

APPENDIX

I

INLAND
RAIL 

Terrestrial and Aquatic Ecology Technical Report

Part 2 of 2

HELIDON TO CALVERT ENVIRONMENTAL IMPACT STATEMENT

APPENDIX



Terrestrial and Aquatic Ecology Technical Report

Appendix C Database Search Results

HELIDON TO CALVERT ENVIRONMENTAL IMPACT STATEMENT



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: 17/03/20 12:33:31

[Summary](#)

[Details](#)

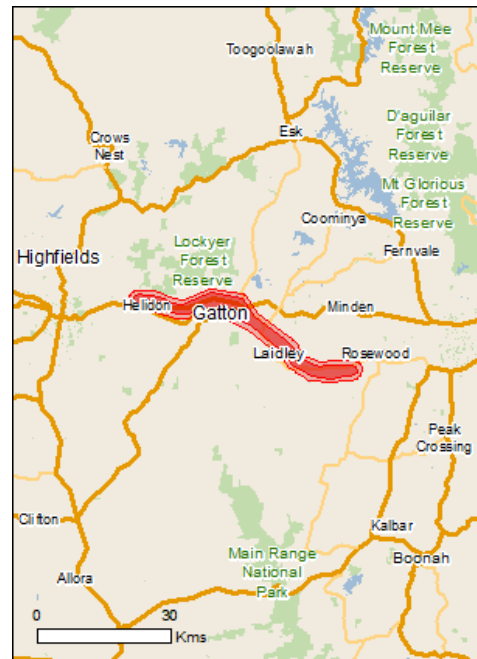
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are
©Commonwealth of Australia
(Geoscience Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 1.0Km



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:	5
Listed Threatened Species:	37
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:	None
Listed Marine Species:	26
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:	2
Regional Forest Agreements:	None
Invasive Species:	39
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)		[Resource Information]
Name		Proximity
Moreton bay		50 - 100km 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
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community may occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area
Swamp Tea-tree (Melaleuca irbyana) Forest of South-east Queensland	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	Foraging, feeding or related behaviour may occur within area
Botaurus poiciloptilus		
Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Erythrorchis radiatus		
Red Goshawk [942]	Vulnerable	Species or species habitat known 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 likely 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

Name	Status	Type of Presence
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may 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 likely to occur within area
Fish		
Maccullochella mariensis Mary River Cod [83806]	Endangered	Translocated population known to occur within area
Neoceratodus forsteri Australian Lungfish, Queensland Lungfish [67620]	Vulnerable	Species or species habitat known to 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 may 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 likely to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat may 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]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus tridactylus Long-nosed Potoroo (SE Mainland) [66645]	Vulnerable	Species or species habitat may occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Plants		
Cadellia pentastylis Ooline [9828]	Vulnerable	Species or species habitat likely to occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Fontainea venosa [24040]	Vulnerable	Species or species habitat may occur within area
Grevillea quadricauda [64651]	Vulnerable	Species or species habitat known to occur

Name	Status	Type of Presence
within area		
Haloragis exalata subsp. velutina Tall Velvet Sea-berry [16839]	Vulnerable	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 likely to occur within area
Notelaea lloydii Lloyd's Olive [15002]	Vulnerable	Species or species habitat likely to occur within area
Paspalidium grandispiculatum a grass [10838]	Vulnerable	Species or species habitat likely to occur within area
Phebalium distans Mt Berryman Phebalium [81869]	Critically Endangered	Species or species habitat may occur within area
Rhaponticum australe Austral Cornflower, Native Thistle [22647]	Vulnerable	Species or species habitat likely to occur within area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		
Anomalopus mackayi Five-clawed Worm-skink, Long-legged Worm-skink [25934]	Vulnerable	Species or species habitat may occur within area
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	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 Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may 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 may occur within area

Name	Threatened	Type of Presence
Motacilla flava Yellow Wagtail [644]		Species or species habitat may 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 known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may 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
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known 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 - GATTON AGRICULTURAL COLLEGE TRAINING DEPOT

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
--	--	--

Name	Threatened	Type of Presence
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 alba Great Egret, White Egret [59541]		Breeding known 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 known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to 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
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		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
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may 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 may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may 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 may occur within

Name	Threatened	Type of Presence area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		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
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area

Extra Information

State and Territory Reserves [\[Resource Information \]](#)

Name	State
Bowman Park Koala	QLD
Lockyer	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 Resources 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 [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 [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
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 norvegicus Brown Rat, Norway Rat [83]		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		
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 africanus Climbing Asparagus, Climbing Asparagus Fern [66907]		Species or species 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
Cryptostegia grandiflora Rubber Vine, Rubbervine, India Rubber Vine, India		Species or species

Name	Status	Type of Presence
Rubbervine, Palay Rubbervine, Purple Allamanda [18913] Dolichandra unguis-cati Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]		habitat likely to occur within area 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
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892] Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area Species or species habitat likely to occur within area
Nassella neesiana Chilean Needle grass [67699]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		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
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
Solanum elaeagnifolium Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323]		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

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

-27.54466 152.10413,-27.54121 152.09944,-27.53715 152.09794,-27.53219 152.09894,-27.52795 152.10403,-27.52724 152.10902,-27.52945 152.12248,-27.5291 152.13016,-27.52945 152.13645,-27.53122 152.14802,-27.53573 152.16009,-27.53936 152.16837,-27.54183 152.18114,-27.54484 152.19032,-27.54555 152.1973,-27.54404 152.20318,-27.52468 152.2542,-27.53457 152.31634,-27.56729 152.34278,-27.60761 152.40217,-27.61446 152.41316,-27.62419 152.42243,-27.63879 152.43118,-27.6467 152.44543,-27.654 152.46534,-27.65537 152.47427,-27.65521 152.48611,-27.65476 152.49247,-27.65445 152.51993,-27.65476 152.52645,-27.65445 152.5359,-27.65384 152.54019,-27.65673 152.54723,-27.6616 152.55032,-27.66738 152.54843,-27.67057 152.54448,-27.67391 152.53572,-27.67452 152.5292,-27.67407 152.52628,-27.67756 152.4959,-27.67422 152.45624,-27.66555 152.4432,-27.65977 152.42878,-27.654 152.41968,-27.6467 152.41247,-27.63727 152.40698,-27.63225 152.4044,-27.62617 152.39754,-27.61735 152.38106,-27.58266 152.33248,-27.57003 152.30381,-27.56668 152.2887,-27.56364 152.276,-27.56121 152.27102,-27.55679 152.26536,-27.55923 152.22004,-27.56227 152.20562,-27.56334 152.19515,-27.56273 152.18674,-27.55938 152.17661,-27.55771 152.16785,-27.55466 152.15549,-27.55055 152.14674,-27.54446 152.10417,-27.54466 152.10413

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.



Queensland Government

Department of Environment and Science

Environmental Reports

Matters of State Environmental Significance

For the selected area of interest

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

Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government 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.



Table of Contents

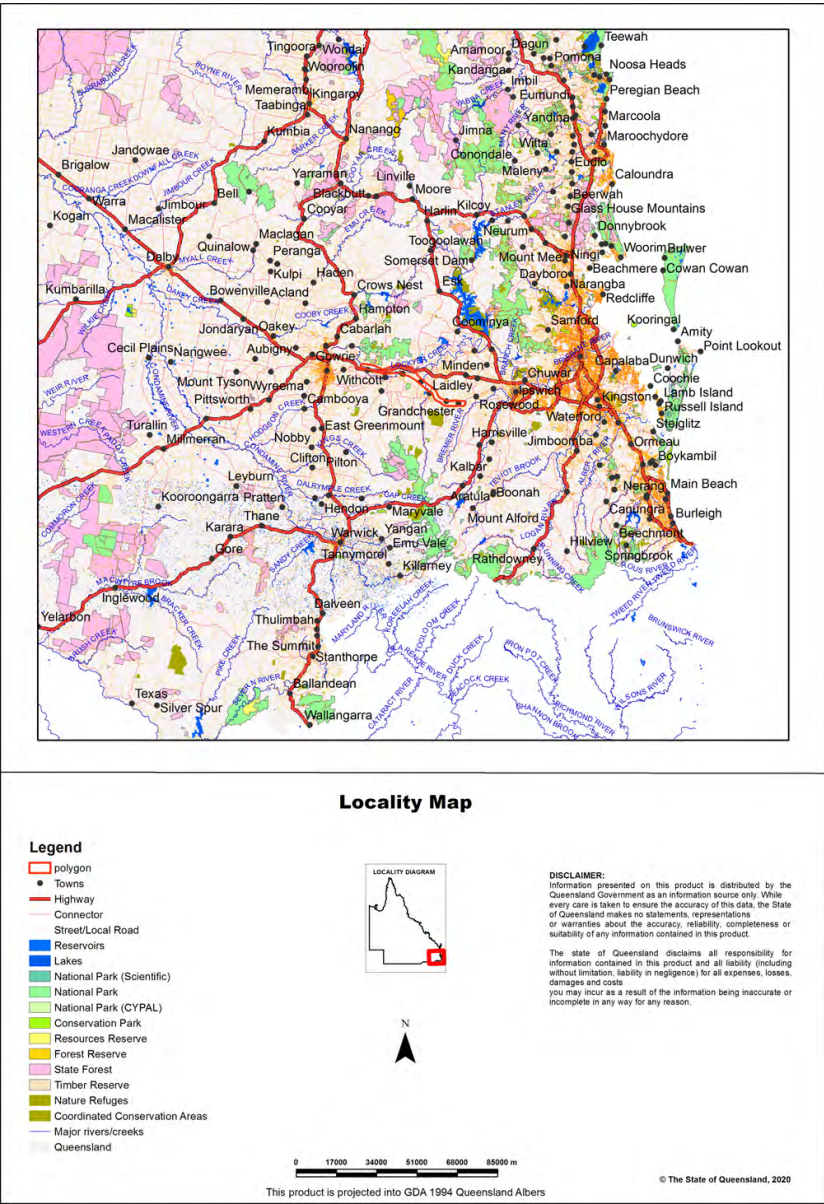
Assessment Area Details	4
Matters of State Environmental Significance (MSES)	5
MSES Categories	5
MSES Values Present	6
Additional Information with Respect to MSES Values Present	7
MSES - State Conservation Areas	7
MSES - Wetlands and Waterways	7
MSES - Species	7
MSES - Regulated Vegetation	9
Map 1 - MSES - State Conservation Areas	12
Map 2 - MSES - Wetlands and Waterways	13
Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals	14
Map 3b - MSES - Species - Koala habitat area (SEQ)	15
Map 4 - MSES - Regulated Vegetation	16
Map 5 - MSES - Offset Areas	17
Appendices	18
Appendix 1 - Matters of State Environmental Significance (MSES) methodology	18
Appendix 2 - Source Data	19
Appendix 3 - Acronyms and Abbreviations	20

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

Size (ha)	11,827.44
Local Government(s)	Ipswich City, Lockyer Valley Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Moreton Basin
Catchment(s)	Brisbane



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	0.0 ha	0.0 %
1b Protected Areas- nature refuges	9.97 ha	0.1%
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	22.7 ha	0.2%
6a High Ecological Value (HEV) wetlands	62.29 ha	0.5%
6b High Ecological Value (HEV) waterways **	18.9 km	Not applicable
7a Threatened (endangered or vulnerable) wildlife	951.14 ha	8.0%
7b Special least concern animals	843.12 ha	7.1%
7c i Koala habitat area - core (SEQ)	2605.63 ha	22.0%
7c ii Koala habitat area - locally refined (SEQ)	0.0 ha	0.0 %
8a Regulated Vegetation - Endangered/Of concern in Category B (remnant)	501.41 ha	4.2%
8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth)	837.9 ha	7.1%
8c Regulated Vegetation - Category R (GBR riverine regrowth)	0.0 ha	0.0 %
8d Regulated Vegetation - Essential habitat	2603.83 ha	22.0%
8e Regulated Vegetation - intersecting a watercourse **	264.5 km	Not applicable
8f Regulated Vegetation - within 100m of a Vegetation Management Wetland	35.7 ha	0.3%
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

(no results)

1b. Protected Areas - nature refuges

Name
Bowman Park Koala Nature Refuge

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)

Not applicable

Threatened (endangered or vulnerable) wildlife habitat suitability models

Species	Common name	NCA status	Presence
<i>Boronia keysii</i>		V	None
<i>Calyptorhynchus lathami</i>	Glossy black cockatoo	V	Core
<i>Casuarus casuarus johnsonii</i>	Sthn population cassowary	E	None
<i>Crinia tinnula</i>	Wallum froglet	V	None
<i>Denisonia maculata</i>	Ornamental snake	V	None
<i>Litoria freycineti</i>	Wallum rocketfrog	V	None
<i>Litoria olongburensis</i>	Wallum sedgefrog	V	None
<i>Melaleuca irbyana</i>		E	Core
<i>Petaurus gracilis</i>	Mahogany Glider	E	None
<i>Petrogale persephone</i>	Proserpine rock-wallaby	E	None
<i>Phascogale cinereus</i>	Koala - outside SEQ*	V	None
<i>Pezoporus wallicus wallicus</i>	Eastern ground parrot	V	None
<i>Taudactylus Pleione</i>	Kroombit tinkerfrog	E	None
<i>Xeromys myoides</i>	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
<i>Calidris ferruginea</i>	curlew sandpiper	E	CE	M-C/J/R/B/E
<i>Geophaps scripta scripta</i>	squatter pigeon (southern subspecies)	V	V	
<i>Rostratula australis</i>	Australian painted snipe	E	E	
<i>Petrogale penicillata</i>	brush-tailed rock-wallaby	V	V	
<i>Eucalyptus taurina</i>	Helidon ironbark	V		
<i>Ninox strenua</i>	powerful owl	V		
<i>Thesium australe</i>	toadflax	V	V	
<i>Notelaea lloydii</i>	Lloyd's native olive	V	V	
<i>Hemiaspis damelii</i>	grey snake	E		
<i>Grevillea quadricauda</i>		V	V	

Special least concern animal species records

Scientific name	Common name	Migratory status
<i>Ornithorhynchus anatinus</i>	platypus	
<i>Tachyglossus aculeatus</i>	short-beaked echidna	
<i>Tringa glareola</i>	wood sandpiper	M-C/J/R/B/E
<i>Gallinago hardwickii</i>	Latham's snipe	M-J/R/B/E
<i>Tringa stagnatilis</i>	marsh sandpiper	M-C/J/R/B/E
<i>Calidris acuminata</i>	sharp-tailed sandpiper	M-C/J/R/B/E
<i>Calidris melanotos</i>	pectoral sandpiper	M-J/R/B/E
<i>Actitis hypoleucos</i>	common sandpiper	M-C/J/R/B/E
<i>Calidris ruficollis</i>	red-necked stint	M-C/J/R/B/E
<i>Pluvialis fulva</i>	Pacific golden plover	M-C/J/R/B/E
<i>Numenius phaeopus</i>	whimbrel	M-C/J/R/B/E
<i>Limosa limosa</i>	black-tailed godwit	M-C/J/R/B/E
<i>Tringa nebularia</i>	common greenshank	M-C/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
12.3.7/12.3.2	O-subdom	rem_oc
12.9-10.2/12.9-10.5a/12.9-10.7	O-subdom	rem_oc
12.3.3/12.3.7	E-dom	rem_end
12.3.7/12.3.3	E-subdom	rem_end
12.3.3	E-dom	rem_end
12.9-10.2/12.9-10.7	O-subdom	rem_oc
12.9-10.7	O-dom	rem_oc
12.9-10.2/12.9-10.7/12.9-10.19/12.9-10.5/12.9-10.3	O-subdom	rem_oc

Regional ecosystem	Vegetation management polygon	Vegetation management status
12.3.19	E-dom	rem_end
12.3.18	E-dom	rem_end
12.9-10.27	E-dom	rem_end
12.3.8	O-dom	rem_oc
12.3.3d	E-dom	rem_end
12.9-10.2/12.9-10.3	O-subdom	rem_oc

8b. Regulated Vegetation - Endangered/Of concern in Category C (regrowth)

Regional ecosystem	Vegetation management polygon	Vegetation management status
12.3.3/12.3.7	E-dom	hvr_end
12.9-10.2/12.9-10.7	O-subdom	hvr_oc
12.9-10.2/12.9-10.5a/12.9-10.7	O-subdom	hvr_oc
12.9-10.7/12.9-10.2	O-dom	hvr_oc
12.3.3	E-dom	hvr_end
12.9-10.2/12.9-10.7/12.9-10.5a	O-subdom	hvr_oc
12.3.8	O-dom	hvr_oc
12.9-10.2/12.9-10.7/12.9-10.19/12.9-10.5/12.9-10.3	O-subdom	hvr_oc
12.9-10.3	O-dom	hvr_oc
12.3.3/12.3.7/12.3.10a	E-dom	hvr_end
12.9-10.7/12.9-10.6/12.9-10.2	E-subdom	hvr_end
12.9-10.7/12.9-10.6	E-subdom	hvr_end
12.9-10.2/12.9-10.7/12.9-10.17a	O-subdom	hvr_oc
12.9-10.27	E-dom	hvr_end
12.9-10.7/12.9-10.3	O-dom	hvr_oc
12.3.3d	E-dom	hvr_end
12.3.18	E-dom	hvr_end
12.3.19	E-dom	hvr_end
12.9-10.7	O-dom	hvr_oc

8c. Regulated Vegetation - Category R (GBR riverine regrowth)

Not applicable

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	RVM rule
C	9442	3
B	9442	2

Refer to **Map 4 - MSES - Regulated Vegetation** for an overview of the relevant MSES.

MSES - Offsets

9a. Legally secured offset areas - offset register areas

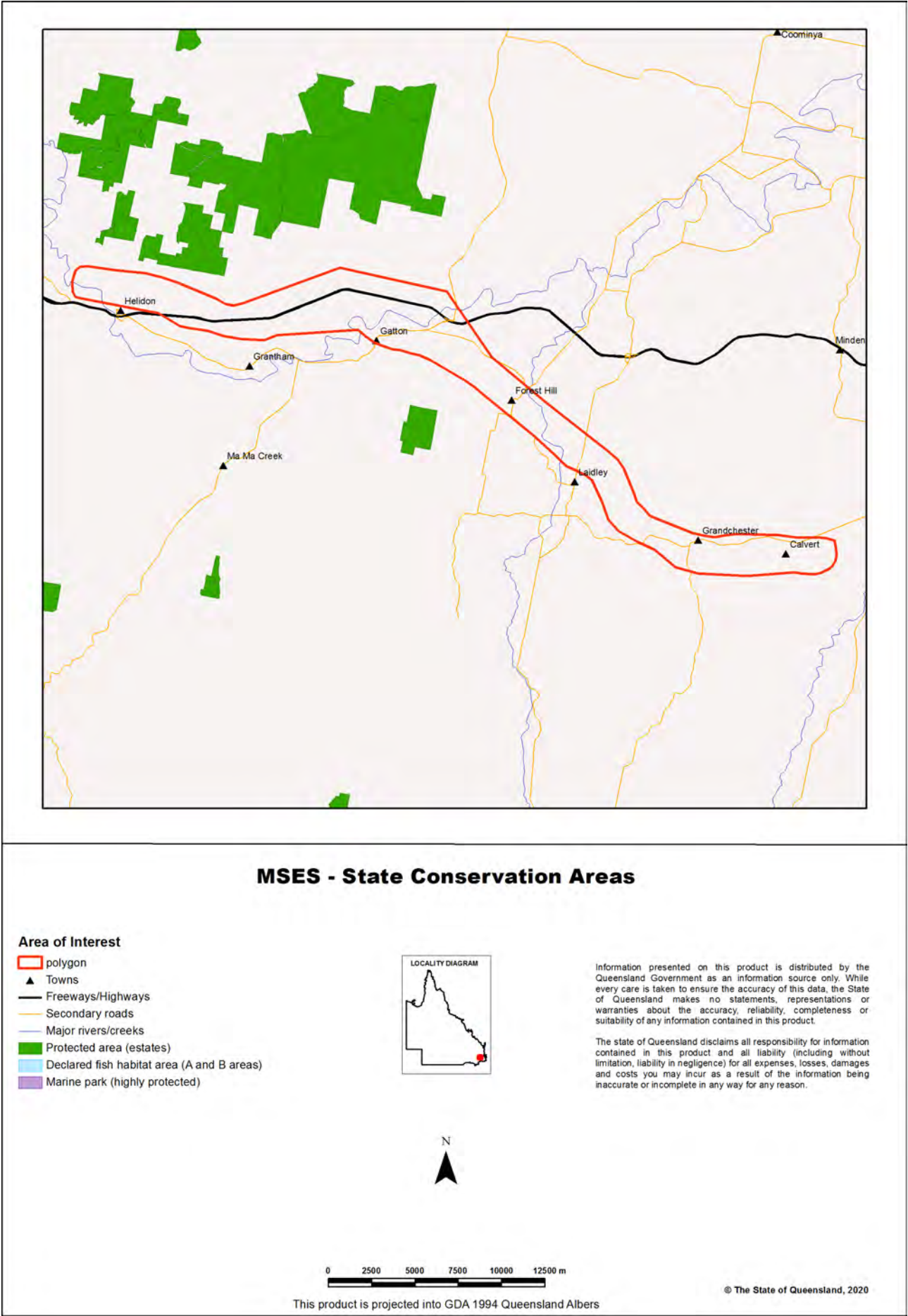
(no results)

9b. Legally secured offset areas - vegetation offsets through a Property Map of Assessable Vegetation

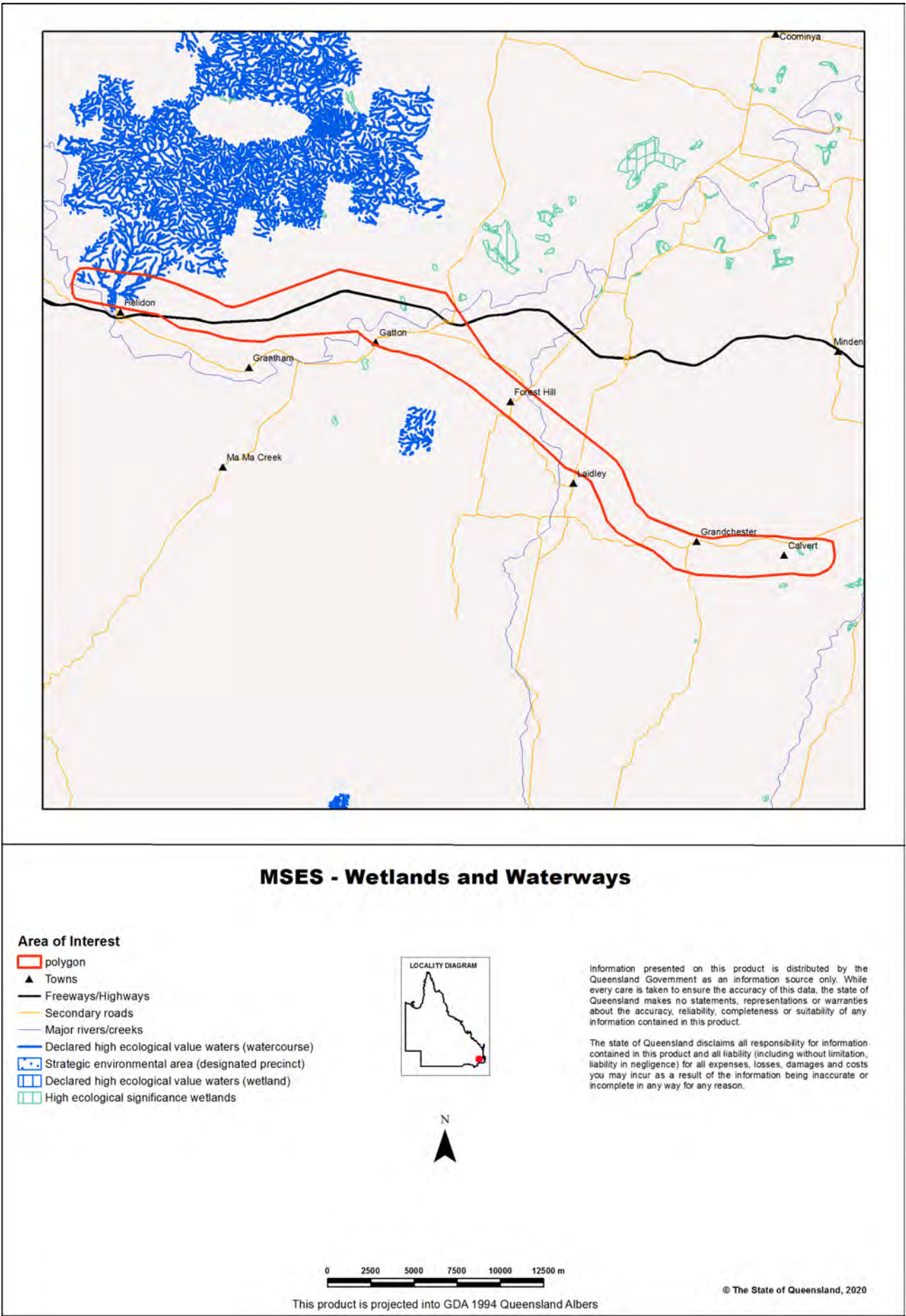
(no results)

Refer to **Map 5 - MSES - Offset Areas** for an overview of the relevant MSES.

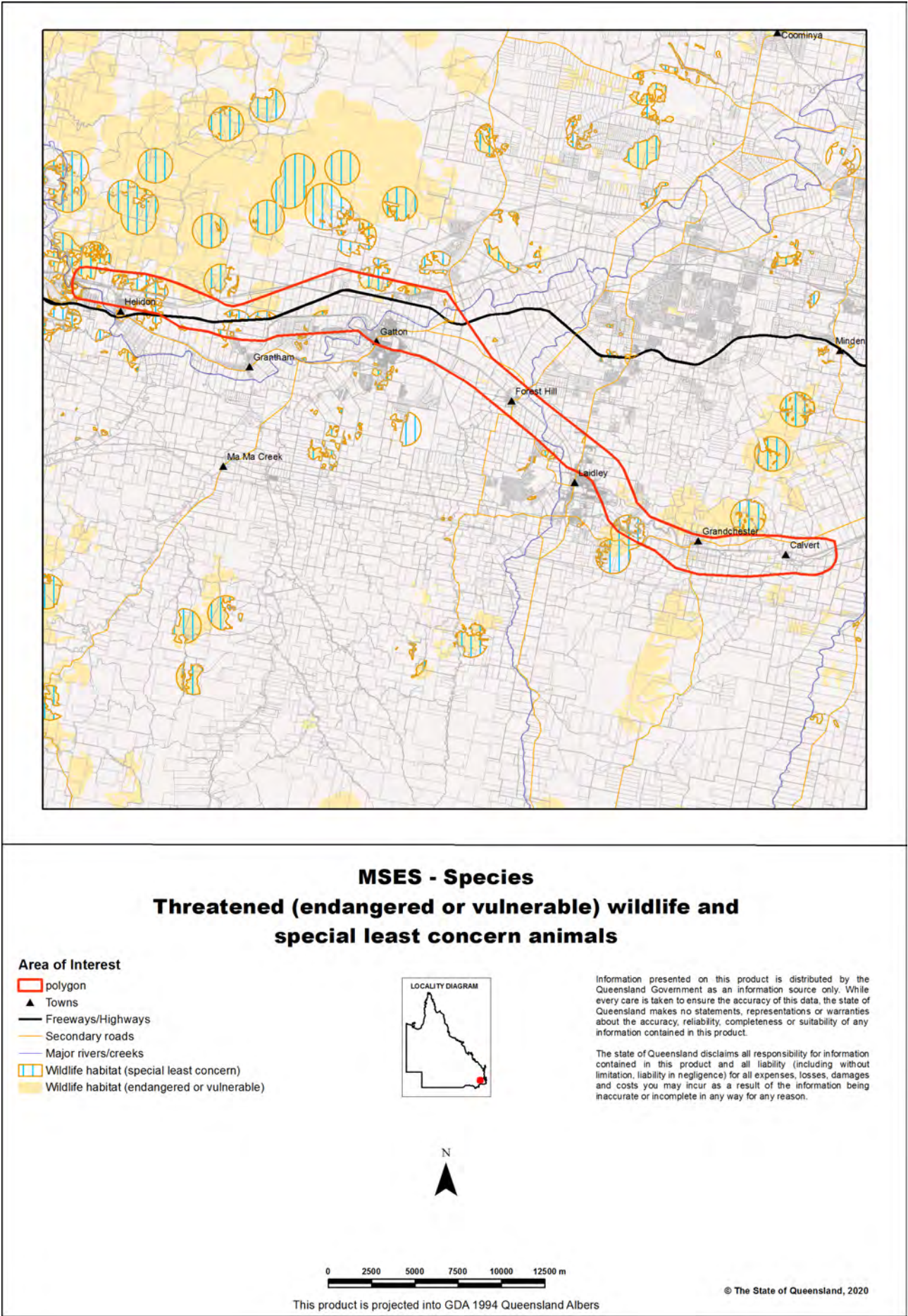
Map 1 - MSES - State Conservation Areas



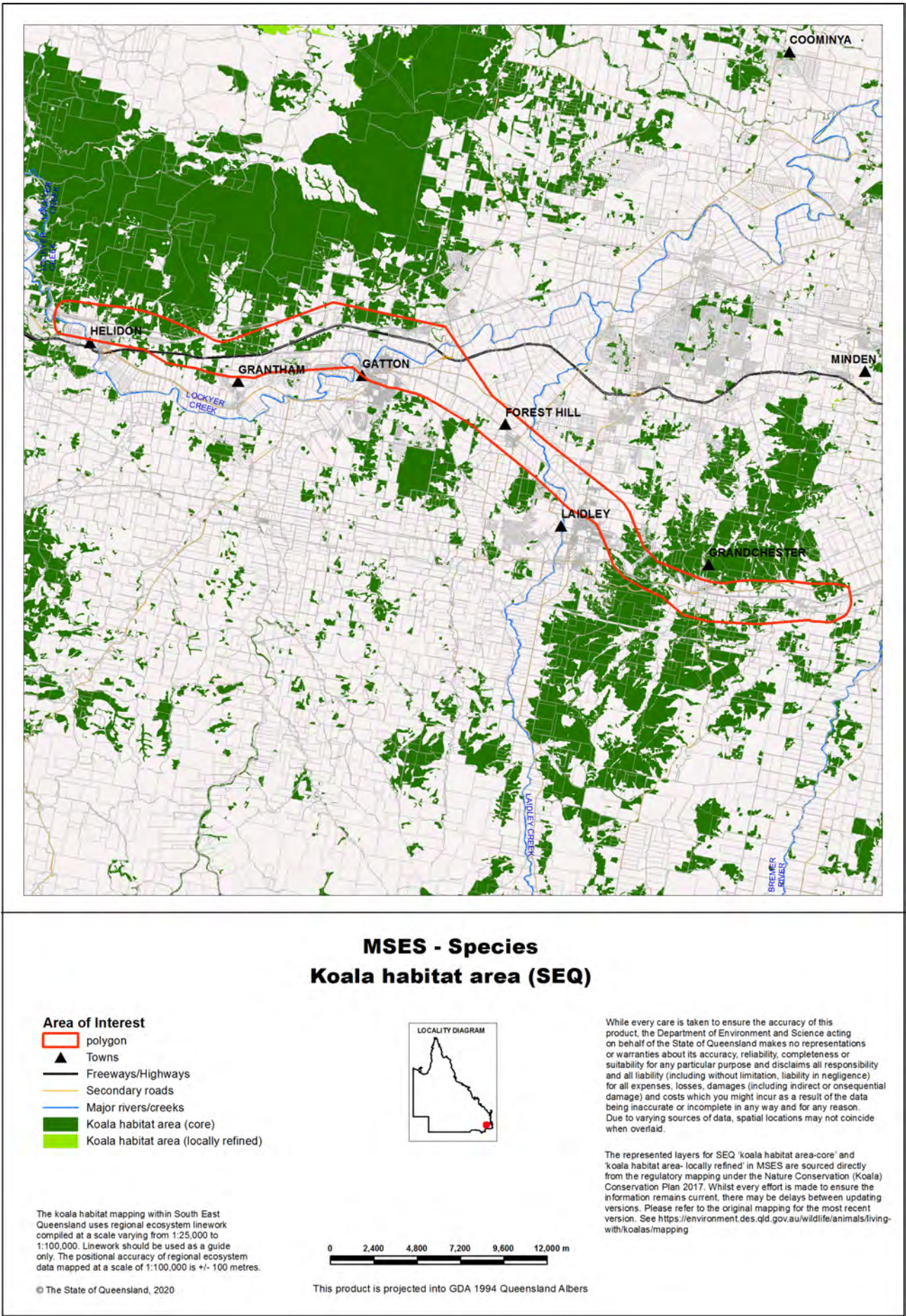
Map 2 - MSES - Wetlands and Waterways



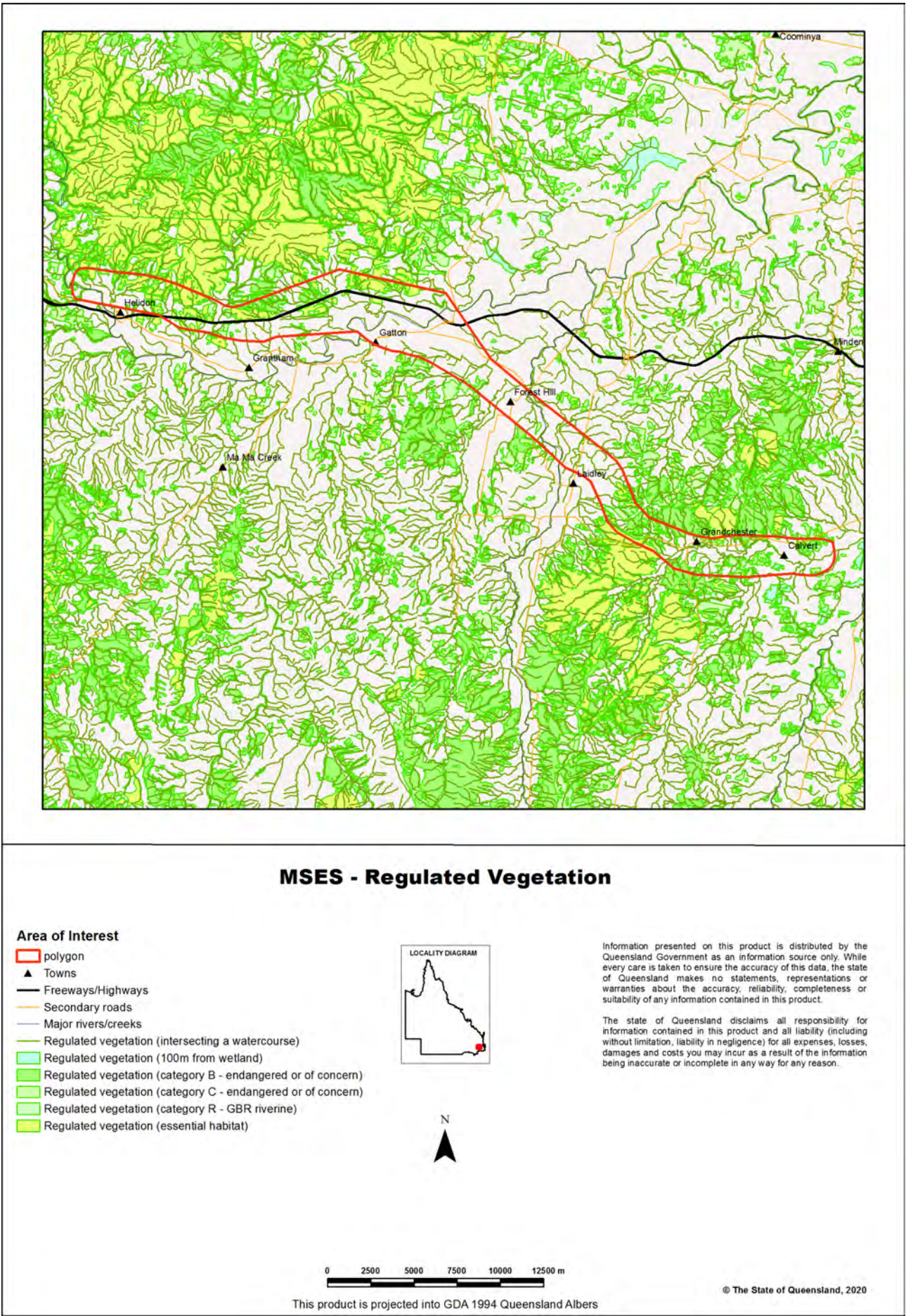
Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals



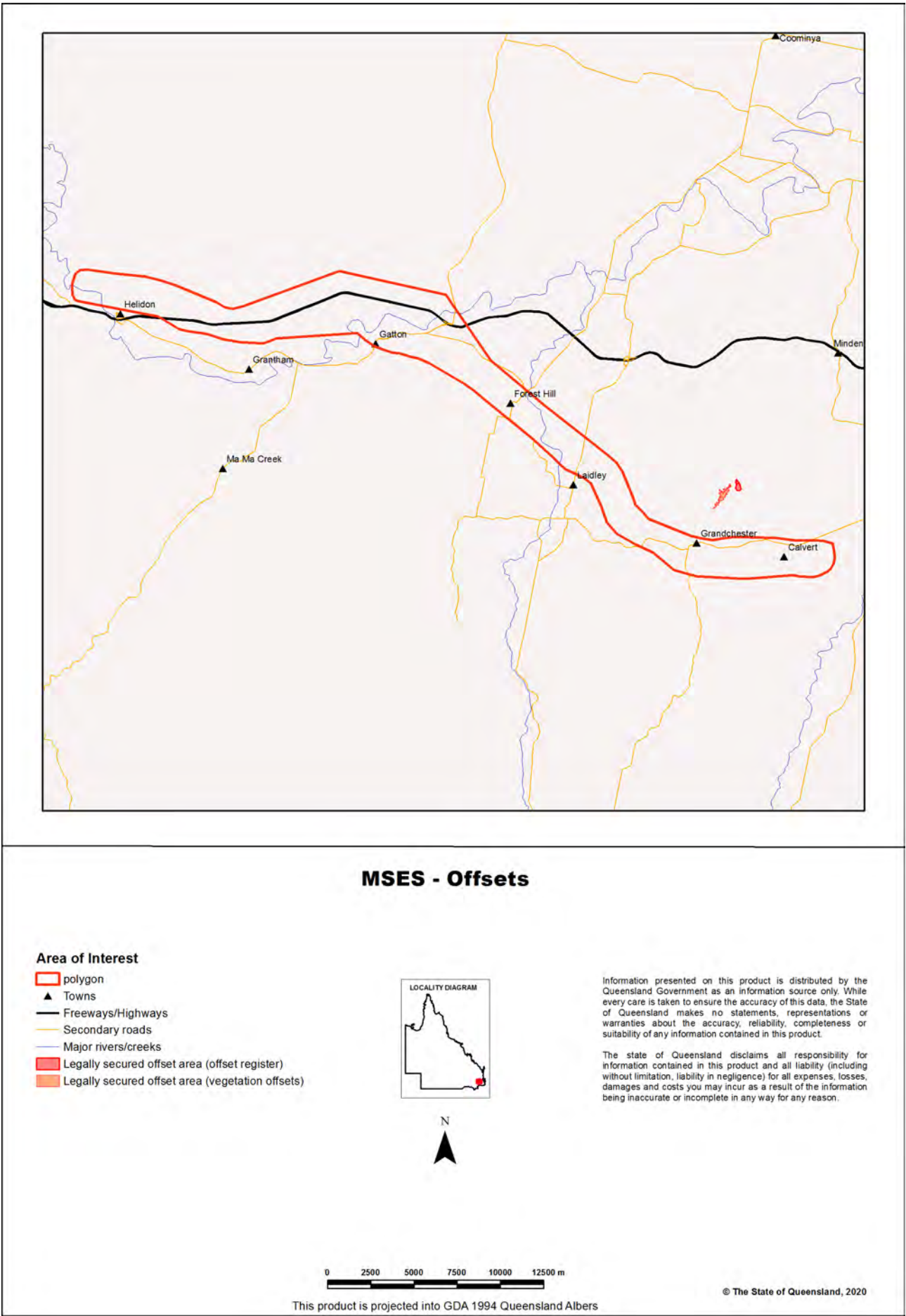
Map 3b - MSES - Species - Koala habitat area (SEQ)



Map 4 - MSES - Regulated Vegetation



Map 5 - MSES - Offset Areas



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 and Nature Refuges	- Protected areas of Queensland - Nature Refuges - 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 (multiple locations) intent for waters Source Wetlands: - Queensland Wetland Mapping (Current version 4, 2015) 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	- <i>Environmental Protection Act 1994</i>
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	- <i>Nature Conservation Act 1992</i>
RE	- Regional Ecosystem
SPP	- State Planning Policy
VMA	- <i>Vegetation Management Act 1999</i>

Atlas of Living Australia flora and fauna records within the Ecology Study area

Accessed: 13th March 2020, 09:29 AEDT

Kingdom	Family	Scientific Name	Common Name	NCA_status	EPBC_status
Animalia	Acanthizidae	Gerygone olivacea	White-throated Gerygone	C	
Animalia	Acanthizidae	Smicrornis brevirostris	Weebill	C	
Animalia	Accipitridae	Circus approximans	Kahu	C	
Animalia	Accipitridae	Circus assimilis	Spotted Harrier	C	
Animalia	Accipitridae	Elanus axillaris	Black-shouldered Kite	C	
Animalia	Accipitridae	Haliastur indus	brahminy kite	C	
Animalia	Accipitridae	Haliastur sphenurus	Whistling Kite	C	
Animalia	Accipitridae	Lophoictinia isura	Square-tailed Kite	C	
Animalia	Accipitridae	Milvus migrans	Black Kite	C	
Animalia	Aeshnidae	Adversaeschna brevistyla			
Animalia	Aeshnidae	Anax papuensis			
Animalia	Aeshnidae	Austrogynacantha heterogena			
Animalia	Agamidae	Pogona barbata	Bearded Dragon	C	
Animalia	Alcedinidae	Ceyx azureus	Azure Kingfisher	C	
Animalia	Ambassidae	Ambassia agassizii	Doody		
Animalia	Anatidae	Biziura lobata	Musk Duck	C	
Animalia	Anatidae	Chenonetta jubata	Maned Duck	C	
Animalia	Anatidae	Malacorhynchus membranaceus	Pink-ear	C	
Animalia	Anatidae	Oxyura australis	Blue-billed duck	C	
Animalia	Anatidae	Stictonetta naevosa	Freckled Duck	C	
Animalia	Anseranatidae	Anseranas semipalmata	Magpie Goose	C	
Animalia	Ardeidae	Ardea alba modesta		C	
Animalia	Ardeidae	Egretta garzetta	Little Egret	C	
Animalia	Ardeidae	Egretta novaehollandiae	White-faced Heron	C	
Animalia	Ardeidae	Ixobrychus flavicollis	Black Bittern	C	
Animalia	Ardeidae	Nycticorax caledonicus	Nankeen night heron	C	
Animalia	Artamidae	Cracticus nigrogularis	Pied Butcherbird	C	
Animalia	Artamidae	Cracticus torquatus	Grey Butcherbird	C	
Animalia	Artamidae	Gymnorhina tibicen	Australian Magpie	C	
Animalia	Atherinidae	Craterocephalus stercusmuscarum	Flyspecked Hardyhead		
Animalia	Bufonidae	Rhinella marina	Cane Toad		
Animalia	Cacatuidae	Eolophus roseicapilla	Galah	C	
Animalia	Cacatuidae	Nymphicus hollandicus	Cockatiel	C	
Animalia	Canidae	Vulpes vulpes	Fox		

Animalia	Carphodactylidae	Underwoodisaurus milii	Thick-tailed Gecko	C	
Animalia	Ceratodontidae	Neoceratodus forsteri	Australian Lungfish		V
Animalia	Charadriidae	Vanellus miles novaehollandiae		C	
Animalia	Chelidae	Emydura macquarii macquarii	Macquarie River Turtle	C	
Animalia	Climacteridae	Cormobates leucophaea metastasis		C	
Animalia	Coenagrionidae	Argiocnemis rubescens			
Animalia	Coenagrionidae	Ceriagrion aeruginosum			
Animalia	Coenagrionidae	Ischnura pruinescens			
Animalia	Colubridae	Boiga irregularis	Brown Tree Snake	C	
Animalia	Colubridae	Dendrelaphis punctulatus	Common Tree Snake	C	
Animalia	Colubridae	Tropidonophis mairii	Freshwater Snake	C	
Animalia	Columbidae	Chalcophaps indica	Emerald Dove	C	
Animalia	Columbidae	Geopelia humeralis	Bar-shouldered Dove	C	
Animalia	Columbidae	Geopelia striata	Peaceful Dove	C	
Animalia	Columbidae	Leucosarcia melanoleuca	Wonga Pigeon	C	
Animalia	Columbidae	Macropygia amboinensis		C	
Animalia	Columbidae	Ocyphaps lophotes	Crested Pigeon	C	
Animalia	Coraciidae	Eurystomus orientalis	Eastern broad-billed Roller	C	
Animalia	Corcoracidae	Corcorax melanorhamphos	White-winged Chough	C	
Animalia	Corvidae	Corvus orru	Torresian Crow	C	
Animalia	Cuculidae	Chalcites basalis	Horsfield's Bronze-cuckoo	C	
Animalia	Cuculidae	Chalcites lucidus	Shining Bronze-cuckoo	C	
Animalia	Cuculidae	Eudynamys orientalis	Pacific Koel	C	
Animalia	Cuculidae	Scythrops novaehollandiae	Channel-billed Cuckoo	C	
Animalia	Elapidae	Cacophis harriettae	White-crowned Snake	C	
Animalia	Elapidae	Cacophis squamulosus	Golden-crowned Snake	C	
Animalia	Elapidae	Cryptophis boschmai	Carpentaria Snake	C	
Animalia	Elapidae	Demansia psammophis	Yellow-faced Whip Snake	C	
Animalia	Elapidae	Furina diadema	Red-naped Snake	C	
Animalia	Elapidae	Hemiaspis damelii	Grey Snake	E	
Animalia	Elapidae	Pseudechis guttatus	Spotted Black Snake	C	
Animalia	Elapidae	Pseudechis porphyriacus	Red-bellied Black Snake	C	
Animalia	Elapidae	Pseudonaja textilis	Eastern Brown Snake	C	
Animalia	Elapidae	Vermicella annulata	Bandy-bandy	C	

Animalia	Eleotridae	Hypseleotris galii	Firetail Gudgeon		
Animalia	Eleotridae	Hypseleotris klunzingeri	Western Carp Gudgeon		
Animalia	Eleotridae	Mogurnda adspersa	Trout Gudgeon		
Animalia	Estrildidae	Taeniopygia guttata	Zebra Finch	C	
Animalia	Gomphidae	Antipodogomphus acolythus			
Animalia	Gomphidae	Antipodogomphus proselythus			
Animalia	Hirundinidae	Cheramoeca leucosterna	White-backed Swallow	C	
Animalia	Hylidae	Cyclorana brevipes	Short-footed Frog	C	
Animalia	Hylidae	Litoria caerulea	Green Tree Frog	C	
Animalia	Hylidae	Litoria fallax	Eastern Dwarf Tree Frog	C	
Animalia	Hylidae	Litoria gracilentia	Dainty Green Tree Frog	C	
Animalia	Hylidae	Litoria rubella	Red Tree Frog	C	
Animalia	Jacanidae	Irediparra gallinacea	Comb-crested Jacana	C	
Animalia	Leporidae	Lepus europaeus			
Animalia	Lestidae	Austrolestes leda			
Animalia	Libellulidae	Crocothemis nigrifrons			
Animalia	Libellulidae	Diplacodes bipunctata			
Animalia	Libellulidae	Diplacodes haematodes			
Animalia	Libellulidae	Diplacodes trivialis			
Animalia	Libellulidae	Orthetrum caledonicum			
Animalia	Libellulidae	Orthetrum sabina			
Animalia	Libellulidae	Orthetrum villosivittatum			
Animalia	Libellulidae	Pantala flavescens			
Animalia	Libellulidae	Rhyothemis graphiptera			
Animalia	Libellulidae	Tholymis tillarga			
Animalia	Libellulidae	Tramea loewii			
Animalia	Limnodynastidae	Limnodynastes peronii	Brown-striped Frog	C	
Animalia	Limnodynastidae	Limnodynastes tasmaniensis	Spotted Grass Frog	C	
Animalia	Limnodynastidae	Limnodynastes terraereginae	Northern Banjo Frog	C	
Animalia	Limnodynastidae	Platyplectrum ornatum	Ornate Burrowing Frog	C	
Animalia	Lindeniidae	Ictinogomphus australis			
Animalia	Lycaenidae	Sahulana scintillata	Glistening Blue		
Animalia	Macropodidae	Macropus giganteus	Eastern Grey Kangaroo	C	
Animalia	Macropodidae	Macropus rufogriseus		C	
Animalia	Macropodidae	Petrogale penicillata	Brush-tailed Rock-wallaby	V	V

Animalia	Macropodidae	Wallabia bicolor	Swamp Wallaby	C	
Animalia	Megaluridae	Megalurus timoriensis	Tawny Grassbird	C	
Animalia	Megapodiidae	Alectura lathamii	Wild Turkey	C	
Animalia	Melanotaeniidae	Melanotaenia duboulayi	Doublay's Rainbowfish		
Animalia	Meliphagidae	Acanthorhynchus tenuirostris	Eastern Spinebill	C	
Animalia	Meliphagidae	Caligavis chrysops	Yellow-faced Honeyeater	C	
Animalia	Meliphagidae	Entomyzon cyanotis	Blue-faced Honeyeater	C	
Animalia	Meliphagidae	Ptilotula fusca	Fuscous Honeyeater	C	
Animalia	Meliphagidae	Ptilotula penicillata	White-plumed Honeyeater	C	
Animalia	Monarchidae	Grallina cyanoleuca	Magpie-lark	C	
Animalia	Muridae	Hydromys chrysogaster	Water-rat	C	
Animalia	Myobatrachidae	Crinia parinsignifera	Eastern Sign-bearing Froglet	C	
Animalia	Myobatrachidae	Crinia signifera	Common Froglet	C	
Animalia	Myobatrachidae	Uperoleia rugosa	Wrinkled Toadlet	C	
Animalia	Nymphalidae	Charaxes sempronius sempronius			
Animalia	Nymphalidae	Danaus petilia	Lesser Wanderer		
Animalia	Nymphalidae	Hypolimnas bolina nerina	Common Eggfly		
Animalia	Nymphalidae	Phaedyma shepherdii shepherdii	Common Aeroplane		
Animalia	Oriolidae	Sphecotheres vieilloti	Australasian Figbird	C	
Animalia	Ornithorhynchidae	Ornithorhynchus anatinus	Platypus	SL	
Animalia	Otididae	Ardeotis australis	Wild Turkey	C	
Animalia	Pachycephalidae	Falcunculus frontatus	Crested Shrike-tit	C	
Animalia	Peramelidae	Isodon macrourus	Northern Brown Bandicoot	C	
Animalia	Percichthyidae	Macquaria ambigua	Golden Perch		
Animalia	Petauridae	Petaurus norfolcensis	Squirrel Glider	C	
Animalia	Phascolarctidae	Phascolarctos cinereus	Koala	V	V
Animalia	Pieridae	Belenois java teutonia	Caper White		
Animalia	Pieridae	Delias aganippe	Wood White		
Animalia	Pieridae	Eurema smilax	Small Grass-yellow		
Animalia	Platynemididae	Nososticta solida			
Animalia	Plotosidae	Tandanus tandanus	Cattie		
Animalia	Podargidae	Podargus strigoides	Tawny Frogmouth	C	
Animalia	Podicipedidae	Podiceps cristatus	Crested Grebe	C	
Animalia	Potoroidae	Aepyprymnus rufescens	Rufous Bettong	C	
Animalia	Psittacidae	Alisterus scapularis	Australian King-parrot	C	
Animalia	Psittacidae	Glossopsitta concinna	Musk Lorikeet	C	

Animalia	Psittacidae	Melopsittacus undulatus	Budgerigar	C	
Animalia	Psittacidae	Parvipsitta pusilla	Little Lorikeet	C	
Animalia	Psittacidae	Trichoglossus chlorolepidotus	Scaly-breasted Lorikeet	C	
Animalia	Psittacidae	Trichoglossus haematodus moluccanus		C	
Animalia	Pteropodidae	Pteropus alecto	Black Flying-fox	C	
Animalia	Pteropodidae	Pteropus poliocephalus	Grey-headed Flying-fox	C	V
Animalia	Pteropodidae	Pteropus scapulatus	Little Red Flying-fox	C	
Animalia	Ptilonorhynchidae	Ailuroedus crassirostris	Green Catbird	C	
Animalia	Ptilonorhynchidae	Ptilonorhynchus violaceus	Satin Bowerbird	C	
Animalia	Pygopodidae	Lialis burtonis	Burton's Snake-lizard	C	
Animalia	Pythonidae	Antaresia maculosa	Spotted Python	C	
Animalia	Pythonidae	Morelia spilota	Carpet Python	C	
Animalia	Rallidae	Fulica atra	Eurasian Coot	C	
Animalia	Rallidae	Gallirallus philippensis		C	
Animalia	Rallidae	Tribonyx ventralis	Black-tailed Native-hen	C	
Animalia	Retropinnidae	Retropinna semoni	Smelt		
Animalia	Rostratulidae	Rostratula australis	Australian Painted Snipe	E	E
Animalia	Scincidae	Carlia munda	Shaded-litter Rainbow-skink	C	
Animalia	Scincidae	Lygisaurus foliorum	Tree-base Litter-skink	C	
Animalia	Sturnidae	Acridotheres tristis	Common myna		
Animalia	Synlestidae	Episynlestes albicauda			
Animalia	Synthemistidae	Choristhemis flavoterminalata			
Animalia	Synthemistidae	Parasynthemis regina			
Animalia	Tachyglossidae	Tachyglossus aculeatus	Short-beaked Echidna	SL	
Animalia	Terapontidae	Leiopotherapon unicolor	Bobby		
Animalia	Threskiornithidae	Plegadis falcinellus	Glossy Ibis	SL	
Animalia	Threskiornithidae	Threskiornis spinicollis	Straw-necked Ibis	C	
Animalia	Turdidae	Turdus merula	Blackbird	P	
Animalia	Turnicidae	Turnix pyrrhothorax	Red-chested Button-quail	C	
Animalia	Typhlopidae	Anilius ligatus	Robust Blind Snake	C	
Animalia	Typhlopidae	Anilius proximus	Proximus Blind Snake	C	
Animalia	Tytonidae	Tyto delicatula		C	
Animalia	Vespertilionidae	Nyctophilus geoffroyi	Lesser Long-eared Bat	C	
Animalia	Vespertilionidae	Scotorepens orion	Eastern Broad-nosed Bat	C	

Fungi	Agaricaceae	Cyathus stercoreus		C	
Fungi	Atheliaceae	Athelia rolfsii		C	
Fungi	Lecanoraceae	Lecanora impressa		C	
Fungi	Lecideaceae	Lecidea terrena		C	
Fungi	Physciaceae	Pyxine petricola		C	
Fungi	Polyporaceae	Trametes marianna		C	
Plantae	Acanthaceae	Brunoniella australis		C	
Plantae	Adoxaceae	Sambucus gaudichaudiana		C	
Plantae	Aizoaceae	Trianthema portulacastrum	Black pigweed		
Plantae	Amaranthaceae	Amaranthus hybridus			
Plantae	Amaranthaceae	Amaranthus retroflexus			
Plantae	Amaranthaceae	Amaranthus viridis	Green pigweed		
Plantae	Amaranthaceae	Gomphrena celosioides			
Plantae	Amaranthaceae	Guilleminia densa			
Plantae	Apiaceae	Cyclospermum leptophyllum			
Plantae	Apocynaceae	Alyxia ruscifolia		C	
Plantae	Apocynaceae	Gomphocarpus physocarpus			
Plantae	Asteraceae	Acanthospermum hispidum			
Plantae	Asteraceae	Ambrosia psilostachya			
Plantae	Asteraceae	Arctotheca calendula			
Plantae	Asteraceae	Brachyscome basaltica		C	
Plantae	Asteraceae	Calotis cuneata		C	
Plantae	Asteraceae	Calotis lappulacea		C	
Plantae	Asteraceae	Camptacra barbata		C	
Plantae	Asteraceae	Cassinia laevis		C	
Plantae	Asteraceae	Galinsoga parviflora			
Plantae	Asteraceae	Glossocardia bidens		C	
Plantae	Asteraceae	Ozothamnus diosmifolius		C	
Plantae	Asteraceae	Parthenium hysterophorus			
Plantae	Asteraceae	Rhaponticum australe		V	V
Plantae	Asteraceae	Soliva anthemifolia			
Plantae	Asteraceae	Tagetes minuta			
Plantae	Asteraceae	Tridax procumbens			
Plantae	Asteraceae	Xanthium spinosum			
Plantae	Asteraceae	Zinnia peruviana			
Plantae	Basellaceae	Anredera cordifolia			
Plantae	Bignoniaceae	Jacaranda mimosifolia	jacaranda		
Plantae	Brassicaceae	Lepidium africanum	Peppercress		
Plantae	Brassicaceae	Lepidium bonariense			

Plantae	Brassicaceae	Lepidium didymum			
Plantae	Brassicaceae	Rapistrum rugosum			
Plantae	Brassicaceae	Rorippa eustylis		C	
Plantae	Brassicaceae	Rorippa laciniata		C	
Plantae	Cactaceae	Opuntia tomentosa			
Plantae	Campanulaceae	Lobelia concolor		C	
Plantae	Campanulaceae	Lobelia purpurascens		C	
Plantae	Campanulaceae	Wahlenbergia capillaris		C	
Plantae	Campanulaceae	Wahlenbergia gracilis		C	
Plantae	Campanulaceae	Wahlenbergia graniticola		C	
Plantae	Campanulaceae	Wahlenbergia planiflora subsp. longipila		C	
Plantae	Caryophyllaceae	Polycarpon tetraphyllum			
Plantae	Celastraceae	Denhamia cunninghamii		C	
Plantae	Chenopodiaceae	Chenopodium album	Fat-hen		
Plantae	Chenopodiaceae	Chenopodium murale			
Plantae	Chenopodiaceae	Sclerolaena muricata var. muricata		C	
Plantae	Convolvulaceae	Convolvulus arvensis			
Plantae	Convolvulaceae	Ipomoea plebeia	Bell vine	C	
Plantae	Crassulaceae	Bryophyllum delagoense			
Plantae	Crassulaceae	Bryophyllum fedtschenkoi			
Plantae	Crassulaceae	Bryophyllum x houghtonii			
Plantae	Crassulaceae	Crassula sieberiana		C	
Plantae	Cyperaceae	Cyperus fulvus		C	
Plantae	Cyperaceae	Cyperus scariosus		C	
Plantae	Cyperaceae	Eleocharis acuta	Club rush	C	
Plantae	Cyperaceae	Eleocharis dulcis	Chinese water chestnut	C	
Plantae	Cyperaceae	Eleocharis gracilis		C	
Plantae	Cyperaceae	Eleocharis pusilla		C	
Plantae	Cyperaceae	Fimbristylis dichotoma		C	
Plantae	Elaeocarpaceae	Elaeocarpus reticulatus		C	
Plantae	Ericaceae	Melichrus urceolatus		C	
Plantae	Euphorbiaceae	Euphorbia dallachyana		C	
Plantae	Euphorbiaceae	Ricinus communis	Maple weed		
Plantae	Fabaceae	Acacia baeuerlenii		C	
Plantae	Fabaceae	Acacia concurrens		C	
Plantae	Fabaceae	Acacia crassa subsp. crassa		C	
Plantae	Fabaceae	Acacia falcata		C	

Plantae	Fabaceae	Acacia glaucocarpa		C	
Plantae	Fabaceae	Acacia harpophylla		C	
Plantae	Fabaceae	Acacia julifera subsp. julifera		C	
Plantae	Fabaceae	Acacia penninervis var. longiracemosa		C	
Plantae	Fabaceae	Acacia podalyriifolia	Mount Morgan wattle	C	
Plantae	Fabaceae	Acacia quadrilateralis		C	
Plantae	Fabaceae	Acacia salicina		C	
Plantae	Fabaceae	Chamaecrista nomame var. nomame		C	
Plantae	Fabaceae	Chorizema parviflorum		C	
Plantae	Fabaceae	Crotalaria lanceolata subsp. lanceolata			
Plantae	Fabaceae	Cullen tenax		C	
Plantae	Fabaceae	Desmodium gunnii		C	
Plantae	Fabaceae	Desmodium varians		C	
Plantae	Fabaceae	Glycine latifolia		C	
Plantae	Fabaceae	Hardenbergia violacea	purple coral-pea	C	
Plantae	Fabaceae	Jacksonia scoparia		C	
Plantae	Fabaceae	Leucaena leucocephala subsp. leucocephala			
Plantae	Fabaceae	Lotus australis		C	
Plantae	Fabaceae	Macroptilium lathyroides var. semierectum			
Plantae	Fabaceae	Medicago polymorpha			
Plantae	Fabaceae	Melilotus indicus			
Plantae	Fabaceae	Pultenaea spinosa		C	
Plantae	Fabaceae	Trifolium repens var. repens			
Plantae	Fabaceae	Zornia dyctiocarpa var. dyctiocarpa		C	
Plantae	Geraniaceae	Geranium solanderi var. solanderi	Austral Crane's-bill	C	
Plantae	Goodeniaceae	Goodenia hederacea subsp. hederacea		C	
Plantae	Goodeniaceae	Velleia paradoxa		C	
Plantae	Hemerocallidaceae	Dianella longifolia var. longifolia		C	
Plantae	Hydrocharitaceae	Vallisneria australis		C	
Plantae	Juncaceae	Juncus flavidus		C	
Plantae	Lamiaceae	Ajuga australis		C	
Plantae	Lamiaceae	Ajuga sinuata		C	
Plantae	Lamiaceae	Marrubium vulgare			
Plantae	Lamiaceae	Salvia coccinea			
Plantae	Lamiaceae	Salvia plebeia		C	
Plantae	Lamiaceae	Salvia reflexa			

Plantae	Lamiaceae	Stachys arvensis			
Plantae	Linaceae	Linum usitatissimum			
Plantae	Loranthaceae	Amyema congener subsp. rotundifolia		C	
Plantae	Loranthaceae	Amyema quandang var. bancroftii		C	
Plantae	Malvaceae	Hibiscus tridactylites		C	
Plantae	Malvaceae	Malva sylvestris			
Plantae	Malvaceae	Sida rhombifolia			
Plantae	Meliaceae	Melia azedarach	Umbrella tree	C	
Plantae	Meliaceae	Owenia venosa		C	
Plantae	Myrtaceae	Angophora leiocarpa		C	
Plantae	Myrtaceae	Angophora woodsiana		C	
Plantae	Myrtaceae	Corymbia citriodora subsp. variegata		C	
Plantae	Myrtaceae	Corymbia clarksoniana		C	
Plantae	Myrtaceae	Corymbia intermedia		C	
Plantae	Myrtaceae	Corymbia tessellaris		C	
Plantae	Myrtaceae	Corymbia trachyphloia subsp. trachyphloia		C	
Plantae	Myrtaceae	Eucalyptus baileyana		C	
Plantae	Myrtaceae	Eucalyptus crebra		C	
Plantae	Myrtaceae	Eucalyptus fibrosa subsp. fibrosa		C	
Plantae	Myrtaceae	Eucalyptus helidonica		C	
Plantae	Myrtaceae	Lophostemon suaveolens		C	
Plantae	Myrtaceae	Melaleuca irbyana		E	
Plantae	Oleaceae	Notelaea lloydii		V	V
Plantae	Onagraceae	Oenothera affinis			
Plantae	Onagraceae	Oenothera curtiflora			
Plantae	Papaveraceae	Fumaria muralis subsp. muralis			
Plantae	Philydraceae	Philydrum lanuginosum		C	
Plantae	Phyllanthaceae	Breynia oblongifolia		C	
Plantae	Pittosporaceae	Bursaria incana		C	
Plantae	Pittosporaceae	Hymenosporum flavum		C	
Plantae	Plantaginaceae	Plantago varia		C	
Plantae	Poaceae	Ancistrachne uncinulata		C	
Plantae	Poaceae	Anthosachne fertilis		C	
Plantae	Poaceae	Aristida calycina var. praealta		C	
Plantae	Poaceae	Aristida gracilipes		C	
Plantae	Poaceae	Aristida leichhardtiana		C	
Plantae	Poaceae	Aristida personata		C	
Plantae	Poaceae	Arundo donax			

Plantae	Poaceae	Astrebla elymoides		C	
Plantae	Poaceae	Astrebla lappacea		C	
Plantae	Poaceae	Astrebla pectinata		C	
Plantae	Poaceae	Astrebla squarrosa		C	
Plantae	Poaceae	Austrostipa verticillata		C	
Plantae	Poaceae	Bothriochloa bladhii subsp. bladhii		C	
Plantae	Poaceae	Bothriochloa bladhii subsp. glabra			
Plantae	Poaceae	Bothriochloa decipiens var. decipiens		C	
Plantae	Poaceae	Bromus catharticus			
Plantae	Poaceae	Bromus hordeaceus			
Plantae	Poaceae	Capillipedium parviflorum		C	
Plantae	Poaceae	Capillipedium spicigerum		C	
Plantae	Poaceae	Chloris divaricata var. divaricata		C	
Plantae	Poaceae	Chloris gayana			
Plantae	Poaceae	Chloris truncata		C	
Plantae	Poaceae	Chloris ventricosa		C	
Plantae	Poaceae	Chloris virgata	Feather fingergrass		
Plantae	Poaceae	Cleistochloa subjuncea		C	
Plantae	Poaceae	Cymbopogon refractus	Barb-wire grass	C	
Plantae	Poaceae	Cynodon dactylon var. dactylon			
Plantae	Poaceae	Dactyloctenium radulans		C	
Plantae	Poaceae	Dichanthium aristatum			
Plantae	Poaceae	Dichanthium sericeum subsp. sericeum		C	
Plantae	Poaceae	Dichelachne micrantha		C	
Plantae	Poaceae	Digitaria bicornis		C	
Plantae	Poaceae	Digitaria ciliaris			
Plantae	Poaceae	Digitaria didactyla			
Plantae	Poaceae	Digitaria divaricatissima var. divaricatissima		C	
Plantae	Poaceae	Digitaria eriantha			
Plantae	Poaceae	Digitaria sanguinalis			
Plantae	Poaceae	Echinochloa colona			
Plantae	Poaceae	Echinochloa telmatophila		C	
Plantae	Poaceae	Eleusine indica			
Plantae	Poaceae	Enteropogon paucispiceus		C	
Plantae	Poaceae	Entolasia stricta		C	

Plantae	Poaceae	Eragrostis cilianensis			
Plantae	Poaceae	Eragrostis elongata		C	
Plantae	Poaceae	Eragrostis leptostachya		C	
Plantae	Poaceae	Eragrostis minor			
Plantae	Poaceae	Eragrostis parviflora		C	
Plantae	Poaceae	Eragrostis pilosa			
Plantae	Poaceae	Eragrostis tenuifolia			
Plantae	Poaceae	Eremochloa bimaculata		C	
Plantae	Poaceae	Eriochloa procera		C	
Plantae	Poaceae	Eriochloa pseudoacrotricha		C	
Plantae	Poaceae	Hemarthria uncinata var. uncinata		C	
Plantae	Poaceae	Heteropogon contortus		C	
Plantae	Poaceae	Hyparrhenia hirta			
Plantae	Poaceae	Hyparrhenia rufa subsp. rufa			
Plantae	Poaceae	Imperata cylindrica		C	
Plantae	Poaceae	Lachnagrostis filiformis	Perehia	C	
Plantae	Poaceae	Leersia hexandra	Southern cutgrass	C	
Plantae	Poaceae	Lolium x hybridum			
Plantae	Poaceae	Megathyrsus maximus var. pubiglumis			
Plantae	Poaceae	Melinis repens			
Plantae	Poaceae	Microlaena stipoides var. stipoides		C	
Plantae	Poaceae	Moorochloa eruciformis			
Plantae	Poaceae	Panicum decompositum var. decompositum		C	
Plantae	Poaceae	Panicum queenslandicum var. acuminatum		C	
Plantae	Poaceae	Panicum queenslandicum var. queenslandicum		C	
Plantae	Poaceae	Panicum simile		C	
Plantae	Poaceae	Paspalidium albobillosum		C	
Plantae	Poaceae	Paspalidium flavidum		C	
Plantae	Poaceae	Paspalidium jubiflorum		C	
Plantae	Poaceae	Paspalum distichum			
Plantae	Poaceae	Paspalum urvillei			
Plantae	Poaceae	Poa annua			
Plantae	Poaceae	Polytrias indica			
Plantae	Poaceae	Sehima nervosum		C	

Plantae	Poaceae	Setaria parviflora			
Plantae	Poaceae	Setaria verticillata			
Plantae	Poaceae	Sorghum halepense	sudan grass		
Plantae	Poaceae	Sporobolus africanus	ratstail		
Plantae	Poaceae	Sporobolus creber		C	
Plantae	Poaceae	Sporobolus natalensis			
Plantae	Poaceae	Sporobolus pyramidalis			
Plantae	Poaceae	Themeda triandra	Kangaroo grass	C	
Plantae	Poaceae	Tragus australianus		C	
Plantae	Poaceae	Urochloa decumbens			
Plantae	Poaceae	Urochloa foliosa		C	
Plantae	Poaceae	Urochloa mosambicensis			
Plantae	Poaceae	Urochloa piligera		C	
Plantae	Poaceae	Urochloa subquadripara			
Plantae	Poaceae	Urochloa texana			
Plantae	Poaceae	Urochloa whiteana		C	
Plantae	Polygonaceae	Persicaria orientalis		C	
Plantae	Polygonaceae	Polygonum aviculare	MÄ• kÄ• kaka		
Plantae	Polygonaceae	Rumex brownii		C	
Plantae	Proteaceae	Grevillea quadricauda		V	V
Plantae	Proteaceae	Persoonia sericea		C	
Plantae	Pteridaceae	Cheilanthes sieberi subsp. sieberi		C	
Plantae	Ranunculaceae	Ranunculus sceleratus subsp. sceleratus			
Plantae	Rubiaceae	Asperula conferta		C	
Plantae	Rubiaceae	Richardia stellaris			
Plantae	Rubiaceae	Sherardia arvensis			
Plantae	Rutaceae	Citrus australis		C	
Plantae	Santalaceae	Thesium australe		V	V
Plantae	Sapindaceae	Alectryon tomentosus		C	
Plantae	Scrophulariaceae	Verbascum virgatum			
Plantae	Smilacaceae	Smilax australis		C	
Plantae	Solanaceae	Datura stramonium			
Plantae	Solanaceae	Lycium ferocissimum			
Plantae	Solanaceae	Nicandra physalodes			
Plantae	Solanaceae	Solanum ellipticum		C	
Plantae	Thymelaeaceae	Pimelea glauca		C	
Plantae	Verbenaceae	Lantana montevidensis			
Plantae	Verbenaceae	Verbena litoralis var. litoralis			
Plantae	Verbenaceae	Verbena rigida	Veined verbena		
Plantae	Zygophyllaceae	Tribulus micrococcus		C	

WildNet Records

Species List

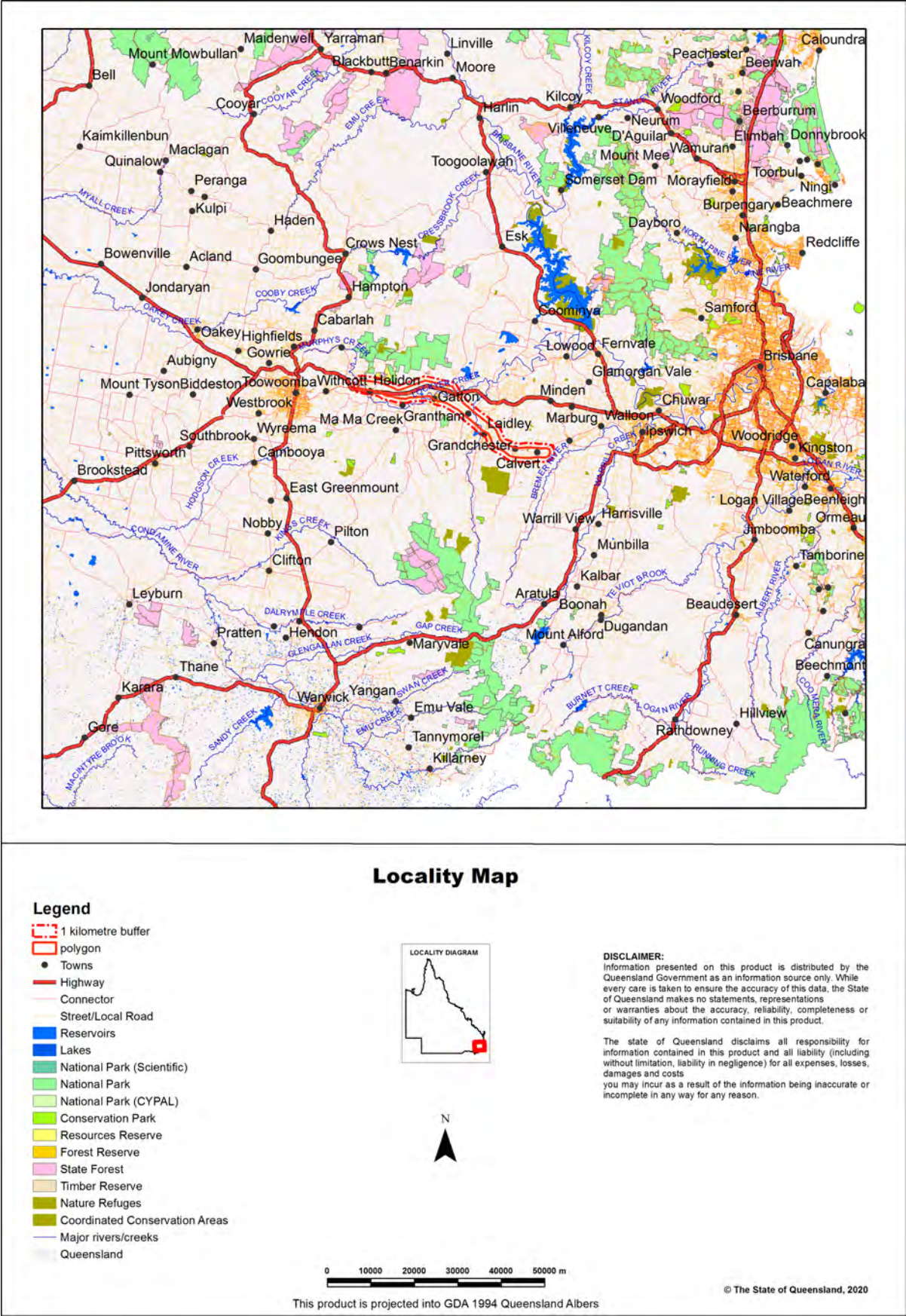


For the selected area of interest 11827.44ha

Current as at 17/03/2020

WildNetspecieslist

Map 1. Locality Map



Summary Information

The following table provides an overview of the area of interest .

Table 1. Area of interest details

Size (ha)	11,827.44
Local Government(s)	Ipswich City, Lockyer Valley Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Moreton Basin
Catchment(s)	Brisbane

Protected Area(s)

No estates or reserves are located within the area of interest.

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 Species List report is derived only from records from the WildNet database managed by the Department of Environment and Science. Other data sources may provide additional information on species occurrence.

The WildNet dataset is constantly being enhanced and the taxonomic and status information revised. If a species does not occur in the report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area.

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 protists 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	<i>Ambassis agassizii</i>	Agassiz's glassfish	None	None	0	2	27/10/2010
26908	Actinopterygii	Anguillidae	<i>Anguilla australis</i>	southern shortfin eel	None	None	0	6	24/04/2014
26910	Actinopterygii	Anguillidae	<i>Anguilla reinhardtii</i>	longfin eel	None	None	0	22	29/04/2014
26920	Actinopterygii	Atherinidae	<i>Craterocephalus stercusmuscarum</i>	flyspecked hardyhead	None	None	0	1	02/05/2013
26941	Actinopterygii	Clupeidae	<i>Nematalosa erebi</i>	bony bream	None	None	0	2	06/05/2010
19545	Actinopterygii	Cyprinidae	<i>Carassius auratus</i>	goldfish	None	None	0	6	29/04/2014
26952	Actinopterygii	Eleotridae	<i>Gobiomorphus australis</i>	striped gudgeon	None	None	0	4	29/04/2014
26955	Actinopterygii	Eleotridae	<i>Hypseleotris galii</i>	firetail gudgeon	None	None	0	32	29/04/2014
26956	Actinopterygii	Eleotridae	<i>Hypseleotris klunzingeri</i>	western carp gudgeon	None	None	0	9	24/04/2014

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
18168	Actinopterygii	Eleotridae	<i>Mogurnda adspersa</i>	southern purplespotted gudgeon	None	None	0	8	24/04/2014
27024	Actinopterygii	Melanotaeniidae	<i>Melanotaenia duboulayi</i>	crimsonspotted rainbowfish	None	None	0	13	29/04/2014
27042	Actinopterygii	Percichthyidae	<i>Macquaria ambigua</i>	golden perch	None	None	0	2	31/05/2003
27054	Actinopterygii	Plotosidae	<i>Tandanus tandanus</i>	freshwater catfish	None	None	0	8	29/04/2014
27055	Actinopterygii	Poeciliidae	<i>Gambusia holbrooki</i>	mosquitofish	None	None	0	31	29/04/2014
27061	Actinopterygii	Retropinnidae	<i>Retropinna semoni</i>	Australian smelt	None	None	0	5	24/04/2014
27089	Actinopterygii	Terapontidae	<i>Leiopotherapon unicolor</i>	spangled perch	None	None	0	23	29/04/2014
716	Amphibia	Bufonidae	<i>Rhinella marina</i>	cane toad	None	None	0	16	17/03/2019
624	Amphibia	Hylidae	<i>Cyclorana alboguttata</i>	greenstripe frog	C	None	1	2	24/02/1994
643	Amphibia	Hylidae	<i>Cyclorana brevipes</i>	superb collared frog	C	None	1	3	25/11/2007
627	Amphibia	Hylidae	<i>Litoria caerulea</i>	common green treefrog	C	None	0	15	26/10/2010
608	Amphibia	Hylidae	<i>Litoria fallax</i>	eastern sedgefrog	C	None	0	11	22/08/2015
611	Amphibia	Hylidae	<i>Litoria gracilentae</i>	graceful treefrog	C	None	0	5	18/11/2012
614	Amphibia	Hylidae	<i>Litoria latopalmata</i>	broad palmed rocketfrog	C	None	0	1	31/12/1990
596	Amphibia	Hylidae	<i>Litoria peronii</i>	emerald spotted treefrog	C	None	0	2	21/10/1998
600	Amphibia	Hylidae	<i>Litoria rubella</i>	ruddy treefrog	C	None	0	6	26/10/2010
681	Amphibia	Limnodynastidae	<i>Limnodynastes peronii</i>	striped marshfrog	C	None	0	8	31/05/2015
684	Amphibia	Limnodynastidae	<i>Limnodynastes tasmaniensis</i>	spotted grassfrog	C	None	0	4	26/10/2010
673	Amphibia	Limnodynastidae	<i>Limnodynastes terraereginae</i>	scarlet sided pobblebonk	C	None	0	8	01/07/1996
680	Amphibia	Limnodynastidae	<i>Platyplectrum ornatum</i>	ornate burrowing frog	C	None	0	3	16/01/2004
696	Amphibia	Myobatrachidae	<i>Crinia parinsignifera</i>	beeping froglet	C	None	0	1	16/01/2004
698	Amphibia	Myobatrachidae	<i>Crinia signifera</i>	clicking froglet	C	None	0	2	01/12/2008
672	Amphibia	Myobatrachidae	<i>Pseudophryne coriacea</i>	red backed broodfrog	C	None	0	1	30/06/1991
659	Amphibia	Myobatrachidae	<i>Pseudophryne major</i>	great brown broodfrog	C	None	0	1	01/09/1996
635	Amphibia	Myobatrachidae	<i>Uperoleia laevis</i>	eastern gungan	C	None	2	2	31/12/1986
639	Amphibia	Myobatrachidae	<i>Uperoleia rugosa</i>	chubby gungan	C	None	1	2	16/01/2004
640	Amphibia	Myobatrachidae	<i>Uperoleia sp.</i>	None	None	None	0	1	31/12/1967

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1419	Aves	Acanthizidae	<i>Acanthiza chrysorrhoa</i>	yellow-rumped thornbill	C	None	0	173	22/08/2015
1421	Aves	Acanthizidae	<i>Acanthiza lineata</i>	striated thornbill	C	None	0	21	28/10/2001
1422	Aves	Acanthizidae	<i>Acanthiza nana</i>	yellow thornbill	C	None	0	51	01/11/2010
1423	Aves	Acanthizidae	<i>Acanthiza pusilla</i>	brown thornbill	C	None	0	35	25/10/1998
1425	Aves	Acanthizidae	<i>Acanthiza reguloides</i>	buff-rumped thornbill	C	None	0	57	21/06/2011
1407	Aves	Acanthizidae	<i>Gerygone fusca</i>	western gerygone	C	None	0	24	21/05/1994
1410	Aves	Acanthizidae	<i>Gerygone mouki</i>	brown gerygone	C	None	0	4	30/12/2005
1396	Aves	Acanthizidae	<i>Gerygone olivacea</i>	white-throated gerygone	C	None	0	119	26/09/2015
1403	Aves	Acanthizidae	<i>Pyrholaemus sagittatus</i>	speckled warbler	C	None	0	68	01/11/2010
1382	Aves	Acanthizidae	<i>Sericornis frontalis</i>	white-browed scrubwren	C	None	0	71	01/11/2010
1371	Aves	Acanthizidae	<i>Smicornis brevirostris</i>	weebill	C	None	0	70	22/08/2015
1742	Aves	Accipitridae	<i>Accipiter cirrocephalus</i>	collared sparrowhawk	C	None	0	54	11/02/2012
1729	Aves	Accipitridae	<i>Accipiter fasciatus</i>	brown goshawk	C	None	0	88	01/11/2010
1730	Aves	Accipitridae	<i>Accipiter novaehollandiae</i>	grey goshawk	C	None	1	4	19/04/2008
1732	Aves	Accipitridae	<i>Aquila audax</i>	wedge-tailed eagle	C	None	0	113	29/08/2018
1721	Aves	Accipitridae	<i>Aviceda subcristata</i>	Pacific baza	C	None	0	58	30/11/2014
1722	Aves	Accipitridae	<i>Circus approximans</i>	swamp harrier	C	None	0	44	16/07/2018
1723	Aves	Accipitridae	<i>Circus assimilis</i>	spotted harrier	C	None	0	38	31/05/2015
1725	Aves	Accipitridae	<i>Elanus axillaris</i>	black-shouldered kite	C	None	1	132	22/08/2015
1728	Aves	Accipitridae	<i>Erythrorhynchus radiatus</i>	red goshawk	E	V	0	19	09/06/2002
1718	Aves	Accipitridae	<i>Haliaeetus leucogaster</i>	white-bellied sea-eagle	C	None	0	94	26/06/2017
1720	Aves	Accipitridae	<i>Haliastur indus</i>	brahminy kite	C	None	0	5	31/10/2015
1707	Aves	Accipitridae	<i>Haliastur sphenurus</i>	whistling kite	C	None	0	160	10/03/2019
1710	Aves	Accipitridae	<i>Hieraaetus morphnoides</i>	little eagle	C	None	0	33	26/05/2002
1712	Aves	Accipitridae	<i>Lophoictinia isura</i>	square-tailed kite	C	None	0	26	10/03/2019
1714	Aves	Accipitridae	<i>Milvus migrans</i>	black kite	C	None	0	36	10/03/2019
1702	Aves	Accipitridae	<i>Pandion cristatus</i>	eastern osprey	SL	None	0	4	13/03/1999
1305	Aves	Acrocephalidae	<i>Acrocephalus australis</i>	Australian reed-warbler	C	None	0	149	16/07/2018
1973	Aves	Aegothelidae	<i>Aegotheles cristatus</i>	Australian owl-nightjar	C	None	0	18	22/12/1999
1652	Aves	Alaudidae	<i>Mirafra javanica</i>	Horsfield's bushlark	C	None	0	28	15/06/2014
1776	Aves	Alcedinidae	<i>Ceyx azureus</i>	azure kingfisher	C	None	0	71	02/11/2009
1992	Aves	Anatidae	<i>Anas castanea</i>	chestnut teal	C	None	0	50	04/01/2019

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1993	Aves	Anatidae	<i>Anas gracilis</i>	grey teal	C	None	1	368	23/03/2019
1994	Aves	Anatidae	<i>Anas platyrhynchos</i>	northern mallard	None	None	0	6	03/07/2000
1997	Aves	Anatidae	<i>Anas sp.</i>	None	None	None	0	1	03/11/2011
1998	Aves	Anatidae	<i>Anas superciliosa</i>	Pacific black duck	C	None	0	421	23/03/2019
1999	Aves	Anatidae	<i>Aythya australis</i>	hardhead	C	None	0	283	04/01/2019
2001	Aves	Anatidae	<i>Biziura lobata</i>	musk duck	C	None	0	16	30/12/2003
2003	Aves	Anatidae	<i>Chenonetta jubata</i>	Australian wood duck	C	None	0	393	17/03/2019
2005	Aves	Anatidae	<i>Cygnus atratus</i>	black swan	C	None	0	192	04/01/2016
1977	Aves	Anatidae	<i>Dendrocygna arcuata</i>	wandering whistling-duck	C	None	0	74	08/02/2016
1978	Aves	Anatidae	<i>Dendrocygna eytoni</i>	plumed whistling-duck	C	None	0	264	23/03/2019
1980	Aves	Anatidae	<i>Malacorhynchus membranaceus</i>	pink-eared duck	C	None	0	241	23/03/2019
1982	Aves	Anatidae	<i>Nettapus coromandelianus</i>	cotton pygmy-goose	C	None	0	66	10/11/2007
1983	Aves	Anatidae	<i>Nettapus pulchellus</i>	green pygmy-goose	C	None	0	1	31/12/1984
1985	Aves	Anatidae	<i>Oxyura australis</i>	blue-billed duck	C	None	0	48	08/03/2015
1996	Aves	Anatidae	<i>Spatula rhynchotis</i>	Australasian shoveler	C	None	0	138	04/01/2019
1987	Aves	Anatidae	<i>Stictonetta naevosa</i>	freckled duck	C	None	0	57	10/03/2019
1279	Aves	Anhingidae	<i>Anhinga novaehollandiae</i>	Australasian darter	C	None	0	180	24/11/2017
1963	Aves	Anseranatidae	<i>Anseranas semipalmata</i>	maggie goose	C	None	0	151	04/06/2019
1965	Aves	Apodidae	<i>Apus pacificus</i>	fork-tailed swift	SL	None	0	9	28/12/2008
1971	Aves	Apodidae	<i>Hirundapus caudacutus</i>	white-throated needletail	V	V	0	40	28/12/2008
1829	Aves	Ardeidae	<i>Ardea alba modesta</i>	eastern great egret	C	None	0	207	17/03/2019
1831	Aves	Ardeidae	<i>Ardea intermedia</i>	intermediate egret	C	None	0	153	24/11/2017
1832	Aves	Ardeidae	<i>Ardea pacifica</i>	white-necked heron	C	None	0	112	23/03/2019
1830	Aves	Ardeidae	<i>Bubulcus ibis</i>	cattle egret	C	None	0	337	04/01/2019
1840	Aves	Ardeidae	<i>Egretta garzetta</i>	little egret	C	None	0	110	24/11/2017
1826	Aves	Ardeidae	<i>Egretta novaehollandiae</i>	white-faced heron	C	None	0	220	20/11/2015
1815	Aves	Ardeidae	<i>Ixobrychus flavicollis</i>	black bittern	C	None	0	2	02/11/2009
1818	Aves	Ardeidae	<i>Nycticorax caledonicus</i>	nankeen night-heron	C	None	0	33	14/12/2014
1659	Aves	Artamidae	<i>Artamus cyanopterus</i>	dusky woodswallow	C	None	0	58	28/10/2001
1660	Aves	Artamidae	<i>Artamus leucorhynchus</i>	white-breasted woodswallow	C	None	0	52	27/08/2014
1647	Aves	Artamidae	<i>Artamus personatus</i>	masked woodswallow	C	None	0	7	10/10/1994

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1649	Aves	Artamidae	<i>Artamus superciliosus</i>	white-browed woodswallow	C	None	0	4	28/10/2001
1654	Aves	Artamidae	<i>Cracticus nigrogularis</i>	pied butcherbird	C	None	0	301	26/09/2015
1656	Aves	Artamidae	<i>Cracticus torquatus</i>	grey butcherbird	C	None	0	161	16/07/2018
1644	Aves	Artamidae	<i>Gymnorhina tibicen</i>	Australian magpie	C	None	0	394	17/03/2019
1645	Aves	Artamidae	<i>Strepera graculina</i>	pied currawong	C	None	0	116	21/06/2011
1191	Aves	Cacatuidae	<i>Cacatua galerita</i>	sulphur-crested cockatoo	C	None	0	37	26/10/2008
1194	Aves	Cacatuidae	<i>Cacatua sanguinea</i>	little corella	C	None	0	53	17/03/2019
1196	Aves	Cacatuidae	<i>Calyptorhynchus banksii</i>	red-tailed black-cockatoo	C	None	0	46	22/08/2015
1185	Aves	Cacatuidae	<i>Calyptorhynchus funereus</i>	yellow-tailed black-cockatoo	C	None	0	30	04/01/2016
1171	Aves	Cacatuidae	<i>Calyptorhynchus lathami</i>	glossy black-cockatoo	V	None	0	1	02/11/2013
22494	Aves	Cacatuidae	<i>Calyptorhynchus lathami lathami</i>	glossy black-cockatoo (eastern)	V	None	0	24	11/05/2017
1193	Aves	Cacatuidae	<i>Eolophus roseicapilla</i>	galah	C	None	0	306	17/03/2019
1173	Aves	Cacatuidae	<i>Nymphicus hollandicus</i>	cockatiel	C	None	0	136	12/06/2016
1634	Aves	Campephagidae	<i>Coracina lineata</i>	barred cuckoo-shrike	C	None	0	1	08/04/1983
1635	Aves	Campephagidae	<i>Coracina maxima</i>	ground cuckoo-shrike	C	None	0	38	25/08/2014
1636	Aves	Campephagidae	<i>Coracina novaehollandiae</i>	black-faced cuckoo-shrike	C	None	0	281	07/06/2017
1637	Aves	Campephagidae	<i>Coracina papuensis</i>	white-bellied cuckoo-shrike	C	None	0	63	27/08/2014
1639	Aves	Campephagidae	<i>Coracina tenuirostris</i>	cicadabird	C	None	0	42	29/01/2005
1640	Aves	Campephagidae	<i>Lalage leucomela</i>	varied triller	C	None	0	4	29/01/2005
1642	Aves	Campephagidae	<i>Lalage tricolor</i>	white-winged triller	C	None	0	68	02/11/2012
1937	Aves	Charadriidae	<i>Charadrius ruficapillus</i>	red-capped plover	C	None	0	12	15/06/2014
1939	Aves	Charadriidae	<i>Charadrius veredus</i>	oriental plover	SL	None	0	5	31/12/1991
1940	Aves	Charadriidae	<i>Elseyornis melanops</i>	black-fronted dotterel	C	None	0	213	17/03/2019
1942	Aves	Charadriidae	<i>Erythronyx cinctus</i>	red-kneed dotterel	C	None	0	130	15/10/2017
1944	Aves	Charadriidae	<i>Pluvialis fulva</i>	Pacific golden plover	SL	None	0	4	30/11/1992
27774	Aves	Charadriidae	<i>Vanellus miles</i>	masked lapwing	C	None	0	82	31/05/2015

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1933	Aves	Charadriidae	<i>Vanellus miles novaehollandiae</i>	masked lapwing (southern subspecies)	C	None	0	301	23/03/2019
18143	Aves	Charadriidae	<i>Vanellus tricolor</i>	banded lapwing	C	None	0	45	02/11/1994
1820	Aves	Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	black-necked stork	C	None	0	38	28/03/2010
1294	Aves	Cisticolidae	<i>Cisticola exilis</i>	golden-headed cisticola	C	None	0	213	15/10/2017
1617	Aves	Climacteridae	<i>Cormobates leucophaea</i>	white-throated treecreeper	C	None	0	3	26/05/2002
18293	Aves	Climacteridae	<i>Cormobates leucophaea metastasis</i>	white-throated treecreeper (southern)	C	None	0	48	21/06/2011
1801	Aves	Columbidae	<i>Chalcophaps indica</i>	emerald dove	C	None	0	3	28/10/2001
1804	Aves	Columbidae	<i>Columba livia</i>	rock dove	None	None	0	268	19/07/2018
1809	Aves	Columbidae	<i>Geopelia cuneata</i>	diamond dove	C	None	0	7	16/10/1994
1810	Aves	Columbidae	<i>Geopelia humeralis</i>	bar-shouldered dove	C	None	0	130	30/11/2014
1797	Aves	Columbidae	<i>Geopelia striata</i>	peaceful dove	C	None	0	169	24/11/2017
1785	Aves	Columbidae	<i>Geophaps scripta scripta</i>	squatter pigeon (southern subspecies)	V	V	0	30	08/08/1993
1787	Aves	Columbidae	<i>Leucosarcia melanoleuca</i>	wonga pigeon	C	None	0	1	31/12/1990
1789	Aves	Columbidae	<i>Lopholaimus antarcticus</i>	topknot pigeon	C	None	0	2	31/08/1993
1791	Aves	Columbidae	<i>Macropygia amboinensis</i>	brown cuckoo-dove	C	None	0	3	28/10/2001
1793	Aves	Columbidae	<i>Ocyphaps lophotes</i>	crested pigeon	C	None	0	359	23/03/2019
1795	Aves	Columbidae	<i>Phaps chalcoptera</i>	common bronzewing	C	None	0	84	26/10/2008
1774	Aves	Columbidae	<i>Streptopelia chinensis</i>	spotted dove	None	None	0	173	20/09/2014
1779	Aves	Coraciidae	<i>Eurystomus orientalis</i>	dollarbird	C	None	0	117	15/10/2017
1603	Aves	Corcoracidae	<i>Corcorax melanorhamphos</i>	white-winged chough	C	None	0	88	11/02/2012
1609	Aves	Corvidae	<i>Corvus orru</i>	Torresian crow	C	None	0	419	23/03/2019
1610	Aves	Corvidae	<i>Corvus sp.</i>	None	None	None	0	1	16/08/2006
1754	Aves	Cuculidae	<i>Cacomantis flabelliformis</i>	fan-tailed cuckoo	C	None	0	41	25/07/2010
1750	Aves	Cuculidae	<i>Cacomantis pallidus</i>	pallid cuckoo	C	None	0	35	28/10/2001
1743	Aves	Cuculidae	<i>Cacomantis variolosus</i>	brush cuckoo	C	None	0	29	31/10/2005
1751	Aves	Cuculidae	<i>Centropus phasianinus</i>	pheasant coucal	C	None	0	98	07/08/2018
1744	Aves	Cuculidae	<i>Chalcites basalis</i>	Horsfield's bronze-cuckoo	C	None	0	30	01/11/2010

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1745	Aves	Cuculidae	<i>Chalcites lucidus</i>	shining bronze-cuckoo	C	None	0	26	02/11/2009
1756	Aves	Cuculidae	<i>Chalcites minutillus barnardi</i>	Eastern little bronze-cuckoo	C	None	0	4	28/10/2001
1747	Aves	Cuculidae	<i>Chalcites osculans</i>	black-eared cuckoo	C	None	0	1	30/11/1992
1736	Aves	Cuculidae	<i>Cuculus optatus</i>	oriental cuckoo	SL	None	0	6	30/11/1992
1738	Aves	Cuculidae	<i>Eudynamis orientalis</i>	eastern koel	C	None	0	122	24/11/2017
1740	Aves	Cuculidae	<i>Scythrops novaehollandiae</i>	channel-billed cuckoo	C	None	0	106	25/10/2015
1405	Aves	Dasyornithidae	<i>Dasyornis brachypterus</i>	eastern bristlebird	E	E	0	1	31/12/1965
1601	Aves	Dicruridae	<i>Dicrurus bracteatus</i>	spangled drongo	C	None	0	33	02/11/2009
1366	Aves	Estrildidae	<i>Lonchura castaneothorax</i>	chestnut-breasted mannikin	C	None	0	91	30/11/2014
1367	Aves	Estrildidae	<i>Lonchura punctulata</i>	nutmeg mannikin	None	None	0	2	31/12/1992
1369	Aves	Estrildidae	<i>Neochmia modesta</i>	plum-headed finch	C	None	0	62	28/12/2015
1359	Aves	Estrildidae	<i>Neochmia temporalis</i>	red-browed finch	C	None	0	85	21/06/2011
1355	Aves	Estrildidae	<i>Stagonopleura guttata</i>	diamond firetail	C	None	0	5	11/08/1998
1342	Aves	Estrildidae	<i>Taeniopygia bichenovii</i>	double-barred finch	C	None	0	201	23/03/2019
1343	Aves	Estrildidae	<i>Taeniopygia guttata</i>	zebra finch	C	None	0	141	01/11/2010
1962	Aves	Eurostopodidae	<i>Eurostopodus argus</i>	spotted nightjar	C	None	0	3	30/11/1990
1949	Aves	Eurostopodidae	<i>Eurostopodus mystacalis</i>	white-throated nightjar	C	None	0	30	25/10/1998
1716	Aves	Falconidae	<i>Falco berigora</i>	brown falcon	C	None	0	84	22/05/2018
1704	Aves	Falconidae	<i>Falco cenchroides</i>	nankeen kestrel	C	None	0	229	28/12/2015
1705	Aves	Falconidae	<i>Falco hypoleucos</i>	grey falcon	V	None	0	1	11/04/1998
1691	Aves	Falconidae	<i>Falco longipennis</i>	Australian hobby	C	None	0	95	16/07/2018
1692	Aves	Falconidae	<i>Falco peregrinus</i>	peregrine falcon	C	None	0	56	29/12/2015
1693	Aves	Falconidae	<i>Falco subniger</i>	black falcon	C	None	0	18	15/10/2017
1766	Aves	Halcyonidae	<i>Dacelo leachii</i>	blue-winged kookaburra	C	None	0	4	17/05/2017
1767	Aves	Halcyonidae	<i>Dacelo novaeguineae</i>	laughing kookaburra	C	None	0	257	04/01/2019
1760	Aves	Halcyonidae	<i>Todiramphus macleayi</i>	forest kingfisher	C	None	0	8	27/04/2001
1761	Aves	Halcyonidae	<i>Todiramphus pyrrhopygius</i>	red-backed kingfisher	C	None	0	13	13/02/2000
1762	Aves	Halcyonidae	<i>Todiramphus sanctus</i>	sacred kingfisher	C	None	0	146	24/11/2017
1583	Aves	Hirundinidae	<i>Cheramoeca leucosterna</i>	white-backed swallow	C	None	0	82	07/11/2014

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1572	Aves	Hirundinidae	<i>Hirundo neoxena</i>	welcome swallow	C	None	0	345	23/03/2019
1585	Aves	Hirundinidae	<i>Petrochelidon ariel</i>	fairy martin	C	None	0	165	04/01/2016
1573	Aves	Hirundinidae	<i>Petrochelidon nigricans</i>	tree martin	C	None	0	80	03/01/2015
1928	Aves	Jacaniidae	<i>Irediparra gallinacea</i>	comb-crested jacana	C	None	0	137	19/07/2018
1919	Aves	Laridae	<i>Chlidonias hybrida</i>	whiskered tern	C	None	0	46	04/01/2016
1920	Aves	Laridae	<i>Chlidonias leucopterus</i>	white-winged black tern	SL	None	0	5	31/12/1992
1912	Aves	Laridae	<i>Chroicocephalus novaehollandiae</i>	silver gull	C	None	0	22	04/01/2019
1886	Aves	Laridae	<i>Gelochelidon nilotica</i>	gull-billed tern	SL	None	0	10	12/06/2016
1896	Aves	Laridae	<i>Hydroprogne caspia</i>	Caspian tern	SL	None	0	13	24/11/2017
1570	Aves	Maluridae	<i>Malurus cyaneus</i>	superb fairy-wren	C	None	0	209	24/01/2016
1556	Aves	Maluridae	<i>Malurus lamberti</i>	variegated fairy-wren	C	None	0	65	23/03/2019
1558	Aves	Maluridae	<i>Malurus melanocephalus</i>	red-backed fairy-wren	C	None	0	129	15/10/2017
1291	Aves	Megaluridae	<i>Cincloramphus cruralis</i>	brown songlark	C	None	0	31	25/10/2015
1292	Aves	Megaluridae	<i>Cincloramphus mathewsi</i>	rufous songlark	C	None	0	36	15/10/2017
1287	Aves	Megaluridae	<i>Megalurus gramineus</i>	little grassbird	C	None	0	46	16/07/2018
1289	Aves	Megaluridae	<i>Megalurus timoriensis</i>	tawny grassbird	C	None	0	71	31/05/2015
1694	Aves	Megapodiidae	<i>Alectura lathami</i>	Australian brush-turkey	C	None	0	16	01/11/2010
1552	Aves	Meliphagidae	<i>Acanthagenys rufogularis</i>	spiny-cheeked honeyeater	C	None	0	2	13/07/2016
1555	Aves	Meliphagidae	<i>Acanthorhynchus tenuirostris</i>	eastern spinebill	C	None	0	24	01/09/1996
1541	Aves	Meliphagidae	<i>Anthochaera carunculata</i>	red wattlebird	C	None	0	3	10/11/2007
1542	Aves	Meliphagidae	<i>Anthochaera chrysoptera</i>	little wattlebird	C	None	0	2	09/03/1975
1523	Aves	Meliphagidae	<i>Caligavis chrysops</i>	yellow-faced honeyeater	C	None	0	70	19/07/2018
1539	Aves	Meliphagidae	<i>Entomyzon cyanotis</i>	blue-faced honeyeater	C	None	0	103	03/01/2015
1497	Aves	Meliphagidae	<i>Lichmera indistincta</i>	brown honeyeater	C	None	0	226	17/03/2019
1500	Aves	Meliphagidae	<i>Manorina melanocephala</i>	noisy miner	C	None	0	415	17/03/2019
1504	Aves	Meliphagidae	<i>Meliphaga lewinii</i>	Lewin's honeyeater	C	None	0	87	21/06/2011
1507	Aves	Meliphagidae	<i>Melithreptus albogularis</i>	white-throated honeyeater	C	None	0	86	21/06/2011
1508	Aves	Meliphagidae	<i>Melithreptus brevirostris</i>	brown-headed honeyeater	C	None	0	51	29/01/2005

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1483	Aves	Meliphagidae	<i>Melithreptus gularis</i>	black-chinned honeyeater	C	None	0	14	24/10/1993
1485	Aves	Meliphagidae	<i>Melithreptus lunatus</i>	white-naped honeyeater	C	None	0	30	26/10/2008
1489	Aves	Meliphagidae	<i>Myzomela sanguinolenta</i>	scarlet honeyeater	C	None	0	64	21/06/2011
1516	Aves	Meliphagidae	<i>Nesoptilotis leucotis</i>	white-eared honeyeater	C	None	0	1	31/12/1954
1493	Aves	Meliphagidae	<i>Philemon citreogularis</i>	little friarbird	C	None	0	143	19/07/2018
1494	Aves	Meliphagidae	<i>Philemon corniculatus</i>	noisy friarbird	C	None	0	129	19/07/2018
1482	Aves	Meliphagidae	<i>Phylidonyris niger</i>	white-cheeked honeyeater	C	None	0	1	30/09/1992
1471	Aves	Meliphagidae	<i>Plectorhyncha lanceolata</i>	striped honeyeater	C	None	0	185	16/07/2018
1513	Aves	Meliphagidae	<i>Ptilotula fusca</i>	fuscous honeyeater	C	None	0	102	25/10/2015
1518	Aves	Meliphagidae	<i>Ptilotula penicillata</i>	white-plumed honeyeater	C	None	0	1	04/05/2000
1546	Aves	Meliphagidae	<i>Sugomel niger</i>	black honeyeater	C	None	0	5	31/10/1994
1764	Aves	Meropidae	<i>Merops ornatus</i>	rainbow bee-eater	C	None	0	148	25/10/2015
1589	Aves	Monarchidae	<i>Grallina cyanoleuca</i>	magpie-lark	C	None	0	507	23/03/2019
1595	Aves	Monarchidae	<i>Monarcha melanopsis</i>	black-faced monarch	SL	None	0	9	25/10/1998
1600	Aves	Monarchidae	<i>Myiagra inquieta</i>	restless flycatcher	C	None	0	58	29/08/2014
1586	Aves	Monarchidae	<i>Myiagra rubecula</i>	leaden flycatcher	C	None	0	60	01/11/2010
1597	Aves	Monarchidae	<i>Symphysichrus trivirgatus</i>	spectacled monarch	SL	None	0	2	30/11/1991
1455	Aves	Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian pipit	C	None	0	77	25/08/2014
1611	Aves	Nectariniidae	<i>Dicaeum hirundinaceum</i>	mistletoebird	C	None	0	147	01/11/2010
1453	Aves	Neosittidae	<i>Daphoenositta chrysoptera</i>	varied sittella	C	None	0	58	26/10/2008
1442	Aves	Oriolidae	<i>Oriolus sagittatus</i>	olive-backed oriole	C	None	0	98	24/11/2017
1444	Aves	Oriolidae	<i>Sphecotheres vieilloti</i>	Australasian figbird	C	None	0	156	10/03/2019
1680	Aves	Otididae	<i>Ardeotis australis</i>	Australian bustard	C	None	0	1	10/12/2009
1449	Aves	Pachycephalidae	<i>Colluricincla harmonica</i>	grey shrike-thrush	C	None	0	92	26/09/2015
1450	Aves	Pachycephalidae	<i>Colluricincla megarhyncha</i>	little shrike-thrush	C	None	0	1	09/03/1975
1429	Aves	Pachycephalidae	<i>Falcunculus frontatus</i>	crested shrike-tit	C	None	0	26	31/12/2000
1436	Aves	Pachycephalidae	<i>Pachycephala pectoralis</i>	golden whistler	C	None	0	54	22/08/2015
1437	Aves	Pachycephalidae	<i>Pachycephala rufiventris</i>	rufous whistler	C	None	0	104	19/07/2018
1389	Aves	Pardalotidae	<i>Pardalotus punctatus</i>	spotted pardalote	C	None	0	50	21/06/2011

