.Sc. Thesis. University of Queensland.

Common name	Scientific name	Habitat categories	Mapping rules	Mapping criteria justification	References
		<i>Specific nesting habitat</i>	Unconsolidated sediments within 100 m of pool habitat	Almost all nesting occurs on alluvial sand banks (Connell & Wedlock 2006; Van Kampen 2003), which are often reworked with each significant flooding event (Limpus 2008). The maximum distance nesting has been recorded from the water's edge is 43.6m (Michell-Campbell et al. 2013).	<ul style="list-style-type: none"> Connell, M. and Wedlock, B. (2006) Mary River turtle protection: Tiaro District of Southeast Queensland, 2005-2006 nesting season. Conservation Technical and Data Report. Limpus, C. (2008) 'Freshwater turtles in the Mary River: Review of biological data for turtles in the Mary River, with emphasis on Elusor macrurus and Elseya albogularis.', The State of Queensland. Michell-Campbell, M.A., Baumgartl, T., Booth, D.T., Campbell, H.A., Connell, M. and Franklin, C.E. (2013) Selectivity and repeated use of nesting sites in a freshwater turtle. <i>Herpetologica</i> 69, 383-396. Van Kampen, T., Emerick, S. and Parkes, D. (2003) Increasing the survivorship of Mary river turtle: Tiaro District of Southeast Queensland. Tiaro.
White-throated Snapping Turtle	<i>Elseya albogularis</i>	Foraging	<ul style="list-style-type: none"> Deep pool Shallow pool Run Riffle Large woody debris Undercut banks (must overlap with either deep or shallow pool) <p>The following must overlap with either deep or shallow pool, or riffle:</p> <ul style="list-style-type: none"> Boulders Overhanging vegetation Macrophytes (instream submerged and semi-emergent forms) 	<p>They are known to inhabit both clear (Schaffer et al. 2015) and turbid waters with varying depths and flow rates (Hamann et al. 2007). According to Fitzroy and Mary River catchment records, the white-throated snapping turtle (<i>Elseya albogularis</i>) is regularly associated with shallow riffle zones at night and submerged logs and log jams during the day (Tracey 2017). More recent investigations regarding habitat preferences (Collett 2017) of white-throated snapping turtles in the Mary River indicated no specialisation of habitat variables except for a greater affinity with pebble substrates.</p> <p>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, mid or high density of log jams/submerged boulders, overhanging 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.</p> <p>Based on the identified records (Figure 3) and associated habitat attributes for each record, the following order of habitat preferences were identified:</p> <ol style="list-style-type: none"> 1- 37% of records – Run pool dominant, overhanging vegetation, submerged macrophytes and LWD; 2- 29% of records – Pool dominant, overhanging vegetation, submerged macrophytes and LWD; 3- 24% of records – Run riffle dominant, undercut banks, submerged macrophytes and LWD; and 4- 10% of records – pool riffle dominant. 	<ul style="list-style-type: none"> Collett, S. (2017) 'Understanding the environmental conditions that dictate the abundance and distribution of two threatened freshwater turtles of South-East Queensland', in. Available at: https://api.semanticscholar.org/CorpusID:230523274. Hamann, M., Schäuble, C., Limpus, D., Emerick, S. and Limpus, C. (2007) Management plan for the conservation of Elseya sp. (Burnett River) in the Burnett River Catchment. Brisbane. Schaffer, J.R., Hamann, M., and Rowe, R. (2015). Muddy waters: the influence of high suspended sediment concentration on the diving behaviour of a bimodally respiration freshwater turtle from north-eastern Australia. <i>Marine and Freshwater Research</i>. Tracey, C. (2017). Final Report White-throated snapping turtle recovery actions in the Fitzroy Basin 2017. Report for the Fitzroy Basin Association, Rockhampton.
		<i>Specific nesting habitat</i>	Unconsolidated sediments including areas with grasses within 100 m of pool habitat	Nests occur in sandy-loam banks, they also can occur in loose or compact soils (Hamann et al. 2007; Limpus 2008; Limpus et al. 2011). Ranging from 1-86 m from the water's edge.	<ul style="list-style-type: none"> Hamann, M., Schäuble, C., Limpus, D., Emerick, S. and Limpus, C. (2007) Management plan for the conservation of Elseya sp. (Burnett River) in the Burnett River Catchment. Brisbane. Limpus, C. (2008) 'Freshwater turtles in the Mary River: Review of biological data for turtles in the Mary River, with emphasis on Elusor macrurus and Elseya albogularis.', The State of Queensland. Limpus, C., Limpus, D., Parmenter, C., Hodge, J., Forest, M. and McLachlan, J. (2011) The Biology and Management Strategies for Freshwater Turtles in the Fitzroy Catchment, with particular emphasis on Elseya albogularis and <i>Rheodytes leukops</i>: A study initiated in response to the proposed construction of Rookwood Weir and the raising of Eden Bann Weir. [Brisbane, Qld.]: Dept. of Environment and Resource Management.

Common name	Scientific name	Habitat categories	Mapping rules	Mapping criteria justification	References
Ball Nut	<i>Floydia paealta</i>	Known	100 m buffer around all species records where the buffer falls within area mapped as potential habitat	Individuals may live for more than 100 years, with a juvenile period of 10 years (Queensland CRA/RFA Steering Committee 1997). The plant germinates readily from fresh seed and this is the main reproduction mechanism (DEWHA 2008a). Seed has a viability of approximately three months, and is most likely dispersed by birds (Floyd 1989; Queensland CRA/RFA Steering Committee 1997). Vegetative suckering from the roots can occur (Queensland CRA/RFA Steering Committee 1997).	<ul style="list-style-type: none"> • Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008c). Approved Conservation Advice for <i>Floydia paealta</i> (Ball Nut). Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/1576-conservation-advice.pdf. • Floyd, A.G. (1989). Rainforest Trees of Mainland South-eastern Australia. Melbourne: Inkata Press. • Queensland CRA/RFA Steering Committee (1997). Forest taxa at risk, threats, conservation needs and recovery planning in south-east Queensland. Queensland Government & Commonwealth of Australia.
		Potential	12.11.1, 12.11.10, 12.12.16, 12.3.1a	The Ball nut was found within the Borumba PHEs Survey area on notophyll and microphyll vine forest. Known and potential habitat for the species was further refined and includes complex to simple notophyll and microphyll vine forest on metamorphic substrates and alluvial plains. REs 12.11.1, 12.11.10, 12.12.16, 12.3.1a.	<ul style="list-style-type: none"> • Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008c). Approved Conservation Advice for <i>Floydia paealta</i> (Ball Nut). Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/1576-conservation-advice.pdf. • Floyd, A.G. (1989). Rainforest Trees of Mainland South-eastern Australia. Melbourne: Inkata Press. • Queensland CRA/RFA Steering Committee (1997). Forest taxa at risk, threats, conservation needs and recovery planning in south-east Queensland. Queensland Government & Commonwealth of Australia.
Brush Sophora	<i>Sophora fraseri</i>	Known	30 m buffer around records	Flowering of <i>Sophora fraseri</i> has been recorded in April and from late August to mid November. Fruiting has been recorded in January, April, July-August and November (Barker & Borsboom 1997b; Wearne 2012). Regeneration after fire from soil seed bank, grazing by livestock: inappropriate fire regimes as too frequent fire depletes the soil seed banks; and localised extinction of small populations (Forster et al. 1991; Barker & Borsboom 1997b).	<ul style="list-style-type: none"> • Barker, M. and Borsboom, A. (1997b). <i>Sophora fraseri</i> Species Management Profile. Department of Environment and Resource Management • Forster, P.I., Bostock, P.D., Bird, L.H. and Bean, A.R. (1991). Vineforest Plant Atlas for South-East Queensland with Assessment of Conservation Status. Indooroopilly: Queensland Herbarium. • Wearne, L. (2012). Species profile—<i>Sophora fraseri</i> (brush sophora). Department of Environment and Science. Brisbane: Queensland Government