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1392	Aves	Pardalotidae	<i>Pardalotus striatus</i>	striated pardalote	C	None	0	275	19/07/2018
1360	Aves	Passeridae	<i>Passer domesticus</i>	house sparrow	None	None	0	162	23/03/2019
1284	Aves	Pelecanidae	<i>Pelecanus conspicillatus</i>	Australian pelican	C	None	0	182	04/01/2016
1347	Aves	Petroicidae	<i>Eopsaltria australis</i>	eastern yellow robin	C	None	0	68	01/11/2010
1339	Aves	Petroicidae	<i>Microeca fascians</i>	jacky winter	C	None	0	117	22/08/2015
1330	Aves	Petroicidae	<i>Petroica boodang</i>	scarlet robin	C	None	0	1	12/07/1981
1329	Aves	Petroicidae	<i>Petroica goodenovii</i>	red-capped robin	C	None	0	18	28/10/2001
1332	Aves	Petroicidae	<i>Petroica rosea</i>	rose robin	C	None	0	36	16/07/2000
1261	Aves	Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	little pied cormorant	C	None	0	251	17/03/2019
1275	Aves	Phalacrocoracidae	<i>Phalacrocorax carbo</i>	great cormorant	C	None	0	82	15/10/2017
1263	Aves	Phalacrocoracidae	<i>Phalacrocorax sulcirostris</i>	little black cormorant	C	None	0	224	23/03/2019
1264	Aves	Phalacrocoracidae	<i>Phalacrocorax varius</i>	pied cormorant	C	None	0	58	12/06/2016
1699	Aves	Phasianidae	<i>Coturnix pectoralis</i>	stubble quail	C	None	0	15	30/10/1994
1687	Aves	Phasianidae	<i>Coturnix ypsilophora</i>	brown quail	C	None	0	108	04/01/2016
1698	Aves	Phasianidae	<i>Excalfactoria chinensis</i>	king quail	C	None	0	2	31/08/1990
1955	Aves	Podargidae	<i>Podargus strigoides</i>	tawny frogmouth	C	None	0	50	03/09/2017
1271	Aves	Podicipedidae	<i>Podiceps cristatus</i>	great crested grebe	C	None	0	35	12/06/2016
1260	Aves	Podicipedidae	<i>Poliocephalus poliocephalus</i>	hoary-headed grebe	C	None	0	27	02/02/2014
1249	Aves	Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian grebe	C	None	0	398	23/03/2019
1318	Aves	Pomatostomidae	<i>Pomatostomus temporalis</i>	grey-crowned babbler	C	None	0	94	14/05/2019
1188	Aves	Procellariidae	<i>Ardenna pacifica</i>	wedge-tailed shearwater	V	None	0	1	07/05/1996
1180	Aves	Psittacidae	<i>Alisterus scapularis</i>	Australian king-parrot	C	None	0	99	21/06/2011
1182	Aves	Psittacidae	<i>Aprosmictus erythropterus</i>	red-winged parrot	C	None	0	5	21/01/1993
1145	Aves	Psittacidae	<i>Glossopsitta concinna</i>	musk lorikeet	C	None	0	6	04/07/2009
1149	Aves	Psittacidae	<i>Lathamus discolor</i>	swift parrot	E	CE	0	1	27/07/1994
1151	Aves	Psittacidae	<i>Melopsittacus undulatus</i>	budgerigar	C	None	0	2	24/10/2005
1154	Aves	Psittacidae	<i>Neophema pulchella</i>	turquoise parrot	C	None	0	4	15/08/1993
1147	Aves	Psittacidae	<i>Parvipsitta pusilla</i>	little lorikeet	C	None	0	90	26/09/2015

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1136	Aves	Psittacidae	<i>Platycercus adscitus</i>	pale-headed rosella	C	None	0	279	17/03/2019
1138	Aves	Psittacidae	<i>Platycercus elegans</i>	crimson rosella	C	None	0	2	30/06/1990
1118	Aves	Psittacidae	<i>Psephotus haematonotus</i>	red-rumped parrot	C	None	0	124	08/06/2019
1124	Aves	Psittacidae	<i>Trichoglossus chlorolepidotus</i>	scaly-breasted lorikeet	C	None	0	195	24/11/2017
1125	Aves	Psittacidae	<i>Trichoglossus haematodus moluccanus</i>	rainbow lorikeet	C	None	0	127	17/03/2019
1619	Aves	Psophodidae	<i>Cinclosoma punctatum</i>	spotted quail-thrush	C	None	0	1	01/09/1996
1623	Aves	Psophodidae	<i>Psophodes olivaceus</i>	eastern whipbird	C	None	0	110	21/06/2011
1320	Aves	Ptilonorhynchidae	<i>Ptilonorhynchus violaceus</i>	satin bowerbird	C	None	0	2	31/01/1973
1308	Aves	Ptilonorhynchidae	<i>Sericulus chrysocephalus</i>	regent bowerbird	C	None	0	1	22/06/2000
1682	Aves	Rallidae	<i>Amauromis moluccana</i>	pale-vented bush-hen	C	None	0	1	30/01/2004
1686	Aves	Rallidae	<i>Fulica atra</i>	Eurasian coot	C	None	0	258	04/01/2019
1673	Aves	Rallidae	<i>Gallinula tenebrosa</i>	dusky moorhen	C	None	0	310	23/03/2019
1675	Aves	Rallidae	<i>Gallirallus philippensis</i>	buff-banded rail	C	None	0	61	22/08/2015
1670	Aves	Rallidae	<i>Lewinia pectoralis</i>	Lewin's rail	C	None	0	2	31/01/1992
1662	Aves	Rallidae	<i>Porphyrio melanotus</i>	purple swamphen	C	None	0	261	17/03/2019
1664	Aves	Rallidae	<i>Porzana fluminea</i>	Australian spotted crane	C	None	0	12	18/11/2017
1665	Aves	Rallidae	<i>Porzana pusilla</i>	Baillon's crane	C	None	0	23	18/11/2017
1667	Aves	Rallidae	<i>Porzana tabuensis</i>	spotless crane	C	None	0	5	05/07/2002
1674	Aves	Rallidae	<i>Tribonyx ventralis</i>	black-tailed native-hen	C	None	0	3	30/11/2014
18832	Aves	Recurvirostridae	<i>Cladorhynchus leucocephalus</i>	banded stilt	C	None	0	1	06/04/2002
1893	Aves	Recurvirostridae	<i>Himantopus himantopus</i>	black-winged stilt	C	None	0	325	23/03/2019
1881	Aves	Recurvirostridae	<i>Recurvirostra novaehollandiae</i>	red-necked avocet	C	None	0	77	10/03/2019
1575	Aves	Rhipiduridae	<i>Rhipidura albiscapa</i>	grey fantail	C	None	0	106	16/07/2018
1576	Aves	Rhipiduridae	<i>Rhipidura leucophrys</i>	willie wagtail	C	None	0	392	23/03/2019
1578	Aves	Rhipiduridae	<i>Rhipidura rufifrons</i>	rufous fantail	SL	None	0	19	31/10/2005
1883	Aves	Rostratulidae	<i>Rostratula australis</i>	Australian painted snipe	E	E	0	26	20/10/2004
1885	Aves	Scolopacidae	<i>Actitis hypoleucos</i>	common sandpiper	SL	None	0	22	05/12/1999
1874	Aves	Scolopacidae	<i>Calidris acuminata</i>	sharp-tailed sandpiper	SL	None	0	47	10/03/2019

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1878	Aves	Scolopacidae	<i>Calidris ferruginea</i>	curlew sandpiper	E	CE	0	5	30/10/1994
1849	Aves	Scolopacidae	<i>Calidris pugnax</i>	ruff	SL	None	0	1	31/01/1973
1880	Aves	Scolopacidae	<i>Calidris ruficollis</i>	red-necked stint	SL	None	0	4	31/01/1993
1857	Aves	Scolopacidae	<i>Gallinago hardwickii</i>	Latham's snipe	SL	None	0	63	30/12/2013
1855	Aves	Scolopacidae	<i>Limosa limosa</i>	black-tailed godwit	SL	None	0	8	31/12/1994
1845	Aves	Scolopacidae	<i>Numenius phaeopus</i>	whimbrel	SL	None	0	2	10/05/1992
1847	Aves	Scolopacidae	<i>Phalaropus lobatus</i>	red-necked phalarope	SL	None	0	8	10/05/1992
1852	Aves	Scolopacidae	<i>Tringa glareola</i>	wood sandpiper	SL	None	0	7	30/11/1992
1853	Aves	Scolopacidae	<i>Tringa nebularia</i>	common greenshank	SL	None	0	7	13/03/2005
1841	Aves	Scolopacidae	<i>Tringa stagnatilis</i>	marsh sandpiper	SL	None	0	56	25/10/2015
1102	Aves	Strigidae	<i>Ninox boobook</i>	southern boobook	C	None	0	28	06/01/2015
1101	Aves	Strigidae	<i>Ninox connivens</i>	barking owl	C	None	0	1	29/02/1992
1107	Aves	Strigidae	<i>Ninox strenua</i>	powerful owl	V	None	0	5	13/02/2019
1314	Aves	Sturnidae	<i>Acridotheres tristis</i>	common myna	None	None	0	445	23/03/2019
1303	Aves	Sturnidae	<i>Sturnus vulgaris</i>	common starling	None	None	0	251	28/12/2015
1265	Aves	Sulidae	<i>Morus serrator</i>	Australasian gannet	C	None	0	1	21/11/1993
1822	Aves	Threskiornithidae	<i>Platalea flavipes</i>	yellow-billed spoonbill	C	None	0	144	07/06/2017
1823	Aves	Threskiornithidae	<i>Platalea regia</i>	royal spoonbill	C	None	0	171	10/03/2019
1825	Aves	Threskiornithidae	<i>Plegadis falcinellus</i>	glossy ibis	SL	None	0	81	10/02/2018
1812	Aves	Threskiornithidae	<i>Threskiornis molucca</i>	Australian white ibis	C	None	0	238	23/03/2019
1800	Aves	Threskiornithidae	<i>Threskiornis spinicollis</i>	straw-necked ibis	C	None	0	263	10/03/2019
1276	Aves	Timaliidae	<i>Zosterops lateralis</i>	silveryeye	C	None	0	137	21/06/2011
19677	Aves	Turdidae	<i>Turdus merula</i>	common blackbird	P	None	0	1	09/04/2013
1465	Aves	Turdidae	<i>Zoothera sp.</i>	None	None	None	0	1	20/10/1979
1091	Aves	Turnicidae	<i>Turnix maculosus</i>	red-backed button-quail	C	None	0	11	30/03/1994
1094	Aves	Turnicidae	<i>Turnix pyrrhothorax</i>	red-chested button-quail	C	None	0	15	11/02/2012
1081	Aves	Turnicidae	<i>Turnix varius</i>	painted button-quail	C	None	0	56	21/06/2011
1082	Aves	Turnicidae	<i>Turnix velox</i>	little button-quail	C	None	0	2	31/10/1992
1108	Aves	Tytonidae	<i>Tyto delicatula</i>	eastern barn owl	C	None	0	42	04/09/2009
1109	Aves	Tytonidae	<i>Tyto longimembris</i>	eastern grass owl	C	None	0	1	31/12/1992
1096	Aves	Tytonidae	<i>Tyto novaehollandiae</i>	masked owl	C	None	0	3	31/01/1992
18292	Aves	Tytonidae	<i>Tyto novaehollandiae novaehollandiae</i>	masked owl (southern subspecies)	C	None	0	4	01/09/1995
35081	Insecta	Aeshnidae	<i>Anax papuensis</i>	Australian Emperor	None	None	0	7	23/03/2019
35112	Insecta	Coenagrionidae	<i>Ischnura heterosticta heterosticta</i>	common bluetail	None	None	0	3	29/03/2015

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
35114	Insecta	Coenagrionidae	<i>Pseudagrion aureofrons</i>	gold-fronted riverdamselfly	None	None	0	1	18/11/2012
35121	Insecta	Coenagrionidae	<i>Xanthagrion erythronurum</i>	red & blue damselfly	None	None	0	1	23/03/2019
35124	Insecta	Corduliidae	<i>Hemicordulia australis</i>	Australian emerald	None	None	0	2	21/03/2013
35144	Insecta	Gomphidae	<i>Austrogomphus ampiclitus</i>	pale hunter	None	None	0	1	07/04/2013
19046	Insecta	Hesperiidae	<i>Cephreris trichopepla</i>	yellow palm-dart	None	None	0	2	30/04/1991
18980	Insecta	Hesperiidae	<i>Trapezites eliena</i>	orange ochre	None	None	0	1	16/01/2005
35194	Insecta	Libellulidae	<i>Brachydiplax denticauda</i>	palemouth	None	None	0	2	21/03/2013
35198	Insecta	Libellulidae	<i>Crocotermis nigrifrons</i>	black-headed skimmer	None	None	0	7	10/03/2019
35199	Insecta	Libellulidae	<i>Diplacodes bipunctata</i>	wandering percher	None	None	0	3	23/03/2019
35200	Insecta	Libellulidae	<i>Diplacodes haematodes</i>	scarlet percher	None	None	0	5	17/03/2019
35201	Insecta	Libellulidae	<i>Diplacodes melanopsis</i>	black-faced percher	None	None	0	2	29/03/2015
35204	Insecta	Libellulidae	<i>Hydrobasileus brevistylus</i>	water prince	None	None	0	1	21/03/2013
35219	Insecta	Libellulidae	<i>Orthetrum caledonicum</i>	blue skimmer	None	None	0	8	23/03/2019
35223	Insecta	Libellulidae	<i>Orthetrum villosivittatum</i>	fiery skimmer	None	None	0	1	02/12/2016
35224	Insecta	Libellulidae	<i>Pantala flavescens</i>	wandering glider	None	None	0	1	17/03/2019
35229	Insecta	Libellulidae	<i>Rhyothemis graphiptera</i>	graphic flutterer	None	None	0	6	02/12/2016
35934	Insecta	Libellulidae	<i>Rhyothemis phyllis</i>	yellow-striped flutterer	None	None	0	1	21/03/2013
35237	Insecta	Libellulidae	<i>Tramea loewii</i>	common glider	None	None	0	5	23/03/2019
35244	Insecta	Lindenidae	<i>Ictinogomphus australis</i>	Australian tiger	None	None	0	3	10/03/2019
19950	Insecta	Lycaenidae	<i>Ogyris amaryllis</i>	None	None	None	0	1	19/04/2008
19316	Insecta	Lycaenidae	<i>Zizina otis labradus</i>	common grass-blue (Australian subspecies)	None	None	0	2	28/05/1994
19149	Insecta	Nymphalidae	<i>Acraea andromacha andromacha</i>	glasswing	None	None	0	1	31/03/1993
19147	Insecta	Nymphalidae	<i>Charaxes sempronius sempronius</i>	tailed emperor	None	None	0	5	31/12/2003
19179	Insecta	Nymphalidae	<i>Danaus petilia</i>	lesser wanderer	None	None	0	1	31/03/1993
19177	Insecta	Nymphalidae	<i>Danaus plexippus</i>	monarch	None	None	0	3	06/10/1994
19185	Insecta	Nymphalidae	<i>Euploea corinna</i>	common crow	None	None	0	2	31/03/1993
19163	Insecta	Nymphalidae	<i>Hypolimnas bolina nerina</i>	varied eggfly	None	None	0	1	31/03/1993

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
19172	Insecta	Nymphalidae	<i>Junonia villida villida</i>	meadow argus	None	None	0	2	31/03/1993
19159	Insecta	Nymphalidae	<i>Phaedyma shepherdi shepherdi</i>	white-banded plane (southern subspecies)	None	None	0	1	11/02/2012
19170	Insecta	Nymphalidae	<i>Vanessa itea</i>	yellow admiral	None	None	0	1	31/03/1993
19169	Insecta	Nymphalidae	<i>Vanessa kershawi</i>	Australian painted lady	None	None	0	1	31/03/1993
19068	Insecta	Papilionidae	<i>Papilio aegaeus aegaeus</i>	orchard swallowtail (Australian subspecies)	None	None	0	2	31/03/1993
19074	Insecta	Papilionidae	<i>Papilio demoleus sthenelus</i>	chequered swallowtail	None	None	0	1	03/04/1991
19110	Insecta	Pieridae	<i>Belenois java teutonia</i>	caper white	None	None	0	1	02/11/2012
19079	Insecta	Pieridae	<i>Catopsilia gorgophone gorgophone</i>	yellow migrant	None	None	0	1	03/04/1991
19078	Insecta	Pieridae	<i>Catopsilia pomona</i>	lemon migrant	None	None	0	1	31/03/1993
19077	Insecta	Pieridae	<i>Catopsilia pyranthe crokera</i>	white migrant	None	None	0	1	03/04/1991
19104	Insecta	Pieridae	<i>Delias aganippe</i>	spotted jezebel	None	None	0	1	31/03/1993
19098	Insecta	Pieridae	<i>Delias argenthona argenthona</i>	scarlet jezebel	None	None	0	2	06/10/1994
19086	Insecta	Pieridae	<i>Eurema hecabe</i>	large grass-yellow	None	None	0	1	31/03/1993
19118	Insecta	Pieridae	<i>Pieris rapae</i>	cabbage white	None	None	0	2	19/04/2008
35264	Insecta	Platycnemididae	<i>Nososticta solida</i>	orange threadtail	None	None	0	2	07/04/2013
33587	Malacostraca	Parastacidae	<i>Cherax quadricarinatus</i>	redclaw	None	None	0	1	29/09/2003
930	Mammalia	Acrobatidae	<i>Acrobates pygmaeus</i>	feathertail glider	C	None	0	2	15/03/2016
1084	Mammalia	Bovidae	<i>Bos taurus</i>	European cattle	None	None	0	1	26/10/2010
1068	Mammalia	Canidae	<i>Canis familiaris (dingo)</i>	dingo	None	None	0	5	09/11/2019
1071	Mammalia	Canidae	<i>Vulpes vulpes</i>	red fox	None	None	0	5	04/06/2019
1077	Mammalia	Cervidae	<i>Cervus elaphus</i>	red deer	None	None	0	2	22/12/1993
803	Mammalia	Dasyuridae	<i>Dasyurus maculatus maculatus</i>	spotted-tailed quoll (southern subspecies)	V	E	0	1	31/12/1974
808	Mammalia	Dasyuridae	<i>Phascogale tapoatafa tapoatafa</i>	brush-tailed phascogale	C	None	0	3	18/05/2018
811	Mammalia	Dasyuridae	<i>Planigale maculata</i>	common planigale	C	None	0	3	01/09/2009
793	Mammalia	Dasyuridae	<i>Sminthopsis murina</i>	common dunnart	C	None	0	7	01/09/2009
1006	Mammalia	Emballonuridae	<i>Saccolaimus flaviventris</i>	yellow-bellied sheath-tail bat	C	None	0	3	04/05/1993
814	Mammalia	Equidae	<i>Equus caballus</i>	horse	None	None	0	1	31/07/1933
1056	Mammalia	Felidae	<i>Felis catus</i>	cat	None	None	0	2	30/04/1993

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
832	Mammalia	Leporidae	<i>Lepus europaeus</i>	European brown hare	None	None	0	21	23/03/2019
914	Mammalia	Macropodidae	<i>Macropus dorsalis</i>	black-striped wallaby	C	None	0	6	21/09/2017
901	Mammalia	Macropodidae	<i>Macropus giganteus</i>	eastern grey kangaroo	C	None	0	13	26/12/2018
902	Mammalia	Macropodidae	<i>Macropus parryi</i>	whiptail wallaby	C	None	0	3	24/05/2018
904	Mammalia	Macropodidae	<i>Macropus rufogriseus</i>	red-necked wallaby	C	None	0	15	10/08/2018
906	Mammalia	Macropodidae	<i>Macropus sp.</i>	None	None	None	0	1	31/12/1844
890	Mammalia	Macropodidae	<i>Petrogale penicillata</i>	brush-tailed rock-wallaby	V	V	0	1	11/07/1996
885	Mammalia	Macropodidae	<i>Wallabia bicolor</i>	swamp wallaby	C	None	0	3	30/04/1992
955	Mammalia	Miniopteridae	<i>Miniopterus schreibersii oceanensis</i>	eastern bent-wing bat	C	None	0	1	21/03/1994
998	Mammalia	Molossidae	<i>Mormopterus lumsdenae</i>	northern free-tailed bat	C	None	0	1	28/01/1993
989	Mammalia	Molossidae	<i>Tadarida australis</i>	white-striped freetail bat	C	None	0	3	01/09/1995
767	Mammalia	Muridae	<i>Hydromys chrysogaster</i>	water rat	C	None	0	2	12/02/2016
764	Mammalia	Muridae	<i>Mus musculus</i>	house mouse	None	None	0	3	17/01/1994
731	Mammalia	Muridae	<i>Rattus rattus</i>	black rat	None	None	0	2	09/01/1992
836	Mammalia	Ornithorhynchidae	<i>Ornithorhynchus anatinus</i>	platypus	SL	None	1	5	22/07/1992
784	Mammalia	Peramelidae	<i>Isoodon macrourus</i>	northern brown bandicoot	C	None	0	7	06/07/2003
787	Mammalia	Peramelidae	<i>Perameles nasuta</i>	long-nosed bandicoot	C	None	0	2	16/07/2018
877	Mammalia	Petauridae	<i>Petaurus breviceps</i>	sugar glider	C	None	0	2	01/09/1995
879	Mammalia	Petauridae	<i>Petaurus norfolcensis</i>	squirrel glider	C	None	0	11	16/03/2016
857	Mammalia	Phalangeridae	<i>Trichosurus caninus</i>	short-eared possum	C	None	0	3	21/08/2018
859	Mammalia	Phalangeridae	<i>Trichosurus vulpecula</i>	common brushtail possum	C	None	0	20	05/08/2016
860	Mammalia	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala	V	V	0	819	29/09/2019
862	Mammalia	Potoroidae	<i>Aepyprymnus rufescens</i>	rufous bettong	C	None	0	13	07/04/2019
2455	Mammalia	Pseudocheiridae	<i>Petauroides volans volans</i>	southern greater glider	V	V	1	4	01/09/1995
984	Mammalia	Pteropodidae	<i>Pteropus alecto</i>	black flying-fox	C	None	0	31	17/12/2013
962	Mammalia	Pteropodidae	<i>Pteropus poliocephalus</i>	grey-headed flying-fox	C	V	0	29	18/11/2011
963	Mammalia	Pteropodidae	<i>Pteropus scapulatus</i>	little red flying-fox	C	None	0	18	18/10/2017
838	Mammalia	Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna	SL	None	0	13	05/08/2019

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
972	Mammalia	Vespertilionidae	<i>Chalinolobus gouldii</i>	Gould's wattled bat	C	None	0	2	01/09/1995
948	Mammalia	Vespertilionidae	<i>Chalinolobus picatus</i>	little pied bat	C	None	0	1	18/12/2001
935	Mammalia	Vespertilionidae	<i>Nyctophilus geoffroyi</i>	lesser long-eared bat	C	None	0	3	15/12/2016
931	Mammalia	Vespertilionidae	<i>Scotorepens greyii</i>	little broad-nosed bat	C	None	0	1	28/01/1993
19464	Mammalia	Vespertilionidae	<i>Scotorepens orion</i>	south-eastern broad-nosed bat	C	None	0	3	07/10/1994
923	Mammalia	Vespertilionidae	<i>Vespadelus darlingtoni</i>	large forest bat	C	None	0	1	01/09/1995
567	Reptilia	Agamidae	<i>Diporiphora australis</i>	tommy roundhead	C	None	0	1	31/03/1991
554	Reptilia	Agamidae	<i>Intellagama lesueurii</i>	eastern water dragon	C	None	0	9	18/11/2012
556	Reptilia	Agamidae	<i>Pogona barbata</i>	bearded dragon	C	None	0	17	29/07/2018
537	Reptilia	Boidae	<i>Antaresia maculosa</i>	spotted python	C	None	2	4	31/12/1996
519	Reptilia	Boidae	<i>Morelia spilota</i>	carpet python	C	None	0	7	31/12/2003
396	Reptilia	Carphodactylidae	<i>Underwoodisaurus milii</i>	thick-tailed gecko	C	None	0	2	08/06/1996
62	Reptilia	Chelidae	<i>Chelodina expansa</i>	broad-shelled river turtle	C	None	0	4	08/06/2019
63	Reptilia	Chelidae	<i>Chelodina longicollis</i>	eastern snake-necked turtle	C	None	0	8	06/04/2019
58	Reptilia	Chelidae	<i>Emydura macquarii krefftii</i>	Krefft's river turtle	C	None	0	1	18/11/1994
43	Reptilia	Chelidae	<i>Emydura macquarii macquarii</i>	Murray turtle	C	None	0	30	17/03/2019
54	Reptilia	Chelidae	<i>Wollumbinia latisternum</i>	saw-shelled turtle	C	None	0	3	10/08/2003
522	Reptilia	Colubridae	<i>Boiga irregularis</i>	brown tree snake	C	None	0	4	17/12/1994
512	Reptilia	Colubridae	<i>Dendrelaphis punctulatus</i>	green tree snake	C	None	0	21	10/03/2019
508	Reptilia	Colubridae	<i>Tropidonophis mairii</i>	freshwater snake	C	None	0	24	25/01/2015
429	Reptilia	Diplodactylidae	<i>Diplodactylus vittatus</i>	wood gecko	C	None	0	4	23/10/1993
391	Reptilia	Diplodactylidae	<i>Nebulifera robusta</i>	robust velvet gecko	C	None	0	1	05/08/2016
501	Reptilia	Elapidae	<i>Cacophis harriettae</i>	white-crowned snake	C	None	0	3	27/10/1996
490	Reptilia	Elapidae	<i>Cacophis squamulosus</i>	golden crowned snake	C	None	0	4	23/04/1997
455	Reptilia	Elapidae	<i>Cryptophis boschmai</i>	Carpentaria whip snake	C	None	0	2	22/02/1997
457	Reptilia	Elapidae	<i>Cryptophis nigrescens</i>	eastern small-eyed snake	C	None	0	1	30/04/1990
493	Reptilia	Elapidae	<i>Demansia psammophis</i>	yellow-faced whipsnake	C	None	0	1	30/11/1990
486	Reptilia	Elapidae	<i>Furina diadema</i>	red-naped snake	C	None	1	3	31/12/1996

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
438	Reptilia	Elapidae	<i>Parasuta dwyeri</i>	Dwyer's snake	C	None	0	4	30/04/1991
474	Reptilia	Elapidae	<i>Pseudechis guttatus</i>	spotted black snake	C	None	0	3	31/12/1988
462	Reptilia	Elapidae	<i>Pseudechis porphyriacus</i>	red-bellied black snake	C	None	0	2	08/03/2013
454	Reptilia	Elapidae	<i>Pseudonaja textilis</i>	eastern brown snake	C	None	0	27	30/08/2011
444	Reptilia	Elapidae	<i>Vermicella annulata</i>	bandy-bandy	C	None	0	2	18/12/2011
420	Reptilia	Gekkonidae	<i>Gehyra dubia</i>	dubious dtella	C	None	0	2	26/10/2010
413	Reptilia	Gekkonidae	<i>Heteronotia binoei</i>	Bynoe's gecko	C	None	0	1	26/10/2010
325	Reptilia	Pygopodidae	<i>Lialis burtonis</i>	Burton's legless lizard	C	None	3	4	31/12/1996
304	Reptilia	Scincidae	<i>Anomalopus leuckartii</i>	two-clawed worm-skink	C	None	1	1	24/10/1964
308	Reptilia	Scincidae	<i>Anomalopus verreauxii</i>	three-clawed worm-skink	C	None	1	3	25/02/1994
302	Reptilia	Scincidae	<i>Carlia schmeltzii</i>	robust rainbow-skink	C	None	0	1	06/03/1993
277	Reptilia	Scincidae	<i>Carlia vivax</i>	tussock rainbow-skink	C	None	0	1	01/09/1996
188	Reptilia	Scincidae	<i>Concinnia martini</i>	dark bar-sided skink	C	None	1	1	31/03/1977
31898	Reptilia	Scincidae	<i>Cryptoblepharus pulcher pulcher</i>	elegant snake-eyed skink	C	None	0	4	26/10/2010
240	Reptilia	Scincidae	<i>Ctenotus spaldingi</i>	straight-browed ctenotus	C	None	2	9	26/10/2010
243	Reptilia	Scincidae	<i>Ctenotus taeniolatus</i>	copper-tailed skink	C	None	0	3	08/08/1993
207	Reptilia	Scincidae	<i>Eremiascincus richardsonii</i>	broad-banded sand swimmer	C	None	0	1	24/12/1990
190	Reptilia	Scincidae	<i>Eulamprus quoyii</i>	eastern water skink	C	None	0	1	26/02/2016
184	Reptilia	Scincidae	<i>Lampropholis delicata</i>	dark-flecked garden sunskink	C	None	0	5	01/09/1996
226	Reptilia	Scincidae	<i>Liopholis modesta</i>	eastern ranges rock-skink	C	None	0	6	04/02/1994
150	Reptilia	Scincidae	<i>Lygisaurus foliorum</i>	tree-base litter-skink	C	None	0	1	04/02/1994
134	Reptilia	Scincidae	<i>Morethia boulengeri</i>	south-eastern morethia skink	C	None	0	1	09/04/1993
104	Reptilia	Scincidae	<i>Tiliqua scincoides</i>	eastern blue-tongued lizard	C	None	0	1	06/08/2017
78	Reptilia	Varanidae	<i>Varanus gouldii</i>	sand monitor	C	None	0	2	24/02/1991
61	Reptilia	Varanidae	<i>Varanus varius</i>	lace monitor	C	None	0	3	30/04/1992
26926	Sarcopterygii	Ceratodontidae	<i>Neoceratodus forsteri</i>	Australian lungfish	None	V	0	2	29/09/2003

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
8237	Charophyceae	Characeae	<i>Nitella furcata</i>	None	C	None	1	1	31/07/1970
8238	Charophyceae	Characeae	<i>Nitella hyalina</i>	None	C	None	1	1	31/07/1970

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
17767	Equisetopsida	Acanthaceae	<i>Brunoniella australis</i>	blue trumpet	C	None	1	1	31/03/1921
11947	Equisetopsida	Adoxaceae	<i>Sambucus gaudichaudiana</i>	white elder	C	None	2	2	31/03/1920
16014	Equisetopsida	Aizoaceae	<i>Trianthema portulacastrum</i>	black pigweed	None	None	2	2	05/02/1981
22741	Equisetopsida	Amaranthaceae	<i>Amaranthus retroflexus</i>	None	None	None	2	2	28/04/2017
11782	Equisetopsida	Amaranthaceae	<i>Guilleminea densa</i>	small matweed	None	None	1	1	24/01/2005
9420	Equisetopsida	Amaryllidaceae	<i>Zephyranthes</i>	None	None	None	1	1	05/05/1987
25551	Equisetopsida	Aneuraceae	<i>Riccardia</i>	None	None	None	1	1	31/07/1888
29155	Equisetopsida	Anomodontaceae	<i>Anomodon pseudotristis</i>	None	C	None	1	1	31/12/1888
34890	Equisetopsida	Apiaceae	<i>Eryngium paludosum</i>	None	C	None	1	1	29/05/1970
19732	Equisetopsida	Apocynaceae	<i>Alyxia ruscifolia</i>	None	C	None	1	1	30/06/2002
17050	Equisetopsida	Apocynaceae	<i>Gomphocarpus physocarpus</i>	balloon cottonbush	None	None	1	1	10/12/1986
13015	Equisetopsida	Asphodelaceae	<i>Asphodelus fistulosus</i>	asphodel	None	None	1	1	05/09/1989
15715	Equisetopsida	Asteraceae	<i>Acanthospermum hispidum</i>	star burr	None	None	1	1	26/02/1946
15644	Equisetopsida	Asteraceae	<i>Arctotheca calendula</i>	Cape weed	None	None	2	2	30/09/2012
18905	Equisetopsida	Asteraceae	<i>Calotis cuneata</i>	None	C	None	1	1	26/02/1946
15565	Equisetopsida	Asteraceae	<i>Calotis cuneifolia</i>	burr daisy	C	None	1	1	01/11/1970
15568	Equisetopsida	Asteraceae	<i>Calotis lappulacea</i>	yellow burr daisy	C	None	1	1	28/11/1930
9664	Equisetopsida	Asteraceae	<i>Carduus pycnocephalus</i>	None	None	None	1	1	21/07/1966
14738	Equisetopsida	Asteraceae	<i>Cassinia laevis</i>	None	C	None	1	1	16/02/2009
41275	Equisetopsida	Asteraceae	<i>Cassinia laevis subsp. rosmarinifolia</i>	None	C	None	3	3	16/02/2008
8398	Equisetopsida	Asteraceae	<i>Chryscephalum apiculatum</i>	yellow buttons	C	None	1	1	12/04/1930
15532	Equisetopsida	Asteraceae	<i>Cichorium intybus</i>	chicory	None	None	1	1	26/02/1946
8366	Equisetopsida	Asteraceae	<i>Ozothamnus diosmifolius</i>	white dogwood	C	None	2	2	05/07/1930
10959	Equisetopsida	Asteraceae	<i>Parthenium hysterophorus</i>	parthenium weed	None	None	1	1	20/01/1999
10475	Equisetopsida	Asteraceae	<i>Podolepis neglecta</i>	None	C	None	1	1	23/08/1987
31135	Equisetopsida	Asteraceae	<i>Rhaponticum australe</i>	None	V	V	1	1	27/01/1944
10486	Equisetopsida	Asteraceae	<i>Senecio madagascariensis</i>	fireweed	None	None	1	1	08/09/2016
10489	Equisetopsida	Asteraceae	<i>Senecio vulgaris</i>	common groundsel	None	None	1	1	25/08/2011
10442	Equisetopsida	Asteraceae	<i>Solenogyne belliioides</i>	None	C	None	1	1	19/02/1930
34624	Equisetopsida	Asteraceae	<i>Sphaeromorphaea australis</i>	None	C	None	1	1	19/04/2019
10411	Equisetopsida	Asteraceae	<i>Zinnia peruviana</i>	wild zinnia	None	None	1	1	26/02/1946
25562	Equisetopsida	Balantiopsidaceae	<i>Balantiopsis</i>	None	None	None	1	1	07/11/2000

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
11266	Equisetopsida	Basellaceae	<i>Anredera cordifolia</i>	Madeira vine	None	None	1	1	26/02/1946
31609	Equisetopsida	Bignoniaceae	<i>Tecoma stans</i> var. <i>stans</i>	None	None	None	1	1	17/10/1990
11193	Equisetopsida	Boraginaceae	<i>Heliotropium amplexicaule</i>	blue heliotrope	None	None	1	1	13/11/2008
12221	Equisetopsida	Brassicaceae	<i>Lepidium bonariense</i>	Argentine peppergrass	None	None	1	2	13/11/2008
27691	Equisetopsida	Brassicaceae	<i>Lepidium didymum</i>	None	None	None	1	1	31/12/2003
27690	Equisetopsida	Brassicaceae	<i>Lepidium draba</i>	None	None	None	1	1	31/08/1959
10482	Equisetopsida	Brassicaceae	<i>Rorippa eustylis</i>	None	C	None	2	2	23/08/1990
10481	Equisetopsida	Brassicaceae	<i>Rorippa laciniata</i>	None	C	None	2	2	05/06/1987
26206	Equisetopsida	Bryaceae	<i>Rosulabryum albolimbatum</i>	None	C	None	1	1	31/12/1888
26344	Equisetopsida	Cactaceae	<i>Harrisia martinii</i>	None	None	None	1	3	21/01/2016
19352	Equisetopsida	Cactaceae	<i>Opuntia stricta</i>	None	None	None	1	1	17/06/1982
9535	Equisetopsida	Cactaceae	<i>Opuntia tomentosa</i>	velvety tree pear	None	None	0	7	21/01/2016
33856	Equisetopsida	Campanulaceae	<i>Lobelia concolor</i>	None	C	None	1	1	30/06/2002
16766	Equisetopsida	Campanulaceae	<i>Lobelia purpurascens</i>	white root	C	None	1	1	30/06/2002
36488	Equisetopsida	Campanulaceae	<i>Wahlenbergia capillaris</i>	None	C	None	1	1	19/11/1969
15918	Equisetopsida	Campanulaceae	<i>Wahlenbergia gracilis</i>	sprawling bluebell	C	None	1	1	28/08/1945
21924	Equisetopsida	Caryophyllaceae	<i>Spergularia marina</i>	None	C	None	1	1	31/12/2003
18013	Equisetopsida	Casuarinaceae	<i>Allocasuarina luehmannii</i>	bull oak	C	None	0	1	25/06/1999
9087	Equisetopsida	Casuarinaceae	<i>Casuarina cunninghamiana</i>	None	C	None	0	1	25/06/1999
34775	Equisetopsida	Celastraceae	<i>Denhamia cunninghamii</i>	None	C	None	2	2	10/04/1988
17684	Equisetopsida	Chenopodiaceae	<i>Chenopodium album</i>	fat-hen	None	None	3	3	13/11/2008
31671	Equisetopsida	Chenopodiaceae	<i>Tecticornia pergranulata</i> subsp. <i>queenslandica</i>	None	C	None	1	1	31/12/2003
17598	Equisetopsida	Convolvulaceae	<i>Convolvulus arvensis</i>	None	None	None	1	1	05/08/1968
17422	Equisetopsida	Convolvulaceae	<i>Dichondra repens</i>	kidney weed	C	None	1	1	13/08/1970
16862	Equisetopsida	Convolvulaceae	<i>Ipomoea plebeia</i>	bellvine	C	None	2	2	16/06/2008
16399	Equisetopsida	Convolvulaceae	<i>Polymeria</i>	None	None	None	1	1	23/08/1987
21934	Equisetopsida	Crassulaceae	<i>Bryophyllum delagoense</i>	None	None	None	2	8	21/01/2016
10550	Equisetopsida	Crassulaceae	<i>Bryophyllum fedtschenkoi</i>	None	None	None	1	1	01/08/1985

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
31058	Equisetopsida	Crassulaceae	<i>Bryophyllum x houghtonii</i>	None	None	None	1	1	25/02/1970
19806	Equisetopsida	Cucurbitaceae	<i>Cucumis anguria</i>	None	None	None	0	1	09/07/1996
8952	Equisetopsida	Cyperaceae	<i>Cyperus nutans</i> var. <i>eleusinoides</i>	flatsedge	C	None	2	2	09/04/2002
24659	Equisetopsida	Daltoniaceae	<i>Distichophyllum crispulum</i>	None	C	None	2	2	07/11/2000
35068	Equisetopsida	Droseraceae	<i>Drosera finlaysoniana</i>	None	C	None	0	1	15/04/1992
24665	Equisetopsida	Entodontaceae	<i>Entodon mackaviensis</i>	None	C	None	1	1	31/07/1888
34525	Equisetopsida	Ericaceae	<i>Leucopogon affinis</i>	None	C	None	1	1	22/08/1972
16832	Equisetopsida	Ericaceae	<i>Leucopogon biflorus</i>	None	C	None	1	1	23/08/1987
6758	Equisetopsida	Ericaceae	<i>Lissanthe strigosa</i> subsp. <i>subulata</i>	None	C	None	1	1	23/08/1987
16662	Equisetopsida	Ericaceae	<i>Melichrus urceolatus</i>	honey gorse	C	None	2	2	22/08/1970
36665	Equisetopsida	Erpodiaceae	<i>Venturiella hodgkinsoniae</i>	None	C	None	1	1	22/09/2003
5309	Equisetopsida	Euphorbiaceae	<i>Euphorbia dallachyana</i>	None	C	None	1	1	16/06/2008
17179	Equisetopsida	Euphorbiaceae	<i>Excoecaria dallachyana</i>	scrub poison tree	C	None	1	1	30/06/2002
11288	Equisetopsida	Euphorbiaceae	<i>Ricinus communis</i>	castor oil bush	None	None	0	11	21/01/2016
14687	Equisetopsida	Fabaceae	<i>Crotalaria juncea</i>	sunhemp	None	None	1	1	26/02/1946
15457	Equisetopsida	Fabaceae	<i>Desmodium gunnii</i>	None	C	None	1	1	31/07/2006
13935	Equisetopsida	Fabaceae	<i>Desmodium varians</i>	slender tick trefoil	C	None	0	1	25/06/1999
5717	Equisetopsida	Fabaceae	<i>Galactia tenuiflora</i> var. <i>lucida</i>	None	C	None	1	1	30/03/1989
15309	Equisetopsida	Fabaceae	<i>Hardenbergia violacea</i>	None	C	None	1	1	05/07/1930
22172	Equisetopsida	Fabaceae	<i>Hovea lorata</i>	None	C	None	1	1	16/08/1986
9630	Equisetopsida	Fabaceae	<i>Hovea planifolia</i>	None	C	None	2	2	16/08/1986
26614	Equisetopsida	Fabaceae	<i>Hovea planifolia</i> x <i>Hovea ramulosa</i>	None	C	None	3	3	16/08/1986
22168	Equisetopsida	Fabaceae	<i>Hovea ramulosa</i>	None	C	None	1	1	31/07/1998
15295	Equisetopsida	Fabaceae	<i>Indigofera linifolia</i>	None	C	None	1	1	26/02/1946
13897	Equisetopsida	Fabaceae	<i>Kennedia procurrens</i>	purple running pea	C	None	1	1	29/01/1969
9873	Equisetopsida	Fabaceae	<i>Medicago polymorpha</i>	burr medic	None	None	1	1	25/09/1968
15240	Equisetopsida	Fabaceae	<i>Melilotus albus</i>	sweet clover	None	None	1	1	26/02/1946
15241	Equisetopsida	Fabaceae	<i>Melilotus indicus</i>	hexham scent	None	None	1	1	13/11/2008
14298	Equisetopsida	Fabaceae	<i>Pultenaea euchila</i>	orange pultenaea	C	None	2	2	24/08/1980
15082	Equisetopsida	Fabaceae	<i>Pultenaea flexilis</i>	None	C	None	2	2	23/08/1987
12876	Equisetopsida	Fabaceae	<i>Stylosanthes scabra</i>	None	None	None	1	1	19/04/2019
24678	Equisetopsida	Fabroniaceae	<i>Fabronia</i> sp. (Brisbane F.M.Bailey 296)	None	C	None	1	1	31/12/1888
24670	Equisetopsida	Fissidentaceae	<i>Fissidens</i>	None	None	None	2	2	29/04/2008
24705	Equisetopsida	Fissidentaceae	<i>Fissidens pallidus</i>	None	C	None	1	1	10/03/2008
25597	Equisetopsida	Frullaniaceae	<i>Frullania ericoides</i>	None	C	None	1	1	31/12/1888

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
25600	Equisetopsida	Frullaniaceae	<i>Frullania monocera</i>	None	C	None	1	1	31/12/1888
17060	Equisetopsida	Goodeniaceae	<i>Goodenia glabra</i>	None	C	None	1	1	30/11/1963
17062	Equisetopsida	Goodeniaceae	<i>Goodenia hederacea</i> subsp. <i>hederacea</i>	None	C	None	1	1	30/06/2002
11360	Equisetopsida	Goodeniaceae	<i>Velleia paradoxa</i>	spur velleia	C	None	1	1	30/06/2002
24743	Equisetopsida	Grimmiaceae	<i>Grimmia laevigata</i>	None	C	None	1	1	01/12/1996
16608	Equisetopsida	Haloragaceae	<i>Myriophyllum verrucosum</i>	water milfoil	C	None	1	1	31/07/1970
17467	Equisetopsida	Hemerocallidaceae	<i>Dianella longifolia</i> var. <i>longifolia</i>	None	C	None	1	1	14/09/1948
24779	Equisetopsida	Hypnaceae	<i>Hypnum</i>	None	None	None	2	2	31/12/1888
24769	Equisetopsida	Hypnaceae	<i>Hypnum</i> sp. (Burpengary C.J. Wild AQ733958)	None	C	None	1	1	31/12/1888
24775	Equisetopsida	Hypnaceae	<i>Hypnum</i> sp. (Caboolture J.F. Shirley AQ733970)	None	C	None	1	1	31/12/1888
8220	Equisetopsida	Lamiaceae	<i>Ajuga sinuata</i>	None	C	None	1	1	05/07/1932
15549	Equisetopsida	Lamiaceae	<i>Chloanthes parviflora</i>	None	C	None	1	1	13/09/1978
11765	Equisetopsida	Lamiaceae	<i>Salvia coccinea</i>	red salvia	None	None	1	1	26/02/1946
15105	Equisetopsida	Lamiaceae	<i>Salvia plebeia</i>	common sage	C	None	1	1	30/11/1949
15106	Equisetopsida	Lamiaceae	<i>Salvia reflexa</i>	None	None	None	1	1	26/02/1946
16773	Equisetopsida	Laxmanniaceae	<i>Lomandra laxa</i>	broad-leaved matrush	C	None	1	1	19/04/2019
16776	Equisetopsida	Laxmanniaceae	<i>Lomandra longifolia</i>	None	C	None	0	2	25/06/1999
25979	Equisetopsida	Lejeuneaceae	<i>Thysananthus spathulistipus</i>	None	C	None	1	1	31/12/1888
24801	Equisetopsida	Leucobryaceae	<i>Leucobryum candidum</i>	None	C	None	3	3	22/01/2002
17988	Equisetopsida	Loranthaceae	<i>Amyema congener</i> subsp. <i>rotundifolia</i>	None	C	None	1	1	26/10/2003
33995	Equisetopsida	Malvaceae	<i>Hibiscus tridactylites</i>	None	C	None	1	1	26/02/1946
14347	Equisetopsida	Malvaceae	<i>Pavonia hastata</i>	pink pavonia	None	None	1	1	26/02/1946
31869	Equisetopsida	Martyniaceae	<i>Proboscidea lutea</i>	None	None	None	1	1	31/01/1981
16559	Equisetopsida	Meliaceae	<i>Owenia venosa</i>	crow's apple	C	None	1	1	30/06/2002
24877	Equisetopsida	Meteoriaceae	<i>Papillaria flexicaulis</i>	None	C	None	1	1	31/07/1888
25703	Equisetopsida	Metzgeriaceae	<i>Metzgeria</i>	None	None	None	1	1	31/12/1888
15781	Equisetopsida	Mimosaceae	<i>Acacia buxifolia</i> subsp. <i>pubiflora</i>	None	C	None	1	1	29/05/1978
15789	Equisetopsida	Mimosaceae	<i>Acacia complanata</i>	flatstem wattle	C	None	1	1	19/04/2019
15790	Equisetopsida	Mimosaceae	<i>Acacia concurrens</i>	None	C	None	3	5	09/08/2017
15799	Equisetopsida	Mimosaceae	<i>Acacia falcata</i>	sickle wattle	C	None	1	1	05/07/1930
7558	Equisetopsida	Mimosaceae	<i>Acacia julifera</i> subsp. <i>julifera</i>	None	C	None	1	1	04/06/1986
14890	Equisetopsida	Mimosaceae	<i>Acacia penninervis</i>	None	C	None	0	1	25/06/1999
15739	Equisetopsida	Mimosaceae	<i>Acacia podalyriifolia</i>	Queensland silver wattle	C	None	4	4	07/11/2000
15694	Equisetopsida	Mimosaceae	<i>Acacia salicina</i>	doolan	C	None	1	1	31/05/1917

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
6280	Equisetopsida	Mimosaceae	<i>Leucaena leucocephala</i> subsp. <i>leucocephala</i>	None	None	None	1	1	14/12/1987
33123	Equisetopsida	Myrsinaceae	<i>Lysimachia arvensis</i>	None	None	None	1	1	13/11/2008
17999	Equisetopsida	Myrtaceae	<i>Angophora leiocarpa</i>	rusty gum	C	None	0	2	25/06/1999
12533	Equisetopsida	Myrtaceae	<i>Angophora subvelutina</i>	None	C	None	0	1	25/06/1999
18000	Equisetopsida	Myrtaceae	<i>Angophora woodsiana</i>	smudgee	C	None	1	1	22/08/1970
6531	Equisetopsida	Myrtaceae	<i>Corymbia citriodora</i>	spotted gum	C	None	0	4	25/06/1999
26382	Equisetopsida	Myrtaceae	<i>Corymbia citriodora</i> subsp. <i>variegata</i>	None	C	None	1	1	22/08/1970
30785	Equisetopsida	Myrtaceae	<i>Corymbia citriodora</i> x <i>Corymbia torelliana</i>	None	C	None	1	1	29/08/2004
6534	Equisetopsida	Myrtaceae	<i>Corymbia clarksoniana</i>	None	C	None	0	2	25/06/1999
6445	Equisetopsida	Myrtaceae	<i>Corymbia intermedia</i>	pink bloodwood	C	None	1	3	25/06/1999
6572	Equisetopsida	Myrtaceae	<i>Corymbia tessellaris</i>	Moreton Bay ash	C	None	0	3	25/06/1999
6443	Equisetopsida	Myrtaceae	<i>Corymbia trachyphloia</i> subsp. <i>trachyphloia</i>	None	C	None	2	2	11/08/1990
8935	Equisetopsida	Myrtaceae	<i>Eucalyptus carnea</i>	None	C	None	2	2	26/10/1996
17252	Equisetopsida	Myrtaceae	<i>Eucalyptus crebra</i>	narrow-leaved red ironbark	C	None	1	3	25/06/1999
12500	Equisetopsida	Myrtaceae	<i>Eucalyptus fibrosa</i> subsp. <i>fibrosa</i>	None	C	None	1	1	22/08/1970
2443	Equisetopsida	Myrtaceae	<i>Eucalyptus helidonica</i>	None	C	None	6	6	26/10/1996
17204	Equisetopsida	Myrtaceae	<i>Eucalyptus tereticornis</i>	None	C	None	0	7	25/06/1999
14441	Equisetopsida	Myrtaceae	<i>Leptospermum polygalifolium</i>	tantoon	C	None	0	1	25/06/1999
16730	Equisetopsida	Myrtaceae	<i>Lophostemon suaveolens</i>	swamp box	C	None	0	4	25/06/1999
16684	Equisetopsida	Myrtaceae	<i>Melaleuca bracteata</i>	None	C	None	0	1	25/06/1999
26403	Equisetopsida	Myrtaceae	<i>Melaleuca irbyana</i>	None	E	None	1	1	29/04/1995
31375	Equisetopsida	Myrtaceae	<i>Melaleuca viminalis</i>	None	C	None	0	1	25/06/1999
13417	Equisetopsida	Oleaceae	<i>Ligustrum lucidum</i>	large-leaved privet	None	None	0	1	21/01/2016
9680	Equisetopsida	Oleaceae	<i>Notelaea lloydii</i>	Lloyd's native olive	V	V	2	2	06/09/2018
16731	Equisetopsida	Onagraceae	<i>Ludwigia peploides</i> subsp. <i>montevidensis</i>	None	C	None	1	1	31/07/1970
14328	Equisetopsida	Onagraceae	<i>Oenothera affinis</i>	long-flowered evening primrose	None	None	0	1	10/11/2003
32785	Equisetopsida	Onagraceae	<i>Oenothera curtiflora</i>	None	None	None	1	1	05/12/1969
14086	Equisetopsida	Orchidaceae	<i>Acianthus exsertus</i>	None	C	None	1	1	30/04/1963
17505	Equisetopsida	Orchidaceae	<i>Cymbidium canaliculatum</i>	None	C	None	0	1	25/09/2003
13280	Equisetopsida	Orchidaceae	<i>Dendrobium aemulum</i>	ironbark orchid	C	None	1	1	23/07/1986
9457	Equisetopsida	Oxalidaceae	<i>Oxalis corniculata</i>	None	None	None	1	1	31/10/1930

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
20740	Equisetopsida	Papaveraceae	<i>Fumaria</i>	None	None	None	1	1	13/11/2008
12804	Equisetopsida	Papaveraceae	<i>Fumaria muralis</i> <i>subsp. muralis</i>	wall fumitory	None	None	1	1	30/08/1948
16463	Equisetopsida	Philydraceae	<i>Philydrum lanuginosum</i>	frogsmouth	C	None	1	1	04/12/1950
9378	Equisetopsida	Phyllanthaceae	<i>Glochidion ferdinandi</i>	None	C	None	0	1	25/06/1999
12718	Equisetopsida	Piperaceae	<i>Peperomia pellucida</i>	None	None	None	1	1	24/01/1981
16933	Equisetopsida	Pittosporaceae	<i>Hymenosporum flavum</i>	native frangipani	C	None	1	1	31/05/1917
16422	Equisetopsida	Plantaginaceae	<i>Plantago lanceolata</i>	None	None	None	1	1	13/11/2008
14318	Equisetopsida	Plantaginaceae	<i>Plantago varia</i>	None	C	None	1	1	07/09/1945
9957	Equisetopsida	Poaceae	<i>Aristida leichhardtiana</i>	None	C	None	1	1	05/07/1930
8934	Equisetopsida	Poaceae	<i>Aristida personata</i>	None	C	None	1	1	28/11/1930
11123	Equisetopsida	Poaceae	<i>Aristida queenslandica</i> <i>var. queenslandica</i>	None	C	None	1	1	27/12/1978
9661	Equisetopsida	Poaceae	<i>Aristida ramosa</i>	purple wiregrass	C	None	1	1	12/04/1930
19746	Equisetopsida	Poaceae	<i>Arundo donax</i>	None	None	None	1	1	05/07/1930
10755	Equisetopsida	Poaceae	<i>Avena fatua</i>	wild oats	None	None	1	1	20/08/1969
15604	Equisetopsida	Poaceae	<i>Bothriochloa bladhii</i> <i>subsp. bladhii</i>	None	C	None	1	1	12/04/1930
14794	Equisetopsida	Poaceae	<i>Bromus catharticus</i>	prairie grass	None	None	1	1	13/11/2008
15550	Equisetopsida	Poaceae	<i>Chloris divaricata</i> <i>var. divaricata</i>	slender chloris	C	None	1	1	12/04/1930
15551	Equisetopsida	Poaceae	<i>Chloris gayana</i>	rhodes grass	None	None	1	1	03/07/1947
15498	Equisetopsida	Poaceae	<i>Cleistochloa subjuncea</i>	None	C	None	1	1	19/12/2012
7812	Equisetopsida	Poaceae	<i>Cynodon dactylon</i> <i>var. dactylon</i>	None	None	None	1	1	26/02/1946
15490	Equisetopsida	Poaceae	<i>Dactyloctenium radulans</i>	button grass	C	None	1	1	19/04/2019
10400	Equisetopsida	Poaceae	<i>Dichanthium sericeum</i> <i>subsp. humilium</i>	None	C	None	1	1	29/08/1945
10403	Equisetopsida	Poaceae	<i>Dichelachne crinita</i>	longhair plumegrass	C	None	1	1	30/11/2010
32006	Equisetopsida	Poaceae	<i>Dichelachne montana</i>	None	C	None	1	1	31/07/2006
15419	Equisetopsida	Poaceae	<i>Digitaria brownii</i>	None	C	None	1	1	19/02/1930
15420	Equisetopsida	Poaceae	<i>Digitaria ciliaris</i>	summer grass	None	None	1	1	12/04/1930
11066	Equisetopsida	Poaceae	<i>Digitaria didactyla</i>	Queensland blue couch	None	None	0	1	25/06/1999
34501	Equisetopsida	Poaceae	<i>Dinebra panicea</i> <i>var. brachiata</i>	None	None	None	1	1	23/02/1989
10367	Equisetopsida	Poaceae	<i>Dinebra retroflexa</i>	None	None	None	1	1	30/01/1974
14567	Equisetopsida	Poaceae	<i>Echinochloa colona</i>	awnless barnyard grass	None	None	2	2	01/04/1931
10372	Equisetopsida	Poaceae	<i>Echinochloa frumentacea</i>	Siberian millet	None	None	1	1	01/04/1931
15436	Equisetopsida	Poaceae	<i>Echinochloa telmatophila</i>	swamp barnyard grass	C	None	1	1	12/04/1930

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
10340	Equisetopsida	Poaceae	<i>Enteropogon acicularis</i>	curly windmill grass	C	None	1	1	19/02/1930
15412	Equisetopsida	Poaceae	<i>Entolasia whiteana</i>	None	C	None	1	1	04/04/2012
15391	Equisetopsida	Poaceae	<i>Eragrostis cilianensis</i>	None	None	None	1	1	21/05/1985
15380	Equisetopsida	Poaceae	<i>Eremochloa bimaculata</i>	poverty grass	C	None	1	1	30/06/2002
15331	Equisetopsida	Poaceae	<i>Eriochloa procera</i>	slender cupgrass	C	None	2	2	12/04/1930
15332	Equisetopsida	Poaceae	<i>Eriochloa pseudoacrotricha</i>	None	C	None	1	1	01/04/1931
15320	Equisetopsida	Poaceae	<i>Heteropogon contortus</i>	black speargrass	C	None	1	1	12/04/1930
14437	Equisetopsida	Poaceae	<i>Leersia hexandra</i>	swamp rice grass	C	None	1	1	12/04/1930
9139	Equisetopsida	Poaceae	<i>Lolium x hybridum</i>	None	None	None	1	1	10/12/1969
28224	Equisetopsida	Poaceae	<i>Megathyrsus maximus</i> var. <i>coloratus</i>	None	None	None	1	1	30/06/1969
27900	Equisetopsida	Poaceae	<i>Megathyrsus maximus</i> var. <i>pubiglumis</i>	None	None	None	1	1	30/06/1969
9591	Equisetopsida	Poaceae	<i>Microlaena stipoides</i> var. <i>stipoides</i>	None	C	None	1	1	30/06/2002
29956	Equisetopsida	Poaceae	<i>Moorochloa eruciformis</i>	None	None	None	1	1	31/12/1973
15173	Equisetopsida	Poaceae	<i>Panicum decompositum</i> var. <i>decompositum</i>	None	C	None	1	1	12/04/1930
18424	Equisetopsida	Poaceae	<i>Panicum simile</i>	None	C	None	1	1	12/04/1930
10817	Equisetopsida	Poaceae	<i>Paspalidium globoideum</i>	sago grass	C	None	1	1	01/04/1931
11418	Equisetopsida	Poaceae	<i>Paspalidium jubiflorum</i>	warrego grass	C	None	1	1	26/02/1946
10818	Equisetopsida	Poaceae	<i>Paspalum distichum</i>	water couch	None	None	1	1	12/04/1930
27800	Equisetopsida	Poaceae	<i>Sarga leiocladum</i>	None	C	None	1	1	19/12/2012
8882	Equisetopsida	Poaceae	<i>Setaria parviflora</i>	slender pigeon grass	None	None	1	1	26/04/1985
10242	Equisetopsida	Poaceae	<i>Setaria verticillata</i>	whorled pigeon grass	None	None	2	2	08/05/1969
10246	Equisetopsida	Poaceae	<i>Sorghum arundinaceum</i>	Rhodesian Sudan grass	None	None	1	1	13/11/2008
15043	Equisetopsida	Poaceae	<i>Sorghum halepense</i>	Johnson grass	None	None	1	1	05/07/1930
15001	Equisetopsida	Poaceae	<i>Sporobolus creber</i>	None	C	None	1	1	12/04/1930
10158	Equisetopsida	Poaceae	<i>Sporobolus natalensis</i>	None	None	None	3	3	29/10/1993
10156	Equisetopsida	Poaceae	<i>Sporobolus pyramidalis</i>	None	None	None	3	3	29/10/1993
14974	Equisetopsida	Poaceae	<i>Themeda triandra</i>	kangaroo grass	C	None	2	2	12/04/1930
11356	Equisetopsida	Poaceae	<i>Tragus australianus</i>	small burr grass	C	None	1	1	12/04/1930
29242	Equisetopsida	Poaceae	<i>Urochloa foliosa</i>	None	C	None	1	1	26/02/1946
14999	Equisetopsida	Poaceae	<i>Urochloa mosambicensis</i>	sabi grass	None	None	1	1	30/06/1969

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
29214	Equisetopsida	Poaceae	<i>Urochloa whiteana</i>	None	C	None	1	1	30/11/1916
20065	Equisetopsida	Poaceae	<i>Vulpia myuros</i>	None	None	None	1	1	09/11/1950
14351	Equisetopsida	Polygonaceae	<i>Persicaria orientalis</i>	princes feathers	C	None	2	2	16/11/2004
14279	Equisetopsida	Polygonaceae	<i>Polygonum aviculare</i>	wireweed	None	None	1	1	05/02/1981
16271	Equisetopsida	Polygonaceae	<i>Rumex brownii</i>	swamp dock	C	None	1	1	18/02/1997
25588	Equisetopsida	Porellaceae	<i>Porella crawfordii</i>	None	C	None	1	1	31/07/1888
19434	Equisetopsida	Portulacaceae	<i>Portulaca pilosa</i>	None	None	None	1	1	05/10/2006
24536	Equisetopsida	Pottiaceae	<i>Barbula</i>	None	None	None	2	2	31/12/1888
24533	Equisetopsida	Pottiaceae	<i>Barbula subcalycina</i>	None	C	None	1	1	31/12/1888
30953	Equisetopsida	Pottiaceae	<i>Weissia</i> sp. (Victoria Park H.Tryon AQ645533)	None	C	None	1	1	31/12/1888
6963	Equisetopsida	Proteaceae	<i>Grevillea quadricauda</i>	None	V	V	1	1	15/06/2017
35803	Equisetopsida	Proteaceae	<i>Hakea benthamii</i>	None	C	None	1	1	30/11/1964
16500	Equisetopsida	Proteaceae	<i>Persoonia sericea</i>	silky geebung	C	None	3	3	04/01/1990
24588	Equisetopsida	Pterobryaceae	<i>Calypothecium recurvulum</i>	None	C	None	1	1	31/12/1888
24905	Equisetopsida	Ptychomitriaceae	<i>Ptychomitrium australe</i>	None	C	None	1	1	31/12/1888
24718	Equisetopsida	Ptychomniaceae	<i>Euptychium cuspidatum</i>	None	C	None	1	1	31/12/1888
34359	Equisetopsida	Pylaisiadelphaceae	<i>Wijkia</i>	None	None	None	1	1	31/07/1888
17622	Equisetopsida	Ranunculaceae	<i>Clematis glycinoides</i>	None	C	None	1	1	23/08/1987
22935	Equisetopsida	Ranunculaceae	<i>Ranunculus sceleratus</i> subsp. <i>sceleratus</i>	None	None	None	2	2	28/09/2003
27168	Equisetopsida	Rosaceae	<i>Rubus anglocandicans</i>	blackberry	None	None	1	1	26/02/1946
16640	Equisetopsida	Rubiaceae	<i>Mitracarpus hirtus</i>	None	None	None	1	1	19/04/2019
8448	Equisetopsida	Rubiaceae	<i>Oldenlandia galioides</i>	None	C	None	1	1	21/11/1974
12195	Equisetopsida	Rubiaceae	<i>Richardia stellaris</i>	None	None	None	1	1	23/01/1969
27221	Equisetopsida	Rubiaceae	<i>Sherardia arvensis</i>	None	None	None	1	1	29/07/1999
17843	Equisetopsida	Rutaceae	<i>Boronia rosmarinifolia</i>	forest boronia	C	None	1	1	02/01/2000
13501	Equisetopsida	Santalaceae	<i>Thesium australe</i>	toadflax	V	V	1	1	13/11/1985
17738	Equisetopsida	Sapindaceae	<i>Cardiospermum grandiflorum</i>	heart seed vine	None	None	1	1	13/11/2008
8631	Equisetopsida	Scrophulariaceae	<i>Eremophila debilis</i>	winter apple	C	None	1	1	06/03/1985
25188	Equisetopsida	Sematophyllaceae	<i>Sematophyllum homomallum</i>	None	C	None	1	1	31/12/1888
26202	Equisetopsida	Sematophyllaceae	<i>Sematophyllum subhumile</i>	None	C	None	2	2	31/12/1888
16736	Equisetopsida	Solanaceae	<i>Lycium ferocissimum</i>	African boxthorn	None	None	2	2	30/06/2002
10269	Equisetopsida	Solanaceae	<i>Petunia axillaris</i>	petunia	None	None	1	1	09/01/1979
16157	Equisetopsida	Solanaceae	<i>Solanum americanum</i>	None	C	None	3	3	13/11/2008
16165	Equisetopsida	Solanaceae	<i>Solanum ellipticum</i>	potato bush	C	None	1	1	30/06/2002

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
29345	Equisetopsida	Thuidiaceae	<i>Thuidiopsis sparsa</i>	None	C	None	1	1	31/12/1888
36374	Equisetopsida	Thymelaeaceae	<i>Pimelea altior</i>	None	C	None	1	1	08/01/2005
16487	Equisetopsida	Thymelaeaceae	<i>Pimelea glauca</i>	smooth riceflower	C	None	1	1	04/09/1948
12654	Equisetopsida	Ulmaceae	<i>Celtis sinensis</i>	Chinese elm	None	None	0	8	21/01/2016
19905	Equisetopsida	Verbenaceae	<i>Lantana camara</i>	lantana	None	None	0	16	21/01/2016
13853	Equisetopsida	Verbenaceae	<i>Lantana montevidensis</i>	creeping lantana	None	None	0	1	09/07/1996
27944	Equisetopsida	Verbenaceae	<i>Verbena litoralis</i> var. <i>litoralis</i>	None	None	None	1	1	12/04/1930
30780	Equisetopsida	Verbenaceae	<i>Verbena rigida</i>	None	None	None	1	1	26/02/1946

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
33512	Agaricomycetes	Agaricaceae	<i>Bovista pusilla</i>	None	C	None	1	1	22/03/1952
25857	Agaricomycetes	Agaricaceae	<i>Cyathus stercoreus</i>	None	C	None	1	1	30/04/1951
28036	Agaricomycetes	Agaricaceae	<i>Disciseda anomala</i>	None	C	None	1	1	11/09/2008
26124	Agaricomycetes	Agaricaceae	<i>Podaxis beringamensis</i>	None	C	None	0	2	14/05/2017
23512	Eurotiomycetes	Pyrenulaceae	<i>Pyrenula quassiaecola</i>	None	C	None	1	1	07/11/2000
31956	Lecanoromycetes	Caliciaceae	<i>Cratiria lauricassiae</i>	None	C	None	1	1	22/02/2011
23096	Lecanoromycetes	Caliciaceae	<i>Dirinaria applanata</i>	None	C	None	2	2	22/02/2011
23098	Lecanoromycetes	Caliciaceae	<i>Dirinaria confluens</i>	None	C	None	1	1	22/02/2011
34339	Lecanoromycetes	Caliciaceae	<i>Monerolechia badia</i>	None	C	None	2	2	22/02/2011
23536	Lecanoromycetes	Caliciaceae	<i>Pyxine petricola</i>	None	C	None	1	1	04/10/1985
23542	Lecanoromycetes	Caliciaceae	<i>Pyxine subcinerea</i>	None	C	None	1	1	22/02/2011
34907	Lecanoromycetes	Cladoniaceae	<i>Cladia muelleri</i>	None	C	None	1	1	22/02/2011
23057	Lecanoromycetes	Cladoniaceae	<i>Ramalinora glaucolivida</i>	None	C	None	1	1	07/11/2000
23076	Lecanoromycetes	Coccocarpiaceae	<i>Coccocarpia pellita</i>	None	C	None	1	1	22/02/2011
26558	Lecanoromycetes	Coenogoniaceae	<i>Coenogonium luteum</i>	None	C	None	1	1	07/11/2000
23093	Lecanoromycetes	Graphidaceae	<i>Diploschistes actinostomus</i>	None	C	None	1	1	07/11/2000
23216	Lecanoromycetes	Lecanoraceae	<i>Lecanora impressa</i>	None	C	None	1	1	01/01/1986

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
23241	Lecanoromycetes	Lecideaceae	<i>Lecidea terrena</i>	None	C	None	1	1	08/10/2001
23346	Lecanoromycetes	Lecideaceae	<i>Paraporphidia leptocarpa</i>	None	C	None	1	1	22/02/2011
23455	Lecanoromycetes	Lecideaceae	<i>Poeltiaria turgescens</i>	None	C	None	1	1	22/02/2011
23316	Lecanoromycetes	Megalosporaceae	<i>Megalospora sulphurata</i>	None	C	None	1	1	01/10/1987
25789	Lecanoromycetes	Ochrolechiaceae	<i>Ochrolechia africana</i>	None	C	None	1	1	22/02/2011
34341	Lecanoromycetes	Parmeliaceae	<i>Austroparmelia conlabrosa</i>	None	C	None	2	2	22/02/2011
34935	Lecanoromycetes	Parmeliaceae	<i>Crespoa crozalsiana</i>	None	C	None	1	1	22/02/2011
23351	Lecanoromycetes	Parmeliaceae	<i>Parmelia tenuirima</i>	None	C	None	1	1	22/02/2011
23715	Lecanoromycetes	Parmeliaceae	<i>Parmotrema cooperi</i>	None	C	None	1	1	22/02/2011
23448	Lecanoromycetes	Parmeliaceae	<i>Parmotrema tinctorum</i>	None	C	None	2	2	22/02/2011
29478	Lecanoromycetes	Parmeliaceae	<i>Usnea rubicunda</i>	None	C	None	1	1	22/02/2011
23801	Lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia congesta</i>	None	C	None	1	1	22/02/2011
23807	Lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia filsonii</i>	None	C	None	2	2	22/02/2011
23817	Lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia neotinctina</i>	None	C	None	1	1	22/02/2011
30138	Lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia numinbahensis</i>	None	C	None	1	1	22/02/2011
30020	Lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia pulla</i>	None	C	None	1	1	22/02/2011
23829	Lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia thamnoides</i>	None	C	None	1	1	22/02/2011
23428	Lecanoromycetes	Pertusariaceae	<i>Pertusaria</i>	None	None	None	1	1	22/02/2011
23408	Lecanoromycetes	Pertusariaceae	<i>Pertusaria hartmannii</i>	None	C	None	1	1	22/02/2011
23420	Lecanoromycetes	Pertusariaceae	<i>Pertusaria subventosa</i>	None	C	None	1	1	22/02/2011
23413	Lecanoromycetes	Pertusariaceae	<i>Pertusaria xanthoplaca</i>	None	C	None	1	1	22/02/2011
23049	Lecanoromycetes	Physciaceae	<i>Heterodermia speciosa</i>	None	C	None	1	1	22/02/2011
31344	Lecanoromycetes	Physciaceae	<i>Rinodina moziana</i> var. <i>moziana</i>	None	C	None	1	1	22/02/2011
23844	Lecanoromycetes	Physciaceae	<i>Rinodina xanthomelana</i>	None	C	None	1	1	07/11/2000
31981	Lecanoromycetes	Ramboldiaceae	<i>Ramboldia sanguinolenta</i>	None	C	None	1	1	30/04/2002

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
22962	Lecanoromycetes	Teloschistaceae	<i>Caloplaca</i>	None	None	None	1	1	22/02/2011
22988	Lecanoromycetes	Teloschistaceae	<i>Caloplaca cinnabarina</i>	None	C	None	1	1	07/11/2000
23783	Lecanoromycetes	Trapeliaceae	<i>Trapelia</i>	None	None	None	1	1	22/02/2011
26790	Sordariomycetes	Xylariaceae	<i>Xylaria</i>	None	None	None	1	1	29/02/1984

Table 5. Protists 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* (Endangered (E), Extinct in the Wild (PE), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern(C)).

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), Extinct in the Wild (XW) and Vulnerable (V)).

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 species information approved for publication, and generate reports
- [Qld wildlife data API](#) - access 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 species profiles
- [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.

Other useful sites for accessing biodiversity data include:

- [Queensland Government Data](#)
- [Atlas of Living Australia](#)
- [OZCAM - Online Zoological Collections of Australian Museums](#)
- [AVH - Australia's Virtual Herbarium](#)
- [Protected Matters Search Tool](#)

Please direct queries about this report to the [WildNet Team](#).

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

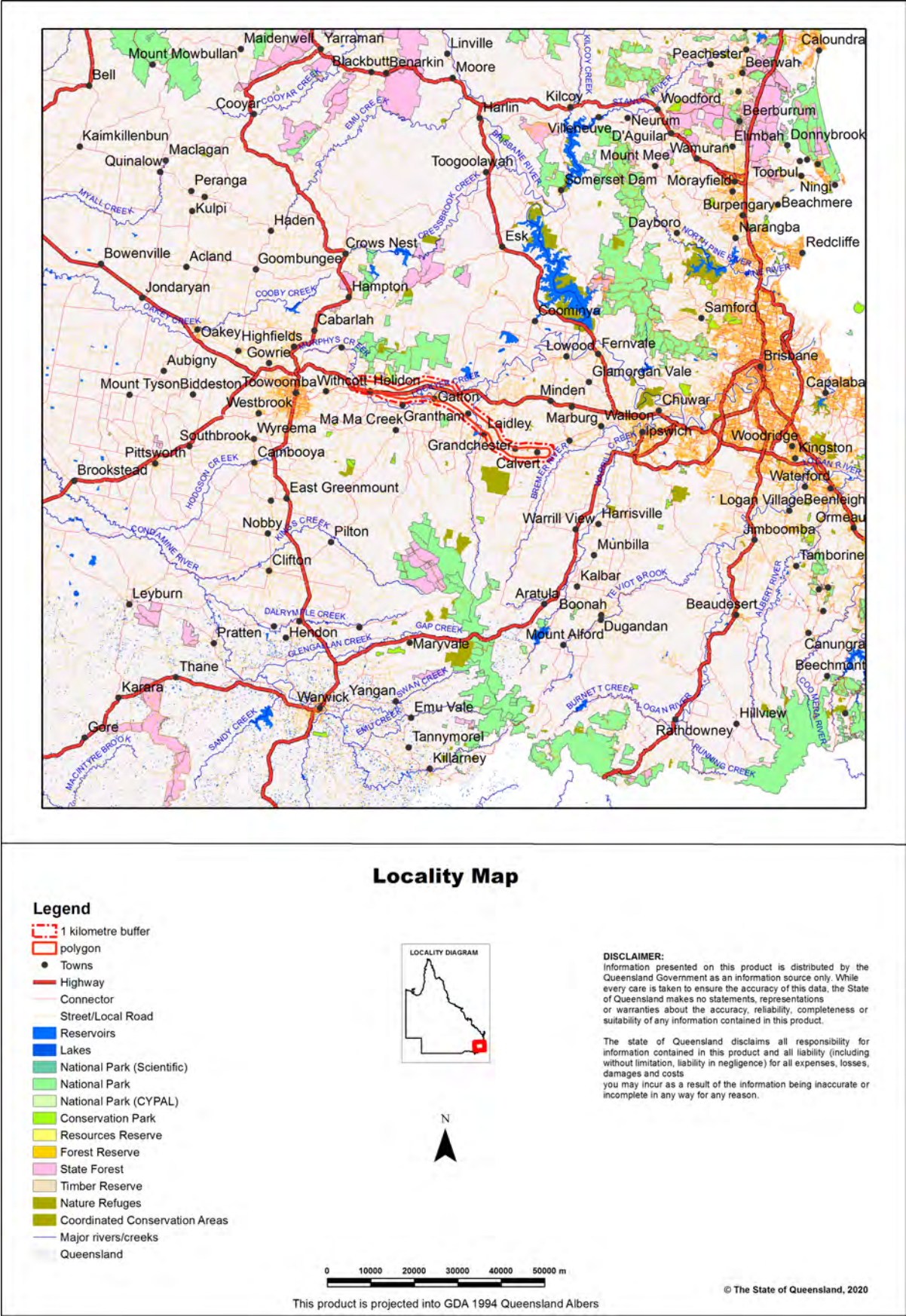


For the selected area of interest 11827.44ha

Current as at 17/03/2020

WildNetCSspecieslist

Map 1. Locality Map



Summary Information

The following table provides an overview of the area of interest .

Table 1. Area of interest details

Size (ha)	11,827.44
Local Government(s)	Ipswich City, Lockyer Valley Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Moreton Basin
Catchment(s)	Brisbane

Protected Area(s)

No estates or reserves are located within the area of interest.

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

This Conservation Significant Species List report is derived only from records from the WildNet database managed by the Department of Environment and Science. Other data sources may provide additional information on species occurrence.

Conservation significant species are species listed:

- as [threatened](#) or near threatened under the Nature Conservation Act 1992;
- as threatened under the [Environment Protection and Biodiversity Conservation Act 1999](#) or
- [migratory species](#) protected under the following international agreements:
 - o Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)
 - o China-Australia Migratory Bird Agreement
 - o Japan-Australia Migratory Bird Agreement
 - o Republic of Korea-Australia Migratory Bird Agreement

The WildNet dataset is constantly being enhanced and the taxonomic and status information revised. If a species does not occur in the report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area.

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
1728	Animalia	Aves	Accipitridae	<i>Erythrotriorchis radiatus</i>	red goshawk	E	V	0	19	09/06/2002
1702	Animalia	Aves	Accipitridae	<i>Pandion cristatus</i>	eastern osprey	SL	None	0	4	13/03/1999
1965	Animalia	Aves	Apodidae	<i>Apus pacificus</i>	fork-tailed swift	SL	None	0	9	28/12/2008
1971	Animalia	Aves	Apodidae	<i>Hirundapus caudacutus</i>	white-throated needletail	V	V	0	40	28/12/2008
1171	Animalia	Aves	Cacatuidae	<i>Calyptrorhynchus lathami</i>	glossy black-cockatoo	V	None	0	1	02/11/2013

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
22494	Animalia	Aves	Cacatuidae	<i>Calyptorhynchus lathami lathami</i>	glossy black-cockatoo (eastern)	V	None	0	24	11/05/2017
1939	Animalia	Aves	Charadriidae	<i>Charadrius veredus</i>	oriental plover	SL	None	0	5	31/12/1991
1944	Animalia	Aves	Charadriidae	<i>Pluvialis fulva</i>	Pacific golden plover	SL	None	0	4	30/11/1992
1785	Animalia	Aves	Columbidae	<i>Geophaps scripta scripta</i>	squatter pigeon (southern subspecies)	V	V	0	30	08/08/1993
1736	Animalia	Aves	Cuculidae	<i>Cuculus optatus</i>	oriental cuckoo	SL	None	0	6	30/11/1992
1405	Animalia	Aves	Dasyornithidae	<i>Dasyornis brachypterus</i>	eastern bristlebird	E	E	0	1	31/12/1965
1705	Animalia	Aves	Falconidae	<i>Falco hypoleucos</i>	grey falcon	V	None	0	1	11/04/1998
1920	Animalia	Aves	Laridae	<i>Chlidonias leucopterus</i>	white-winged black tern	SL	None	0	5	31/12/1992
1886	Animalia	Aves	Laridae	<i>Gelochelidon nilotica</i>	gull-billed tern	SL	None	0	10	12/06/2016
1896	Animalia	Aves	Laridae	<i>Hydroprogne caspia</i>	Caspian tern	SL	None	0	13	24/11/2017
1595	Animalia	Aves	Monarchidae	<i>Monarcha melanopsis</i>	black-faced monarch	SL	None	0	9	25/10/1998
1597	Animalia	Aves	Monarchidae	<i>Symposiachrus trivirgatus</i>	spectacled monarch	SL	None	0	2	30/11/1991
1188	Animalia	Aves	Procellariidae	<i>Ardenna pacifica</i>	wedge-tailed shearwater	V	None	0	1	07/05/1996
1149	Animalia	Aves	Psittacidae	<i>Lathamus discolor</i>	swift parrot	E	CE	0	1	27/07/1994
1578	Animalia	Aves	Rhipiduridae	<i>Rhipidura rufifrons</i>	rufous fantail	SL	None	0	19	31/10/2005
1883	Animalia	Aves	Rostratulidae	<i>Rostratula australis</i>	Australian painted snipe	E	E	0	26	20/10/2004
1885	Animalia	Aves	Scolopacidae	<i>Actitis hypoleucos</i>	common sandpiper	SL	None	0	22	05/12/1999
1874	Animalia	Aves	Scolopacidae	<i>Calidris acuminata</i>	sharp-tailed sandpiper	SL	None	0	47	10/03/2019
1878	Animalia	Aves	Scolopacidae	<i>Calidris ferruginea</i>	curlew sandpiper	E	CE	0	5	30/10/1994
1849	Animalia	Aves	Scolopacidae	<i>Calidris pugnax</i>	ruff	SL	None	0	1	31/01/1973
1880	Animalia	Aves	Scolopacidae	<i>Calidris ruficollis</i>	red-necked stint	SL	None	0	4	31/01/1993
1857	Animalia	Aves	Scolopacidae	<i>Gallinago hardwickii</i>	Latham's snipe	SL	None	0	63	30/12/2013
1855	Animalia	Aves	Scolopacidae	<i>Limosa limosa</i>	black-tailed godwit	SL	None	0	8	31/12/1994
1845	Animalia	Aves	Scolopacidae	<i>Numenius phaeopus</i>	whimbrel	SL	None	0	2	10/05/1992
1847	Animalia	Aves	Scolopacidae	<i>Phalaropus lobatus</i>	red-necked phalarope	SL	None	0	8	10/05/1992

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1852	Animalia	Aves	Scolopacidae	<i>Tringa glareola</i>	wood sandpiper	SL	None	0	7	30/11/1992
1853	Animalia	Aves	Scolopacidae	<i>Tringa nebularia</i>	common greenshank	SL	None	0	7	13/03/2005
1841	Animalia	Aves	Scolopacidae	<i>Tringa stagnatilis</i>	marsh sandpiper	SL	None	0	56	25/10/2015
1107	Animalia	Aves	Strigidae	<i>Ninox strenua</i>	powerful owl	V	None	0	5	13/02/2019
1825	Animalia	Aves	Threskiornithidae	<i>Plegadis falcinellus</i>	glossy ibis	SL	None	0	81	10/02/2018
19177	Animalia	Insecta	Nymphalidae	<i>Danaus plexippus</i>	monarch	None	None	0	3	06/10/1994
803	Animalia	Mammalia	Dasyuridae	<i>Dasyurus maculatus maculatus</i>	spotted-tailed quoll (southern subspecies)	V	E	0	1	31/12/1974
890	Animalia	Mammalia	Macropodidae	<i>Petrogale penicillata</i>	brush-tailed rock-wallaby	V	V	0	1	11/07/1996
836	Animalia	Mammalia	Ornithorhynchidae	<i>Ornithorhynchus anatinus</i>	platypus	SL	None	1	5	22/07/1992
860	Animalia	Mammalia	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala	V	V	0	819	29/09/2019
2455	Animalia	Mammalia	Pseudocheiridae	<i>Petauroides volans volans</i>	southern greater glider	V	V	1	4	01/09/1995
962	Animalia	Mammalia	Pteropodidae	<i>Pteropus poliocephalus</i>	grey-headed flying-fox	C	V	0	29	18/11/2011
838	Animalia	Mammalia	Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna	SL	None	0	13	05/08/2019
26926	Animalia	Sarcopterygii	Ceratodontidae	<i>Neoceratodus forsteri</i>	Australian lungfish	None	V	0	2	29/09/2003
31135	Plantae	Equisetopsida	Asteraceae	<i>Rhaphonticum australe</i>	None	V	V	1	1	27/01/1944
26403	Plantae	Equisetopsida	Myrtaceae	<i>Melaleuca irbyana</i>	None	E	None	1	1	29/04/1995
9680	Plantae	Equisetopsida	Oleaceae	<i>Notelaea lloydii</i>	Lloyd's native olive	V	V	2	2	06/09/2018
6963	Plantae	Equisetopsida	Proteaceae	<i>Grevillea quadricauda</i>	None	V	V	1	1	15/06/2017
13501	Plantae	Equisetopsida	Santalaceae	<i>Thesium australe</i>	toadflax	V	V	1	1	13/11/1985

Taxon Id: Unique identifier of the taxon from the WildNet database.

NCA: Queensland conservation status of the taxon under the *Nature Conservation Act 1992* (Endangered (E), Extinct in the Wild (PE), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern(C)).

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), Extinct in the Wild (XW) and Vulnerable (V)).

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 species information approved for publication, and generate reports
- [Qld wildlife data API](#) - access 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 species profiles
- [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 biodiversity data include:

- [Queensland Government Data](#)
- [Atlas of Living Australia](#)
- [OZCAM - Online Zoological Collections of Australian Museums](#)
- [AVH - Australia's Virtual Herbarium](#)
- [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.





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

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

Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government 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.



Table of Contents

Summary Information	4
Biodiversity Planning Assessments	6
Introduction	6
Diagnostic Criteria	6
Other Essential Criteria	8
Aquatic Conservation Assessments	15
Introduction	15
Explanation of Criteria	15
Riverine Wetlands	16
Non-riverine Wetlands	18
Threatened and Priority Species	20
Introduction	20
Threatened Species	20
BPA Priority Species	21
ACA Priority Species	22
Maps	25
Map 1 - Locality Map	25
Map 2 - Biodiversity Planning Assessment (BPA)	26
Map 3 - Corridors	27
Map 4 - Wetlands and waterways	28
Map 5 - Aquatic Conservation Assessment (ACA) - riverine	29
Map 6 - Aquatic Conservation Assessment (ACA) - non-riverine	30
References	31
Appendices	32
Appendix 1 - Source Data	32
Appendix 2 - Acronyms and Abbreviations	33

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:

Size (ha)	11,827.44
Local Government(s)	Ipswich City, Lockyer Valley Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Moreton Basin
Catchment(s)	Brisbane

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)	South East Queensland Catchments v1.1
Aquatic Conservation Assessment(s) (non-riverine)	South East Queensland 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	104.39	0.88
Of concern	256.64	2.17
No concern at present	1,325.09	11.2

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	89.26	0.75
State	670.04	5.67
Regional	674.46	5.7
Local or Other Values	292.64	2.47

Table 5: Non-riverine wetlands intersecting the AOI

Non-riverine wetland types intersecting the area of interest	#
Number of Palustrine wetlands	4
Number of Lacustrine wetlands	12
Total number of non-riverine wetlands	16

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
FRANKLIN VALE CREEK	Non-perennial
GATTON CREEK	Non-perennial
LAIDLEY CREEK	Non-perennial
LOCKYER CREEK	Non-perennial
REDBANK CREEK	Non-perennial
SANDY CREEK	Non-perennial
SHEEP CREEK	Non-perennial
WESTERN 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	0.0	0.0
High	464.93	3.93
Medium	11,362.74	96.07
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	22.7	0.19
High	64.74	0.55
Medium	7.01	0.06
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	89.26	0.75
State	670.04	5.67
Regional	674.46	5.7
Local or Other Values	292.64	2.47

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	Remnant contains at least 1 Endangered or 2 Vulnerable or Near Threatened species (A)	85.13	0.72
State	Remnant contains at least 1 Endangered or 2 Vulnerable or Near Threatened species (A) & Nat. Threatened Ecol. Community (B1)	4.13	0.03
State	Remnant contains at least 1 Endangered RE (B1)	90.25	0.76
Regional	Remnant contains at least 1 Vulnerable or Near Threatened species (A)	855.34	7.23
Regional	Remnant contains at least one Of Concern RE (B1)	7.99	0.07
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)	68.35	0.58
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)	41.47	0.35
Local or Other Values	Refer to diagnostic data for additional information	554.32	4.69

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	89.24	0.8	944.04	8.0	673.75	5.7		
B1: Ecosystem Value (Bioregion)	102.66	0.9	140.71	1.2	1,393.87	11.8	63.68	0.5
B2: Ecosystem Value (Subregion)	101.05	0.9	134.33	1.1	1,401.86	11.9	63.68	0.5
C: Tract Size	740.98	6.3	448.25	3.8	224.14	1.9	287.55	2.4
D1: Relative RE Size (Bioregion)			26.31	0.2			1,674.61	14.2
D2: Relative RE Size (Subregion)	91.68	0.8	26.31	0.2	61.87	0.5	1,521.06	12.9
F: Ecosystem Diversity	21.84	0.2	708.42	6.0	540.62	4.6	430.04	3.6
G: Context and Connection	282.84	2.4	72.92	0.6	1,202.30	10.2	142.86	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)	125.18	1.06
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)	132.6	1.12
State	Remnant contains Core Habitat for Priority Taxa (H) & Remnant forms part of a bioregional corridor (J)	14.0	0.12
State	Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I)	71.5	0.6
State	Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I) & Remnant forms part of a bioregional corridor (J)	291.58	2.47
Regional	Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I)	14.7	0.12
Regional	Remnant forms part of a bioregional corridor (J)	445.79	3.77
Local	Refer to Expert Panel data for additional information	300.31	2.54

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 assess 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	271.76	2.3			444.05	3.8	985.11	8.3
Ia: Centres of Endemism	382.38	3.2						
Ib: Wildlife Refugia	495.68	4.2	14.7	0.1				
Ic: Disjunct Populations								
Id: Limits of Geographic Ranges	382.38	3.2						
Ie: High Species Richness	9.36	0.1	146.55	1.2				
If: Relictual Populations								
Ig: Variation in Species Composition								
Ih: Artificial Wetland								
Ii: Hollow Bearing Trees	0.67		150.53	1.3				
Ij: Breeding or Roosting Site	0.67							
Ik: Climate Refugia	391.74	3.3						

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	32.26	0.27
Regional	851.71	7.2
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_21	Lockyer Valley wetland	Regional	Ib (wildlife refugia): HIGH

Decision Number	Description	Panel Recommended Significance	Criteria Values
seq_fa_26	Lowland areas likely to contain reasonable densities of hollow bearing trees	State	lb (wildlife refugia): VERY HIGH li (hollow bearing trees): VERY HIGH lj (breeding / roosting sites): VERY HIGH
seqs_fl_84	Lowland riparian /gallery rainforest in the southern SEQ Bioregion	State	la (SEQ endemic taxa): VERY HIGH lb (wildlife refugia): VERY HIGH
seqs_l_17	Helidon Hills	State	la (SEQ endemic taxa): VERY HIGH lb (wildlife refugia): VERY HIGH ld (disjunct populations): VERY HIGH lk (climate refugia): VERY HIGH
seqs_l_22	Terrestrial bioregional corridors	State or Regional	Criterion J
seqs_l_49	Riparian bioregional corridors	State	Criterion J
seqs_l_51	Permanent groundwater dependent ecosystems (GDE)	State	lb (wildlife refugia): VERY HIGH le (high species richness): VERY HIGH lk (climate refugia): VERY HIGH
seqs_l_57	Riparian lowland forest systems (other than riparian/gallery rainforests systems)	State	lb (wildlife refugia): VERY HIGH le (high species richness): HIGH li (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_21

Includes major wetlands in the lower Lockyer Valley. Remnants of floodplain - Lake Idley, Atkinson's Dam, Lake Clarendon, 7-Mile Swamp, Jahnke's lagoon, Lake Dyer. Wetlands are large after heavy rain and include habitat for water birds like the cotton pygmy-geese Nettapus coromandelianus, freckled duck Stictonetta naevosa, magpie goose Anseranas semipalmata, blue-billed duck Oxyura australis (breeding) and plumed whistling-duck Dendrocygna eytoni. A range of dry country frogs (15 species) are present. Other fauna includes grey snakes Hemiaspis damelii, blue winged kookaburras Dacelo leachii, certain Trichoptera (caddisflies) found only in the Lockyer Valley in SEQ. Breeding site for Australian painted snipe Rostratula australis.

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.

seqs_fl_84

Localised linear patches of lowland riparian rainforest in fragmented landscapes in the southern part of the bioregion. They provide refugia for animal and plant species more commonly associated with the higher rainfall parts of SEQ.

- SEQ endemic taxa (Criterion Ia):
- Wildlife refugia (Criterion Ib):

Note: refer also to seqs_fl_02 and seqs_fl_19 for specific values associated with riparian rainforest communities within southern Gold Coast and Nambour areas respectively.

seqs_I_17

Collectively, the area delineated has very high flora and landscape values. It is an area of sedimentary geology in places capped by the remnants of an old duricrusted surface of Tertiary age. It has weathered surfaces throughout. Watercourses have cut gorges through the sandstone beds especially on the western side.

The values identified for the area include:

- SEQ endemic taxa including narrow endemic taxa (Criterion Ia): SEQ endemic taxa - *Bertya lapicola* subsp. *lapicola*, *Bossiaea dasycarpa*, *Eucalyptus dura*, *E. helidonica*, *E. taurina*, *Caustis blakei* subsp. *macrantha*, *Goodenia heterophylla* subsp. *teucriifolia*, *Grevillea quadricauda*, *Hovea impressinerva*, *H. ramulosa*, *Leionema obtusifolium*, *Paspalidium grandispiculatum*, *Syncarpia verecunda*, *Xylomelum benthamii*.
- Wildlife refugia (Criterion Ib).
- Disjunct taxa (Criterion Ic): largely species from sandstone areas in the Brigalow Belt region. Disjunct taxa: *Acacia baeuerlenii*, *A. blakei* subsp. *blakei*, *A. brachycarpa*, *A. julifera* subsp. *julifera*, *A. leichhardtii*, *Allocasuarina inophloia*, *Aotus subglauca* var. *filiformis*, *A. subglauca* var. *subglauca*, *Sannantha collina*, *Eucalyptus baileyana*, *Gompholobium foliolosum*, *Grevillea singuliflora*, *Hakea plurinervia*, *Leucopogon biflorus*, *Leptospermum lamellatum*, *Lysicarpus angustifolius*, *Mirbelia speciosa* subsp. *ringrosei*, *Xanthosia stellata*.
- Climate refugia (Criterion Ik): A combination of ecosystem and landscape elements are present across parts of the general area described considered to provide refugial functions and/or which facilitate adaptation zones (SEQ Catchments 2016).

seqs_I_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_I_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_I_51

This decision relates to all ecosystems that have a permanent groundwater connection. Two examples include the Blue Lake on North Stradbroke Island and the upper Lamington plateau streams. Such systems are very rare in the Australian landscape.

Additionally, given the expected increase in frequency of droughts and higher temperatures, such areas may act as important drought refugia.

seqs_I_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_I_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 processes

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	0.0	0.0

Aquatic conservation significance (riverine wetlands)	Area (Ha)	% of AOI
High	464.93	3.93
Medium	11,362.74	96.07
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			99.3	0.8	8,090.99	68.4	3,637.36	30.8
2. Naturalness catchment			3,282.18	27.8	2,084.28	17.6	6,461.19	54.6
3. Diversity and richness	2,552.09	21.6	2,044.65	17.3	7,207.21	60.9	23.7	0.2
4. Threatened species and ecosystems	695.02	5.9	567.35	4.8	10,565.28	89.3		
5. Priority species and ecosystems	3,279.80	27.7	3,958.50	33.5	4,565.65	38.6		
6. Special features			389.33	3.3				
7. Connectivity	1,194.50	10.1	193.75	1.6	1,369.83	11.6	9,069.57	76.7
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)
ly_r_ec_03	High energy lotic systems	Lockyer	6.1.1	3
ly_r_fl_01	Eucalyptus tereticornis communities 12.3.11	Lockyer	6.3.1	3

4 is the highest rating/value

Expert panel decision descriptions:

ly_r_ec_03

Boulder to cobble bed stretches in stream beds providing pool and riffle environments. Provide diversity in substrate habitat and a highly oxygenated, self-cleaning system. Believed to be some examples downstream from Wivenhoe and Somerset dams and below other major infrastructure; regulated flow in these locations can result in enhanced biodiversity relative to natural state. Not all examples will have high ecological value due to other factors e.g. water quality. Activities that remove boulders and stones cause degradation.

ly_r_fl_01

RE 12.3.11 provides habitat for flora and fauna and is subject to a number of threatening processes in the coastal catchments. Remnant pockets have good biodiversity. REs 12.3.3, 12.3.7, 12.3.11 in flood plain or riverine system contain **E. tereticornis**, although the expert panel decision relates specifically to 12.3.11.

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	22.7	0.19
High	64.74	0.55
Medium	7.01	0.06
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			8.0	0.1			86.45	0.7
2. Naturalness catchment	4.85		3.44		34.34	0.3	51.82	0.4
3. Diversity and richness			79.64	0.7	13.37	0.1	1.44	
4. Threatened species and ecosystems	12.29	0.1	38.85	0.3	32.96	0.3		
5. Priority species and ecosystems	32.72	0.3	48.81	0.4	12.92	0.1		
6. Special features	22.7	0.2	64.74	0.5				
7. Connectivity								
8. Representative- ness			22.7	0.2				

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)
br_nr_ec_03	Ephemeral wetlands	Bremer	5.2.1, 6.3.1	4, 4
ly_nr_ec_01	Ephemeral wetlands	Lockyer	5.2.1, 6.3.1	4,4
ly_nr_fa_01	Lower Lockyer Valley major wetlands	Lockyer	6.3.1	4
ly_nr_fa_02	Lower Lockyer Valley minor wetlands	Lockyer	6.3.1	3

4 is the highest rating/value

Expert panel decision descriptions:

br_nr_ec_03

Ephemeral wetlands RE 12.3.8. Regardless of condition (e.g. grazing, weeds), these wetlands have important refugial values in highly degraded landscapes. Unique wetland type. Distinctive RE type. Most mapped as their own wetland.

ly_nr_ec_01

Ephemeral wetlands RE 12.3.8. Regardless of condition (e.g. grazing, weeds), these wetlands have important refugial values in highly degraded landscapes. Unique wetland type. Distinctive RE type. Most mapped as their own wetland.

ly_nr_fa_01

Decision includes every major wetland in the lower Lockyer Valley. Remnants of floodplain. Lake Idley, Atkinson's Dam, Lake Clarendon, 7-Mile Swamp, Jahnke's lagoon, Lake Dyer (wader birds study group). Wetlands are large after heavy rain and include habitat for water birds like the cotton pygmy-goose, freckled duck, magpie goose, blue-billed duck (breeding) and plumed whistling-duck. A range of dry country frogs (15 species) are present. Other fauna includes grey snakes, blue winged kookaburras, certain Trichoptera (caddisflies) found only in the Lockyer Valley in SEQ. Breeding place for Australian painted snipe.

ly_nr_fa_02

Smaller wetlands in lower Lockyer Valley. Remnants of floodplain. Wetlands are large after heavy rain and include habitat for water birds including the cotton pygmy-goose. A range of dry country frogs (15 species) are present. Other fauna includes grey snakes, blue winged kookaburras, certain Trichoptera (caddisflies) found only in the Lockyer Valley in SEQ. Breeding place for Australian painted snipe.

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
<i>Bidyanus bidyanus</i>	silver perch		CE	Medium		Y	FA
<i>Botaurus poiciloptilus</i>	Australasian bittern	C	E	Medium		Y	FA
<i>Calidris ferruginea</i>	curlew sandpiper	E	CE	Low	Y	Y	FA
<i>Callitris baileyi</i>	Bailey's cypress	NT		High			FL
<i>Eucalyptus curtisii</i>	Plunkett mallee	NT		Low			FL
<i>Eucalyptus taurina</i>	Helidon ironbark	V		Low			FL
<i>Geophaps scripta scripta</i>	squatter pigeon (southern subspecies)	V	V	Medium			FA
<i>Grantiella picta</i>	painted honeyeater	V	V	High	Y		FA
<i>Grevillea quadricauda</i>		V	V	Low			FL
<i>Hemiaspis damelii</i>	grey snake	E		Medium			FA
<i>Lathamus discolor</i>	swift parrot	E	CE	Medium	Y		FA

Species	Common name	NCA status	EPBC status	Back on Track rank	Migratory species*	Wetland species**	Identified flora/fauna
<i>Maccullochella mariensis</i>	Mary River cod		E	High		Y	FA
<i>Melaleuca irbyana</i>		E		Medium			FL
<i>Neoceratodus forsteri</i>	Australian lungfish		V	Critical		Y	FA
<i>Ninox strenua</i>	powerful owl	V		Medium			FA
<i>Notelaea lloydii</i>	Lloyd's native olive	V	V	Low			FL
<i>Paspalidium grandispiculatum</i>		V	V	Low			FL
<i>Petauroides volans</i>	greater glider	V	V	Low			FA
<i>Petrogale penicillata</i>	brush-tailed rock-wallaby	V	V	High			FA
<i>Phascolarctos cinereus</i>	koala	V	V	Low			FA
<i>Phascolarctos cinereus</i>	Koala	V	V				FA
<i>Pteropus poliocephalus</i>	grey-headed flying-fox	C	V	Critical			FA
<i>Rostratula australis</i>	Australian painted snipe	V	E	Medium		Y	FA
<i>Sophora fraseri</i>	brush sophora	V	V	Low			FL
<i>Thesium australe</i>	toadflax	V	V	Medium			FL
<i>Turnix melanogaster</i>	black-breasted button-quail	V	V	Critical			FA

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.

**Y - wetland indicator 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
<i>Biziura lobata</i>	Musk Duck	Low	FA
<i>Cheramoeca leucosterna</i>	White-backed Swallow	Low	FA
<i>Chlamydosaurus kingii</i>	Frilled Lizard	Low	FA
<i>Cyclorana alboguttata</i>	Greenstripe Frog	Low	FA
<i>Cyclorana brevipes</i>	Superb Collared Frog	Low	FA
<i>Delma plebeia</i>	Common Delma	Medium	FA

Species	Common name	Back on Track rank	Identified flora/fauna
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	Low	FA
<i>Erythrura numerosa</i>			FL
<i>Limnodynastes salmini</i>	Salmon Striped Frog	Low	FA
<i>Litoria dentata</i>	Bleating Treefrog	Low	FA
<i>Lophoictinia isura</i>	Square-tailed Kite	Low	FA
<i>Macropus dorsalis</i>	Black-striped Wallaby	Low	FA
<i>Melithreptus gularis</i>	Black-chinned Honeyeater	Low	FA
<i>Mormopterus norfolkensis</i>	East-coast Freetail Bat	Low	FA
<i>Ornithorhynchus anatinus</i>	Platypus	Low	FA
<i>Pedinogyra hayii</i>	Hay's Flat-coiled Snail		FA
<i>Phascogale tapoatafa tapoatafa</i>	Brush-tailed Phascogale	Low	FA
<i>Pomatostomus temporalis</i>	Grey-crowned Babbler		FA
<i>Pseudechis guttatus</i>	Spotted Black Snake	Medium	FA
<i>Pseudophryne coriacea</i>	Red Backed Broodfrog	Low	FA
<i>Pteropus alecto</i>	Black Flying-fox	Low	FA
<i>Pteropus scapulatus</i>	Little Red Flying-fox	Low	FA
<i>Squamagenia separanda</i>	Pine Rivers Bristle Snail		FA
<i>Stagonopleura guttata</i>	Diamond Firetail	High	FA
<i>Syzygium oleosum</i>	blue cherry		FL

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
<i>Acrocephalus australis</i>	Australian Reed-Warbler	L	FA
<i>Actitis hypoleucos</i>	Common Sandpiper	L	FA
<i>Anguilla australis</i>	Southern Shortfin Eel	L	FA
<i>Anguilla reinhardtii</i>	Longfin Eel	L	FA
<i>Ardea ibis</i>	Cattle Egret	Low	FA
<i>Ardea modesta</i>	Eastern Great Egret	Low	FA
<i>Biziura lobata</i>	Musk Duck	L	FA
<i>Castanospermum australe</i>	black bean		FL
<i>Casuarina cunninghamiana</i>			FL
<i>Eucalyptus tereticornis</i>			FL
<i>Ficus coronata</i>	creek sandpaper fig		FL
<i>Gallinago hardwickii</i>	Latham's Snipe	L	FA

Species	Common name	Back on Track rank	Identified flora/fauna
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	L	FA
<i>Hydroprogne caspia</i>	Caspian Tern	L	FA
<i>Lomandra hystrix</i>			FL
<i>Macquaria novemaculeata</i>	Australian Bass	L	FA
<i>Melaleuca bracteata</i>			FL
<i>Melaleuca viminalis</i>		L	FL
<i>Ornithorhynchus anatinus</i>	Platypus	L	FA
<i>Oxyura australis</i>	Blue-billed Duck	L	FA
<i>Pandion cristatus</i>	Eastern Osprey	L	FA
<i>Rostratula australis</i>	Australian Painted Snipe	M	FA
<i>Vallisneria nana</i>		L	FL

Table 25: Priority species recorded on, or within 4 km of the AOI - non-riverine

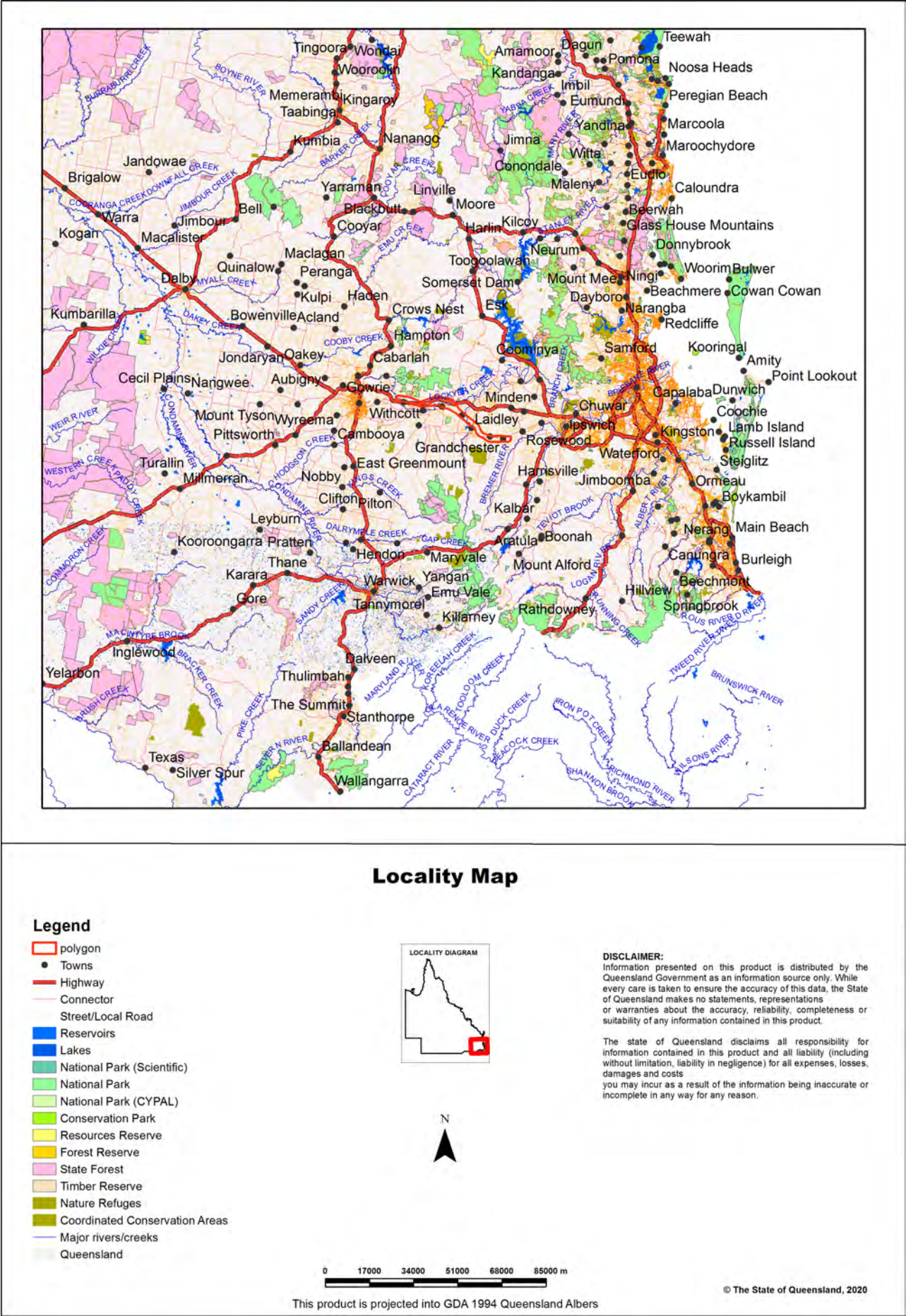
Species	Common name	Back on Track rank	Identified flora/fauna
<i>Acrocephalus australis</i>	Australian Reed-Warbler	L	FA
<i>Anguilla australis</i>	Southern Shortfin Eel	L	FA
<i>Anguilla reinhardtii</i>	Longfin Eel	L	FA
<i>Ardea ibis</i>	Cattle Egret	Low	FA
<i>Ardea modesta</i>	Eastern Great Egret	Low	FA
<i>Biziura lobata</i>	Musk Duck	L	FA
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	L	FA
<i>Calidris ferruginea</i>	Curlew Sandpiper	L	FA
<i>Calidris melanotos</i>	Pectoral Sandpiper	L	FA
<i>Charadrius bicinctus</i>	Double-banded Plover	L	FA
<i>Chlidonias leucopterus</i>	White-winged Black Tern	L	FA
<i>Cyclorana alboguttata</i>	Greenstripe Frog	L	FA
<i>Cyclorana brevipes</i>	Superb Collared Frog	L	FA
<i>Eucalyptus tereticornis</i>			FL
<i>Gallinago hardwickii</i>	Latham's Snipe	L	FA
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	L	FA
<i>Hydroprogne caspia</i>	Caspian Tern	L	FA
<i>Limnodynastes salmini</i>	Salmon Striped Frog	L	FA
<i>Limosa limosa</i>	Black-tailed Godwit	L	FA
<i>Melaleuca bracteata</i>			FL
<i>Ornithorhynchus anatinus</i>	Platypus	L	FA
<i>Oxyura australis</i>	Blue-billed Duck	L	FA
<i>Pandion cristatus</i>	Eastern Osprey	L	FA
<i>Plegadis falcinellus</i>	Glossy Ibis	L	FA
<i>Rostratula australis</i>	Australian Painted Snipe	M	FA
<i>Tringa glareola</i>	Wood Sandpiper	L	FA
<i>Tringa nebularia</i>	Common Greenshank	L	FA

Species	Common name	Back on Track rank	Identified flora/fauna
<i>Tringa stagnatilis</i>	Marsh Sandpiper	L	FA

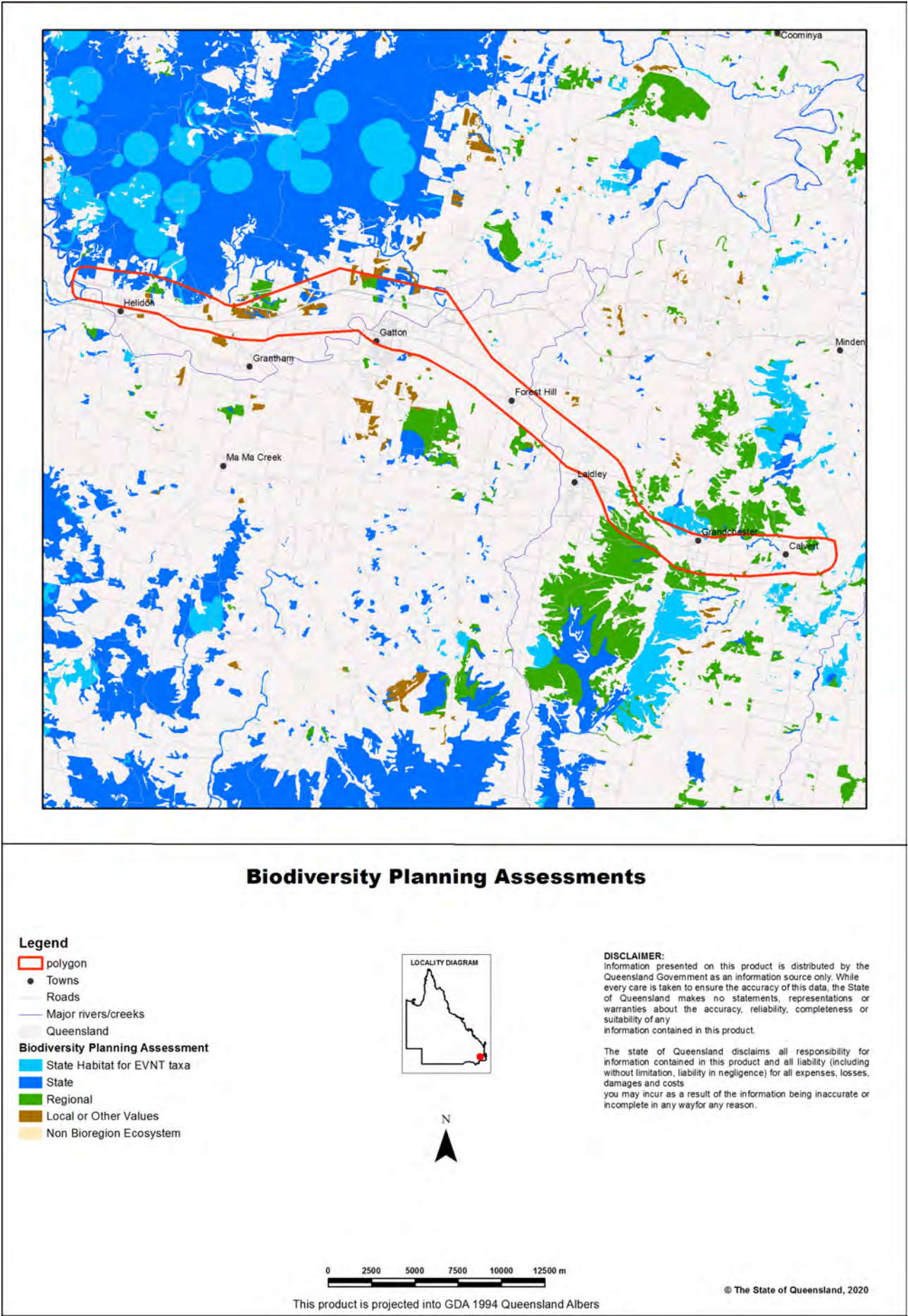
NB. Please note that the priority species records used in the above two tables are comprised of those adopted for the released individual ACAs. The ACA riverine and non-riverine priority species databases are updated from time to time to reflect new release of ACAs. At each update, the taxonomic details for all ACAs records are amended as necessary to reflect current taxonomic name and/or status changes.