		Potential	In addition to the associated RE's listed below, the adjacent / contiguous vegetation community that intersects a known record will be included as potential habitat. 12.11.1, 12.11.3, 12.11.3a, 12.11.10, 12.12.16, 12.3.1a	<i>Sophora fraseri</i> grows in moist habitats, often in hilly terrain at altitudes from 60–660 m on shallow soils along rainforest margins in eucalypt forests or in large canopy gaps in closed forest communities (DEWHA 2008b; Halford 1998). Rainforest, moist and wet sclerophyll forest may support this species. The revised habitat mapping rules reflect the ability of this species to establish in areas of disturbance and on the margin of a range of vegetation communities and accounts for some of the uncertainty around this.	<ul style="list-style-type: none"> • Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008). Approved Conservation Advice for <i>Sophora fraseri</i>. Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/883e-conservation-advice.pdf • Halford, D.A. (1998). Survey of Threatened Plant Species in south east Queensland Biogeographical Region. Queensland CRA/RFA Steering Committee. Queensland Department of Environment. http://www.daff.gov.au/_data/assets/pdf_file/0004/49738/qld_se_eh113.pdf
-	<i>Coleus omissus</i> (syn. <i>Plectranthus omissus</i>)	Potential	Rocky outcrops within 100m either side of rainforest ecotones in 12.11.1, 12.11.3, 12.11.3a, 12.11.10, 12.12.16, 12.12.23, 12.3.1a	<i>Plectranthus omissus</i> grows on rock outcrops in eucalypt open forest and adjacent to vine forest (Booth 2012b; DEWHA 2008g). The species is strongly associated with rainforest and wet sclerophyll forest on land zones 11 and 12. This is why the mapping has used a 100m buffer either side of the rainforest ecotones.	<ul style="list-style-type: none"> • Booth, R. (2012b). Species profile—<i>Plectranthus omissus</i>. Department of Environment and Science. Brisbane: Queensland Government. • Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008g). Approved Conservation Advice for <i>Plectranthus omissus</i>. Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/55729-conservation-advice.pdf
-	<i>Coleus torrenticola</i>	Known	30 m buffer around records	<i>Plectranthus torrenticola</i> flowering occurs in February–April and is believed to be fire-sensitive. Like many <i>Plectranthus</i> species, <i>P. torrenticola</i> produces roots from branch nodes where the branches come in contact with the soil surface (DEWHA 2008h). Pollinators are suggested to be bees and flies, as these are the most common pollinators for other <i>Plectranthus</i> species (Halford 1998). Potential habitat is based on species microhabitat modelling. Lidar data was interrogated to map sharp changes in topography which are indicative of rocky outcrops. As this species has only been recorded in association with rocky outcrops within 20 m of watercourses, a buffer was applied to watercourses which also contain rocky outcrops to map the extent of suitable habitat. These areas also had to intersect with rainforest or wet sclerophyll forest. These areas are considered potential habitat.	<ul style="list-style-type: none"> • Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008h). Approved Conservation Advice for <i>Plectranthus torrenticola</i>. Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/55728-conservation-advice.pdf • Halford, D.A. (1998). Survey of Threatened Plant Species in south east Queensland Biogeographical Region. Queensland CRA/RFA Steering Committee. Queensland Department of Environment. http://www.daff.gov.au/_data/assets/pdf_file/0004/49738/qld_se_eh113.pdf