Maps

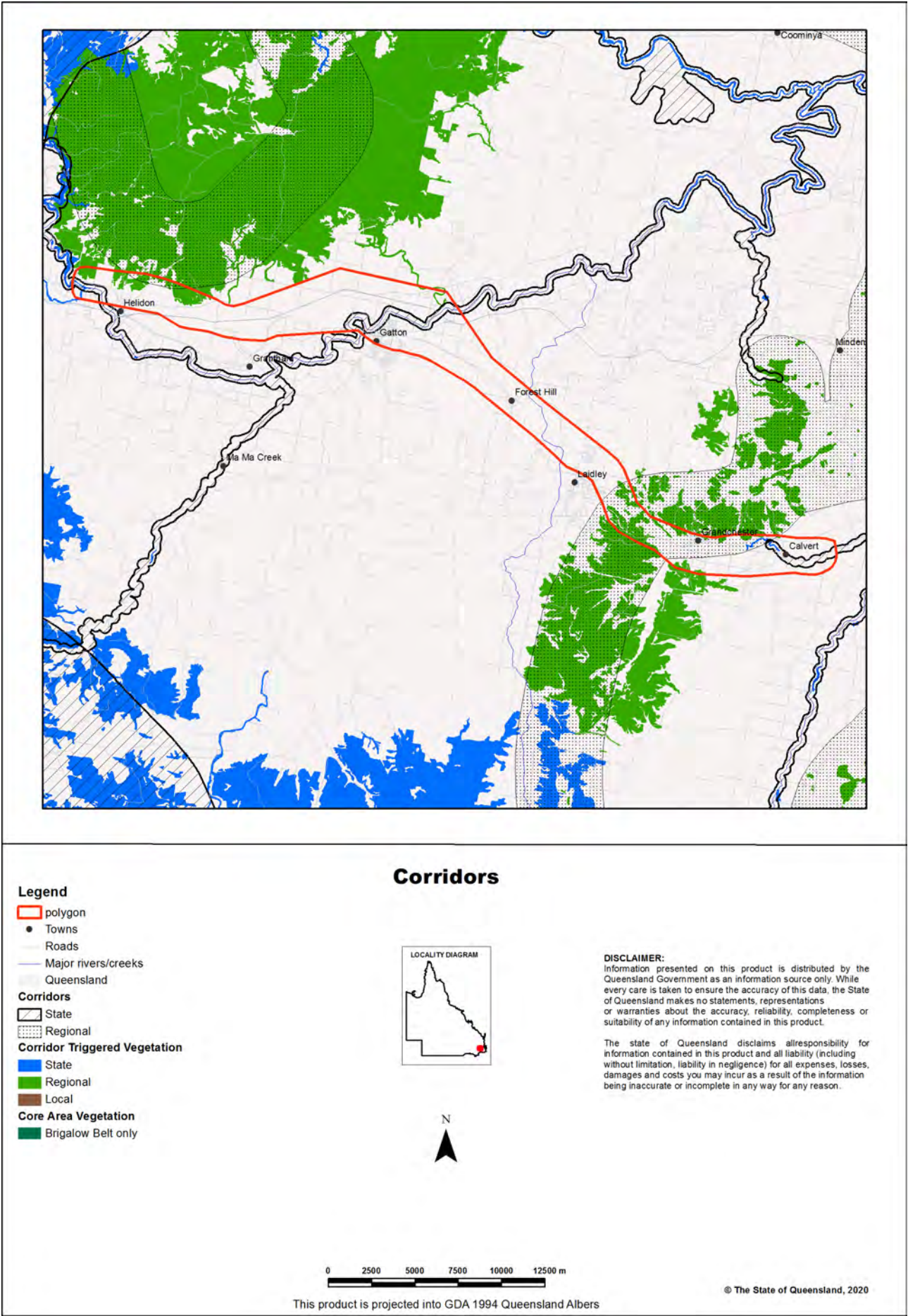
Map 1 - Locality Map



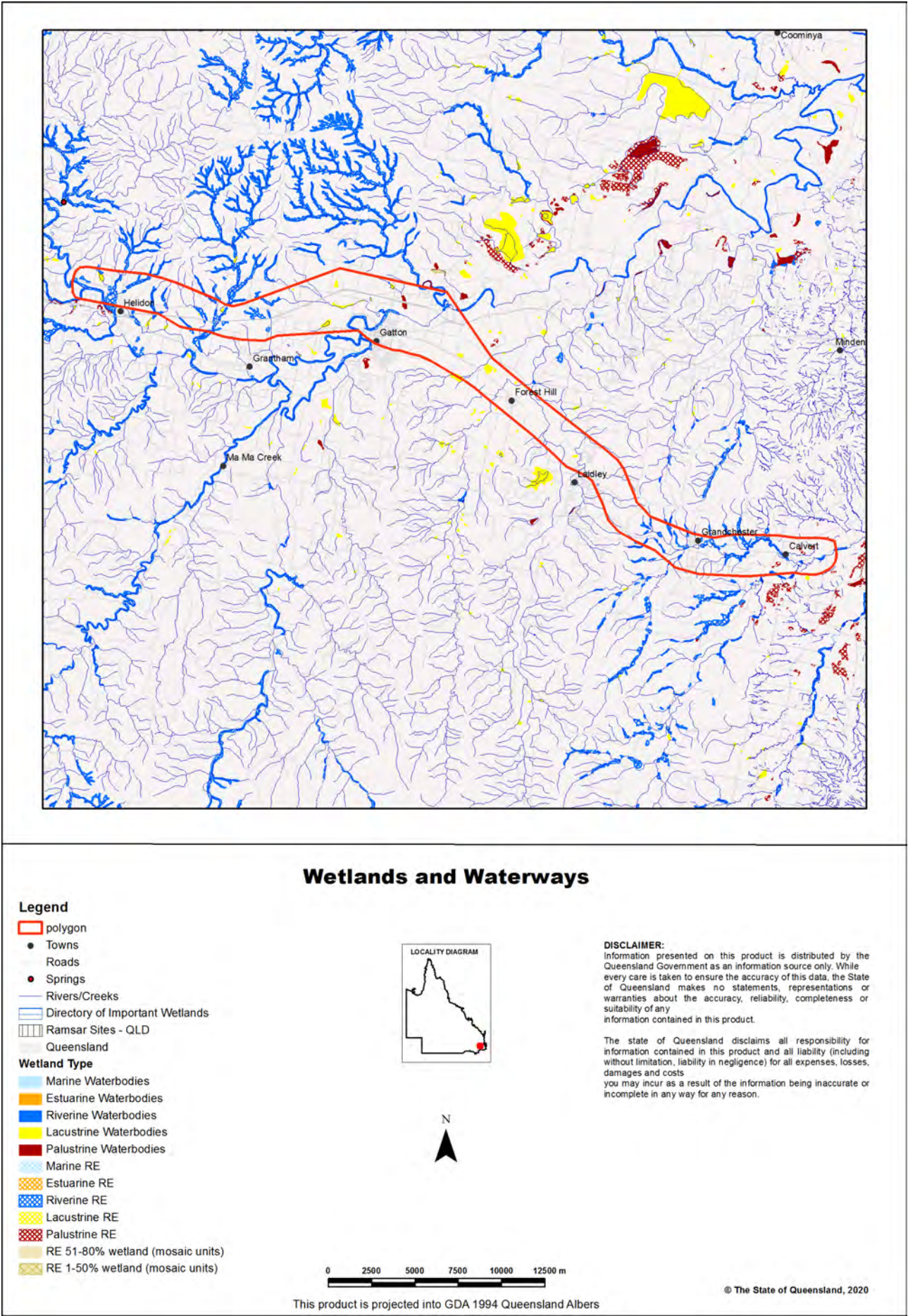
Map 2 - Biodiversity Planning Assessment (BPA)



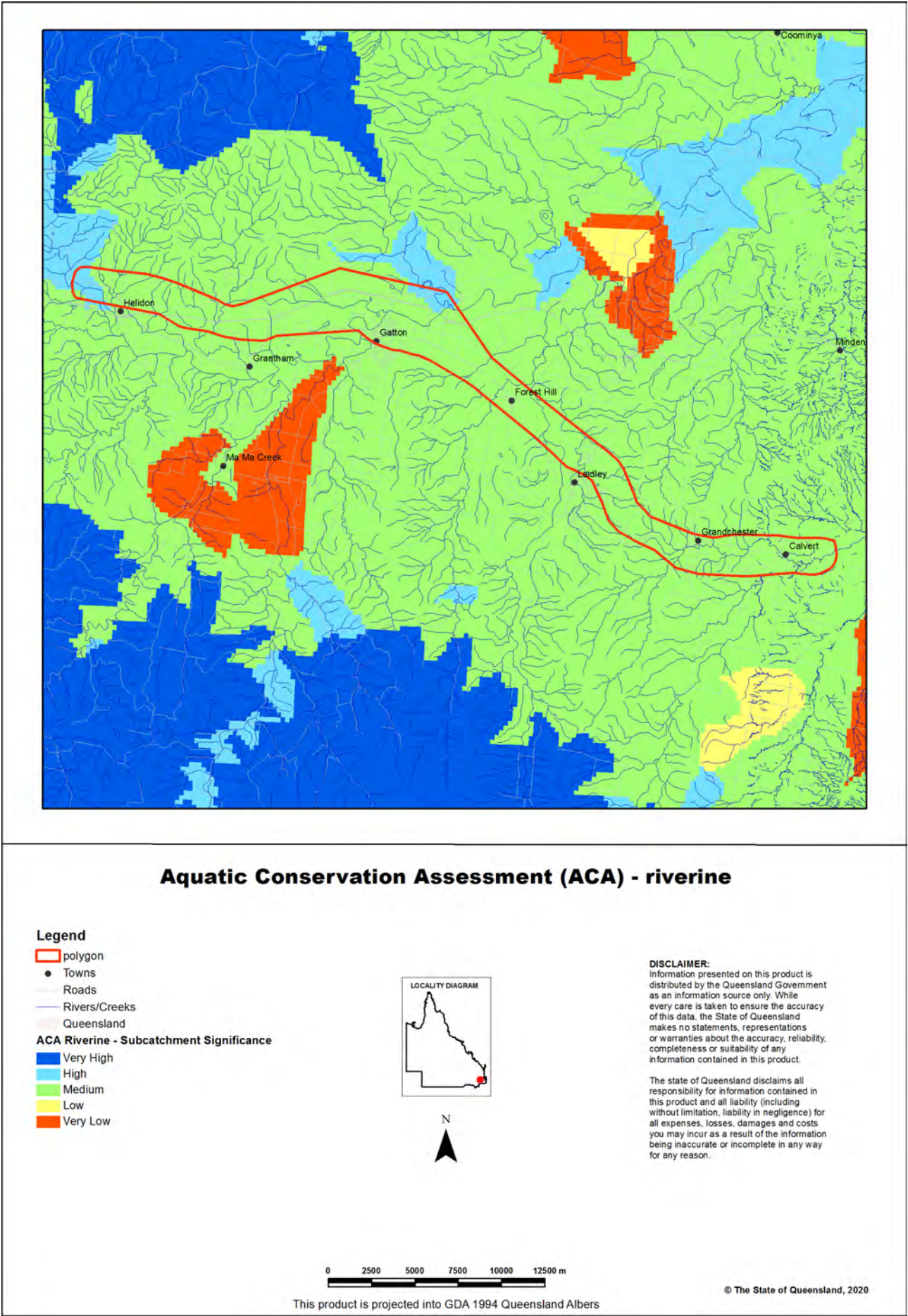
Map 3 - Corridors



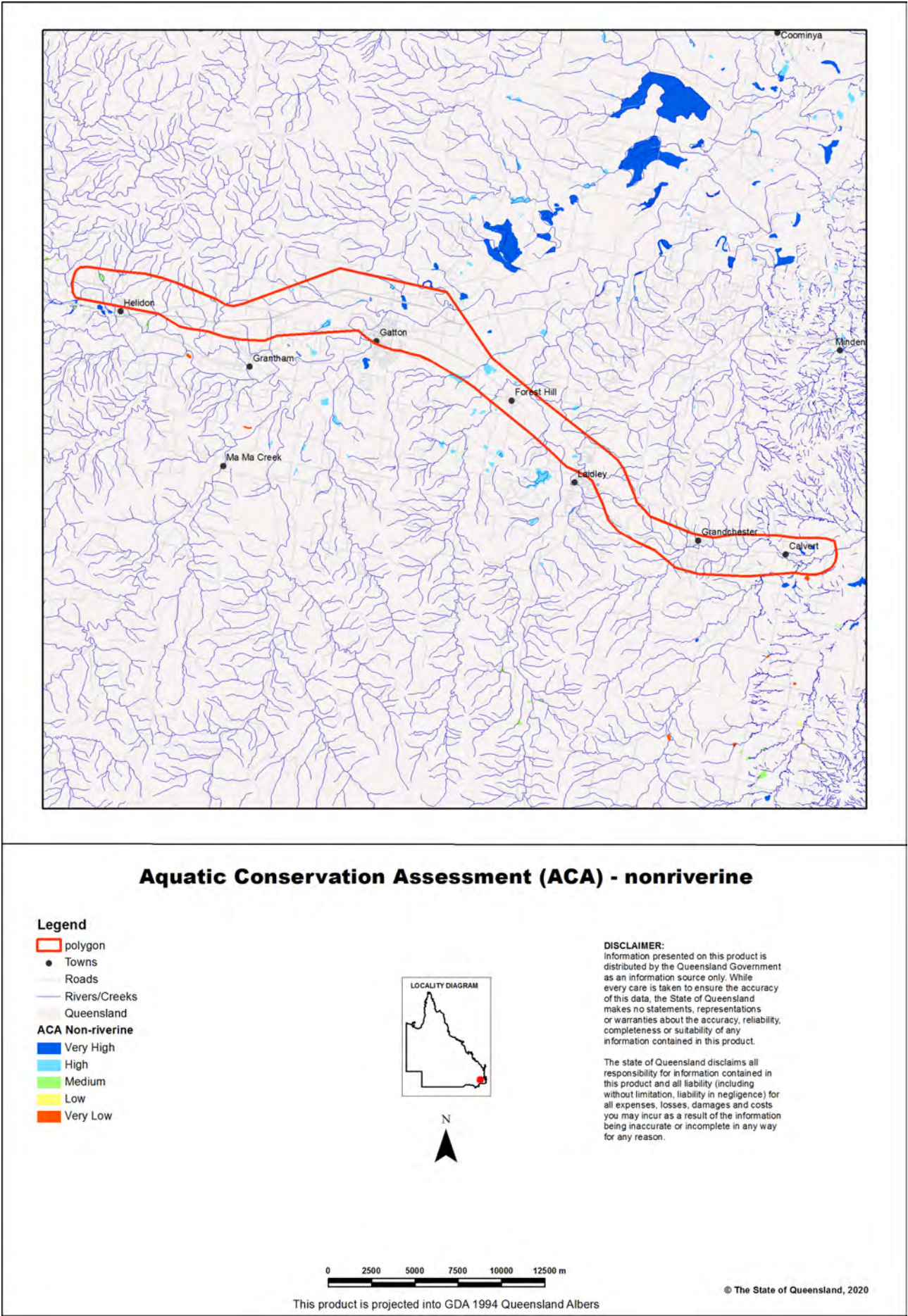
Map 4 - Wetlands and waterways



Map 5 - Aquatic Conservation Assessment (ACA) - riverine



Map 6 - Aquatic Conservation Assessment (ACA) - non-riverine



References

Clayton, P.D., Fielder, D.F., Howell, S. and Hill, C.J. (2006) *Aquatic biodiversity assessment and mapping method (AquaBAMM): a conservation values assessment tool for wetlands with trial application in the Burnett River catchment*. Published by the Environmental Protection Agency, Brisbane. ISBN 1-90928-07-3. Available at

<http://wetlandinfo.des.qld.gov.au/wetlands/assessment/assessment-methods/aca/>

Environmental Protection Agency (2002) *Biodiversity Assessment and Mapping Methodology. Version 2.1, July 2002*. (Environmental Protection Agency, Brisbane).

Morton, S. R., Short, J. and Barker, R. D. with an Appendix by G.F. Griffin and G. Pearce (1995). *Refugia for Biological Diversity in Arid and Semi-arid Australia. Biodiversity Series*, Paper No. 4, Biodiversity Unit, Environment Australia.

Sattler, P.S. and Williams, R.D. (eds) (1999). *The Conservation Status of Queensland's Bioregional Ecosystems*. Environmental Protection Agency, Brisbane.

Appendices

Appendix 1 - Source Data

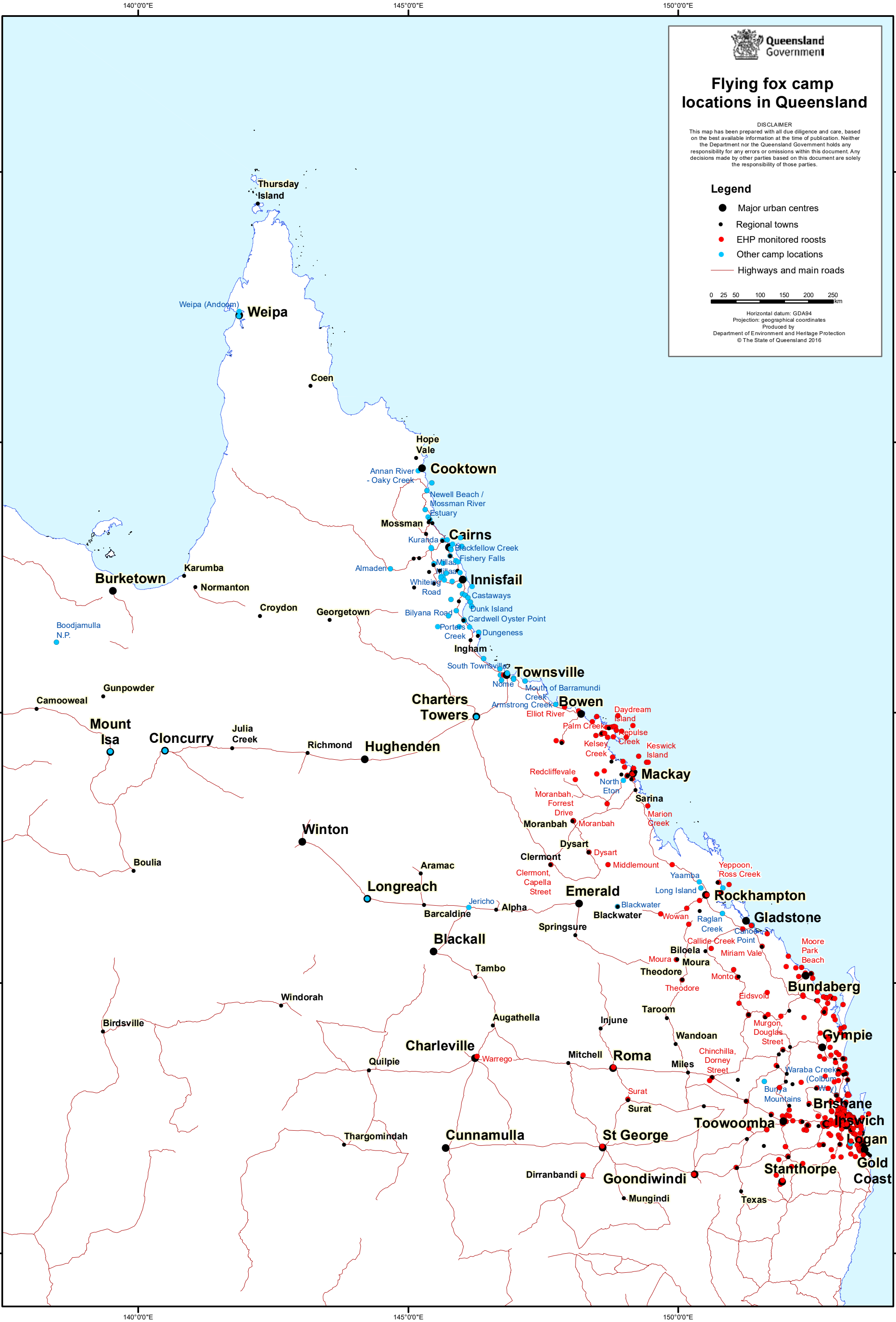
Theme	Datasets
Aquatic Conservation Assessments Non-riverine*	Combination of the following datasets: Cape York Peninsula Non-riverine v1.1 Eastern Gulf of Carpentaria v1.1 Great Barrier Reef Catchment Non-riverine v1.3 Lake Eyre and Bulloo Basins v1.1 QMDB Non-riverine ACA v1.4 Southeast Queensland ACA v1.1 WBB Non-riverine ACA v1.1
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
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 Southeast Queensland v4.1 Wet Tropics v1.1
Statewide BPA Corridors*	Statewide corridors v1.5
Threatened Species	An internal DES database compiled from Wildnet, Herbrecks, Corveg, the QLD Museum, as well as other incidental sources.
BPA Priority Species	An internal DES database compiled from Wildnet, Herbrecks, Corveg, the QLD Museum, as well as other incidental sources.
ACA Priority Species	An internal DES database compiled from Wildnet, Herbrecks, 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	- <i>Environment Protection and Biodiversity Conservation Act 1999</i>
EVNT	- Endangered, Vulnerable, Near Threatened
GDA94	- Geocentric Datum of Australia 1994
GIS	- Geographic Information System
JAMBA	- Japan-Australia Migratory Bird Agreement
NCA	- <i>Nature Conservation Act 1992</i>
RE	- Regional Ecosystem
REDD	- Regional Ecosystem Description Database
ROKAMBA	- Republic of Korea-Australia Migratory Bird Agreement



Queensland
Government

Flying fox camp locations in Queensland

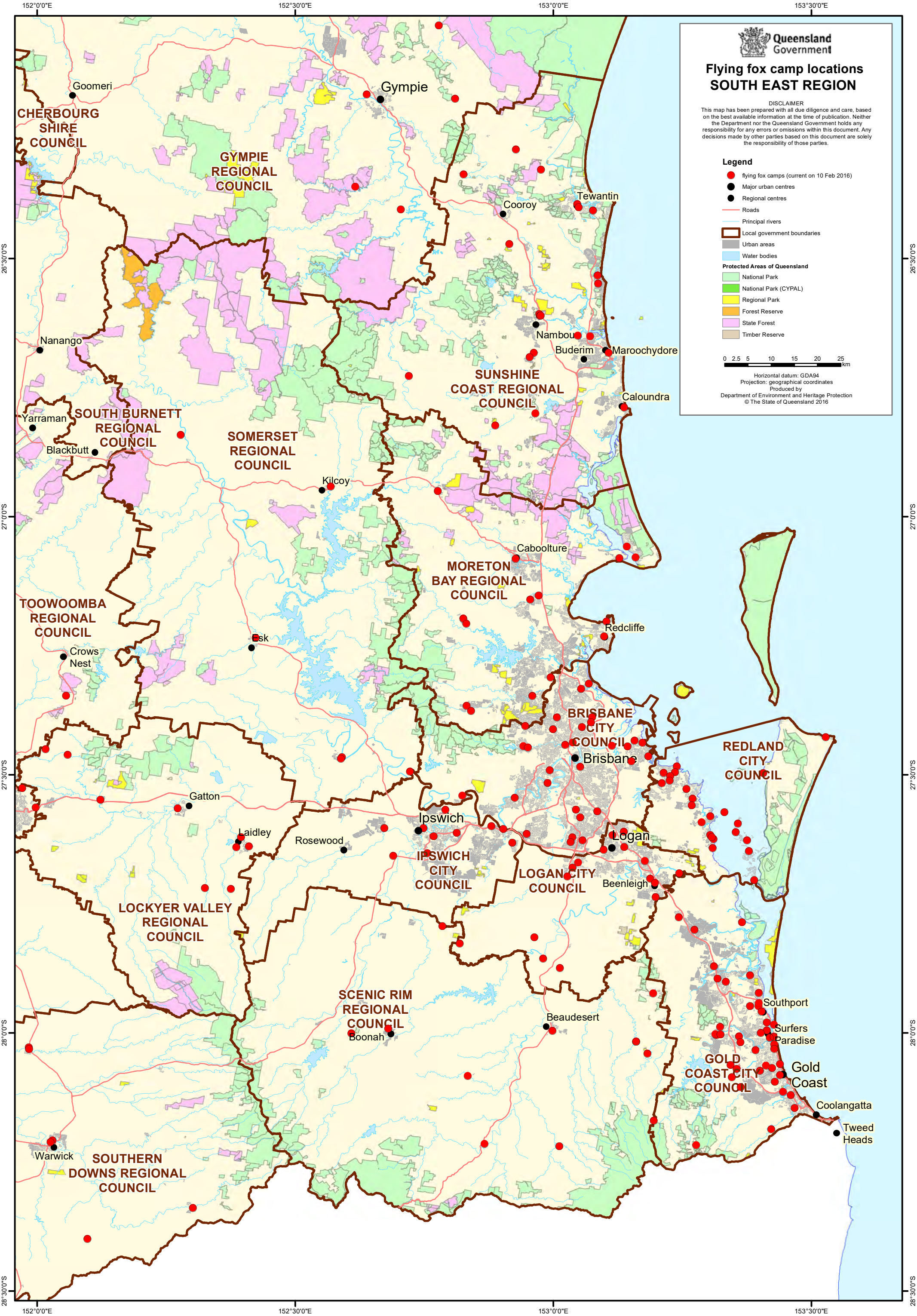
DISCLAIMER
This map has been prepared with all due diligence and care, based on the best available information at the time of publication. Neither the Department nor the Queensland Government holds any responsibility for any errors or omissions within this document. Any decisions made by other parties based on this document are solely the responsibility of those parties.

Legend

- Major urban centres
- Regional towns
- EHP monitored roosts
- Other camp locations
- Highways and main roads

0 25 50 100 150 200 250 km

Horizontal datum: GDA94
Projection: geographical coordinates
Produced by
Department of Environment and Heritage Protection
© The State of Queensland 2016



WetlandMaps Report



For selected area of interest

Current as at 17/03/2020

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 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.

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.

To the maximum extent permitted by applicable law, in no event shall the department be liable for any special, incidental, indirect, or consequential loss whatsoever (including, but not limited to, damages for loss of profits or confidential or other information, for business interruption, for personal injury, for loss of privacy, for failure to meet any duty including of good faith or of reasonable care, for negligence, for any other pecuniary or other loss whatsoever including, without limitation, legal costs on a solicitor own client basis) arising out of, or in any way related to, the use of or inability to use the data.

Summary Information

The following table provides an overview of the area of interest.

Table 1. Area of interest details

Size (ha)	11,827.44
Local Government(s)	Ipswich City, Lockyer Valley Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Moreton Basin
Catchment(s)	Brisbane
Drainage sub-basin	Bremer River, Lockyer Creek

NRM Regions

The following NRM region(s) are in the area of interest:

Healthy Land and Water

Water Resource Plan Boundaries

The following Water Resource Plan(s) are in the area of interest:

Great Artesian Basin and Other Regional Aquifers
Moreton

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:

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/>

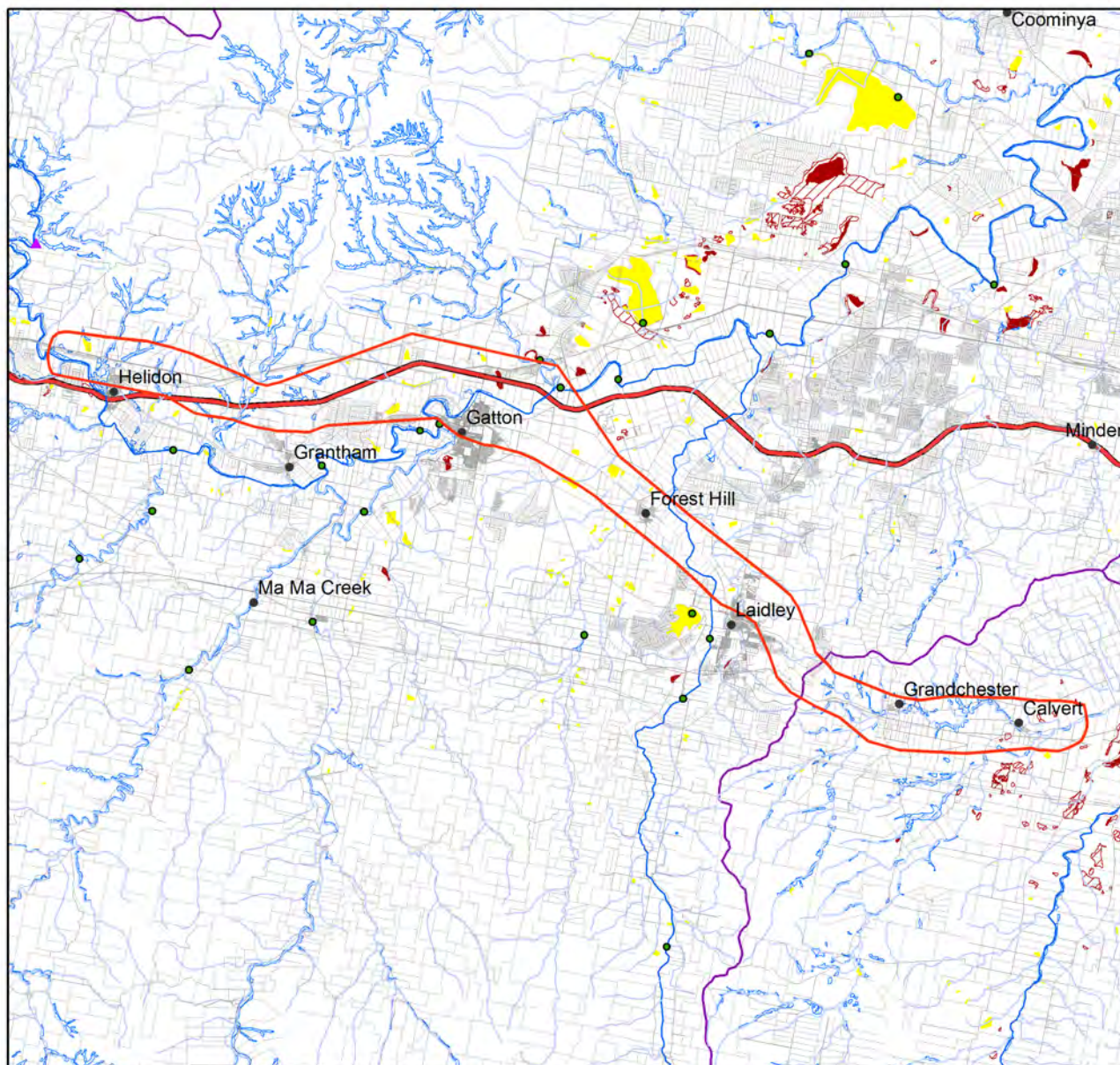
Regional Ecosystem Mapping information: :

<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 Dependant Ecosystems information:

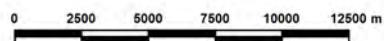
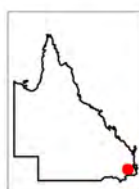
<https://wetlandinfo.des.qld.gov.au/wetlands/ecology/aquatic-ecosystems-natural/groundwater-dependent/>



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

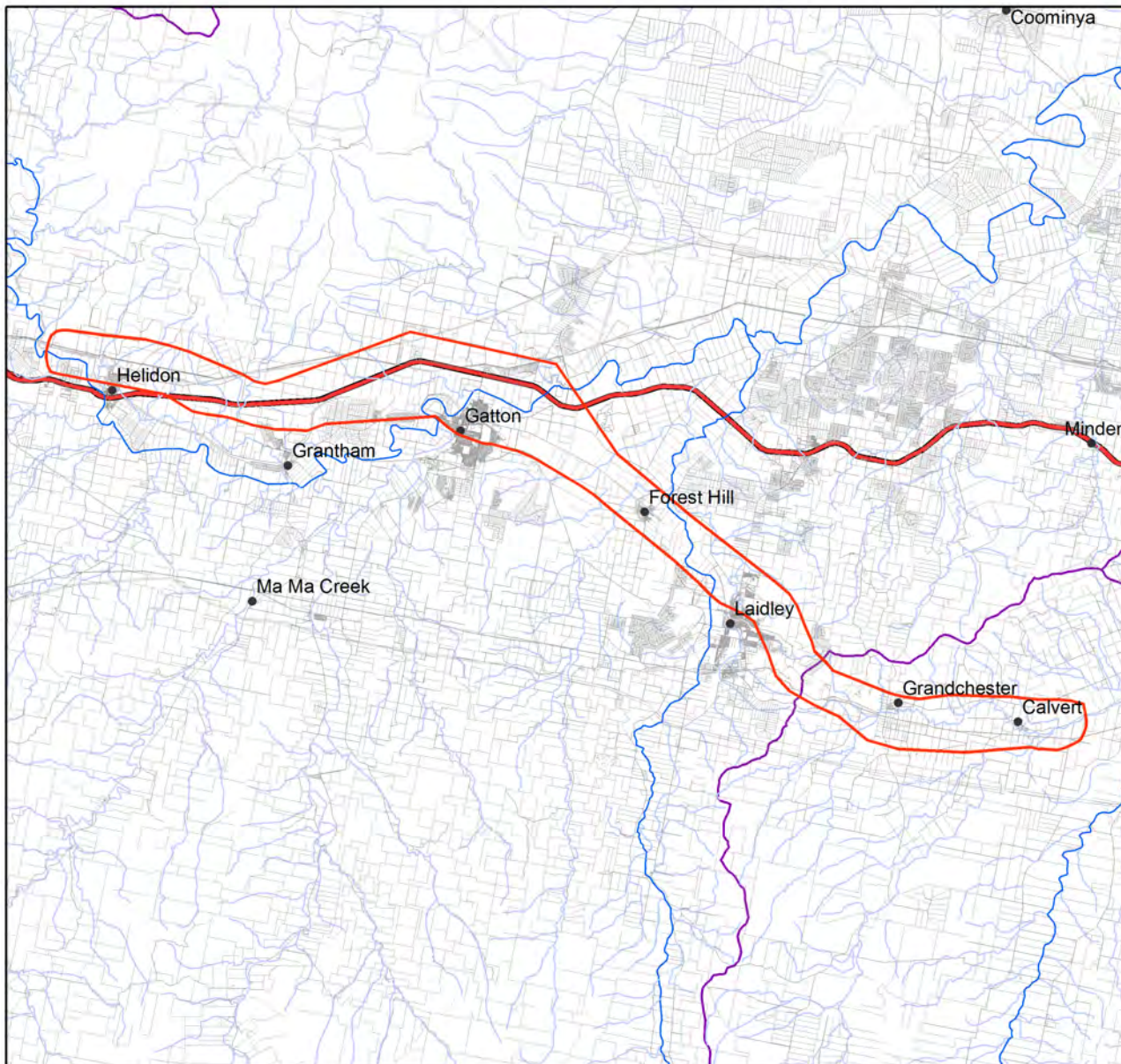


Horizontal Datum: Geographic Datum of Australia 1994 (GDA94)

This map was produced by the Queensland Wetlands Program, Department of Environment and Science, March 2020.

For further information contact: wetlands@des.qld.gov.au

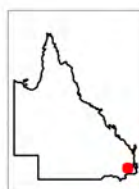
© The State of Queensland, 2020



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

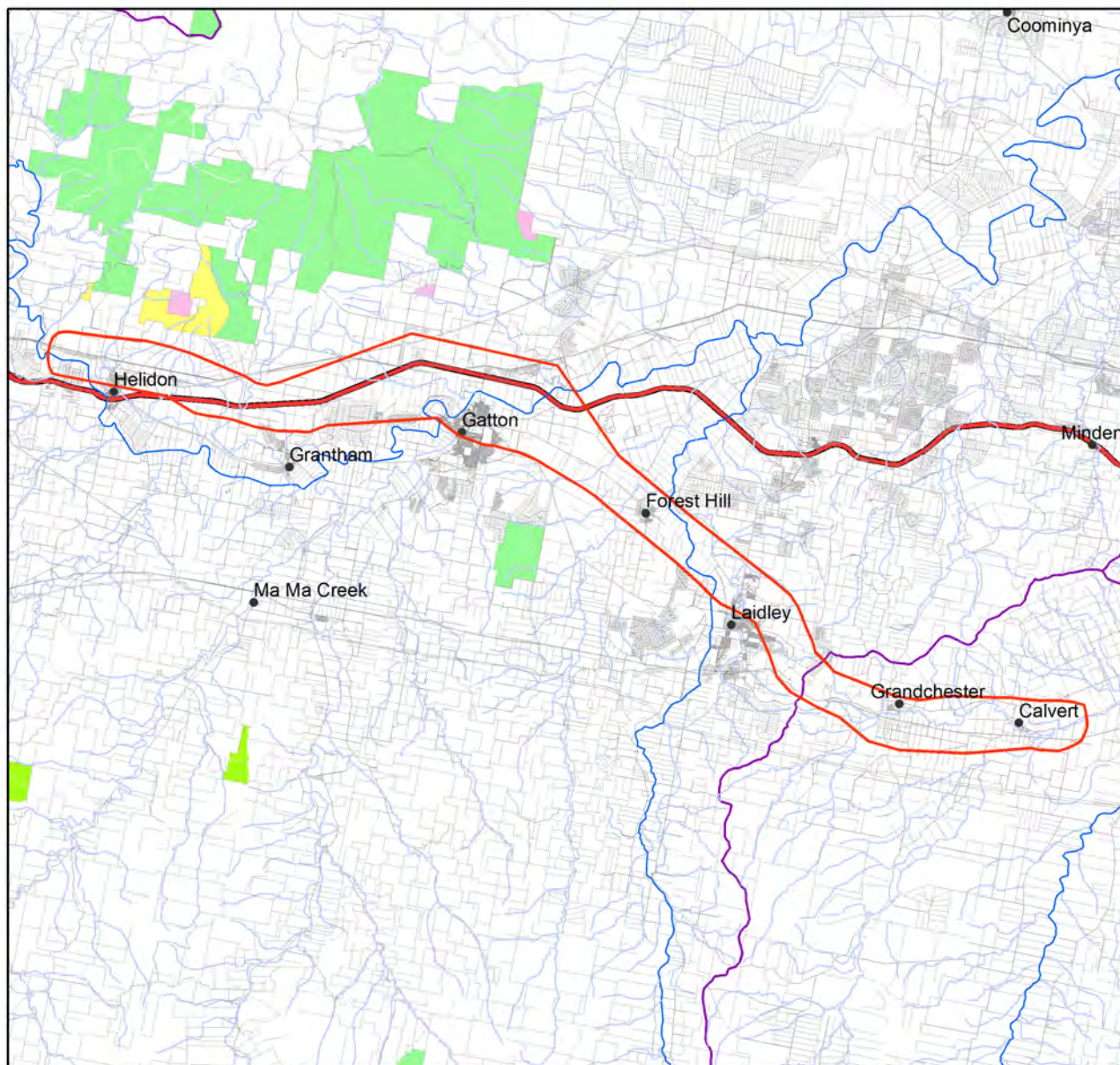


Horizontal Datum: Geographic Datum of Australia 1994 (GDA94)

This map was produced by the Queensland Wetlands Program, Department of Environment and Science, March 2020.

For further information contact: wetlands@des.qld.gov.au

© The State of Queensland, 2020



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 Protected Area Map



Queensland
Wetlands Program



0 2500 5000 7500 10000 12500 m

Horizontal Datum: Geographic Datum of Australia 1994 (GDA94)

This map was produced by the Queensland Wetlands Program,
Department of Environment and Science, March 2020.

For further information contact: wetlands@des.qld.gov.au

© The State of Queensland, 2020

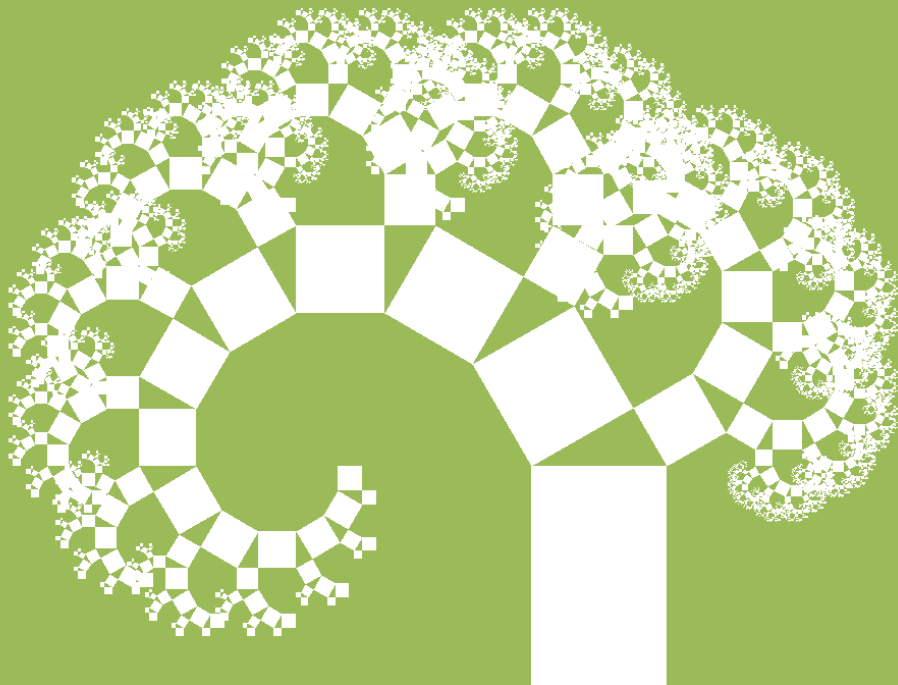
Wetland habitat types in the AOI. Total area: 587.18ha

Wetland Class	Habitat type	Area (ha)
Riverine	Riverine	441.46
Lacustrine	Artificial/ highly modified wetlands (dams, ring tanks, irrigation channel)	116.43
Palustrine	Coastal/ Sub-coastal floodplain grass, sedge and herb swamps	22.7
Palustrine	Coastal/ Sub-coastal floodplain tree swamps (Melaleuca and Eucalypt)	6.59

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
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

Wetland name	Conceptual model	Wetland profile
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



Modelled potential habitat

For the selected area of interest 11827.44ha

Current as at 17/03/2020

Introduction

Species lists in this report are derived from Maxent pre-clear potential habitat models and buffered point coverages produced by the Queensland Herbarium for NCA listed 'endangered' or 'vulnerable' species, EPBC listed 'critically endangered', 'endangered' or 'vulnerable' species and other priority species.

The models utilise records of fauna species occurrence compiled for the purpose of Biodiversity Assessment by the Queensland Department of Environment and Resource Management (EPA 2002) and specimen backed flora records compiled from the Queensland Herbarium's HerbreCs database. All records have a location precision of better than 2000 m, and all fauna records are less than 50 years old. Models were constrained within an occurrence mask for each species, defined by a buffer of 200 km around a convex hull that encompasses all records. All models were based on seven environmental layers, annual mean temperature, temperature seasonality (coefficient of variation), annual precipitation, mean moisture index of the lowest quarter moisture index, pre-clearing broad vegetation group (1:1M), land zone and taxonomic ruggedness. Climate layers were modelled using Anuclim software on an 83 m digital elevation model. A mask of Queensland's road network was used to down-weight species records collected along roads. Model performance was assessed by comparing the area under the ROC curve (AUC) with the 95th percentile AUC from 1000 null models for each species created by randomly selecting locations from within the minimum convex hull of species presence records. For species with very restricted ranges, model performance was further tested using randomly selected locations from within the species mask. Thresholds were applied (either equal training sensitivity and specificity logistic threshold or 10th percentile training presence logistic threshold, whichever was highest) in order to convert model output to a prediction of potential habitat. Any presence records excluded by the threshold applied were incorporated into the output with a 1km buffer. The output was clipped to the species mask and simplified using a majority filter algorithm to remove outlying orphan cells in the model output. The resulting shapefile defines the modelled pre-clear potential habitat for selected threatened and priority species.

If a species is not listed in the report, it does not indicate that its habitat is absent from the queried location and conversely, species listed may not currently inhabit the area.

Threatened fauna species

Threatened fauna species modelled to have pre-clear potential habitat within the area of interest , with an area of 11827.44ha hectares

Threatened Species animals

Class	Scientific name	Common name	NCA Status	EPBC Status	Area (ha)
birds	<i>Ninox strenua</i>	powerful owl	V	None	7099.02
birds	<i>Grantiella picta</i>	painted honeyeater	V	V	8379.48
birds	<i>Lathamus discolor</i>	swift parrot	E	CE	11750.51
birds	<i>Calyptorhynchus lathamii</i>	glossy black-cockatoo	V	None	2491.74
birds	<i>Erythrotriorchis radiatus</i>	red goshawk	E	V	11827.67
birds	<i>Geophaps scripta scripta</i>	squatter pigeon (southern subspecies)	V	V	10979.9
birds	<i>Botaurus poiciloptilus</i>	Australasian bittern	C	E	10114.37
birds	<i>Turnix melanogaster</i>	black-breasted button-quail	V	V	665.19
birds	<i>Rostratula australis</i>	Australian painted snipe	V	E	11827.67
mammals	<i>Petrogale penicillata</i>	brush-tailed rock-wallaby	V	V	972.96
mammals	<i>Dasyurus maculatus maculatus</i>	spotted-tailed quoll (southern subspecies)	V	E	5387.78
mammals	<i>Pseudomys novaehollandiae</i>	New Holland mouse	V	V	114.86
mammals	<i>Phascolarctos cinereus</i>	koala	V	V	7760.49
mammals	<i>Nyctophilus corbeni</i>	eastern long-eared bat	V	V	39.48
mammals	<i>Pteropus poliocephalus</i>	grey-headed flying-fox	C	V	2972.96
reptiles	<i>Hemiaspis damelii</i>	grey snake	E	None	9420.56
reptiles	<i>Egernia rugosa</i>	yakka skink	V	V	160.13
reptiles	<i>Delma torquata</i>	collared delma	V	V	10757.59

Threatened flora species

Threatened flora species modelled to have pre-clear potential habitat within the selected area

Threatened Species plants

Class	Scientific name	Common name	NCA Status	EPBC Status	Area (ha)
higher dicots	<i>Grevillea quadricauda</i>	None	V	V	114.86
higher dicots	<i>Notelaea lloydii</i>	Lloyd's native olive	V	V	276.76
higher dicots	<i>Eucalyptus virens</i>	shiny-leaved ironbark	V	V	655.51

Class	Scientific name	Common name	NCA Status	EPBC Status	Area (ha)
higher dicots	<i>Bertya opponens</i>	None	C	V	5923.42
higher dicots	<i>Rhaponticum australe</i>	None	V	V	508.4
higher dicots	<i>Cadellia pentastylis</i>	ooline	V	V	25.82
higher dicots	<i>Picris barbarorum</i>	None	V	None	0.76
higher dicots	<i>Melaleuca irbyana</i>	None	E	None	4852.19
higher dicots	<i>Leionema obtusifolium</i>	None	V	V	118.24
higher dicots	<i>Marsdenia coronata</i>	slender milkvine	V	None	33.79
higher dicots	<i>Lepidium peregrinum</i>	None	C	E	< 0.01
higher dicots	<i>Sophora fraseri</i>	brush sophora	V	V	70.97
higher dicots	<i>Pomaderris coomingalensis</i>	None	E	None	4550.98
higher dicots	<i>Cossinia australiana</i>	None	E	E	260.46
higher dicots	<i>Corynocarpus rupestris subsp. arborescens</i>	southern corynocarpus	V	None	77.03
higher dicots	<i>Rutidosis lanata</i>	None	NT	None	1272.1
higher dicots	<i>Polianthion minutiflorum</i>	None	V	V	197.14
higher dicots	<i>Eucalyptus taurina</i>	Helidon ironbark	V	None	114.86
higher dicots	<i>Thesium australe</i>	toadflax	V	V	5584.3
monocots	<i>Dichanthium setosum</i>	None	C	V	4985.99
monocots	<i>Caustis blakei subsp. macrantha</i>	None	V	None	114.86
monocots	<i>Paspalidium grandispiculatum</i>	None	V	V	131.57
monocots	<i>Arthraxon hispidus</i>	None	V	V	10807.12
monocots	<i>Cyperus clarus</i>	None	V	None	5746.61

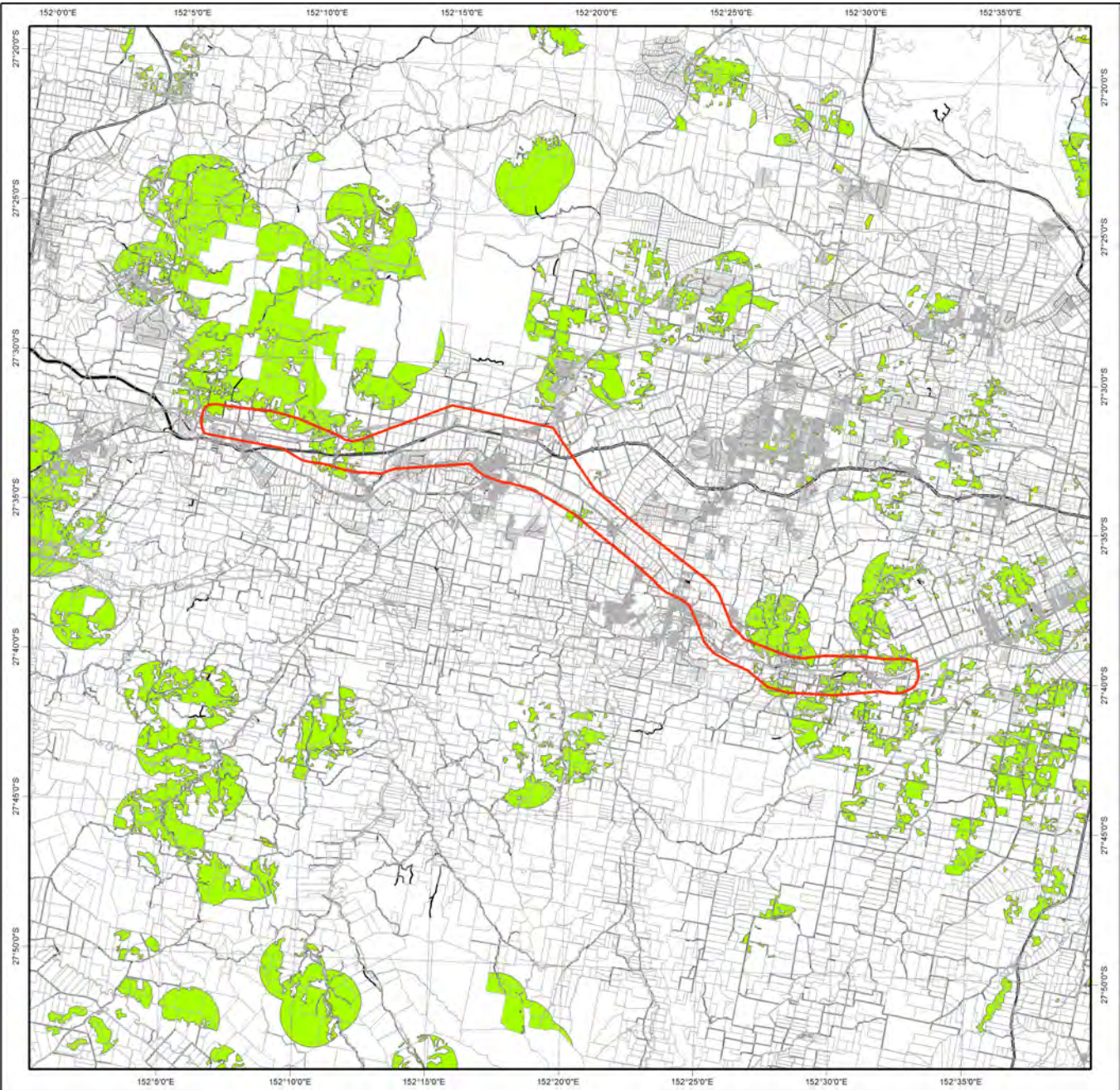
Links and support

[Modelled potential habitat for selected threatened and priority species in Queensland](#) - access the geodatabase of modelled potential habitat for Queensland's threatened species.

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.

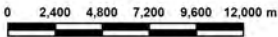
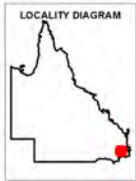




Protected Plants Flora Survey Trigger Map

Legend

- polygon
- High risk area
- Cadastral line
Property boundaries shown are provided as a locational aid only
- Freeways / motorways / highways
- Secondary roads / streets



This product is projected into:
GDA 1994 Queensland Albers

This map shows areas where particular provisions of the Nature Conservation Act 1992 apply to the clearing of protected plants.

This map is produced at a scale relevant to the size of the area selected and should be printed as A4 size in portrait orientation.

For further information or assistance with interpretation of this product, please contact the Department of Environment and Science at palm@ehp.qld.gov.au

Disclaimer:
While every care is taken to ensure the accuracy of the data used to generate this product, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaim all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damages) and costs which might be incurred as a consequence of reliance on the data, or as a result of the data being inaccurate or incomplete in any way and for any reason.

Protected plants flora survey trigger map

The protected plants flora survey trigger map identifies 'high risk areas' where endangered, vulnerable or near threatened plants are known to exist or are likely to exist. Under the *Nature Conservation Act 1992* (the Act) it is an offence to clear protected plants that are 'in the wild' unless you are authorised or the clearing is exempt, for more information see [section 89](#) of the Act.

Please see the Department of Environment and Science webpage on the [clearing of protected plants](#) for information on what exemptions may apply in your circumstances, whether you may need to undertake a flora survey, and whether you may need a protected plants clearing permit.

Updates to the data informing the flora survey trigger map

The flora survey trigger map will be reviewed, and updated if necessary, at least every 12 months to ensure the map reflects the most up-to-date and accurate data available.

Species information

Please note that flora survey trigger maps do not identify species associated with 'high risk areas'. While some species information may be publicly available, for example via the [Queensland Spatial Catalogue](#), the Department of Environment and Science does not provide species information on request. Regardless of whether species information is available for a particular high risk area, clearing plants in a high risk area may require a flora survey and/or clearing permit. Please see the Department of Environment and Science webpage on the [clearing of protected plants](#) for more information.



Queensland Government

Department of Environment and Science

Environmental Reports

Regional Ecosystems

Biodiversity Status

For the selected area of interest

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 input coordinates.

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 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 Queensland Herbarium's Regional Ecosystem framework. The Biodiversity Status has been used to depict the extent of "Endangered", "Of Concern" and "No Concern at Present" regional ecosystems in all cases, rather than the classes used for the purposes of the *Vegetation Management Act 1999* (VMA). Mapping and figures presented in this document reflect the Queensland Herbarium's Remnant and Pre-clearing Regional Ecosystem Datasets, and not the certified mapping used for the purpose of the VMA.

For matters relevant to vegetation management under the VMA, please refer to the Department of Natural Resources, Mines and Energy website

<https://www.dnrme.qld.gov.au/>

Please direct queries about these reports to: Queensland.Herbarium@dsiti.qld.gov.au

Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government 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.



Table of Contents

Summary Information 4

Regional Ecosystems 5

 1. Introduction 5

 2. Remnant Regional Ecosystems 6

 3. Remnant Regional Ecosystems by Broad Vegetation Group 8

 4. Technical and BioCondition Benchmark Descriptions 10

Maps 12

 Map 1 - Location 12

 Map 2 - Remnant 2017 regional ecosystems 13

 Map 3 - Pre-clearing regional ecosystems 14

 Map 4 - Remnant 2017 regional ecosystems by BVG (5M) 15

 Map 5 - Pre-clearing regional ecosystems by BVG (5M) 16

 Map 6 - Wetlands and waterways 17

Links and Other Information Sources 18

References 18

Appendices 19

 Appendix 1 - Source Data 19

 Appendix 2 - Acronyms and Abbreviations 20

Summary Information

The following table provides an overview of the AOI with respect to selected topographic and environmental themes. Refer to **Map 1** for locality information.

Table 1: Area of interest details:

Size (ha)	11,827.44
Local Government(s)	Ipswich City, Lockyer Valley Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Moreton Basin
Catchment(s)	Brisbane

The table below summarizes the extent of remnant vegetation classed as "Endangered", "Of concern" and "No concern at present" regional ecosystems classified by Biodiversity Status within the area of interest (AOI).

Table 2: Summary table, biodiversity status of regional ecosystems within the AOI

Biodiversity Status	Area (Ha)	% of AOI
Endangered	104.39	0.88
Of concern	256.64	2.17
No concern at present	1,325.09	11.2
Total remnant vegetation	1,686.12	14.26

Refer to **Map 2** for further information.

Regional Ecosystems

1. Introduction

Regional ecosystems are vegetation communities in a bioregion that are consistently associated with particular combinations of geology, landform and soil (Sattler and Williams 1999). Descriptions of Queensland's Regional ecosystems are available online from the Regional Ecosystem Description Database (REDD). Descriptions are compiled from a broad range of information sources including vegetation, land system and geology survey and mapping and detailed vegetation site data. The regional ecosystem classification and descriptions are reviewed as new information becomes available. A number of vegetation communities may form a single regional ecosystem and are usually distinguished by differences in dominant species, frequently in the shrub or ground layers and are denoted by a letter following the regional ecosystem code (e.g. a, b, c). Vegetation communities and regional ecosystems are amalgamated into a higher level classification of broad vegetation groups (BVGs).

A published methodology for survey and mapping of regional ecosystems across Queensland (Neldner et al 2017) provides further details on regional ecosystem concepts and terminology.

This report provides information on the type, status, and extent of vegetation communities, regional ecosystems and broad vegetation groups present within a user specified area of interest. Please note, for the purpose of this report, the Biodiversity Status is used. This report has not been developed for application of the *Vegetation Management Act 1999* (VMA). Additionally, information generated in this report has been derived from the Queensland Herbarium's Regional Ecosystem Mapping, and not the regulated mapping certified for the purposes of the VMA. If your interest/matter relates to regional ecosystems and the VMA, users should refer to the Department of Natural Resources, Mines and Energy website.

<https://www.dnrme.qld.gov.au/>

With respect to the Queensland Biodiversity Status,

"Endangered" regional ecosystems are described as those where:

- remnant vegetation is less than 10 per cent of its pre-clearing extent across the bioregion; or 10-30% of its pre-clearing extent remains and the remnant vegetation is less than 10,000 hectares, or
- less than 10 per cent of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss*, or
- 10-30 per cent of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss and the remnant vegetation is less than 10,000 hectares; or
- it is a rare** regional ecosystem subject to a threatening process.***

"Of concern" regional ecosystems are described as those where:

- the degradation criteria listed above for 'Endangered' regional ecosystems are not met and,
- remnant vegetation is 10-30 per cent of its pre-clearing extent across the bioregion; or more than 20 per cent of its pre-clearing extent remains and the remnant extent is less than 10,000 hectares, or
- 10-30 percent of its pre-clearing extent remains unaffected by moderate degradation and/or biodiversity loss.****

and "No concern at present" regional ecosystems are described as those where:

- remnant vegetation is over 30 per cent of its pre-clearing extent across the bioregion, and the remnant area is greater than 10,000 hectares, and
- the degradation criteria listed above for 'Endangered' or 'Of concern' regional ecosystems are not met.

**Severe degradation and/or biodiversity loss is defined as: floristic and/or faunal diversity is greatly reduced but unlikely to recover within the next 50 years even with the removal of threatening processes; or soil surface is severely degraded, for example, by loss of A horizon, surface expression of salinity; surface compaction, loss of organic matter or sheet erosion.*

***Rare regional ecosystem: pre-clearing extent (1000 ha); or patch size (100 ha and of limited total extent across its range).*

****Threatening processes are those that are reducing or will reduce the biodiversity and ecological integrity of a regional ecosystem. For example, clearing, weed invasion, fragmentation, inappropriate fire regime or grazing pressure, or infrastructure development.*

****Moderate degradation and/or biodiversity loss is defined as: floristic and/or faunal diversity is greatly reduced but unlikely to recover within the next 20 years even with the removal of threatening processes; or soil surface is moderately degraded.

2. Remnant Regional Ecosystems

The following table identifies the remnant regional ecosystems and vegetation communities mapped within the AOI and provides their short descriptions, Biodiversity Status, and remnant extent within the selected AOI. Please note, where heterogeneous vegetated patches (mixed patches of remnant vegetation mapped as containing multiple regional ecosystems) occur within the AOI, they have been split and listed as individual regional ecosystems (or vegetation communities where present) for the purposes of the table below. In such instances, associated area figures have been generated based upon the estimated proportion of each regional ecosystem (or vegetation community) predicted to be present within the larger mixed patch.

Table 3: Remnant regional ecosystems, description and status within the AOI

Regional Ecosystem	Short Description	BD Status	Area (Ha)	% of AOI
12.3.18	Melaleuca irbyana low open forest on alluvial plains	Endangered	4.6	0.04
12.3.19	Eucalyptus moluccana and/or Eucalyptus tereticornis and E. crebra open forest to woodland, with a sparse to mid-dense understorey of Melaleuca irbyana on alluvial plains	Endangered	7.8	0.07
12.3.2	Eucalyptus grandis tall open forest on alluvial plains	Of concern	less than 0.01	less than 0.01
12.3.3	Eucalyptus tereticornis woodland on Quaternary alluvium	Endangered	85.12	0.72
12.3.3d	Eucalyptus tereticornis woodland on Quaternary alluvium	Endangered	2.08	0.02
12.3.7	Eucalyptus tereticornis, Casuarina cunninghamiana subsp. cunninghamiana +/- Melaleuca spp. fringing woodland	Of concern	135.45	1.15
12.3.8	Swamps with Cyperus spp., Schoenoplectus spp. and Eleocharis spp.	Of concern	8.0	0.07
12.9-10.19	Eucalyptus fibrosa subsp. fibrosa woodland on sedimentary rocks	No concern at present	20.43	0.17
12.9-10.2	Corymbia citriodora subsp. variegata +/- Eucalyptus crebra open forest on sedimentary rocks	No concern at present	1,130.14	9.56
12.9-10.27	Corymbia citriodora subsp. variegata and/or E. moluccana, E. tereticornis, E. crebra open forest with Melaleuca irbyana understorey on sedimentary rocks	Endangered	4.79	0.04
12.9-10.3	Eucalyptus moluccana open forest on sedimentary rocks	Of concern	9.28	0.08
12.9-10.5	Woodland complex often with Corymbia trachyphloia subsp. trachyphloia, C. citriodora subsp. variegata, Eucalyptus crebra, E. fibrosa subsp. fibrosa on quartzose sandstone	No concern at present	9.75	0.08
12.9-10.5a	Woodland complex often with Corymbia trachyphloia subsp. trachyphloia, C. citriodora subsp. variegata, Eucalyptus crebra, E. fibrosa subsp. fibrosa on quartzose sandstone	No concern at present	164.77	1.39
12.9-10.7	Eucalyptus crebra +/- E. tereticornis, Corymbia tessellaris, Angophora spp., E. melanophloia woodland on sedimentary rocks	Of concern	103.91	0.88
non-rem	None	None	10,141.53	85.75

Refer to **Map 2** for further information. **Map 3** also provides a visual estimate of the distribution of regional ecosystems present before clearing.

Table 4 provides further information in regards to the remnant regional ecosystems present within the AOI. Specifically, the extent of remnant vegetation remaining within the bioregion, the 1:1,000,000 broad vegetation group (BVG) classification, whether the regional ecosystem is identified as a wetland, and extent of representation in Queensland's Protected Area Estate. For a description of the vegetation communities within the AOI and classified according to the 1:1,000,000 BVG, refer to **Table 6**.

Table 4: Remnant regional ecosystems within the AOI, additional information

Regional Ecosystem	Remnant Extent	BVG (1 Million)	Wetland	Representation in protected estate
12.3.18	Pre-clearing 2000 ha; Remnant 2017 100 ha	21b	Palustrine wetland (e.g. vegetated swamp).	No representation
12.3.19	Pre-clearing 3000 ha; Remnant 2017 300 ha	13d	Floodplain (other than floodplain wetlands).	No representation
12.3.2	Pre-clearing 22000 ha; Remnant 2017 7000 ha	8a	Riverine wetland or fringing riverine wetland.	Medium
12.3.3	Pre-clearing 438000 ha; Remnant 2017 40000 ha	16c	Floodplain (other than floodplain wetlands).	Low
12.3.3d	Pre-clearing 438000 ha; Remnant 2017 40000 ha	13d	Floodplain (other than floodplain wetlands).	Low
12.3.7	Pre-clearing 118000 ha; Remnant 2017 60000 ha	16a	Riverine wetland or fringing riverine wetland.	Low
12.3.8	Pre-clearing 7000 ha; Remnant 2017 4000 ha	34c	Palustrine wetland (e.g. vegetated swamp).	Low
12.9-10.19	Pre-clearing 59000 ha; Remnant 2017 41000 ha	12a	None	Medium
12.9-10.2	Pre-clearing 222000 ha; Remnant 2017 87000 ha	10b	None	Low
12.9-10.27	Pre-clearing 5000 ha; Remnant 2017 400 ha	10b	None	No representation
12.9-10.3	Pre-clearing 95000 ha; Remnant 2017 27000 ha	13d	None	Low
12.9-10.5	Pre-clearing 28000 ha; Remnant 2017 20000 ha	9h	None	High
12.9-10.5a	Pre-clearing 28000 ha; Remnant 2017 20000 ha	9h	None	High
12.9-10.7	Pre-clearing 248000 ha; Remnant 2017 41000 ha	13c	None	Low
non-rem	None	None	None	None

Representation in Protected Area Estate: High greater than 10% of pre-clearing extent is represented; Medium 4 - 10% is represented; Low less than 4% is represented, No representation.

The distribution of mapped wetland systems within the area of interest is displayed in **Map 6**.

The following table lists known special values associated with a regional ecosystem type.

Table 5: Remnant regional ecosystems within the AOI, special values

Regional Ecosystem	Special Values
12.3.18	Habitat for listed plant species <i>Melaleuca irbyana</i> and <i>Marsdenia coronata</i> .
12.3.19	Habitat for listed plant species <i>Melaleuca irbyana</i> .
12.3.2	Habitat for threatened plant species including <i>Marsdenia longiloba</i> and near threatened species including <i>Diteilis simmondsii</i> .
12.3.3	Habitat for threatened plant species including <i>Rhaponticum australe</i> . 12.3.3a: Habitat for threatened plant species including occasional <i>Rhaponticum australe</i> . 12.3.3b: Habitat for threatened flora species including <i>Melaleuca irbyana</i> . 12.3.3c: Habitat for threatened flora species including <i>Melaleuca irbyana</i> and <i>Marsdenia coronata</i> . 12.3.3d: Habitat for threatened plant species including <i>Rhaponticum australe</i> .
12.3.3d	Habitat for threatened plant species including <i>Rhaponticum australe</i> . 12.3.3a: Habitat for threatened plant species including occasional <i>Rhaponticum australe</i> . 12.3.3b: Habitat for threatened flora species including <i>Melaleuca irbyana</i> . 12.3.3c: Habitat for threatened flora species including <i>Melaleuca irbyana</i> and <i>Marsdenia coronata</i> . 12.3.3d: Habitat for threatened plant species including <i>Rhaponticum australe</i> .
12.3.7	Habitat for an extensive range of aquatic flora and fauna.
12.3.8	Provides wetland habitat for a plant and fauna. 12.3.8a: Provides wetland habitat for a plant and fauna.
12.9-10.19	Habitat for threatened plant species including <i>Macrozamia parcifolia</i> ,
12.9-10.2	Habitat for threatened plant species including <i>Notelaea lloydii</i> , <i>Grevillea quadricauda</i> , <i>Westringia sericea</i> , <i>Plectranthus habrophyllus</i>
12.9-10.27	Habitat for listed plant species <i>Melaleuca irbyana</i> .
12.9-10.3	Potential habitat for NCA listed species: <i>Callitris baileyi</i> , <i>Haloragis exalata</i> subsp. <i>velutina</i> , <i>Picris conyzoides</i> , <i>Sophora fraseri</i>
12.9-10.5	Habitat for threatened plant species including <i>Leucopogon recurvisepalus</i> , <i>Paspalidium grandispiculatum</i> , <i>Leionema obtusifolium</i> and near threatened species including <i>Eucalyptus curtisii</i> . 12.9-10.5a: Habitat for threatened plant species including <i>Eucalyptus taurina</i> , <i>Caustis blakei</i> subsp. <i>macrantha</i> , <i>Paspalidium grandispiculatum</i> , <i>Leionema obtusifolium</i> and <i>Grevillea quadricauda</i> . 12.9-10.5b: Habitat for threatened flora species including <i>Paspalidium grandispiculatum</i> . 12.9-10.5d: Habitat for threatened plant species including <i>Sophora fraseri</i> .
12.9-10.5a	Habitat for threatened plant species including <i>Leucopogon recurvisepalus</i> , <i>Paspalidium grandispiculatum</i> , <i>Leionema obtusifolium</i> and near threatened species including <i>Eucalyptus curtisii</i> . 12.9-10.5a: Habitat for threatened plant species including <i>Eucalyptus taurina</i> , <i>Caustis blakei</i> subsp. <i>macrantha</i> , <i>Paspalidium grandispiculatum</i> , <i>Leionema obtusifolium</i> and <i>Grevillea quadricauda</i> . 12.9-10.5b: Habitat for threatened flora species including <i>Paspalidium grandispiculatum</i> . 12.9-10.5d: Habitat for threatened plant species including <i>Sophora fraseri</i> .
12.9-10.7	Potential habitat for NCA listed species: <i>Callitris baileyi</i> , <i>Graptophyllum reticulatum</i> , <i>Melaleuca formosa</i> , <i>Melaleuca irbyana</i> , <i>Paspalidium grandispiculatum</i> , <i>Plectranthus habrophyllus</i> , <i>Polianthion minutiflorum</i> , <i>Zieria inexpectata</i>
non-rem	None

3. Remnant Regional Ecosystems by Broad Vegetation Group

BVGs are a higher-level grouping of vegetation communities. Queensland encompasses a wide variety of landscapes across temperate, wet and dry tropics and semi-arid climatic zones. BVGs provide an overview of vegetation communities across the state or a bioregion and allow comparison with other states. There are three levels of BVGs which reflect the approximate scale at which they are designed to be used: the 1:5,000,000 (national), 1:2,000,000 (state) and 1:1,000,000 (regional) scales.

A comprehensive description of BVGs is available at:

<https://publications.qld.gov.au/dataset/redd/resource/>

The following table provides a description of the 1:1,000,000 BVGs present and their associated extent within the AOI.

Table 6: Broad vegetation groups (1 million) within the AOI

BVG (1 Million)	Description	Area (Ha)	% of AOI
None	None	10,141.53	85.75
10b	Moist open forests to woodlands dominated by <i>Corymbia citriodora</i> (spotted gum). (land zones 12, 11, 9, 5, 8) (SEQ, CQC, EIU, WET)	1,134.94	9.6
12a	Dry woodlands to open woodlands dominated by ironbarks such as <i>Eucalyptus decorticans</i> (gum-topped ironbark), <i>E. fibrosa</i> subsp. <i>nubila</i> (blue-leaved ironbark), or <i>E. crebra</i> (narrow-leaved red ironbark) and/or bloodwoods such as <i>Corymbia trachyphloia</i> (yellow bloodwood), <i>C. leichhardtii</i> (rustyjacket), <i>C. watsoniana</i> (Watson's yellow bloodwood), <i>C. lamprophylla</i> , <i>C. peltata</i> (yellowjacket). Occasionally <i>E. thozetiana</i> (mountain yapunyah), <i>E. cloeziana</i> (Gympie messmate) or <i>E. mediocris</i> are dominant. Mostly on sub-coastal/inland hills with shallow soils. (land zones 10, 7, 9) (BRB, DEU, SEQ, GUP)	20.43	0.17
13c	Woodlands of <i>Eucalyptus crebra</i> (sens. lat.) (narrow-leaved red ironbark), <i>E. drepanophylla</i> (grey ironbark), <i>E. fibrosa</i> (dusky-leaved ironbark), <i>E. shirleyi</i> (shirley's silver-leaved ironbark) on granitic and metamorphic ranges (land zones 12, 11, 9, [5]) (BRB, EIU, SEQ, NET, CQC)	103.91	0.88
13d	Woodlands dominated by <i>Eucalyptus moluccana</i> (gum-topped box) (or <i>E. microcarpa</i> (inland grey box)) on a range of substrates. (land zone 5, 9, 3, 11, 12) (BRB, SEQ, EIU, CQC, [NET, WET])	19.16	0.16
16a	Open forest and woodlands dominated by <i>Eucalyptus camaldulensis</i> (river red gum) (or <i>E. tereticornis</i> (blue gum)) and/or <i>E. coolabah</i> (coolabah) (or <i>E. microtheca</i> (coolabah)) fringing drainage lines. Associated species may include <i>Melaleuca</i> spp., <i>Corymbia tessellaris</i> (carbeen), <i>Angophora</i> spp., <i>Casuarina cunninghamiana</i> (riveroak). Does not include alluvial areas dominated by herb and grasslands or alluvial plains that are not flooded. (land zone 3) (MGD, BRB, GUP, CHC, MUL, DEU, EIU, NWH, SEQ, [NET, WET]) (All bioregions except CYP and CQC)	135.45	1.15
16c	Woodlands and open woodlands dominated by <i>Eucalyptus coolabah</i> (coolabah) or <i>E. microtheca</i> (coolabah) or <i>E. largiflorens</i> (black box) or <i>E. tereticornis</i> (blue gum) or <i>E. chlorophylla</i> on floodplains. Does not include alluvial areas dominated by herb and grasslands or alluvial plains that are not flooded. (land zone 3) (All bioregions except WET, principally GUP, BRB, MUL).	85.12	0.72
21b	Low open woodlands and tall shrublands of <i>Melaleuca citrolens</i> or <i>M. stenostachya</i> or other <i>Melaleuca</i> spp. (land zones 5, 3, 7, 10, 11, 12) (GUP, CYP, EIU, DEU, BRB, [SEQ])	4.6	0.04

BVG (1 Million)	Description	Area (Ha)	% of AOI
34c	Palustrine wetlands. Freshwater swamps on coastal floodplains dominated by sedges and grasses such as <i>Oryza</i> spp., <i>Eleocharis</i> spp. (spikerush) or <i>Baloskion</i> spp. (cord rush) / <i>Leptocarpus tenax</i> / <i>Gahnia sieberiana</i> (sword grass) / <i>Lepironia</i> spp. (land zones 3, 2, [1]) (CYP, GUP, BRB, SEQ, WET, [CQC])	8.0	0.07
8a	Wet tall open forest dominated by species such as <i>Eucalyptus grandis</i> (flooded gum) or <i>E. saligna</i> , <i>E. resinifera</i> (red mahogany), <i>Lophostemon confertus</i> (brush box), <i>Syncarpia glomulifera</i> (turpentine), <i>E. laevopinea</i> (silvertop stringybark). Contains a well developed understorey of rainforest components, including ferns and palms, or the understorey may be dominated by sclerophyll shrubs. (land zones 12, 8, 10, 11, 3, 5, 9) (SEQ, WET, BRB, CQC, [NET])	less than 0.01	less than 0.01
9h	Dry woodlands dominated by species such as <i>Eucalyptus acmenoides</i> (narrow-leaved white stringybark) (or <i>E. portuensis</i>), <i>E. tereticornis</i> (blue gum), <i>Angophora leiocarpa</i> (rusty gum), <i>Corymbia trachyphloia</i> (yellow bloodwood) or <i>C. intermedia</i> (pink bloodwood), and often ironbarks including <i>E. crebra</i> (narrow-leaved red ironbark) or <i>E. fibrosa</i> (dusky-leaved ironbark). A heathy shrub layer is frequently present. On undulating to hilly terrain. (land zones 12, 11, [5]) (SEQ, BRB)	174.52	1.48

Refer to **Map 4** for further information. **Map 5** also provides a representation of the distribution of vegetation communities as per the 1:5,000,000 BVG believed to be present prior to European settlement.

4. Technical and BioCondition Benchmark Descriptions

Technical descriptions provide a detailed description of the full range in structure and floristic composition of regional ecosystems (e.g. 11.3.1) and their component vegetation communities (e.g. 11.3.1a, 11.3.1b). See:

<http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/technical-descriptions/>

The descriptions are compiled using site survey data from the Queensland Herbarium's CORVEG database. Distribution maps, representative images (if available) and the pre-clearing and remnant extent (hectares) of each vegetation community derived from the regional ecosystem mapping data are included. The technical descriptions should be used in conjunction with the fields from the regional ecosystem description database (REDD) for a full description of the regional ecosystem.

Technical descriptions include data on canopy height, canopy cover and native plant species composition of the predominant layer, which are attributes relevant to assessment of the remnant status of vegetation under the *Vegetation Management Act 1999*. However, as technical descriptions reflect the full range in structure and floristic composition across the climatic, natural disturbance and geographic range of the regional ecosystem, local reference sites should be used for remnant assessment where possible (Neldner et al. 2012 (PDF)* section 3.3.1 of:

<https://publications.qld.gov.au/dataset/redd/resource/>

The technical descriptions are subject to review and are updated as additional data becomes available.

When conducting a BioCondition assessment, these technical descriptions should be used in conjunction with BioCondition benchmarks for the specific regional ecosystem, or component vegetation community.

<http://www.qld.gov.au/environment/plants-animals/biodiversity/benchmarks/>

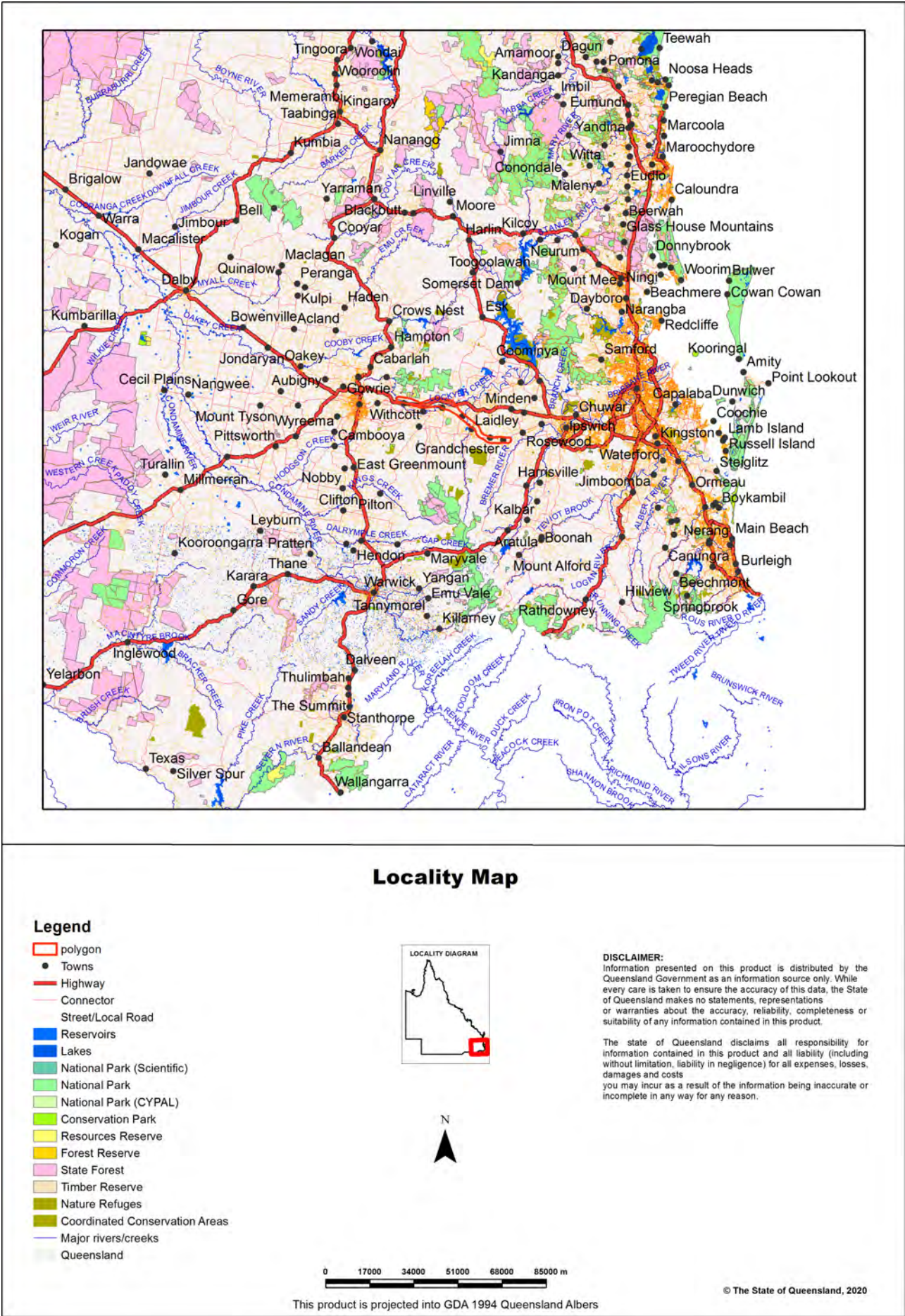
Benchmarks are based on a combination of quantitative and qualitative information and should be used as a guide only. Benchmarks are specific to one regional ecosystem vegetation community, however, the natural variability in structure and floristic composition under a range of climatic and natural disturbance regimes has been considered throughout the geographic extent of the regional ecosystem. Local reference sites should be used for this spatial and temporal (seasonal and annual) variability.

Table 7: List of remnant regional ecosystems within the AOI for which technical and biocondition benchmark descriptions are available

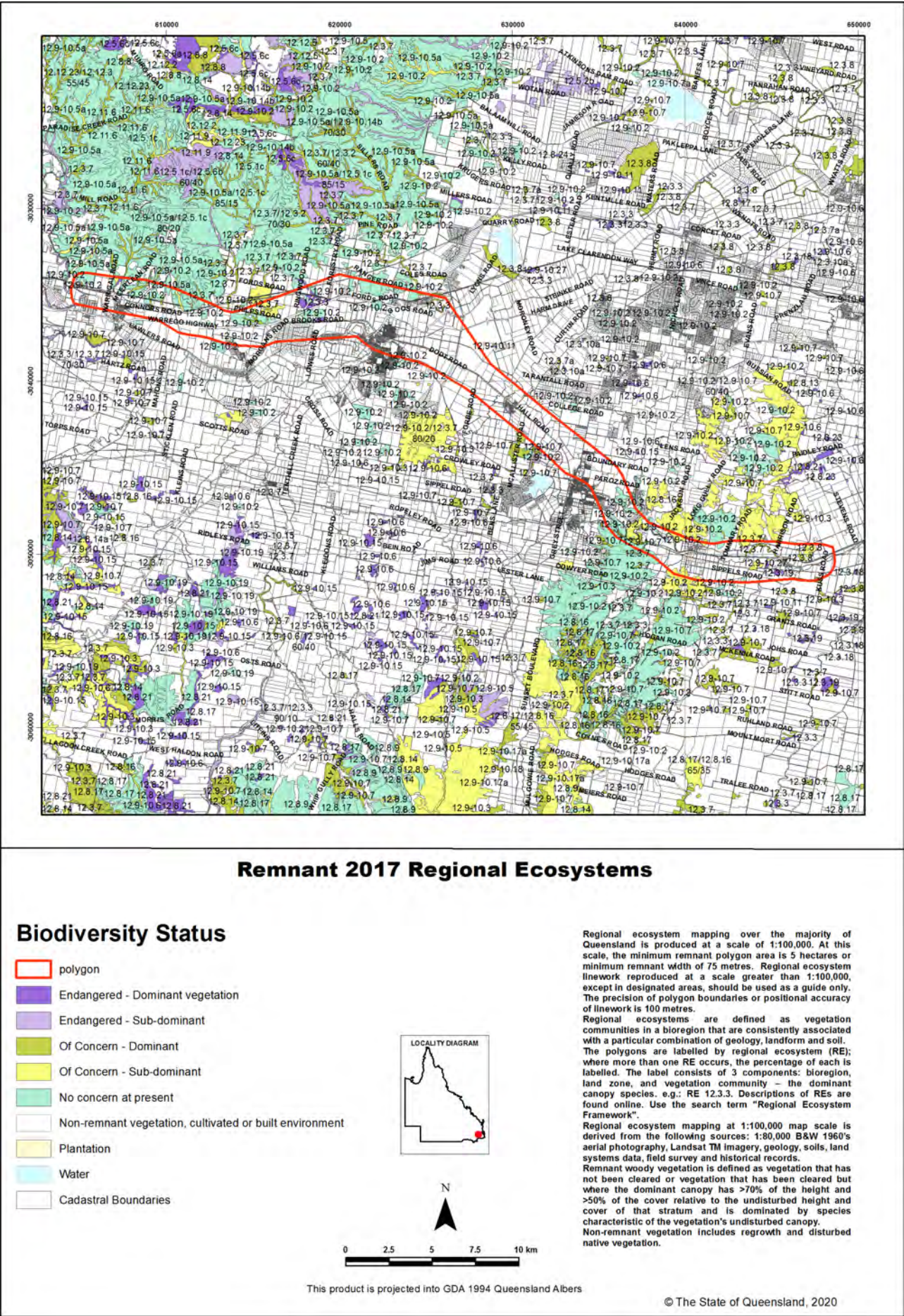
Regional ecosystems mapped as within the AOI	Technical Descriptions	Biocondition Benchmarks
12.3.18	Not currently available	Not currently available
12.3.19	Not currently available	Not currently available
12.3.2	Not currently available	Not currently available
12.3.3	Available	Not currently available
12.3.3d	Available	Not currently available
12.3.7	Available	Not currently available
12.3.8	Not currently available	Not currently available
12.9-10.19	Available	Not currently available
12.9-10.2	Available	Not currently available
12.9-10.27	Not currently available	Not currently available
12.9-10.3	Available	Not currently available
12.9-10.5	Not currently available	Not currently available
12.9-10.5a	Available	Not currently available
12.9-10.7	Available	Not currently available
non-rem	Not currently available	Not currently available

Maps

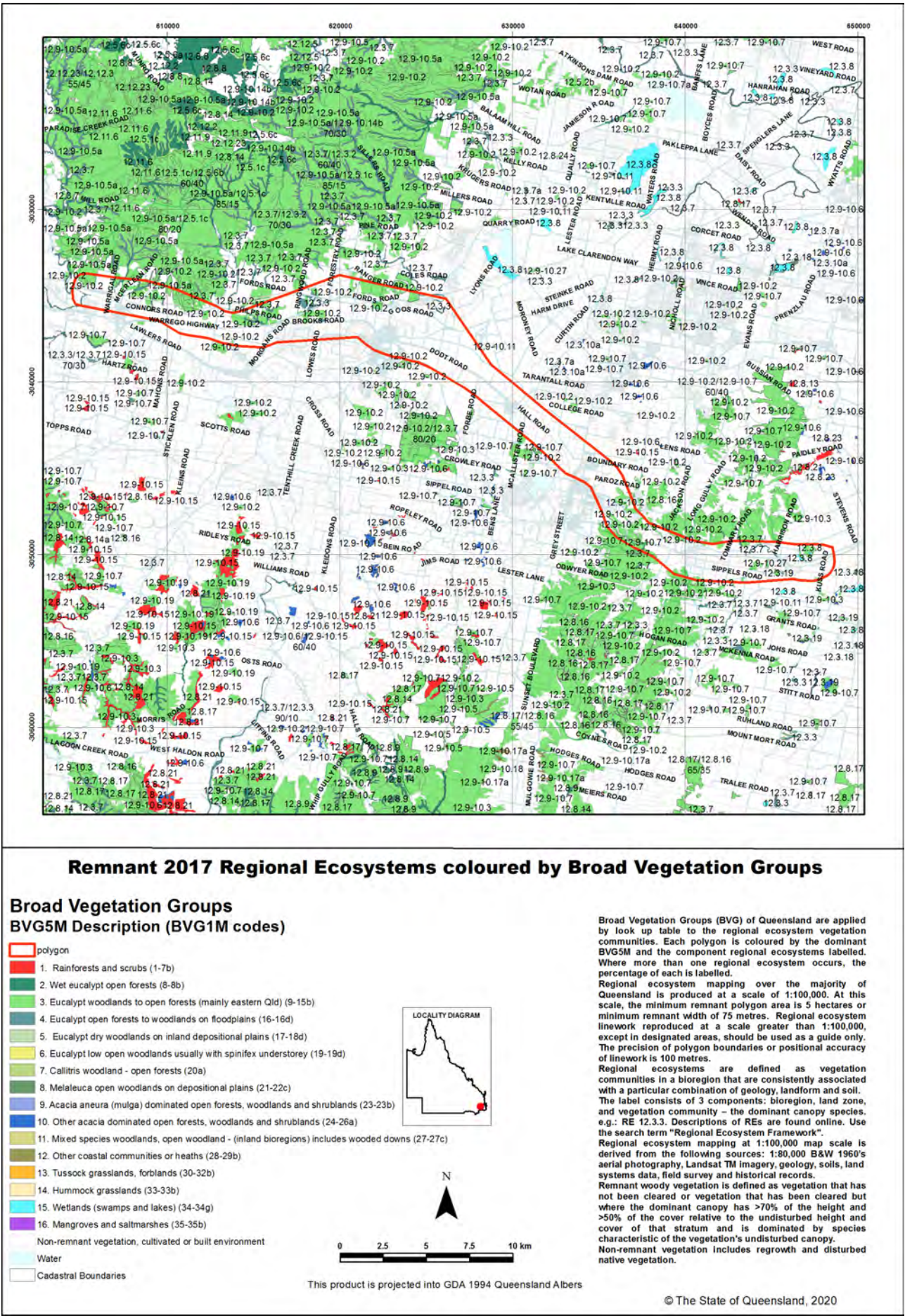
Map 1 - Location



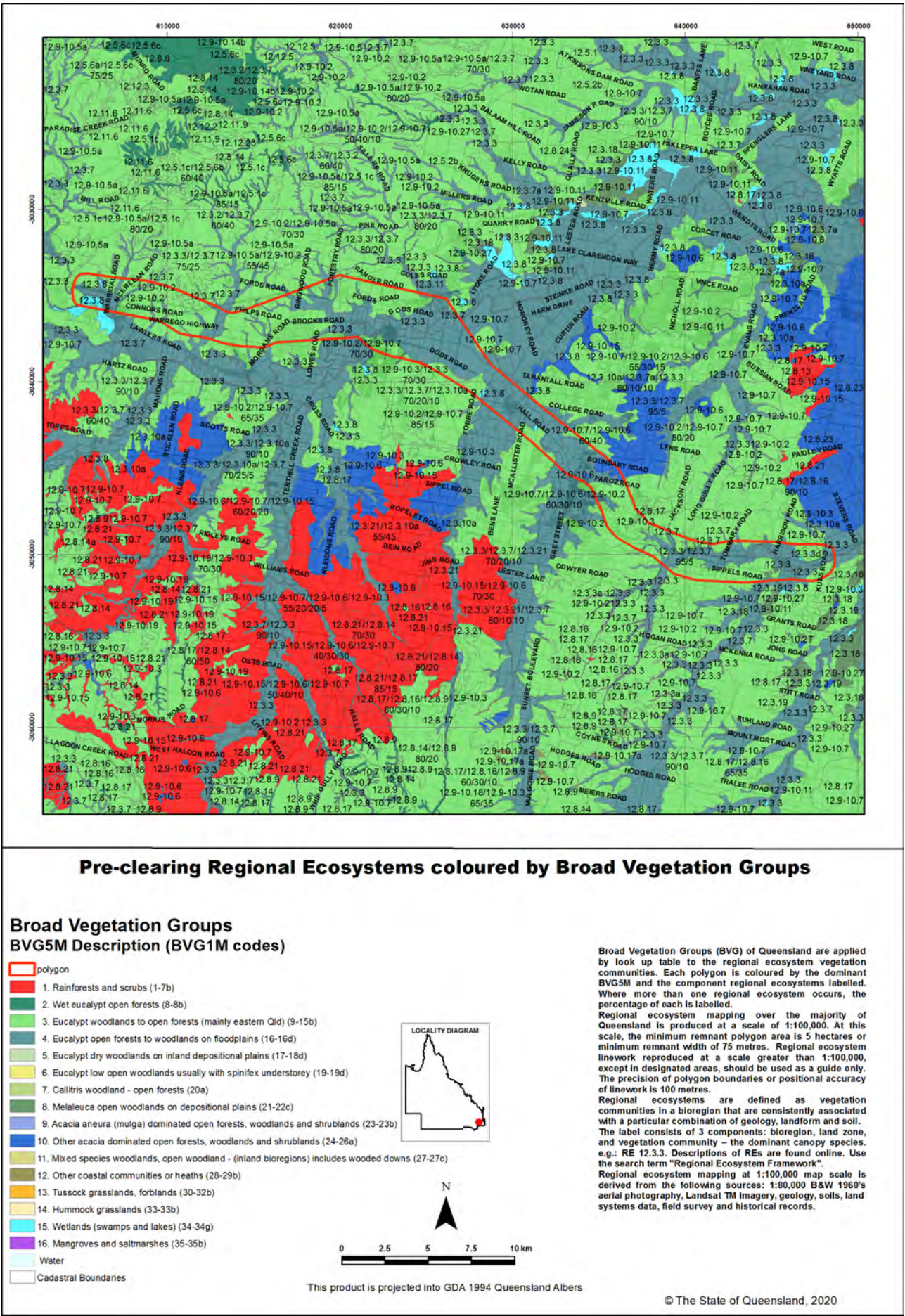
Map 2 - Remnant 2017 regional ecosystems



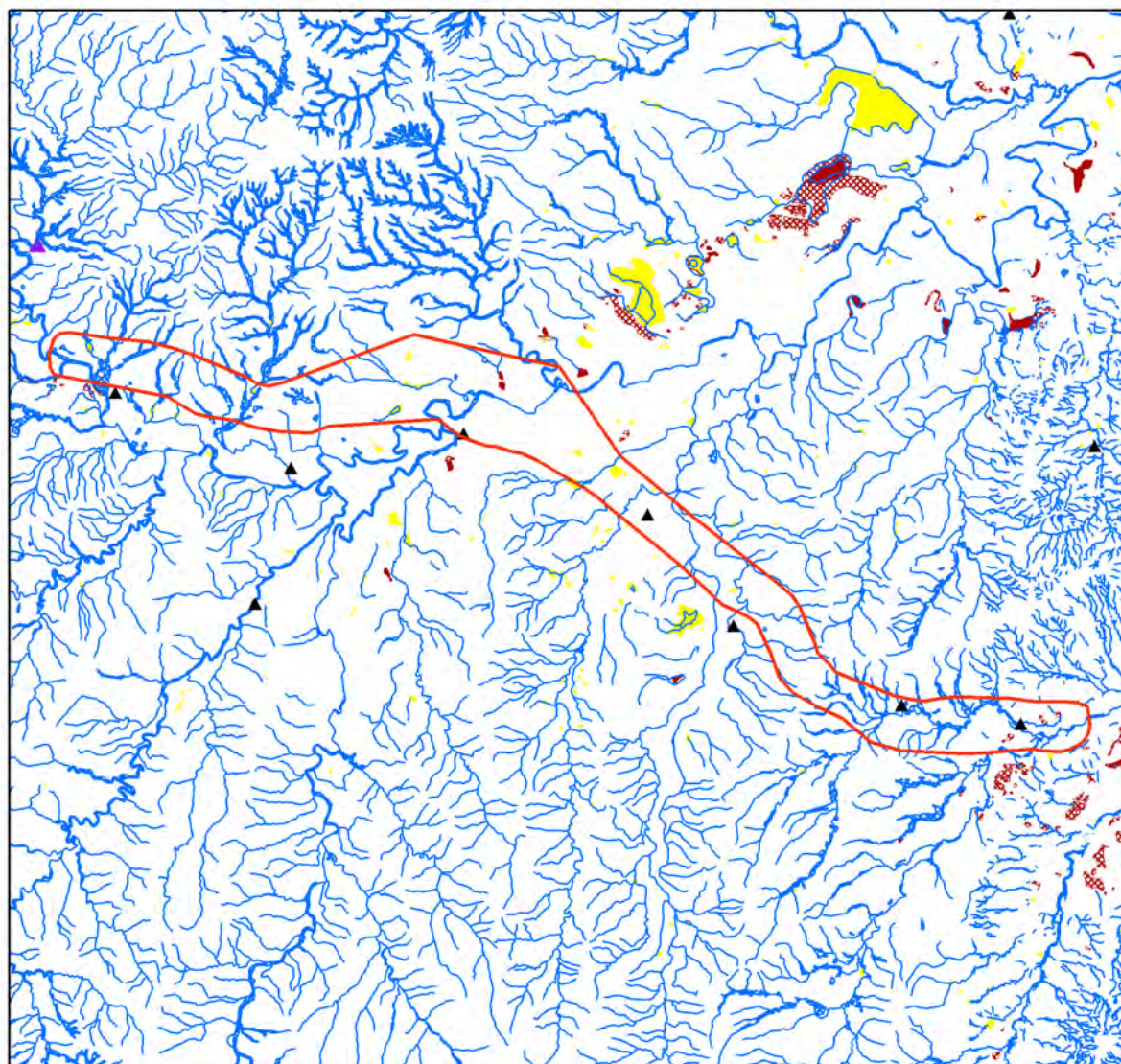
Map 4 - Remnant 2017 regional ecosystems by BVG (5M)



Map 5 - Pre-clearing regional ecosystems by BVG (5M)



Map 6 - Wetlands and waterways



Queensland Wetland Data

Legend

□ polygon

▲ Towns

Queensland Wetland Data

— Riverine Drainage Lines

▲ Springs

Wetland System - Water Bodies

■ Marine Waterbodies

■ Estuarine Waterbodies

■ Riverine Waterbodies

■ Lacustrine Waterbodies

■ Palustrine Waterbodies

Wetland System - Regional Ecosystems

■ Marine RE

■ Estuarine RE

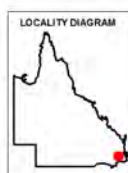
■ Riverine RE

■ Lacustrine RE

■ Palustrine RE

■ RE 51-80% wetland (mosaic units)

■ RE 1-50% wetland (mosaic units)



0 2500 5000 7500 10000 12500 m

Accuracy information: The positional accuracy of wetland data mapped at a scale of 1:100,000 is +/-100m with a minimum polygon size of 5ha or 75m wide for linear features, except for areas along the east coast which are mapped at the 1:50,000 scale with a positional accuracy of +/-50m, with a minimum polygon size of 1ha or 35m wide for linear features. Wetlands smaller than 1ha are not delineated on the wetland data. Consideration of the effects of mapped scale is necessary when interpreting data at a larger scale, e.g. 1:25,000. For property assessment, digital linework should be used as a guide only. The extent of wetlands depicted on this map is based on rectified 2013 Landsat ETM+ imagery supplied by Statewide Landcover and Trees Study (SLATS), Department of Environment and Science. The extent of water bodies is based on the maximum extent of inundation derived from available Landsat imagery up to and including the 2013 imagery.

© The State of Queensland, 2020

This product is projected into GDA 1994 Queensland Albers

Links and Other Information Sources

The Department of Environment and Science's Website -

<http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/>

provides further information on the regional ecosystem framework, including access to links to the Regional Ecosystem Database, Broad Vegetation Group Definitions, Regional Ecosystem and Land zone descriptions.

Descriptions of the broad vegetation groups of Queensland can be downloaded from:

<https://publications.qld.gov.au/dataset/redd/resource/>

The methodology for mapping regional ecosystems can be downloaded from:

<https://publications.qld.gov.au/dataset/redd/resource/>

Technical descriptions for regional ecosystems can be obtained from:

<http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/technical-descriptions/>

Benchmarks can be obtained from:

<http://www.qld.gov.au/environment/plants-animals/biodiversity/benchmarks/>

For further information associated with the remnant regional ecosystem dataset used by this report, refer to the metadata associated with the Biodiversity status of pre-clearing and Remnant Regional Ecosystems of Queensland dataset (version listed in **Appendix 1**) which is available through the Queensland Government Information System portal,

<http://dds.information.qld.gov.au/dds/>

The Queensland Globe is a mapping and data application. As an interactive online tool, Queensland Globe allows you to view and explore Queensland maps, imagery (including up-to-date satellite images) and other spatial data, including regional ecosystem mapping. To further view and explore regional ecosystems over an area of interest, access the Biota Globe (a component of the Queensland Globe). The Queensland Globe can be accessed via the following link:

<http://www.dnrm.qld.gov.au/mapping-data/queensland-globe>

References

Neldner, V.J., Niehus R.E., Wilson, B.A. McDonald, W.J.F., Ford, A.J. and Accad, A. (2017) The Vegetation of Queensland. Descriptions of Broad Vegetation Groups. Version 3.0. Queensland Herbarium, Department of Science, Information Technology, Innovation and the Arts.

<https://publications.qld.gov.au/dataset/redd/resource/78209e74-c7f2-4589-90c1-c33188359086>

Neldner, V.J., Wilson, B.A., Dillewaard, H.A., Ryan, T.S. and Butler, D.W. (2017) *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland*. Version 4.0. Queensland Herbarium, Department of Science, Information Technology, Innovation and the Arts.

<https://publications.qld.gov.au/dataset/redd/resource/6dee78ab-c12c-4692-9842-b7257c2511e4>

Sattler, P.S. and Williams, R.D. (eds) (1999). *The Conservation Status of Queensland's Bioregional Ecosystems*. Environmental Protection Agency, Brisbane.

Appendices

Appendix 1 - Source Data

The dataset listed below is available for download from:

<http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/download/>

- Regional Ecosystem Description Database

The datasets listed below are available for download from:

<http://dds.information.qld.gov.au/dds/>

- Biodiversity status of pre-clearing and 2017 remnant regional ecosystems of Queensland
- Pre-clearing Vegetation Communities and Regional Ecosystems of Queensland
- Queensland Wetland Data Version - Wetland lines
- Queensland Wetland Data Version - Wetland points
- Queensland Wetland Data Version - Wetland areas

Appendix 2 - Acronyms and Abbreviations

AOI	- Area of Interest
GDA94	- Geocentric Datum of Australia 1994
GIS	- Geographic Information System
RE	- Regional Ecosystem
REDD	- Regional Ecosystem Description Database
VMA	- <i>Vegetation Management Act 1999</i>

APPENDIX



Terrestrial and Aquatic Ecology Technical Report

Appendix D Flora Species List

HELIDON TO CALVERT ENVIRONMENTAL IMPACT STATEMENT

Family	Scientific Name	Common Name	Conservation status		Native/non-native	Restricted matter
			NC Act	EPBC Act		
Acanthaceae	<i>Brunoniella australis</i>	blue trumpet	C	-	Native	
Acanthaceae	<i>Pseuderanthemum variabile</i>	pastel flower	C	-	Native	
Acanthaceae	<i>Rostellularia adscendens</i>		C	-	Native	
Agavaceae	<i>Agave sisalana</i>	sisal hemp	-	-	Non-native	
Amaranthaceae	<i>Achyranthes aspera</i>	chaff flower	C	-	Native	
Amaranthaceae	<i>Alternanthera denticulata</i>	lesser joyweed	C	-	Native	
Amaranthaceae	<i>Alternanthera nana</i>	hairy joyweed	C	-	Native	
Amaranthaceae	<i>Alternanthera nodiflora</i>	common joyweed	C	-	Native	
Amaranthaceae	<i>Alternanthera pungens</i>	khaki weed	-	-	Non-native	
Amaranthaceae	<i>Amaranthus hybridus</i>	redshank	-	-	Non-native	
Amaranthaceae	<i>Gomphrena celosioides</i>	gomphrena weed	-	-	Non-native	
Apiaceae	<i>Centella asiatica</i>		C	-	Native	
Apiaceae	<i>Daucus carota</i>	wild carrot	-	-	Non-native	
Apiaceae	<i>Daucus glochidiatus</i>	Australian carrot	C	-	Native	
Apocynaceae	<i>Alstonia constricta</i>	bitterbark	C	-	Native	
Apocynaceae	<i>Alyxia ruscifolia</i>	chrainfruit	C	-	Native	
Apocynaceae	<i>Asclepias curassavica</i>	red-head cottonbush	-	-	Non-native	
Apocynaceae	<i>Carissa ovata</i>	currantbush	C	-	Native	
Apocynaceae	<i>Cryptostegia grandiflora</i>	rubber vine	-	-	Non-native	Class 3
Apocynaceae	<i>Gomphocarpus physocarpus</i>	balloon cottonbush	-	-	Non-native	
Apocynaceae	<i>Marsdenia lloydii</i>		C	-	Native	
Apocynaceae	<i>Nerium oleander</i>	oleander	-	-	Non-native	
Apocynaceae	<i>Parsonsia lanceolata</i>	parsonsia	C	-	Native	
Apocynaceae	<i>Parsonsia straminea</i>	monkey rope	C	-	Native	
Araceae	<i>Gymnostachys anceps</i>	settler's flax	C	-	Native	
Araliaceae	<i>Hydrocotyle acutiloba</i>		C	-	Native	
Araliaceae	<i>Hydrocotyle laxiflora</i>	stinking pennywort	C	-	Native	
Araliaceae	<i>Hydrocotyle pedicellosa</i>		C	-	Native	
Araliaceae	<i>Polyscias elegans</i>	celery wood	C	-	Native	
Araliaceae	<i>Trachymene procumbens</i>	creeping wild parsnip	C	-	Native	
Araucariaceae	<i>Araucaria cunninggha+B3:B363mii</i>	hoop pine	C	-	Native	
Asparagaceae	<i>Asparagus aethiopicus</i>	Asparagus fern	-	-	Non-native	Class 2,3,4,5
Asparagaceae	<i>Asparagus asparagoides</i>	bridal creeper	-	-	Non-native	Class 3
Asparagaceae	<i>Asparagus plumosus</i>	climbing asparagus	-	-	Non-native	Class 3
Asphodelaceae	<i>Aloe maculata</i>		-	-	Non-native	

Family	Scientific Name	Common Name	Conservation status		Native/non-native	Restricted matter
			NC Act	EPBC Act		
Asphodelaceae	<i>Aloe vera</i>		-	-	Non-native	
Aspleniaceae	<i>Asplenium attenuatum</i> var. <i>attenuatum</i>		C	-	Native	
Aspleniaceae	<i>Asplenium australasicum</i>		C	-	Native	
Asteraceae	<i>Ageratina adenophora</i>	crofton weed	-	-	Non-native	
Asteraceae	<i>Ageratina riparia</i>	mistflower	-	-	Non-native	
Asteraceae	<i>Ageratum houstonianum</i>	blue billygoat weed	-	-	Non-native	
Asteraceae	<i>Ambrosia artemisiifolia</i>	annual ragweed	-	-	Non-native	Class 3
Asteraceae	<i>Arctotheca calendula</i>	Cape weed	-	-	Non-native	
Asteraceae	<i>Baccharis halimifolia</i>	groundsel bush	-	-	Non-native	Class 3
Asteraceae	<i>Bidens pilosa</i>		-	-	Non-native	
Asteraceae	<i>Brachyscome basaltica</i>		C	-	Native	
Asteraceae	<i>Calotis cuneata</i>		C	-	Native	
Asteraceae	<i>Calotis cuneifolia</i>	burr daisy	C	-	Native	
Asteraceae	<i>Calotis lappulacea</i>	yellow burr daisy	C	-	Native	
Asteraceae	<i>Cassinia laevis</i>		C	-	Native	
Asteraceae	<i>Chrysocephalum apiculatum</i>	yellow buttons	C	-	Native	
Asteraceae	<i>Cirsium vulgare</i>	spear thistle	-	-	Non-native	
Asteraceae	<i>Crassocephalum crepidioides</i>	thickhead	-	-	Non-native	
Asteraceae	<i>Emilia sonchifolia</i> var. <i>javanica</i>		-	-	Non-native	
Asteraceae	<i>Helianthus annuus</i>		-	-	Non-native	
Asteraceae	<i>Hypochaeris albiflora</i>		-	-	Non-native	
Asteraceae	<i>Hypochaeris radicata</i>	catsear	-	-	Non-native	
Asteraceae	<i>Lactuca serriola</i>	prickly lettuce	-	-	Non-native	
Asteraceae	<i>Senecio madagascariensis</i>	fireweed	-	-	Non-native	Class 3
Asteraceae	<i>Sigesbeckia orientalis</i>	Indian weed	C	-	Native	
Asteraceae	<i>Silybum marianum</i>	variegated thistle	-	-	Non-native	
Asteraceae	<i>Sonchus oleraceus</i>	common sowthistle	-	-	Non-native	
Asteraceae	<i>Tagetes minuta</i>	stinking roger	-	-	Non-native	
Asteraceae	<i>Taraxacum officinale</i>	dandelion	-	-	Non-native	
Asteraceae	<i>Tridax procumbens</i>	tridax daisy	-	-	Non-native	
Asteraceae	<i>Vittadinia sulcata</i>	native daisy	C	-	Native	
Asteraceae	<i>Xanthium occidentale</i>		-	-	Non-native	
Asteraceae	<i>Zinnia peruviana</i>	wild zinnia	-	-	Non-native	
Basellaceae	<i>Anredera cordifolia</i>	Madeira vine	-	-	Non-native	Class 3

Family	Scientific Name	Common Name	Conservation status		Native/non-native	Restricted matter
			NC Act	EPBC Act		
Bignoniaceae	<i>Jacaranda mimosifolia</i>	jacaranda	-	-	Non-native	
Bignoniaceae	<i>Pandorea pandorana</i>	wonga vine	C	-	Native	
Bignoniaceae	<i>Tecoma stans</i> var. <i>stans</i>	yellow bells	-	-	Non-native	Class 3
Boraginaceae	<i>Heliotropium amplexicaule</i>	blue heliotrope	-	-	Non-native	
Brassicaceae	<i>Brassica x juncea</i>	Indian mustard	-	-	Non-native	
Brassicaceae	<i>Capsella bursapastoris</i>	shepherd's purse	-	-	Non-native	
Brassicaceae	<i>Lepidium africanum</i>	common peppergrass	-	-	Non-native	
Brassicaceae	<i>Rapistrum rugosum</i>	turnip weed	-	-	Non-native	
Cactaceae	<i>Opuntia stricta</i>	prickly pear	-	-	Non-native	Class 3
Cactaceae	<i>Opuntia tomentosa</i>	velvety tree pear	-	-	Non-native	Class 3
Caesalpiniaceae	<i>Bauhinia variegata</i>	orchid tree	-	-	Non-native	
Campanulaceae	<i>Lobelia purpurascens</i>	white root	SLC	-	Native	
Campanulaceae	<i>Wahlenbergia glabra</i>	native bluebell	SLC	-	Native	
Campanulaceae	<i>Wahlenbergia gracilis</i>	sprawling bluebell	SLC	-	Native	
Campanulaceae	<i>Wahlenbergia stricta</i>	small bluebell	SLC	-	Native	
Cannaceae	<i>Canna indica</i>	canna lily	-	-	Non-native	
Caryophyllaceae	<i>Stellaria media</i>	chickweed	-	-	Non-native	
Casuarinaceae	<i>Allocasuarina littoralis</i>	black she-oak	C	-	Native	
Casuarinaceae	<i>Allocasuarina luehmannii</i>	bull oak	C	-	Native	
Casuarinaceae	<i>Casuarina cunninghamiana</i>		C	-	Native	
Chenopodiaceae	<i>Chenopodium album</i>	fat-hen	-	-	Non-native	
Chenopodiaceae	<i>Einadia hastata</i>		C	-	Native	
Chenopodiaceae	<i>Maireana microphylla</i>		C	-	Native	
Chenopodiaceae	<i>Sclerolaena bicornis</i>	goats head burr	C	-	Native	
Commelinaceae	<i>Commelina diffusa</i>	wandering jew	C	-	Native	
Commelinaceae	<i>Murdannia graminea</i>	murdannia	C	-	Native	
Convolvulaceae	<i>Convolvulus erubescens</i>	Australian bindweed	C	-	Native	
Convolvulaceae	<i>Dichondra repens</i>	kidney weed	C	-	Native	
Convolvulaceae	<i>Evolvulus alsinoides</i>	evolvulus	C	-	Native	
Convolvulaceae	<i>Ipomoea cairica</i>	mile-a-minute	-	-	Non-native	
Convolvulaceae	<i>Ipomoea purpurea</i>	purple morning glory	-	-	Non-native	
Convolvulaceae	<i>Polymeria calycina</i>	slender bindweed	C	-	Native	
Crassulaceae	<i>Bryophyllum delagoense</i>	mother of millions	-	-	Non-native	Class 3
Cupressaceae	<i>Callitris glaucophylla</i>	white cypress pine	C	-	Native	
Cyperaceae	<i>Cyperus bifax</i>	western nutgrass	C	-	Native	

Family	Scientific Name	Common Name	Conservation status		Native/non-native	Restricted matter
			NC Act	EPBC Act		
Cyperaceae	<i>Cyperus difformis</i>	rice sedge	C	-	Native	
Cyperaceae	<i>Cyperus involucratus</i>		-	-	Non-native	
Cyperaceae	<i>Cyperus rotundus</i>	nutgrass	-	-	Non-native	
Cyperaceae	<i>Fimbristylis dichotoma</i>	common fringe-rush	C	-	Native	
Cyperaceae	<i>Fimbristylis nutans</i>	fringe rush	C	-	Native	
Cyperaceae	<i>Gahnia aspera</i>		C	-	Native	
Cyperaceae	<i>Lepidosperma laterale</i>		C	-	Native	
Dennstaedtiaceae	<i>Pteridium esculentum</i>	common bracken	C	-	Native	
Dicksoniaceae	<i>Calochlaena dubia</i>	soft bracken fern	C	-	Native	
Dilleniaceae	<i>Hibbertia aspera</i>		C	-	Native	
Dilleniaceae	<i>Hibbertia salicifolia</i>		C	-	Native	
Dilleniaceae	<i>Hibbertia stricta</i>		C	-	Native	
Ericaceae	<i>Acrotriche aggregata</i>	red cluster heath	C	-	Native	
Ericaceae	<i>Leucopogon juniperinus</i>	prickly heath	C	-	Native	
Ericaceae	<i>Melichrus urceolatus</i>	honey gorse	C	-	Native	
Euphorbiaceae	<i>Acalypha eremorum</i>	soft acalypha	C	-	Native	
Euphorbiaceae	<i>Alchornea ilicifolia</i>	native holly	C	-	Native	
Euphorbiaceae	<i>Baloghia inophylla</i>	scrub bloodwood	C	-	Native	
Euphorbiaceae	<i>Croton stigmatosus</i>	white croton	C	-	Native	
Euphorbiaceae	<i>Euphorbia hirta</i>	asthma plant	-	-	Non-native	
Euphorbiaceae	<i>Mallotus claoxyloides</i>	green kamala	C	-	Native	
Euphorbiaceae	<i>Mallotus philippensis</i>	red kamala	C	-	Native	
Euphorbiaceae	<i>Ricinus communis</i>	castor oil bush	-	-	Non-native	
Fabaceae	<i>Aeschynomene indica</i>	budda pea	C	-	Native	
Fabaceae	<i>Cullen tenax</i>	Emu foot	C	-	Native	
Fabaceae	<i>Daviesia ulicifolia</i>	spiny daviesia	C	-	Native	
Fabaceae	<i>Daviesia villifera</i>	prickly daviesia	C	-	Native	
Fabaceae	<i>Desmodium brachypodium</i>	large ticktrefoil	C	-	Native	
Fabaceae	<i>Desmodium gunnii</i>		C	-	Native	
Fabaceae	<i>Desmodium rhytidophyllum</i>		C	-	Native	
Fabaceae	<i>Desmodium varians</i>	slender tick trefoil	C	-	Native	
Fabaceae	<i>Erythrina vespertilio</i>		C	-	Native	
Fabaceae	<i>Glycine clandestina</i>		C	-	Native	
Fabaceae	<i>Glycine tabacina</i>	glycine pea	C	-	Native	
Fabaceae	<i>Glycine tomentella</i>	woolly glycine	C	-	Native	

Family	Scientific Name	Common Name	Conservation status		Native/non-native	Restricted matter
			NC Act	EPBC Act		
Fabaceae	<i>Gompholobium virgatum</i>		C	-	Native	
Fabaceae	<i>Hardenbergia violacea</i>		C	-	Native	
Fabaceae	<i>Hovea planifolia</i>		C	-	Native	
Fabaceae	<i>Indigofera australis</i>		C	-	Native	
Fabaceae	<i>Indigofera hirsuta</i>	hairy indigo	C	-	Native	
Fabaceae	<i>Indigofera linnaei</i>	Birdsville indigo	C	-	Native	
Fabaceae	<i>Indigofera spicata</i>	creeping indigo	-	-	Non-native	
Fabaceae	<i>Jacksonia scoparia</i>		C	-	Native	
Fabaceae	<i>Kennedia rubicunda</i>	red Kennedy pea	C	-	Native	
Fabaceae	<i>Lespedeza juncea</i>		C	-	Native	
Fabaceae	<i>Macroptilium atropurpureum</i>	siratro	-	-	Non-native	
Fabaceae	<i>Macroptilium lathyroides</i>		-	-	Non-native	
Fabaceae	<i>Medicago lupulina</i>	black medic	-	-	Non-native	
Fabaceae	<i>Medicago polymorpha</i>	burr medic	-	-	Non-native	
Fabaceae	<i>Medicago sativa</i>	lucerne	-	-	Non-native	
Fabaceae	<i>Neonotonia wightii</i> var. <i>wightii</i>		-	-	Non-native	
Fabaceae	<i>Pultenaea euchila</i>	orange pultenaea	C	-	Native	
Fabaceae	<i>Rhynchosia minima</i>		C	-	Native	
Fabaceae	<i>Stylosanthes scabra</i>	Stylo	-	-	Non-native	
Fabaceae	<i>Tipuana tipu</i>	tipuana	-	-	Non-native	
Fabaceae	<i>Trifolium repens</i> var. <i>repens</i>	white clover	-	-	Non-native	
Geraniaceae	<i>Geranium homeanum</i>		C	-	Native	
Geraniaceae	<i>Geranium solanderi</i>	Australian crane's bill	C	-	Native	
Goodeniaceae	<i>Goodenia glabra</i>		C	-	Native	
Hemerocallidaceae	<i>Dianella caerulea</i>		C	-	Native	
Hemerocallidaceae	<i>Dianella longifolia</i>		C	-	Native	
Hemerocallidaceae	<i>Dianella revoluta</i>		C	-	Native	
Hemerocallidaceae	<i>Geitonoplesium cymosum</i>	scrambling lily	C	-	Native	
Lamiaceae	<i>Ajuga australis</i>	Australian bugle	C	-	Native	
Lamiaceae	<i>Chloanthes parviflora</i>		C	-	Native	
Lamiaceae	<i>Clerodendrum floribundum</i>		C	-	Native	
Lamiaceae	<i>Mentha satuireioides</i>	native pennyroyal	C	-	Native	
Lamiaceae	<i>Stachys arvensis</i>	stagger weed	-	-	Non-native	
Lauraceae	<i>Cassytha filiformis</i>	dodder laurel	C	-	Native	
Lauraceae	<i>Cassytha muelleri</i>		C	-	Native	

Family	Scientific Name	Common Name	Conservation status		Native/non-native	Restricted matter
			NC Act	EPBC Act		
Lauraceae	<i>Cinnamomum camphora</i>	camphor laurel	-	-	Non-native	
Laxmanniaceae	<i>Eustrephus latifolius</i>	wombat berry	C	-	Native	
Laxmanniaceae	<i>Lomandra confertifolia</i>		C	-	Native	
Laxmanniaceae	<i>Lomandra filiformis</i>		C	-	Native	
Laxmanniaceae	<i>Lomandra hystrix</i>	creek mat rush	C	-	Native	
Laxmanniaceae	<i>Lomandra leucocephala</i>	woolly mat rush	C	-	Native	
Laxmanniaceae	<i>Lomandra longifolia</i>		C	-	Native	
Laxmanniaceae	<i>Lomandra multiflora</i>		C	-	Native	
Laxmanniaceae	<i>Thysanotus tuberosus</i>		C	-	Native	
Lythraceae	<i>Lagerstroemia indica</i>		-	-	Non-native	
Malvaceae	<i>Malva parviflora</i>	small-flowered mallow	-	-	Non-native	
Malvaceae	<i>Malvastrum americanum</i>	spiked malvastrum	-	-	Non-native	
Malvaceae	<i>Malvastrum coromandelianum</i> subsp. <i>coromandelianum</i>		-	-	Non-native	
Malvaceae	<i>Sida cordifolia</i>	flannel weed	-	-	Non-native	
Malvaceae	<i>Sida corrugata</i>		C	-	Native	
Malvaceae	<i>Sida hackettiana</i>	native hemp	C	-	Native	
Malvaceae	<i>Sida rhombifolia</i>		-	-	Non-native	
Malvaceae	<i>Sida trichopoda</i>	high sida	C	-	Native	
Marsileaceae	<i>Marsilea drummondii</i>	common nardoo	C	-	Native	
Marsileaceae	<i>Marsilea mutica</i>	shiny nardoo	C	-	Native	
Meliaceae	<i>Melia azedarach</i>	white cedar	C	-	Native	
Menispermaceae	<i>Stephania japonica</i>		C	-	Native	
Mimosaceae	<i>Acacia amblygona</i>	fan-leaf wattle	C	-	Native	
Mimosaceae	<i>Acacia aulacocarpa</i>	hickory wattle	C	-	Native	
Mimosaceae	<i>Acacia decora</i>	pretty wattle	C	-	Native	
Mimosaceae	<i>Acacia falcata</i>	sickle wattle	C	-	Native	
Mimosaceae	<i>Acacia fimbriata</i>	Brisbane golden wattle	C	-	Native	
Mimosaceae	<i>Acacia glaucocarpa</i>	hickory wattle	C	-	Native	
Mimosaceae	<i>Acacia harpophylla</i>	brigalow	C	-	Native	
Mimosaceae	<i>Acacia implexa</i>	lightwood	C	-	Native	
Mimosaceae	<i>Acacia irrorata</i>		C	-	Native	
Mimosaceae	<i>Acacia leiocalyx</i>	black wattle	C	-	Native	
Mimosaceae	<i>Acacia maidenii</i>	Maiden's wattle	C	-	Native	
Mimosaceae	<i>Acacia melanoxylon</i>	blackwood	C	-	Native	

Family	Scientific Name	Common Name	Conservation status		Native/non-native	Restricted matter
			NC Act	EPBC Act		
Mimosaceae	<i>Acacia penninervis</i>		C	-	Native	
Mimosaceae	<i>Acacia podalyriifolia</i>	Queensland silver wattle	C	-	Native	
Mimosaceae	<i>Acacia salicina</i>	doolan	C	-	Native	
Mimosaceae	<i>Acacia ulicifolia</i>		C	-	Native	
Mimosaceae	<i>Albizia lebbbeck</i>	Indian siris	C	-	Native	
Mimosaceae	<i>Leucaena leucocephala</i>	Leucaena	-	-	Non-native	
Mimosaceae	<i>Leucaena leucocephala subsp. leucocephala</i>		-	-	Non-native	
Mimosaceae	<i>Vachellia farnesiana</i>	Mimosa bush	-	-	Non-native	
Moraceae	<i>Ficus coronata</i>	creek sandpaper fig	C	-	Native	
Moraceae	<i>Ficus obliqua</i>		C	-	Native	
Moraceae	<i>Ficus opposita</i>		C	-	Native	
Moraceae	<i>Ficus rubiginosa</i>		C	-	Native	
Moraceae	<i>Ficus virens</i>		C	-	Native	
Moraceae	<i>Maclura cochinchinensis</i>	cockspur thorn	C	-	Native	
Myrsinaceae	<i>Ardisia crenata</i>		-	-	Non-native	
Myrsinaceae	<i>Lysimachia arvensis</i>	Pimpernel	-	-	Non-native	
Myrtaceae	<i>Angophora floribunda</i>	rough-barked apple	C	-	Native	
Myrtaceae	<i>Angophora leiocarpa</i>	rusty gum	C	-	Native	
Myrtaceae	<i>Angophora subvelutina</i>		C	-	Native	
Myrtaceae	<i>Angophora woodsiana</i>	smudgee	C	-	Native	
Myrtaceae	<i>Corymbia citriodora</i>	spotted gum	C	-	Native	
Myrtaceae	<i>Corymbia citriodora x C.torelliana</i>		C	-	Native	
Myrtaceae	<i>Corymbia intermedia</i>	pink bloodwood	C	-	Native	
Myrtaceae	<i>Corymbia tessellaris</i>	Moreton Bay ash	C	-	Native	
Myrtaceae	<i>Corymbia trachyphloia</i>	brown bloodwood	C	-	Native	
Myrtaceae	<i>Eucalyptus baileyana</i>	Bailey's stringybark	C	-	Native	
Myrtaceae	<i>Eucalyptus carnea</i>		C	-	Native	
Myrtaceae	<i>Eucalyptus crebra</i>	narrow-leaved ironbark	C	-	Native	
Myrtaceae	<i>Eucalyptus helidonica</i>		C	-	Native	
Myrtaceae	<i>Eucalyptus major</i>	mountain grey gum	C	-	Native	
Myrtaceae	<i>Eucalyptus melanophloia</i>	silver leaf ironbark	C	-	Native	
Myrtaceae	<i>Eucalyptus melliodora</i>	yellow box	C	-	Native	
Myrtaceae	<i>Eucalyptus microcorys</i>		C	-	Native	

Family	Scientific Name	Common Name	Conservation status		Native/non-native	Restricted matter
			NC Act	EPBC Act		
Myrtaceae	<i>Eucalyptus moluccana</i>	gum-topped box	C	-	Native	
Myrtaceae	<i>Eucalyptus pilularis</i>	blackbutt	C	-	Native	
Myrtaceae	<i>Eucalyptus propinqua</i>	small-fruited grey gum	C	-	Native	
Myrtaceae	<i>Eucalyptus tereticornis</i>	Queensland blue gum	C	-	Native	
Myrtaceae	<i>Lophostemon confertus</i>	brush box	C	-	Native	
Myrtaceae	<i>Lophostemon suaveolens</i>	swamp box	C	-	Native	
Myrtaceae	<i>Lysicarpus angustifolius</i>	budgeroo	C	-	Native	
Myrtaceae	<i>Melaleuca bracteata</i>		C	-	Native	
Myrtaceae	<i>Melaleuca quinquenervia</i>	swamp paperbark	C	-	Native	
Myrtaceae	<i>Melaleuca sieberi</i>		C	-	Native	
Myrtaceae	<i>Melaleuca viminalis</i>		C	-	Native	
Nephrolepidaceae	<i>Nephrolepis cordifolia</i>	fishbone fern	C	-	Native	
Oleaceae	<i>Ligustrum lucidum</i>	large-leaved privet	-	-	Non-native	Class 3
Onagraceae	<i>Ludwigia octovalvis</i>	willow primrose	C	-	Native	
Onagraceae	<i>Ludwigia peploides subsp. montevidensis</i>		C	-	Native	
Orchidaceae	<i>Cymbidium canaliculatum</i>		SLC	-	Native	
Oxalidaceae	<i>Oxalis chnoodes</i>		C	-	Native	
Oxalidaceae	<i>Oxalis corniculata</i>		-	-	Non-native	
Papaveraceae	<i>Argemone ochroleuca subsp. ochroleuca</i>	Mexican poppy	-	-	Non-native	
Passifloraceae	<i>Passiflora foetida</i>	Stinking passionflower	-	-	Non-native	
Passifloraceae	<i>Passiflora suberosa</i>	corky passion flower	-	-	Non-native	
Passifloraceae	<i>Passiflora subpeltata</i>	white passion flower	-	-	Non-native	
Petiveriaceae	<i>Rivina humilis</i>		-	-	Non-native	
Philydraceae	<i>Philydrum lanuginosum</i>	frogsmouth	C	-	Native	
Phyllanthaceae	<i>Breynia oblongifolia</i>		C	-	Native	
Phyllanthaceae	<i>Bridelia exaltata</i>		C	-	Native	
Phyllanthaceae	<i>Glochidion ferdinandi</i>		C	-	Native	
Phyllanthaceae	<i>Phyllanthus gunnii</i>		C	-	Native	
Phyllanthaceae	<i>Phyllanthus virgatus</i>	twiggy phyllantus	C	-	Native	
Phytolaccaceae	<i>Phytolacca octandra</i>	inkweed	-	-	Non-native	
Picrodendraceae	<i>Petalostigma pubescens</i>	quinine tree	C	-	Native	
Pinaceae	<i>Pinus radiata</i>	radiata pine	-	-	Non-native	
Piperaceae	<i>Peperomia blanda var. floribunda</i>		C	-	Native	

Family	Scientific Name	Common Name	Conservation status		Native/non-native	Restricted matter
			NC Act	EPBC Act		
Pittosporaceae	<i>Bursaria incana</i>		C	-	Native	
Pittosporaceae	<i>Pittosporum angustifolium</i>	gumby gumby	C	-	Native	
Pittosporaceae	<i>Pittosporum revolutum</i>	yellow pittosporum	C	-	Native	
Pittosporaceae	<i>Pittosporum undulatum</i>	sweet pittosporum	C	-	Native	
Plantaginaceae	<i>Plantago lanceolata</i>		-	-	Non-native	
Poaceae	<i>Ancistrachne uncinulata</i>	hooky grass	C	-	Native	
Poaceae	<i>Aristida benthamii</i> var. <i>benthamii</i>		C	-	Native	
Poaceae	<i>Aristida calycina</i>		C	-	Native	
Poaceae	<i>Aristida caput-medusae</i>		C	-	Native	
Poaceae	<i>Aristida jerichoensis</i>	speargrass	C	-	Native	
Poaceae	<i>Aristida queenslandica</i>		C	-	Native	
Poaceae	<i>Aristida ramosa</i>	purple wiregrass	C	-	Native	
Poaceae	<i>Aristida vagans</i>		C	-	Native	
Poaceae	<i>Austrostipa aristiglumis</i>	plains grass	C	-	Native	
Poaceae	<i>Austrostipa pubescens</i>	tall speargrass	C	-	Native	
Poaceae	<i>Austrostipa ramosissima</i>	bamboo grass	C	-	Native	
Poaceae	<i>Austrostipa verticillata</i>	slender bamboo grass	C	-	Native	
Poaceae	<i>Avena fatua</i>	wild oats	-	-	Non-native	
Poaceae	<i>Bothriochloa bladhii</i>		C	-	Native	
Poaceae	<i>Bothriochloa decipiens</i>		C	-	Native	
Poaceae	<i>Bothriochloa pertusa</i>		-	-	Non-native	
Poaceae	<i>Brachyachne convergens</i>	Native couch	C	-	Native	
Poaceae	<i>Briza maxima</i>	quaking grass	-	-	Non-native	
Poaceae	<i>Bromus catharticus</i>	prairie grass	-	-	Non-native	
Poaceae	<i>Capillipedium spicigerum</i>	spicytop	C	-	Native	
Poaceae	<i>Chloris gayana</i>	rhodes grass	-	-	Non-native	
Poaceae	<i>Chloris truncata</i>		C	-	Native	
Poaceae	<i>Chloris ventricosa</i>	tall chloris	C	-	Native	
Poaceae	<i>Chloris virgata</i>	feathertop rhodes grass	-	-	Non-native	
Poaceae	<i>Cymbopogon refractus</i>	barbed-wire grass	C	-	Native	
Poaceae	<i>Cynodon dactylon</i>		-	-	Non-native	
Poaceae	<i>Dichanthium sericeum</i>		C	-	Native	
Poaceae	<i>Digitaria ammophila</i>	silky umbrella grass	C	-	Native	
Poaceae	<i>Digitaria brownii</i>		C	-	Native	

Family	Scientific Name	Common Name	Conservation status		Native/non-native	Restricted matter
			NC Act	EPBC Act		
Poaceae	<i>Digitaria diffusa</i>		C	-	Native	
Poaceae	<i>Echinochloa colona</i>	awnless barnyard grass	-	-	Non-native	
Poaceae	<i>Echinochloa crus-galli</i>	barnyard grass	-	-	Non-native	
Poaceae	<i>Eleusine indica</i>	crowsfoot grass	-	-	Non-native	
Poaceae	<i>Enneapogon gracilis</i>	slender bottlewashers	C	-	Native	
Poaceae	<i>Enteropogon acicularis</i>	curly windmill grass	C	-	Native	
Poaceae	<i>Entolasia stricta</i>	wiry panic	C	-	Native	
Poaceae	<i>Eragrostis brownii</i>	Brown's lovegrass	C	-	Native	
Poaceae	<i>Eragrostis cilianensis</i>	stink grass	-	-	Non-native	
Poaceae	<i>Eragrostis elongata</i>		C	-	Native	
Poaceae	<i>Eragrostis lacunaria</i>	purple lovegrass	C	-	Native	
Poaceae	<i>Eragrostis leptostachya</i>	tall love grass	C	-	Native	
Poaceae	<i>Eragrostis tenuifolia</i>	elastic grass	-	-	Non-native	
Poaceae	<i>Eremochloa bimaculata</i>	poverty grass	C	-	Native	
Poaceae	<i>Heteropogon contortus</i>	black speargrass	C	-	Native	
Poaceae	<i>Imperata cylindrica</i>	blady grass	C	-	Native	
Poaceae	<i>Lachnagrostis filiformis</i>	blow grass	C	-	Native	
Poaceae	<i>Megathyrsus maximus</i>		-	-	Non-native	
Poaceae	<i>Megathyrsus maximus</i> var. <i>maximus</i>	guinea grass	-	-	Non-native	
Poaceae	<i>Megathyrsus maximus</i> var. <i>pubiglumis</i>	green panic	-	-	Non-native	
Poaceae	<i>Melinis repens</i>	red natal grass	-	-	Non-native	
Poaceae	<i>Oplismenus aemulus</i>	creeping shade grass	C	-	Native	
Poaceae	<i>Panicum effusum</i>		C	-	Native	
Poaceae	<i>Panicum queenslandicum</i> var. <i>queenslandicum</i>		C	-	Native	
Poaceae	<i>Panicum simile</i>		C	-	Native	
Poaceae	<i>Paspalidium caespitosum</i>	brigalow grass	C	-	Native	
Poaceae	<i>Paspalidium distans</i>	shotgrass	C	-	Native	
Poaceae	<i>Paspalum dilatatum</i>	paspalum	-	-	Non-native	
Poaceae	<i>Paspalum distichum</i>	knotgrass	C	-	Native	
Poaceae	<i>Phragmites australis</i>	common reed	C	-	Native	
Poaceae	<i>Poa annua</i>	annual poa	-	-	Non-native	
Poaceae	<i>Setaria sphacelata</i>	pigeon grass	-	-	Non-native	

Family	Scientific Name	Common Name	Conservation status		Native/non-native	Restricted matter
			NC Act	EPBC Act		
Poaceae	<i>Setaria surgens</i>	annual setaria	C	-	Native	
Poaceae	<i>Setaria verticillata</i>	whorled pigeon grass	-	-	Non-native	
Poaceae	<i>Sorghum halepense</i>	Johnson grass	-	-	Non-native	
Poaceae	<i>Sporobolus africanus</i>	Parramatta grass	-	-	Non-native	
Poaceae	<i>Sporobolus caroli</i>	Fairy grass	C	-	Native	
Poaceae	<i>Sporobolus creber</i>	Native rats-tail grass	C	-	Native	
Poaceae	<i>Stenotaphrum secundatum</i>	buffalo grass	-	-	Non-native	
Poaceae	<i>Themeda triandra</i>	kangaroo grass	C	-	Native	
Poaceae	<i>Triticum aestivum</i>	wheat	-	-	Non-native	
Poaceae	<i>Urochloa decumbens</i>	signal grass	-	-	Non-native	
Poaceae	<i>Urochloa mosambicensis</i>	sabi grass	-	-	Non-native	
Poaceae	<i>Urochloa mutica</i>		-	-	Non-native	
Polygonaceae	<i>Persicaria attenuata</i>	smart weed	C	-	Native	
Polygonaceae	<i>Persicaria lapathifolia</i>	pale knotweed	C	-	Native	
Polygonaceae	<i>Persicaria orientalis</i>	princes feathers	C	-	Native	
Polygonaceae	<i>Rumex brownii</i>	swamp dock	C	-	Native	
Polypodiaceae	<i>Platyterium bifurcatum</i>		SLC	-	Native	
Polypodiaceae	<i>Pyrrosia rupestris</i>	rock felt fern	C	-	Native	
Portulacaceae	<i>Portulaca oleracea</i>	pigweed	-	-	Non-native	
Portulacaceae	<i>Portulaca pilosa</i>		-	-	Non-native	
Potamogetonaceae	<i>Potamogeton crispus</i>	curly pondweed	SLC	-	Native	
Potamogetonaceae	<i>Potamogeton ochreatus</i>	blunt pondweed	SLC	-	Native	
Proteaceae	<i>Grevillea banksii</i>		C	-	Native	
Proteaceae	<i>Grevillea robusta</i>		C	-	Native	
Proteaceae	<i>Persoonia sericea</i>	silky geebung	C	-	Native	
Proteaceae	<i>Xylomelum benthamii</i>	woody pear	C	-	Native	
Psilotaceae	<i>Psilotum nudum</i>	skeleton fork fern	C	-	Native	
Pteridaceae	<i>Adiantum hispidulum</i>		C	-	Native	
Pteridaceae	<i>Cheilanthes distans</i>	bristly cloak fern	C	-	Native	
Pteridaceae	<i>Cheilanthes sieberi</i>		C	-	Native	
Rhamnaceae	<i>Alphitonia excelsa</i>	soap tree	C	-	Native	
Rosaceae	<i>Rubus parvifolius</i>	pink-flowered native raspberry	C	-	Native	
Rubiaceae	<i>Asperula conferta</i>		C	-	Native	
Rubiaceae	<i>Pomax umbellata</i>		C	-	Native	

Family	Scientific Name	Common Name	Conservation status		Native/non-native	Restricted matter
			NC Act	EPBC Act		
Rubiaceae	<i>Psydrax odorata</i>	hat stand	C	-	Native	
Rubiaceae	<i>Richardia brasiliensis</i>	white eye	-	-	Non-native	
Rutaceae	<i>Acronychia oblongifolia</i>	common acronychia	C	-	Native	
Rutaceae	<i>Flindersia australis</i>	crow's ash	C	-	Native	
Rutaceae	<i>Flindersia xanthoxyla</i>	yellow-wood	C	-	Native	
Rutaceae	<i>Geijera salicifolia</i>	brush wilga	C	-	Native	
Salviniaceae	<i>Azolla pinnata</i>	ferny azolla	C	-	Native	
Santalaceae	<i>Exocarpos cupressiformis</i>	native cherry	C	-	Native	
Sapindaceae	<i>Alectryon connatus</i>	grey birds-eye	C	-	Native	
Sapindaceae	<i>Alectryon diversifolius</i>	scrub boonaree	C	-	Native	
Sapindaceae	<i>Alectryon oleifolius</i>	boonaree	C	-	Native	
Sapindaceae	<i>Cardiospermum grandiflorum</i>	heart seed vine	-	-	Non-native	
Sapindaceae	<i>Dodonaea triquetra</i>	large-leaved hop bush	C	-	Native	
Sapindaceae	<i>Dodonaea viscosa</i>		C	-	Native	
Sapindaceae	<i>Harpullia pendula</i>		C	-	Native	
Scrophulariaceae	<i>Eremophila debilis</i>	winter apple	C	-	Native	
Scrophulariaceae	<i>Myoporum acuminatum</i>	coastal boobialla	C	-	Native	
Scrophulariaceae	<i>Verbascum virgatum</i>	twiggy mullein	-	-	Non-native	
Smilacaceae	<i>Smilax australis</i>	barbed-wire vine	C	-	Native	
Solanaceae	<i>Datura stramonium</i>	common thornapple	-	-	Non-native	
Solanaceae	<i>Solanum mauritianum</i>	wild tobacco	-	-	Non-native	
Solanaceae	<i>Solanum nigrum</i>	black nightshade	-	-	Non-native	
Solanaceae	<i>Solanum seaforthianum</i>	Brazilian nightshade	-	-	Non-native	
Solanaceae	<i>Solanum stelligerum</i>	devil's needles	C	-	Native	
Sparrmanniaceae	<i>Grewia latifolia</i>	dysentery plant	C	-	Native	
Stackhousiaceae	<i>Stackhousia viminea</i>	slender stackhousia	C	-	Native	
Sterculiaceae	<i>Brachychiton acerifolius</i>	flame tree	SLC	-	Native	
Sterculiaceae	<i>Brachychiton discolor</i>		SLC	-	Native	
Sterculiaceae	<i>Brachychiton populneus</i>		SLC	-	Native	
Tectariaceae	<i>Arthropteris tenella</i>	climbing fern	C	-	Native	
Thymelaeaceae	<i>Pimelea neoanglica</i>	poison pimelea	C	-	Native	
Typhaceae	<i>Typha orientalis</i>	Cumbungi	C	-	Native	
Ulmaceae	<i>Celtis sinensis</i>	Chinese elm	-	-	Non-native	Class 3
Ulmaceae	<i>Trema tomentosa</i>		C	-	Native	
Urticaceae	<i>Urtica incisa</i>	stinging nettle	C	-	Native	

Family	Scientific Name	Common Name	Conservation status		Native/non-native	Restricted matter
			NC Act	EPBC Act		
Verbenaceae	<i>Glandularia aristigera</i>	Mayne's curse	-	-	Non-native	
Verbenaceae	<i>Lantana camara</i>	lantana	-	-	Non-native	Class 3
Verbenaceae	<i>Lantana montevidensis</i>	creeping lantana	-	-	Non-native	Class 3
Verbenaceae	<i>Phyla canescens</i>	lippia	-	-	Non-native	
Verbenaceae	<i>Verbena bonariensis</i>	purpletop	-	-	Non-native	
Verbenaceae	<i>Verbena litoralis</i>	Verbena	-	-	Non-native	
Verbenaceae	<i>Verbena rigida</i>		-	-	Non-native	
Violaceae	<i>Hybanthus monopetalus</i>		C	-	Native	
Vitaceae	<i>Cayratia clematidea</i>	slender grape	C	-	Native	
Vitaceae	<i>Cissus antarctica</i>		C	-	Native	
Vitaceae	<i>Cissus hypoglauca</i>		C	-	Native	
Zingiberaceae	<i>Alpinia caerulea</i>	wild ginger	C	-	Native	

APPENDIX



Terrestrial and Aquatic Ecology Technical Report

Appendix E Fauna Species List

HELIDON TO CALVERT ENVIRONMENTAL IMPACT STATEMENT

Family	Scientific Name	Common Name	Conservation status		Native/Non-native	Restricted matter
			NC Act	EPBC Act		
Acanthizidae	<i>Acanthiza chrysorrhoa</i>	yellow-rumped thornbill	C	-	Native	
Acanthizidae	<i>Acanthiza reguloides</i>	buff-rumped thornbill	C	-	Native	
Acanthizidae	<i>Gerygone olivacea</i>	white-throated gerygone	C	-	Native	
Acanthizidae	<i>Smicrornis brevirostris</i>	weebill	C	-	Native	
Accipitridae	<i>Aquila audax</i>	wedge-tailed eagle	C	-	Native	
Accipitridae	<i>Aviceda subcristata</i>	Pacific baza	C	-	Native	
Accipitridae	<i>Elanus axillaris</i>	black-shouldered kite	C	-	Native	
Accipitridae	<i>Haliastur sphenurus</i>	whistling kite	C	-	Native	
Accipitridae	<i>Milvus migrans</i>	black kite	C	-	Native	
Agamidae	<i>Diporiphora australis</i>	tommy roundhead	C	-	Native	
Agamidae	<i>Intellagama lesueurii</i>	eastern water dragon	C	-	Native	
Agamidae	<i>Pogona barbata</i>	bearded dragon	C	-	Native	
Alcedinidae	<i>Ceyx azureus</i>	azure kingfisher	C	-	Native	
Anatidae	<i>Anas castanea</i>	chestnut teal	C	-	Native	
Anatidae	<i>Anas gracilis</i>	grey teal	C	-	Native	
Anatidae	<i>Anas superciliosa</i>	Pacific black duck	C	-	Native	
Anatidae	<i>Aythya australis</i>	hardhead	C	-	Native	
Anatidae	<i>Biziura lobata</i>	musk duck	C	-	Native	
Anatidae	<i>Chenonetta jubata</i>	Australian wood duck	C	-	Native	
Anatidae	<i>Cygnus atratus</i>	black swan	C	-	Native	
Anatidae	<i>Dendrocygna eytoni</i>	plumed whistling-duck	C	-	Native	
Anatidae	<i>Oxyura australis</i>	blue-billed duck	C	-	Native	
Anhingidae	<i>Anhinga novaehollandiae</i>	Australasian darter	C	-	Native	
Anseranatidae	<i>Anseranas semipalmata</i>	magpie goose	C	-	Native	
Ardeidae	<i>Ardea alba modesta</i>	eastern great egret	C	-	Native	
Ardeidae	<i>Ardea intermedia</i>	intermediate egret	C	-	Native	
Ardeidae	<i>Bubulcus ibis</i>	cattle egret	C	-	Native	
Ardeidae	<i>Egretta garzetta</i>	little egret	C	-	Native	
Ardeidae	<i>Egretta novaehollandiae</i>	white-faced heron	C	-	Native	
Artamidae	<i>Artamus leucorhynchus</i>	white-breasted woodswallow	C	-	Native	
Artamidae	<i>Cracticus nigrogularis</i>	pied butcherbird	C	-	Native	
Artamidae	<i>Cracticus tibicen</i>	Australian magpie	C	-	Native	
Artamidae	<i>Cracticus torquatus</i>	grey butcherbird	C	-	Native	
Artamidae	<i>Strepera graculina</i>	pied currawong	C	-	Native	

Family	Scientific Name	Common Name	Conservation status		Native/Non-native	Restricted matter
			NC Act	EPBC Act		
Boidae	<i>Morelia spilota</i>	carpet python	C	-	Native	
Bovidae	<i>Bos taurus</i>	European cattle	-	-	Non-native	
Bovidae	<i>Capra hircus</i>	Feral goat	-	-	Non-native	Class 3
Bufo	<i>Rhinella marina</i>	cane toad	-	-	Non-native	
Cacatuidae	<i>Cacatua galerita</i>	sulphur-crested cockatoo	C	-	Native	
Cacatuidae	<i>Cacatua sanguinea</i>	little corella	C	-	Native	
Cacatuidae	<i>Eolophus roseicapilla</i>	galah	C	-	Native	
Cacatuidae	<i>Nymphicus hollandicus</i>	cockatiel	C	-	Native	
Campephagidae	<i>Coracina lineata</i>	barred cuckoo-shrike	C	-	Native	
Campephagidae	<i>Coracina novaehollandiae</i>	black-faced cuckoo-shrike	C	-	Native	
Campephagidae	<i>Lalage leucomela</i>	varied triller	C	-	Native	
Canidae	<i>Canis lupus familiaris</i>	Wild dog	-	-	Non-native	Class 3
Charadriidae	<i>Vanellus miles</i>	masked lapwing	C	-	Native	
Chelidae	<i>Emydura macquarii macquarii</i>	Murray turtle	C	-	Native	
Cisticolidae	<i>Cisticola exilis</i>	golden-headed cisticola	C	-	Native	
Columbidae	<i>Columba livia</i>	rock dove	-	-	Non-native	
Columbidae	<i>Geopelia humeralis</i>	bar-shouldered dove	C	-	Native	
Columbidae	<i>Geopelia striata</i>	peaceful dove	C	-	Native	
Columbidae	<i>Macropygia amboinensis</i>	brown cuckoo-dove	C	-	Native	
Columbidae	<i>Ocyphaps lophotes</i>	crested pigeon	C	-	Native	
Columbidae	<i>Phaps chalcoptera</i>	common bronzewing	C	-	Native	
Columbidae	<i>Streptopelia chinensis</i>	spotted dove	-	-	Non-native	
Corcoracidae	<i>Corcorax melanorhamphos</i>	white-winged chough	C	-	Native	
Corvidae	<i>Corvus coronoides</i>	Australian raven	C	-	Native	
Corvidae	<i>Corvus orru</i>	Torresian crow	C	-	Native	
Cuculidae	<i>Cacomantis flabelliformis</i>	fan-tailed cuckoo	C	-	Native	
Cuculidae	<i>Centropus phasianinus</i>	pheasant coucal	C	-	Native	
Cuculidae	<i>Scythrops novaehollandiae</i>	channel-billed cuckoo	C	-	Native	
Elapidae	<i>Pseudechis porphyriacus</i>	red-bellied black snake	C	-	Native	
Elapidae	<i>Pseudonaja textilis</i>	eastern brown snake	C	-	Native	
Emballonuridae	<i>Saccolimus flaviventris</i>	yellow-bellied sheath-tail bat	C	-	Native	
Equidae	<i>Equus caballus</i>	horse	-	-	Non-native	
Estrildidae	<i>Neochmia temporalis</i>	red-browed finch	C	-	Native	
Estrildidae	<i>Taeniopygia bichenovii</i>	double-barred finch	C	-	Native	

Family	Scientific Name	Common Name	Conservation status		Native/Non-native	Restricted matter
			NC Act	EPBC Act		
Falconidae	<i>Falco berigora</i>	brown falcon	C	-	Native	
Falconidae	<i>Falco cenchroides</i>	nankeen kestrel	C	-	Native	
Falconidae	<i>Falco hypoleucos</i>	grey falcon	V	-	Native	
Falconidae	<i>Falco longipennis</i>	Australian hobby	C	-	Native	
Felidae	<i>Felis catus</i>	feral cat	-	-	Non-native	Class 3
Halcyonidae	<i>Dacelo novaeguineae</i>	laughing kookaburra	C	-	Native	
Halcyonidae	<i>Todiramphus macleayii</i>	forest kingfisher	C	-	Native	
Halcyonidae	<i>Todiramphus sanctus</i>	sacred kingfisher	C	-	Native	
Hirundinidae	<i>Hirundo neoxena</i>	welcome swallow	C	-	Native	
Hirundinidae	<i>Petrochelidon ariel</i>	fairy martin	C	-	Native	
Hylidae	<i>Litoria caerulea</i>	common green treefrog	C	-	Native	
Hylidae	<i>Litoria fallax</i>	eastern sedgefrog	C	-	Native	
Leporidae	<i>Lepus europaeus</i>	European brown hare	-	-	Non-native	
Leporidae	<i>Oryctolagus cuniculus</i>	rabbit	-	-	Non-native	Class 3
Limnodynastidae	<i>Limnodynastes peronii</i>	striped marshfrog	C	-	Native	
Macropodidae	<i>Macropus dorsalis</i>	black-striped wallaby	C	-	Native	
Macropodidae	<i>Macropus giganteus</i>	eastern grey kangaroo	C	-	Native	
Macropodidae	<i>Macropus rufogriseus</i>	red-necked wallaby	C	-	Native	
Maluridae	<i>Malurus cyaneus</i>	superb fairy-wren	C	-	Native	
Maluridae	<i>Malurus lamberti</i>	variegated fairy-wren	C	-	Native	
Maluridae	<i>Malurus melanocephalus</i>	red-backed fairy-wren	C	-	Native	
Megapodiidae	<i>Alectura lathamii</i>	Australian brush-turkey	C	-	Native	
Meliphagidae	<i>Anthochaera carunculata</i>	red wattlebird	C	-	Native	
Meliphagidae	<i>Entomyzon cyanotis</i>	blue-faced honeyeater	C	-	Native	
Meliphagidae	<i>Lichenostomus melanops</i>	yellow-tufted honeyeater	C	-	Native	
Meliphagidae	<i>Lichmera indistincta</i>	brown honeyeater	C	-	Native	
Meliphagidae	<i>Manorina melanocephala</i>	noisy miner	C	-	Native	
Meliphagidae	<i>Meliphaga lewinii</i>	Lewin's honeyeater	C	-	Native	
Meliphagidae	<i>Melithreptus lunatus</i>	white-naped honeyeater	C	-	Native	
Meliphagidae	<i>Myzomela sanguinolenta</i>	scarlet honeyeater	C	-	Native	
Meliphagidae	<i>Philemon corniculatus</i>	noisy friarbird	C	-	Native	
Meropidae	<i>Merops ornatus</i>	rainbow bee-eater	C	-	Native	
Miniopteridae	<i>Miniopterus australis</i>	little bentwing bat	C	-	Native	
Miniopteridae	<i>Miniopterus orianae oceanensis</i>	eastern bentwing bat	C	-	Native	

Family	Scientific Name	Common Name	Conservation status		Native/Non-native	Restricted matter
			NC Act	EPBC Act		
Molossidae	<i>Austronomus australis</i>	white-striped freetail bat	C	-	Native	
Molossidae	<i>Ozimops lumsdenae</i>	Beccari's freetail bat	C	-	Native	
Molossidae	<i>Ozimops norfolkensis</i>	east-coast freetail bat	C	-	Native	
Molossidae	<i>Ozimops ridei</i>	eastern freetail bat	C	-	Native	
Monarchidae	<i>Grallina cyanoleuca</i>	magpie-lark	C	-	Native	
Monarchidae	<i>Monarcha melanopsis</i>	black-faced monarch	SL	M	Native	
Monarchidae	<i>Myiagra rubecula</i>	leadend flycatcher	C	-	Native	
Monarchidae	<i>Symposiachrus trivirgatus</i>	spectacled monarch	SL	M	Native	
Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian pipit	C	-	Native	
Nectariniidae	<i>Dicaeum hirundinaceum</i>	mistletoebird	C	-	Native	
Neosittidae	<i>Daphoenositta chrysoptera</i>	varied sittella	C	-	Native	
Oriolidae	<i>Sphecotheres vieilloti</i>	Australasian figbird	C	-	Native	
Pachycephalidae	<i>Colluricincla harmonica</i>	grey shrike-thrush	C	-	Native	
Pachycephalidae	<i>Pachycephala rufiventris</i>	rufous whistler	C	-	Native	
Pardalotidae	<i>Pardalotus striatus</i>	striated pardalote	C	-	Native	
Passeridae	<i>Passer domesticus</i>	house sparrow	-	-	Non-native	
Pelecanidae	<i>Pelecanus conspicillatus</i>	Australian pelican	C	-	Native	
Peramelidae	<i>Isoodon macrourus</i>	northern brown bandicoot	C	-	Native	
Petroicidae	<i>Eopsaltria australis</i>	eastern yellow robin	C	-	Native	
Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	little pied cormorant	C	-	Native	
Phalacrocoracidae	<i>Phalacrocorax carbo</i>	great cormorant	C	-	Native	
Phalacrocoracidae	<i>Phalacrocorax sulcirostris</i>	little black cormorant	C	-	Native	
Phalangeridae	<i>Trichosurus vulpecula</i>	common brushtail possum	C	-	Native	
Phascolarctidae	<i>Phascolarctos cinereus</i>	koala	V	V	Native	
Podargidae	<i>Podargus strigoides</i>	tawny frogmouth	C	-	Native	
Podicipedidae	<i>Podiceps cristatus</i>	great crested grebe	C	-	Native	
Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian grebe	C	-	Native	
Pomatostomidae	<i>Pomatostomus temporalis</i>	grey-crowned babbler	C	-	Native	
Psittacidae	<i>Parvipsitta pusilla</i>	little lorikeet	C	-	Native	
Psittacidae	<i>Platycercus adscitus</i>	pale-headed rosella	C	-	Native	
Psittacidae	<i>Psephotus haematonotus</i>	red-rumped parrot	C	-	Native	
Psittacidae	<i>Trichoglossus chlorolepidotus</i>	scaly-breasted lorikeet	C	-	Native	
Psittacidae	<i>Trichoglossus haematodus moluccanus</i>	rainbow lorikeet	C	-	Native	
Psophodidae	<i>Psophodes olivaceus</i>	eastern whipbird	C	-	Native	

Family	Scientific Name	Common Name	Conservation status		Native/Non-native	Restricted matter
			NC Act	EPBC Act		
Pteropodidae	<i>Pteropus alecto</i>	black flying-fox	C	-	Native	
Pteropodidae	<i>Pteropus poliocephalus</i>	grey-headed flying-fox	C	V	Native	
Rallidae	<i>Fulica atra</i>	Eurasian coot	C	-	Native	
Rallidae	<i>Gallinula tenebrosa</i>	dusky moorhen	C	-	Native	
Rallidae	<i>Porphyrio melanotus</i>	purple swamphen	C	-	Native	
Rallidae	<i>Porzana fluminea</i>	Australian spotted crane	C	-	Native	
Recurvirostridae	<i>Himantopus himantopus</i>	black-winged stilt	C	-	Native	
Rhinolophidae	<i>Rhinolophus megaphyllus</i>	eastern horseshoe bat	C	-	Native	
Rhipiduridae	<i>Rhipidura albiscapa</i>	grey fantail	C	-	Native	
Rhipiduridae	<i>Rhipidura leucophrys</i>	willie wagtail	C	-	Native	
Scincidae	<i>Carlia pectoralis</i>		C	-	Native	
Scincidae	<i>Carlia vivax</i>	tussock rainbow-skink	C	-	Native	
Scincidae	<i>Cryptoblepharus pulcher pulcher</i>	elegant snake-eyed skink	C	-	Native	
Scincidae	<i>Lampropholis amacula</i>	friendly sunskink	C	-	Native	
Sturnidae	<i>Acridotheres tristis</i>	common myna	-	-	Non-native	
Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna	SL	-	Native	
Threskiornithidae	<i>Platalea flavipes</i>	yellow-billed spoonbill	C	-	Native	
Threskiornithidae	<i>Platalea regia</i>	royal spoonbill	C	-	Native	
Threskiornithidae	<i>Threskiornis molucca</i>	Australian white ibis	C	-	Native	
Threskiornithidae	<i>Threskiornis spinicollis</i>	straw-necked ibis	C	-	Native	
Timaliidae	<i>Zosterops lateralis</i>	silveryeye	C	-	Native	
Varanidae	<i>Varanus gouldii</i>	sand monitor	C	-	Native	
Vespertilionidae	<i>Chalinolobus gouldii</i>	gould's wattled bat	C	-	Native	
Vespertilionidae	<i>Chalinolobus morio</i>	chocolate wattled bat	C	-	Native	
Vespertilionidae	<i>Chalinolobus nigrogriseus</i>	hoary wattled bat	C	-	Native	
Vespertilionidae	<i>Myotis macropus</i>	large-footed myotis	C	-	Native	
Vespertilionidae	<i>Scoteanax ruepellii</i>	greater broad-nosed bat or eastern broad-nosed bat	C	-	Native	
Vespertilionidae	<i>Scotorepens balstoni</i>	inland broad-nosed bat	C	-	Native	
Vespertilionidae	<i>Scotorepens orion</i>	eastern broad-nosed bat	C	-	Native	
Vespertilionidae	<i>Scotorepens sp.</i>	little broad-nosed bat	C	-	Native	
Vespertilionidae	<i>Vespadelus pumilus</i>	eastern forest bat	C	-	Native	
Vespertilionidae	<i>Vespadelus sp.</i>	-	C	-	Native	

APPENDIX

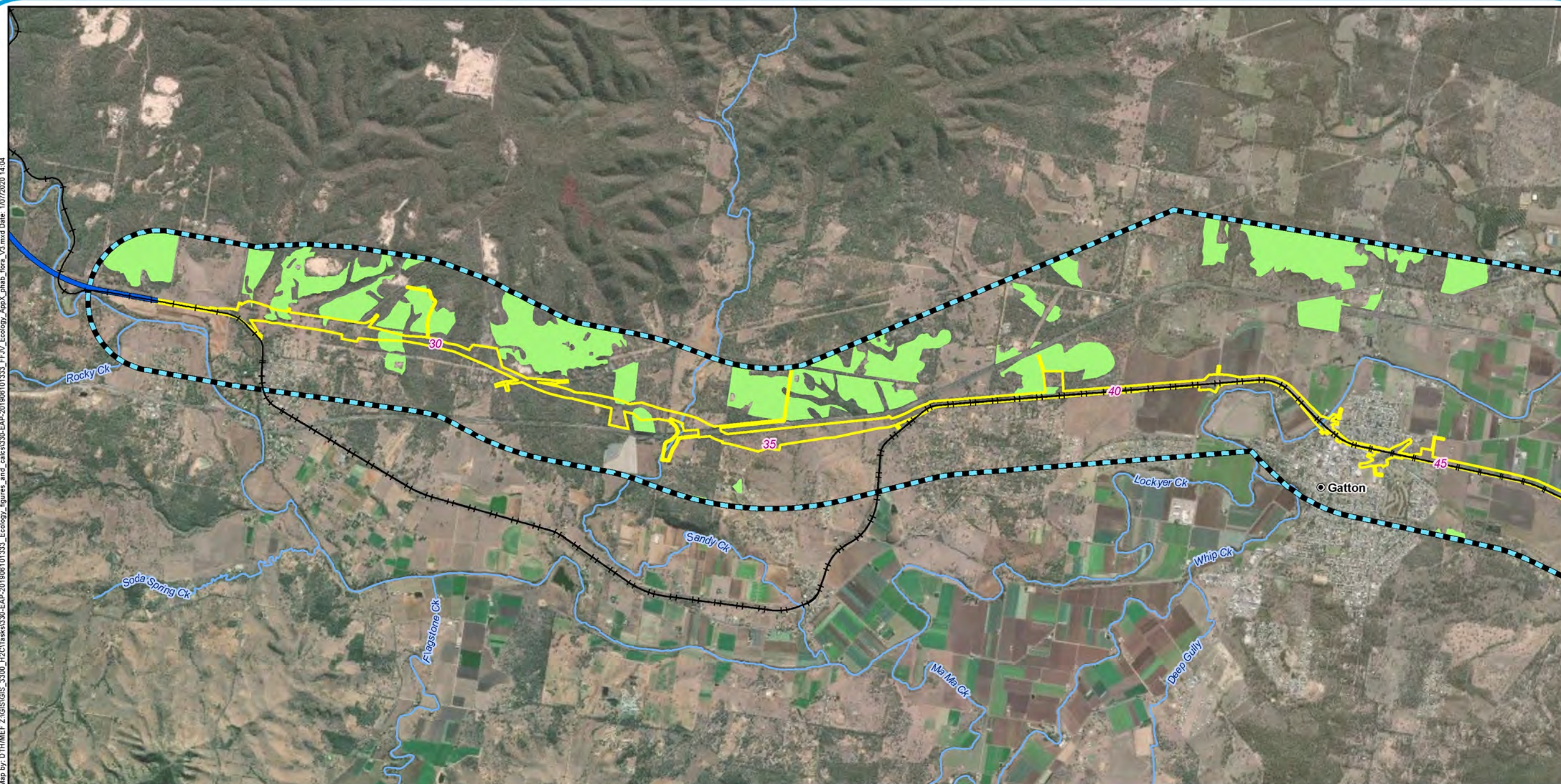


Terrestrial and Aquatic Ecology Technical Report

Appendix F Predictive Habitat Modelling Outputs for Conservation Significant Species

HELIDON TO CALVERT ENVIRONMENTAL IMPACT STATEMENT

Map by: DTH/MEF Z:\GIS\GIS_3300_H2CTask\3300-EAP-201806101333_Ecology_figures_and_calcs\3300-EAP-201806101333_FF_IV_Ecology_AppX_plat flora_V3.mxd Date: 10/07/2020 14:04

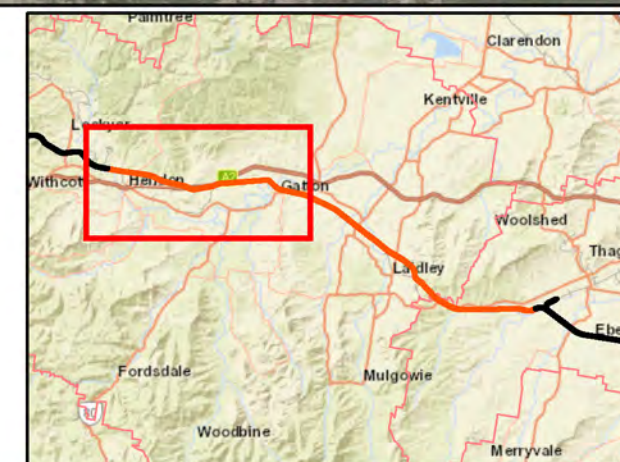


Legend

- Localities
- 5 Chainage (km)
- Railway
- Watercourses
- G2H
- EIS disturbance footprint
- Ecology study area

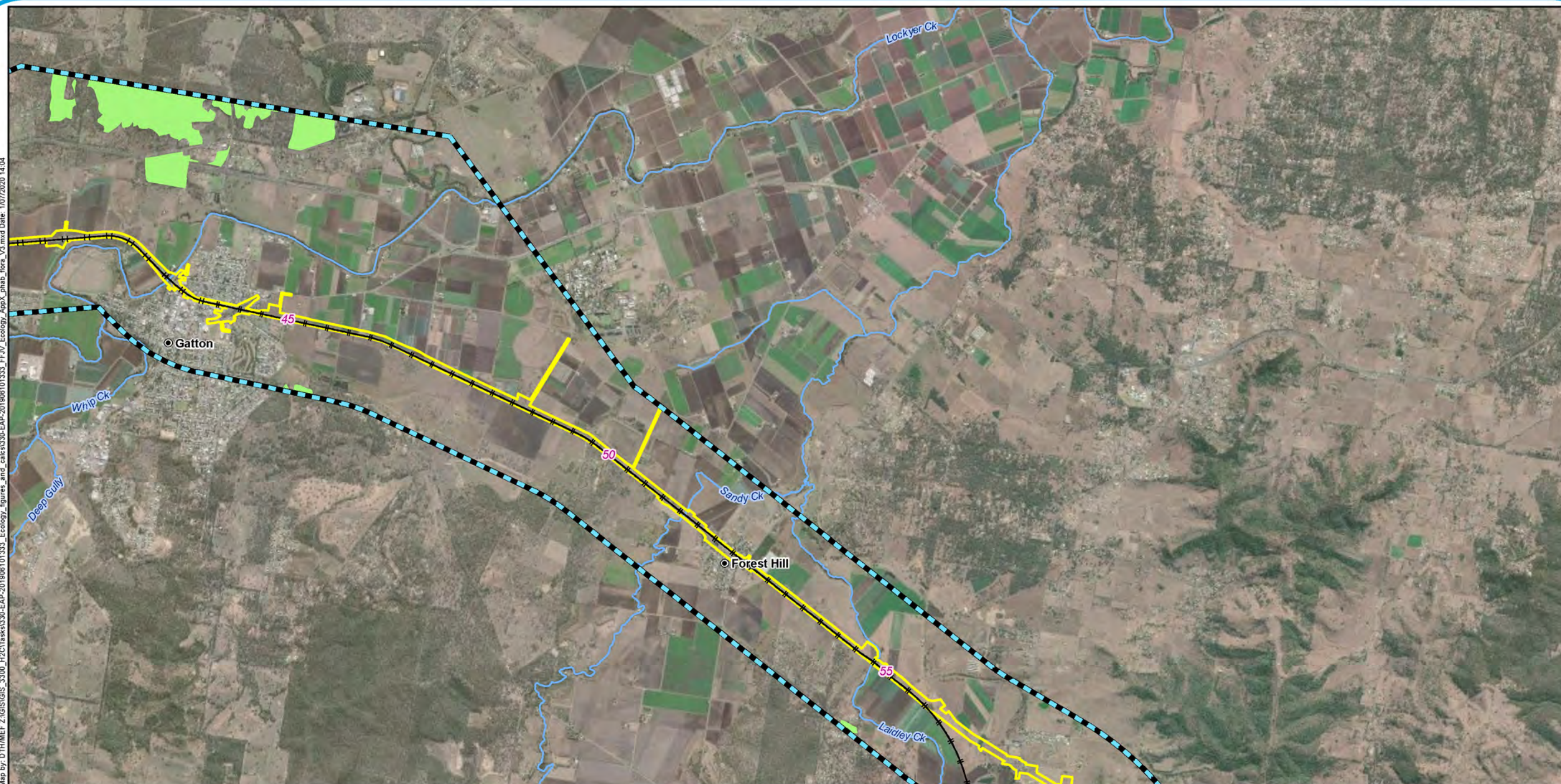
Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.475 0.95 1.9 2.85 3.8 Kilometers

Map by: DTH/MEF Z:\GIS\GIS_3300_H2CTask\3300-EAP-201806101333_Ecology_figures_and_calcs\3300-EAP-201806101333_FF_IV_Ecology_AppX_phab flora_V3.mxd Date: 10/07/2020 14:04

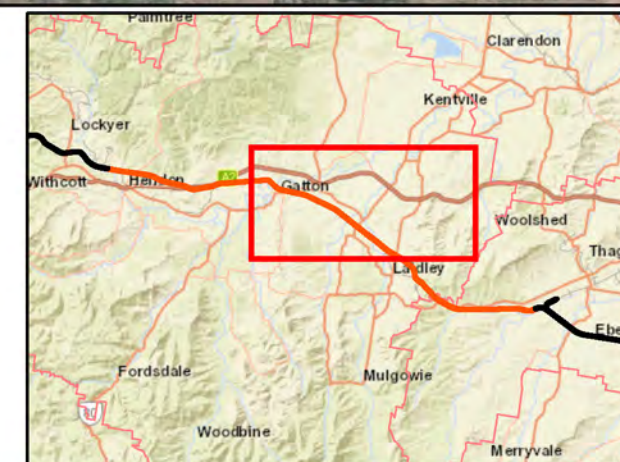


Legend

- Localities
- 5 Chainage (km)
- Railway
- Watercourses
- EIS disturbance footprint
- Ecology study area

Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.475 0.95 1.9 2.85 3.8 Kilometers

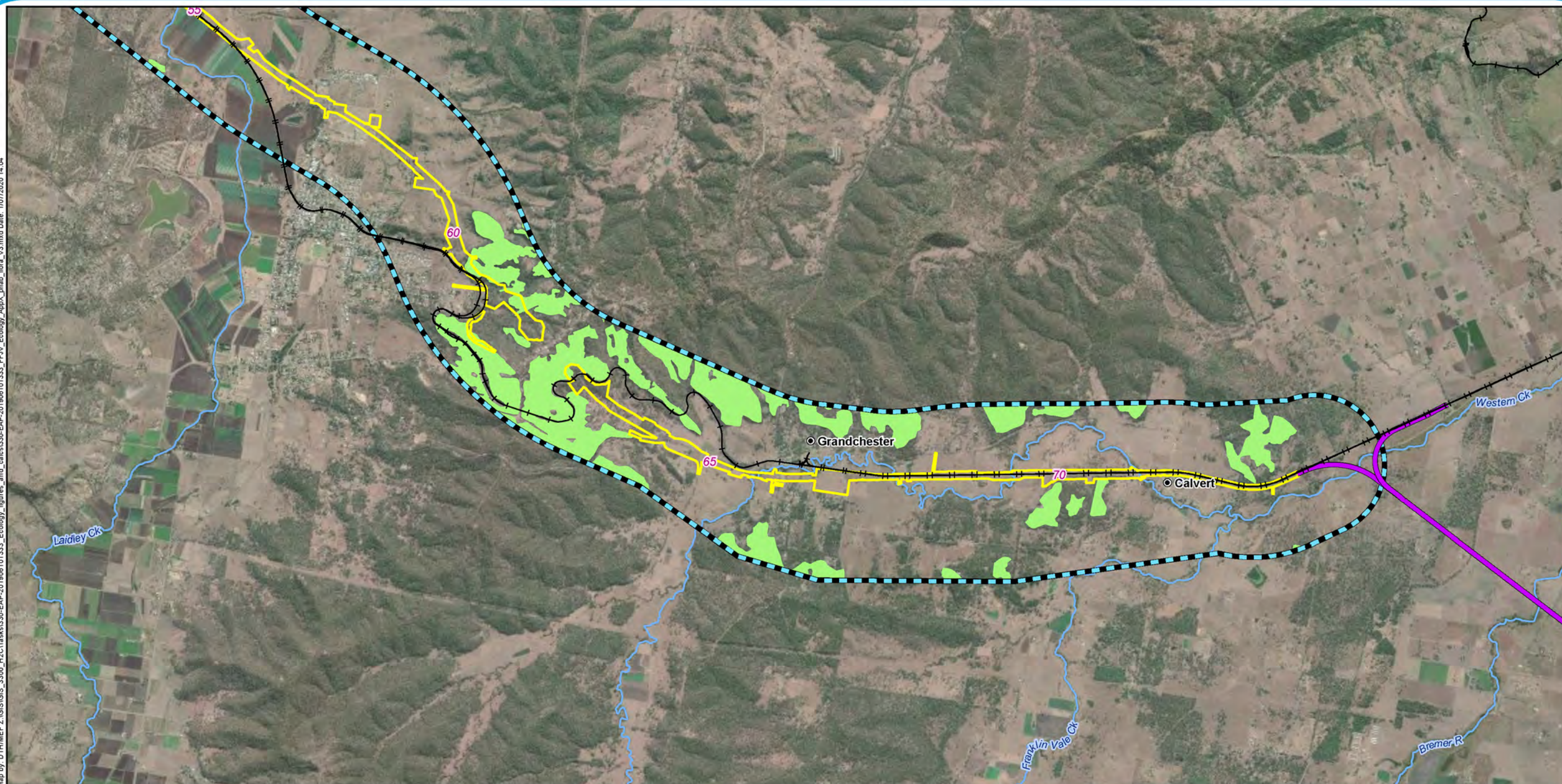


Issue date: 02/09/2019 Version: 3
Coordinate system: MGA56

Helidon to Calvert

Predicted Habitat: *Callitris baileyi* (Bailey's cypress)

Map by: DTH/MEF Z:\GIS\GIS_3300_H2CTask\3300-EAP-201806101333_Ecology_figures_and_calcs\3300-EAP-201806101333_FF_IV_Ecology_AppX_phab flora_V3.mxd Date: 10/07/2020 14:04

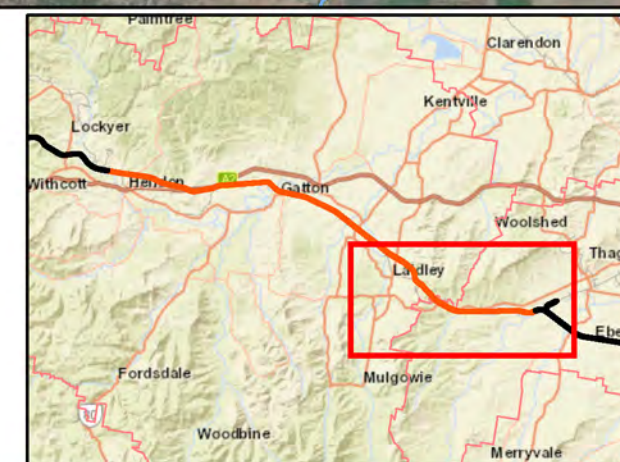


Legend

- Localities
- 5 Chainage (km)
- Railway
- Watercourses
- C2K
- EIS disturbance footprint
- Ecology study area

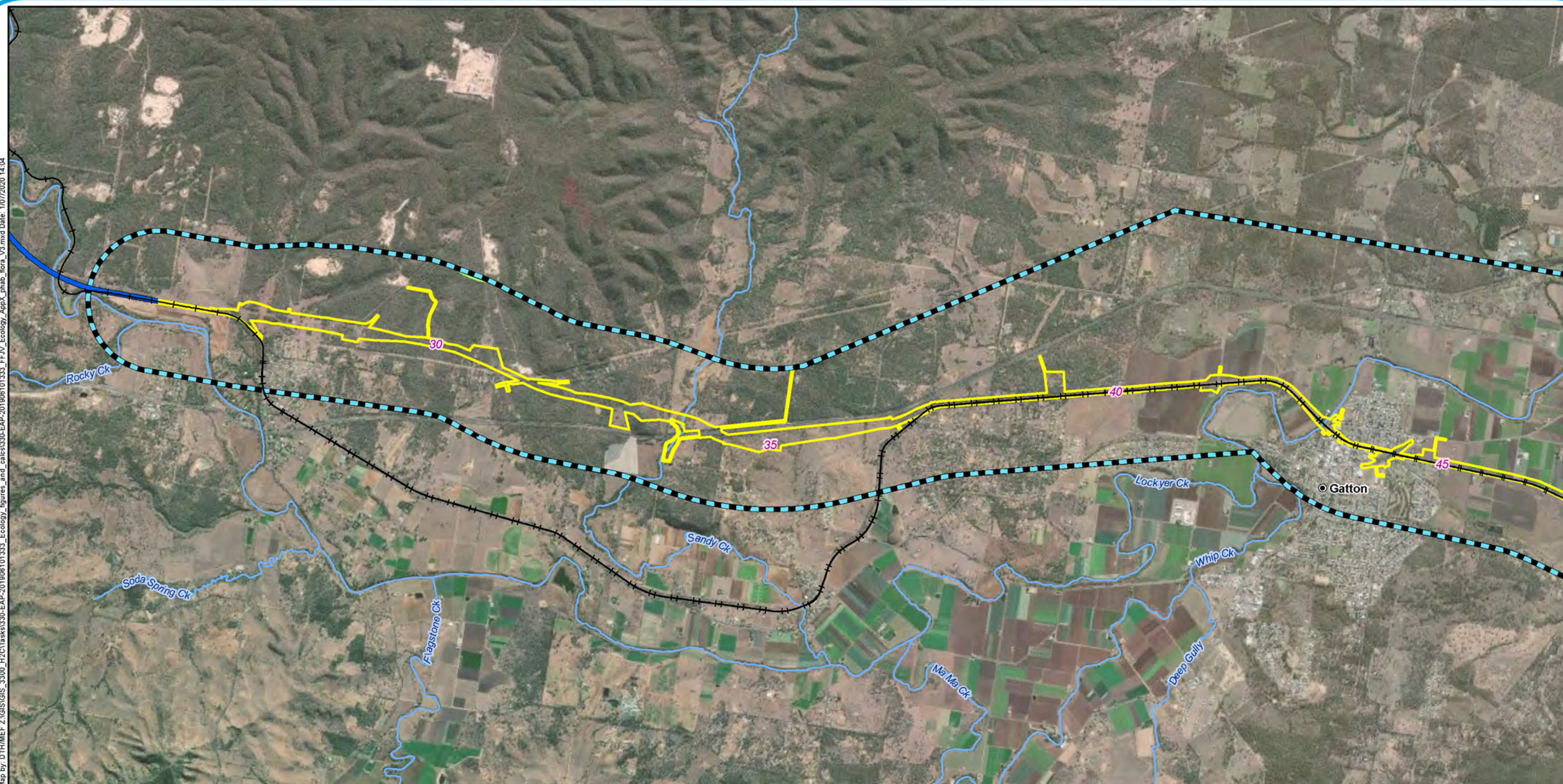
Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.475 0.95 1.9 2.85 3.8 Kilometers

Map by: DTH/MEF Z:\GIS\GIS_3300_H2CTask\3300-EAP-201806101333_Ecology_Figures_and_calcs\3300-EAP-201806101333_FF\IV_Ecology_AppX_plat flora_V3.mxd Date: 10/07/2020 14:04

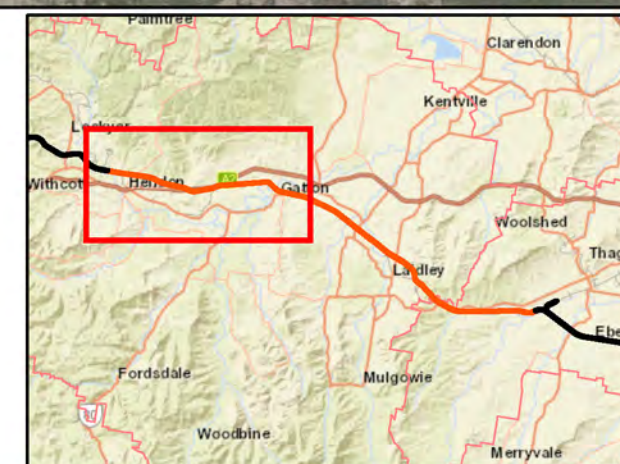


Legend

- Localities
- 5 Chainage (km)
- Railway
- Watercourses
- G2H
- EIS disturbance footprint
- Ecology study area

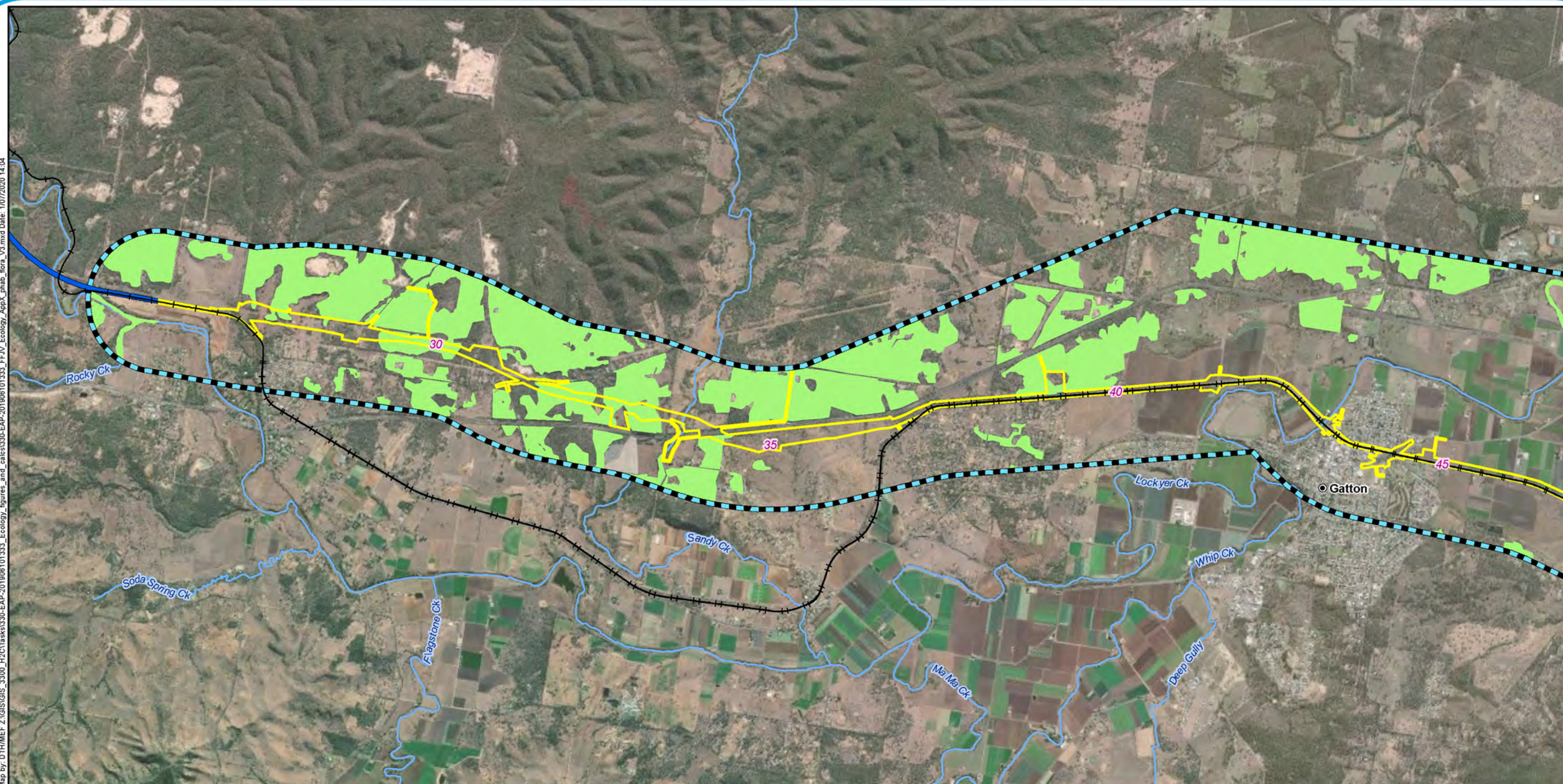
Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.475 0.95 1.9 2.85 3.8 Kilometers

Map by: DTH/MEF Z:\GIS\GIS_3300_H2CTasks\3300-EAP-201806101333_Ecology_figures_and_calcs\3300-EAP-201806101333_FF_IV_Ecology_AppX_phab flora_V3.mxd Date: 10/07/2020 14:04

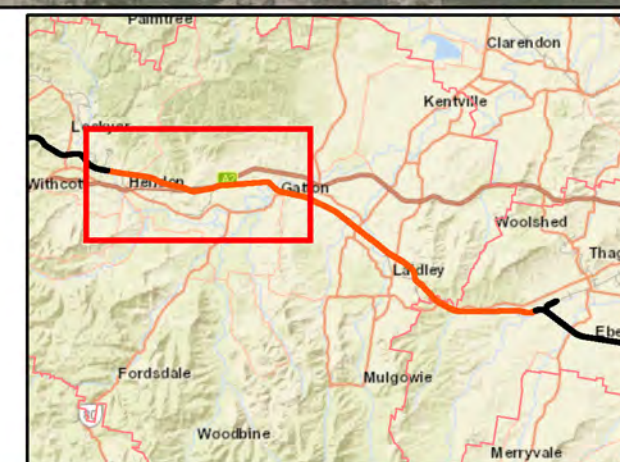


Legend

- Localities
- 5 Chainage (km)
- Railway
- Watercourses
- G2H
- EIS disturbance footprint
- Ecology study area

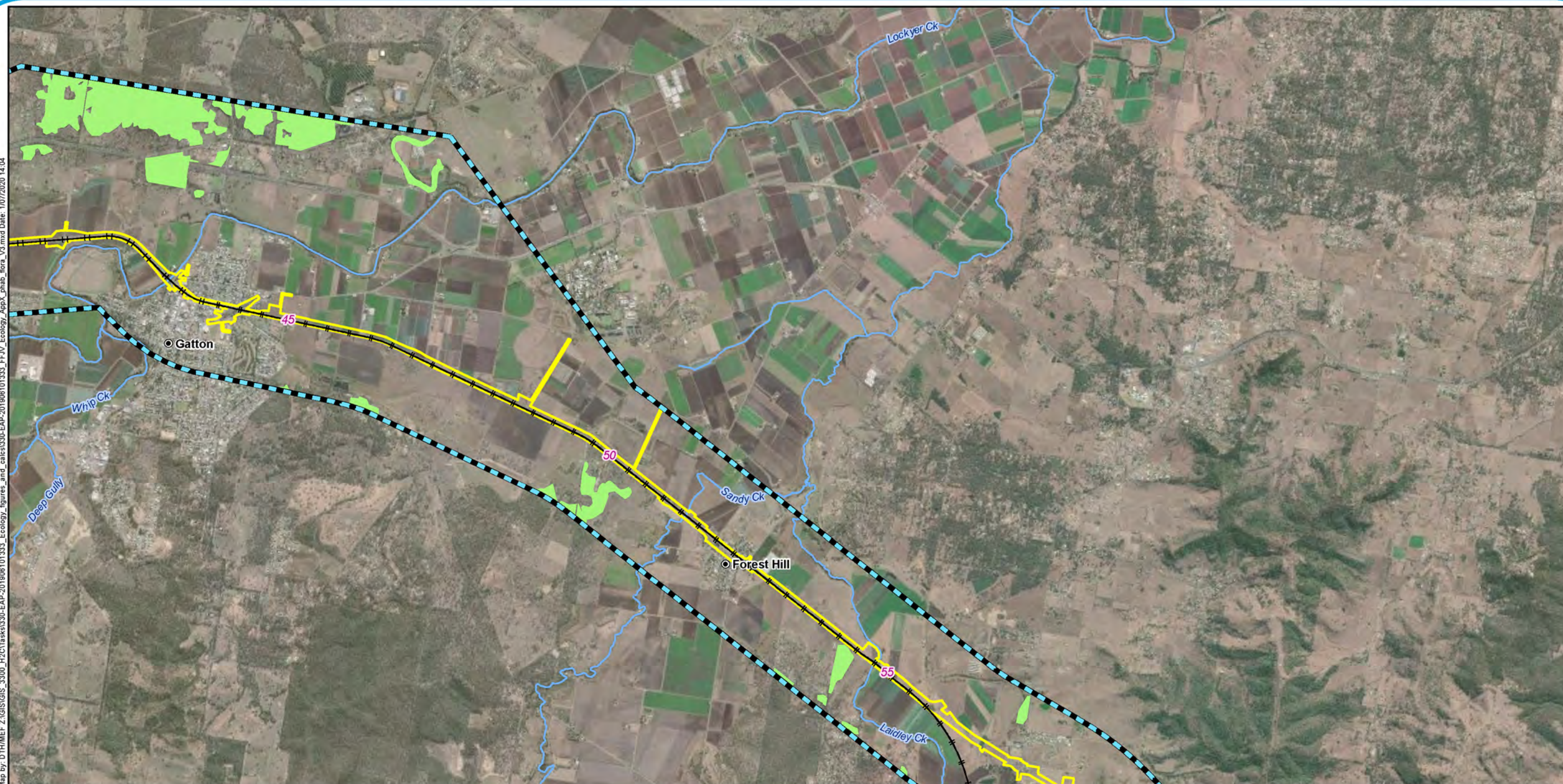
Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.475 0.95 1.9 2.85 3.8 Kilometers

Map by: DTH/MEF Z:\GIS\GIS_3300_H2CTask\3300-EAP-201806101333_Ecology_figures_and_calcs\3300-EAP-201806101333_FF_IV_Ecology_AppX_phab flora_V3.mxd Date: 10/07/2020 14:04

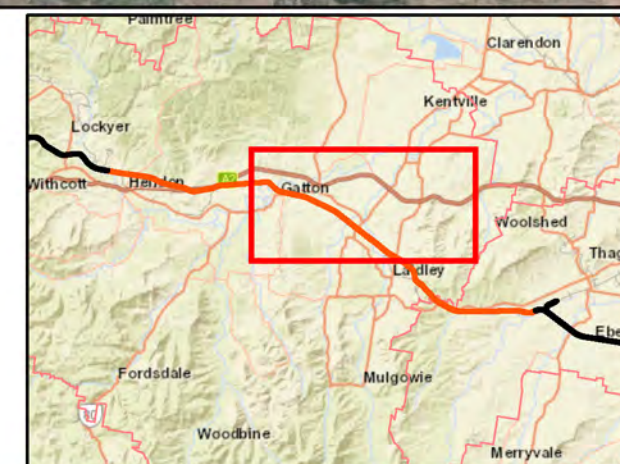


Legend

- Localities
- 5 Chainage (km)
- Railway
- Watercourses
- EIS disturbance footprint
- ▨ Ecology study area

Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.475 0.95 1.9 2.85 3.8 Kilometers

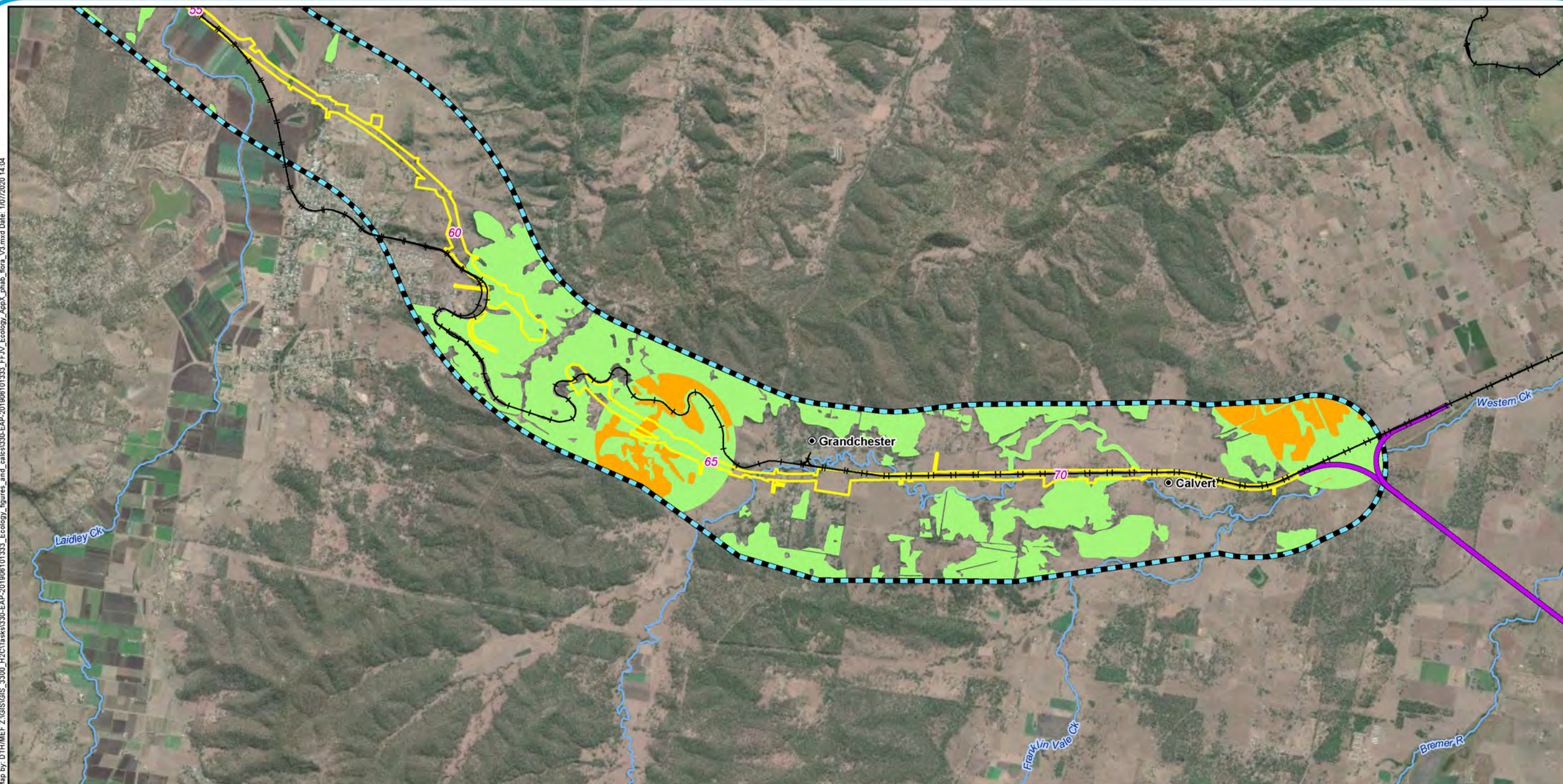


Issue date: 02/09/2019 Version: 3
Coordinate system: MGA56

Helidon to Calvert

Predicted Habitat: *Melaleuca irbyana* (Swamp tea-tree)

Map by: DTH/MEF Z:\GIS\GIS_3300_H2CTask\3300-EAP-201806101333_Ecology_figures_and_calcs\3300-EAP-201806101333_FF_IV_Ecology_AppX_plat flora_V3.mxd Date: 10/07/2020 14:04

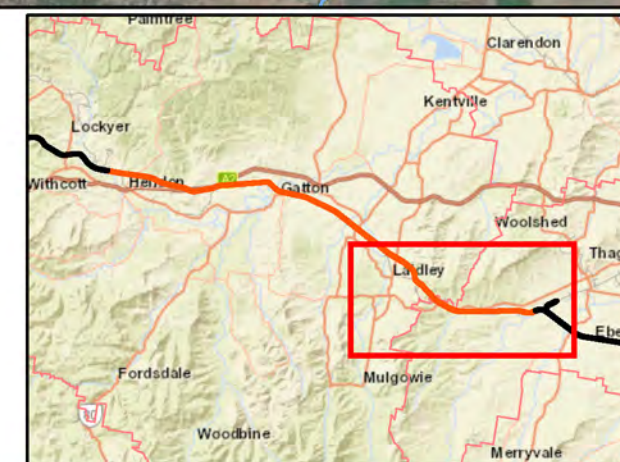


Legend

- Localities
- 5 Chainage (km)
- Railway
- Watercourses
- C2K
- EIS disturbance footprint
- Ecology study area

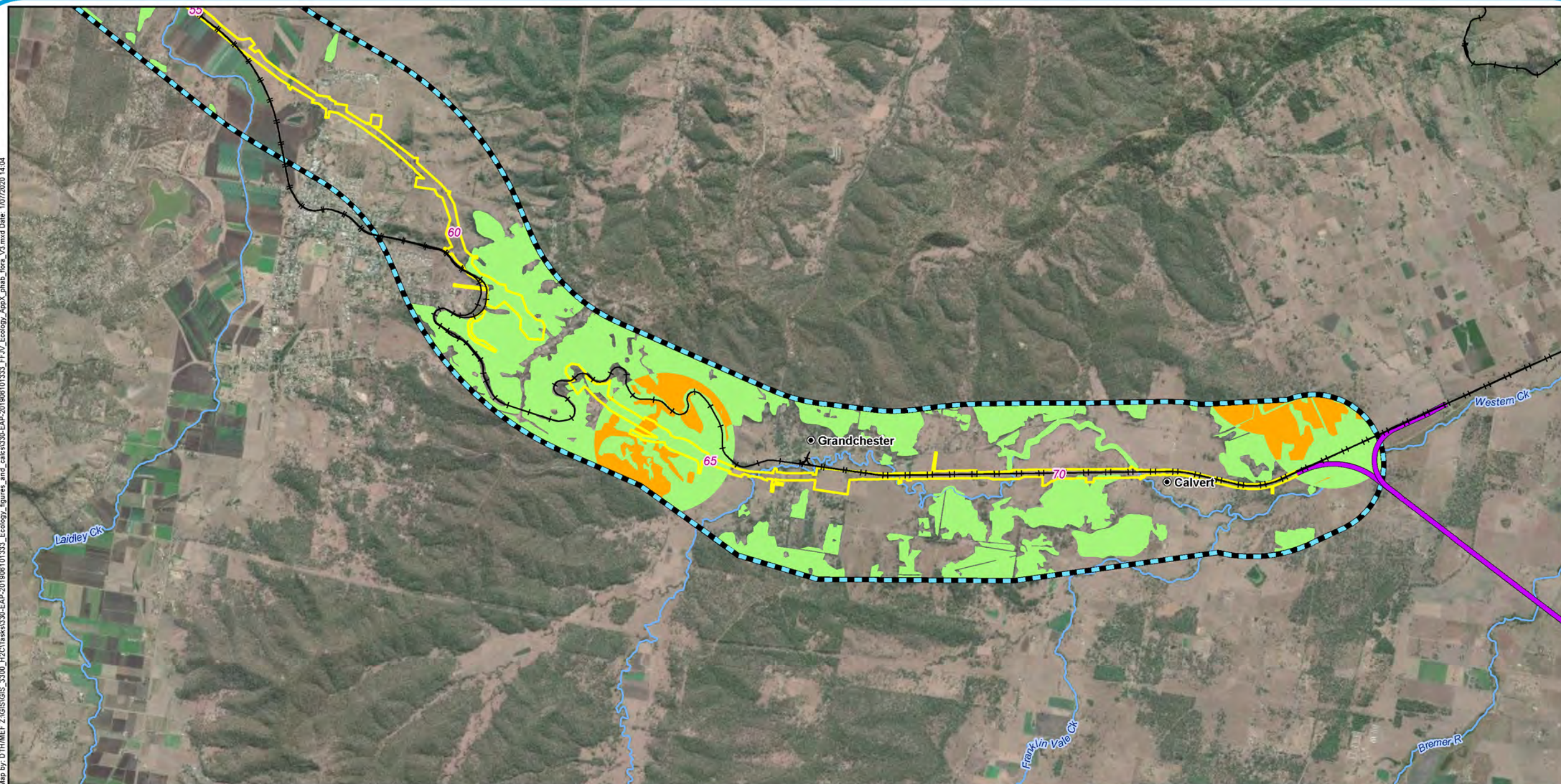
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.475 0.95 1.9 2.85 3.8 Kilometers

Map by: DTH/MEF Z:\GIS\GIS_3300_H2CTask\3300-EAP-201806101333_Ecology_figures_and_calcs\3300-EAP-201806101333_FF_IV_Ecology_AppX_plat_fera_V3.mxd Date: 10/07/2020 14:04

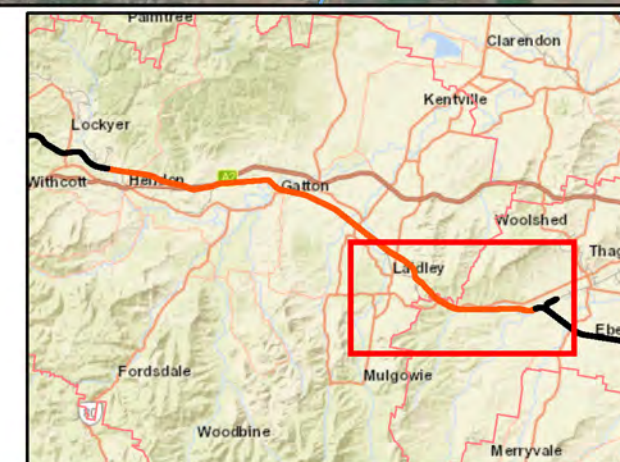


Legend

- Localities
- 5 Chainage (km)
- Railway
- Watercourses
- C2K
- EIS disturbance footprint
- Ecology study area

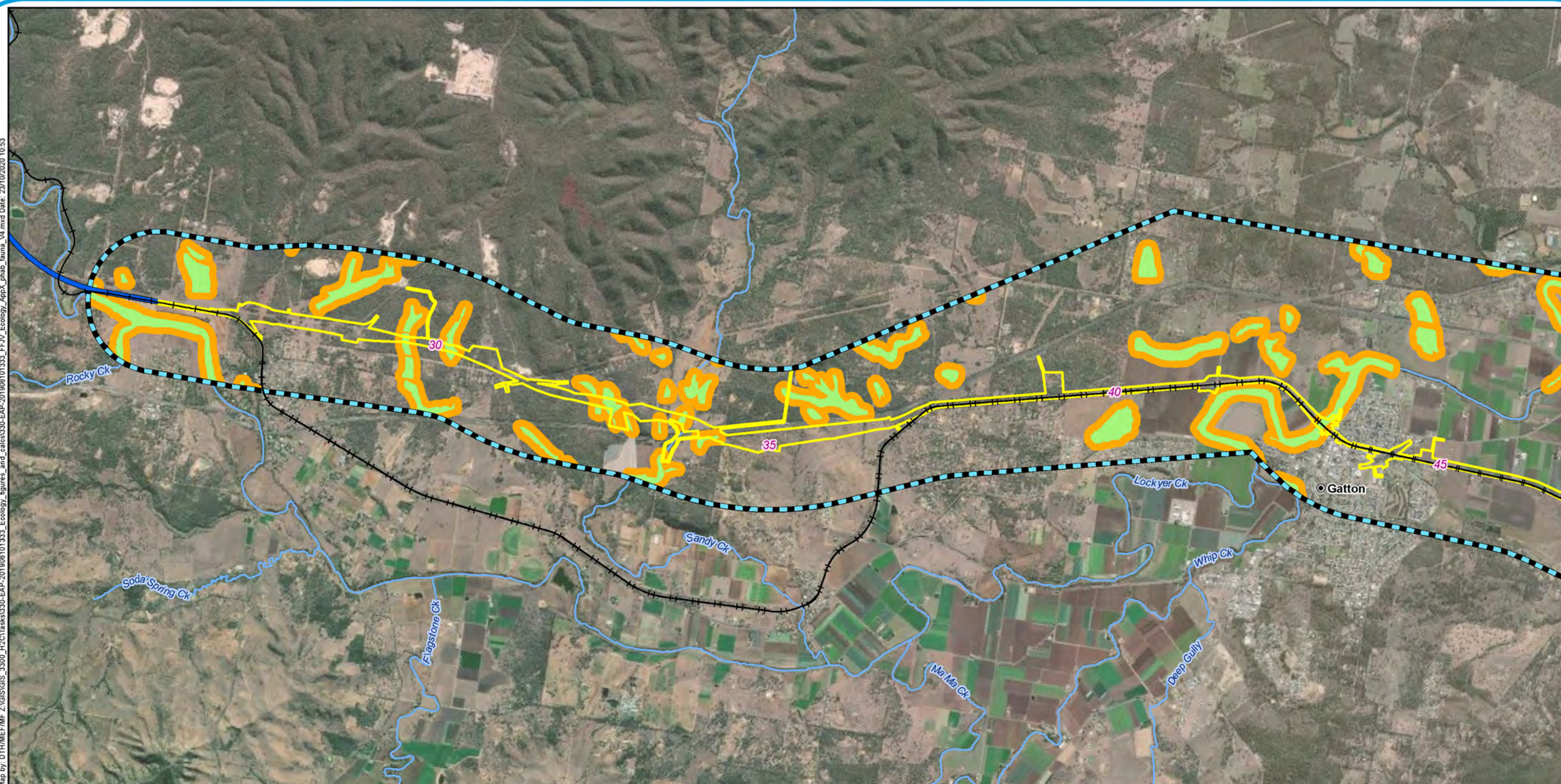
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.475 0.95 1.9 2.85 3.8 Kilometers

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

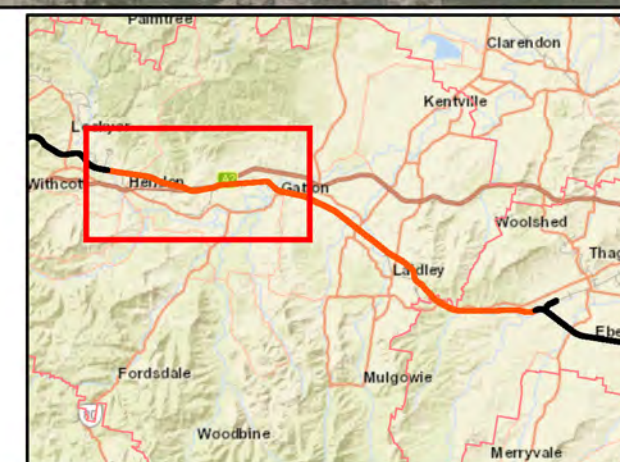


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

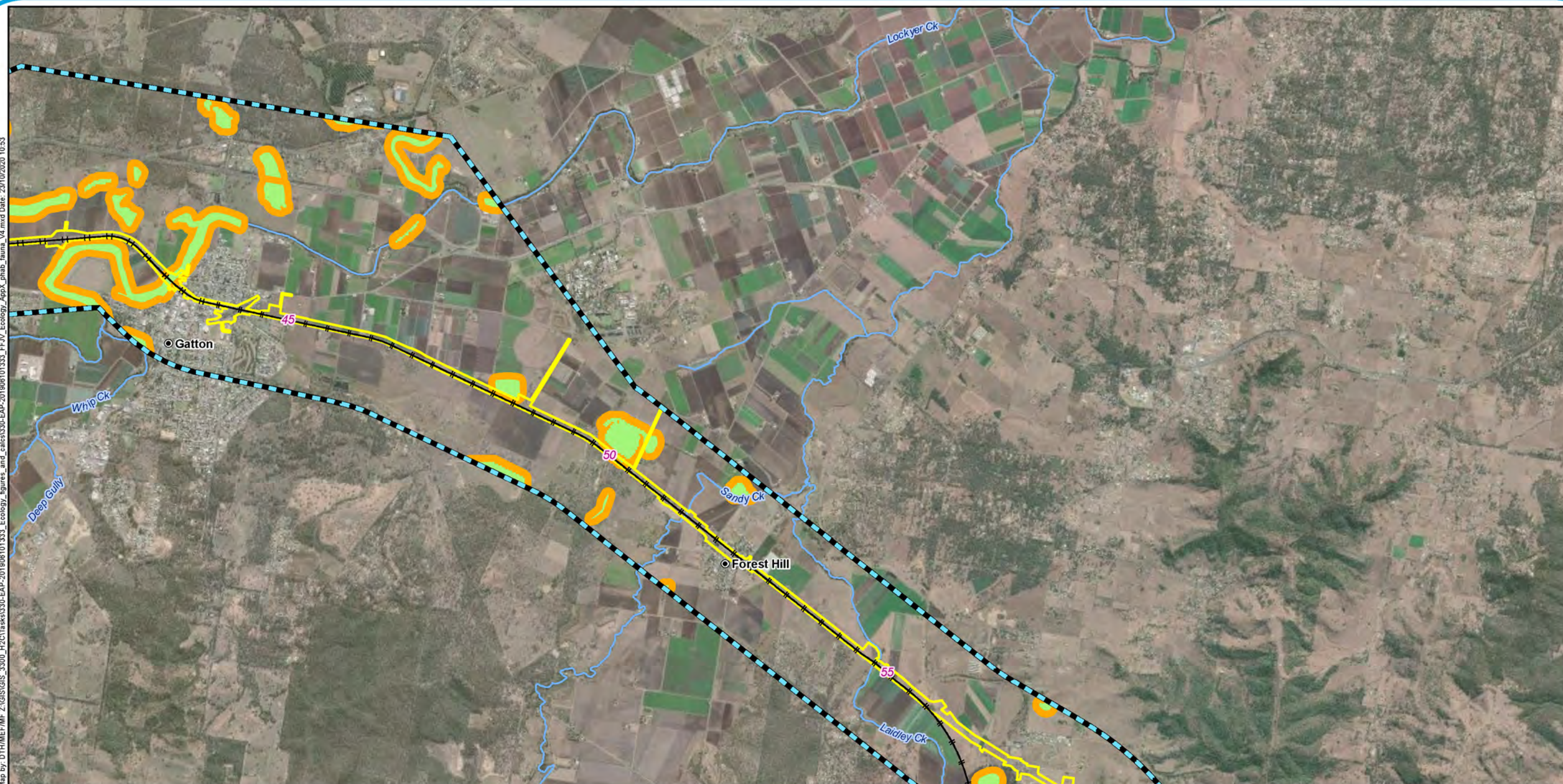
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/MF Z:\GIS\GIS_3300_H2O\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_App\phab_fauna_v4.mxd Date: 23/10/2020 10:53

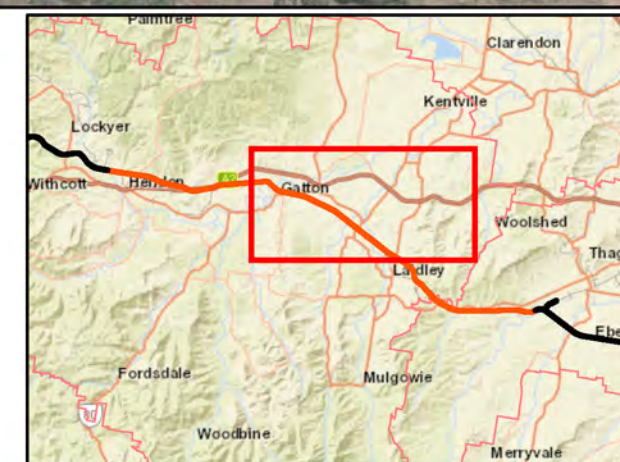


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- Ecology study area

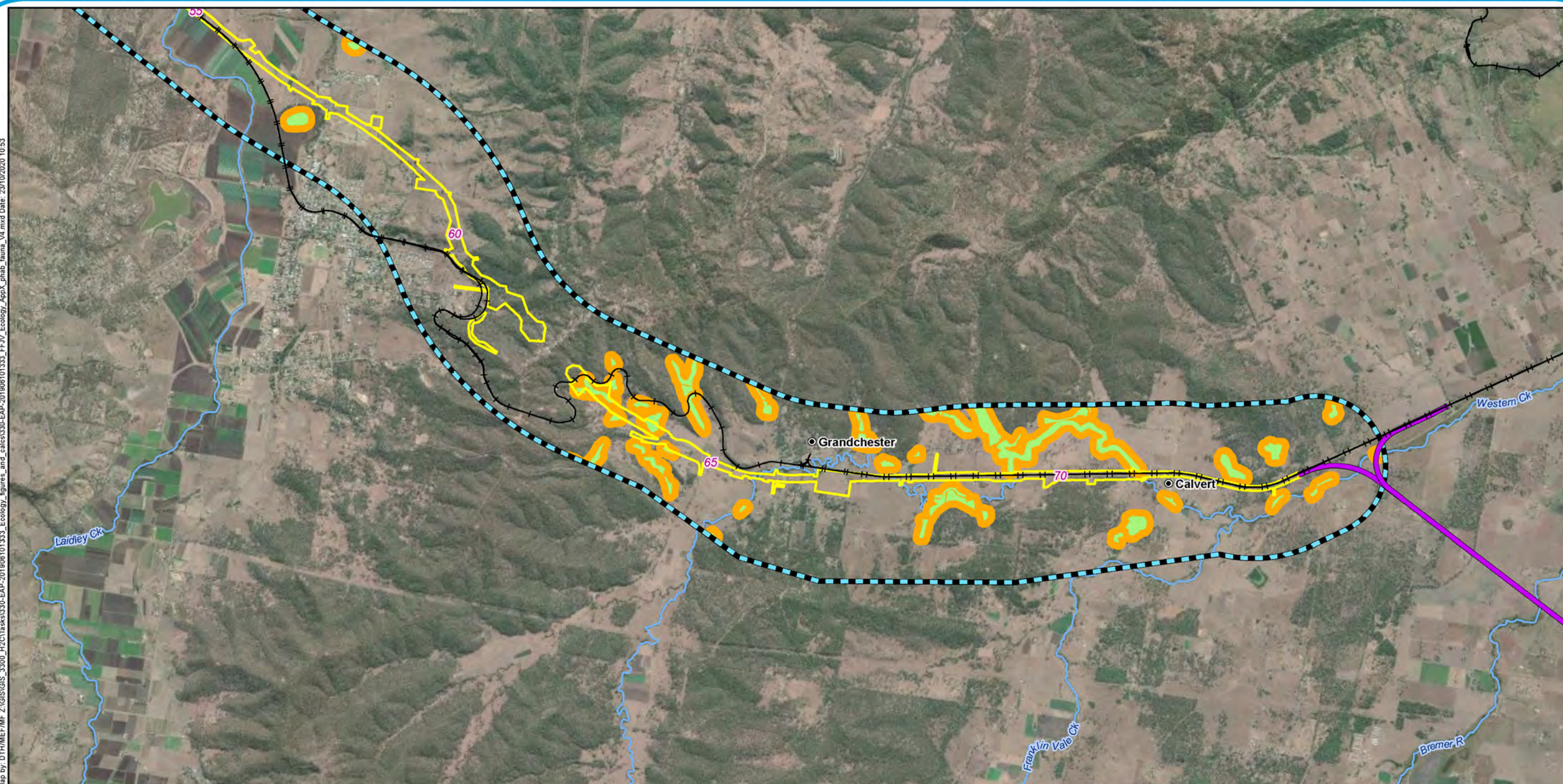
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