		Potential	Rocky outcrops within 20m of a watercourse. These areas also need to be associated with rainforest and wet sclerophyll forests. In addition to this, the immediately adjoining/contiguous supporting vegetation community where a record is located is included as potential habitat.	<i>Plectranthus torrenticola</i> grows at altitudes of 250–450 m above sea level, in open heathland on rock outcrops (DEWHA 2008h); in eucalypt open forest close to margins of rainforest; and often along creek lines (Forster 1992; Halford 1998). This is why a 20m buffer has been applied to watercourses of the associated habitat REs.	<ul style="list-style-type: none"> • Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008h). Approved Conservation Advice for <i>Plectranthus torrenticola</i>. Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/55728-conservation-advice.pdf • Forster, P.I. (1992). Five new species of <i>Plectranthus</i> L. Herit. (Lamiaceae) from Queensland. Austrobaileya. Vol. 3(4), 729–740. • Halford, D.A. (1998). Survey of Threatened Plant Species in south east Queensland Biogeographical Region. Queensland CRA/RFA Steering Committee. Queensland Department of Environment. http://www.daff.gov.au/_data/assets/pdf_file/0004/49738/qld_se_eh113.pdf
Macadamia Nut	<i>Macadamia integrifolia</i>	Potential	12.11.1, 12.11.10, 12.12.16, 12.3.1a	The Macadamia Nut reaches maturity at around ten years, and has a juvenile period of over six years (Queensland CRA/RFA Steering Committee 1997). This species has been recorded flowering in January, March and June (Forster et al. 1991) to November (Barry & Thomas 1994; Gross 1995; Stanley & Ross 1986). Fruits have been recorded from November–January and March–April (Barry & Thomas 1994; Forster et al. 1991). Macadamia Nuts begin to produce viable nut loads at around 10 years of age (Blundell 1998). Reproduction is by seed, with a seed viability of 3–6 months. The seeds are eaten by mammals and are dispersed by stream (DEWHA 2008d). The plant resprouts when damaged (Queensland CRA/RFA Steering Committee 1997).	<ul style="list-style-type: none"> • Barry, S.J. and Thomas, G.T. (1994). Threatened Vascular Rainforest Plants of South-east Queensland: A Conservation Review. Queensland Department of Environment and Heritage. • Blundell, R. (1998). Australia's most delicious bush nut: Macadamia Nuts. Canberra: Australian National University. Available from: http://fennerschool-associated.anu.edu.au/ftp/nwfp/macanut/macanut.html#cul • Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008d). Approved Conservation Advice for <i>Macadamia integrifolia</i> (Macadamia Nut). Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/7326-conservation-advice.pdf • Forster, P.I., Bostock, P.D., Bird, L.H. and Bean, A.R. (1991). Vineforest Plant Atlas for South-East Queensland with Assessment of Conservation Status. Indooroopilly: Queensland Herbarium. • Gross, C.L. (1995). Macadamia. In: Orchard, A.E. & P.M. McCarthy, eds. Flora of Australia. 16:419–425. Canberra: ABRS and Melbourne: CSIRO. • Queensland CRA/RFA Steering Committee (1997). Forest taxa at risk, threats, conservation needs and recovery planning in south-east Queensland. Queensland Government & Commonwealth of Australia. • Stanley, T.D. and Ross, E.M. (1986). Flora of south-eastern Queensland. Volume Two. Brisbane, Queensland: Department of Primary Industries.

Common name	Scientific name	Habitat categories	Mapping rules	Mapping criteria justification	References
Native guava	<i>Rhodomyrtus psidioides</i>	Known	30 m buffer around records	Known records have been buffered by 30 m to account for the known tendency for this species to create sucker fields around a mature individual (TSSC 2020c).	<ul style="list-style-type: none"> • Threatened Species Scientific Committee (TSSC) (2020c). Conservation Advice <i>Rhodomyrtus psidioides</i> Native Guava. Canberra: Department of Agriculture, Water and the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/19162-conservation-advice-12122020.pdf.
		Potential	12.11.1, 12.11.10, 12.12.16, 12.3.1a, 12.12.15, 12.12.15b	Rhodomyrtus psidioides is a rainforest specialist which grows in temperate to sub-tropical rainforest as well as rainforest margins (TSSC 2020c). The REs selected for the habitat mapping are consistent with the known habitat requirements for the species. The restriction to 150m from a stream within a previously unmapped habitat type is reflective of the records made by field ecologists on the site that have recorded the species in close association with gullies.	<ul style="list-style-type: none"> • Threatened Species Scientific Committee (TSSC) (2020c). Conservation Advice <i>Rhodomyrtus psidioides</i> Native Guava. Canberra: Department of Agriculture, Water and the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/19162-conservation-advice-12122020.pdf.