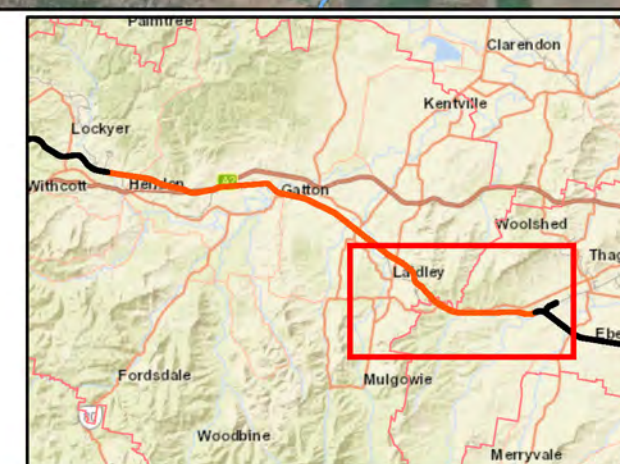


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

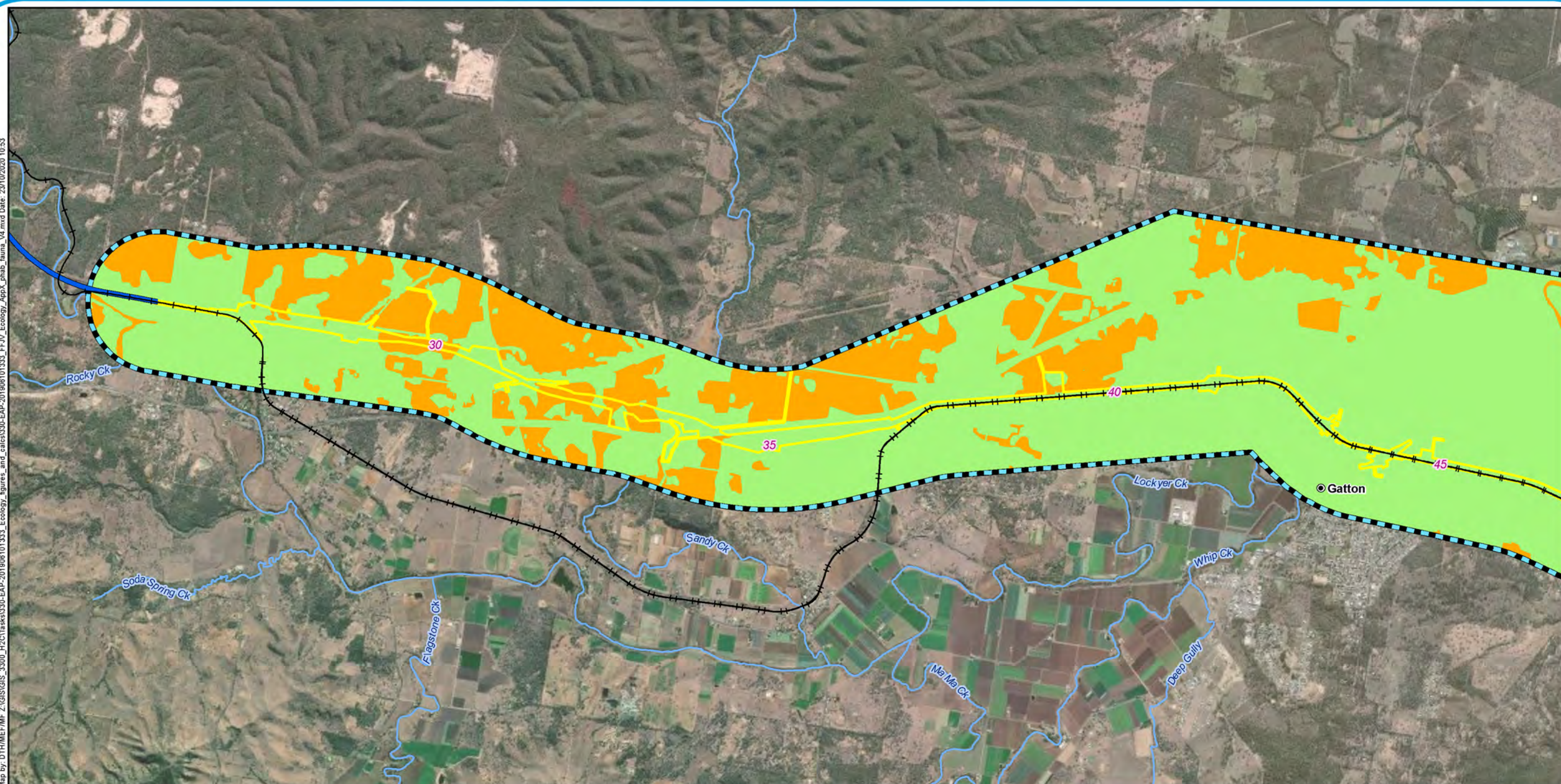
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FFIV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

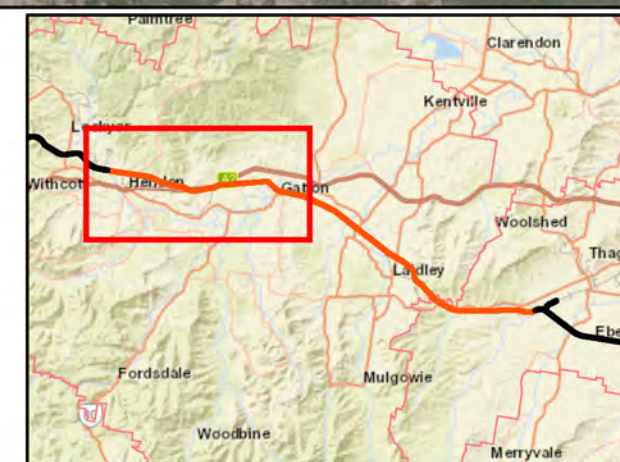


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

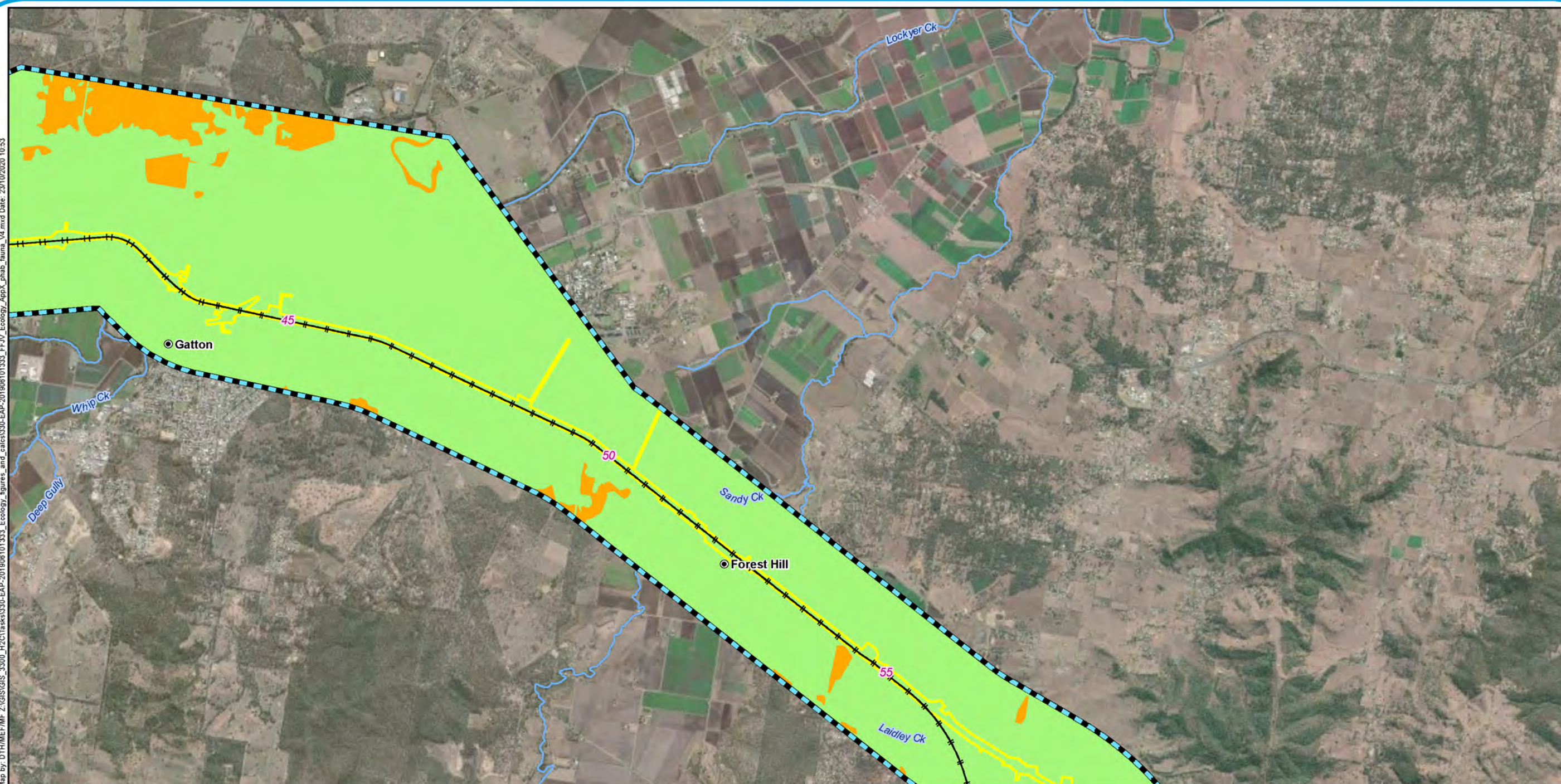
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H20\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

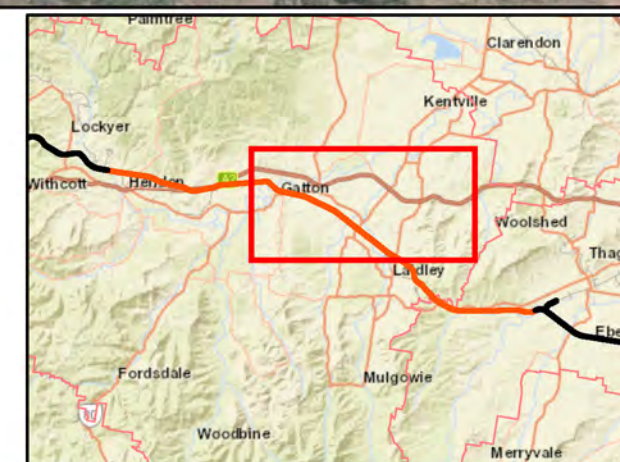


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- Ecology study area

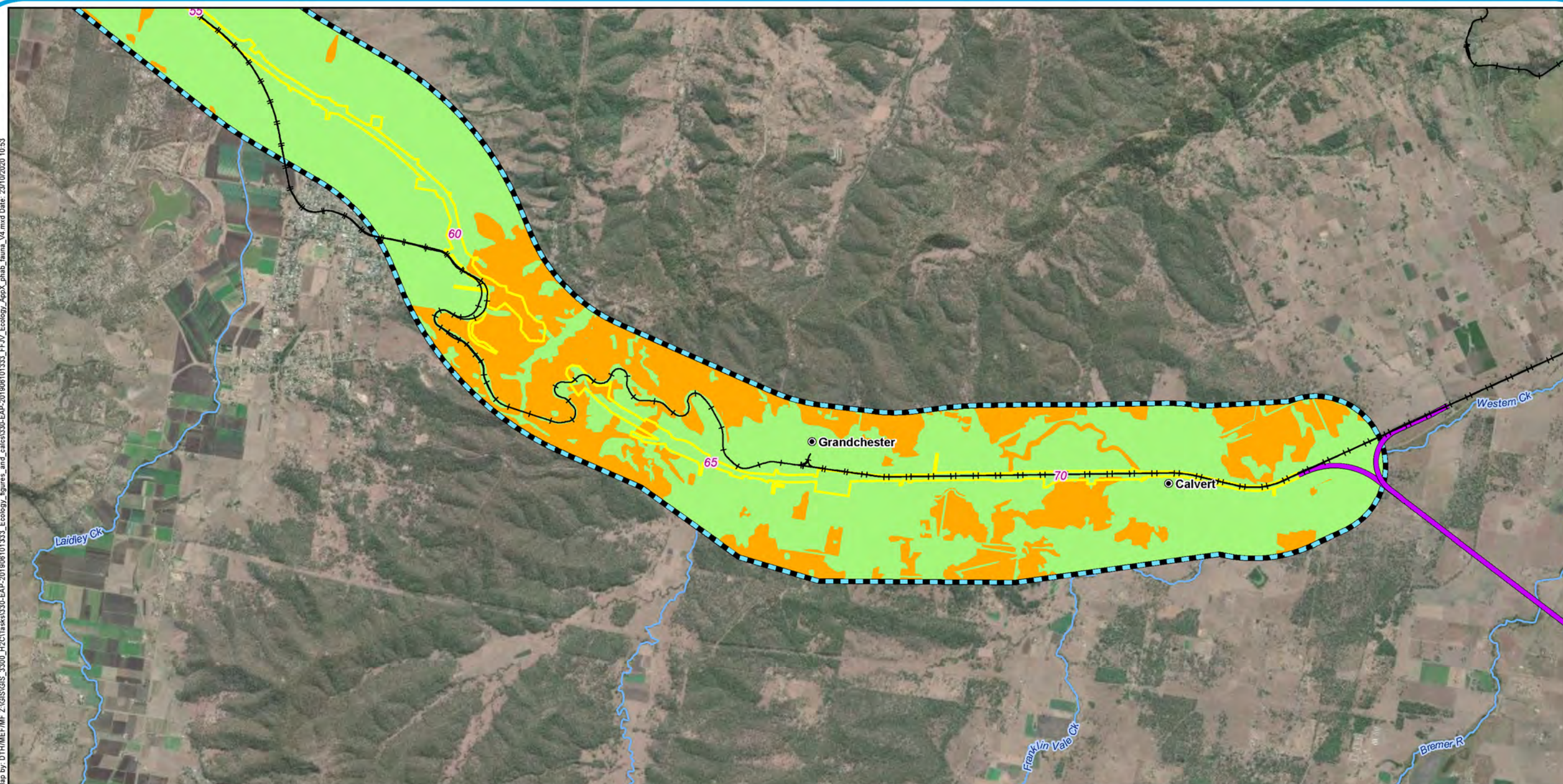
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

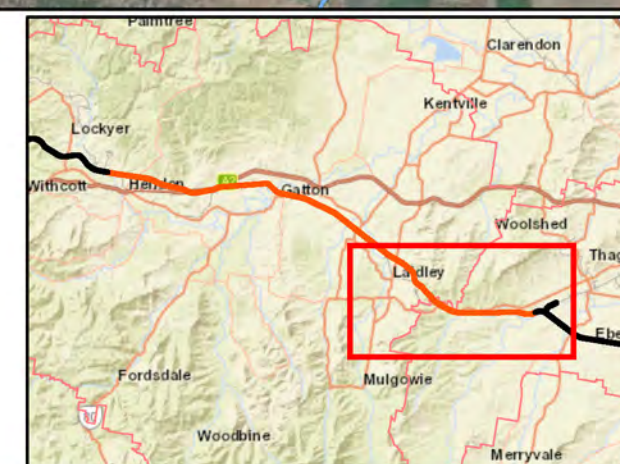


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

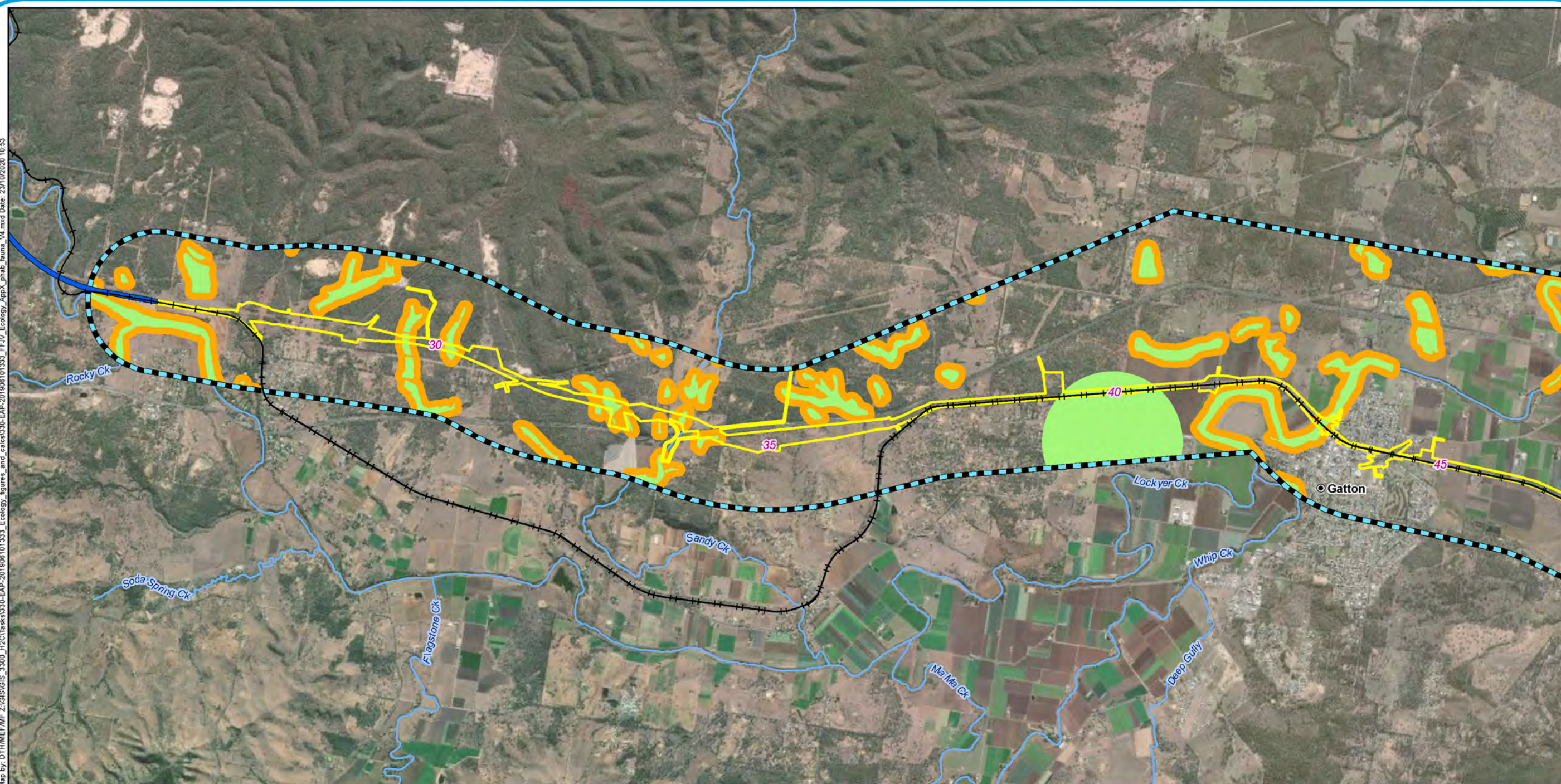
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

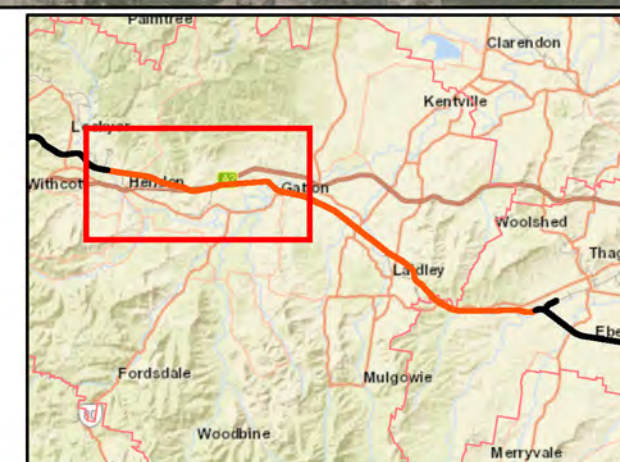


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

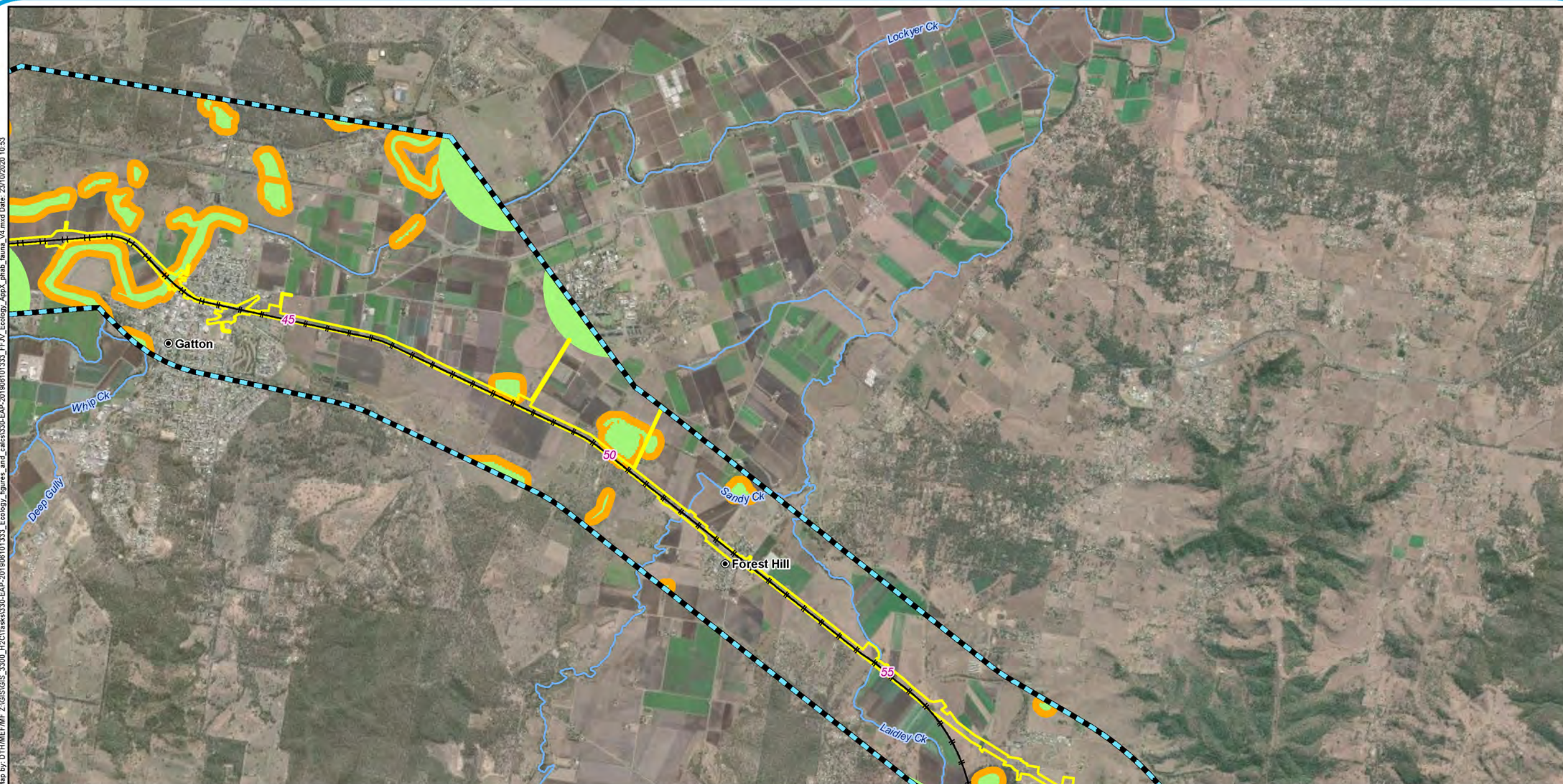
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/MF Z:\GIS\GIS_3300_H2O\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_figura_V4.mxd Date: 23/10/2020 10:53

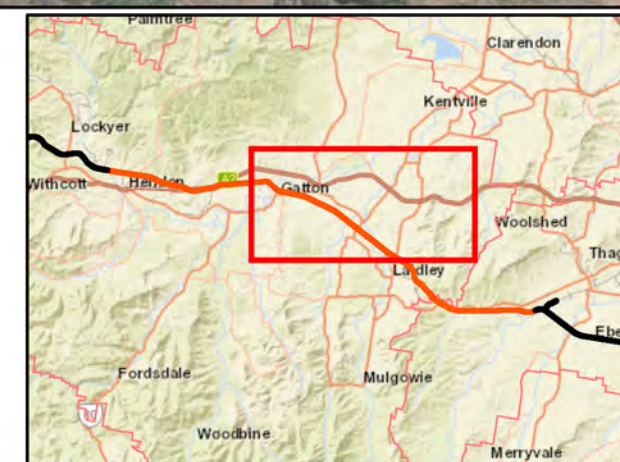


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- Ecology study area

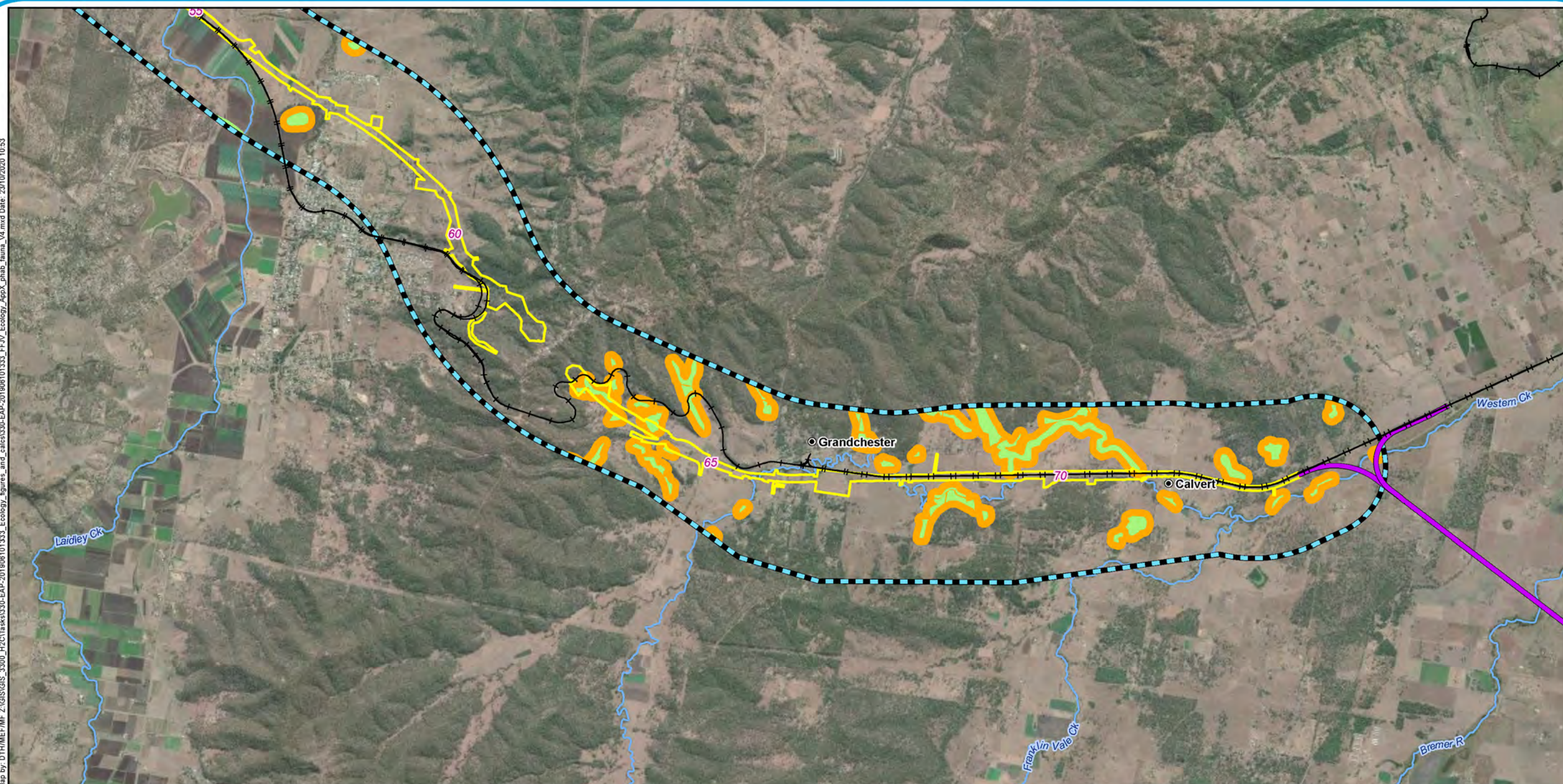
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FFJV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

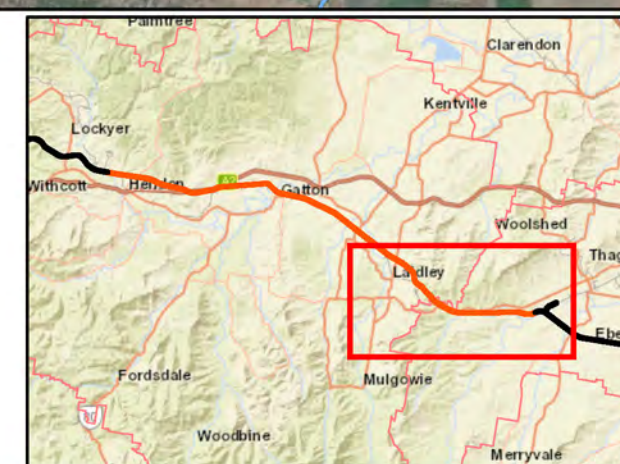


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

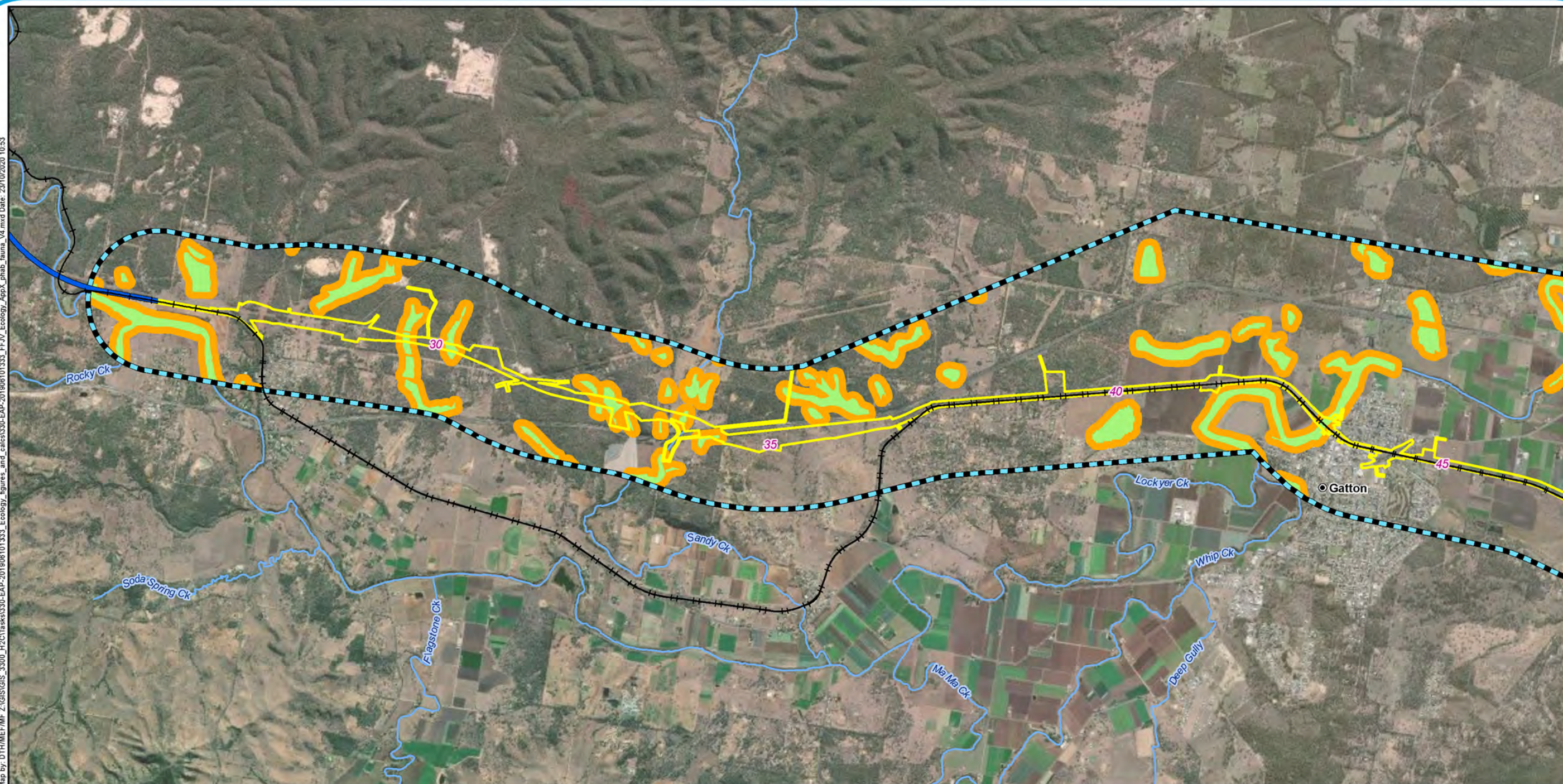
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2CTask\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

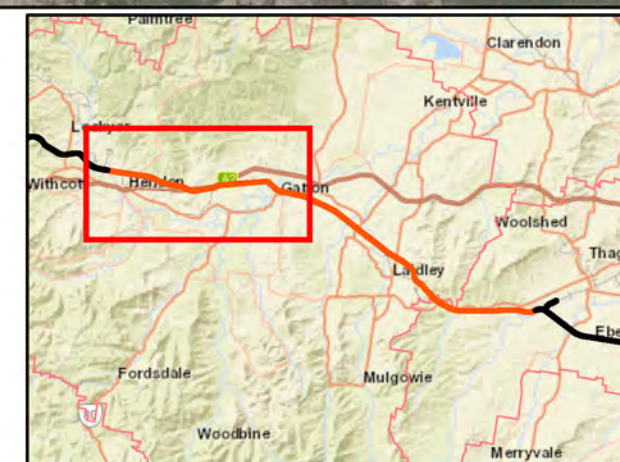


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

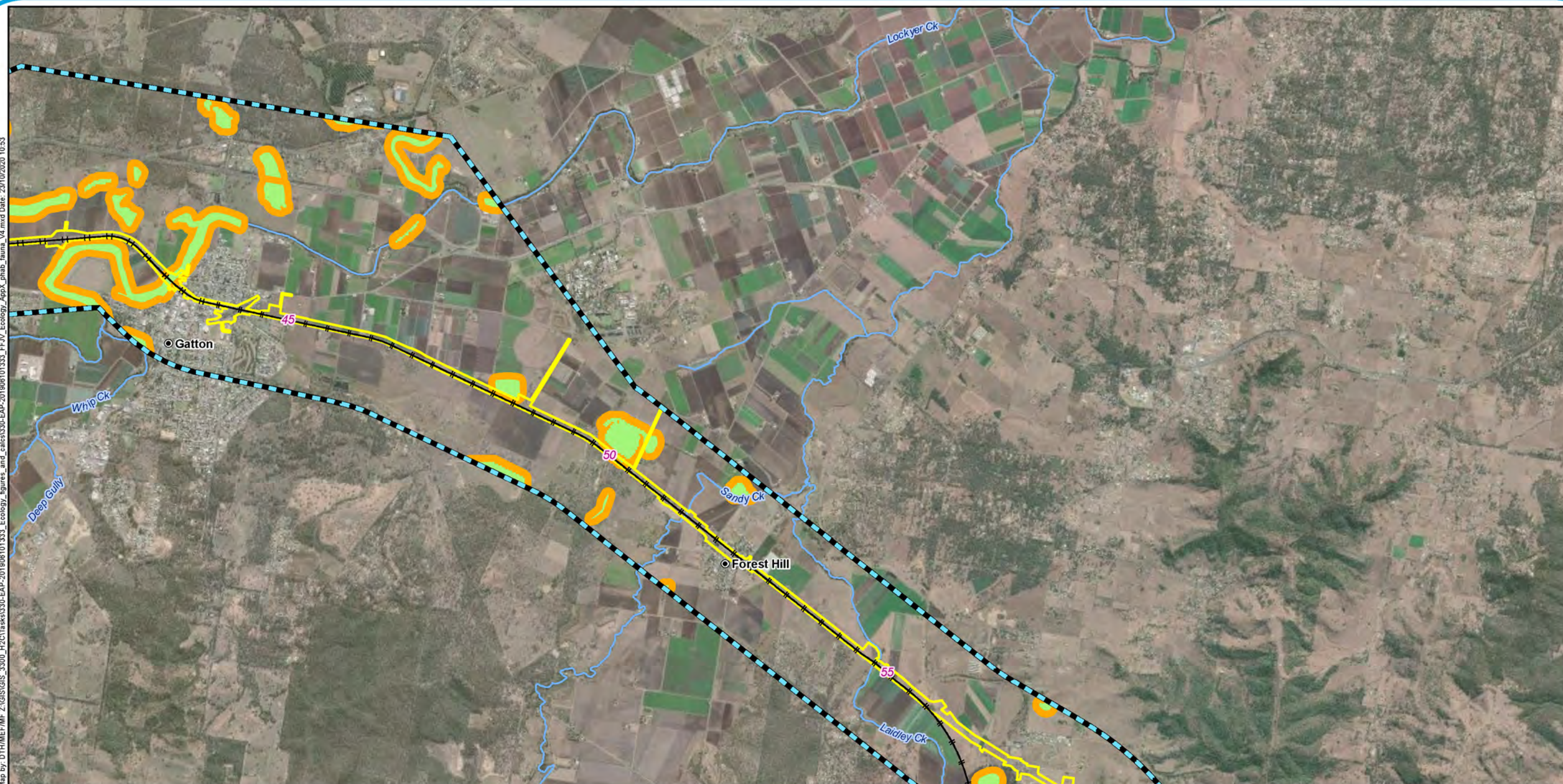
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2O\Task\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

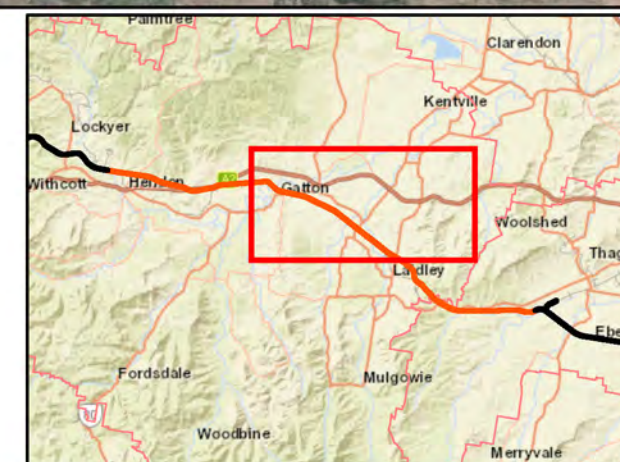


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- Ecology study area

Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

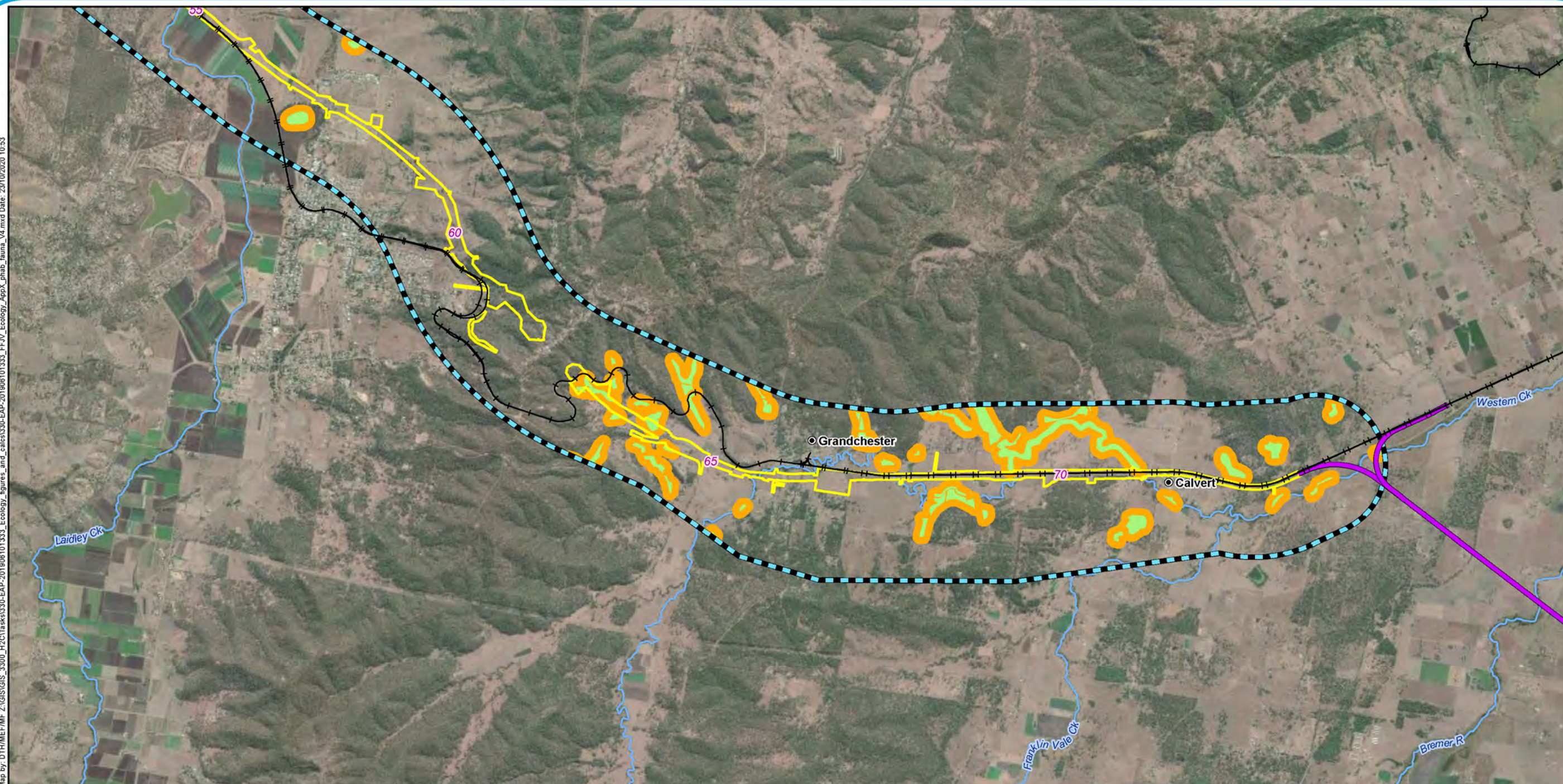


Issue date: 23/10/2020 Version: 3
Coordinate system: MGA56

Helidon to Calvert

Predicted Habitat: *Calidris melanotos* (Pectoral sandpiper)

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FFJV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

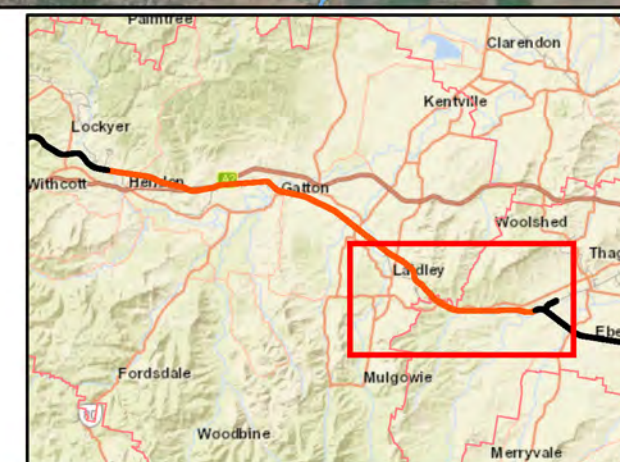


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

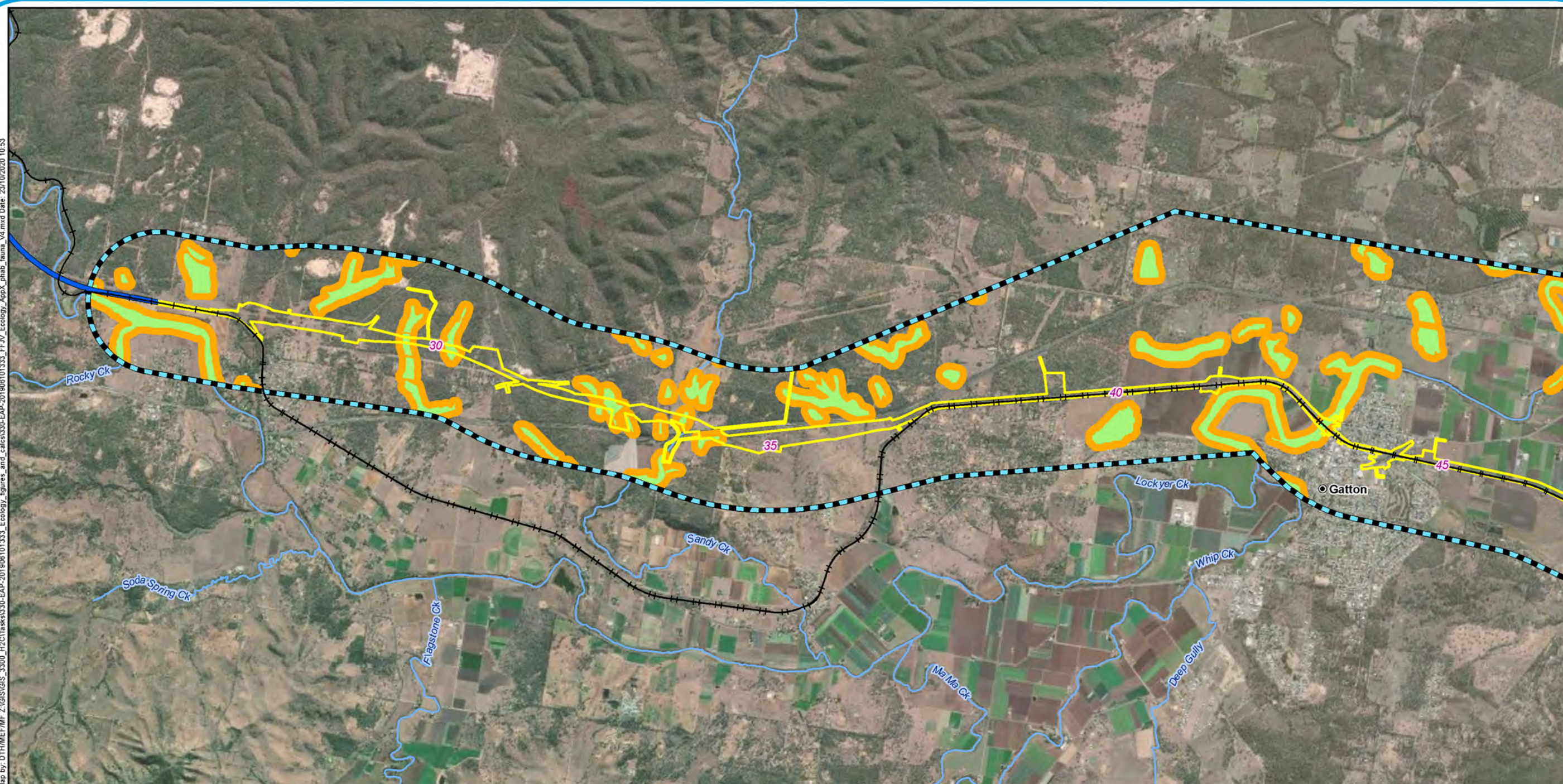
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2CTask\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

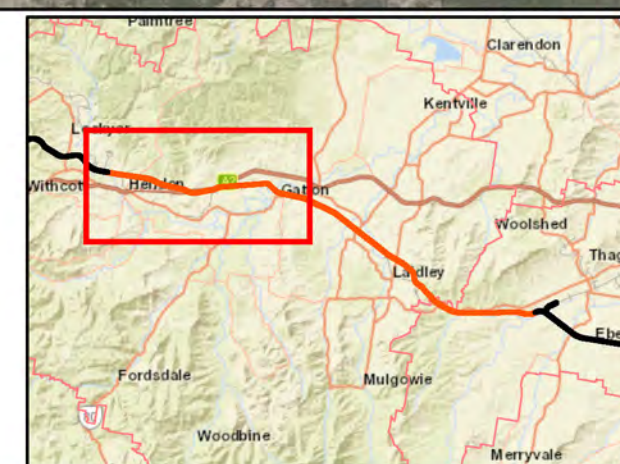


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

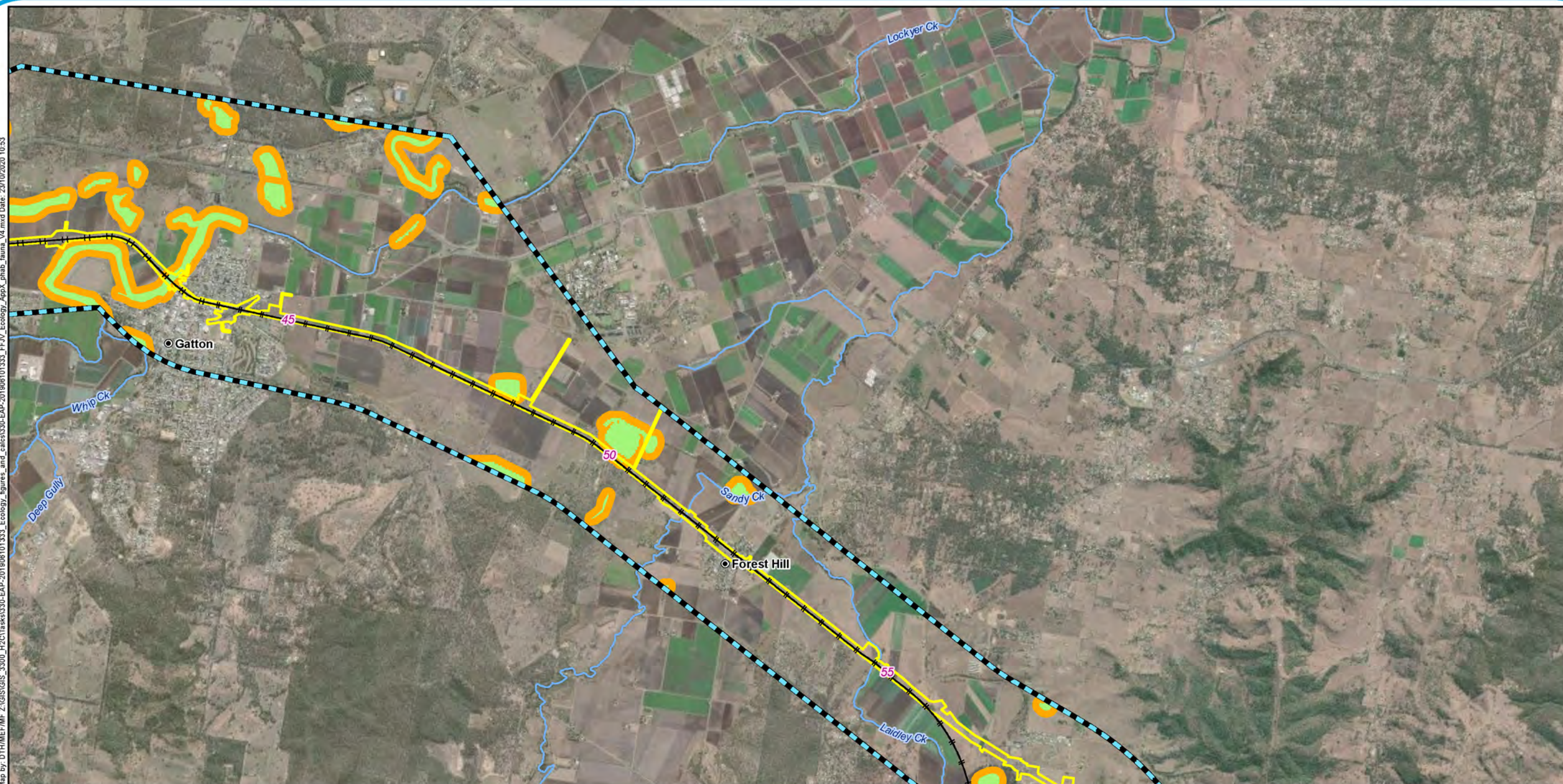
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/MF Z:\GIS\GIS_3300_H20\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

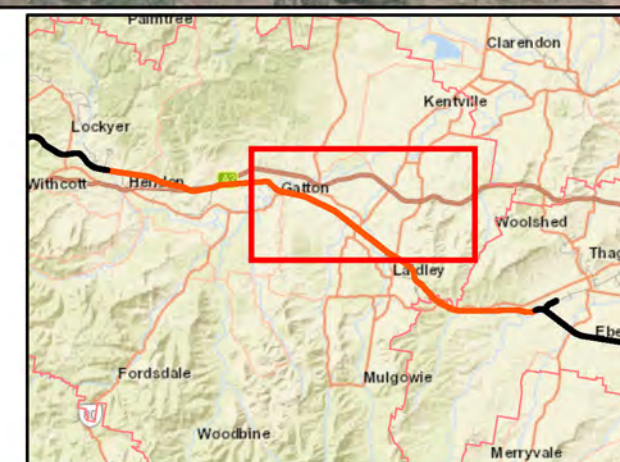


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- ▤ Ecology study area

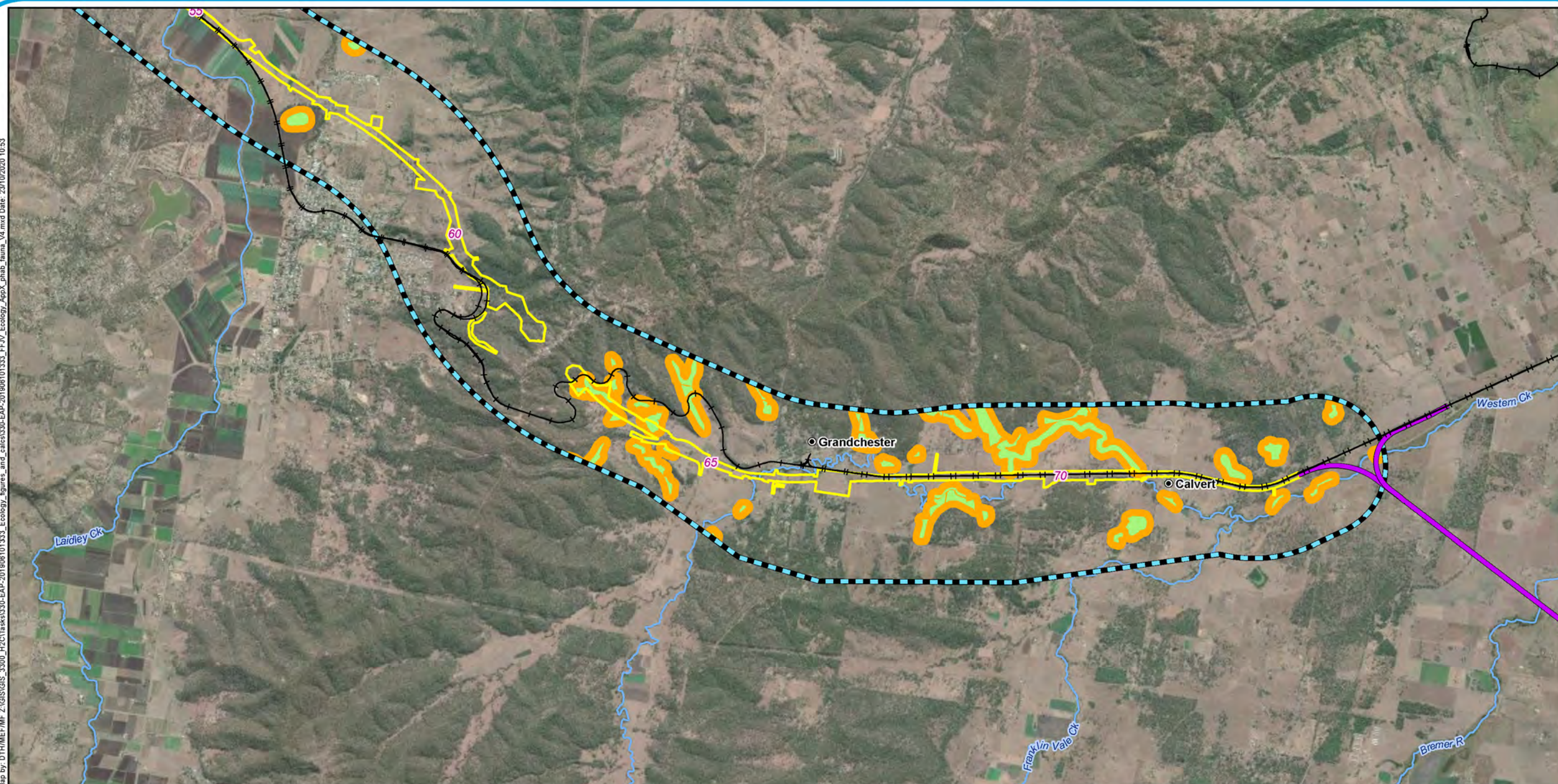
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

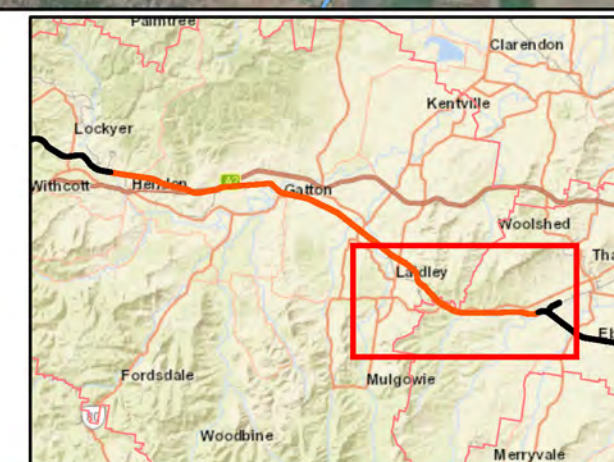


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

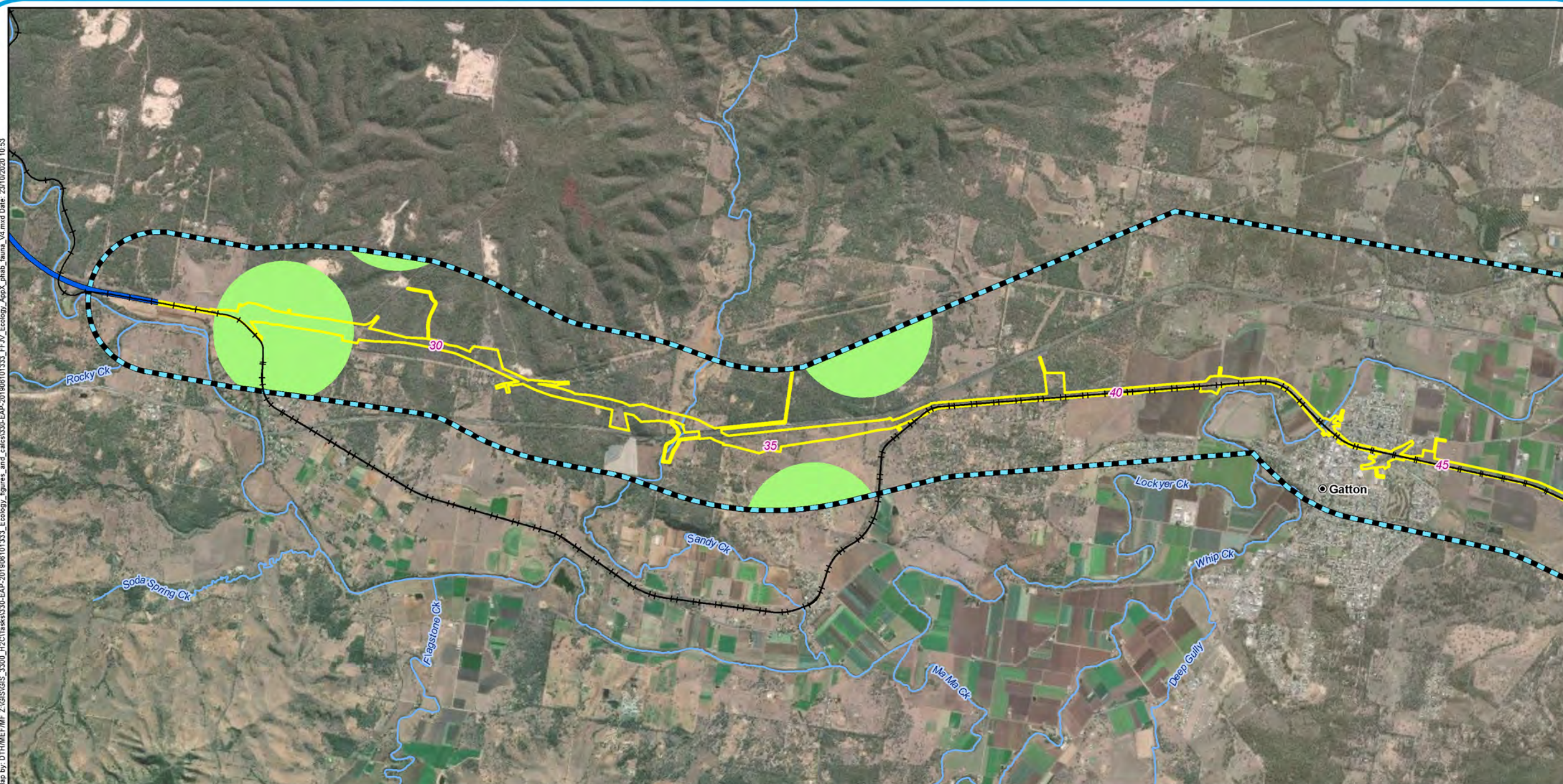
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/MF Z:\GIS\GIS_3300_H2CTask\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

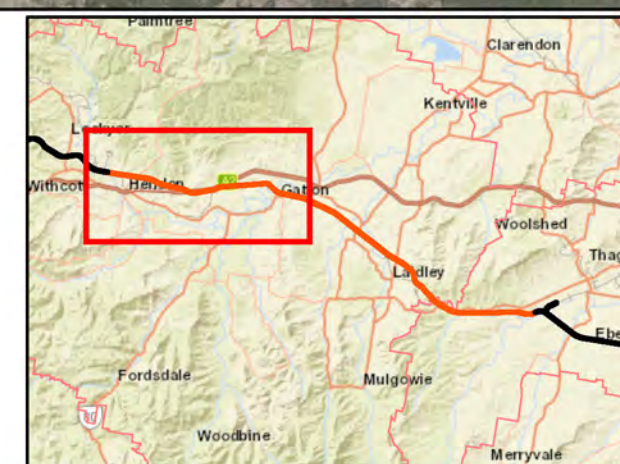


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

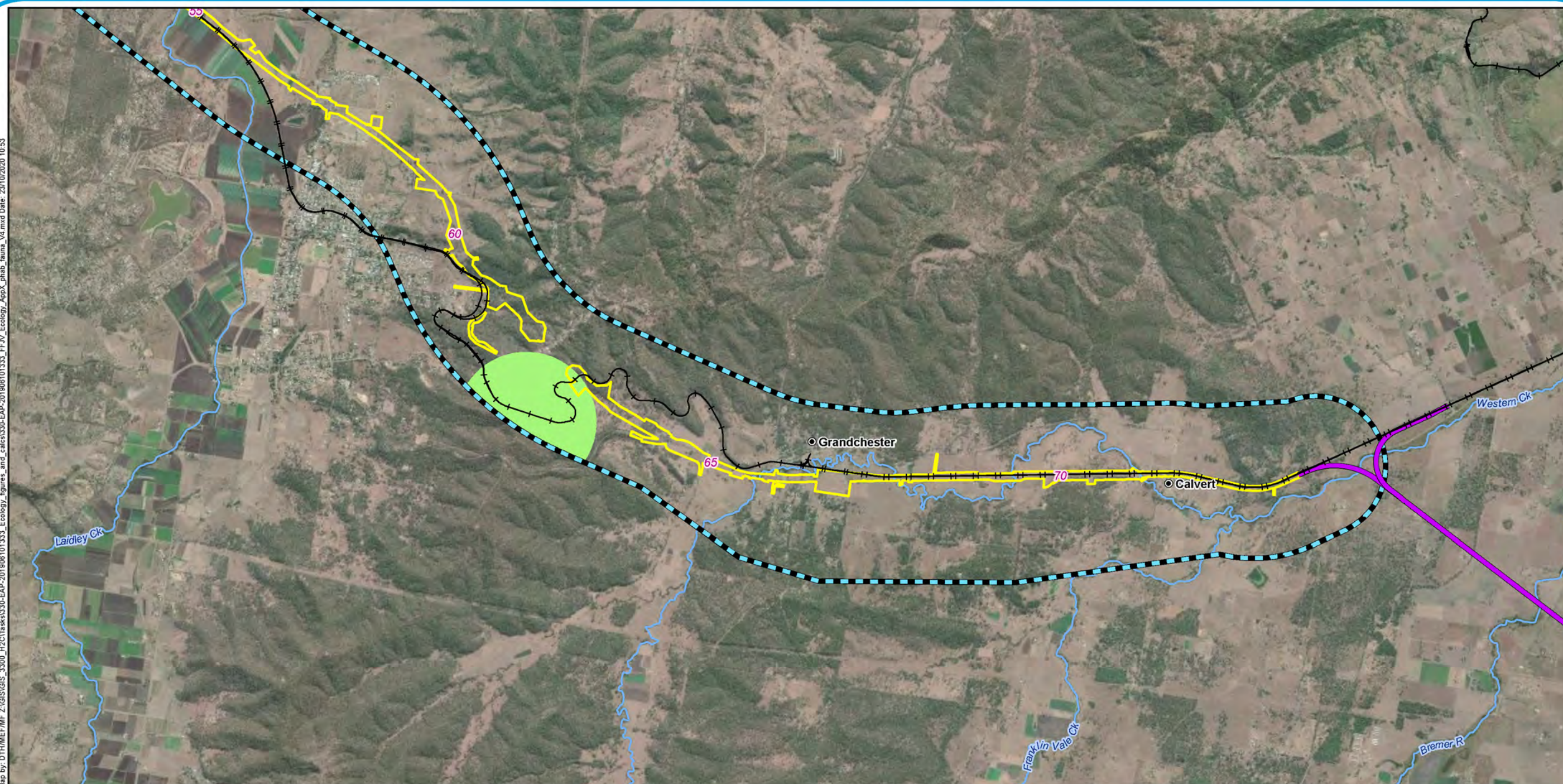


Issue date: 23/10/2020 Version: 3
Coordinate system: MGA56

Helidon to Calvert

Predicted Habitat: *Calyptorhynchus lathami lathami* (Glossy black-cockatoo (eastern))

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FFJV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

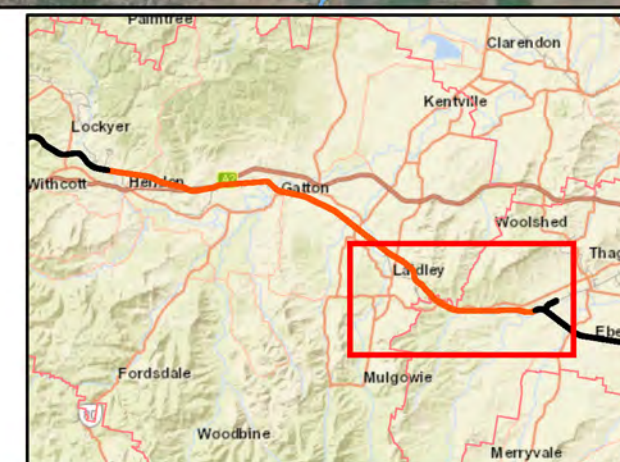


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

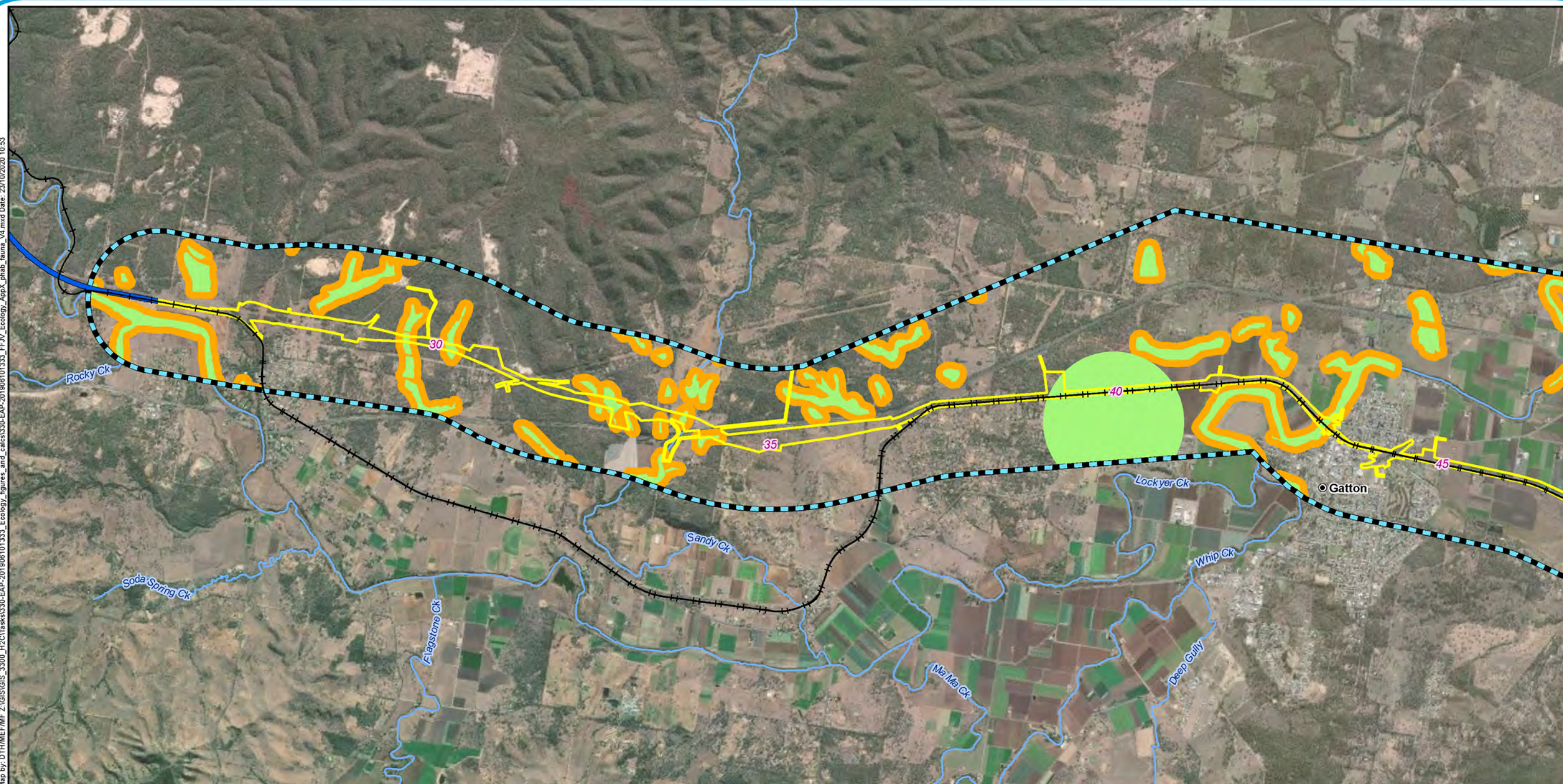


Issue date: 23/10/2020 Version: 3
Coordinate system: MGA56

Helidon to Calvert

Predicted Habitat: *Calyptorhynchus lathami lathami* (Glossy black-cockatoo (eastern))

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

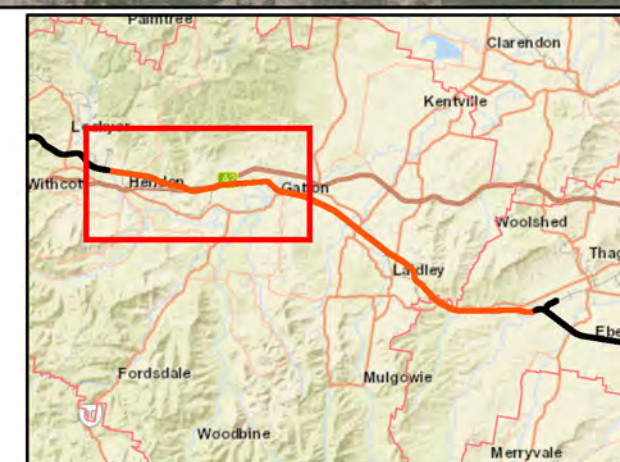


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

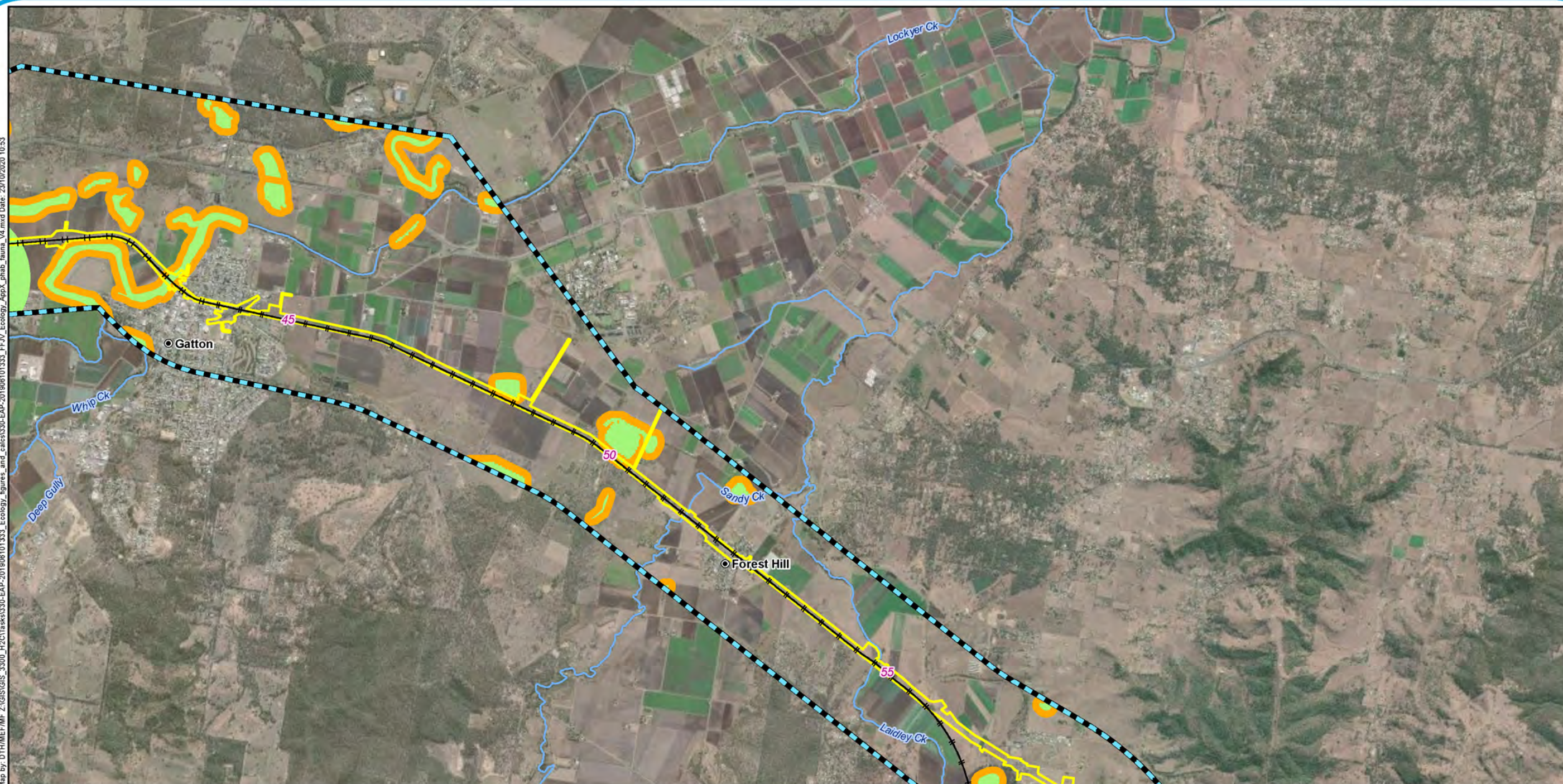
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/MF Z:\GIS\GIS_3300_H2O\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

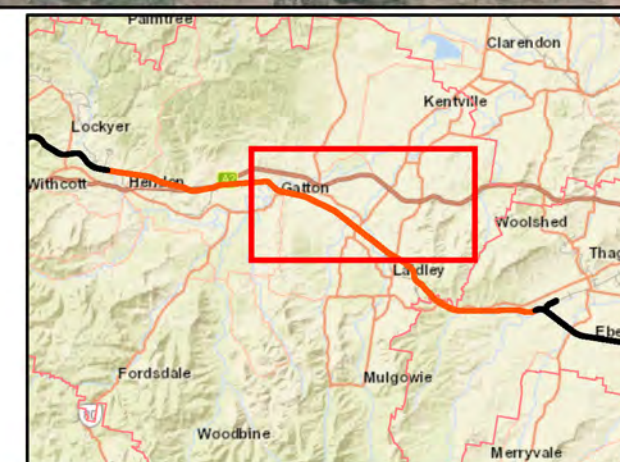


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- Ecology study area

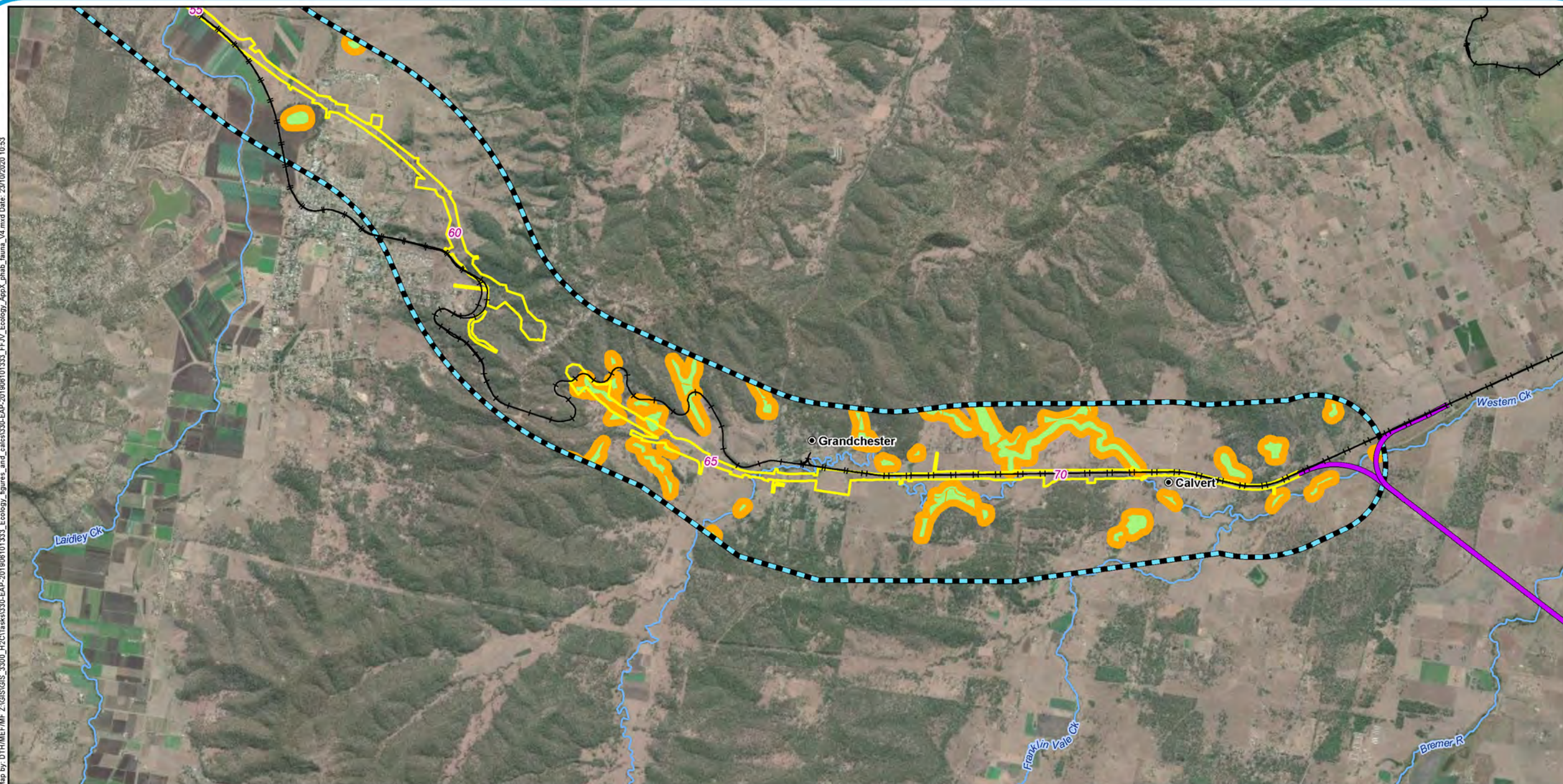
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FFJV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

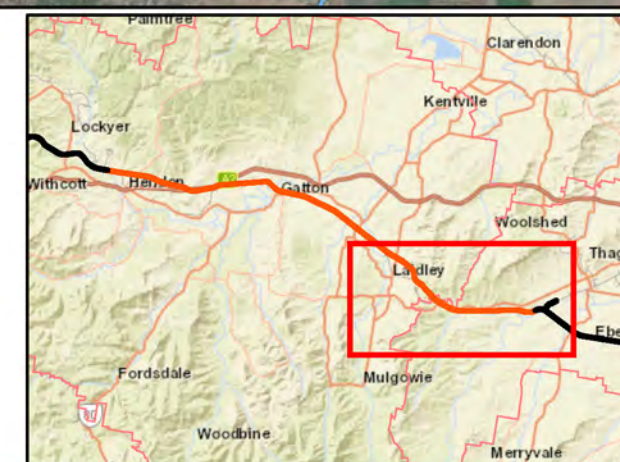


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

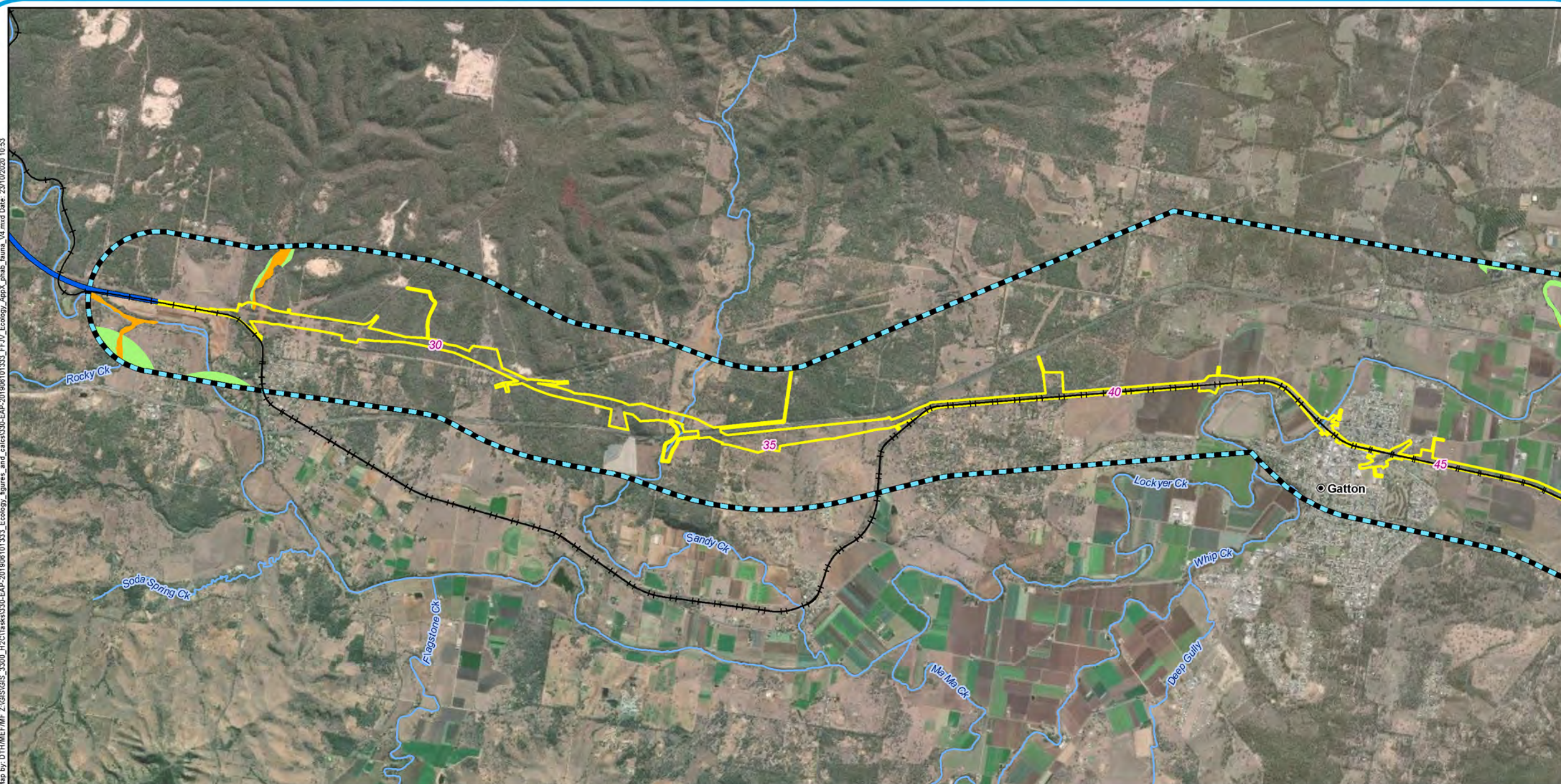
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2CTask\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

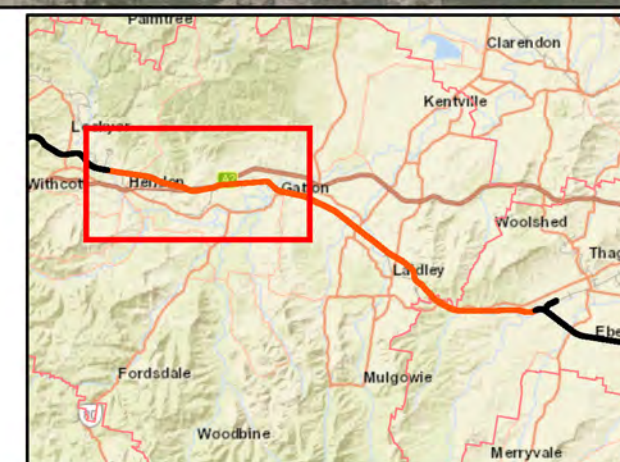


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

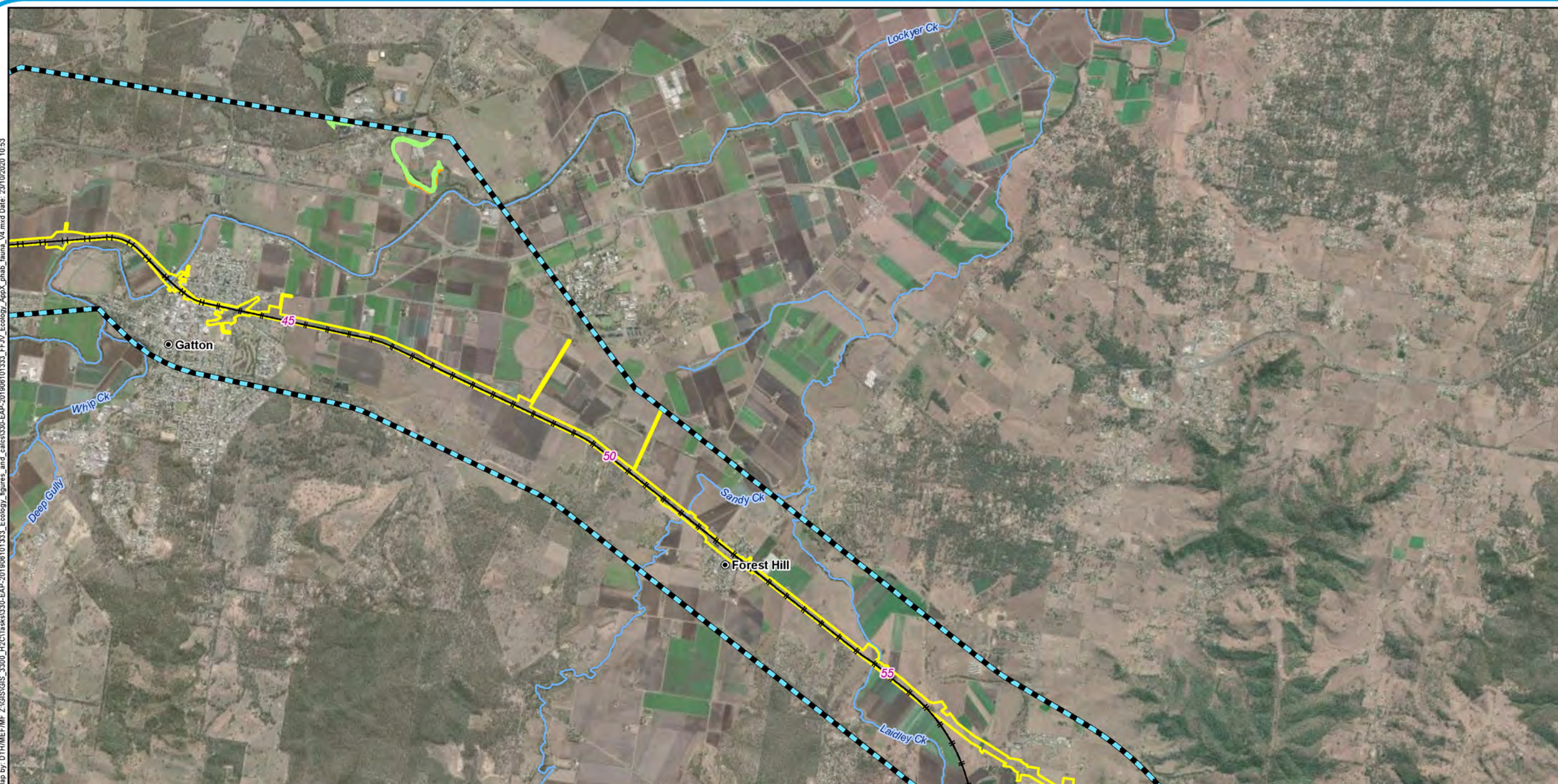
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/MF Z:\GIS\GIS_3300_H20\Task\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

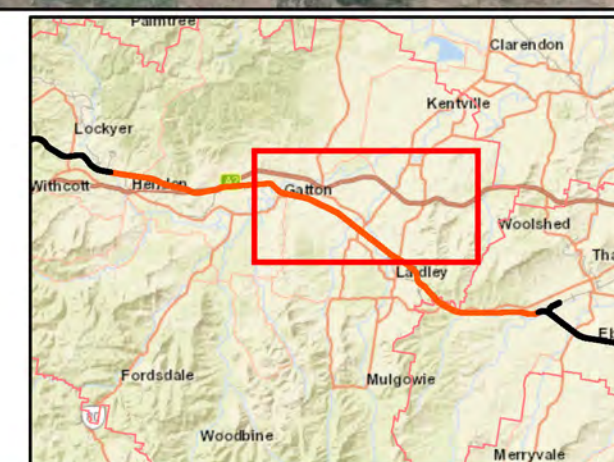


Legend

- Localities
- Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- Ecology study area

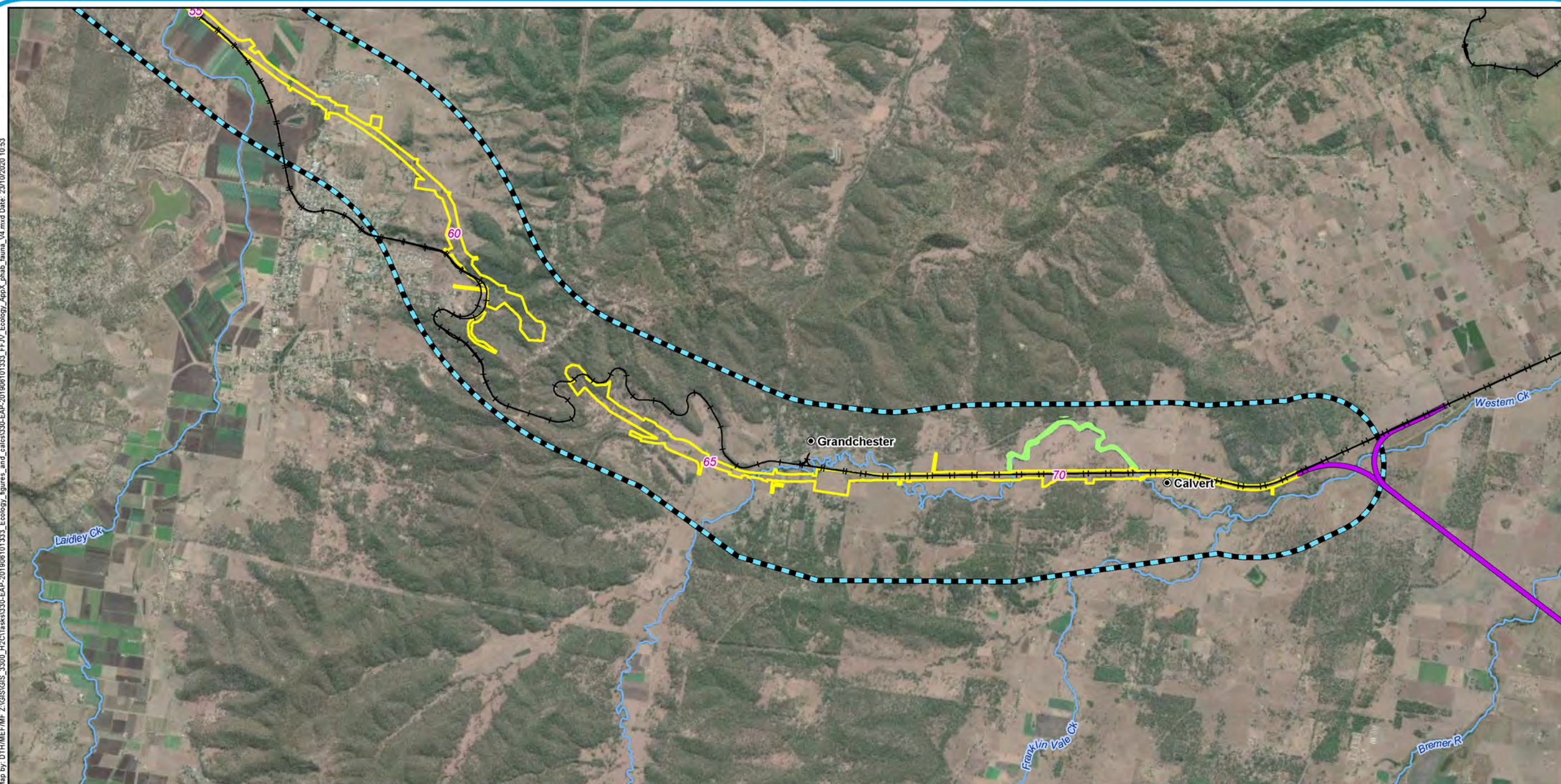
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FFJV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

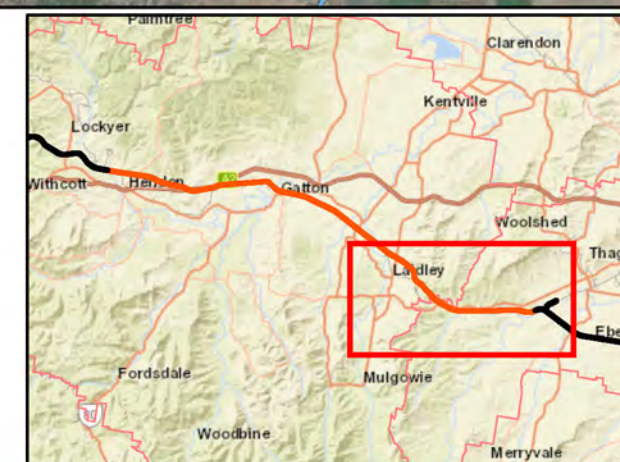


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

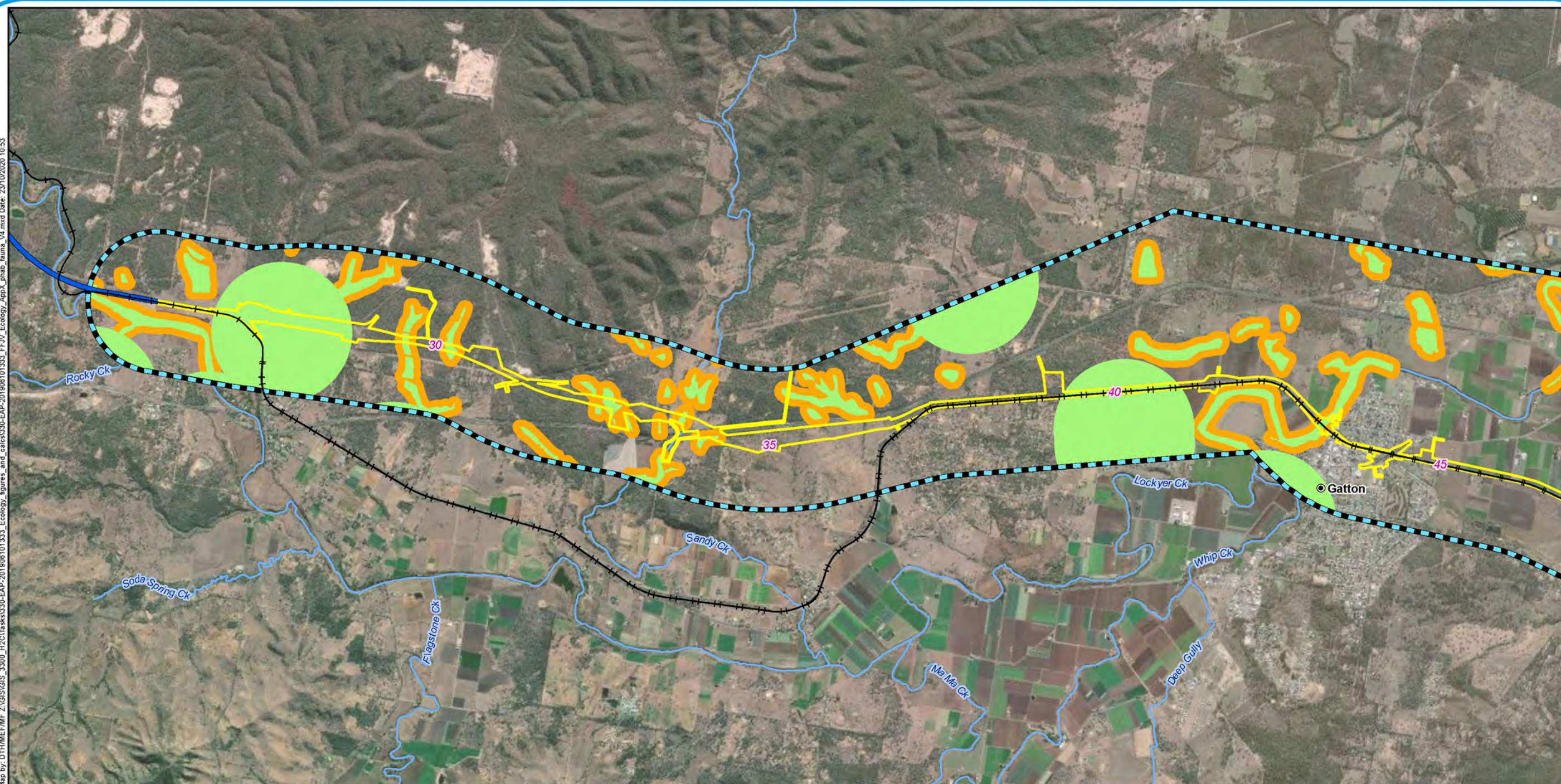
Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

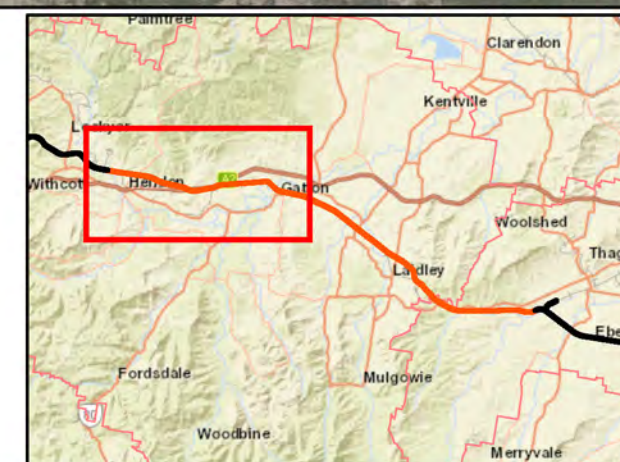


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

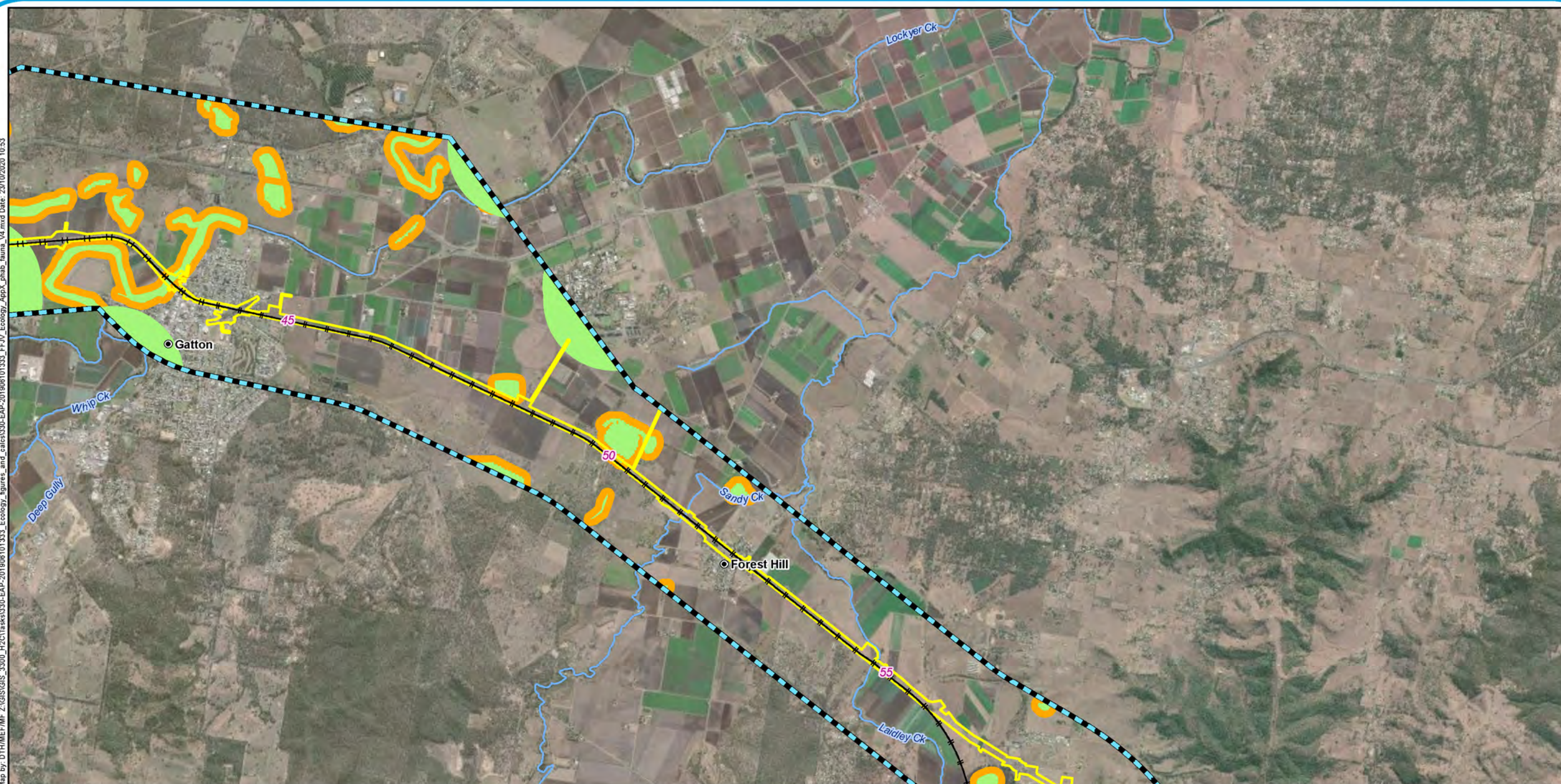
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/MF Z:\GIS\GIS_3300_H20\Task\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FF JV_Ecology_AppX_phab_figura_V4.mxd Date: 23/10/2020 10:53

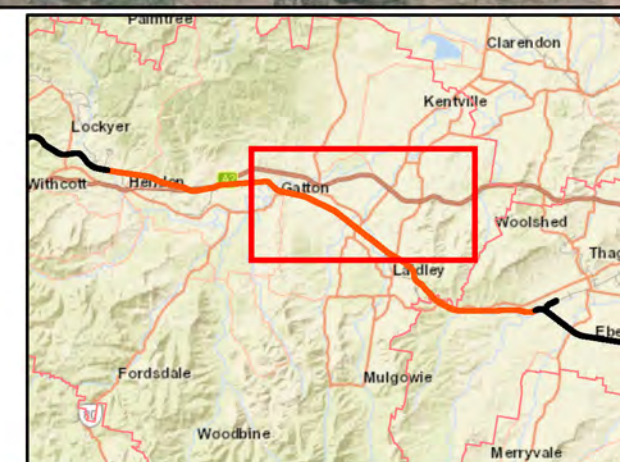


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- ▤ Ecology study area

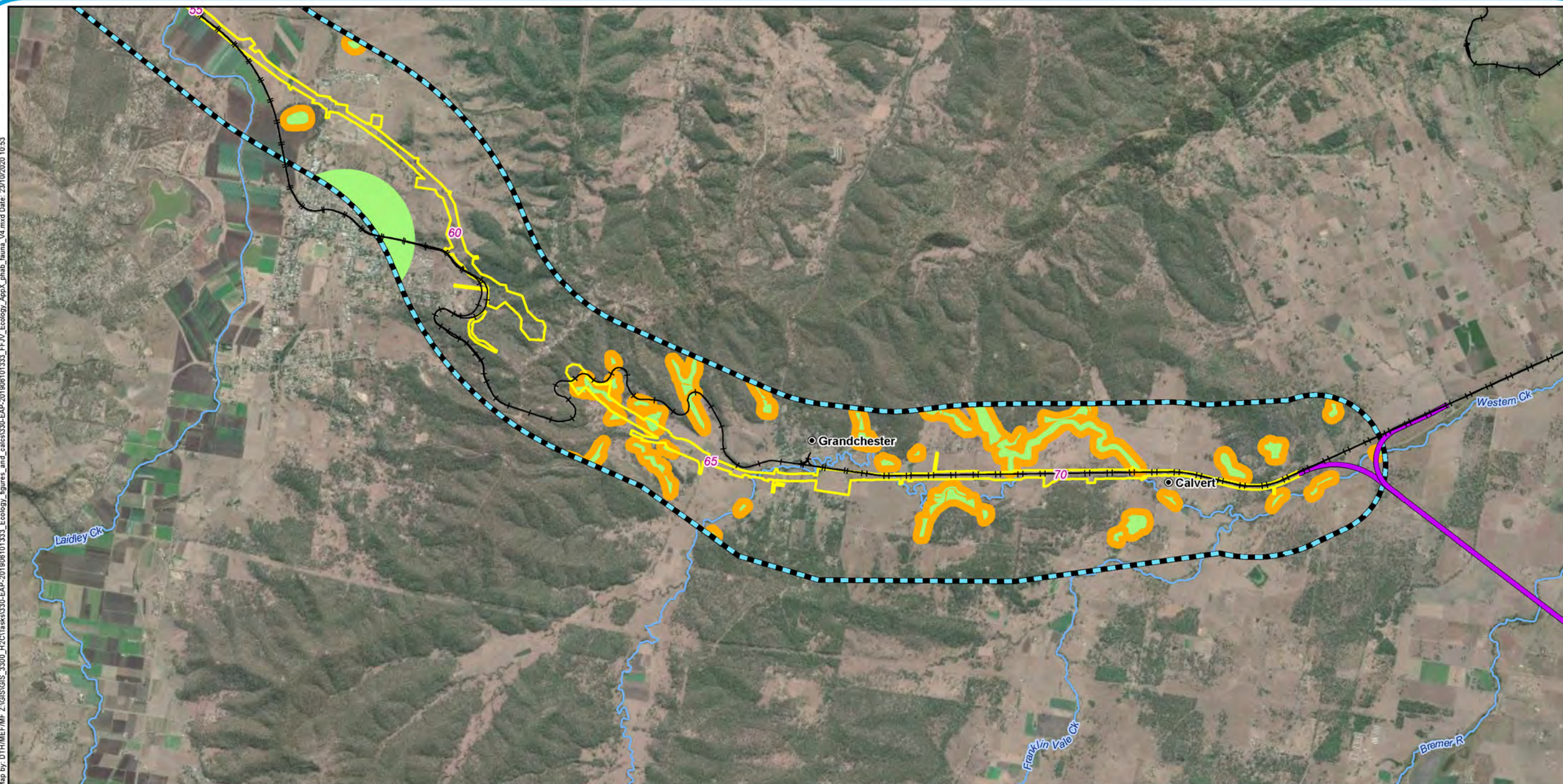
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

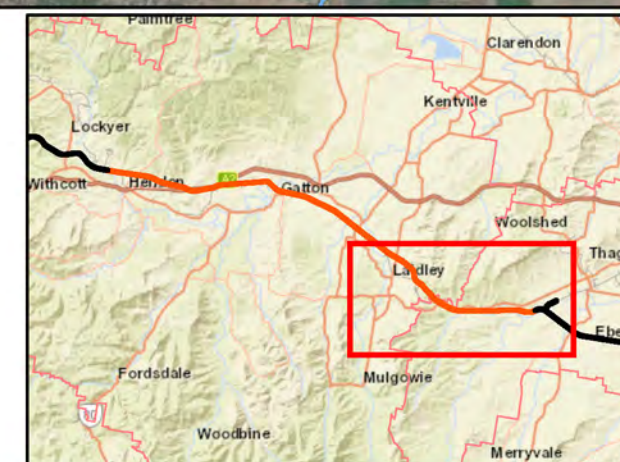


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

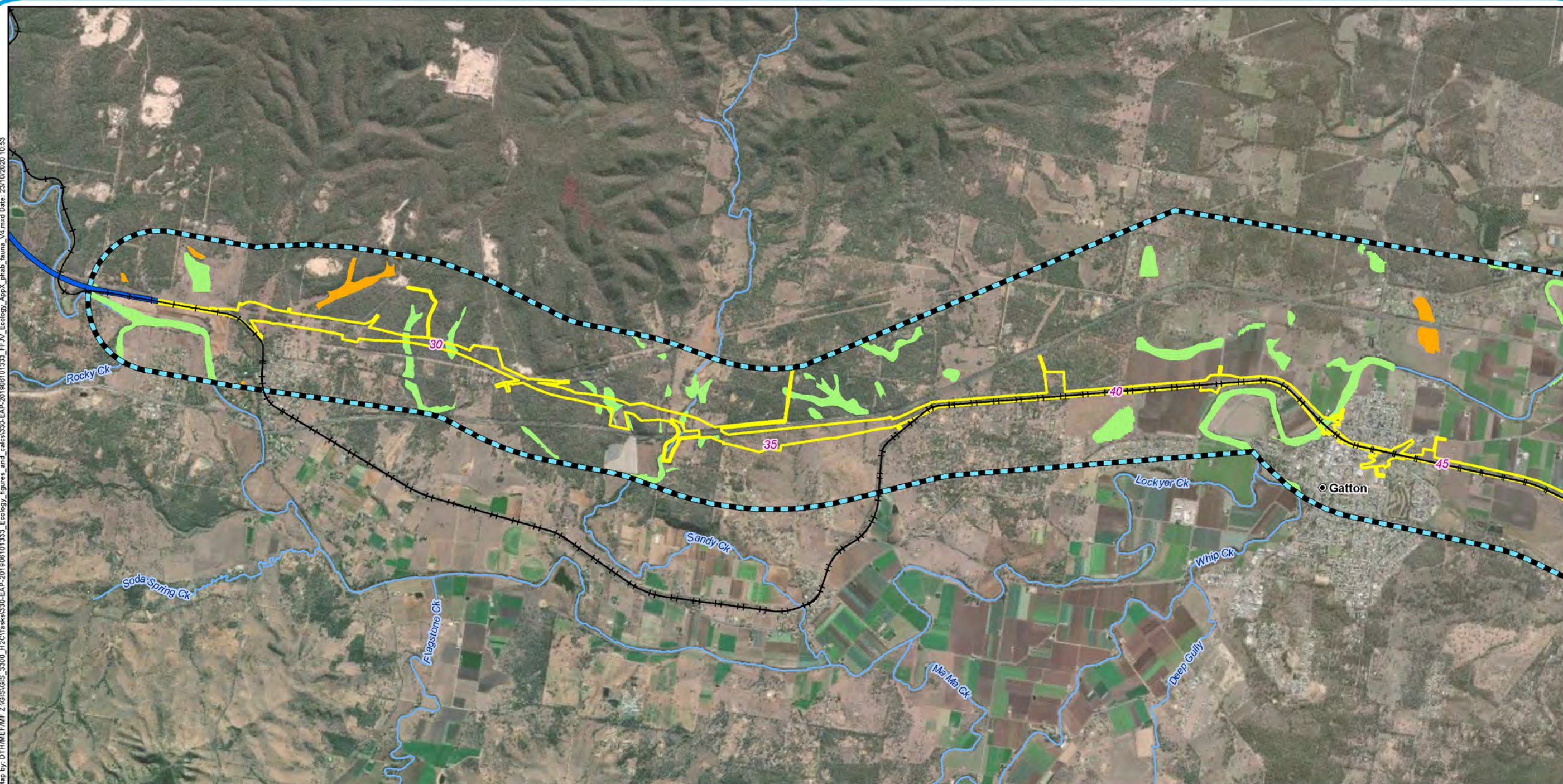
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2CTask\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FFJV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

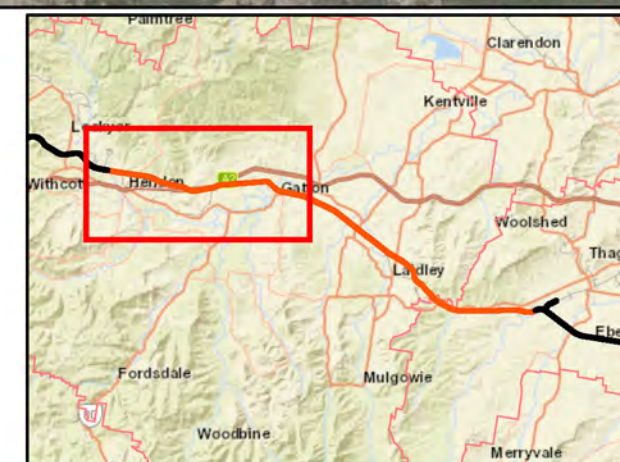


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

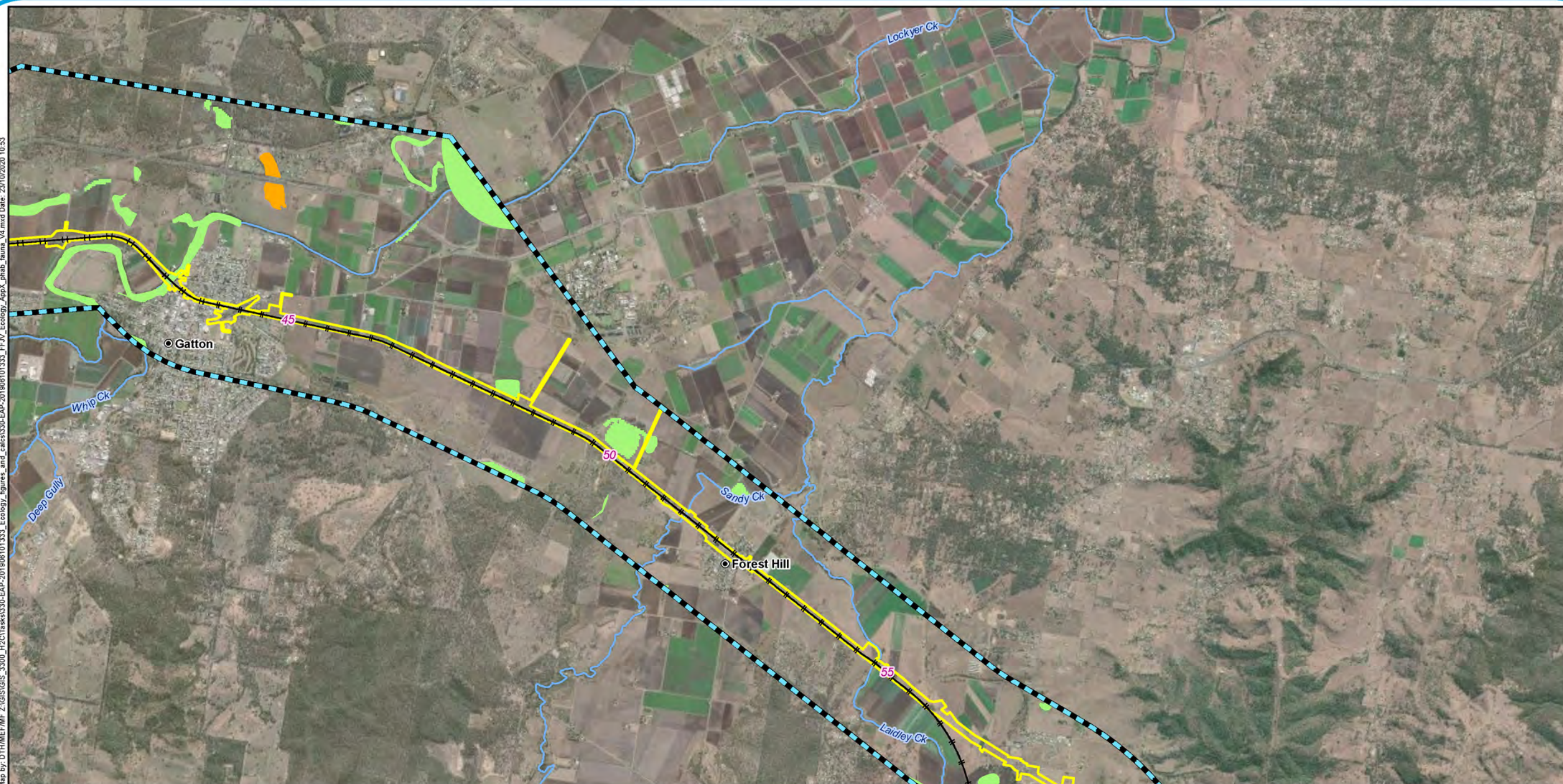
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/MF Z:\GIS\GIS_3300_H20\Task\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

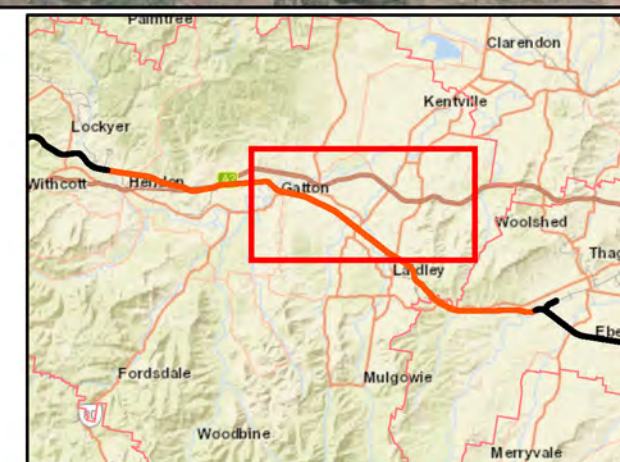


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- ▤ Ecology study area

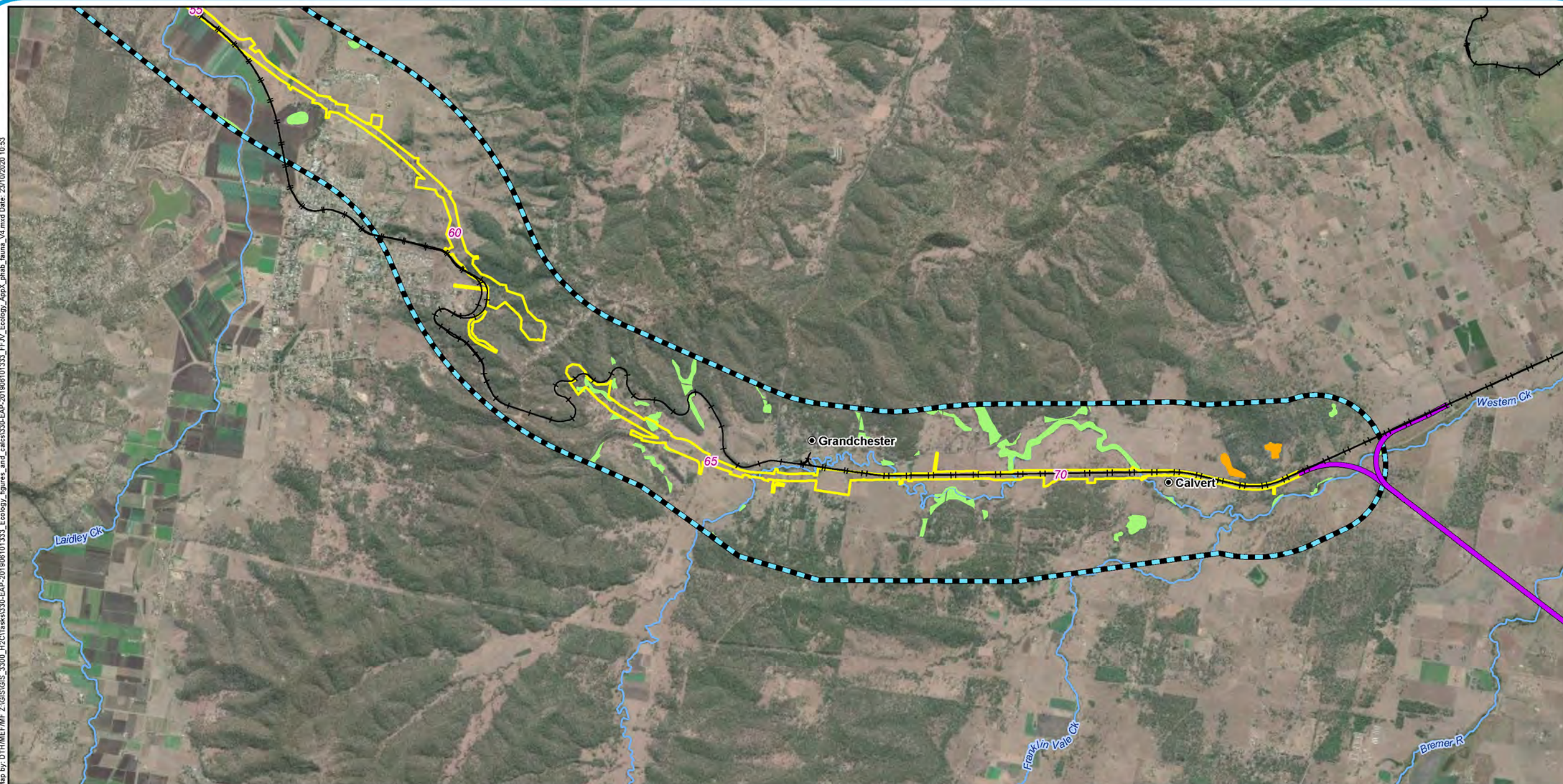
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FFJV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

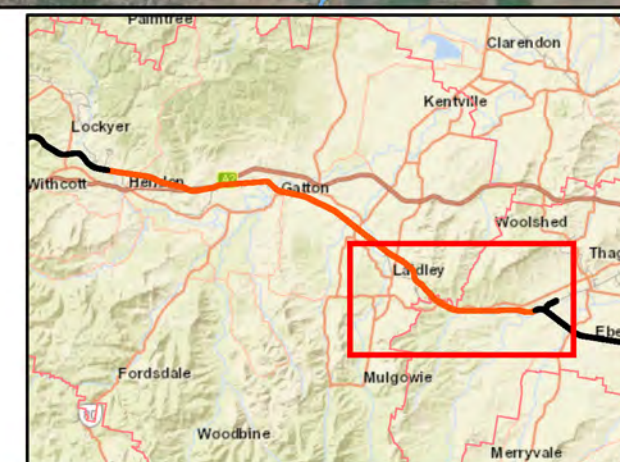


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

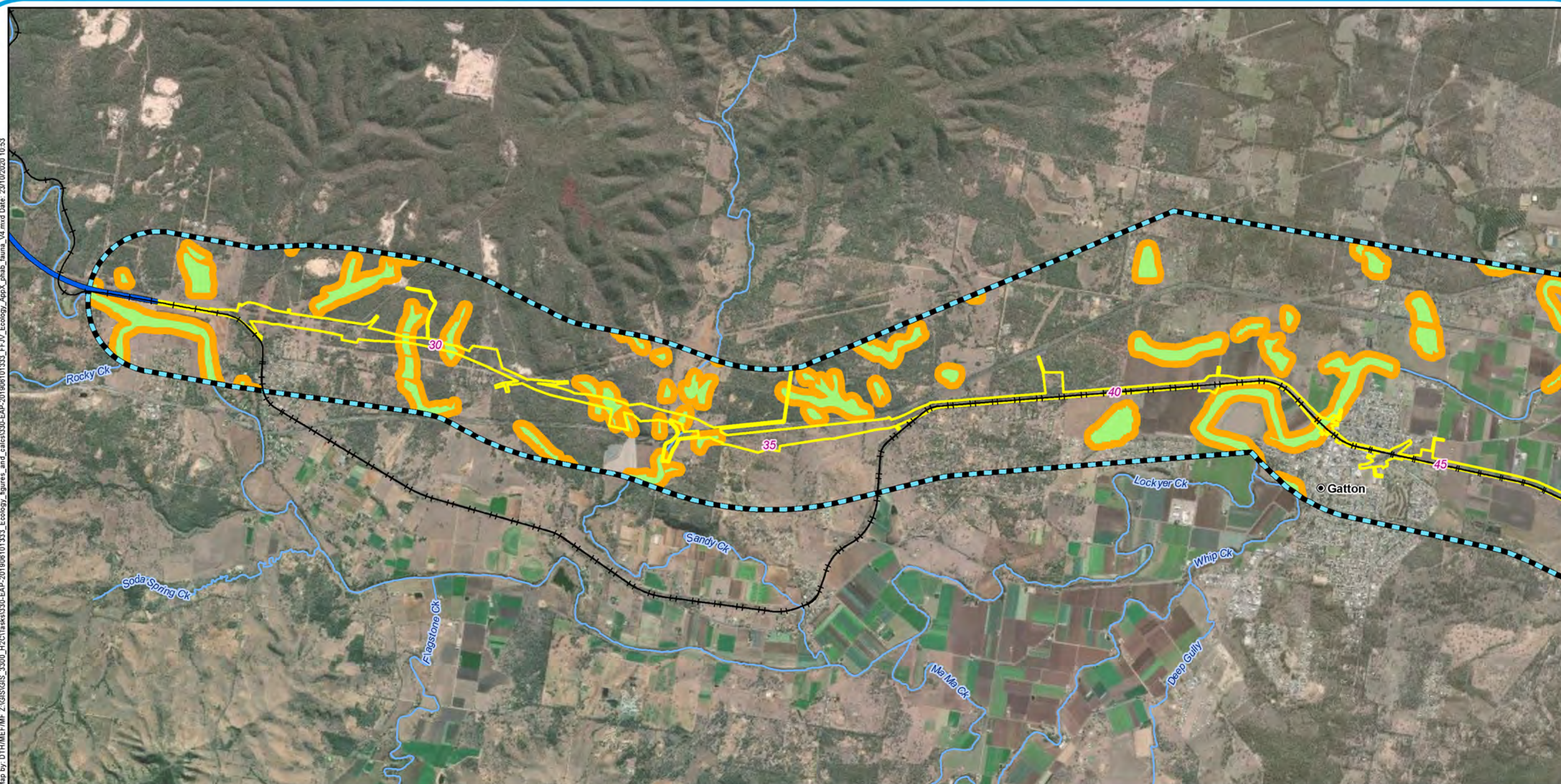
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2C\Tasks\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

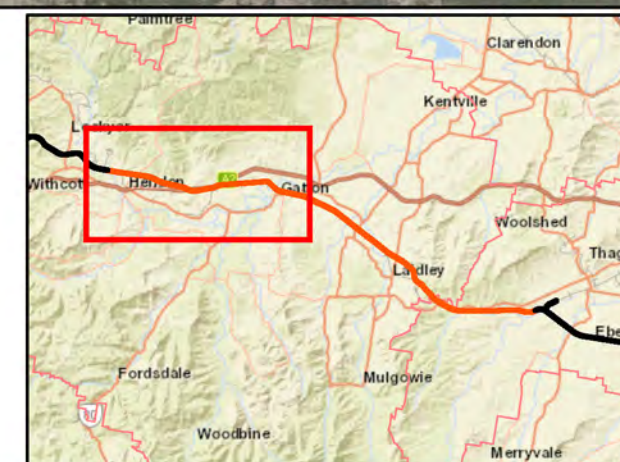


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

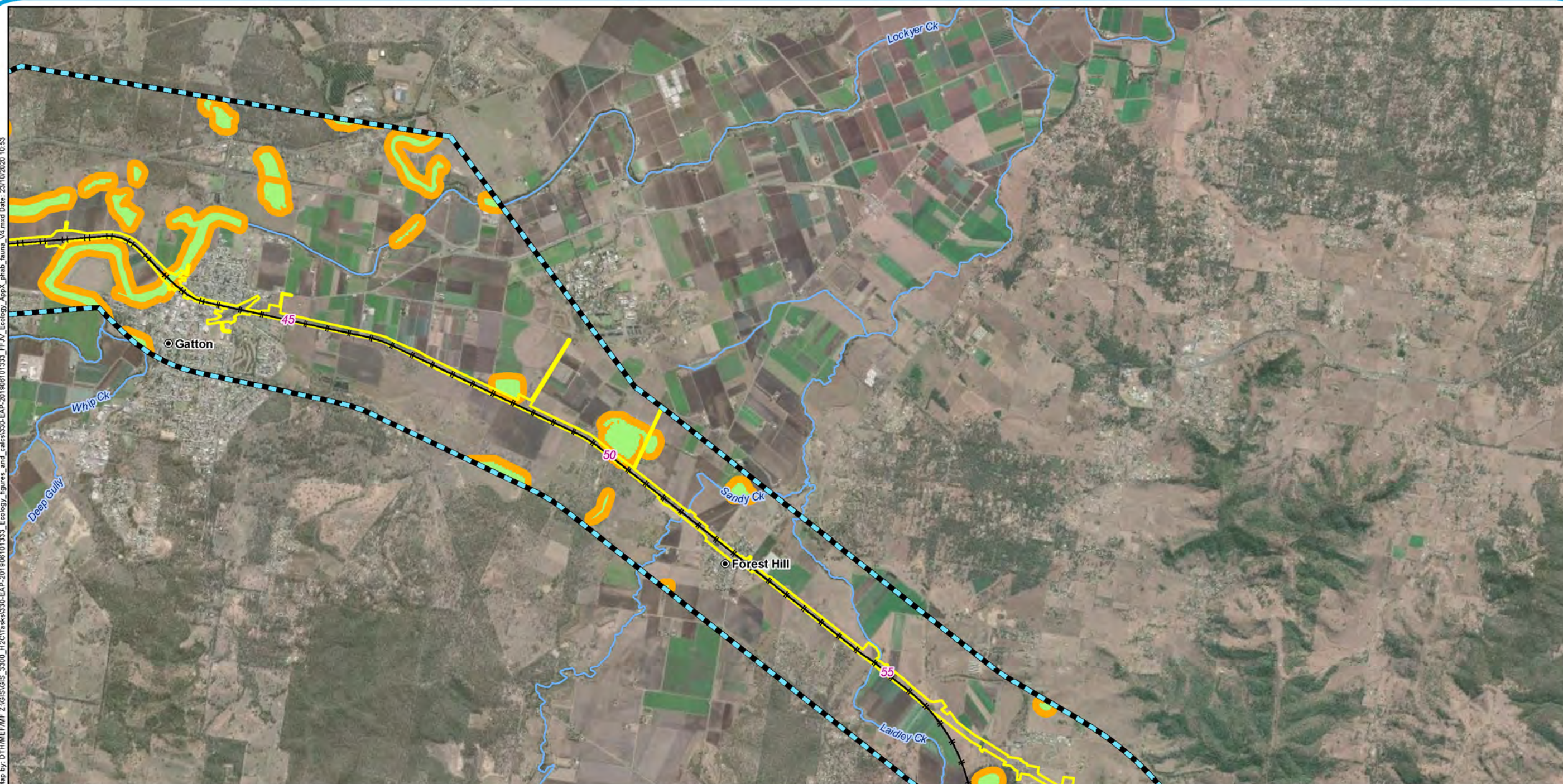
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/MF Z:\GIS\GIS_3300_H2O\Task\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FF JV_Ecology_App\phab_fauna_v4.mxd Date: 23/10/2020 10:53

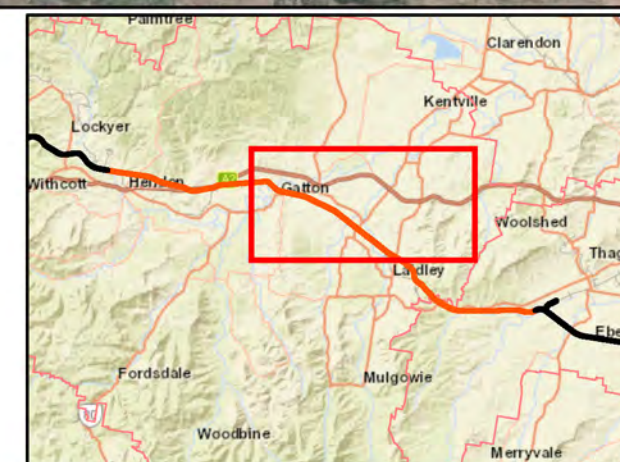


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- Ecology study area

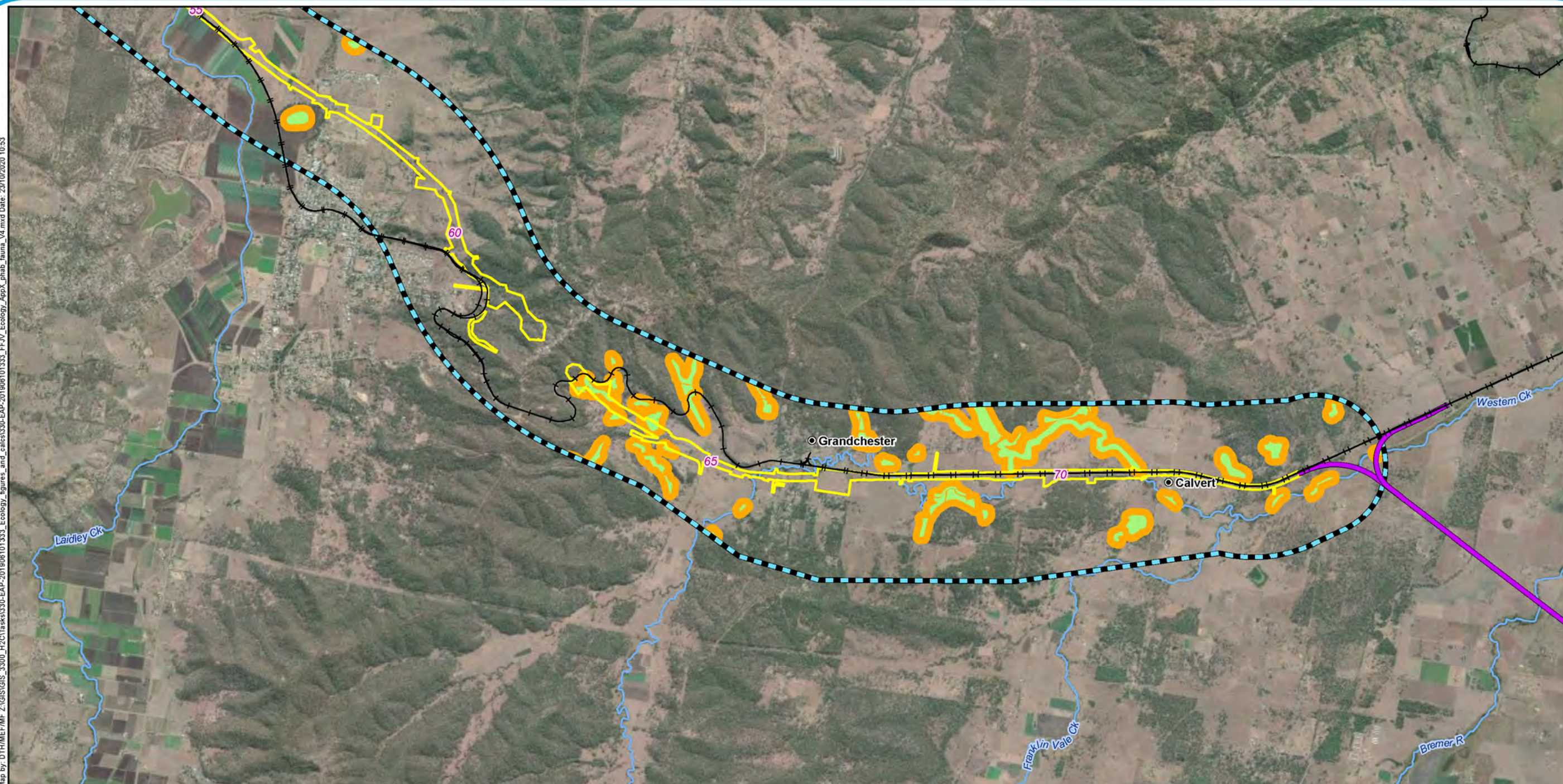
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FFJV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

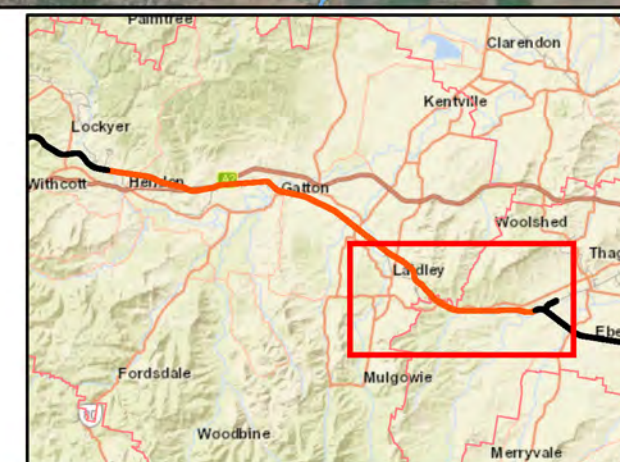


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

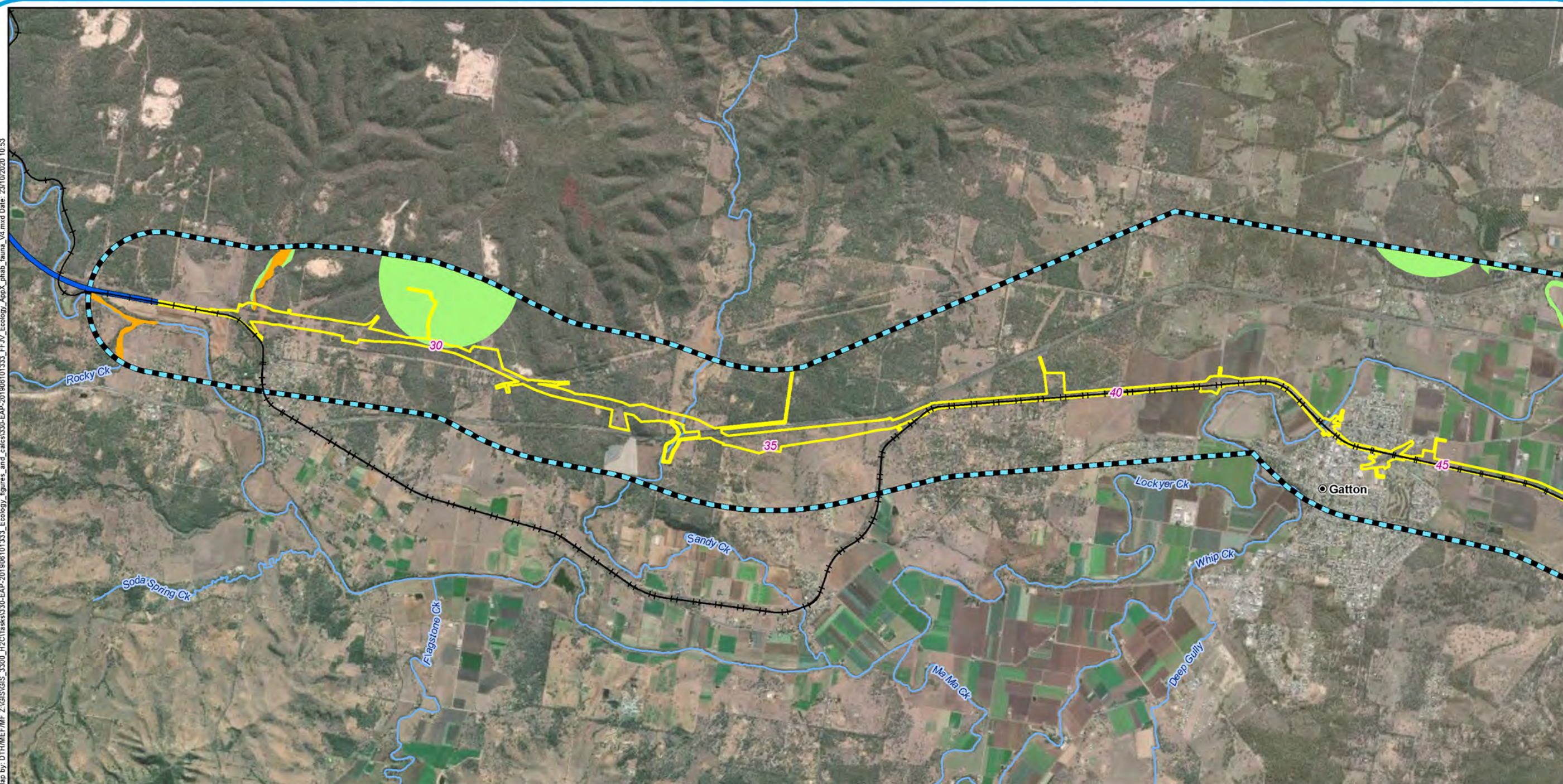
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

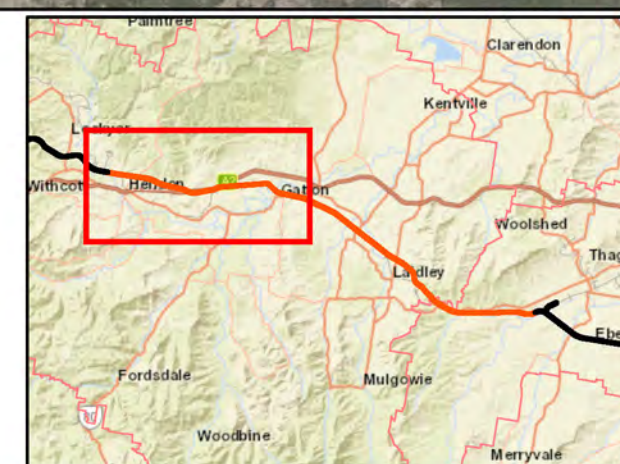


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/MF Z:\GIS\GIS_3300_H2O\Task\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

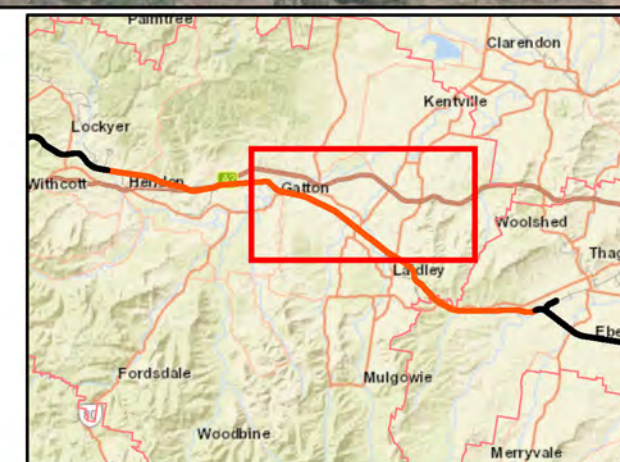


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- Ecology study area

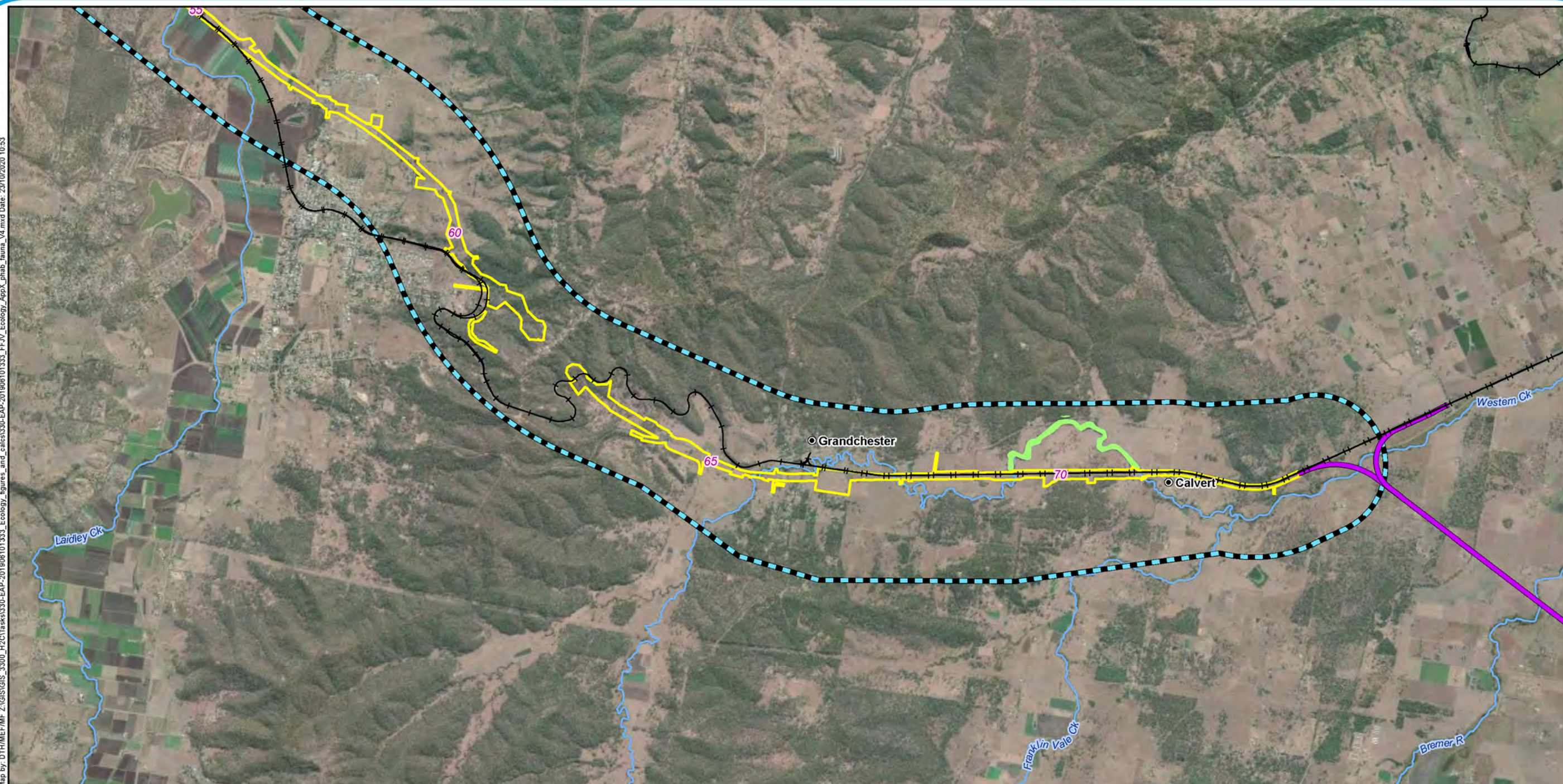
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FFJV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

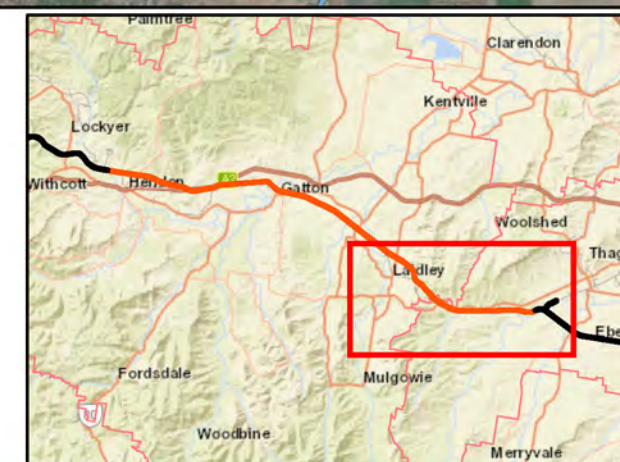


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

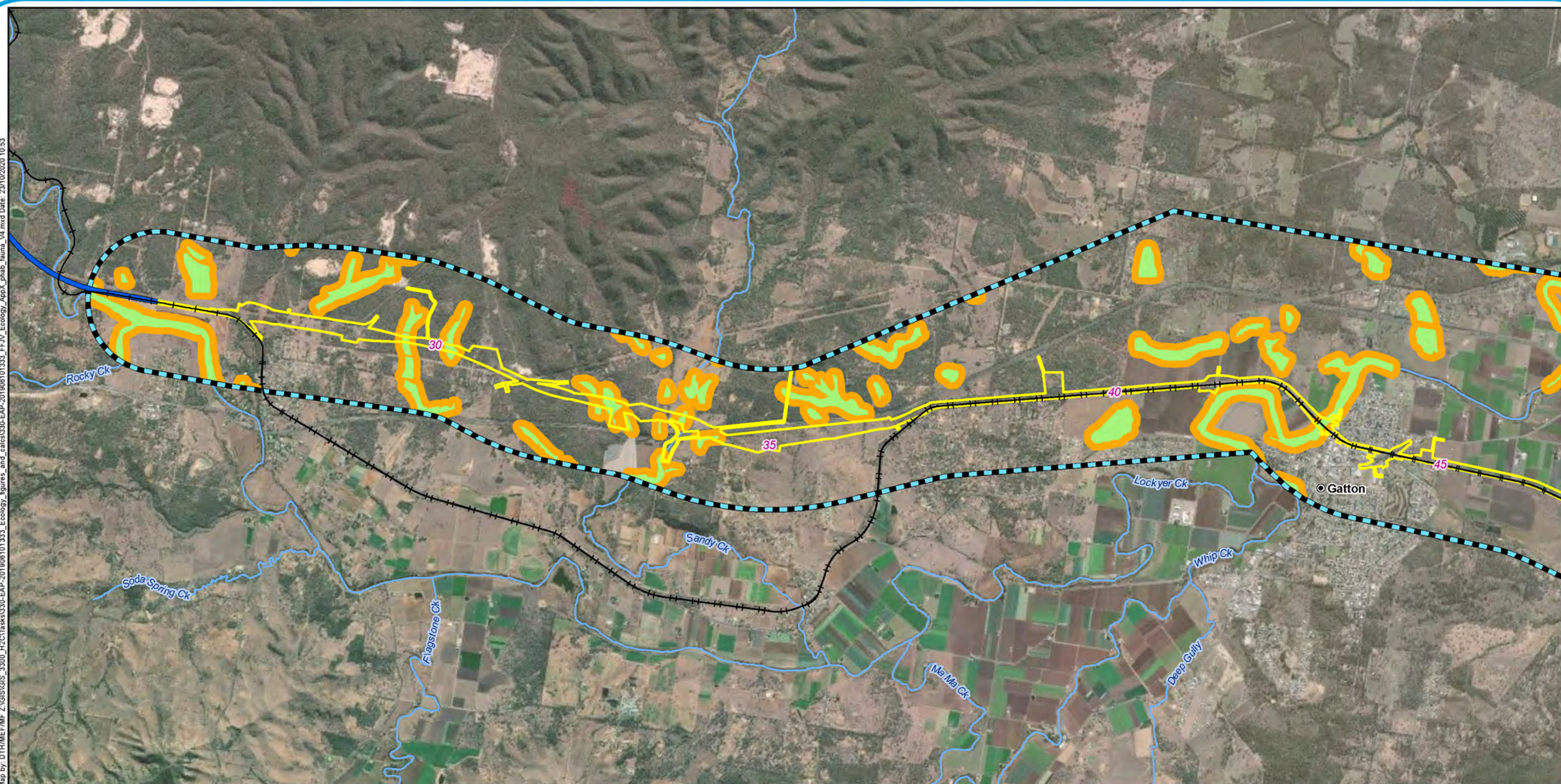
Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

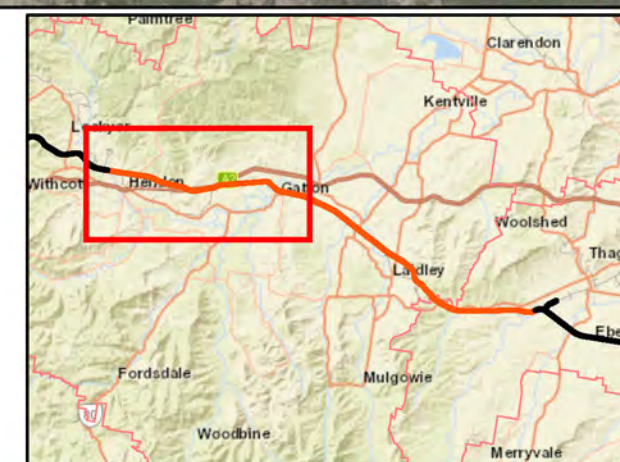


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

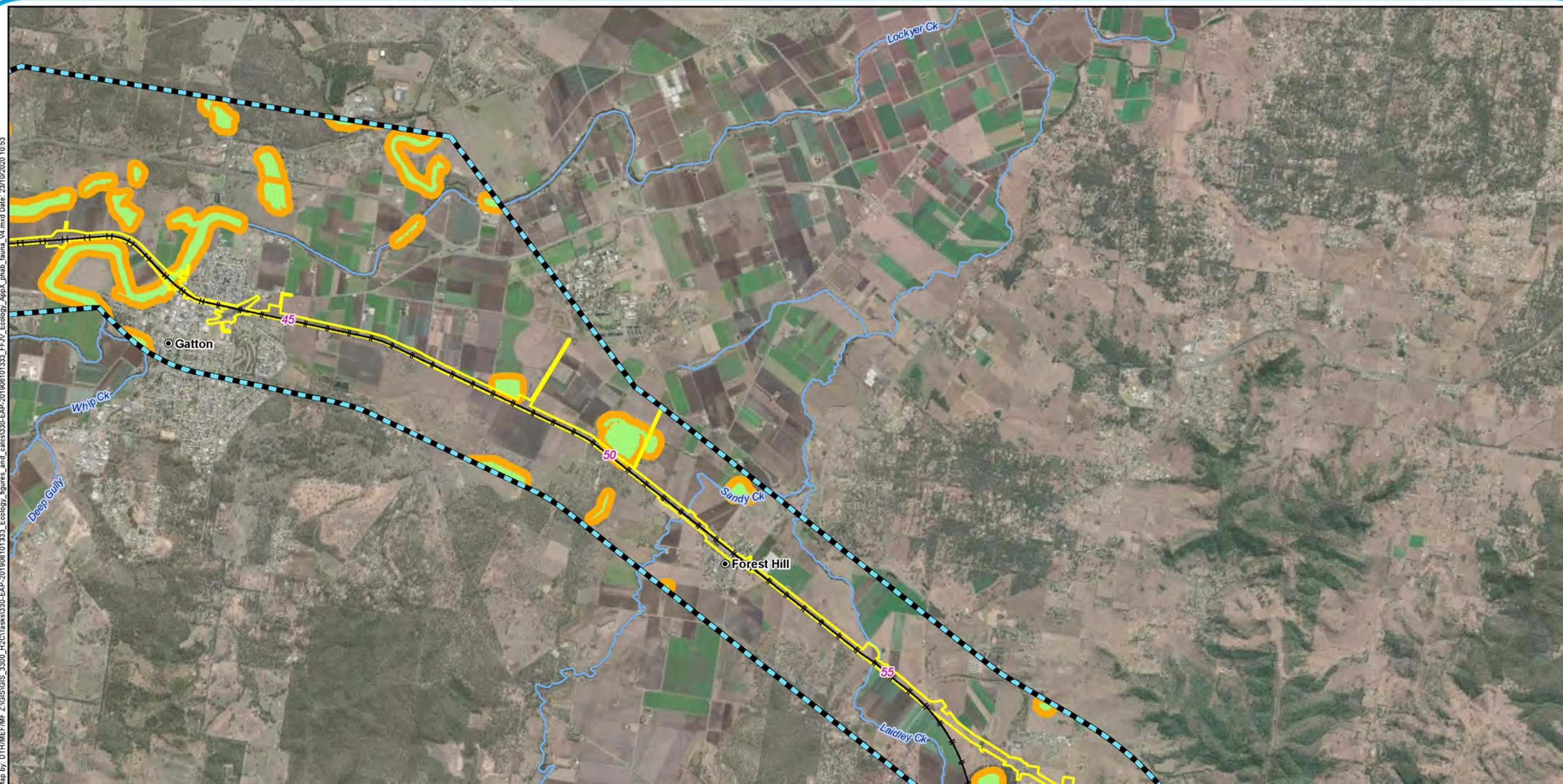
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/MF Z:\GIS\GIS_3300_H2O\Task\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

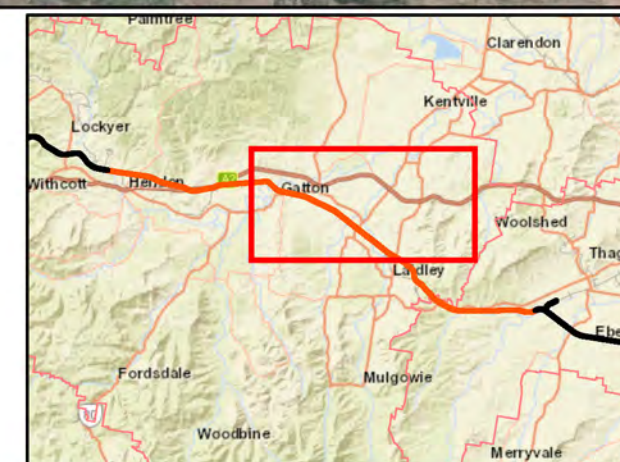


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- Ecology study area

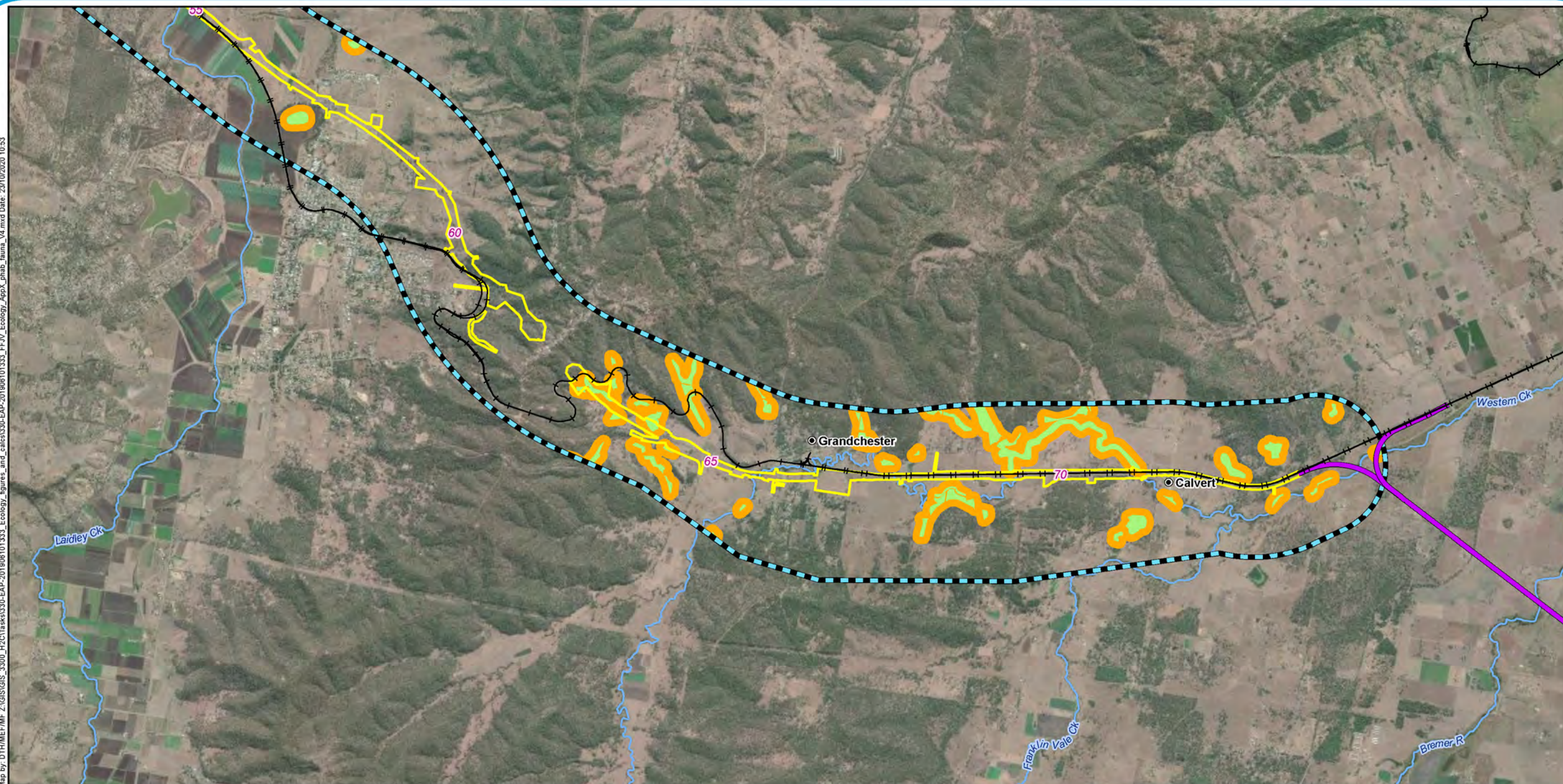
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

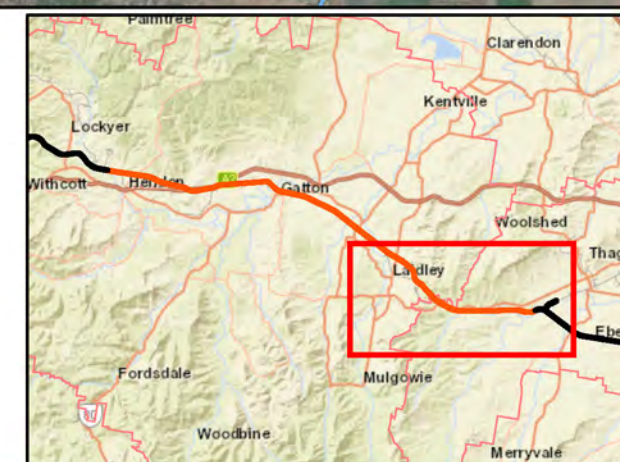


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

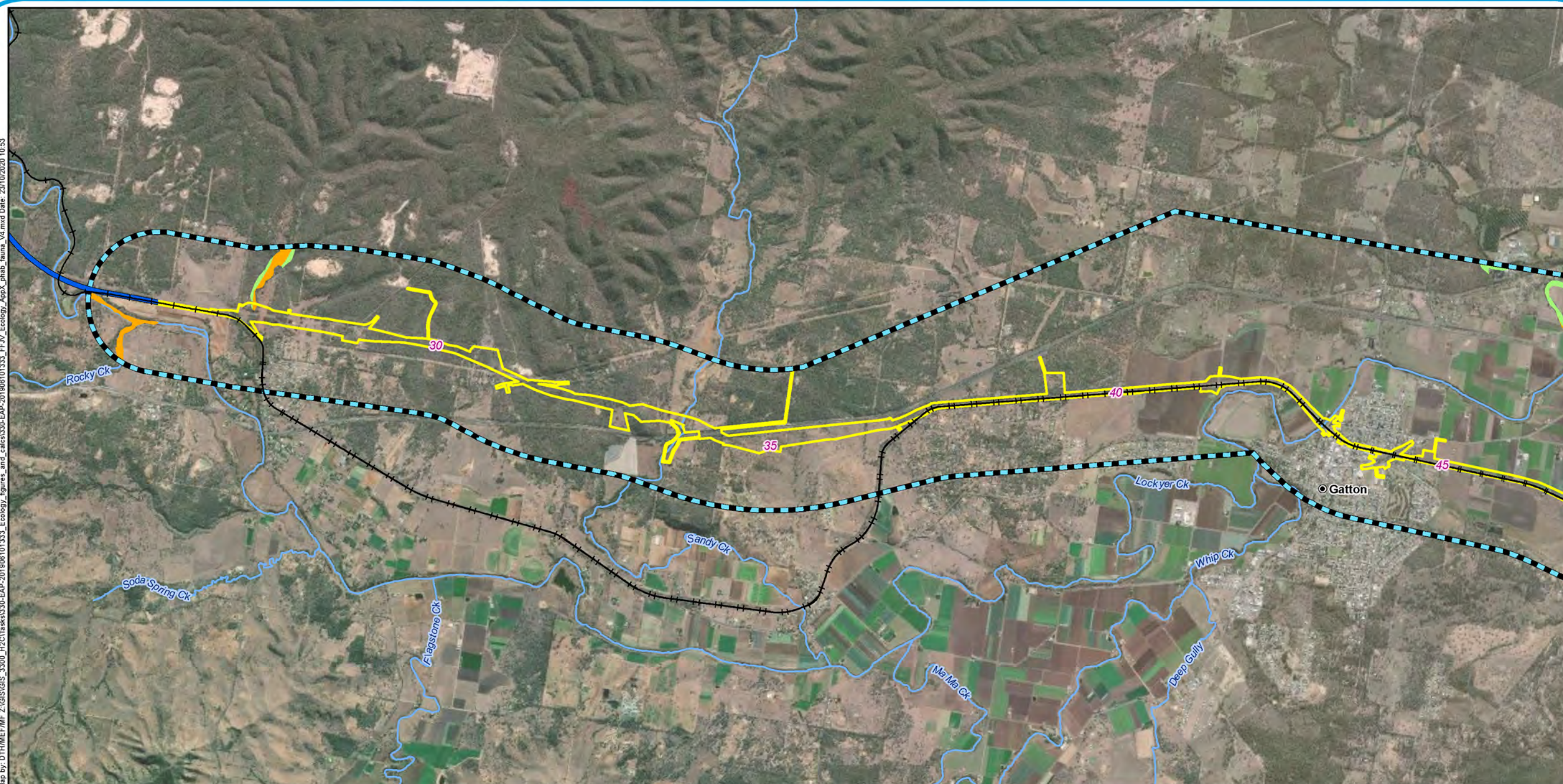
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

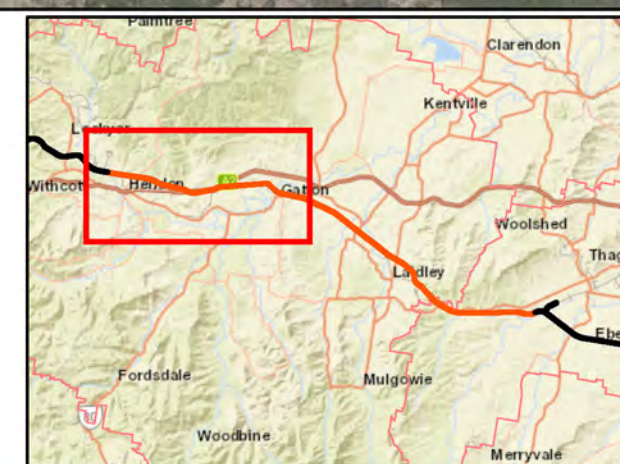


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

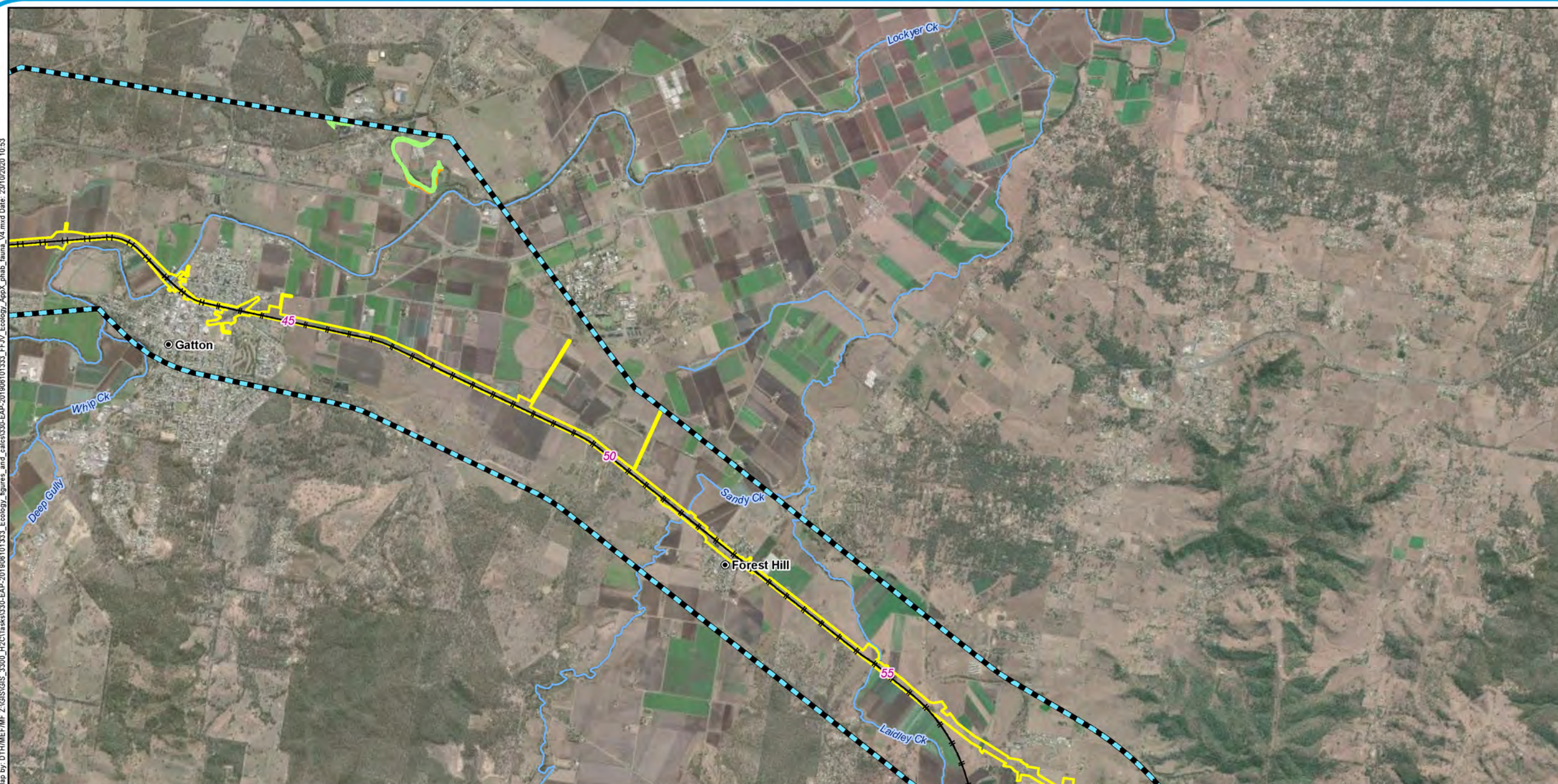
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/MF Z:\GIS\GIS_3300_H2O\Task\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

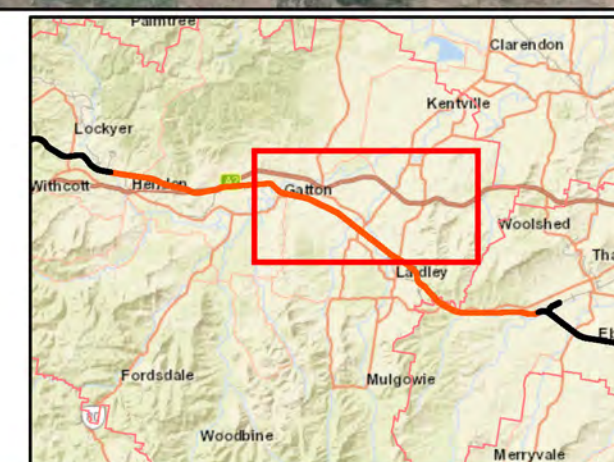


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- Ecology study area

Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

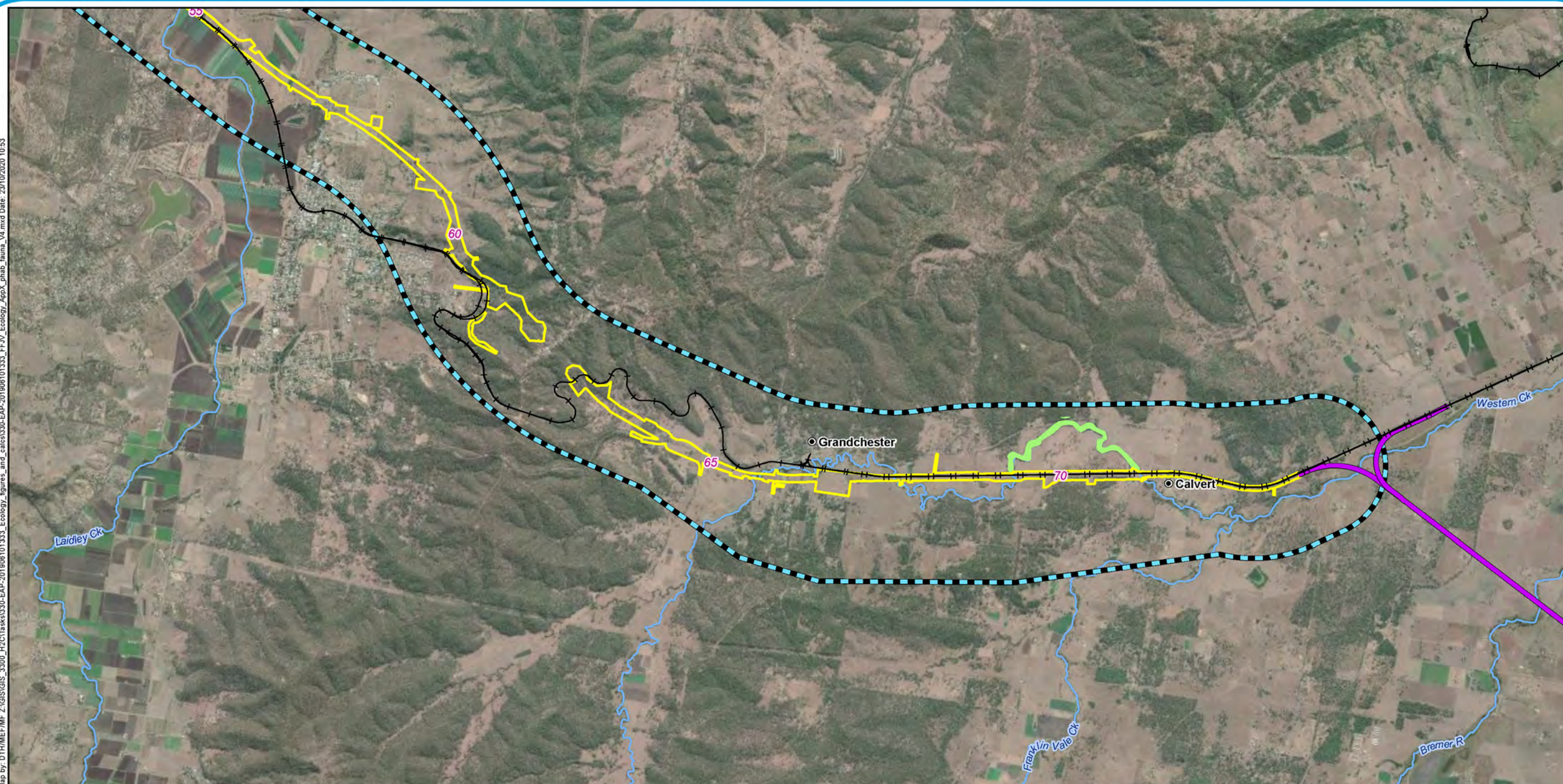


Issue date: 23/10/2020 Version: 3
Coordinate system: MGA56

Helidon to Calvert

Predicted Habitat: *Myiagra cyanoleuca* (Satin flycatcher)

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

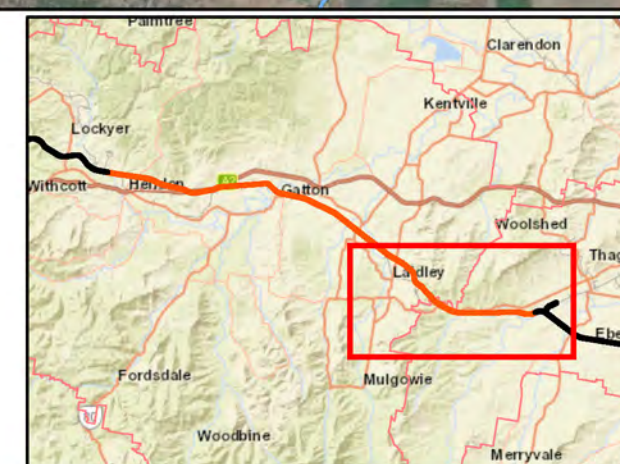


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

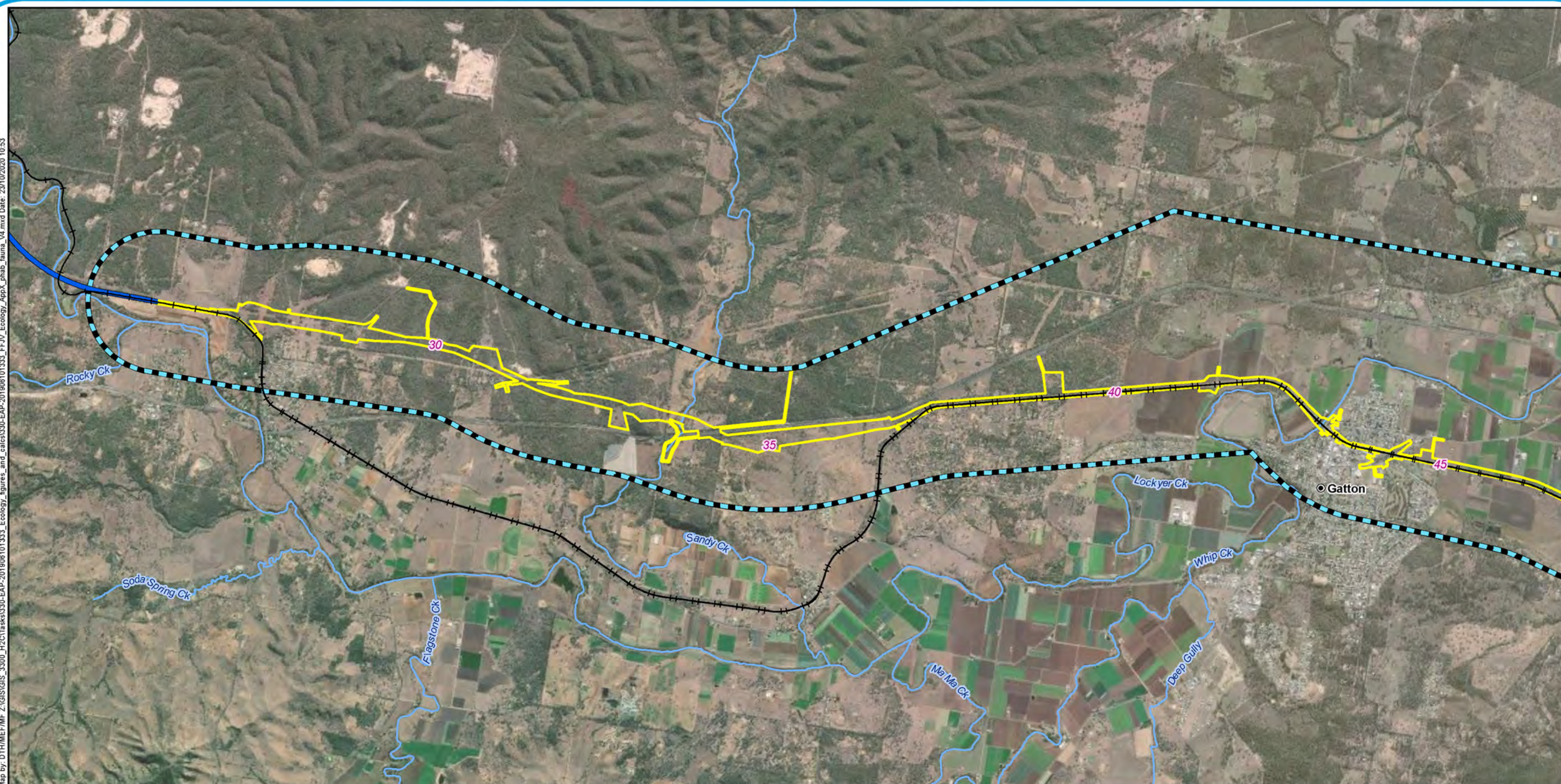
Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2CTask\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

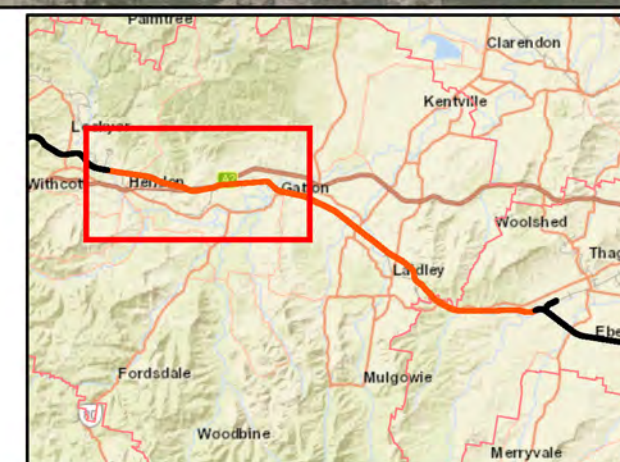


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

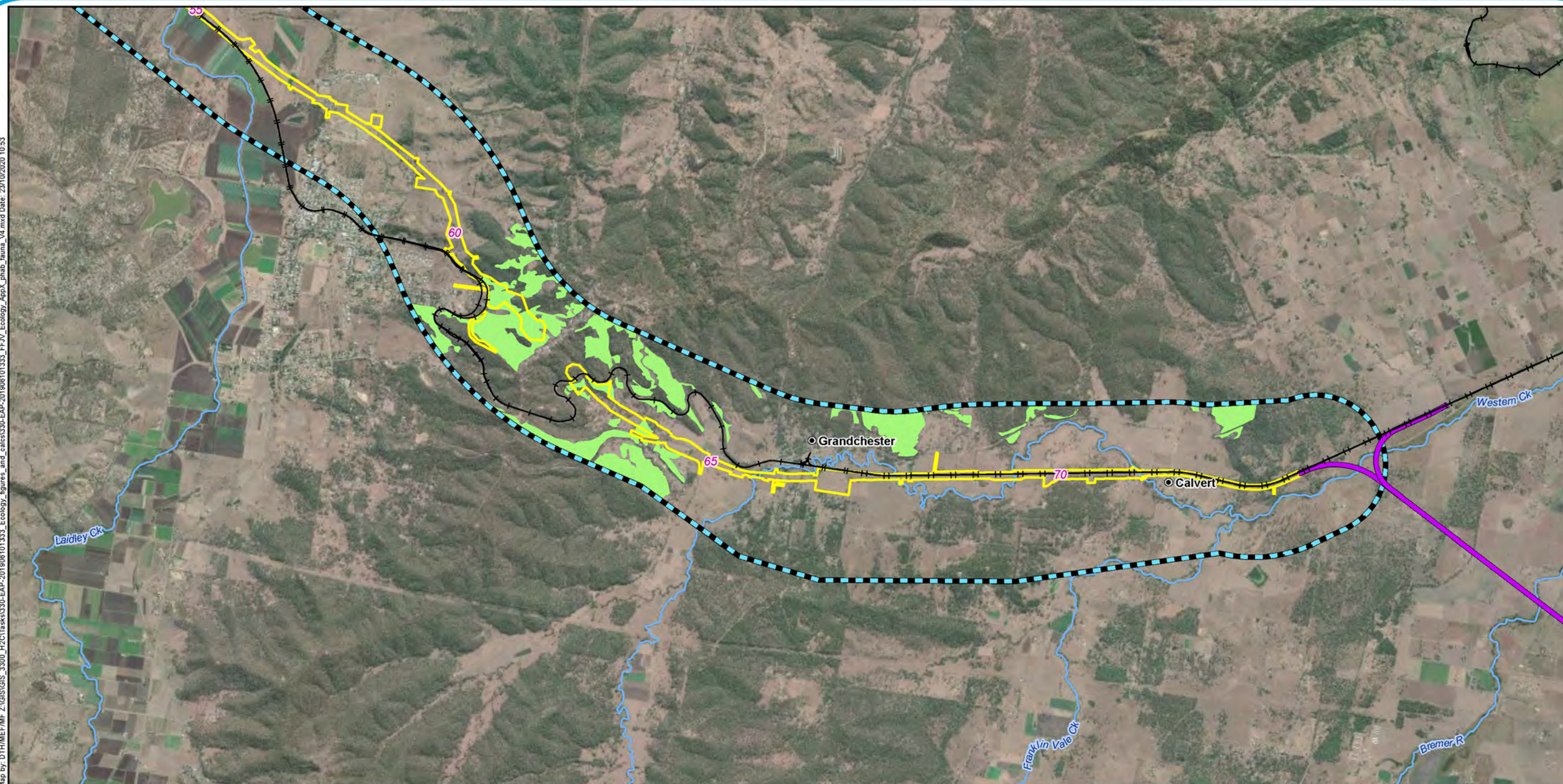
Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_App\phab_fauna_v4.mxd Date: 23/10/2020 10:53

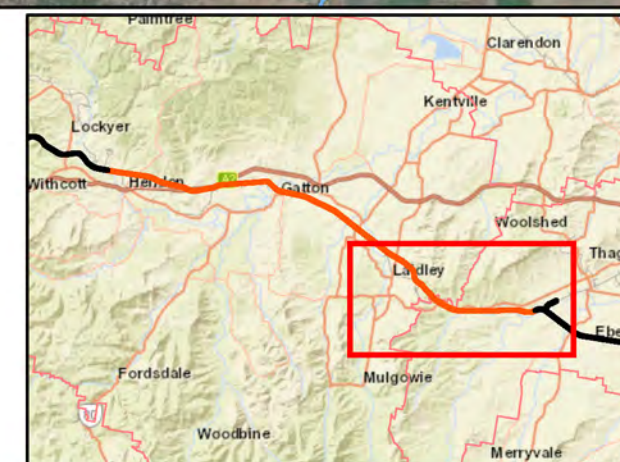


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

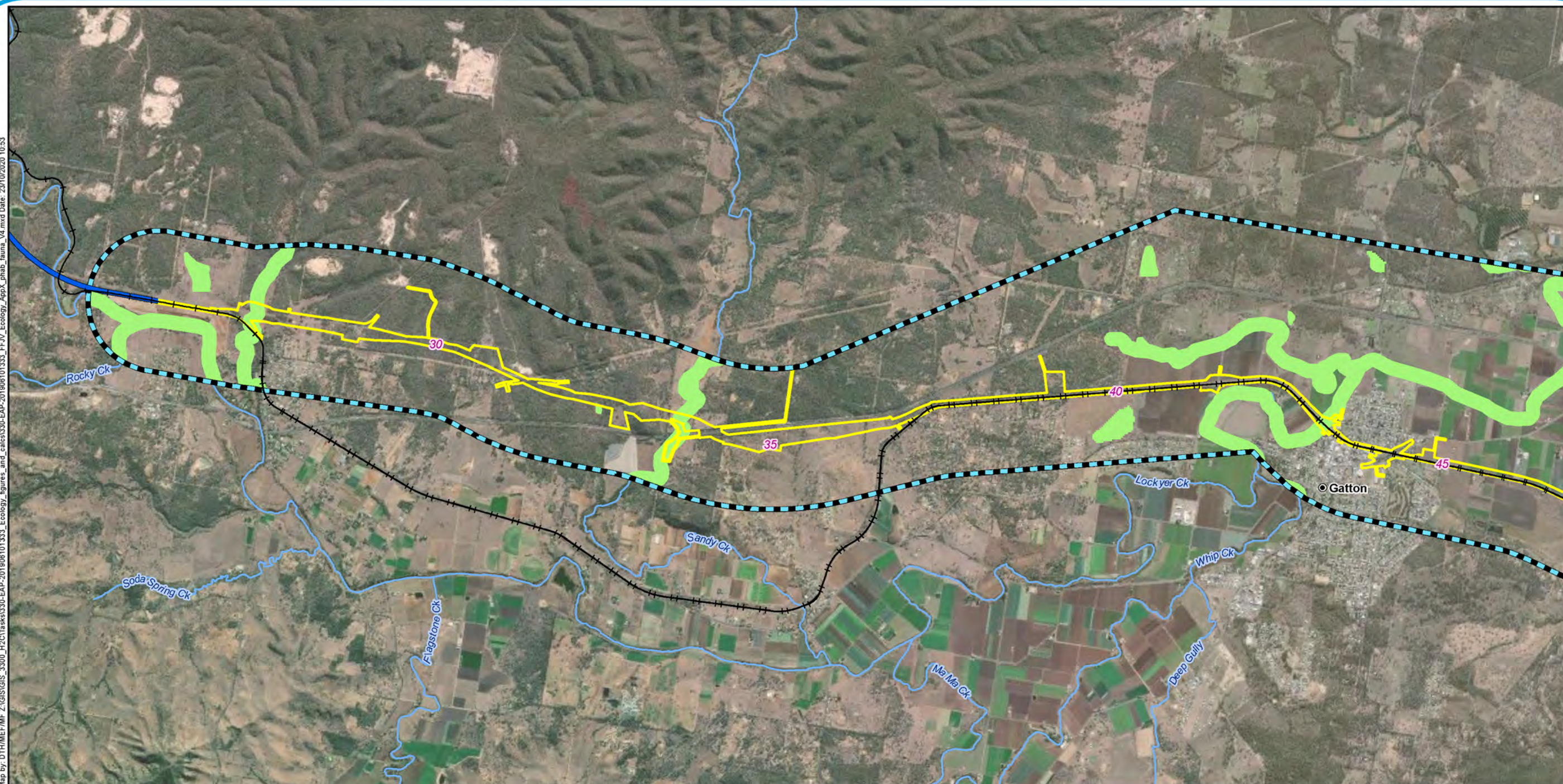
Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2CTask\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

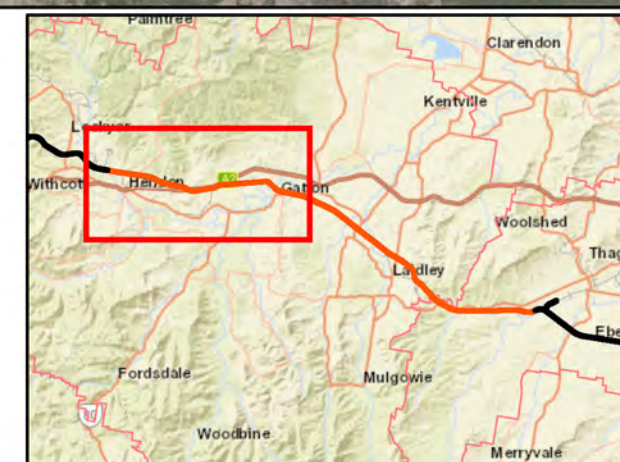


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

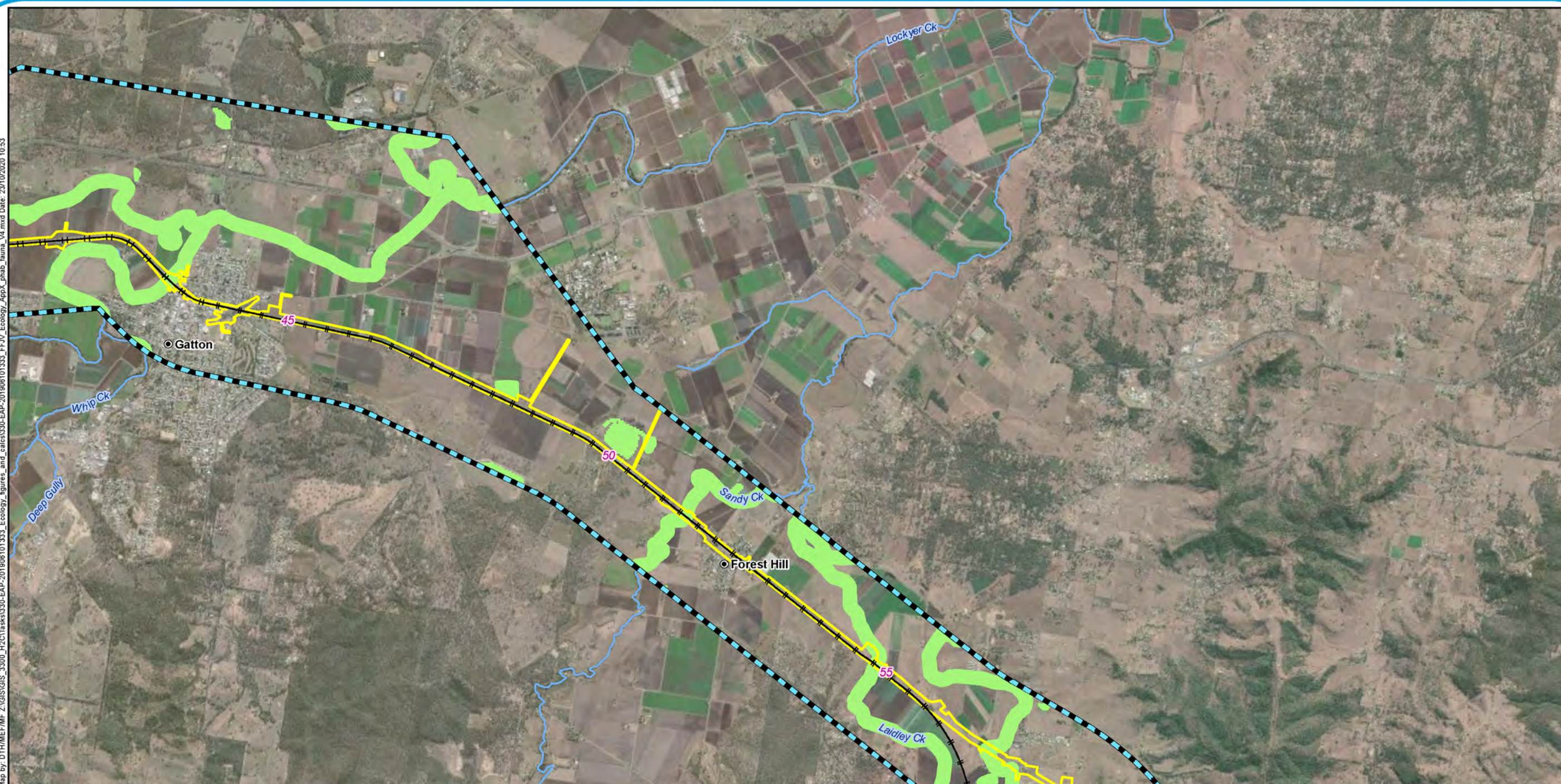
Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2O\Task\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

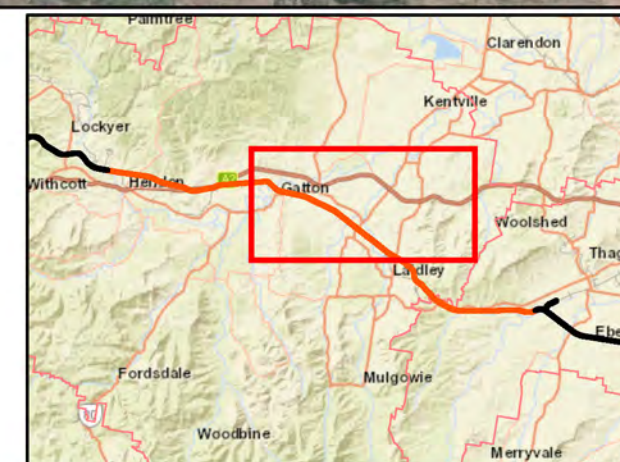


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- + Railway
- EIS disturbance footprint
- ▤ Ecology study area

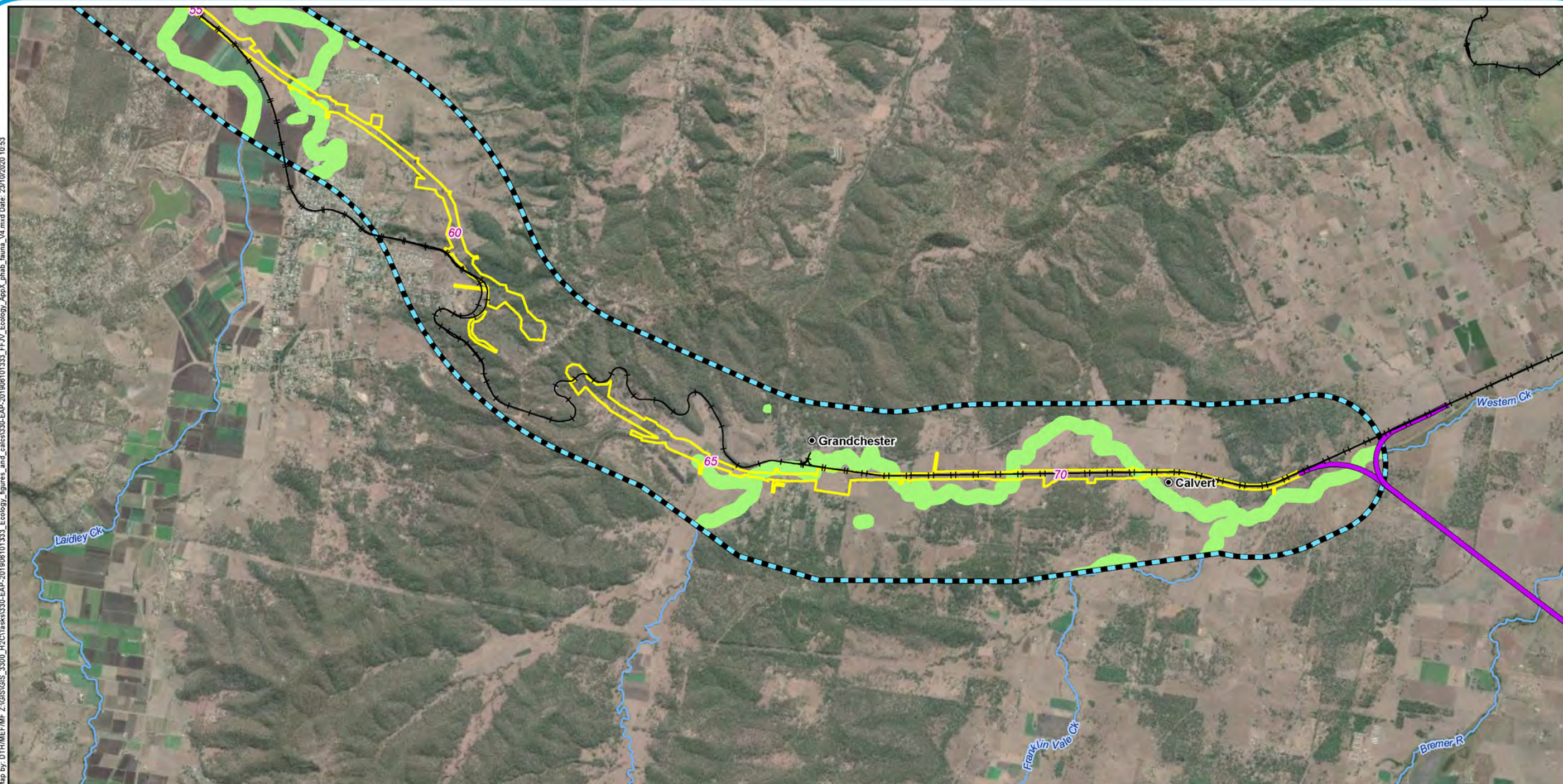
Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FFJV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

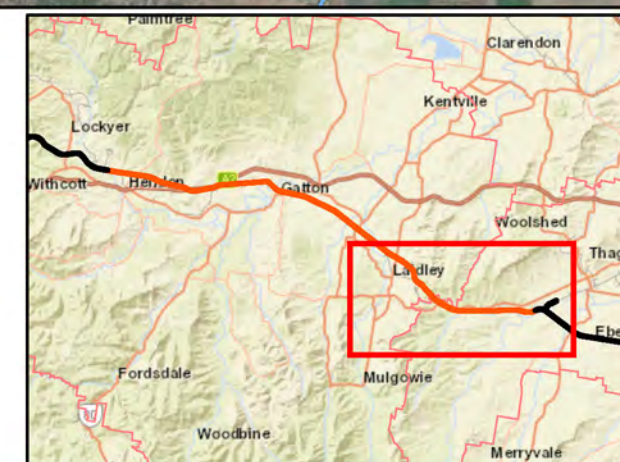


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

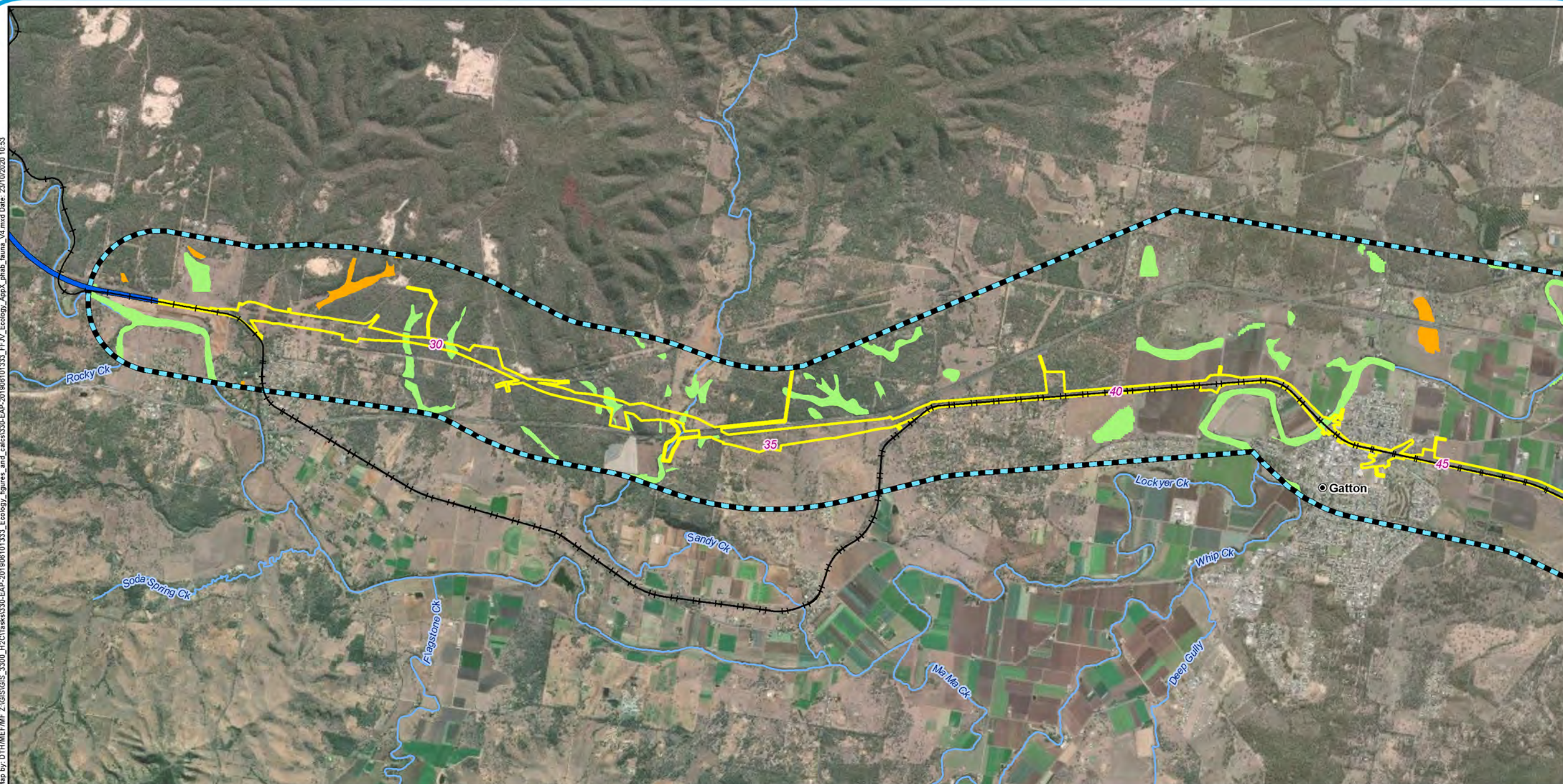
Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2CTask\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

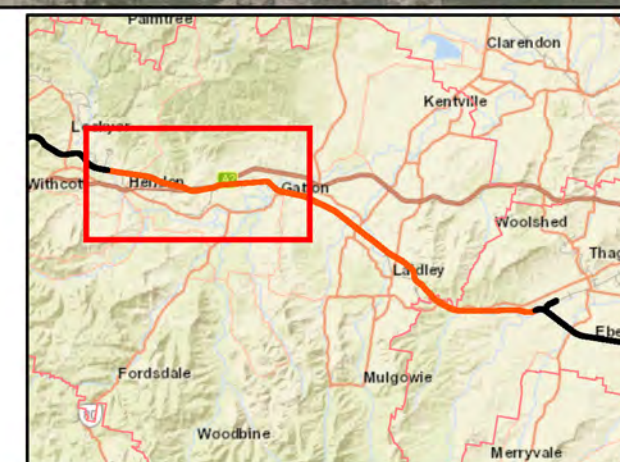


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

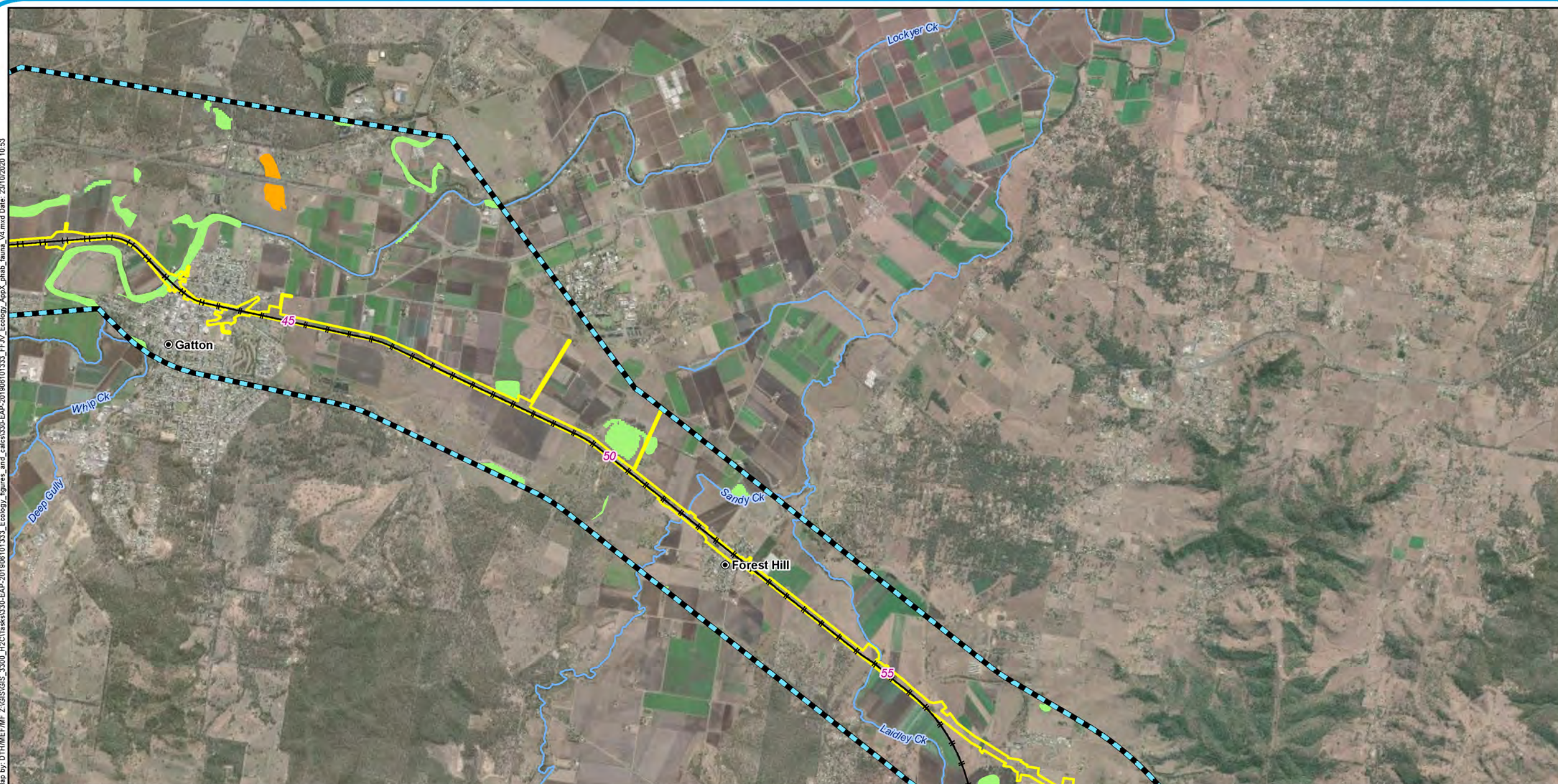
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2O\Task\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

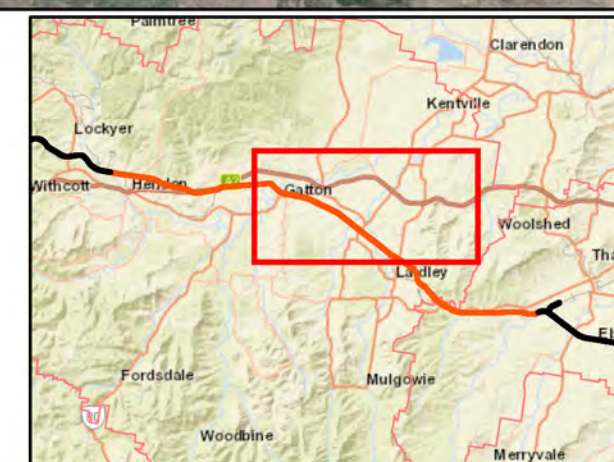


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- ▤ Ecology study area

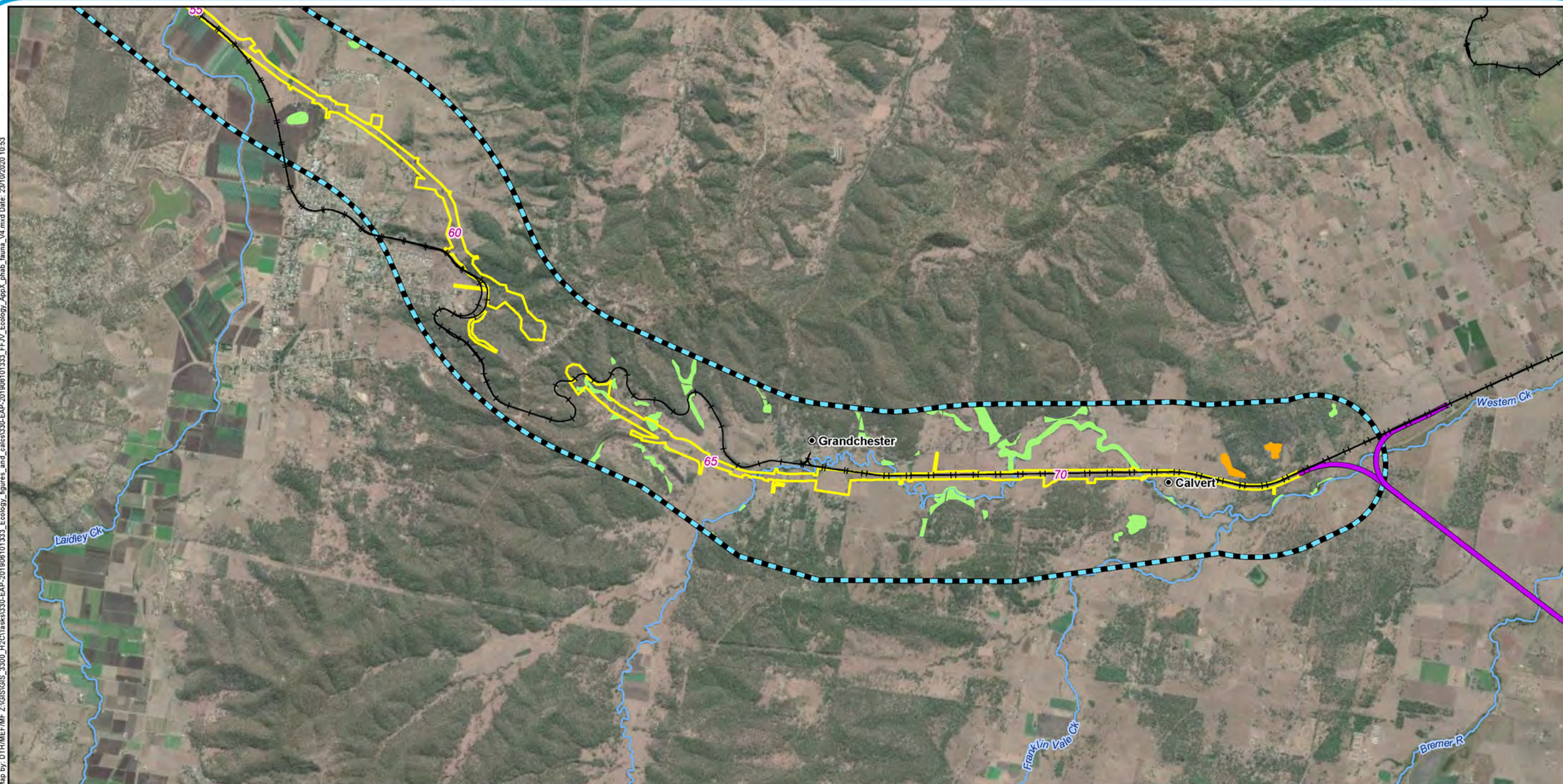
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