Scrub turpentine	<i>Rhodamnia rubescens</i>	Known	30 m buffer around records	Fruits appear in December in the Sydney region (TSSC 2020b). The species is able to resprout from rootstock after fire and produce suckers which may develop into thickets (Benson and McDougall 1998). Soil-stored seed banks are unlikely to be extensive for this species given its affinity for rainforest environments with high litter decomposition rates (TSSC 2020b). The inferred median time to germination of seed is 1.5 months being described as "1-2 months" (Benson and McDougall 1998).	<ul style="list-style-type: none"> • Benson, D. and McDougall, L. (1998). Ecology of Sydney plants. Part 6: Dicotyledon family Myrtaceae. Cunninghamia 5, 809–986. • Threatened Species Scientific Committee (TSSC) (2020b). Conservation Advice <i>Rhodamnia rubescens</i> Scrub Turpentine. Canberra: Department of Agriculture, Water and the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/15763-conservation-advice-11122020.pdf
		Potential	12.11.3, 12.11.10, 12.11.14, 12.12.15, 12.12.15b, 12.12.16.	Occurrences of <i>R. rubescens</i> are contiguous along the entire range of the species with no significant disjunctions. <i>R. rubescens</i> has a large geographic distribution. The extent of occurrence (EOO) was estimated to be 147,340 km ² (TSSC 2020b). The species commonly occurs in all rainforest subforms except cool temperate rainforest. The species occupies a range of volcanically derived and sedimentary soils and is a common pioneer species in eucalypt forests (TSSC 2020b). Populations and individuals of <i>R. rubescens</i> are often found in wet sclerophyll associations in rainforest transition zones (including open forest of <i>Eucalyptus tereticornis</i> and <i>E. bosistoana</i> in the Sydney region) and creekside riparian associations. All records of this species were reviewed to determine the associated REs, and it is limited to RE 12.11.3, 12.11.10, 12.11.14, 12.12.15, 12.12.15b, 12.12.16. Remnant and regrowth areas of these REs are considered potential habitat.	<ul style="list-style-type: none"> • Threatened Species Scientific Committee (TSSC) (2020b). Conservation Advice <i>Rhodamnia rubescens</i> Scrub Turpentine. Canberra: Department of Agriculture, Water and the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/15763-conservation-advice-11122020.pdf
Small-Fruited Queensland Nut	<i>Macadamia ternifolia</i>	Potential	12.11.1, 12.11.10, 12.12.16, 12.3.1a	The Small-fruited Queensland Nut can live for over 100 years, with a juvenile period of six years (Queensland CRA/RFA Steering Committee 1997). Flowering in the species has been recorded from June to October with fruits from December to March (Barry & Thomas 1994; Forster et al. 1991). Pollination occurs via both native (<i>Trigona</i> spp.) and introduced European (<i>Apis mellifera</i>) honey bees (Costello et al. 2009). The Small-fruited Queensland Nut reproduces from seed, which remains viable for one to six months (DEWHA 2008e), and seeds are dispersed by streams or rodents (Barry & Thomas 1994; Queensland CRA/RFA Steering Committee 1997). Seedlings have only occasionally been recorded during surveys of wild populations (Barry & Thomas 1994). Adult plants are recorded to resprout when damaged (Queensland CRA/RFA Steering Committee 1997).	<ul style="list-style-type: none"> • Barry, S.J. and Thomas, G.T. (1994). Threatened Vascular Rainforest Plants of South-east Queensland: A Conservation Review. Queensland Department of Environment and Heritage. • Costello, G., Gregory, M. and Donatiu, P. (2009). Southern Macadamia Species Recovery Plan. Report to Department of the Environment, Water, Heritage and the Arts. Canberra by Horticulture Australia Limited, Sydney. Available from: http://www.environment.gov.au/biodiversity/threatened/recovery-plans/southern-macadamia-species-recovery-plan.pdf. • Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008e). Approved Conservation Advice for <i>Macadamia ternifolia</i> (Small-fruited Queensland Nut). Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/7214-conservation-advice.pdf • Forster, P.I., Bostock, P.D., Bird, L.H. and Bean, A.R. (1991). Vineforest Plant Atlas for South-East Queensland with Assessment of Conservation Status. Indooroopilly: Queensland Herbarium. • Queensland CRA/RFA Steering Committee (1997). Forest taxa at risk, threats, conservation needs and recovery planning in south-east Queensland. Queensland Government & Commonwealth of Australia.
Three-Leaved Bosistoa	<i>Bosistoa transversa</i>	Known	100 m buffer around all species records where the buffer falls within area mapped as potential habitat	Flowering occurs from January to May (Floyd 1989; Harden 1991; Harden 2002; Stanley & Ross 1983) and ripe fruits are present from May to November (Floyd 1989). Germination is noted as erratic (DEWHA 2008b). The fruit is hard, ribbed and egg-shaped with a flattened end, and contain a single kidney-shaped seed (Booth 2012a; NSW OEH 2012).	<ul style="list-style-type: none"> • Booth, R. (2012a). Species profile—<i>Bosistoa transversa</i> (three-leaved bosistoa). Department of Environment and Science. Brisbane: Queensland Government. • Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008b). Approved Conservation Advice for <i>Bosistoa transversa</i> s. lat. (Three-leaved Bosistoa). Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/78841-conservation-advice.pdf • Floyd, A.G. (1989). Rainforest Trees of Mainland South-eastern Australia. Melbourne: Inkata Press. • Harden, G.J. ed. (1991). Flora of New South Wales, Volume Two. Kensington, NSW: University of NSW Press. • Harden, G.J. ed. (2002). Flora of New South Wales, Volume Two - rev. edn. University of New South Wales Press, Sydney. • NSW Office of Environment and Heritage (NSW OEH) (2012). Yellow Satinheart - profile. Available from: http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.asp?id=10103 • Stanley, T.D. and Ross, E.M. (1983). Flora of south-eastern Queensland. Volume One. Brisbane, Queensland: Department of Primary Industries.
		Potential	12.11.1, 12.11.10, 12.12.15, 12.12.16, 12.3.1a	Three-leaved Bosistoa grows in wet sclerophyll forest, dry sclerophyll forest and rainforest up to 300 m in altitude (DEWHA 2008b). The species is a rainforest specialist and 12.11.1, 12.11.10, 12.12.15, 12.12.16, 12.3.1a are most likely to support its preferred habitat	<ul style="list-style-type: none"> • Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008b). Approved Conservation Advice for <i>Bosistoa transversa</i> s. lat. (Three-leaved Bosistoa). Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/78841-conservation-advice.pdf

Common name	Scientific name	Habitat categories	Mapping rules	Mapping criteria justification	References
Austral Toadflax	<i>Thesium australe</i>	Potential	12.11.9, 12.11.14, 12.11.15, 12.12.12, 12.12.23, 12.12.28, 12.8.16	<p>Austral Toadflax is semi-parasitic on roots of a range of grass species (DoE 2013; Leigh et al. 1984), notably Kangaroo Grass (Booth 2012d).</p> <p>Austral Toadflax flowers and fruits throughout the year on the coast (Cohn 2004), and during summer at higher altitudes (Griffith 1996). In subalpine and tableland climates, the species dies back to rootstock during winter and resprouts in spring. In coastal areas the species persists all year round and may live for longer than two years (Cohn 2004). The species appears to cope well with but does not require frequent disturbance. The existence of buds near the soil surface allows the species to resprout after disturbance. It is observed to germinate well after fire; however fire is not essential for germination (Scarlett et al. 1994).</p> <p>Species is a grassy woodland/open forest specialist and RE 12.11.9, 12.11.14, 12.11.15, 12.12.12, 12.12.23, 12.12.28, 12.8.16 are most likely to support Kangaroo grass understorey preferred by this species.</p>	<ul style="list-style-type: none"> • Booth, R. (2012d). Species profile—<i>Thesium australe</i> (toadflax). Department of Environment and Science. Brisbane: Queensland Government. • Department of the Environment (DoE) (2013). Approved Conservation Advice for <i>Thesium australe</i> (austral toadflax). Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/15202-conservation-advice.pdf • Cohn, J.S. (2004). Effects of slashing and burning on <i>Thesium australe</i> R. Brown (Santalaceae) in coastal grasslands of NSW. <i>Proc. Linn. Soc. NSW</i> 125:57-65. Linnean Society of NSW, Kingsford, NSW. • Griffith, S.J. (1996). <i>Thesium australe</i>. Species Recovery Plan. Hurstville: NSW NPWS. • Leigh, J., Boden, R. and Briggs, J. (1984). <i>Extinct and Endangered Plants of Australia</i>. Melbourne, Victoria: Macmillan. • Scarlett, N.H., Branwell, M. and Earl, G. (1994). Action Statement No. 56 Austral Toad-flax <i>Thesium australe</i>. Melbourne: Dept. Natural Resources & Environment. Available from: http://www.nre.vic.gov.au/web/root/domino/cm_da/nrenpa.nsf/frameset/NRE+Plants+and+Animals?OpenDocument
Blotched Sarcochilus	<i>Sarcochilus weinthalii</i>	Potential	12.11.1, 12.11.10, 12.12.16, 12.3.1a	<p>The blotched sarcochilus occurs in rainforest, dry rainforest and drier scrub of sub-coastal ranges and associated foothills (DoE 2014) inland from the coast at altitudes of 400–700 m above sea level (Barker & Borsboom 1997a; NSW OEH 2013). In south-east Queensland, the blotched sarcochilus grows in a number of microphyll and notophyll rainforest types (Halford 1998) and also occurs in patches of isolated scrub (Barker & Borsboom 1997a; Bostock 2009).</p>	<ul style="list-style-type: none"> • Barker, M. and Borsboom, A. (1997a). <i>Sarcochilus weinthalii</i>, in Species Management Manual. Department of Natural Resources, Brisbane. • Bostock, P. (2009). Species profile—<i>Sarcochilus weinthalii</i> (blotched sarcochilus). Department of Environment and Science. Brisbane: Queensland Government. • Department of the Environment (DoE) (2014). Approved Conservation Advice for <i>Sarcochilus weinthalii</i> (blotched sarcochilus). Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/12673-conservation-advice.pdf • NSW Office of Environment and Heritage (NSW OEH) (2013). Blotched Sarcochilus – profile. Sydney, New South Wales: OEH. Available at: http://www.environment.nsw.gov.au/threatenedspecies/ • Halford, D.A. (1998). Survey of Threatened Plant Species in south east Queensland Biogeographical Region. Queensland CRA/RFA Steering Committee. Queensland Department of Environment. http://www.daff.gov.au/_data/assets/pdf_file/0004/49738/qld_se_eh113.pdf