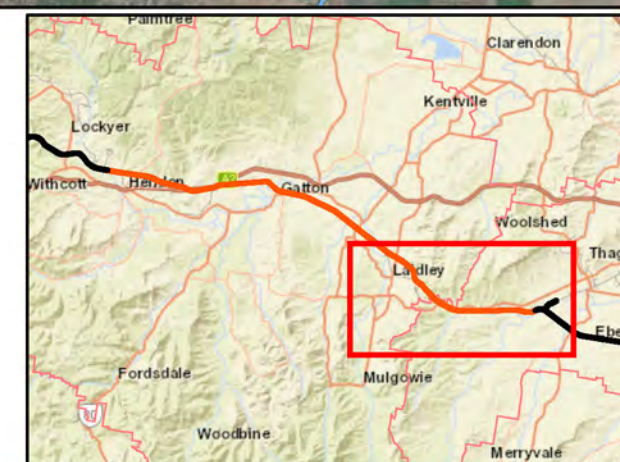


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

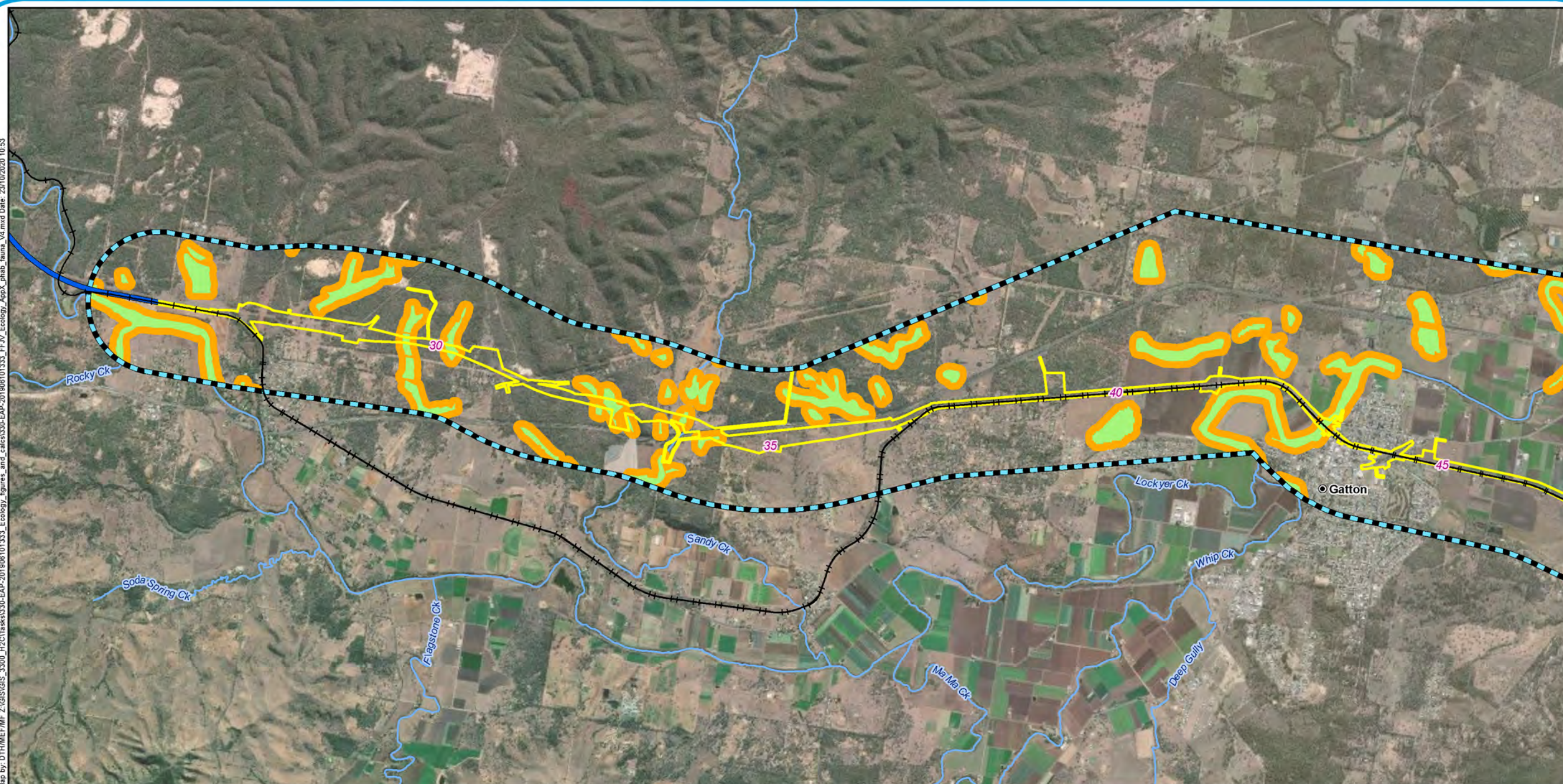
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2CTask\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FFJV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

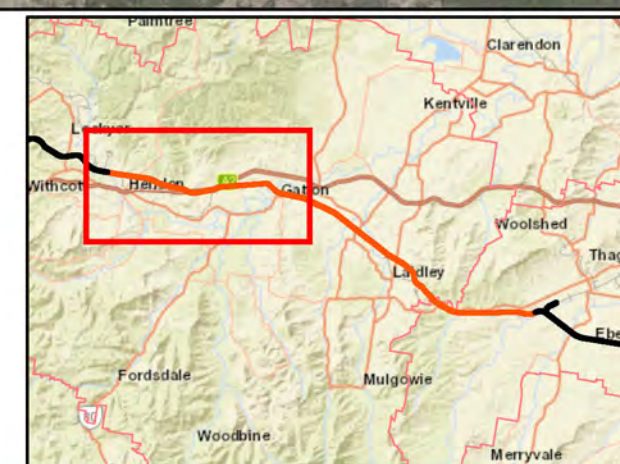


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

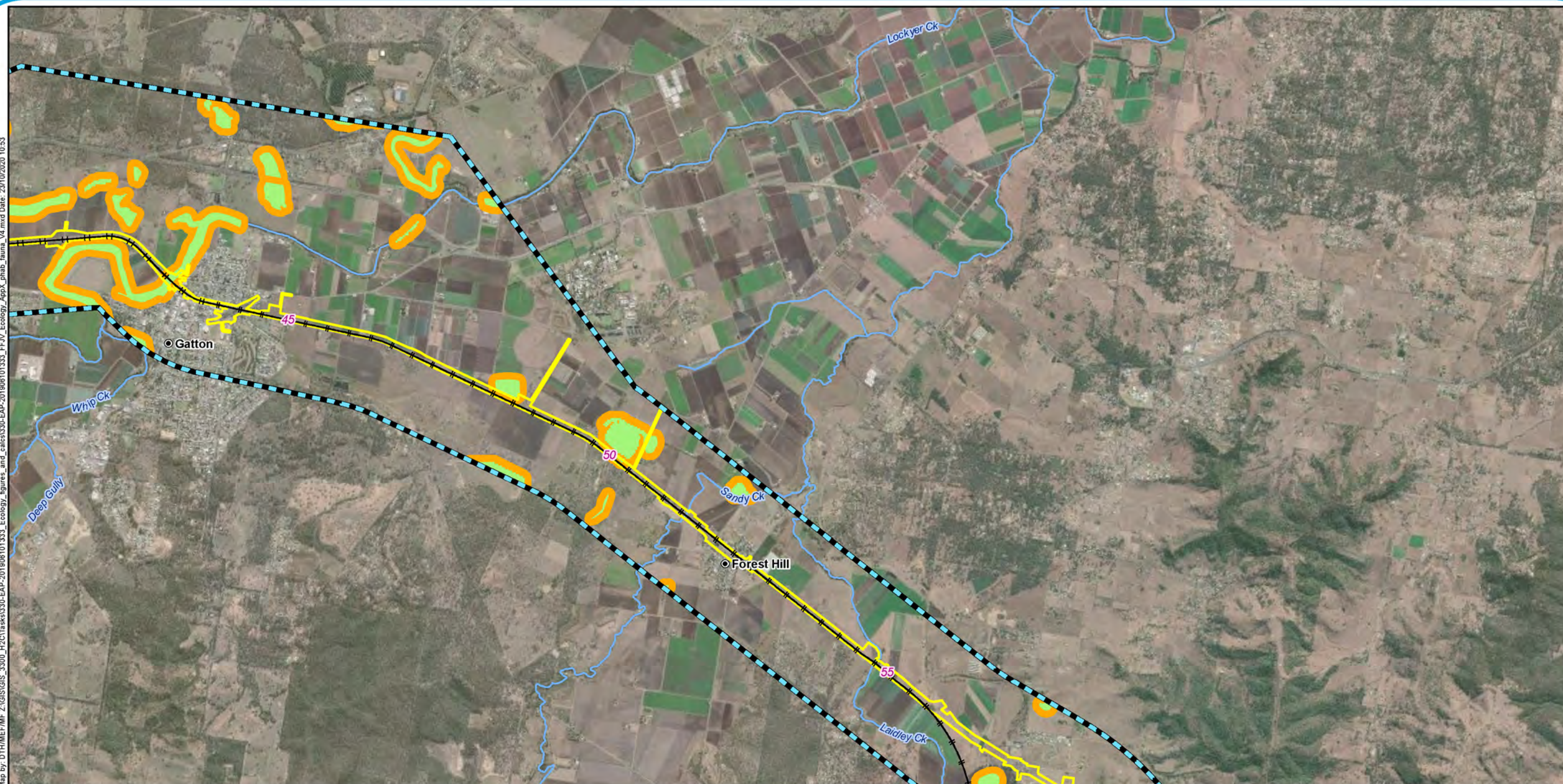
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/MF Z:\GIS\GIS_3300_H2O\Task\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FF JV_Ecology_AppX_phab_figura_V4.mxd Date: 23/10/2020 10:53

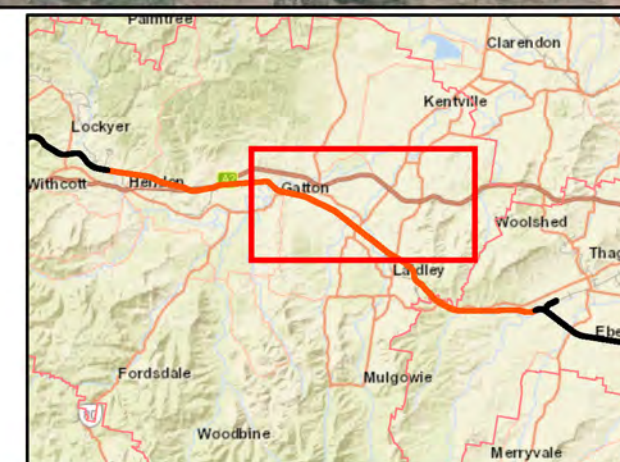


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- + Railway
- EIS disturbance footprint
- ▭ Ecology study area

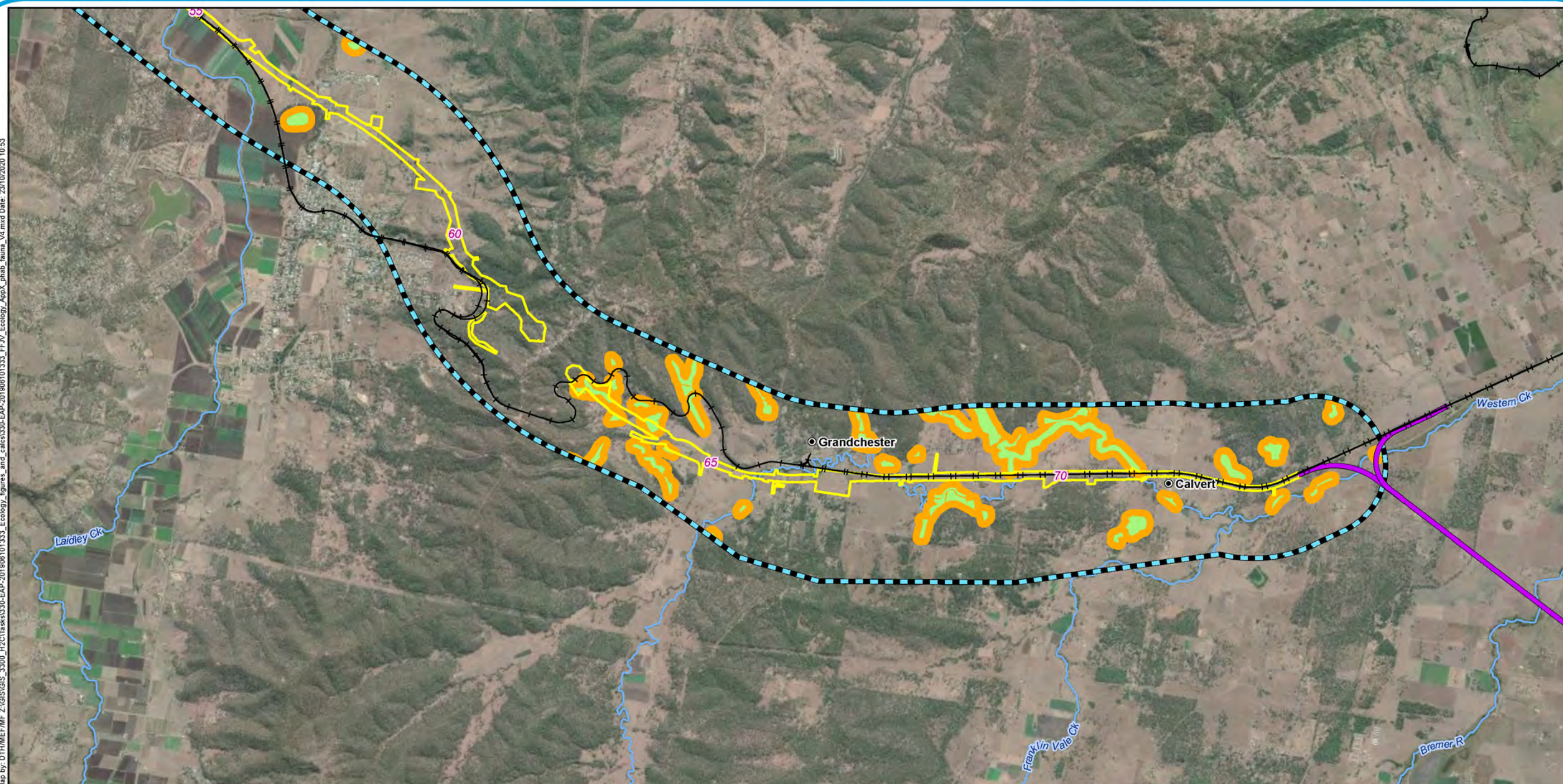
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

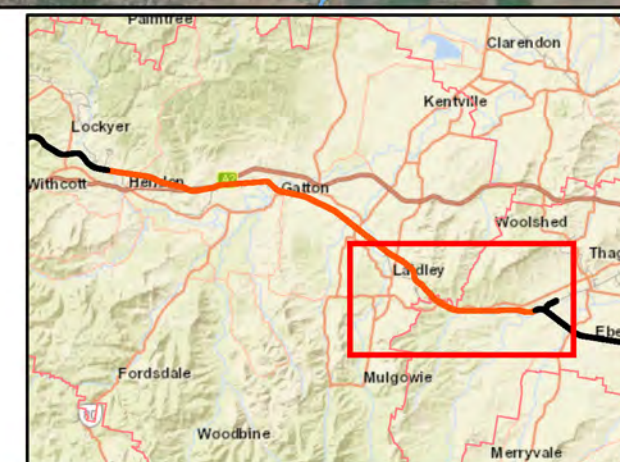


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

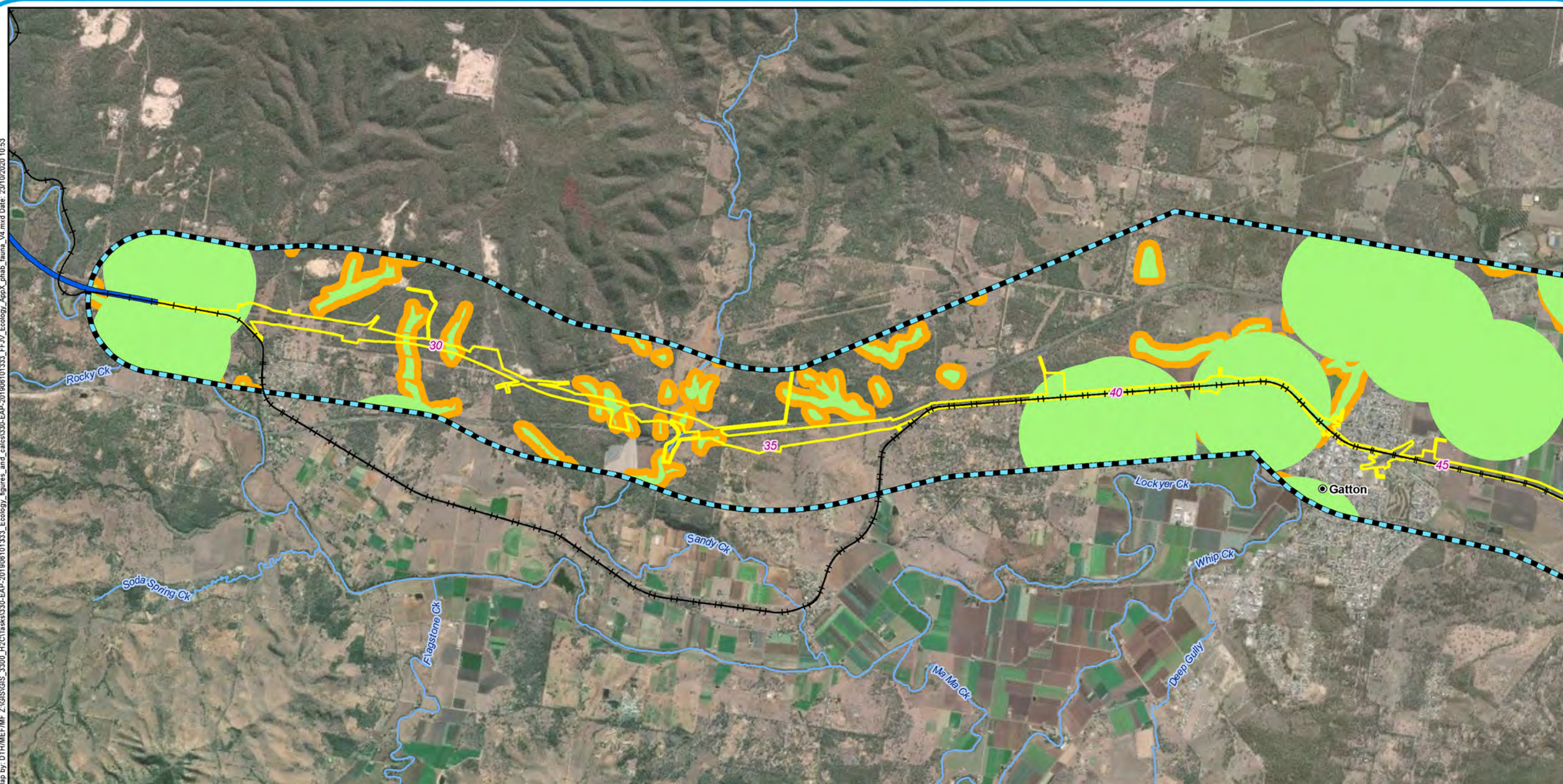
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FFIV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

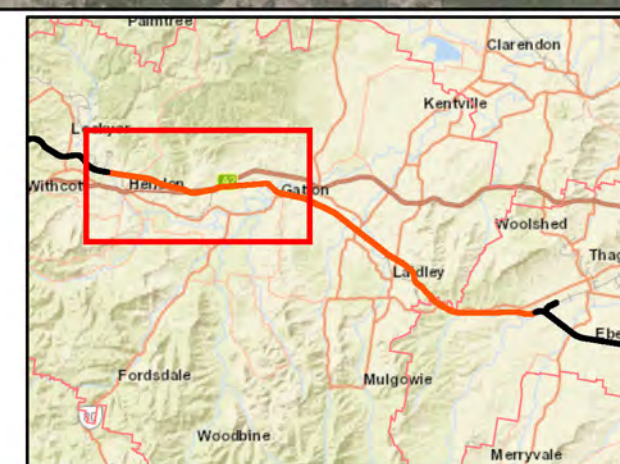


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

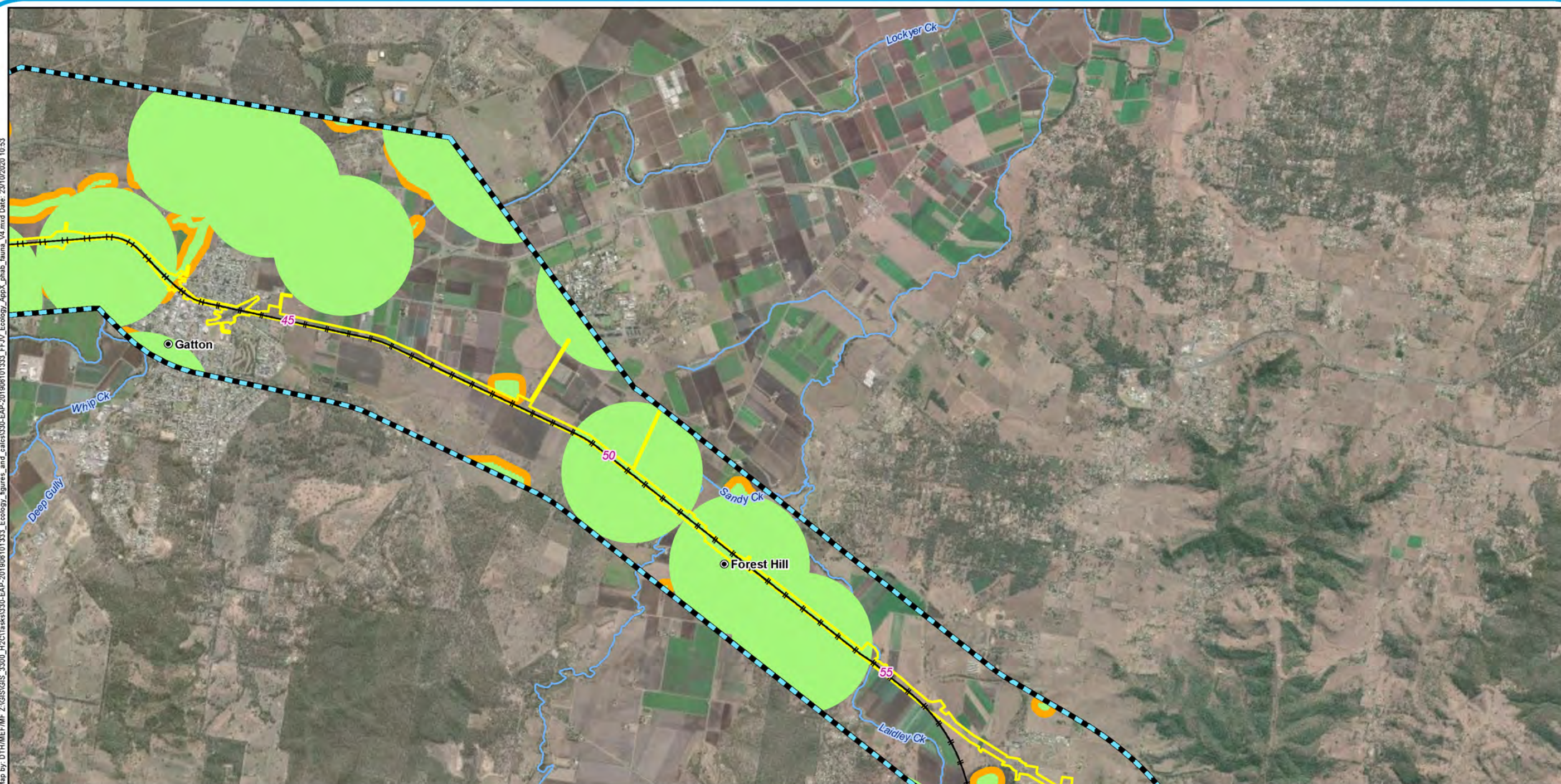
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H20\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

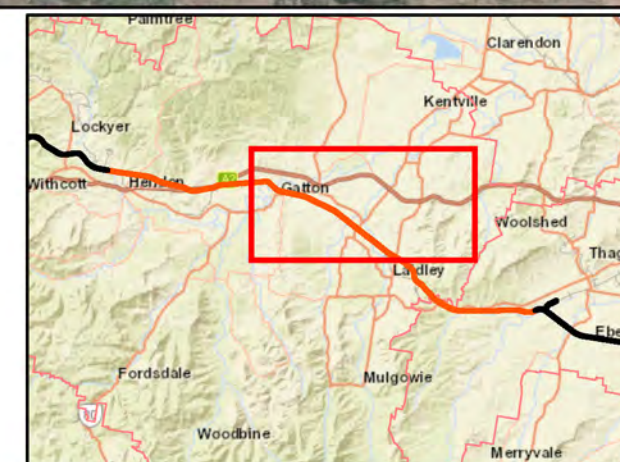


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- Ecology study area

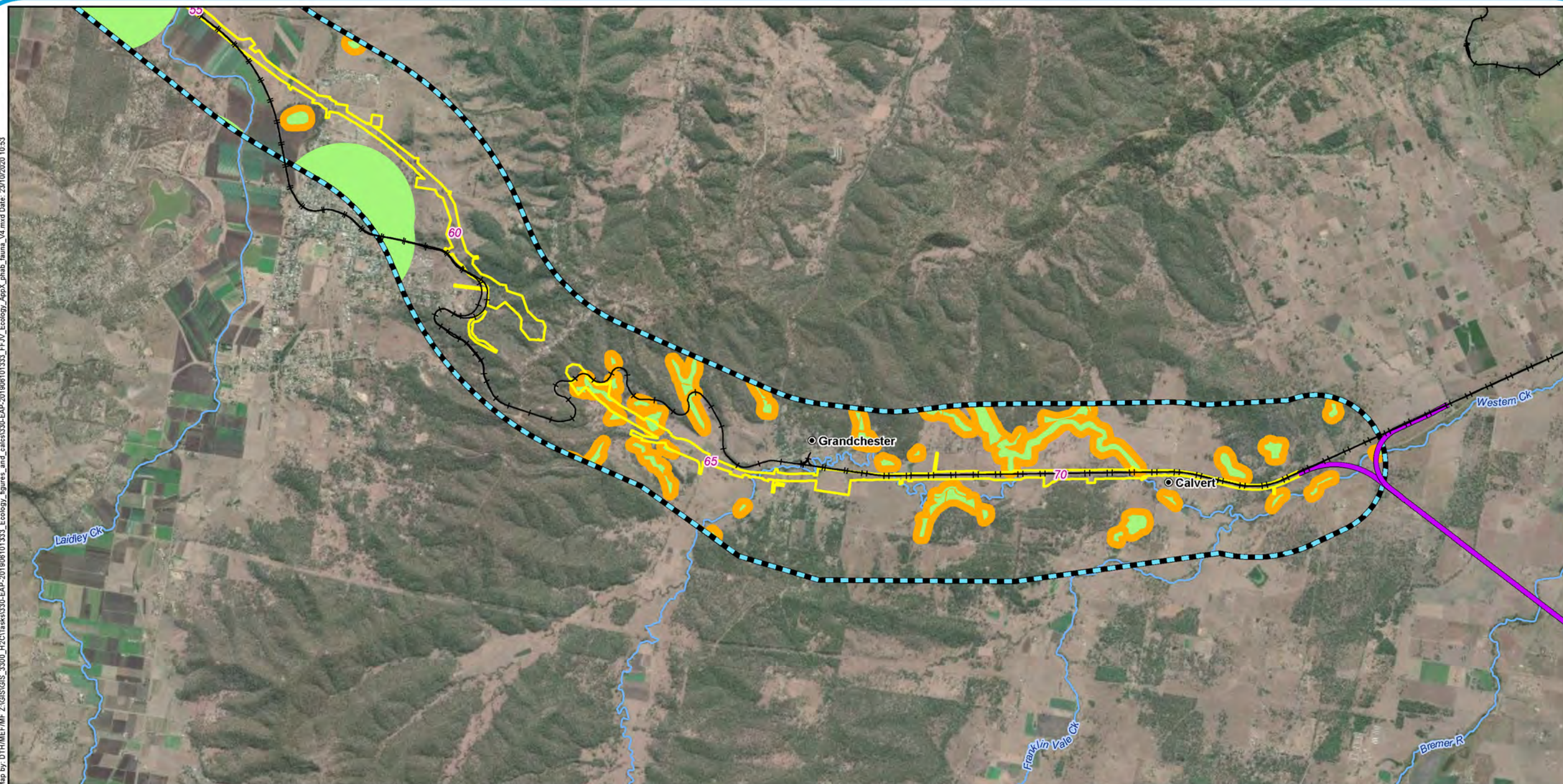
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FFJV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

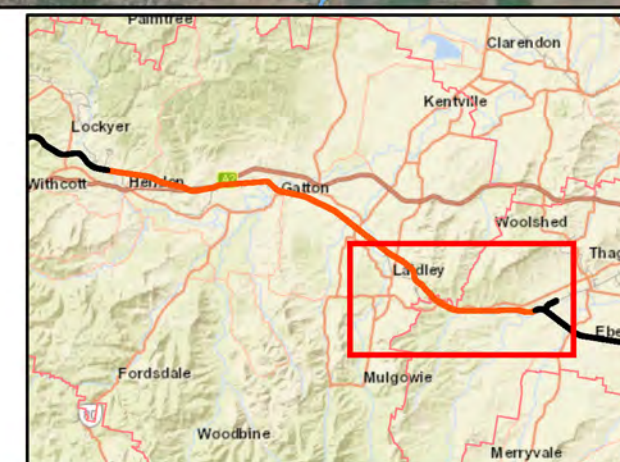


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

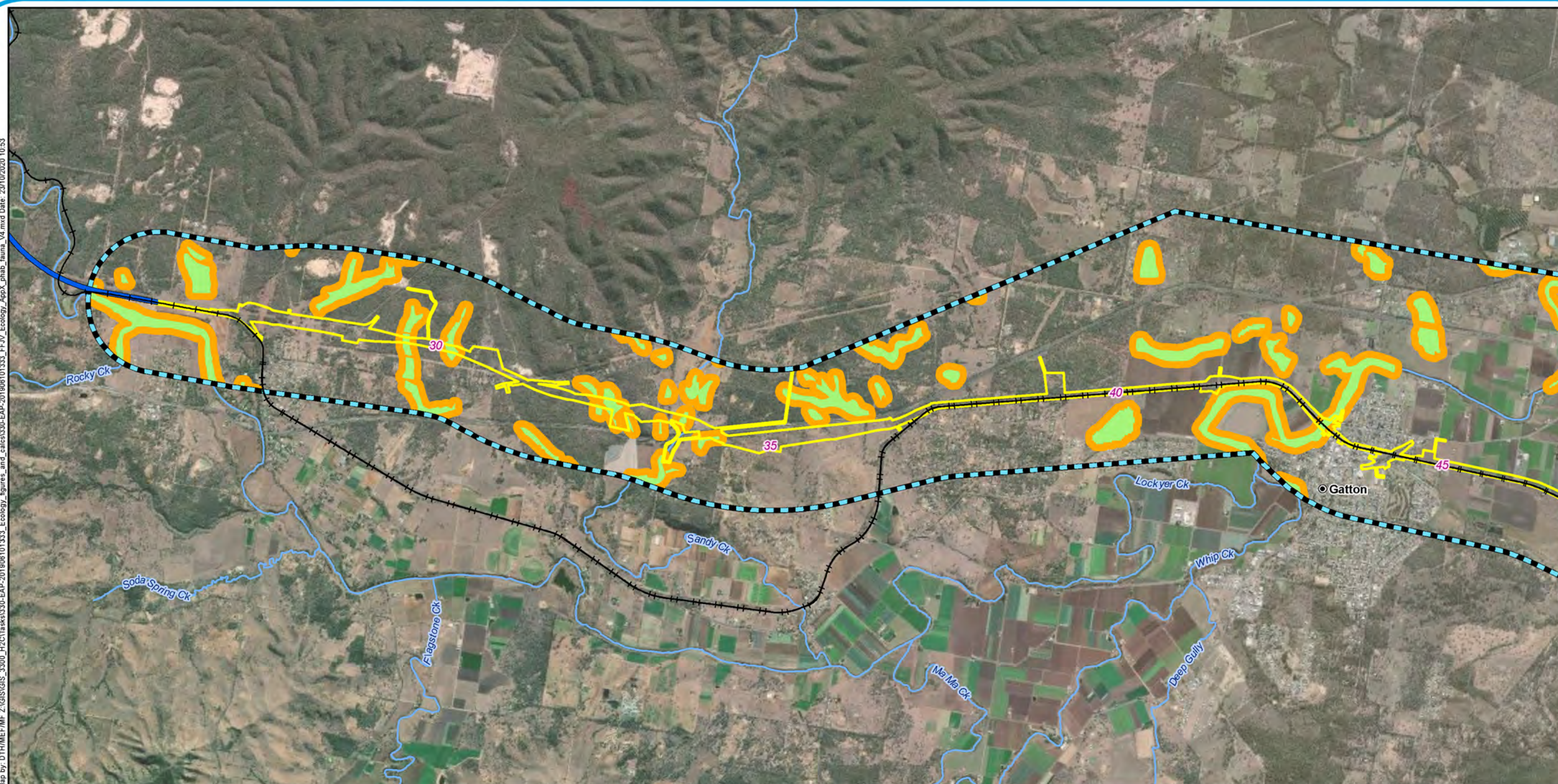
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2CTask\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

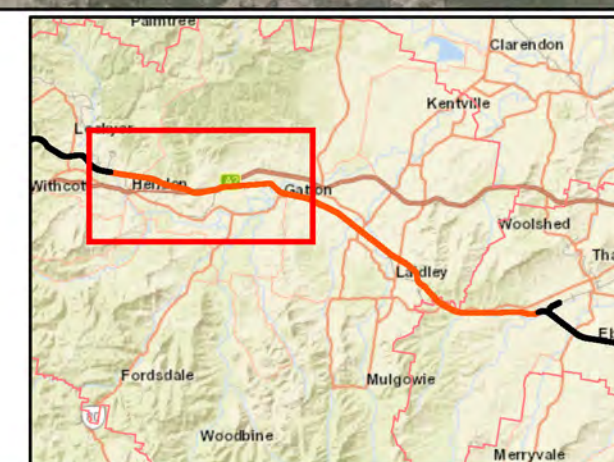


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

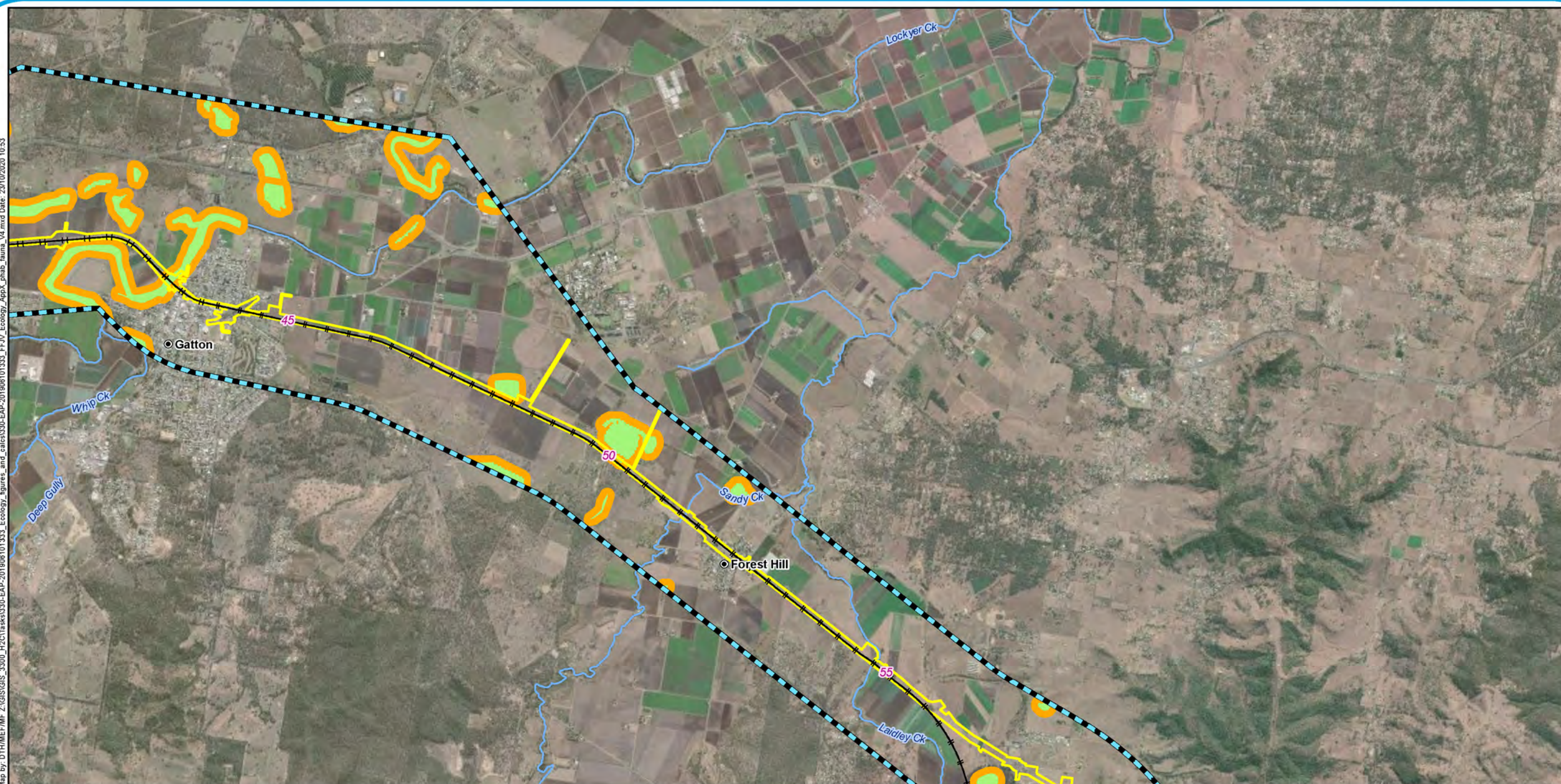
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/MF Z:\GIS\GIS_3300_H2O\Task\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FF_V4_Ecology_AppX_phab_fauna_V4.mxd Date: 23/10/2020 10:53

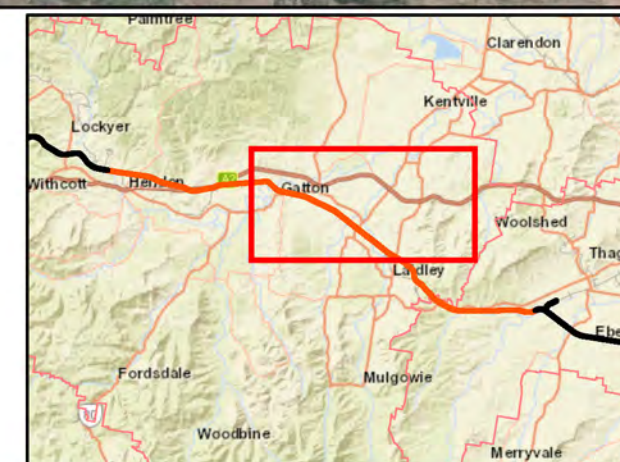


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- Ecology study area

Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

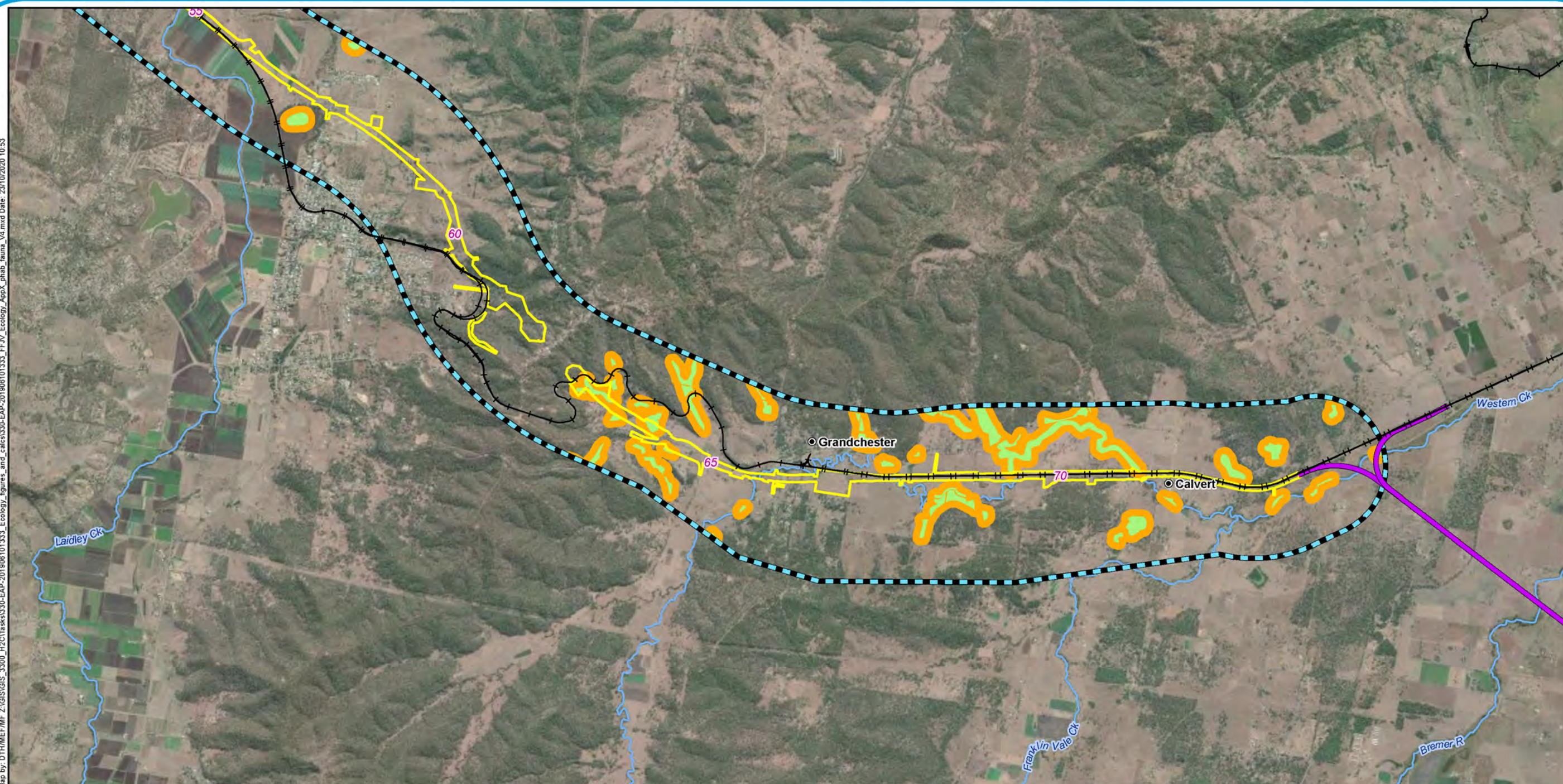


Issue date: 23/10/2020 Version: 3
Coordinate system: MGA56

Helidon to Calvert

Predicted Habitat: *Pluvialis fulva* (Pacific golden plover)

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FFJV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

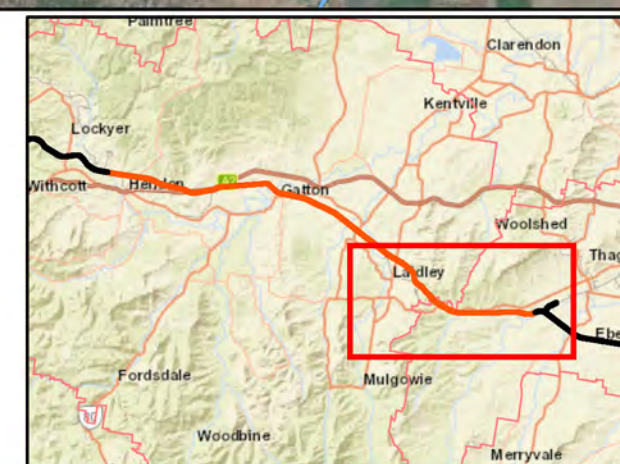


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

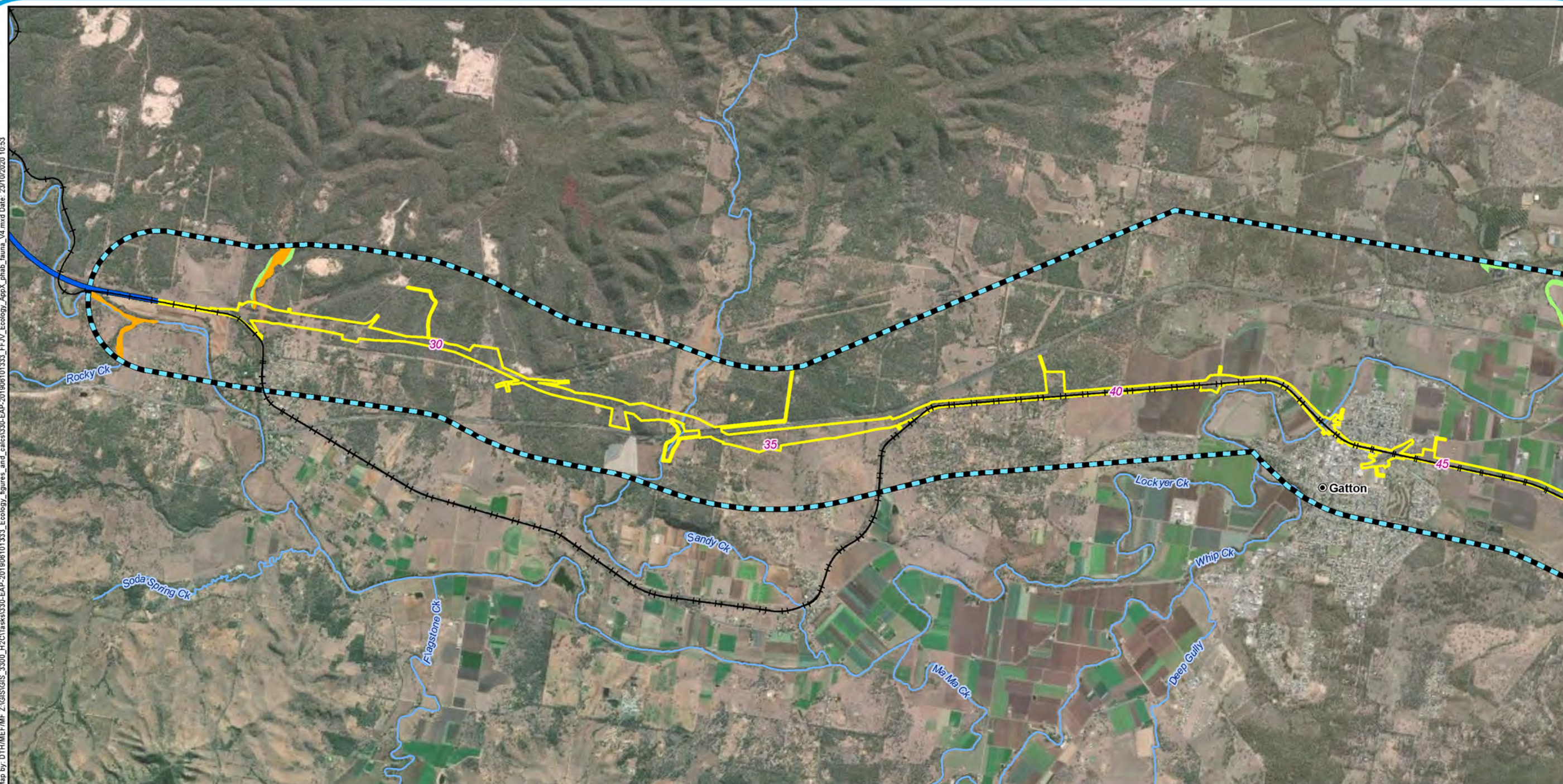
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2CTask\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FFJV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

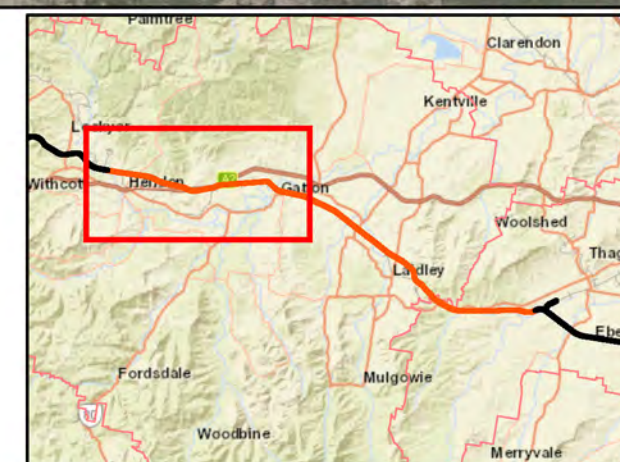


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- Yellow outline EIS disturbance footprint
- Black dashed line Ecology study area

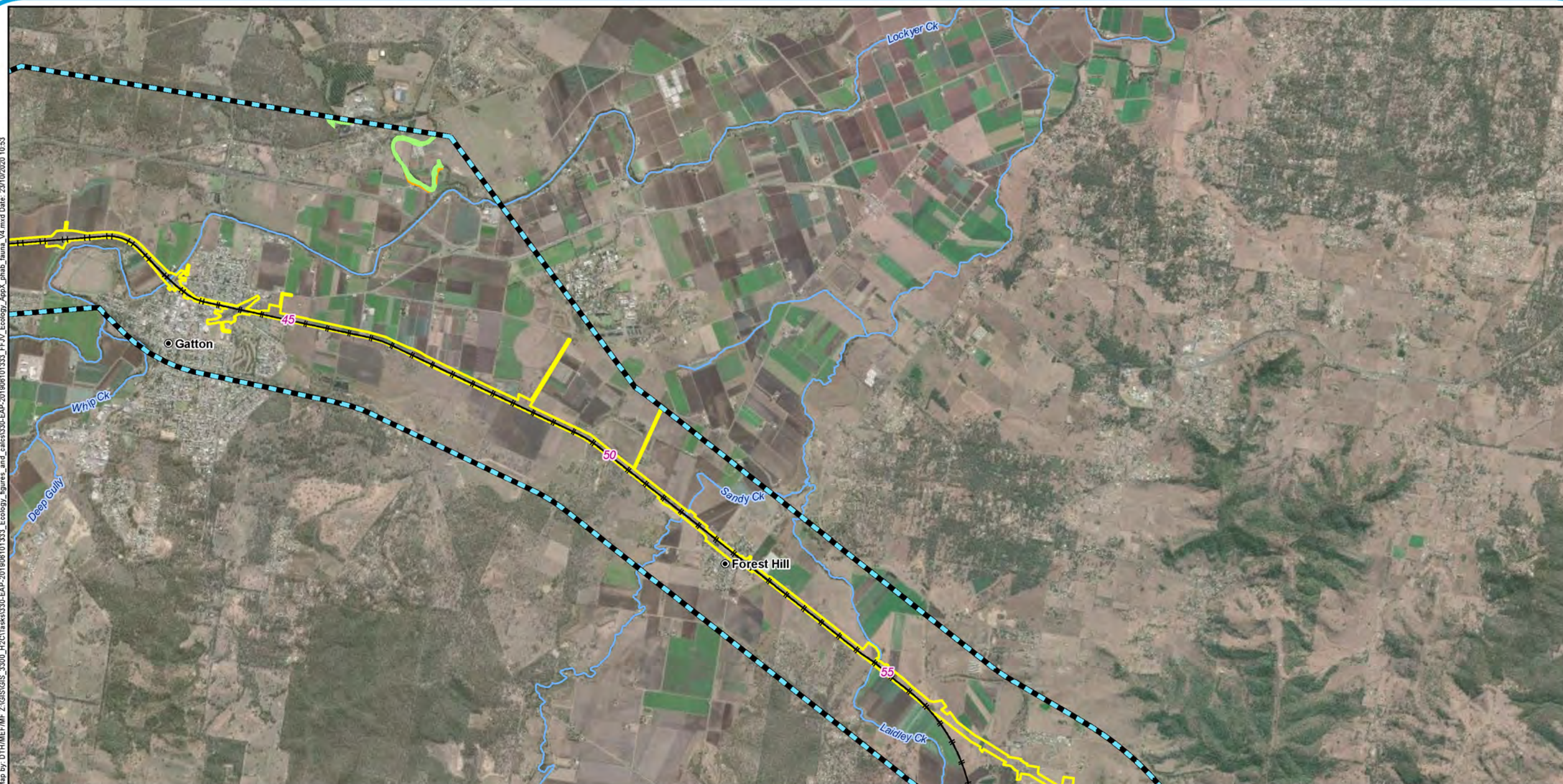
Predicted Habitat

- Orange Important habitat
- Green Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2O\Task\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

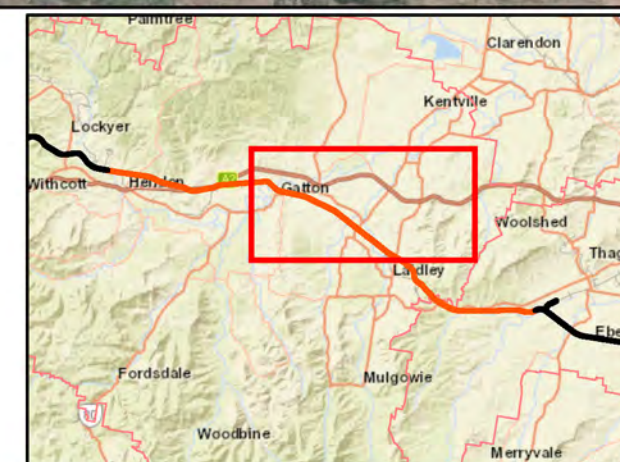


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- Ecology study area

Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

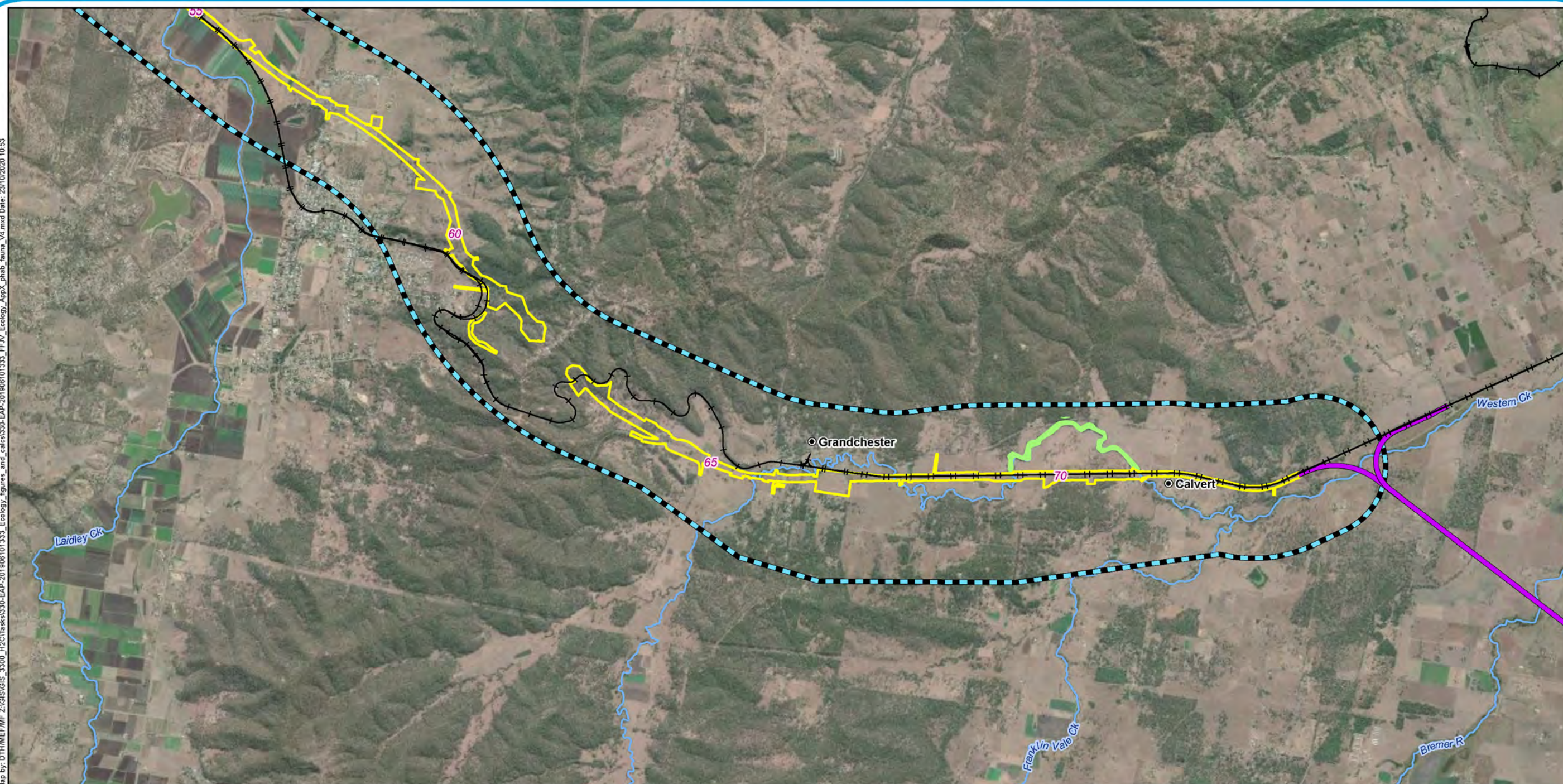


Issue date: 23/10/2020 Version: 3
Coordinate system: MGA56

Helidon to Calvert

Predicted Habitat: *Rhipidura rufifrons* (Rufous fantail)

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FFJV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

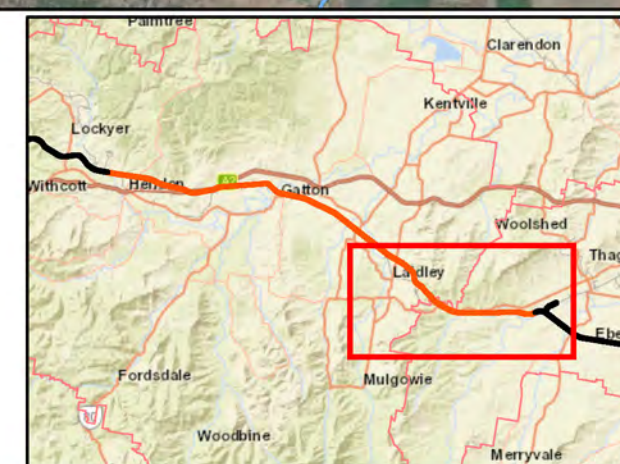


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

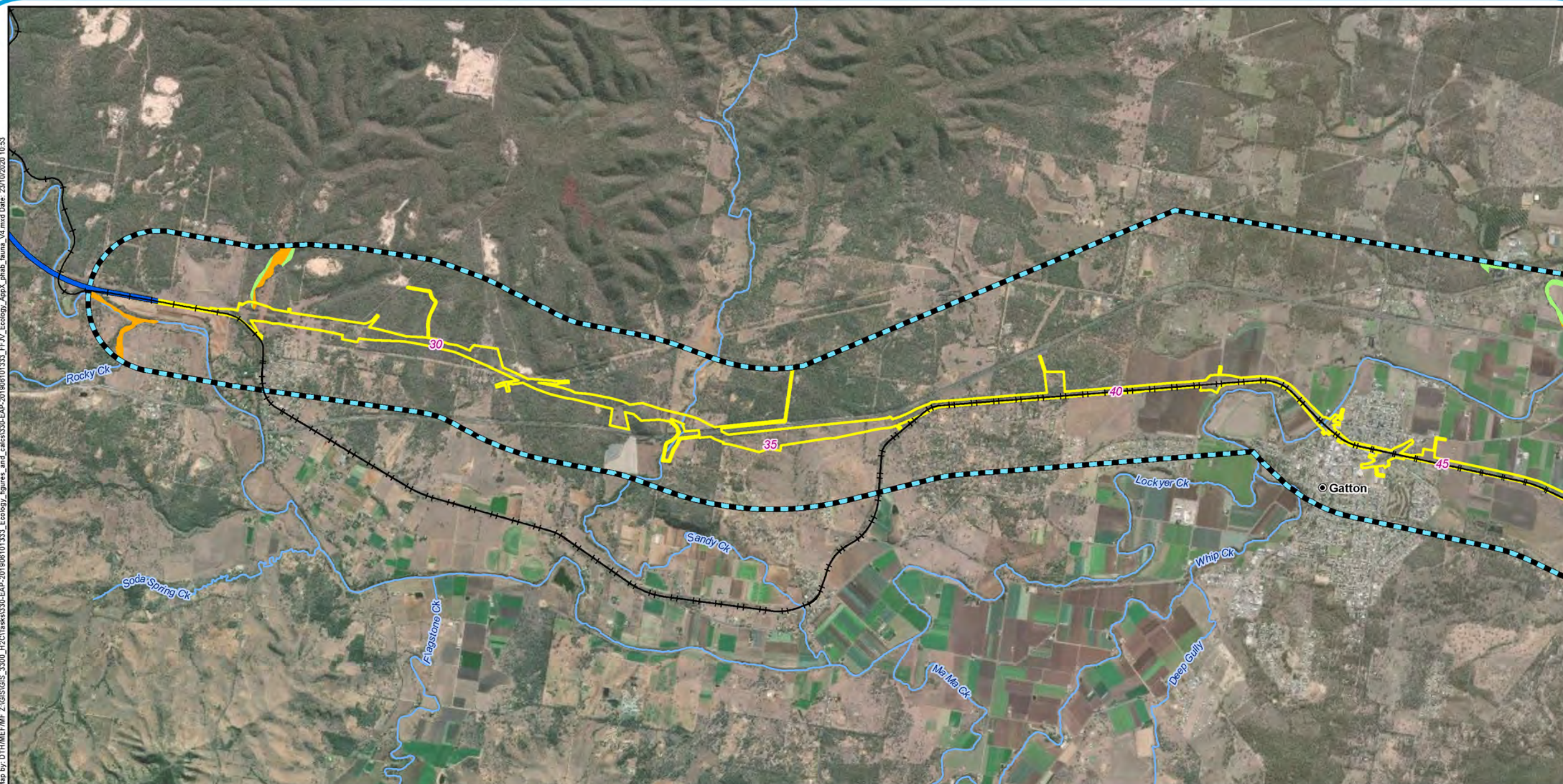
Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2C\Tasks\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

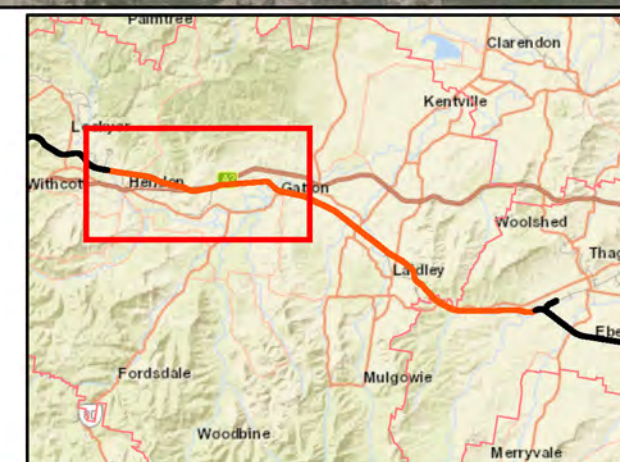


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

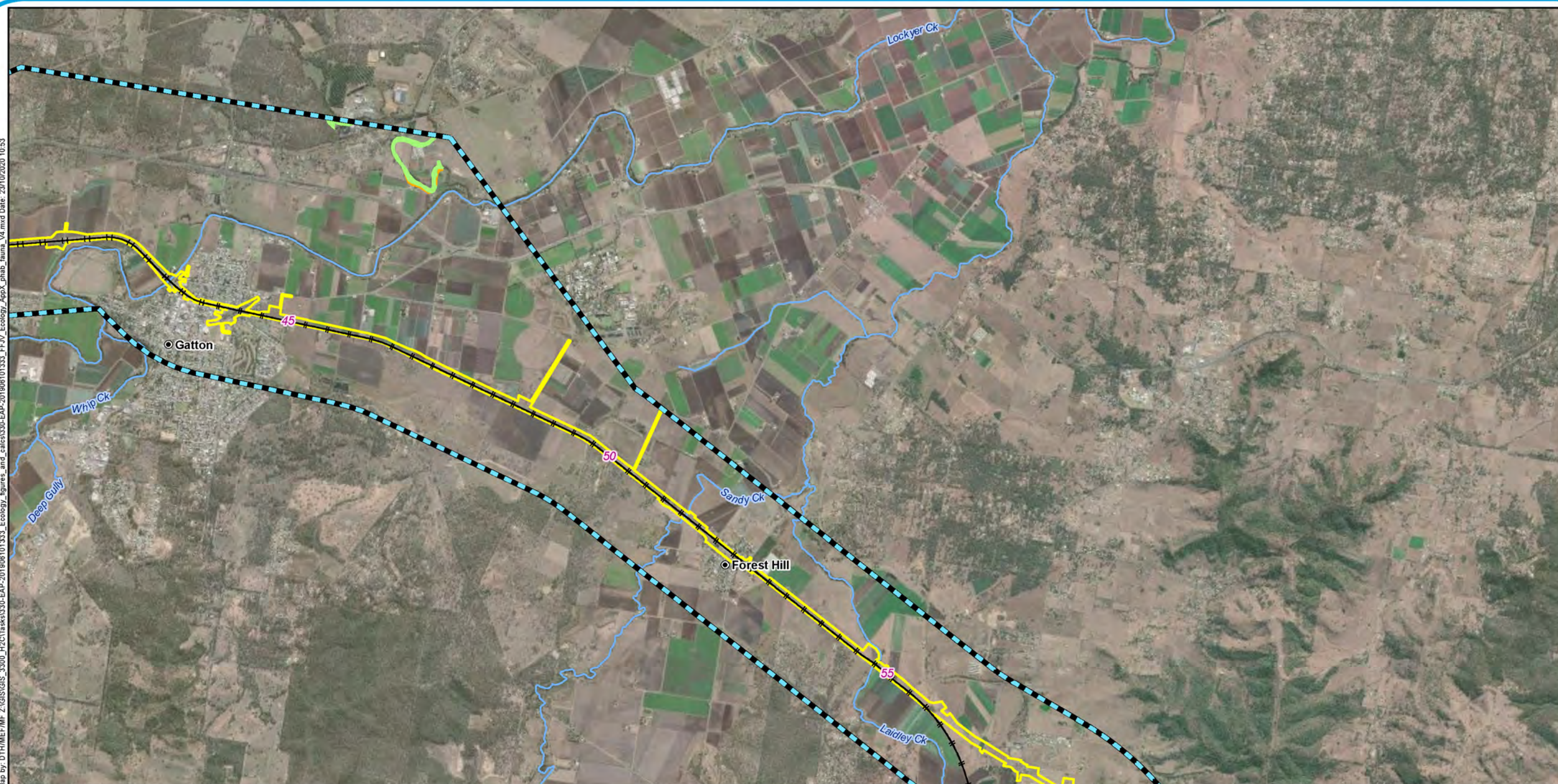
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/MF Z:\GIS\GIS_3300_H20\Task\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FF JV_Ecology_App\phab_fauna_v4.mxd Date: 23/10/2020 10:53

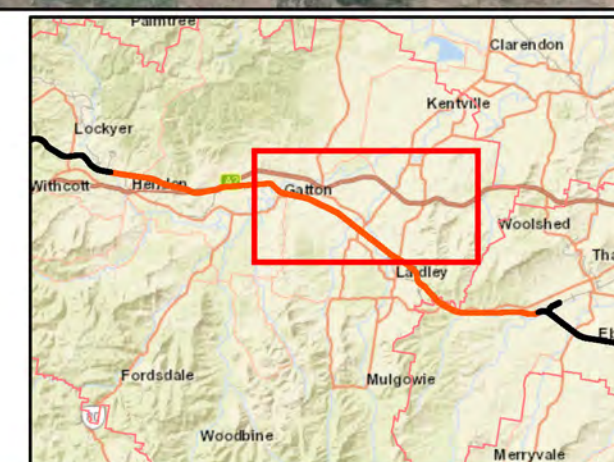


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- ▨ Ecology study area

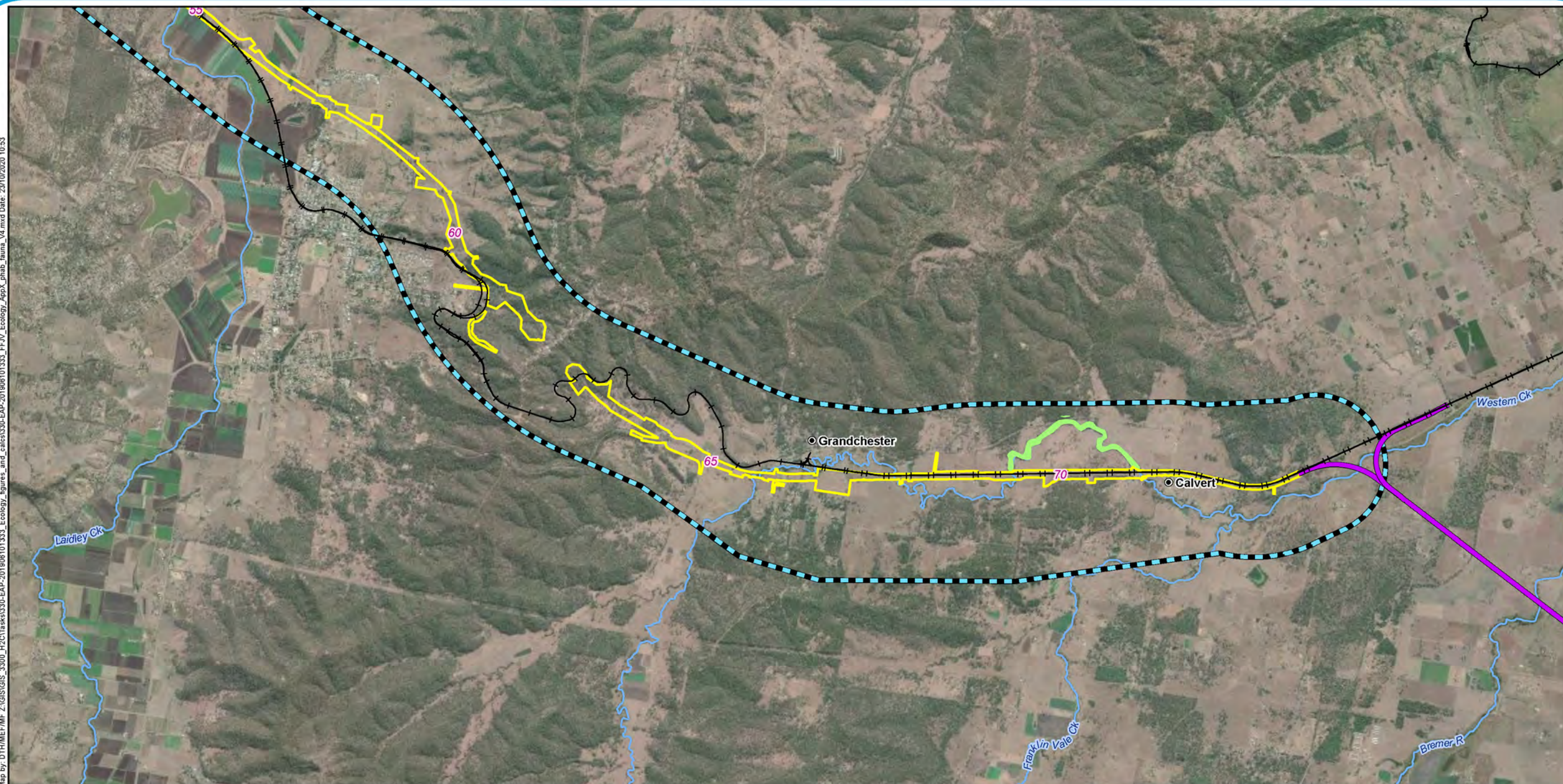
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

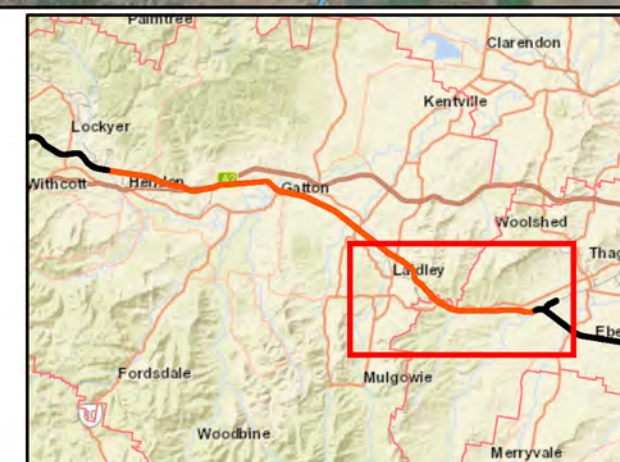


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

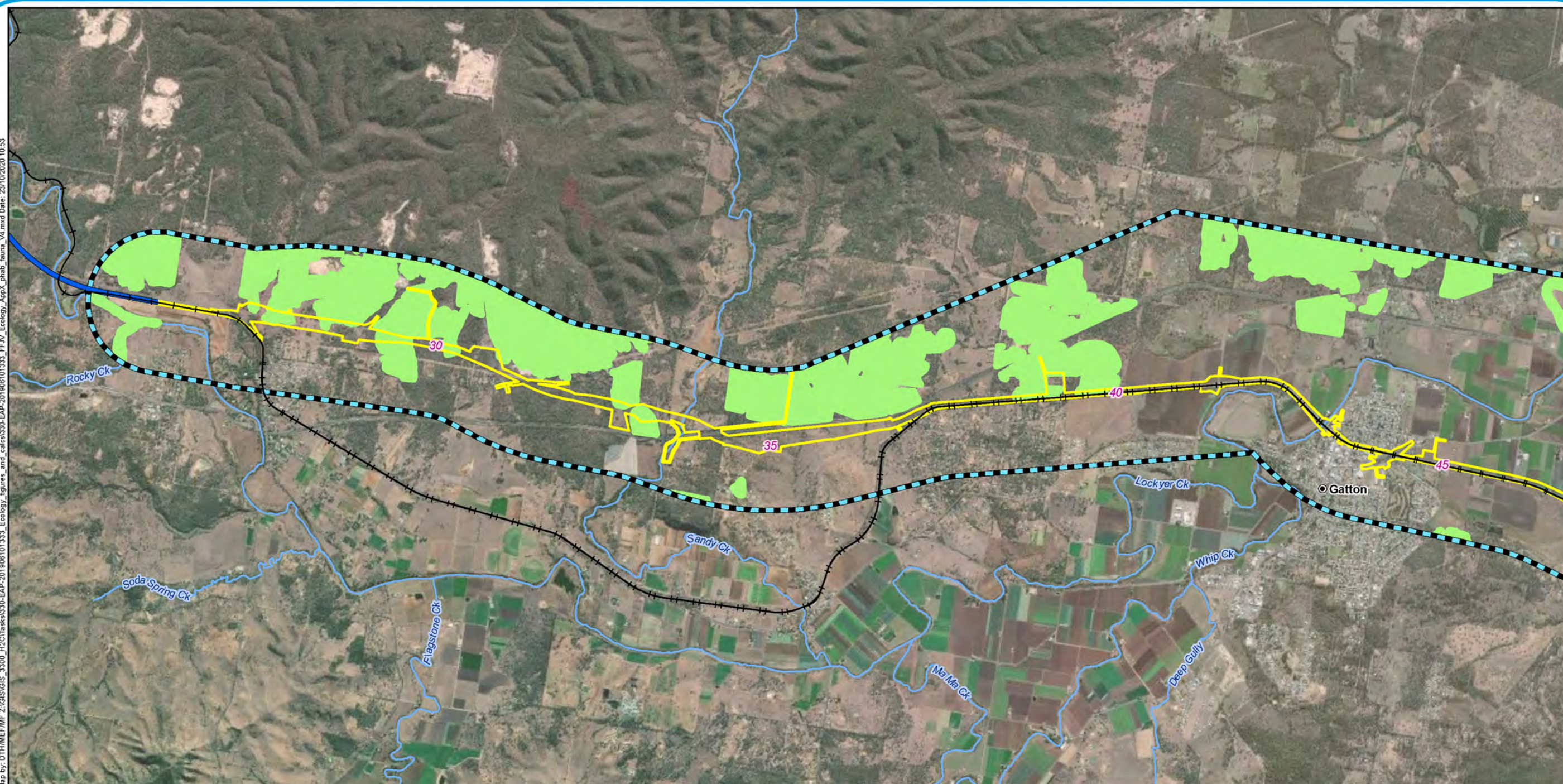
Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FFJV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

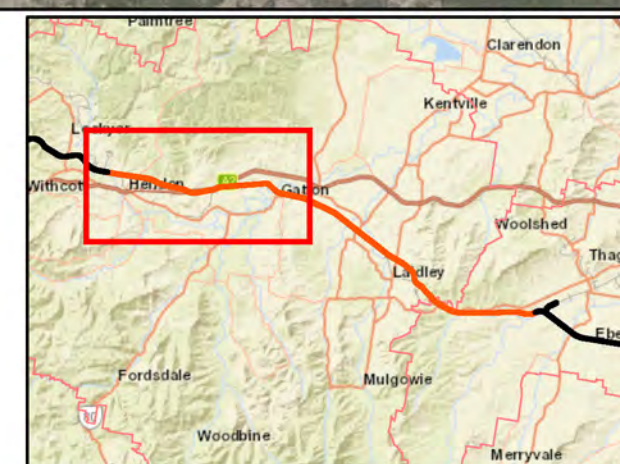


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- +— Railway
- G2H
- EIS disturbance footprint
- Ecology study area

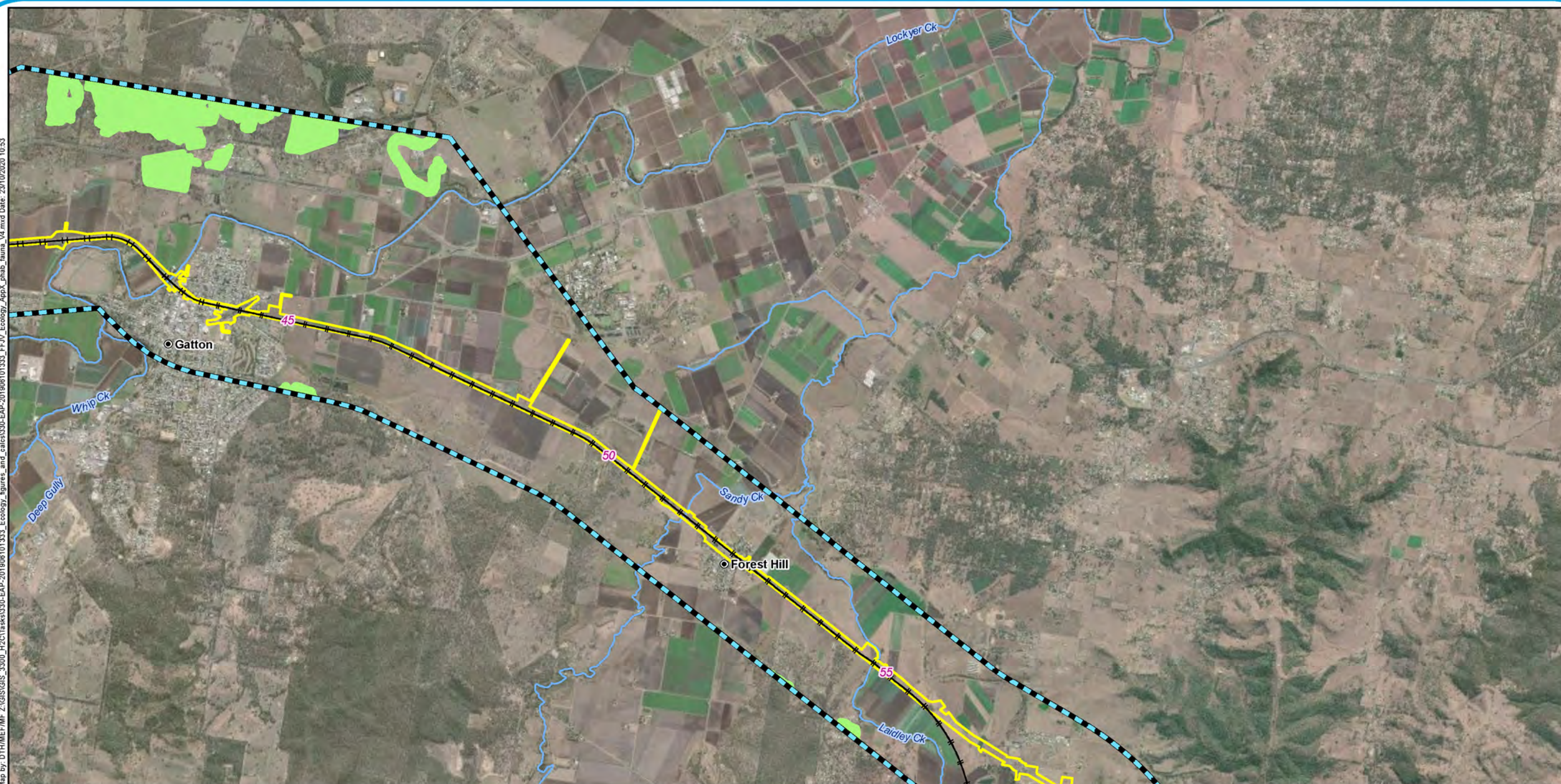
Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/MF Z:\GIS\GIS_3300_H20\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

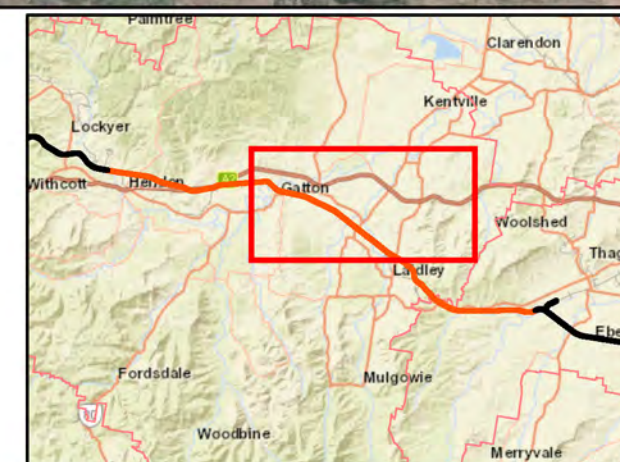


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- + Railway
- EIS disturbance footprint
- ▨ Ecology study area

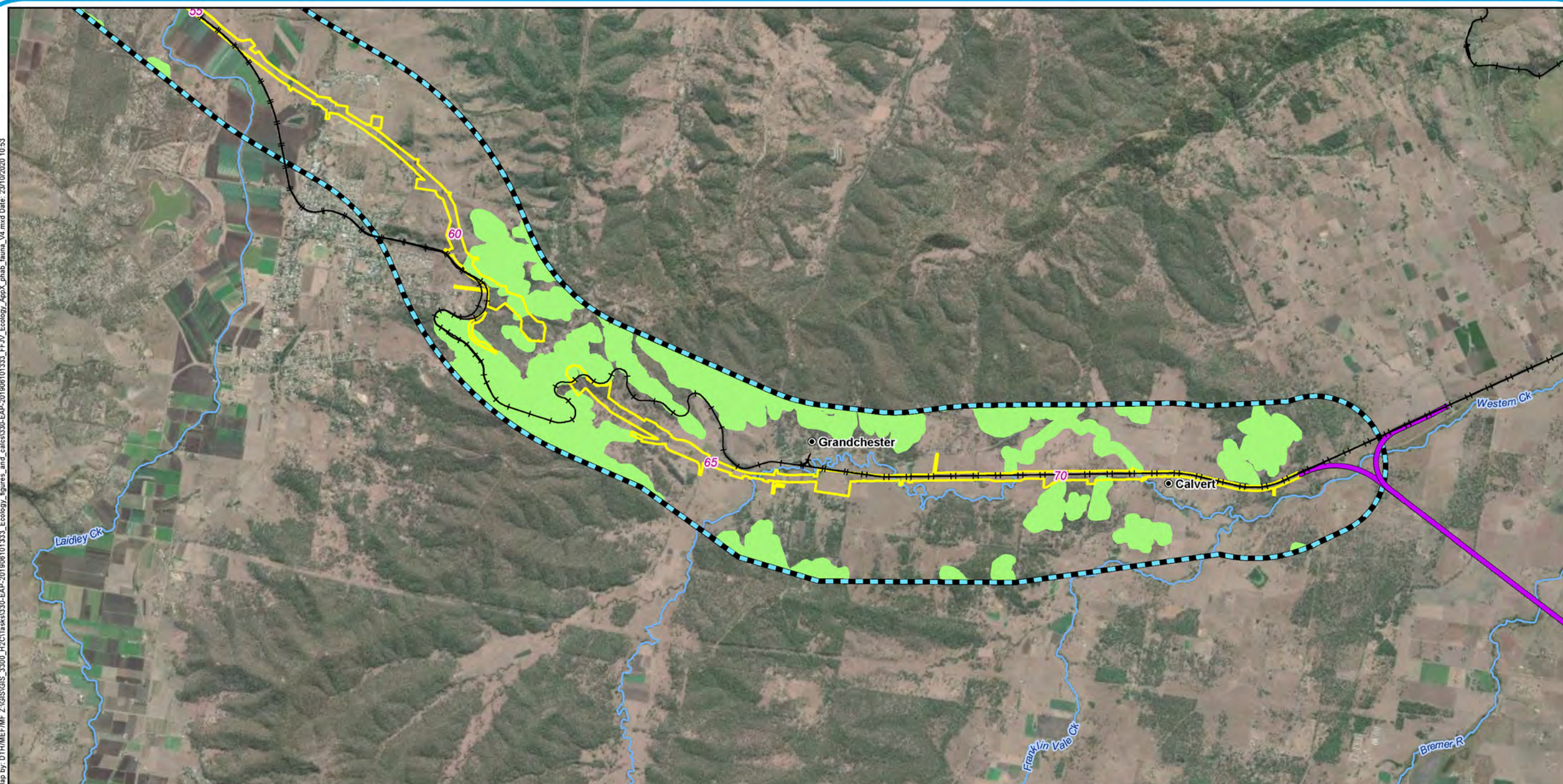
Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FFJV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

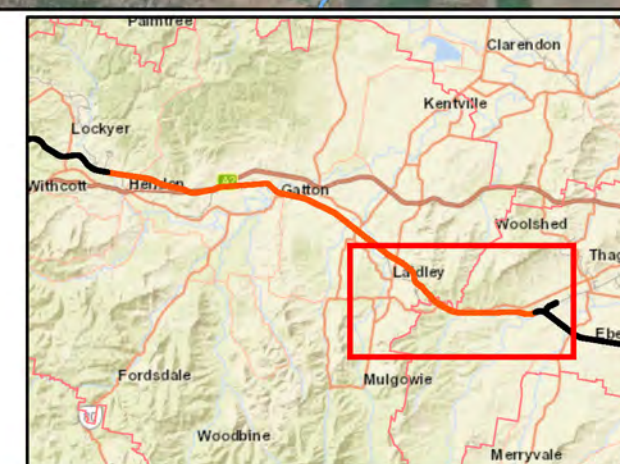


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

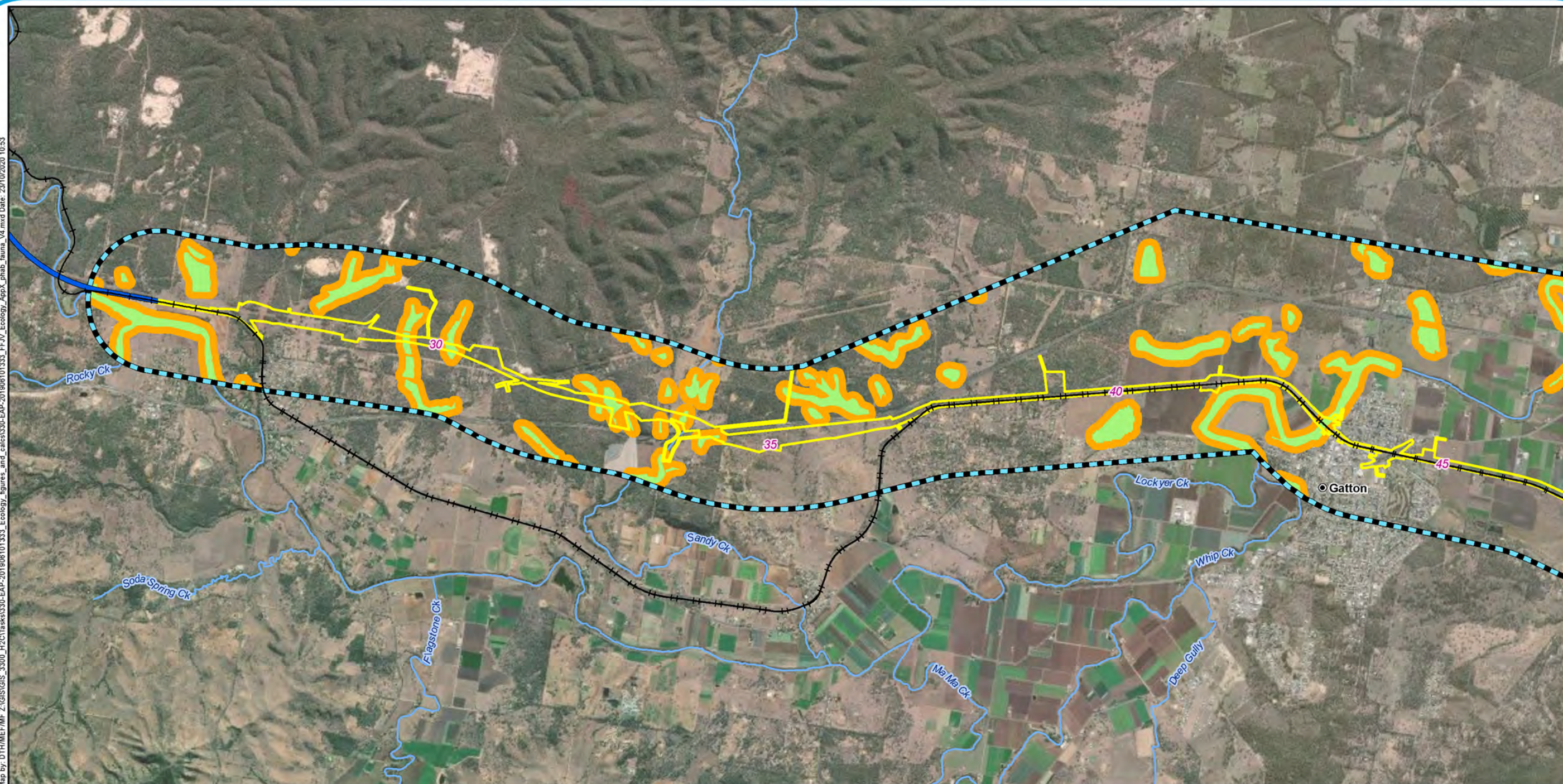
Predicted Habitat

- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

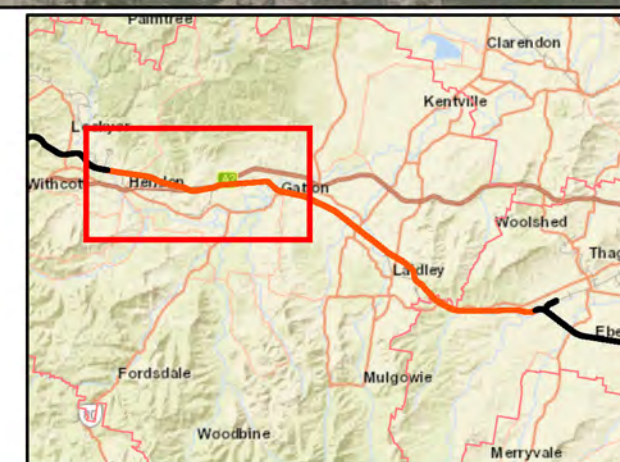


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

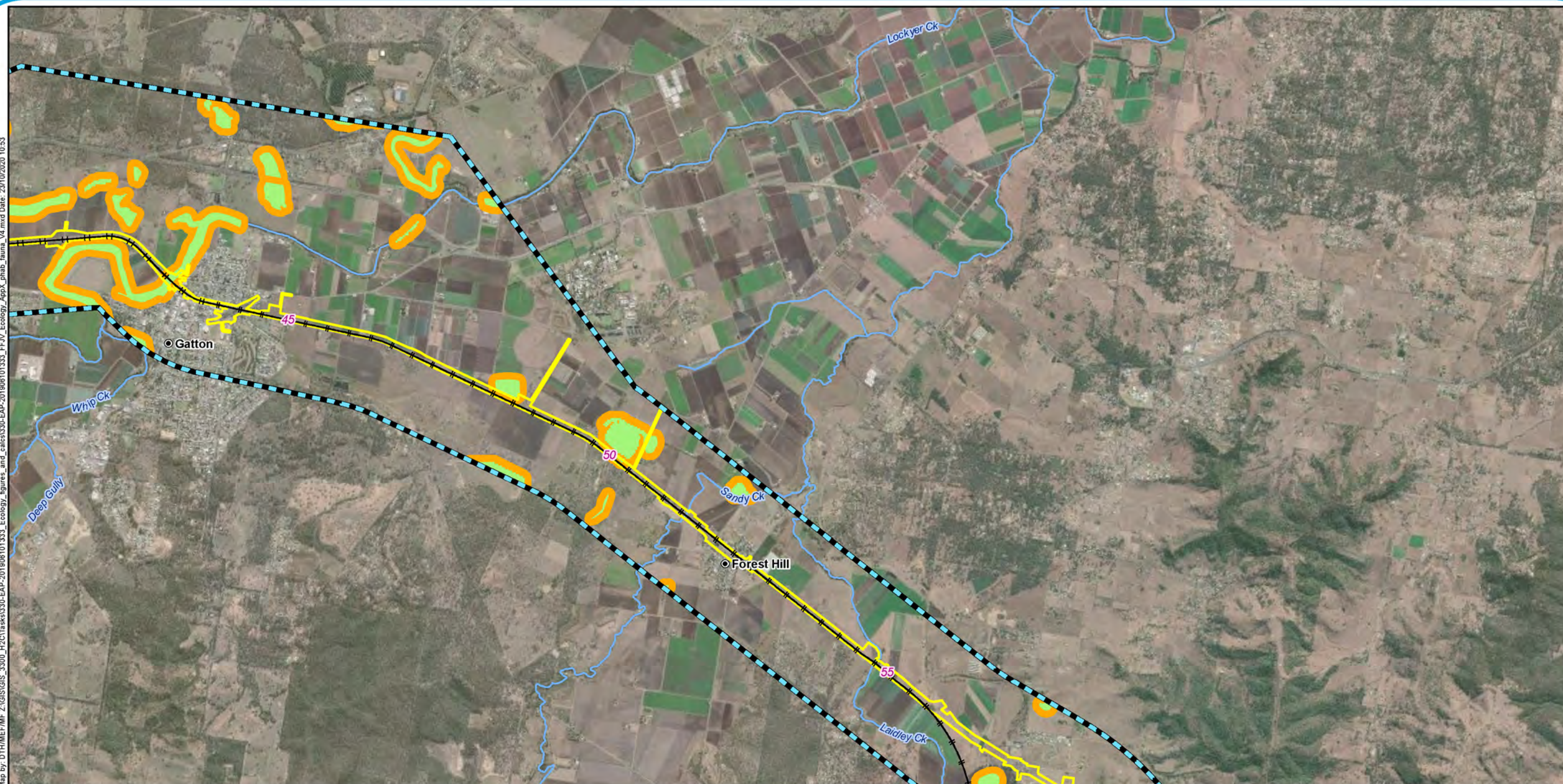
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/MF Z:\GIS\GIS_3300_H20\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

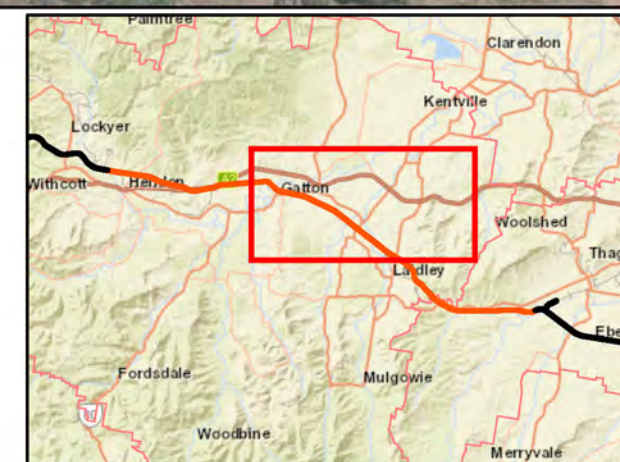


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- Ecology study area

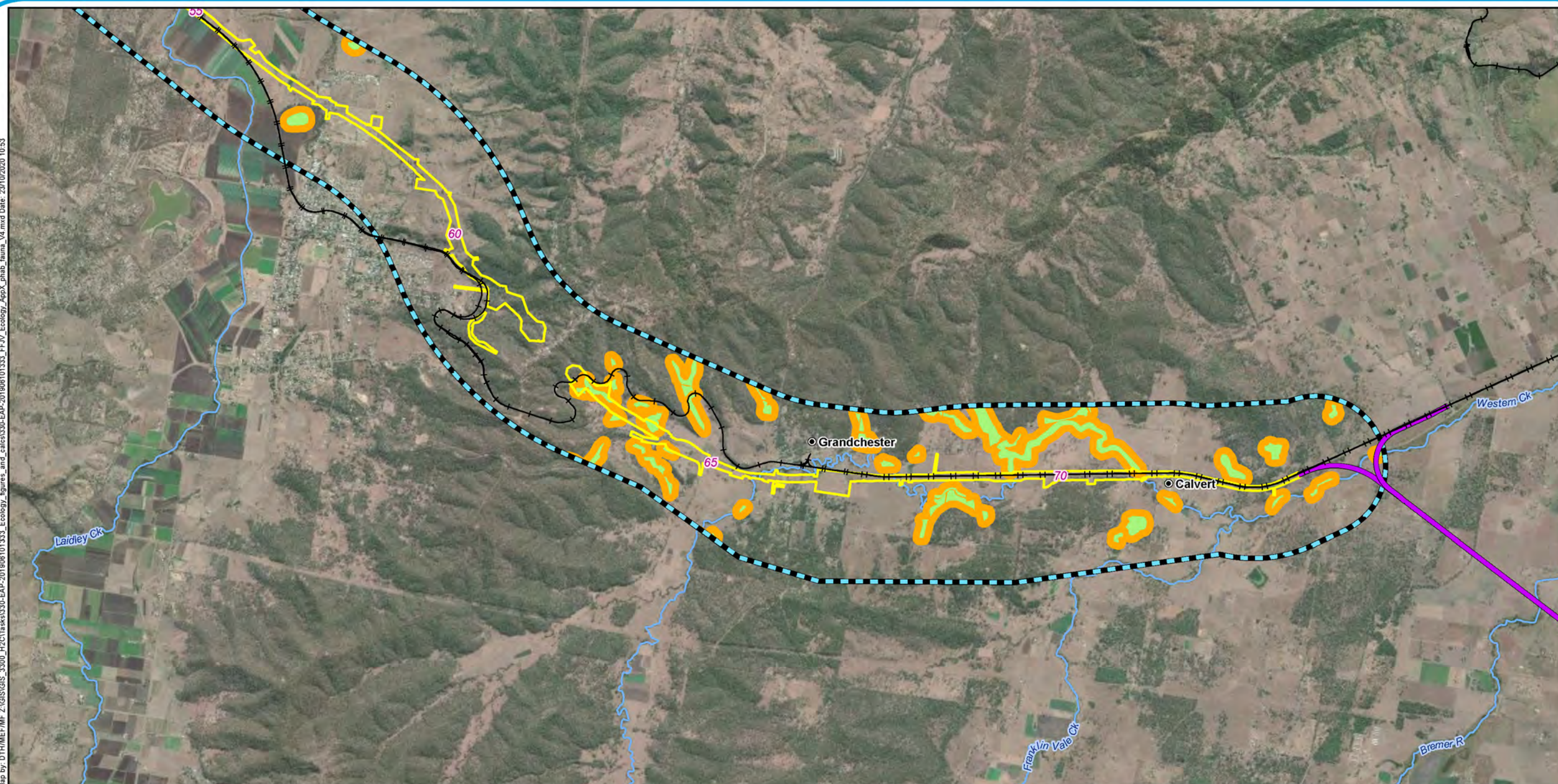
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

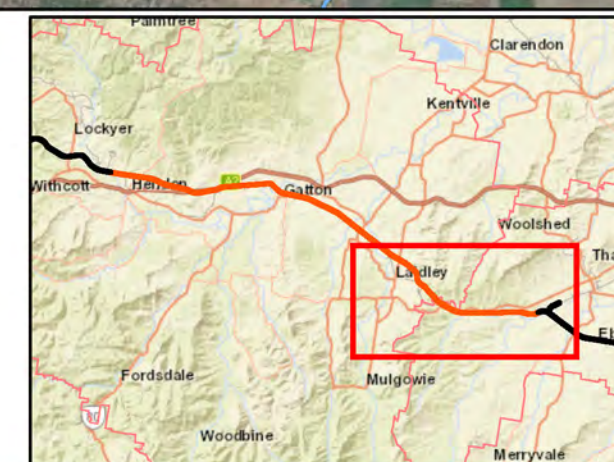


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

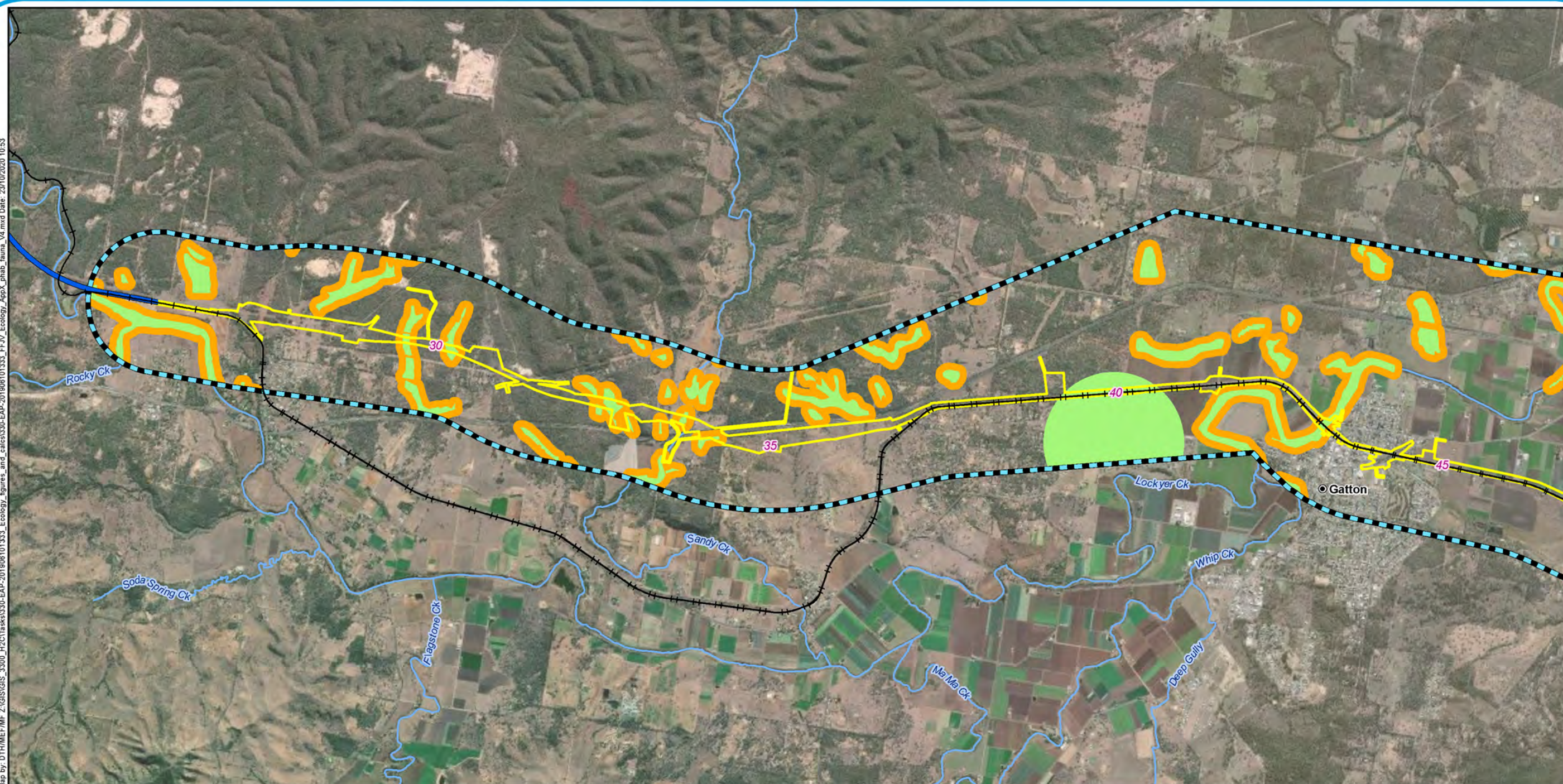
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/IMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FF JV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

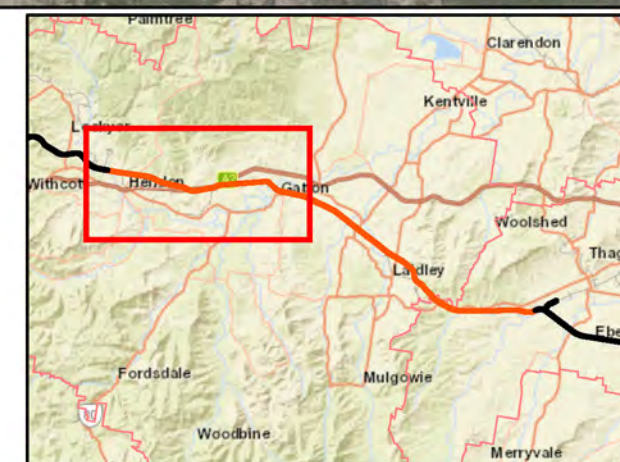


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- G2H
- EIS disturbance footprint
- Ecology study area

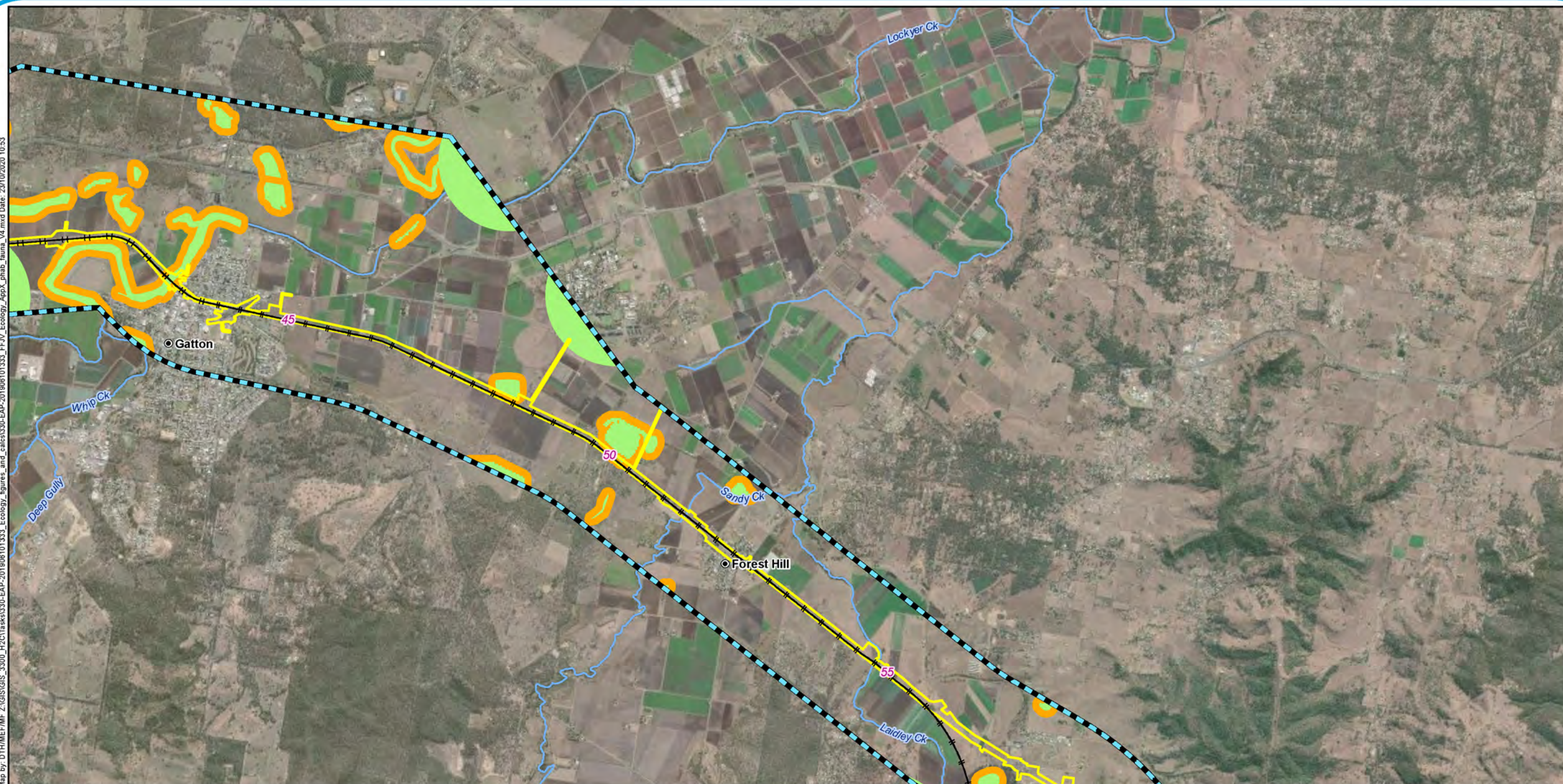
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/MF Z:\GIS\GIS_3300_H2O\Task\3300-EAP-201906101333_Ecology_figures_and_calcs\3300-EAP-201906101333_FF_V4_Ecology_AppX_phab_figura_V4.mxd Date: 23/10/2020 10:53

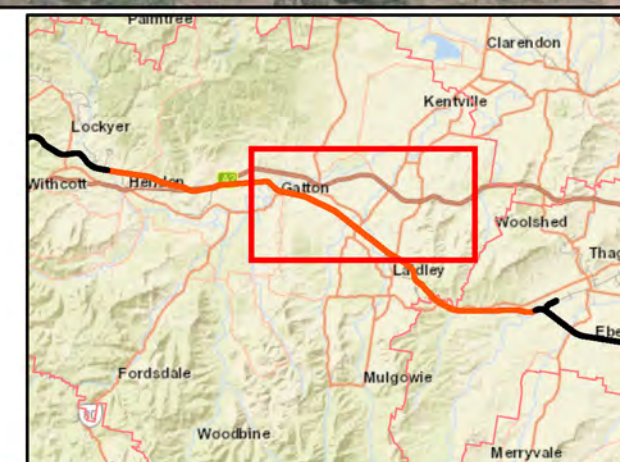


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- EIS disturbance footprint
- Ecology study area

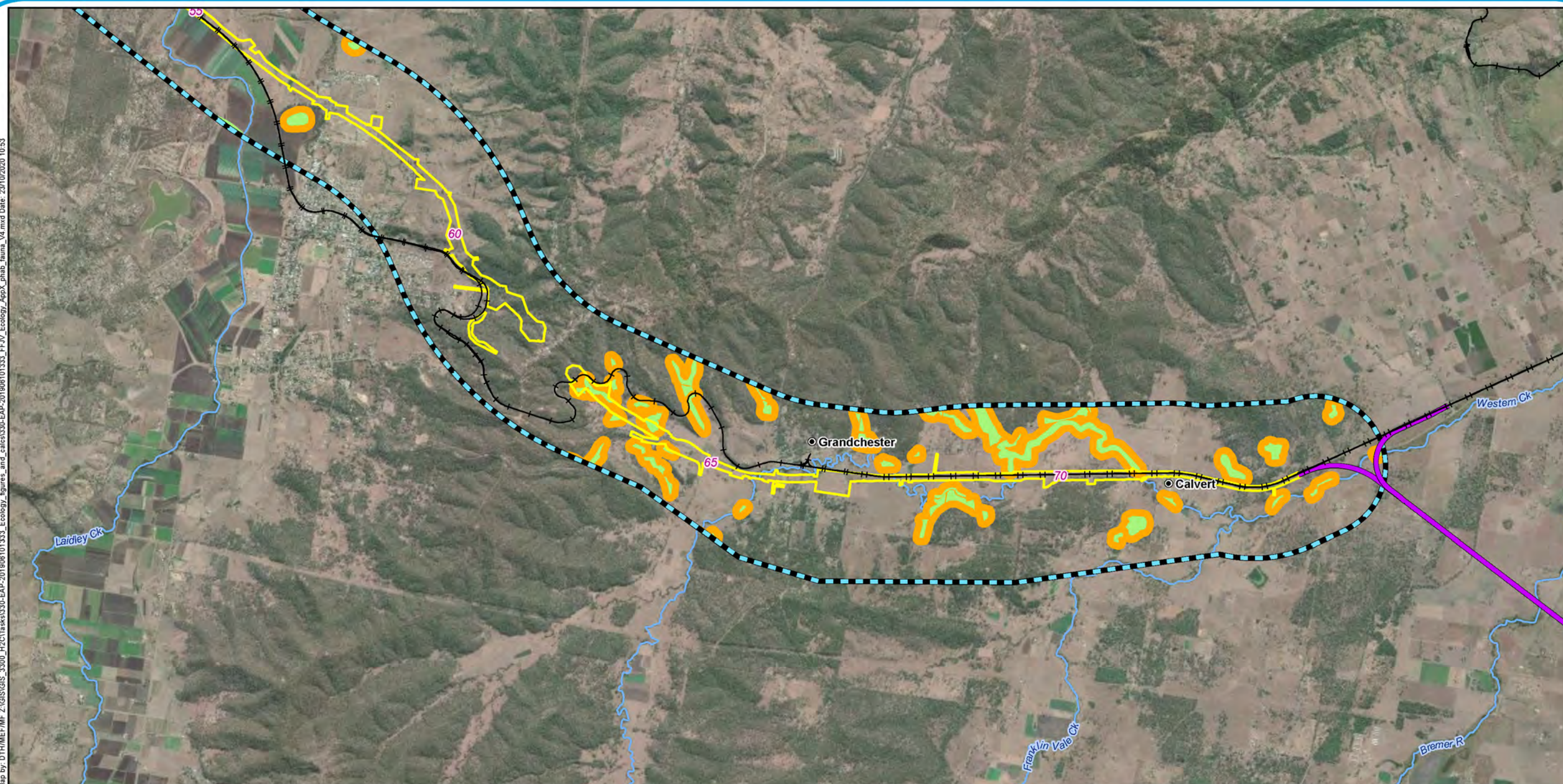
Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

Map by: DTH/MEF/JMF Z:\GIS\GIS_3300_H2C\Task\330-EAP-201906101333_Ecology_figures_and_calcs\330-EAP-201906101333_FFJV_Ecology_AppX_phab_fauna_v4.mxd Date: 23/10/2020 10:53

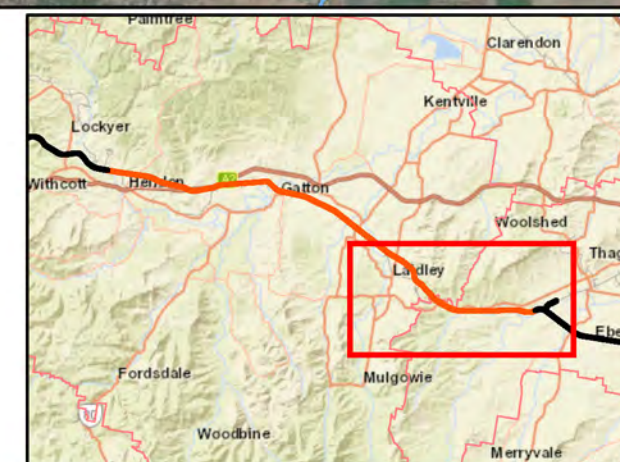


Legend

- Localities
- 5 Chainage (km)
- Watercourses
- Railway
- C2K
- EIS disturbance footprint
- Ecology study area

Predicted Habitat

- Important habitat
- Potential habitat



A3 scale: 1:60,000
0 0.25 0.5 1 1.5 2 km

APPENDIX






Terrestrial and Aquatic Ecology Technical Report




Appendix G Aquatic Ecology Survey Site Descriptions and Images




HELIDON TO CALVERT ENVIRONMENTAL IMPACT STATEMENT




Appendix G




Aquatic Ecology Survey Site Descriptions and Images



Site	Description	Photo
H2C 1A	Site was located on Sandy Creek at the proposed Project alignment waterway crossing location. Fence structures were present as artificial bank protection measures. There was no water present at the time of the assessment.	
H2C 2A	Site was located on Western Creek, at the proposed Project alignment waterway crossing location. RCP and culverts were present associated with the bridge crossing. Fence structures were present as artificial bank protection measures. Lots of vegetation was present within the channel.	
H2C 3A	Site was located at Lockyer Creek, downstream of the Project alignment. No artificial bank protection measures were present. One bank has significant vegetation cover whilst the other had rock/sand stone cover.	