Nightcap Plectranthus	<i>Coleus nitidus</i> (syn. <i>Plectranthus nitidus</i>)	Potential	Rocky outcrops within 20 m of a watercourse associated with rainforest and wet sclerophyll forests (12.11.1, 12.11.3, 12.11.3a, 12.11.10, 12.12.16, 12.3.1a)	<p>Plectranthus nitidus is restricted to south-east Queensland and north-east NSW, where, It forms small clumps in gullies and on boulders in rainforest or open forest on the margins of rainforest (DEWHA 2008). This is why areas of rocky outcrops within the associated habitat REs has been used to determine potential habitat for the species.</p>	<ul style="list-style-type: none"> • Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008f). Approved Conservation Advice for Plectranthus nitidus. Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/55742-conservation-advice.pdf
Hairy-Joint Grass	<i>Arthraxon hispidus</i>	Potential	12.3.7, 12.3.7a, 12.11.1, 12.11.10, 12.12.16, 12.3.1a	<p>Hairy-joint Grass is found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps, as well as woodland (DEWHA 2008a). In south-east Queensland, Hairy-joint Grass has also been recorded growing around freshwater springs on coastal foreshore dunes, in shaded small gullies, on creek banks, and on sandy alluvium in creek beds in open forests and also with bog mosses in mound springs (DEWHA 2008a). Moist riparian areas and wetter forest types most likely to support this species. REDD notes the occurrence of this species in 12.3.11, 12.8.8.</p>	<ul style="list-style-type: none"> • Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008a). Approved Conservation Advice for <i>Arthraxon hispidus</i> (Hairy-joint Grass). Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/9338-conservation-advice.pdf
Quassia	<i>Samadera bidwillii</i>	Potential	12.11.1, 12.11.3, 12.11.3a, 12.11.10, 12.12.15, 12.12.16, 12.11.14, 12.3.1a	<p>Occurs in a range of habitats but appears to be restricted to <510m ASL. Quassia flowers have been recorded in November, December, January and March (DEWHA 2008; ODNR 2000b; Ross 1984). Fruit has been recorded from February to April (Booth 2012c; ODNR 2000b).</p> <p>the red fruit are ovoid-ellipsoid, 1 cm long, hairy and sometimes appear winged (George 1985; Harden 2000; Williams et al. 1984).</p>	<ul style="list-style-type: none"> • Booth, R. (2012c). Species profile—<i>Samadera bidwillii</i>. Department of Environment and Science. Brisbane: Queensland Government. • Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008). Approved Conservation Advice for <i>Quassia bidwillii</i> (Quassia). Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/10094-conservation-advice.pdf • George, A. ed. (1985). <i>Melianthaceae to Simaroubaceae</i>. In: <i>Flora of Australia</i>. 25. Canberra, ACT: Australian Government Publishing Services. • Harden, G.J. ed. (2000). <i>Flora of New South Wales</i>. Vol. 1. UNSW Press, 2nd edition. • Queensland Department of Natural Resources (ODNR) (2000). Volume 3: Species management profiles for plants, in Species Management Manual. Brisbane: Queensland Government. • Ross, E.M. (1984). In Stanley, I.D. and Ross, E.M. (1984). <i>Flora of South-eastern Queensland</i> 1: 474. • Williams, J.B., Harden, G.J. and McDonald, W.J.F. (1984). <i>Trees and shrubs in rainforests of New South Wales and southern Queensland</i>. Armidale, NSW: Botany Department, University of New England.

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