Site	Description	Photo
H2C 4A	Site was located on Lockyer Creek, at the proposed Project alignment waterway crossing location. A rail bridge and road crossing were present with associated stormwater piping. Rip rap and blue rock lining was present along the bank at the bridge abutments as a bank protection measure. Debris was also present under the bridge.	
H2C 5A	Site was located on Sandy Creek, at the proposed Project alignment waterway crossing location. Artificial bank protection measures include the concrete bridge abutments and associated fence structures. 2 reinforced concrete pipes were present associated with the road crossing. There was no water was present at the time of the assessment. It appears the creek has been dried for some time with lots of vegetation present within the creek bed.	
H2C 7A	Site was located on the Laidley Creek, downstream of the Project alignment. 3 box culverts were present associated with the road bridge. Artificial bank protection measures were present in the form of concrete bridge abutments and fence structures. A small pool of water was present at the time of assessment.	

Site	Description	Photo
H2C 8A	Site was located on an un-named waterway, at the proposed Project alignment waterway crossing location. 2 RCPs were present associated with the road crossing. Artificial bank protection measures were present with fence structure. There was no water present at the time of assessment.	
H2C 9A	Site was located on the Eastern Creek, at the proposed Project alignment waterway crossing location. Both banks were demonstrating a moderate level of erosion and lots of vegetation present.	
H2C 10A	Site was located at Western Creek, at the proposed Project alignment waterway crossing location. Artificial bank protection measures included rip rap concrete and concrete abutments associated with the bridge crossing.	

Site	Description	Photo
H2C 11A	Site was located on the Lockyer Creek, downstream of the Project alignment. No artificial bank protection measure was present. There was lots of floating aquatic vegetation present on the surface of the water.	
H2C 12A	Site was located on the Lockyer Creek, upstream of the Project alignment. Rip rap concrete lining was present along the bank at the bridge abutments as a bank protection measure. The rip rap concrete consisted of blue asphalt and there was also a fence structure present as another bank protection measure.	
H2C 13A	Site was located on the Lockyer Creek, upstream of the Project alignment. Rip rap and concrete lining was present along the bank at the bridge abutments as a bank.	

Site	Description	Photo
H2C 14A	Site was located at Laidley Creek, downstream of the Project alignment. Rip rap and concrete lining was present along the bank at the bridge abutments as a bank protection measure. 3 box culverts were present associated within the bridge crossing. There was no water present at the time of assessment.	
H2C 15A	Site was located at Wrights Creek, downstream of the Project alignment. Rip rap and concrete lining was present along the bank at the bridge abutments as a bank protection measure.	
H2C 16A	Site was located on Sandy Creek. Two RCP were present associated with the road crossing. There were no artificial bank protection measures in place. There was no water present at the time of assessment.	

Site	Description	Photo
H2C 17A	Site was located at Laidley Creek, downstream of the Project alignment. Rip rap and concrete lining was present along the bank at the bridge abutments as a bank protection measure. A concrete discharge pipe from the adjacent cropland was also present.	
H2C 18A	Site was located at Western Creek, downstream of the Project alignment. There was no artificial bank protection measures present.	

APPENDIX



Terrestrial and Aquatic Ecology Technical Report

Appendix H Completed Vegetation Assessment Proformas

HELIDON TO CALVERT ENVIRONMENTAL IMPACT STATEMENT

Vegetation Proforma

Date: 25/9/17

Observers: SG + AS

Site Name: 6T HJC



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates:

Datum:

Transect length: 0

Start point

Zone

56 E 0418235

N 6952431

WP 299
EV 164

End point

Zone

5 E 0

N

Photo points (numbers):

North: 651

East: 652

South: 653

West: 654

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent	Tree 2	Shrub*	Ground
Height Range (m): 18-20	Height Range: 10-16	Height Range: 2-4	Height Range: 0.1-0.5
Av. Height (m): 19m	Av. Height: 17	Av. Height: 3	Av. Height: 0.3
Cover (%): 10%	Cover: 40%	Cover: 80% including Lantana	Cover: 10%
Blue gum	Blue gum Black wattle Moreton Bay Ash	Lantana juvenile acacia A. leucaxis juvenile eucalypt A-C	aristria Lomandra longifolia yellow buttons brownie eye guinea grass Lida rambifolia

able notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform: flat	
Soils: fine grained brown-orange alluvium	
Structural formation (eg woodland, open-forest etc.): non-remnant	
Field Observations/ Notes (eg. Level of disturbance connectivity): High disturbance	
Recorded species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):	
Lantana 80%	
Guinea grass	

Fauna Proforma

Habitat characteristics

Habitat Features – Abundance:

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	0
Grazing	0
Clearing	2
Erosion	0

3T H2C
refer to
fauna proforma

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
	Yes	No
What EVNT species are known from region (complete in rows below) – from database searches		
Koala (scats habitat)	✓	
Bats (micro woodland)	✓	

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentaria)	>30cm diameter
	>15cm, <30cm diameter
	>10cm, <15cm diameter
	>5cm, <10cm diameter
	< 5cm diameter
Fallen logs (>10cm diam.)	
Coarse woody debris (<10cm diam.)	
Decorticating bark	
Leaf litter (%)	
Bare ground (%)	
Grass (%)	
Soil cracks	
Soil banks (eg. River banks/road cuttings, etc.)	
Surface Rocks and/or Boulders	
Wetlands (Y/N). if yes complete wetland Proforma	
Weeds and non-native species (%)	
Rock Crevices	
Flower Abundance (%)	
Fruit Abundance (%)	
Water present (Y/N)	

Incidental fauna

observations/scats/traces:

weebill
Kookaburra
Koala scratches
willy wag tail
leaden fly catcher

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Vegetation Proforma

Date: 25/9/17

Observers: GS & SG

Site Name: H2C ^{New site} E Quarry.



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates:

Datum:

Transect length: 100

Start point

Zone

56

E

0414746

N

6954476

EV 185

End point

Zone

56

E

0414649

N

6954479

WP 294

Photo points (numbers):

North:

East:

South:

West:

WP 295
EV 202

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent	Tree 1	Tree 2	Shrub*	Ground
Height Range (m): 2-28	Height Range: 8-14	Height Range: 1.5-4m	Height Range: 0.1-0.3	
Av. Height (m): 28	Av. Height: 12	Av. Height: 3.5	Av. Height: 0.2	
Cover (%):	Cover:	Cover:	Cover:	
Alfordia (spotted gum) * Chepna c blood wood (sample) c	Angophora juvenile eucalyptus Alphoknia more on alphoknia	Alphoknia A. lecalis Jacksonia exocarpus Lantana delisia dotha hairy sample Queensland hemp velvety tree plant/pear	Lamandra dynellor dotha hairy panic arista x2 Umbress (sample) Kangaroo grass dead (sample) ? violace velvet tree pear tall love grass aragrostis sp. pinkish fern bare wire grass roads grass enneaphn sp	

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multiple stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform: gentle slope	
Soils: sandstone - fine / slight gravel	pale orange - cobble + pebbles
Structural formation (eg woodland, open-forest etc.):	open forest
Field Observations/ Notes (eg. Level of disturbance connectivity):	
large amount of alphoknia / acacia regrowth - no disturbance from 10 years. no signs grazing. limiting	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):	
lantana 5% (patchy) roads grass	

bush turkey, Koala.

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)	Intercept	Str./height
100 - 99.43	m	S1 4m
97.52 - 94.87	m	S1 4m
91.55 - 73.87	m	T1 (spotted) 24
86.44 - 83.91	m	T2 (broad) 12m
81.85 - 79.84	m	S1 6m
78.80 - 74.95	m	T2 12m
77.81 - 77.10	m	S1
72.51 - 69	m	T2 12m
71.67 - 65.51	m	T1
69.07 - 61.10	m	S1
66.31 - 65.51	m	T2
63.62 - 61.57	m	T2 12m
59.66 - 56.38	m	T2 12m
56.20 - 54.86	m	S
54.86 - 41.92	m	T1
51.00 - 41.92	m	T2 12m
48.24 - 45.63	m	S1
40.88 - 38.26	m	T2 12m
39.43 - 32.57	m	T1
38.80 - 38.38	m	S1

Summary:		
Minimum height of plants included in the transect table:	m	
Intercept of EDL 0 - 50m:		m
Intercept of EDL 50 - 100m:		m
Measured crown cover % of EDL 0 - 100m:		%
Structural formation		
Conclusions/notes:		

$\frac{22}{100}$
 $100(-22)$
 $\times 0.1$
 $= 12m$
 $\rightarrow 10$
 $+ 70$
 80×0.1
 $= 8m$
 -5
 $150/-5$
 $\times 0.2$
 $= 3km$

36.11 - 37.84	T2 12m
37.23 - 32.57	S1
36.03 - 34.76	S1
33.44 - 32.54	S1

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

31.04 - 28.24	T1	
30.41 - 28.76	T2 12m	
28.86 - 26.53	S1	
26.71 - 24.91	T2 12m	
27.18 - 26.02	T2 12m	
24.04 - 22.35	S1	
17.50 - 17.10	S1	
14.94 - 14.03	T2 12m	
11.00 - 5.79	S1	
9.80 - 9.62	S1	
9.17 - 7.80	S1	
6.86 - 6.22	S1	
4.57 - 3.60	S1	
1.07 - 0	T2	

spotted gum

Vegetation Proforma

Date: 18/9/17

Observers: CS+AS

Site Name: TT (H+OC)



Future Freight
Integrating Community, Environment and Energy

Transect Details (required for all sites)

GPS coordinates:		Datum:		Transect length:	
Start point	Zone 5 E 0			N	27.55195
End point	Zone 5 E 0			N	152.17823
Photo points (numbers): North: _____ East: _____ South: _____ West: _____					

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

GPS 134 (start)
GPS 135 (end)

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent	Tree 2	Shrub*	Ground
Height Range (m): 20-25m	Height Range: 8-10	Height Range:	Height Range:
Av. Height (m): 22m	Av. Height: 9m	Av. Height:	Av. Height:
Cover (%): ~60%	Cover: ~30%	Cover:	Cover:
<i>E. crebra</i> C	<i>E. crebra</i> S	<i>Heathia laetifolia</i> C	<i>Coronilla conchoides</i> (D)
<i>Cec. citrullifera</i> D	<i>Carypa c. hirsuta</i> D	<i>Procyon laetifolia</i> C	<i>Therapsid laetifolia</i> a
<i>Angophora laevis</i> C	<i>Angophora laevis</i> S	<i>Mayla cunninghamii</i> C	<i>Melaleuca repens</i> a
		<i>Alphit. excelsa</i> a	
		<i>Dacrydium laetifolia</i> a	
		<i>Carb. conchoides</i>	
		<i>Gym. hirsuta</i>	

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multiple stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform: Slope	
Soils: C2 9/10 - Sandstone	
Structural formation (eg woodland, open-forest etc.): Open Spotted Gum Forest	
Field Observations/ Notes (eg. Level of disturbance connectivity):	
Tree' forming patches, under of horses, collecting good wood	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):	
<i>Gym. hirsuta</i> - 2% - drought damaged	
<i>Carb. conchoides</i> - 20% - cover - drought damaged	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)	Intercept	Str./height	Summary:
2m - 14m	m	T1 Spotted gum 20m	Minimum height of plants included in the transect table: m
9m - 14m	m	S1 15m Black wattle	Intercept of EDL 0 - 50m: m
14m - 20m	m	S1 15m Black wattle	Intercept of EDL 50 - 100m: m
31m - 33m	m	S2 15m Hairy psyllid	Measured crown cover % of EDL 0 - 100m: %
33m - 35m	m	S2 15m M. cunning	Structural formation
36m - 42	m	T1 Spotted gum 25m	Conclusions/notes:
40 - 42	m	S2 15m M. cunning	
42 - 52	m	T1 e. crebra 18m	
49 - 58	m	S1 Spotted gum 20m	
54 - 58	m	S1 Black wattle 4m	
61 - 81	2X m	T1 Spotted gum 22m	
63 - 65	m	S2 M. cunning 25m	
74 - 75	m	S2 Hairy psyllid 1m	
82 - 83	m	T2 e. crebra 8m	
93 - 96	m	S1 15m Black wattle	
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

refer to previous page	Diuris caerulea	
	Acaen. ardens	
Podium fruticosum		
Heliconia sp.		
Alphitoea scabra		
Conocarpus confertifolius		
Quercus laevis		
Conocarpus confertifolius		
Euphorbia laevis		
Chamaecrista		
Procyon		
Myrica laevis		
Calyptranthes laevis		
Calyptranthes laevis		
Calyptranthes laevis		
Acacia laevis		

Vegetation Proforma

Date: 19/9/17

H2C.

Observers: CS + AS

Site Name: 26T



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: start GPS 126
Start point Zone 5 E 0 N -27.66308
End point Zone 5 E 0 N 152.46262
Photo points (numbers): North: East: South: West: end GPS 137
-27.66282
152.46284

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent T1	Tree 2	Shrub*	Ground
Height Range (m): 18-20	Height Range: 10-15	Height Range: 3-2	Height Range: 0.1-1m
Av. Height (m): 19m	Av. Height: 14	Av. Height: 2.5	Av. Height: 0.5
Cover (%): 60-70%	Cover: 30%	Cover: 30%	Cover: 90%
<i>C. lucidus</i> d	<i>C. lucidus</i> d	<i>C. lucidus</i> a	<i>C. lucidus</i> d
<i>C. lucidus</i> a	<i>C. lucidus</i> d	<i>C. lucidus</i> a	<i>C. lucidus</i> c
<i>C. lucidus</i> a	<i>C. lucidus</i> S	<i>C. lucidus</i> c	<i>C. lucidus</i> c
	<i>C. lucidus</i> S	<i>C. lucidus</i> c	

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem: Confirmed Regional Ecosystem:

Landform:

Soils:

Structural formation (eg woodland, open-forest etc.): open Eucalypt forest with planted gums

Field Observations/ Notes (eg. Level of disturbance connectivity):
Anthropogenic disturbance + planting

Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):
Lantana canna 40%
Green panic (90% ground station)
mossy vine (5%)

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)	Intercept	Str./height	Summary:		
1.7m - 9m	m	Ti Cadag 18m	Minimum height of plants included in the transect table:	m	
3.5m - 5m	m	S1 B. pepper 3.5m	Intercept of EDL 0 - 50m:		m
7.6 - 8.4	m	S2 Tipu 2m	Intercept of EDL 50 - 100m:		m
10m - 32.2	m	Ti Tipu 17m	Measured crown cover % of EDL 0 - 100m:		%
18.8 - 29.4	m	Ti Cadag 19m	Structural formation		
28 - 35.2	m	T2 Fiddlewood 18m	Conclusions/notes:		
32.1 - 45.7	m	Ti Jacaranda 18m			
45.4 - 61.6	X5	Ti Blue gum 7m			
54.5 - 59.2	E	T2 Cadag 4m			
51.2 - 68	12X	S1 Cane 4m			
63.2 - 87.2	4X	Ti Blue gum 18m			
72 - 79.6	3X	Ti C. Tess 18m			
81 - 90	4X	Ti Blue gum 18m			
90 - 100	2X	T2 Confertional 12m			
-	m				
-	m				
-	m				
-	m				
-	m				
-	m				
-	m				

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Puccinellia	Corypha harrisi	Chenopodium Oliver
Indian weed	Oxalis articulata	Solanum (Andi)
White grass	Agrostis sp.	Coriaria
Chinese chestnut	Ficus virens	Plantago
Carthagen camera	Glechoma hirsuta	
Megathura munita	Pidda munita	
White grass	Isop. piri	
Leucaena leucocephala	Acacia marmorata	
Corypha harrisi	Maybush	
Passerina ovata	Celastrus	
E. teretifolia	Banksia integrata	
C. kerrallii	Ficus virens	
C. teretifolia	Callitriche canadensis	
Grevillea robusta	Phytolacca sp.	
Maackia cochinchinensis	Broadleaf pepper	
Veronica rigida	Callitriche (P. v. virens)	
Madroa virens	White cedar	
Millerberry	Broad leaf pepper	
Sisyrinchium	Oleander	

Vegetation Proforma

Date: 19/9/17

Observers: CS + GS

Site Name: T23 H2C



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates:

Datum:

Transect length:

Start point

Zone

5

E

0

N

End point

Zone

5

E

0

N

Photo points (numbers):

North:

East:

South:

West:

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

GPS start 13.7

-27.65620

152.44681

GPS end 13.7

-27.65620

152.44765

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent T1		Tree 2		Shrub#		Ground	
Height Range (m): 22-16		Height Range: 16-12		Height Range: 2-1m		Height Range: 0.1-0.3m	
Av. Height (m): 18		Av. Height: 15		Av. Height: 1.5		Av. Height: 0.1	
Cover (%): 60		Cover: 90		Cover: 10%		Cover: 70%	
<i>Corymbia citrifolia</i>	*	<i>Leptospermum</i>	a	<i>Lantana camara</i>		Chaff weed	
<i>E. lanatocarpus</i>	c	<i>C. citrifolia</i>		<i>Psychotria odorata</i>		Notre de la Vierge	
<i>Corymbia intermedia</i>	a	<i>E. lanatocarpus</i>		<i>Alphitoea excelsa</i>		<i>Eragrostis</i> sp.	
<i>E. crebra</i>	c	<i>Acacia ligustrina</i>		<i>Acacia monnina</i>		<i>Enhalma stricta</i>	
		<i>Corymbia laevis</i>		<i>Leucadendron</i>		<i>Austrostipa</i> sp.	
						Grasses (NFM).	

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed, * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed <2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform: <i>low slope</i>	
Soils: <i>L2 9/16 - sandy loamy with sandstone rocks</i>	
Structural formation (eg woodland, open-forest etc.): <i>open eucalypt forest</i>	
Field Observations/ Notes (eg. Level of disturbance connectivity): <i>under story disturbed by cattle grazing</i>	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016): <i>Lantana (10%)</i>	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)	Intercept	Str./height	Summary:	
0 - 9.4	m	Ti combia 22m	Minimum height of plants included in the transect table:	m
6 - 8.1	m	T2 blue gum 15m	Intercept of EDL 0 - 50m:	m
11 - 17.7	m	T2 spotted gum 16m	Intercept of EDL 50 - 100m:	m
16.5 - 34.5	m	T2 macrebra 23m	Measured crown cover % of EDL 0 - 100m:	%
19.4 - 22	m	T2 spotted gum 15m	Structural formation	
26.7 - 34.3.2	m	T2 crebra 12m	Conclusions/notes:	
31.7 - 35.6	m	T2 Pantana 2m		
45.4 - 46.9	m	T2 Pantana 2m		
47.2 - 56.1	m	T2 spotted gum 18m		
59.3 - 61.2	m	T2 spotted gum 18m		
62.4 - 67.5	m	T2 blue gum 17m		
63.8 - 66.7	m	T2 spotted gum 2m		
68.7 - 81.1	m	T2 spotted gum 18m		
66.7 - 71.5	m	T2 blue gum 18m		
78.8 - 76.8	m	T2 leprosum 10m		
82.7 - 86.7	m	T2 mistle 10m		
87.7 - 91.8	m	T2 spotted gum 16m		
87.7 - 92.3	m	T2 spotted gum 15m		
92.3 - 100	m	T2 spotted 15m		
-	m			

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

<i>Anchda</i> sp.	<i>Gardenia</i> robust.	
<i>Aschysia</i> v.	<i>Lobelia</i> prop.	
<i>Eragrostis</i> sp.	<i>Vernonia</i>	
<i>Eucalyptus</i>	<i>Glycine</i> fabacea	
<i>E. kinabaluensis</i>	<i>Eucalyptus</i> robust	
<i>C. intermedia</i>		
<i>C. c. c. c.</i>		
<i>A. b. b. b. b.</i>		
<i>Loph. Guavacere</i>		
<i>Acacia</i> m. m. m.		
Cliff weed (<i>Acacia</i> sp.)		
<i>Camphor</i> Laurel		
<i>Alphitonia</i> exaltata		
<i>Caribaea</i> caribaea		
<i>Psychotria</i> caribaea		
<i>Melastoma</i> caribaea		
<i>Grass</i> d. d. d.		
<i>Centella</i> caribaea		
<i>Caribaea</i> caribaea		
	Fireweed on Property	

Vegetation Proforma

Date: 19/9/2017

Observers: CS + GS

Site Name: 29T H2C



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 0

Start point Zone 5 E 0 0 0 0 0 0 N 27.66651

End point Zone 5 E 0 0 0 0 0 0 N 152.53465

Photo points (numbers): North: East: South: West: GPS 140

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent	Tree 2	Shrub*	Ground
Height Range (m): 20-25	Height Range: 18-18	Height Range: 5-8	Height Range: 0.2-1.5
Av. Height (m): 22	Av. Height: 17	Av. Height: 5	Av. Height: 1m
Cover (%): 50%	Cover: 70%	Cover: 60	Cover: 100
E. tereticornis D	C. tessellata	Lantana canna	Agrostis cylindrica
C. tessellata C	Celtis sinensis	Acacia implexa	Convolvulus long.
Angerium thick a	Acacia leucoloma	Acacia mackayana	Cymbopogon nederburgii
Corn cyme D		Brachylaena pinnatifida	Sida acuta
		Albizia excelsa	Scorpiurus
		Leucaena leucoloma	Sida acuta

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed <2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform: Beach along drain (Plain)	
Soils: Alluvium L23	
Structural formation (eg woodland, open-forest etc.): open eucalypt forest	
Field Observations/ Notes (eg. Level of disturbance connectivity):	
Cattle + Horse Grazed, more veg. selectively cleared. veg retained along drain	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):	
Lantana canna (10%)	
Muhlenbergia (1%)	
Chenopodium (5%)	
Chenopodium (5%)	

Vegetation Proforma

Date: 19/9/17

Observers: CS + GS

Site Name: 27T H2C



Future Freight

Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 0

Start point Zone 5 E 0 N 015 141
End point Zone 5 E 0 N -27.66400
152.51088

Photo points (numbers): North: East: South: West:

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent	Tree 2	Shrub*	Ground
Height Range (m): 20-22	Height Range: 15-18	Height Range: 1-3m	Height Range: 0.1-0.5
Av. Height (m): 21.	Av. Height: 16m	Av. Height: 2m	Av. Height: 0.3m
Cover (%): 90%	Cover: 60%	Cover: 10%	Cover: 90%
E. crebra	* A. acacia implexa E. crebra	Lonchocarpus Acacia marmorata Eucalyptus	R. glabra C. glabra H. glabra E. glabra J. glabra P. glabra S. glabra

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed <2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform:	
Soils: Dark brown soils L2 9/10? / 3.	
Structural formation (eg woodland, open-forest etc.):	
Field Observations/ Notes (eg. Level of disturbance connectivity):	
Heavily grazed, cleared lots of regrowth E. crebra.	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):	
giant bracken (10%) Lantana camara (10%)	

Adjacent to rail corridor. other side of corridor dominated by QLD Blue Gum

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy “measured”, not “estimated”) A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

[illegible]

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

[illegible]

Vegetation Proforma

Camera + anabat set up here
GPS - 27.66486
152.51575

Date: 19/19/17

Observers: CS + AS

Site Name: 28T H2C



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 0

Start point Zone 5 E 0 N 0
End point Zone 5 E 0 N 0

Photo points (numbers): North: East: South: West:

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent	Tree 2	Shrub*	Ground
Height Range (m): 20 - 26	Height Range: 8 - 15	Height Range:	Height Range:
Av. Height (m): 22	Av. Height: 10	Av. Height:	Av. Height:
Cover (%): 60%	Cover: 40	Cover:	Cover:
E. barkers	F. barkers M. barkers C. barkers C. barkers	Cantana Lecanora wild barkers	Bark barkers Lecanora barkers Canna barkers Canna barkers Canna barkers Canna barkers Canna barkers Canna barkers Canna barkers

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem: Confirmed Regional Ecosystem: 12.3.3,

Landform: drom

Soils: chival (L23).

Structural formation (eg woodland, open-forest etc.): Low open forest

Field Observations/ Notes (eg. Level of disturbance connectivity):
hardly John either side of drive
water pump

Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):
makra vine (5%)
Cantana (30%)
White Alyce (50%)

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy “measured”, not “estimated”) A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

[illegible]

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

C. tessellata	Asparagus plumosus	
F. torreyana		
White Glycyrrhiza		
Canna lily		
Cassia longifolia		
Canavalia long.		
Blue hilly goat.		
Soft fern		
M. v. mansuet.		
Persea leucocarpa		
Green passion		
Cyperus polystachyus		
Solanum mammosum		
Sorbus domestica		
Madro vine		
Croton oil plant.		
Shen der grass		
Sorghum halepense		
Boltonia vine		

Vegetation Proforma

Date: 20/9/17

TSEC property



Future Freight

Observers: CS + JS

Site Name: T25 924

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 100m

Start point Zone 5 E 0 N

End point Zone 5 E 0 N

Photo points (numbers): North: East: South: West:

Start = -27 50 989 152 03 777 (Waypoint)

End = -27 51 061 152 03 738 142

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent	Tree 2	Shrub*	Ground
Height Range (m): 18-25m	Height Range: 10-15	Height Range: 5-8	Height Range:
Av. Height (m): 22m	Av. Height: 12	Av. Height:	Av. Height:
Cover (%): 20%	Cover: 30%	Cover:	Cover:
Crebra	E. crob	Lantana	creeping
E. Melano	E. Melano	camera	lantana
Corymbia. Trac	A. salina (sally)	A. sal	Wombat
XXXXX	A. lecalix (Black	A. lesc	berry
E. Mellodira	A. Glacarpa	A. Glau	bamboo Grass
		XXXXX	black spear
		red carnala	
		Electron Divers	
		A. excelsa	
		white ceda	
		SZ 1-2m	

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed, * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem: Confirmed Regional Ecosystem:

Landform: hill (upper slope)

Soils: LZ 8 (type) LZ 9-10

Structural formation (eg woodland, open-forest etc.): Woodland (etc)

Field Observations/ Notes (eg. Level of disturbance connectivity):

Side of hill - large Quirk of Birds.

Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):

Lantana camara 70% cover

Lantana montana

Quirk tomentosa (5%)

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established - canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

HT	Interval (metres)	Intercept	Str./height	Summary:
12M	0 - 1.6M	12 m	T2 Melo	Minimum height of plants included in the transect table: m
12M	2.5 - 9.5M	m	T2 E. Melo	Intercept of EDL 0 - 50m: m
8M	11.8 - 13M	m	T2 Sully wattle	Intercept of EDL 50 - 100m: m
16M	14.2 - 18.2M	m	T1 E. reb	Measured crown cover % of EDL 0 - 100m: %
1M	20M - 21	m	S2 Lantana	Structural formation
11M	24.6 - 27.1	m	T2 E. reb	Conclusions/notes:
10M	24.6 - 29.4	m	T2 E. reb	
16M	28.2 - 35.5	m	T1 E. reb	
2M	32.6 - 33.5	m	S2 E. reb	
8M	33.5 - 35.5	m	S1 E. reb	
15M	39.5 - 41.3	m	S2 Lantana	
8M	40.6 - 42.6	m	S1 E. reb	
16M	40.3 - 44.7	m	T1 E. reb	
1.5	43.7 - 45.7	m	S2 Lantana	
2.5	43.7 - 45.7	m	S2 Sully wattle	
2	43.7 - 45.7	m	S2 Maiden wattle	
4	46.2 - 47.4	m	S1 White cedar	
18	46 - 51.0	m	T1 E. reb	
8	51.7 - 57.6	m	T2 Black wattle	
9	59.3 - 61.7	m	T2 E. reb	
2.5	59.8 - 63.3		S2 red carnation x 13	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

1M	66.5 - 68	S1 red ash	Acacia limicola
20	73.9 - 81	T1 E. Melo + E. intermedia	gum tree
8	74.3 - 76	S1 Black wattle	Excoecaria agallocha
4	78.4 - 82	S1 Black wattle	Lantana mitchellii
1.5	82.2 - 85.7	S2 Lantana	
5M	85.7 - 88	S1 Maiden wattle	
2M	94.3 - 97.2	S2 Lantana	
3M	98.5 - 100	S1 Black wattle	
E. crebra			Desmodium illinoense
E. melaleuca			Cassia torrensii
M. phyllanthus			Pyrostachys coccinea
Acacia limicola			Acacia saligna
E. crebra			Albizia julibrissin
Gymnosporia reticulata			Acacia gossypifolia
M. phyllanthus			E. melaleuca
Lantana camara			E. melaleuca
Acacia mitchellii			Chloris virgata

Vegetation Proforma

Date: 20/9/17

TSRC property

Observers: CS + SS

Site Name: T23 G2H



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 100m

Start point Zone 5 E 0 N

End point Zone 5 E 0 N

Photo points (numbers): North: East: South: West:

Start - 27.50932 152.03880 (145 Waypoint)

Finish - 27.50994 152.03326 (144 Waypoint)

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent		Tree 2		Shrub*		Ground	
Height Range (m): 18-22		Height Range: 15-18		Height Range: 4-8		Height Range: 0.2-0.5	
Av. Height (m): 20		Av. Height: 16		Av. Height: 5		Av. Height: 0.3	
Cover (%): 70		Cover: 10%		Cover: 70		Cover: 70	
E. crebra	a	E. melanth	a	Conium	D	Nahr grasses	+
C. lescurii	a	C. fasciata	d	Red Kangaroo	E	Fork	
E. melanth	D	C. crebra	a	Alphium wood	C		
C. dorey	a	C. inula	a	A. modan	a		
C. inula	a			A. solium	a		

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem: Confirmed Regional Ecosystem:

Landform: Scree on hill (Chillidun / upper slope)

Soils: Basalt rocks & black soil

Structural formation (eg woodland, open-forest etc.): Eucalypt woodland

Field Observations/ Notes (eg. Level of disturbance connectivity): TSRC construction downslope of site

Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):

Conium canum (40%)

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

H	Interval (metres)	Intercept	Str./height	Summary:
12m	1.8. - 6.1.	m	T ₁ C.ks	Minimum height of plants included in the transect table: m
4m	4. - 5.2.	m	S ₂ A.soli	Intercept of EDL 0 - 50m: m
4m	6.8. - 9.3.	m	S ₂ C.ks x2	Intercept of EDL 50 - 100m: m
16m	9.4. - 14.2.	m	T ₁ C.int	Measured crown cover % of EDL 0 - 100m: %
1.5m	17.7. - 19.8.	m	S ₂ Lantana	Structural formation
20m	18.0. - 26.6.	m	T ₁ C.int x2	Conclusions/notes:
3m	32.1. - 34.9.	m	T ₂ E. creb.	
6m	34.2. - 38.4.	m	T ₂ E. melano	
20m	36.3. - 38.4.	m	T ₁ E. melano	
1m	38.6. - 41.7.	m	S ₂ Lantana	
20m	40.5. - 56.8.	m	T ₁ E. melano x2	
2m	41.3. - 44.2.	m	S ₁ Lantana	
3m	43.2. - 45.8.	m	S ₁ A. sp.	
5m	47.0. - 51.0.	m	T ₂ A. soli	
1.5m	49.2. - 52.4.	m	S ₂ Lantana	
1.5m	53.0. - 53.6.	m	S ₂ E. creb.	
2.5m	56.9. - 58.0.	m	S ₁ E. melano	
20m	62.2. - 70.1.	m	T ₁ E. melo	
2m	68.5. - 69.2.	m	S ₁ Lantana	
20m	73.6. - 82.3.	m	T ₁ C. ks	
5m	85.4. - 91.5.	m	T ₂ A. soli x2	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

12m	89.7. - 96.0.	T ₂ C. ks	Desmodium sp.	
1.5m	91.3. - 94.	S ₂ Lantana	Oxalis corn.	
1.5m	94.5. - 96.3.	S ₂ Lantana	Stemodia sp.	
7.5m	98.3. - 99.6.	S ₁ R. Kanda	Cynopogon robust	
			Pharusia sp.	
			Glycyne tuberosa	
			Chastanthea serotina	
			Holopogon robust	
			Stellaria sp.	
			Cynopogon sp.	
Moreton Bay AEN				
			Lantana sp.	
			Stemodia sp.	
			Lantana sp.	
			Red Kanda	
			Stemodia sp.	
			E. creb.	
			C. trachyphyll	
			C. subcordata	
			A. exserta	
			Acacia sp.	
			A. m. sp.	

Vegetation Proforma

Date:

20/9/17.

Observers: JS + CS.

Site Name: T24 G2H.



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 0

Start point Zone 5 E 0 N

End point Zone 5 E 0 N

Photo points (numbers): North: East: South: West: -27.51116
146 152.03661

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent	Tree 2	Shrub*	Ground
Height Range (m): 20-22	Height Range: 10-12	Height Range: 2-4	Height Range: 0.3-0.5
Av. Height (m): 21.	Av. Height: 11m	Av. Height: 3	Av. Height: 0.4
Cover (%): 15%	Cover: 10%	Cover: 70%	Cover: 30%
E. crebra. C. tessellata	E. crebra A. mo. Smith A. glaucocarpa.	Conium can E. crebra A. glaucocarpa A. glaucocarpa	Polka grasses + Ficus.

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed <2m tall.

Table 2

Mapped Regional Ecosystem: 12.9-10.7. Confirmed Regional Ecosystem:

Landform:

Soils: Sandy / loamy / dark brown (L2 9-10 mm L2 8 shrubs)

Structural formation (eg woodland, open-forest etc.):

Field Observations/ Notes (eg. Level of disturbance connectivity):
Heavy timber, abutment

Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):
Conium can & most → 90%
Grass forbs > 4%

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

[illegible][illegible]

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Thunbergia		
Euphorbia		
Centropogon		
Sida sp.		
Centropogon		
Cymbopogon		
Dig. l. purpurea		
Conoclinium		
Dioscorea		
Veronica sp.		
Hesperis matronalis		
Quercus laevis		
E. coccinea		
C. laetifolia		
Prunella		
Linum catharticum		
Lepidum		
Datura		
Rhus glabra		

Vegetation Proforma

Date: 21/9/17

Observers: GSTCS

Site Name: 197



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length:

Start point Zone 5 E 0 N 0
End point Zone 5 E 0 N 0

Photo points (numbers): North: East: South: West:

CPS no. 51
27-65662
152-43138
CPS no. 150
27-64989
152-4341

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent	Tree 2	Shrub*	Ground
Height Range (m): 20-25	Height Range:	Height Range: 1-4.5m	Height Range: 0.1-0.3
Av. Height (m): 22	Av. Height:	Av. Height:	Av. Height: 0.2
Cover (%): 60.	Cover:	Cover:	Cover: 20%
Angophora laevis* Eucalyptus globulus major	Angophora laevis d	Acacia laevis Ptilotus sp.	native grasses

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem: Confirmed Regional Ecosystem:

Landform: L2 9-10.

Soils: Sandy loam (L2 9/10)

Structural formation (eg woodland, open-forest etc.):

Field Observations/ Notes (eg. Level of disturbance connectivity):
Non disturbed, no non-native species.

Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):
OK

Vegetation Proforma

Date: 21/9/17

Observers: CS1 AS

Site Name: B1 A2C



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 0
Start point Zone 5 E 0 0 0 0 0 0 N 0 0 0 0 0 0
End point Zone 5 E 0 0 0 0 0 0 N 0 0 0 0 0 0
Photo points (numbers): North: East: South: West:

GPS 152
27-68988
152-43283

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent	Tree 2	Shrub*	Ground
Height Range (m): 20-25	Height Range: 10-12 m	Height Range: 0.5-1 m	Height Range: 0.1-0.5
Av. Height (m): 22	Av. Height: 12 m	Av. Height: 1 m	Av. Height: 0.5
Cover (%): 60% (large canopy)	Cover: 40%	Cover: 5%	Cover: 30%
spotted gum rusty gum grey gum	A. ficaria e. crebra spotted gum grey gum	d a d b/s	c c c c native grasses

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform: 9110 - upper slope, sandy loam	
Soils: Sandy loam, in bedded surface rocks (sandstone)	
Structural formation (eg woodland, open-forest etc.): open forests	
Field Observations/ Notes (eg. Level of disturbance connectivity): none	

Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):
0% - none

Vegetation Proforma

Date: 21/9/11

Observers: CS + GS

Site Name: T20 GHZ11



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 0 *non remnant*
 Start point Zone 5 E 0 0 0 0 0 0 N 0 0 0 0 0 0 *GPS 153 29.64996 152.343440*
 End point Zone 5 E 0 0 0 0 0 0 N 0 0 0 0 0 0
 Photo points (numbers): North: East: South: West:

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent T1	Tree 2	Shrub* S1	Ground
Height Range (m): 26-25	Height Range: 16-10	Height Range:	Height Range:
Av. Height (m): 20m	Av. Height:	Av. Height:	Av. Height:
Cover (%): 10%	Cover:	Cover:	Cover:
E. crebra E. permaculatus E. tericonatus	* A. glaucocarpa Alphonia excelsa pitilsporum undulatum E. crebra A. maideneyae Lophosora confusus	a Unknown (sample photo) collected A. maideneyae Alphonia excelsa wild tabacco lantana (10% cover) Alphonia constricta	a green panic bracken fern Sida cordifolia

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform: Landzone 3 alluvium	alluvium non remnant
Soils: alluvium - sandy loam	
Structural formation (eg woodland, open-forest etc.):	non remnant
Field Observations/ Notes (eg. Level of disturbance connectivity):	
High (3)	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):	
lantana 90% wild tabacco (2%)	green panic (90%)

Vegetation Proforma

Date: 22/9/17

Observers: CS + AS

Site Name: T15 H2C



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 0

Start point Zone 5 E 0 N 0

End point Zone 5 E 0 N 0

Photo points (numbers): North: East: South: West:

Handwritten notes: UPS 154, -27.61232, 152.38316

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent	Tree 2	Shrub*	Ground
Height Range (m): 22-26	Height Range: 16-20	Height Range: 25-12	Height Range: 6.1-1
Av. Height (m): 2.4	Av. Height: 1.8	Av. Height: 8	Av. Height: 0.5m
Cover (%): 10%	Cover: 40-60-80% (stat)	Cover: 70%	Cover: 90% (ndrain)
Chinese celtis E. forest cornus	* Chinese celtis M. Viminalis (bottle bush) Casuarina cunninghamiana white mulberry Camfortonia	a Chinese celtis a white mulberry s M. Viminalis c Casuarina bush s Coxspervine	a Cyperus polystachyos c South thistle c persicaria orientalis c mist weed a wild radish c shaggy nettle c flea vine c halimolobos c green panic c blue butterfly grass c Casuarina bush c lot grass c black nightshade

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem: Confirmed Regional Ecosystem:

Landform: drainage line (23)

Soils: Alluvium (sandy)

Structural formation (eg woodland, open forest etc.): non remnant open forest/woodland

Field Observations/ Notes (eg. Level of disturbance connectivity): dominated by native

very high

Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):

Casuarina plant
blue butterfly grass
Chinese celtis
Chimney asparagus
Camfortonia
mist weed
90%

Vegetation Proforma

Date: 22/9/17

Observers: CS + GS

Site Name: 14T H2C



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 0

Start point Zone 5 E 0 N

End point Zone 5 E 0 N

Photo points (numbers): North: East: South: West:

GPS 155
27.58374
152.34950

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent T1	Tree 2	Shrub*	Ground
Height Range (m): 1.5m	Height Range:	Height Range: 1-2	Height Range: 0.1-1m
Av. Height (m): 1.5m	Av. Height:	Av. Height: 1m	Av. Height: 0.5m
Cover (%): 3%	Cover:	Cover: 30%	Cover: 100%
A. Silania (Sally wattle) *	absent	Sally wattle cotton ballon bush lantana black thistle cashol plant	green panic black spear grass signal grass ballon vine south thistle road grass perly grass prickly lettuce wild turnip Johanna grass thistle (sampled) indian couch

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform: Plain (128) (123)	
Soils: Black soil	
Structural formation (eg woodland, open-forest etc.): disturbed / non remnant / occasional trees	
Field Observations/ Notes (eg. Level of disturbance connectivity): High disturbance - non remnant	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):	
lantana cashol plant ballon vine	90%

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy “measured”, not “estimated”) A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

[illegible]

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Refer to post page.

[illegible]

Vegetation Proforma

Date: 22/9/13

Observers: CS + GS

Site Name: 12T H2C



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates:		Datum:		Transect length:	
Start point	Zone 5 E 0		N		GPS 156
End point	Zone 5 E 0		N		27.54960 152.24275
Photo points (numbers): North: _____ East: _____ South: _____ West: _____					

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent	Tree 2	Shrub*	Ground
Height Range (m):	Height Range:	Height Range:	Height Range: 0-0.5
Av. Height (m):	Av. Height:	Av. Height:	Av. Height: 0.2
Cover (%):	Cover:	Cover:	Cover: 90%
absent	absent	absent	native grasses d forbes a
<p>* acrossed rail line Blue gum 22m - open forest Spotted gum cover 60%</p>			

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem: non remnant
Landform: 12-9/10 slight slope	
Soils: sandy loam	
Structural formation (eg woodland, open-forest etc.):	grassland - used for fodder harvesting
Field Observations/ Notes (eg. Level of disturbance connectivity):	Highly disturbed - cleared for fodder
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy “measured”, not “estimated”) A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

[illegible][illegible]

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Billy buttons		
blue grass		
crabgrass		
erigeron (white)		
Cud weed		
giant taro		
black spear grass		
rhinoceros moss		
resurrection fern		
stink bug		
primula		
taximilla		
Saururus (collected)		
pampas grass		
panicum		
binda		
smooth larkspur		
hard larkspur		
south thistle		

Vegetation Proforma

Date: 22/9/17

Observers: CS + AS

Site Name: 2A #2C



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 0

Start point Zone 5 E 0 N 0

End point Zone 5 E 0 N 0

Photo points (numbers): North: East: South: West:

GPS 157
2754212
152026164

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent	Tree 2	Shrub*	Ground
Height Range (m):	Height Range:	Height Range: 1-4m	Height Range: 0-1-1m
Av. Height (m):	Av. Height:	Av. Height: 2m	Av. Height: 0.5
Cover (%):	Cover:	Cover: 27	Cover: within drain 100%.
absent	absent	wild tobacco d Shrubby roger a black Frigate a Spring lettuce a wild Murrup a Cesbrina a cotton ballon bush a	signal grass d ebon a flea hair a louch grass a elastic grass a cape weed a

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform: black soil plain	Land zone 4 - non remnant
Soils: black soil	
Structural formation (eg woodland, open-forest etc.):	cropping land + adjacent drain
Field Observations/ Notes (eg. Level of disturbance connectivity):	Highly disturbed. cropping land
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):	refer above. 100%.

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy “measured”, not “estimated”) A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

[illegible][illegible]

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Refer to front page.

[illegible]

Vegetation Proforma

Date: 23/9/17

Observers: CS + AS

Site Name: 16T H2C



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 0

Start point Zone 5 E 0 N 0

End point Zone 5 E 0 N 0

Photo points (numbers): North: East: South: West:

Handwritten notes: 158, 27.63350, 152.41461

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent T1	Tree 2	Shrub#	Ground
Height Range (m): 10-12	Height Range: 3-6	Height Range: 1-2 m	Height Range: 0.1-0.5m
Av. Height (m): 12m	Av. Height: 5	Av. Height: 1.5m	Av. Height: 0.1
Cover (%): 20%	Cover: 60%	Cover: 90%	Cover: 30%
Wattlebush Drooping wattle Leather Jock (Phodion) Vine trees	Wattlebush Drooping wattle Cotton insularis Leather Jock Bitter bark Alexandria oriolisfolia A. macleayana	native shrub marrubium (collected) alexandria diversifolia lantana Carissa ovata	native grasses exotic grasses forbes Climbing asparagus

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform: slope	
Soils: brown soils	
Structural formation (eg woodland, open-forest etc.): vine scrub regrowth / spm scrub	
Field Observations/ Notes (eg. Level of disturbance connectivity): High cleared.	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016): lantana (controlled) Climbing asparagus	40%

Vegetation Proforma

Date: 23/9/17

Observers: CSTCS

Site Name: ITT H2C



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 100m

Start point Zone 5 E 0 N 27.63660
End point Zone 5 E 0 N 152.41806

Photo points (numbers): North: East: South: West:

start GPS 160
27.63660
152.41806
end GPS 189
27.63587
152.41812

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent T1	Tree 2 + 3	Shrub*	Ground
Height Range (m): 18-22	Height Range: 10-15	Height Range: 1-3m	Height Range: 0-0.5
Av. Height (m): 19m	Av. Height: 12m	Av. Height: 2.5	Av. Height: 0.5
Cover (%): 60%	Cover: 60%	Cover: 15m	Cover: 10%
spotted gum E. acbriia	spotted gum	A. maideneye spotted gum black wattle A. imbrata crow's ash bitter bark wonga vine native wistaria (collected) Climbing asparagus lantana Edvax odoata cham-frut	bamboo grass digetaria lomandra a. fertablia ganneia a. spora alphitonia wombat berry churf weed.

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform: Slope	
Soils: brown sandy loam	
Structural formation (eg woodland, open-forest etc.):	open forest - patch v
Field Observations/ Notes (eg. Level of disturbance connectivity):	
patch very good condition	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):	
lantana prickly pear	10%

Vegetation Proforma

Date: 24/9/17

Observers: CS + AS

Site Name: 8T 42C



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 200

Start point Zone 5 E 0 N CAS 161 Start
21.55212
152.19905

End point Zone 5 E 0 N CAS 162 End
21.55204
152.20007

Photo points (numbers): North: East: South: West:

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent	Tree 2	Shrub*	Ground
Height Range (m): 15-18	Height Range: 8-12m	Height Range: 1-4	Height Range: 0.1-0.5
Av. Height (m): 16m	Av. Height: 10m	Av. Height: 2	Av. Height: 0.1
Cover (%): 80%	Cover: 60%	Cover: 20%	Cover: 10%
spotted gum E. crebra Allocasuarina littoralis	brown bloodwood E. crebra Allocasuarina littoralis spotted gum Quinnie	Alphitonia excelsa Allocasuarina littoralis Black wattle lantana	native grasses forbes
d c	c c d c	c d c c	d a

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform: 1st zone A/10	Sandstone - midslope
Soils: Sandstone	
Structural formation (eg woodland, open-forest etc.):	open forest
Field Observations/ Notes (eg. Level of disturbance connectivity):	medium disturbed adjacent Warrego highway
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):	
lantana 15%	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem. projected north 20M

Interval (metres)	Intercept	Str./height	Summary:
0 - 4	m	Spotted gum 18m	Minimum height of plants included in the transect table: m
0 - 1m	m	Crebrina 1m	Intercept of EDL 0 - 50m: m
1 - 2.3	m	Crebrina 4m	Intercept of EDL 50 - 100m: m
2.3 - 3	m	Crebrina 3m	Measured crown cover % of EDL 0 - 100m: %
4 - 5	m	Crebrina 1m	Structural formation
5 - 12	3m	Spotted gum 20m	Conclusions/notes:
7.2 - 9.8	m	Crebrina 14m	
12.2 - 15	m	Spotted gum 15m	
15.8 - 31	m	Spotted gum 20m	
17 - 20	3m	Crebrina 1m	
22 - 24	3m	Crebrina 3m	
31 - 50	3m	Spotted gum 5m	
35 - 42	m	Spotted gum 15m	
46 - 64.5	2m	Spotted gum 24m	
60 - 64	2m	Spotted gum 2m	
64.5 - 69	m	Quinnie 3m	
68 - 81	3m	Spotted gum 10m	
69.5 - 75	3m	Black wattle 5m	
79 - 89	m	Black wattle 2m	
83 - 92	m	Black wattle 3m	
86 - 91		Spotted 15m	
95 - 100		Black wattle 2m	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Lantana	Clack fern
Spotted gum	rough bush
Crebrina	smooth latisia
Black wattle	highly dark fern
Jacksonia (dog wood)	roads grass
Quinnie	harp, wire grass
Crombida Vaca flower	Vahina littoralis
Alphitonia excelsa	Street wattle red
Allocasuarina littoralis	hrown sedge grass
blue gum	orange grass
dandel giria	South tussock
Banana grass	red wattle grass
white sedge grass	flannal weed
wire lilly	
Callaks (yellow bird daisy)	
Excarpm	
green panic	
signal grass	
tall engross grass (tall box grass)	

Vegetation Proforma

Date: 24/9/17

Observers: CS & GS

Site Name: QT HRC



Future Freight

Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 50m

Start point Zone 5 E 0 N 0
End point Zone 5 E 0 N 0

Photo points (numbers): North: East: South: West:

GPS 164 E
27.5586
152.2086
GPS 163 end
27.55178
152.20861

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent T1	Tree 2	Shrub*	Ground
Height Range (m): 15-22	Height Range: 8-6m	Height Range: 1-2	Height Range: 0.1-1m
Av. Height (m): 20	Av. Height: 5m	Av. Height: 1.5m	Av. Height: 0.5
Cover (%): 60%	Cover: 30%	Cover: 70%	Cover: 90%
moreton Bay Ash Blue gum iron bark (e. crebra)	e crebra cumbra intermedia black wattle aphorbia exelsa Quinnie	Lantana Bush cherry black wattle cough bush gundi gundi	d green panic road grass black spear grass signal grass

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem: 12.33 Confirmed Regional Ecosystem:

Landform: up of drainage line

Soils: alluvium (land zone 3)

Structural formation (eg woodland, open-forest etc.): open forest

Field Observations/ Notes (eg. Level of disturbance connectivity):
medium adjacent to abwege highway

Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):
Lantana
grasses 90% of ground stratum

Vegetation Proforma

Date: 24/9/17

Observers:

Site Name: 117 H2C



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates:

Datum:

Transect length: 0

Start point

Zone

5

E

0

N

End point

Zone

5

E

0

N

GPS 165
21.53799
152.24680

Photo points (numbers):

North:

East:

South:

West:

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

vegetation viewed on both sides of Warrego Highway

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent	Tree 1	Tree 2	Shrub*	Ground
Height Range (m): 19-24	Height Range: 8-12	Height Range: 1-3	Height Range: 0.1-1m	
Av. Height (m): 20	Av. Height: 10	Av. Height: 2	Av. Height: 0.5	
Cover (%): 60%	Cover: 60%	Cover: 30%	Cover: 40%	
E. reticulata E. crebra	d a blue gum e. crebra moreton bay ash leptospermum brish box	d a a Black wattle blue gum lantana	c c E native & exotic grasses forbes	d
primarily southern side of road.				

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform: alluvium	
Soils: alluvium	
Structural formation (eg woodland, open-forest etc.):	open forest (eucalypt)
Field Observations/ Notes (eg. Level of disturbance connectivity):	selectively cleared grazed by cattle tracks disturbed by road
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):	lantana panda grasses 30% (patchy)

Vegetation Proforma

Date: 24/9/17

Observers: CS+GS

Site Name: LOT 162C



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 100m

Start point Zone 5 E 0 0 0 0 0 0 N 0 0 0 0 0 0 APS 167 ⑤
End point Zone 5 E 0 0 0 0 0 0 N 0 0 0 0 0 0 -27.54469
Photo points (numbers): North: East: South: West: 152.23361
APS 166 ⑤
-27.54506
152.23305

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent	Tree 2	Shrub*	Ground
Height Range (m): 18-22	Height Range: 14-18	Height Range: 2-8m	Height Range: 0-1m
Av. Height (m): 20	Av. Height: 5m	Av. Height:	Av. Height: 0.5m
Cover (%): 30%	Cover: 30%	Cover: 20%	Cover: 40%
Spotted gum e. crebrina	* Quinnie e. crebrina Spotted gum Mushy box Snowy gum	d Quinnie Spotted gum black wattle e. crebrina lantana	d native + non native grasses forbes
	c	a	c
	c	a	
	s	a	

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform: upper slope (12 9/10)	
Soils: Sand stone & sandy loam	
Structural formation (eg woodland, open-forest etc.):	Open woodland
Field Observations/ Notes (eg. Level of disturbance connectivity):	
Highly disturbed (2) adjacent to truck stop	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):	
lantana	30% (patchy)

Vegetation Proforma

Date: 25/9/17.

Observers: CS + CA.

Site Name: 24T H2C.



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 100m

Start point Zone 5 E 0 N -27.66079
End point Zone 5 E 0 N 152.45502

Photo points (numbers): North: East: South: West: -27.66081
152.45491

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent	Tree 2	Shrub [#]	Ground
Height Range (m):	Height Range:	Height Range:	Height Range:
Av. Height (m):	Av. Height:	Av. Height:	Av. Height:
Cover (%):	Cover:	Cover:	Cover:
Acacia - 24m *			

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. [#] Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform:	
Soils:	
Structural formation (eg woodland, open-forest etc.):	
Field Observations/ Notes (eg. Level of disturbance connectivity):	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established - canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)	Intercept	Str./height	Summary:
			Minimum height of plants included in the transect table: m
			Intercept of EDL 0 - 50m: m
			Intercept of EDL 50 - 100m: m
			Measured crown cover % of EDL 0 - 100m: %
			Structural formation
			Conclusions/notes:
1.2 98.28 - 97.90.	m	S. ⁵ schubertii -12	1.1m 52.10 - 51.99. B. ⁵ schubertii
1m 97.37 - 97.17	m	S. ⁵ P. ⁵ schubertii	1.1m 50.87 - 50.11 B. ⁵ schubertii
1m 97. - 92.55.	m	Carbena	1m 50.87 - 47.16 Carbena ⁵
9m 92.87 - 88.64	m	Agave ⁵ glauca T ₂	7m 99.86 - 97.10 A. ⁵ disper T ₂
2m 92.58 - 91.90.	m	B. ⁵ schubertii	1m 96.90 - 97.04 Carbena ⁵
31- 90.97. - 87.88.	m	B. ⁵ schubertii ⁵ glauca T ₂	4-6m 92.88 - 36.22 A. ⁵ disper T ₂
9m 87.88 - 82.95	m	Hydrangea	1m 91. - 39.90 Carbena ⁵
1m 86.52 - 85.88.	m	B. ⁵ schubertii	1.2m 39.10 - 38.27 Euc. ⁵ sp
8m 81.75 - 78.39.	m	A. ⁵ disper T ₂	1m 38.70 - 37.15 Carbena ⁵
2m 82.14 - 80.7.	m	Carbena ⁵	2.5. 27.50 - 26.12 Carya ⁵ sp
1m 79.62. - 78.60	m	Carbena ⁵	1m 25.25 - 24.70 Carbena
7m 78.11 - 77.0.	m	B. ⁵ schubertii	4.5m 23.18 - 22.90 A. ⁵ disper T ₂
6m 77.44 - 71.87.	m	A. ⁵ disper T ₂	7m 21.06 - 16.27 A. ⁵ disper T ₂
1m 75.85 - 74.77.	m	Carbena ⁵	1m 18.90 - 17.55 Carbena ⁵
1m 74.04 - 68.70.	m	Carbena ⁵	1m 16.72 - 16 Carbena ⁵
25. 70.64 - 68.45.	m	A. ⁵ disper T ₂	4.5. 14.10 - 0. A. ⁵ disper T ₂
1m 66.16 - 65.30.	m	Carbena ⁵	15. 3-0m spotted
2m 62.86. - 60.70.	m	A. ⁵ disper T ₂	
3m 58.90 - 53.17.	m	A. ⁵ disper T ₂	
5m 54.90. - 52.32.	m	A. ⁵ disper T ₂	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

B. ⁵ schubertii	Cough bark
A. ⁵ disper	Carbena
A. ⁵ glauca	Agave
C. ⁵ trunc x C. ⁵ trunc	Spotted wood
C. ⁵ trunc	Green grass
C. ⁵ trunc	Ficus ⁵ sp
A. ⁵ disper T ₂	Sitting wall
A. ⁵ disper	F. ⁵ cauc
B. ⁵ schubertii	
P. ⁵ schubertii	
Tall ⁵ schubertii (col.)	
K. ⁵ schubertii (miffa into site)	
P. ⁵ schubertii	
M. ⁵ schubertii	
C. ⁵ trunc	
M. ⁵ schubertii	
White cedar	
D. ⁵ schubertii	
L. ⁵ schubertii sp.	

Link QK Euc

Vegetation Proforma

Bee eaters
BF Cuck Shrike
Ree wee
Brown HE

Rabbit scats - macro scats
Bandicoot diggings
RBFW?

Date: 25/9/17

Observers: CS + CA

Site Name: HZC T25



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 0
Start point Zone 5 E 0 N
End point Zone 5 E 0 N
Photo points (numbers): North: East: South: West: WP170

-27.65988, 152.45567

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy (Emergent)	Tree 2	Shrub*	Ground
Height Range (m): 10m	Height Range: 2.5m - 5m	Height Range: 1 - 2.5m	Height Range: 0.1 - 0.5
Av. Height (m): 10m	Av. Height: 3.5m	Av. Height: 2m	Av. Height: 0.2m
Cover (%): < 5%	Cover: 5%	Cover: 10% (patchy)	Cover: 95%
Corymbia intermedia x 1	A. glaucoarpa Alphitonia excelsa Cory	Lantana A. glaucoarpa Alph. excelsa Cory bush Ac. villosa velvety tree pear A. disparima Dalea villosa Ulcifera	Pterocaulon sphaer. Milk weed Eragrostis purpurea? (purple, weeping to 40cm) Muga oats sic Cenchrus weed Tall Aristida Scotch thistle Eriaria sp. (NFM) Wild lettuce Cantua Rhodes grass

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant < 8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem: Non-rem.	Confirmed Regional Ecosystem: Non-rem.
Landform: Top of gently sloping hill	
Soils: Brown, friable w high organic matter	
Structural formation (eg woodland, open-forest etc.):	
Field Observations/ Notes (eg. Level of disturbance connectivity):	
cleared with patches of lantana and Acacia glaucoarpa ↑ grazing by cattle	Sida cordifolia Hairy pigweed Phylla Black house
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):	
lantana, velvety tree pear 5-10% 15% Fireweed	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

[illegible][illegible]

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

[illegible]

Vegetation Proforma

Date: 26/9/17

Observers: SA + AS

Site Name: 6TB H2C



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 0

Start point Zone 56 E 0417638 N 6952576

End point Zone 5 E 0 N

Photo points (numbers): North: East: South: West:

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent	Tree 2	Shrub	Ground
Height Range (m): 18-22	Height Range: 6-10	Height Range: 1.5-4	Height Range: 0-0.3
Av. Height (m): 20	Av. Height: 8m	Av. Height: 2	Av. Height: 0.1
Cover (%): 30-1	Cover: 50%	Cover: 20%	Cover: 60%
E. Balerinia d	Budgeroo d	Lantana d	anistolia sp.
Spotted gum a	Detelostigma pubescens c	A. lecaxis c	green panic
Paperbark angophora s	Alphitonia c	Budgeroo c	panax sp.
Brown bloodwood s	Allocasuarina c	Allocasuarina sp. c	Small core grass
			Heath.
			Small leaf lomatium
			ferm
			panicum simili
			dinella (narrow leaf)
			anistolia sp. x2
			cherry comb

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform: Top of ridge	
Soils: Fine brown sandy - sandstone	
Structural formation (eg woodland, open-forest etc.): woodland	
Field Observations/ Notes (eg. Level of disturbance connectivity): medium disturbance - historical logging	Vegetation restricted to top of slope less 100m diameter
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016): Lantana 5%	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy “measured”, not “estimated”) A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

[illegible]

species slope before
philly pear (not vet)

[illegible]

Vegetation Proforma

Date: 26/9/17

Observers: SQ + GS

Site Name: ST H2C



Future Freight

Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates:

Datum:

Transect length: 0

Start point

Zone

5

E

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

End point

Zone

5

E

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

Photo points (numbers):

North:

East:

South:

West:

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

seen south of point

Table 1: Estimated Canopy Cover (mandatory for all sites)

mapped 12.3.7 - rocks 12.3.3 recording roadside of drainage line

Canopy/ Emergent	Tree 2	Shrub*	Ground
Height Range (m):	Height Range:	Height Range:	Height Range:
Av. Height (m):	Av. Height:	Av. Height:	Av. Height:
Cover (%):	Cover:	Cover:	Cover:
E. Tericordis (olive gum)	* d Laphrodium sandilis moreton bay ash Alphatonia bloodwood sp. intermedia Smooth bark apple (Angitia leucophaea)	d Lantana currant eucalypt Acacia sp.	d

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed <2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform: approximately flat. base of slope	
Soils: orange brown sandstone.	
Structural formation (eg woodland, open-forest etc.):	
Field Observations/ Notes (eg. Level of disturbance connectivity):	
high grazing impact - on edge of non-renewable regrowth.	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):	
Lantana. - dominates shrub layer	

Vegetation Proforma

Date: 26/9/17

Observers: SQ + AS

Site Name: 4T HDC



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length:

Start point Zone E N

End point Zone E N

Photo points (numbers): North: 740 East: 741 South: 742 West: 743.

APS 173
21.54128
152.14329
APS 174
21.54210
152.14354

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

Canopy/ Emergent	Tree 2	Shrub*	Ground
Height Range (m): 20-25	Height Range: 8-14	Height Range: 1.5-4m	Height Range: 0.1-0.8
Av. Height (m): 22	Av. Height: 12	Av. Height: 2m	Av. Height: 0.2
Cover (%):	Cover:	Cover:	Cover: 30%
Spotted gum blue gum bloodwood Angophora Pterocarpus	Lophospermum Alphastonia	Lantana jacksonia canarium totara bitter bark Ac. lecalix petalo stigma spikus	Pomax aristata gruela sp. green panic bark wire lure grass bomachava

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. * Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform: gentle slope to drainage line	
Soils: grey sandstone	
Structural formation (eg woodland, open-forest etc.):	
Field Observations/ Notes (eg. Level of disturbance connectivity):	
historical logging 50+ years - may have been selective.	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):	
lantana 5%	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Regional Ecosystem:			Summary:	
Interval (metres)	Intercept	Str./height	Minimum height of plants included in the transect table:	m
97.00 - 93.44	m	T2 <i>Alphitonia</i>	Intercept of EDL 0 - 50m:	m
97.00 - 93.32	m	T1 <i>Spotted</i>	Intercept of EDL 50 - 100m:	m
94.44 - 93.55	m	S1 <i>Alphitonia</i>	Measured crown cover % of EDL 0 - 100m:	%
92.60 - 89.28	m	T1 <i>Spotted</i>	Structural formation	
91.58 - 84.71 84.71	m	T1 <i>Spotted</i>	Conclusions/notes:	
88.65 - 86.00	m	T2 <i>Alphitonia</i>		
80.00 - 76.71	m	T1 <i>Spotted</i>		
79.60 - 79.10	m	S1		
76.43 - 71.03	m	T2		
70.80 - 70.50	m	S1		
70.07 - 66.31	m	S1 <i>Alphitonia</i>		
65.93 - 66.07	m	T1 <i>Spotted</i>		
68.59 - 56.30	m	T2		
56.96 - 54.53	m	T1 <i>Spotted</i>		
54.80 - 55.02	m	T2		
53.48 - 44.96	m	T2 <i>Spotted</i>		
52.26 - 48.21	m	T1 <i>Spotted</i>		
44.78 - 43.39	m	S1 <i>Alphitonia</i>		
43.08 - 42.44	m	T2 <i>Spotted</i>		
42.44 - 34.15	m	T1 <i>Spotted</i>		

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Table 4. Flora species richness (15-25 June)	Species	Flora
4.75 - 24.00	S1	Alphitonia
20.06 - 15.16	T2	Engelbergia leucophaea
19.90 - 17.95	S1	Spotted gum
13.62 - 10.25	T2	Brown bloodwood
12.04 - 11.44	S1	Blue gum
8.97 - 7.60	T2 ^{rephusians}	A. leucophaea
6.73 - 20.00	T1	Melaleuca bracteata (Gunn)
0.05 - 0.00	S1	

Vegetation Proforma

Date: 26/9/17

Observers: SA + AS

Site Name: 3T 12C



Future Freight
Integrating Community, Environment and Engineering

Transect Details (required for all sites)

GPS coordinates: Datum: Transect length: 0

Start point Zone 5 E 0 N 0
End point Zone 5 E 0 N 0

Photo points (numbers): North: East: South: West:

GPS 775
27.03986
152.14273

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

same KE as 4T

Canopy/ Emergent	Tree 2	Shrub [#]	Ground
Height Range (m): 20-30	Height Range: 8-15	Height Range: 1.5-3	Height Range: 0.1-0.3
Av. Height (m): 24	Av. Height: 12	Av. Height: 2	Av. Height: 0.2
Cover (%): 30%	Cover: 30%	Cover: 50% (including lantana)	Cover: 20%
Spotted gum *	Acacia leucobasis C	lantana d	dinella
brown bloodwood a	lephostamn C	nut pine/hairy	lemandra multiflora
Intermediate bloodwood a	Alphostonia d	Velvety tree pear	green panic
Angophora recarpa d	pedalis sigma C	pedalis sigma	Wombat berry
E. belliniana a		Centurion	brady grass

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi-stems within 20cm from base or if single stemmed < 2m tall.

Table 2

Mapped Regional Ecosystem:	Confirmed Regional Ecosystem:
Landform: gentle slope to drainage	
Soils: sand stone	
Structural formation (eg woodland, open-forest etc.): open forest	
Field Observations/ Notes (eg. Level of disturbance connectivity):	
historically cleared, old fire	no signs of recent grazing
	probably meets remnant requirements
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):	
lantana 50%	

small mammal droppings

GPS WP 302
56 J0415391N 6953454 = grass sample
(hairy joint grass?)

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established - canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem. Saville Tg

[illegible][illegible]

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

[illegible]

APPENDIX



Terrestrial and Aquatic Ecology Technical Report

Appendix I Completed Fauna Assessment Proformas

HELIDON TO CALVERT ENVIRONMENTAL IMPACT STATEMENT

Fauna Proforma

Habitat characteristics

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	0
Grazing	1
Clearing	1
Erosion	0

H2C
site 7T.

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
	Yes	No
What EVNT species are known from region (complete in rows below) – from database searches		
<i>P. largus</i>	✓	
Koala	✓	
Gliders (no hollows)		✓
Glossy ibis (no hollows)		✓
Powerful owl (no hollows)		✓
BBBQ		✓

Incidental fauna
observations/scats/traces:

phantom tail catag.

Habitat Features – Abundance:

Characteristics		Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentartia)	>30cm diameter	0
	>15cm, <30cm diameter	0
	>10cm, <15cm diameter	0
	>5cm, <10cm diameter	0
	< 5cm diameter	0
Fallen logs (>10cm diam.)		6
Coarse woody debris (<10cm diam.)		6
Decorticating bark		0
Leaf litter (%)		7 (deep).
Bare ground (%)		0 - Base on track
Grass (%)		2
Soil cracks		0
Soil banks (eg. River banks/road cuttings, etc.)		0
Surface Rocks and/or Boulders		6
Wetlands (Y/N). If <u>yes</u> complete wetland Proforma		0
Weeds and non-native species (%)		5% - 1m open
Rock Crevices		5
Flower Abundance (%)		0
Fruit Abundance (%)		0
Water present (Y/N)		0

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Fauna Proforma

Habitat characteristics

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	0
Grazing	0
Clearing	2 (adjacent to mountain land)
Erosion	0

H2C
T26.
refer to
flow profana

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) - from database searches	Yes	No
Koala	✓	
Woma		✓
SSBA		✓
Catbirds		✓
Saty (Hymenoptera)	✓	

Habitat Features - Abundance:

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentaria)	>30cm diameter 0
	>15cm, <30cm diameter 0
	>10cm, <15cm diameter 0
	>5cm, <10cm diameter 0
	< 5cm diameter 0
Fallen logs (>10cm diam.)	0
Coarse woody debris (<10cm diam.)	0
Decorticating bark	0
Leaf litter (%)	0
Bare ground (%)	0
Grass (%)	7 (green grass in down)
Soil cracks	0
Soil banks (eg. River banks/road cuttings, etc.)	7 - along drainage line.
Surface Rocks and/or Boulders	0
Wetlands (Y/N). If yes complete wetland Proforma	16 - adjacent to drainage line. ref 9A or H2C.
Weeds and non-native species (%)	5 (ref veg profana)
Rock Crevices	0
Flower Abundance (%)	0
Fruit Abundance (%)	0 - fig in fruit
Water present (Y/N)	Y - in drainage line.

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Incidental fauna

observations/scats/traces:

Water Dragon
Torrean saw
SC collection
Magpie Lark
Small B. Bird
L. the Corvidae
Indian mynah.
Rufous whistler
Indian Flycatcher
Striped Pardalote
Willie Wagtail
Chook.
Channel bill cuckoo

Drainage line likely an important fauna conduit

Fauna Proforma

Habitat characteristics



Future Freight

Integrating Community, Environment and Engineering

Habitat Features – Abundance:

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	0
Grazing	1
Clearing	2
Erosion	1

H2C.

T23

refer to form proforma

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) – from database searches	Yes	No
Koala (scats seen)	✓	
PTBBQ		✓
Glider (no hollow)		✓
Delma (no rocky soil)		✓
Bats (no hollow)		✓

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentaria)	
>30cm diameter	0
>15cm, <30cm diameter	0
>10cm, <15cm diameter	0
>5cm, <10cm diameter	0
< 5cm diameter	0
Fallen logs (>10cm diam.)	5
Coarse woody debris (<10cm diam.)	7
Decorticating bark	0
Leaf litter (%)	5
Bare ground (%)	0
Grass (%)	5
Soil cracks	0
Soil banks (eg. River banks/road cuttings, etc.)	Y 4
Surface Rocks and/or Boulders	0
Wetlands (Y/N). If yes complete wetland Proforma	N
Weeds and non-native species (%)	10% - low
Rock Crevices	0
Flower Abundance (%)	N 0
Fruit Abundance (%)	N 0
Water present (Y/N)	N 0

Incidental fauna

observations/scats/traces:

Wedge tail eagle
Koala scats
Redback
Striped possum
Tasmanian devil

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Scratches:

5

ferns under in trees, no hollows

Fauna Proforma

Habitat characteristics

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	0
Grazing	2
Clearing	2.5 selectively cleared
Erosion	0

T29 H2C
refer to
T29 H2C
vegetation
proforma

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) - from database searches	Yes	No
Koala (suitable habitat present)	✓	
bats (hollows present)	✓	
Quolls		✓
Rehema (no rocks)		✓
Black breast quail		✓
no wetland species		✓
glider (potential hollow habitat present)	✓	

Incidental fauna

observations/scats/traces:

Sacred / blue Kingfisher
Australian magpie
willy wagtail
pied butcher
horse

venet trila (crystal whistler)
grey fantail
fantail looker
Tanzanian crow

Habitat Features – Abundance:

Characteristics		Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentartia)	>30cm diameter	3
	>15cm, <30cm diameter	3
	>10cm, <15cm diameter	3
	>5cm, <10cm diameter	3
	< 5cm diameter	3
Fallen logs (>10cm diam.)		2
Coarse woody debris (<10cm diam.)		2
Decorticating bark		3
Leaf litter (%)		40%
Bare ground (%)		0
Grass (%)		100%
Soil cracks		0
Soil banks (eg. River banks/road cuttings, etc.)		7 adjacent river bank
Surface Rocks and/or Boulders		0
Wetlands (Y/N). If <u>yes</u> complete wetland Proforma		N
Weeds and non-native species (%)		30% non native dec
Rock Crevices		0
Flower Abundance (%)		0
Fruit Abundance (%)		0
Water present (Y/N)		Y

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Fauna Proforma

Habitat characteristics

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	0
Grazing	2
Clearing	1
Erosion	0

T27 H+OC
refer to flora
proforma

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) - from database searches	Yes	No
Koella (suitable habitat)	✓	
Delma (no ticks)		✓
BBBQs		✓
Bats	✓	
Gilders	✓	
powerful owl	✓	
grey red goshawk	✓	
Wetland species		✓

Incidental fauna

observations/scats/traces:

strawed pardalote
bare shoulder dove
peaceful dove
grey butcher bird
pied butcher bird
rainbow whistler
noisy mino

black faced cuckoo
white bellied
Australian magpie
white throat king
blue face whistler
white bellied
grey down babbler
blackbird

cockatoo

Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Scratches

crested pigeon
wood ducks
morse

iron bark
cannot determine

Habitat Features – Abundance:

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentaria)	<div>>30cm diameter</div> <div>>15cm, <30cm diameter</div> <div>>10cm, <15cm diameter</div> <div>>5cm, <10cm diameter</div> <div>< 5cm diameter</div>
Fallen logs (>10cm diam.)	
Coarse woody debris (<10cm diam.)	
Decorticating bark	
Leaf litter (%)	
Bare ground (%)	
Grass (%)	
Soil cracks	
Soil banks (eg. River banks/road cuttings, etc.)	
Surface Rocks and/or Boulders	
Wetlands (Y/N). If yes complete wetland Proforma	
Weeds and non-native species (%)	
Rock Crevices	
Flower Abundance (%)	
Fruit Abundance (%)	
Water present (Y/N)	

other side of rail corridor 5

0

0

4

4

3

3

1

30%

0

90%

0

0

0

0

N

30%

0

0

0

0

N

roads
lantana
vetiver
asparagus

0.5 (morrow top)
two locust flowers

Fauna Proforma

Habitat characteristics

Habitat Features – Abundance:

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	0
Grazing	0
Clearing	0
Erosion	2

T28 H10C
refer to vegetation proforma

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentaria)	<div>>30cm diameter</div> <div>>15cm, <30cm diameter</div> <div>>10cm, <15cm diameter</div> <div>>5cm, <10cm diameter</div> <div>< 5cm diameter</div>
Fallen logs (>10cm diam.)	
Coarse woody debris (<10cm diam.)	
Decorticating bark	
Leaf litter (%)	
Bare ground (%)	
Grass (%)	
Soil cracks	
Soil banks (eg. River banks/road cuttings, etc.)	
Surface Rocks and/or Boulders	
Wetlands (Y/N). If yes complete wetland Proforma	
Weeds and non-native species (%)	
Rock Crevices	
Flower Abundance (%)	
Fruit Abundance (%)	
Water present (Y/N)	

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) – from database searches	Yes	No
Koodla scratches	✓	
Relma		✓
Boots flythugh	✓	
BBBQ		✓
Wetland species	✓	
Goschank (trees too small)	✓	

1-sufficient cover in drain

Incidental fauna

observations/scats/traces:

magpie larks
bar shoulder dove
pearl dove
pale head rook
willie wag tail

grey crow
ferret
water dragon
brown honey eater
masked catbird

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Scratches	5
-----------	---

T25 G2H 20/9/17

CS + JS

Future Freight
Integrating Community, Environment and Engineering

Fauna Proforma

Habitat characteristics

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	1
Grazing	0
Clearing	0
Erosion	0

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) – from database searches	Yes	No
Delma creeping creebra lantana surface rocks open canopy	✓	✓
Wetland spm		✓
Koala – Road over but veg sp. rare		✓
BBBQ (collected seen)	✓	
Goatwink – no small no		✓
Gilgus –		
Boob – no hollows		

Incidental fauna

observations/scats/traces:

rainbow Bee-eater
Gray Butch
Gray shrike-thrush
Rufous whistler
weebill
bearded flycatcher

Habitat Features – Abundance:

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentaria)	
>30cm diameter	0
>15cm, <30cm diameter	0
>10cm, <15cm diameter	0
>5cm, <10cm diameter	0
<5cm diameter	0
Fallen logs (>10cm diam.)	5.
Coarse woody debris (<10cm diam.)	5.
Decorticating bark	1
Leaf litter (%)	30% "3"
Bare ground (%)	10% "1"
Grass (%)	40% "4"
Soil cracks	0.
Soil banks (eg. River banks/road cuttings, etc.)	0.
Surface Rocks and/or Boulders	6
Wetlands (Y/N). If yes complete wetland Proforma	N
Weeds and non-native species (%)	75%
Rock Crevices	0.
Flower Abundance (%)	0%
Fruit Abundance (%)	1 (1%)
Water present (Y/N)	N

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

macroal scats.

("High quality delma habitat").

T24 62H 20/9/17

Fauna Proforma

Habitat characteristics

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	0
Grazing	0
Clearing	0
Erosion	0

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) – from database searches	Yes	No
BBBQ	NO SIGNS	
Dulma open canopy	✓	
Bats		✓
Gliders		✓
P.Owl + BGC		✓
Yakka		✓
Squatter		✓
Owl + Rock W		✓
Goshawk ^{abundant} Water Emergent Trees		✓

Incidental fauna

observations/scats/traces:

Grey kangaroo
magpie
Rufous whistler
Variegated Fairy wren



Future Freight

Integrating Community, Environment and Engineering

Habitat Features – Abundance:

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentartia)	>30cm diameter 0
	>15cm, <30cm diameter 0
	>10cm, <15cm diameter 0
	>5cm, <10cm diameter 1
	< 5cm diameter 0
Fallen logs (>10cm diam.)	5 40%
Coarse woody debris (<10cm diam.)	5 40%
Decorticating bark	2
Leaf litter (%)	6 50%
Bare ground (%)	2 10%
Grass (%)	5 40%
Soil cracks	0
Soil banks (eg. River banks/road cuttings, etc.)	0
Surface Rocks and/or Boulders	5 30%
Wetlands (Y/N). If <u>yes</u> complete wetland Proforma	No
Weeds and non-native species (%)	7 10%
Rock Crevices	0
Flower Abundance (%)	0
Fruit Abundance (%)	1
Water present (Y/N)	0

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

TSRC construction
Noise Mately below

Fauna Proforma

Habitat characteristics

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	0
Grazing	0
Clearing	0
Erosion	0

19T
H2G

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) - from database searches	Yes	No
woodland birds	✓	
Reptiles		✓
Koala (scats seen)	✓	
WBSBQ		✓
Gilgus (small when trees in flower)	✓	
Oats to Ropha		✓
woodland open		✓
Bushland myrtle	✓	

Incidental fauna

observations/scats/traces:

Grey bellied bird
Noddy mouse
Aust. woodpecker
Koala (scat seen)

Habitat Features – Abundance:

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentartia)	>30cm diameter
	0
	>15cm, <30cm diameter
	0
	>10cm, <15cm diameter
	0
	>5cm, <10cm diameter
	0
	< 5cm diameter
	7
Fallen logs (>10cm diam.)	5
Coarse woody debris (<10cm diam.)	5
Decorticating bark	0
Leaf litter (%)	(85%) "7."
Bare ground (%)	0 (0%)
Grass (%)	10% "3"
Soil cracks	0
Soil banks (eg. River banks/road cuttings, etc.)	0
Surface Rocks and/or Boulders	"5"
Wetlands (Y/N). If <u>yes</u> complete wetland Proforma	✓
Weeds and non-native species (%)	0x
Rock Crevices	0
Flower Abundance (%)	0
Fruit Abundance (%)	0
Water present (Y/N)	✓

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Fauna Proforma

Habitat characteristics

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	0
Grazing	0
Clearing	0
Erosion	0

T21
H2C

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) - from database searches	Yes	No
Delma (open mung)	✓	
Glider	✓	
Kooka	✓	
Powdermill owl	✓	
Grey black	✓	
Sats (no hollows)		✓

Incidental fauna

observations/scats/traces:

~~Kooka~~ Kooka
 Lenden Flycatcher
 Noisy miner
 Rainbow bee eater
 Kooka (scrub)
 Glider (scrub) + feed marks on bark

Habitat Features – Abundance:

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentaria)	>30cm diameter
	>15cm, <30cm diameter
	>10cm, <15cm diameter
	>5cm, <10cm diameter
	< 5cm diameter
Fallen logs (>10cm diam.)	5
Coarse woody debris (<10cm diam.)	5
Decorticated bark	0
Leaf litter (%)	85% "7"
Bare ground (%)	0
Grass (%)	15% "3"
Soil cracks	0
Soil banks (eg. River banks/road cuttings, etc.)	0
Surface Rocks and/or Boulders	5
Wetlands (Y/N). If <u>yes</u> complete wetland Proforma	N
Weeds and non-native species (%)	0%
Rock Crevices	0 → adjacent down slope "4"
Flower Abundance (%)	0
Fruit Abundance (%)	0
Water present (Y/N)	0

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Habitat for Delma (plots)
 Search with no
 Bird.

Fauna Proforma

Habitat characteristics

Habitat Features – Abundance:

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	1
Grazing	0
Clearing	2
Erosion	2

T20
H2C
refer to flora
proforma

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) – from database searches	Yes	No
Kooka		✓
Belma		✓
Gilders		✓
Boks		✓
BBBQ		✓
Owl		✓

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentaria)	
>30cm diameter	0
>15cm, <30cm diameter	0
>10cm, <15cm diameter	0
>5cm, <10cm diameter	0
<5cm diameter	0
Fallen logs (>10cm diam.)	3
Coarse woody debris (<10cm diam.)	3
Decorticating bark	0
Leaf litter (%)	2 10%
Bare ground (%)	5 30%
Grass (%)	70%
Soil cracks	0
Soil banks (eg. River banks/road cuttings, etc.)	7
Surface Rocks and/or Boulders	5
Wetlands (Y/N). If <u>yes</u> complete wetland Proforma	N
Weeds and non-native species (%)	85%
Rock Crevices	0
Flower Abundance (%)	0
Fruit Abundance (%)	0
Water present (Y/N)	N

Incidental fauna

observations/scats/traces:

Sliver eye
pied butcher bird
western crow
yellow winged black bell
bee eater nests
noisy minor

your quality
sites.

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Fauna Proforma

Habitat characteristics

Habitat Features – Abundance:

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	0
Grazing	0
Clearing	2
Erosion	2

T15 H2C
refer to flora
proforma

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) – from database searches	Yes	No
Koala		✓
Possum		✓
Bee		✓
Migratory sp	✓	
Wetland		✓
glders		✓
birds		✓

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentaria)	>30cm diameter 1
	>15cm, <30cm diameter 1
	>10cm, <15cm diameter 1
	>5cm, <10cm diameter 1
	< 5cm diameter 1
Fallen logs (>10cm diam.)	5
Coarse woody debris (<10cm diam.)	6
Decorticated bark	2
Leaf litter (%)	30%
Bare ground (%)	60%-70% in drain 0% outside drain
Grass (%)	100% out of drain non-native plant
Soil cracks	0
Soil banks (eg. River banks/road cuttings, etc.)	7
Surface Rocks and/or Boulders	3
Wetlands (Y/N). If yes complete wetland Proforma	N - drainage line
Weeds and non-native species (%)	90%
Rock Crevices	0
Flower Abundance (%)	60% blue sun rotte bush
Fruit Abundance (%)	60% mulberries
Water present (Y/N)	N

Incidental fauna

observations/scats/traces:

bar shoulder dove
spotted dove
emission sp
mistle bird
silver eye
yellow rumped thornbill
smashed parrot

eastern water dragon
lovely sun sink
noisy finch bird
fig bird
rainbow lorikeet

weir
black face munia
bulky wag tail
brown honeyeater

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Fauna Proforma

Habitat characteristics

Habitat Features – Abundance:

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	0
Grazing	2
Clearing	3
Erosion	1

T14 H2C
refer to flora
proforma

along
drain

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) – from database searches	Yes	No
Koala		✓
Grassland species	✓	
flora species requiring black soil	✓	
Delma		✓
BBBQ		✓
not habitat for EVNT species	✓	

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentartia)	>30cm diameter 0
	>15cm, <30cm diameter 0
	>10cm, <15cm diameter 0
	>5cm, <10cm diameter 0
	< 5cm diameter 6
Fallen logs (>10cm diam.)	0
Coarse woody debris (<10cm diam.)	0
Decorticating bark	0
Leaf litter (%)	0
Bare ground (%)	0
Grass (%)	100%
Soil cracks	0
Soil banks (eg. River banks/road cuttings, etc.)	5
Surface Rocks and/or Boulders	0
Wetlands (Y/N). If <u>yes</u> complete wetland Proforma	N
Weeds and non-native species (%)	90% ^{1 antone} ^{each plant} ^{balcon vine}
Rock Crevices	0
Flower Abundance (%)	40%
Fruit Abundance (%)	0
Water present (Y/N)	N

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Incidental fauna

observations/scats/traces:

red back fairy wren
brown honey eater
golden headed castro
grey curlew babbler

crimson crow
dove bar finches
milly wag tail
superb fairy wren
galah
yellow rumped thorn bell

Indian minor
crow

Fauna Proforma

Habitat characteristics

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	0
Grazing	0
Clearing	5
Erosion	0

T12 H2C
refer to
for a proforma

fodder
not used

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) – from database searches	Yes	No
grassland species	✓	
potentially listed grasses?		

Habitat Features – Abundance:

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentaria)	>30cm diameter
	>15cm, <30cm diameter
	>10cm, <15cm diameter
	>5cm, <10cm diameter
	< 5cm diameter
Fallen logs (>10cm diam.)	
Coarse woody debris (<10cm diam.)	
Decorticating bark	
Leaf litter (%)	
Bare ground (%)	
Grass (%)	100%
Soil cracks	
Soil banks (eg. River banks/road cuttings, etc.)	
Surface Rocks and/or Boulders	
Wetlands (Y/N). If yes complete wetland Proforma	N
Weeds and non-native species (%)	30% non native grasses
Rock Crevices	
Flower Abundance (%)	
Fruit Abundance (%)	
Water present (Y/N)	N

Incidental fauna

observations/scats/traces:

golden headed calkato
rainbow lorikeets
echidna scat
pred butcherbird
noisy nio r

forest ki-gf
cattle egret

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Fauna Proforma

Habitat characteristics

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	0
Grazing	3
Clearing	3
Erosion	1

2A H2C
refer to
Vegetation
Proforma

Habitat suitability for target fauna

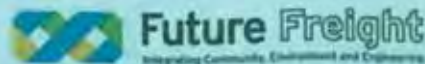
Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) - from database searches	Yes	No
no habitat for EVNT		✓

Incidental fauna

observations/scats/traces:

stilts
black face cormorant
purple swamphen
common minor
golden headed cisticola
brown falcon
willy wag tail
magenta warbler

litrio falix
richardson pipette
welcome swallow
galar



Habitat Features - Abundance:

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentaria)	>30cm diameter 0
	>15cm, <30cm diameter 0
	>10cm, <15cm diameter 0
	>5cm, <10cm diameter 0
	< 5cm diameter 0
Fallen logs (>10cm diam.)	6
Coarse woody debris (<10cm diam.)	0
Decorticating bark	0
Leaf litter (%)	0
Bare ground (%)	100% out drain 0% in drain
Grass (%)	100% in drain 0% out drain
Soil cracks	0
Soil banks (eg. River banks/road cuttings, etc.)	3
Surface Rocks and/or Boulders	0
Wetlands (Y/N). If yes complete wetland Proforma	N
Weeds and non-native species (%)	100% wild tobacco signal grass
Rock Crevices	0
Flower Abundance (%)	0
Fruit Abundance (%)	0
Water present (Y/N)	Y

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Fauna Proforma

Habitat characteristics

Habitat Features – Abundance:

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	1
Grazing	2
Clearing	2
Erosion	2

T16 H2C
refer to flora
proforma

tunnel
erosion

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) – from database searches	Yes	No
BBQ	✓	
Koala		✓
micro bats	✓	
Wattlebirds	✓	
Kangaroos		
ghosts		✓
Wetland		✓
Vine scrub species	✓	

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentaria)	>30cm diameter 0
	>15cm, <30cm diameter 0
	>10cm, <15cm diameter 0
	>5cm, <10cm diameter 0
	< 5cm diameter 0
Fallen logs (>10cm diam.) fallen trees	5
Coarse woody debris (<10cm diam.)	5
Decorticating bark	3
Leaf litter (%)	10%
Bare ground (%)	20%
Grass (%)	20%
Soil cracks	1
Soil banks (eg. River banks/road cuttings, etc.)	0
Surface Rocks and/or Boulders	4
Wetlands (Y/N). If yes complete wetland Proforma	N
Weeds and non-native species (%)	30% lantana grasses
Rock Crevices	0
Flower Abundance (%)	5% (3)
Fruit Abundance (%)	0
Water present (Y/N)	N

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Incidental fauna

observations/scats/traces:

brown honeyeater
rainbow bee eater
double bar
hemstren crow
pied curlew
fairy martin
golden headed ashlar

whippbirds
black face cockatoo

Fauna Proforma

Habitat characteristics

Habitat Features – Abundance:

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	1
Grazing	0
Clearing	0
Erosion	0

TIT H2C
refer to flora
proforma

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) – from database searches	Yes	No
Koala	✓	
woodland birds	✓	

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentartia)	>30cm diameter: 0 >15cm, <30cm diameter: 0 >10cm, <15cm diameter: 0 >5cm, <10cm diameter: 5 < 5cm diameter: 5
Fallen logs (>10cm diam.)	5
Coarse woody debris (<10cm diam.)	5
Decorticating bark	3
Leaf litter (%)	80%
Bare ground (%)	10%
Grass (%)	10%
Soil cracks	0
Soil banks (eg. River banks/road cuttings, etc.)	0
Surface Rocks and/or Boulders	10% (2)
Wetlands (Y/N). If yes complete wetland Proforma	N
Weeds and non-native species (%)	10% 1 ant prickly pear
Rock Crevices	0
Flower Abundance (%)	0
Fruit Abundance (%)	0
Water present (Y/N)	N

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Incidental fauna

observations/scats/traces:

norisy minor
leaden fly catcher
maggie
cumbria
whip bird
eastern grey kangaroo (scats)
kookaburra
have present
yellow whip turn bell

Fauna Proforma

Habitat characteristics

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	0
Grazing	0
Clearing	1 associated with road + fence line
Erosion	0

BT H2C refer to flora proforma

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) – from database searches	Yes	No
glossy black	✓	
small birds	✓	

Habitat Features – Abundance:

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentaria)	<div>>30cm diameter: 0</div> <div>>15cm, <30cm diameter: 0</div> <div>>10cm, <15cm diameter: 0</div> <div>>5cm, <10cm diameter: 5</div> <div>< 5cm diameter: 5</div>
Fallen logs (>10cm diam.)	3
Coarse woody debris (<10cm diam.)	3
Decorticating bark	0
Leaf litter (%)	60%
Bare ground (%)	10%
Grass (%)	20%
Soil cracks	0
Soil banks (eg. River banks/road cuttings, etc.)	0
Surface Rocks and/or Boulders	0
Wetlands (Y/N). If <u>yes</u> complete wetland Proforma	N
Weeds and non-native species (%)	20% - lantana grasses
Rock Crevices	0
Flower Abundance (%)	0
Fruit Abundance (%)	30% - Gairina
Water present (Y/N)	N

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Incidental fauna

observations/scats/traces:

noisy minor
 barfrump + horn bell
 Varied saltella
 possum drag (nest in tree)
 nest of small birds present

northern brown bandicoot digging

Fauna Proforma

Habitat characteristics

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	2
Grazing	0
Clearing	1 associated with road
Erosion	2 drainage line

9T H2C
refer to fauna
proforma

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) – from database searches	Yes	No

no hollows and poor ground stratum
highly disturbed
(non native) species

Incidental fauna

observations/scats/traces:

Variagated fairy wren
rosy minor
bar thumping finch bell
weaver



Future Freight
Integrating Community, Environment and Engineering

Habitat Features – Abundance:

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentartia)	>30cm diameter
	>15cm, <30cm diameter
	>10cm, <15cm diameter
	>5cm, <10cm diameter
	< 5cm diameter
Fallen logs (>10cm diam.)	
Coarse woody debris (<10cm diam.)	
Decorticating bark	
Leaf litter (%)	
Bare ground (%)	
Grass (%)	
Soil cracks	
Soil banks (eg. River banks/road cuttings, etc.)	
Surface Rocks and/or Boulders	
Wetlands (Y/N). If yes complete wetland Proforma	
Weeds and non-native species (%)	
Rock Crevices	
Flower Abundance (%)	
Fruit Abundance (%)	
Water present (Y/N)	

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Fauna Proforma

Habitat characteristics

Habitat Features – Abundance:

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	1
Grazing	1
Clearing	1
Erosion	0

11T H2C
refer to flora
proform

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) – from database searches	Yes	No
bats - fruit	✓	
glider	✓	
Koala	✓	

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentaria)	>30cm diameter 2
	>15cm, <30cm diameter 3
	>10cm, <15cm diameter 4
	>5cm, <10cm diameter 4
	< 5cm diameter 4
Fallen logs (>10cm diam.)	5
Coarse woody debris (<10cm diam.)	5
Decorticating bark	0
Leaf litter (%)	20%
Bare ground (%)	20%
Grass (%)	80%
Soil cracks	0
Soil banks (eg. River banks/road cuttings, etc.)	0
Surface Rocks and/or Boulders	0
Wetlands (Y/N). If yes complete wetland Proforma	N
Weeds and non-native species (%)	30% lantana grasses
Rock Crevices	0
Flower Abundance (%)	60% blue gum
Fruit Abundance (%)	0
Water present (Y/N)	N

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Incidental fauna

observations/scats/traces:

noisy miner
brown honey eater
blue face honey eater
pelican
grey shrike thrush
red back fairy wren

weird
ibis (Australor)
white

Fauna Proforma

Habitat characteristics

Habitat Features – Abundance:

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	0
Grazing	0
Clearing	1 associated with truck stop
Erosion	0

LOT H2O
refer to flora
habitat

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
	Yes	No
What EVNT species are known from region (complete in rows below) – from database searches		
Koala	✓	
woodland birds	✓	
Possum		✓
gliders		✓
BPOB		✓

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentaria)	>30cm diameter
	3
	>15cm, <30cm diameter
	3
	>10cm, <15cm diameter
	5
	>5cm, <10cm diameter
	5
	< 5cm diameter
	5
Fallen logs (>10cm diam.)	5
Coarse woody debris (<10cm diam.)	5
Decorticating bark	2
Leaf litter (%)	40%
Bare ground (%)	20%
Grass (%)	70%
Soil cracks	0
Soil banks (eg. River banks/road cuttings, etc.)	0
Surface Rocks and/or Boulders	0
Wetlands (Y/N). If <u>yes</u> complete wetland Proforma	N
Weeds and non-native species (%)	15% <i>lantana</i> <i>grasses</i>
Rock Crevices	0
Flower Abundance (%)	0
Fruit Abundance (%)	0
Water present (Y/N)	N

Incidental fauna

observations/scats/traces:

grey butcher bird
noisy miner

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Fauna Proforma

Habitat characteristics

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	1
Grazing	1
Clearing	2
Erosion	0

H2C.
T24

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) – from database searches	Yes	No
<i>Pelma</i>	✓	

Incidental fauna observations/scats/traces:

Agropy
Crow
Pigeon
AA/Beaver
A. longirostris

→ *Agropy* - ? *echin*
→ *Echin* scats
macropod scat

Habitat Features – Abundance:

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in <i>termentartia</i>)	
>30cm diameter	0
>15cm, <30cm diameter	0
>10cm, <15cm diameter	0
>5cm, <10cm diameter	0
< 5cm diameter	0
Fallen logs (>10cm diam.)	5
Coarse woody debris (<10cm diam.)	5
Decorticating bark	4
Leaf litter (%)	7% (90%)
Bare ground (%)	5% 1%
Grass (%)	15% 2%
Soil cracks	0
Soil banks (eg. River banks/road cuttings, etc.)	0
Surface Rocks and/or Boulders	5
Wetlands (Y/N). If <u>yes</u> complete wetland Proforma	N
Weeds and non-native species (%)	60% - shrub
Rock Crevices	4
Flower Abundance (%)	0
Fruit Abundance (%)	0
Water present (Y/N)	N

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

thrush birds

Fauna Proforma

Habitat characteristics

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	0
Grazing	3
Clearing	3
Erosion	0

N2C
Refer
T2S

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) - from database searches	Yes	No
Migratory Fovers	✓	



Future Freight

Integrating Community, Environment and Engineering

Habitat Features – Abundance:

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentaria)	>30cm diameter: 0
	>15cm, <30cm diameter: 0
	>10cm, <15cm diameter: 0
	>5cm, <10cm diameter: 0
	< 5cm diameter: 0
Fallen logs (>10cm diam.)	0
Coarse woody debris (<10cm diam.)	3
Decorticating bark	0
Leaf litter (%)	Dead grass 5%
Bare ground (%)	1-1
Grass (%)	90% dead grass
Soil cracks	0
Soil banks (eg. River banks/road cuttings, etc.)	0
Surface Rocks and/or Boulders	0
Wetlands (Y/N). If yes complete wetland Proforma	N
Weeds and non-native species (%)	5% 10% grass not incl. as no FM.
Rock Crevices	0
Flower Abundance (%)	0
Fruit Abundance (%)	0
Water present (Y/N)	N

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Incidental fauna

Termite observations/scats/traces: mound. Cows.

Rainbow Bee eater

Black FCS

Red we

Brown HE

Pred B'bird

Rabbit scats

Bandicoot diggings

Superb FW

macropod scats

Echidna scats

Fauna Proforma

Habitat characteristics

Habitat Features – Abundance:

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	1
Grazing	1
Clearing	2
Erosion	0

6TB H2C
refer to flora
proforma

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentaria)	>30cm diameter 0
	>15cm, <30cm diameter 0
	>10cm, <15cm diameter 10
	>5cm, <10cm diameter 1
	< 5cm diameter 1
Fallen logs (>10cm diam.)	5
Coarse woody debris (<10cm diam.)	6
Decorticating bark	4
Leaf litter (%)	20-50%
Bare ground (%)	10%
Grass (%)	70% native
Soil cracks	0
Soil banks (eg. River banks/road cuttings, etc.)	0
Surface Rocks and/or Boulders	2
Wetlands (Y/N). If yes complete wetland Proforma	N
Weeds and non-native species (%)	5% Lantana
Rock Crevices	0
Flower Abundance (%)	10
Fruit Abundance (%)	0
Water present (Y/N)	N

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) – from database searches	Yes	No
black glossy Kookaburra	feeding ✓	no nesting habitat ✓

Incidental fauna

observations/scats/traces:

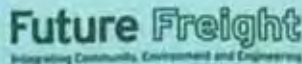
possum scat
macropod scat
rainy woodhead
red butcherbird

Rain-bow bee eater
torreian crow
partridge
pale bill dove
lark
pale head wren
whipbird
Calid sp. (skink?)

Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Fauna Proforma

Habitat characteristics



Habitat Features – Abundance:

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	0
Grazing	1
Clearing	2
Erosion	0

ST H2C
refer to flora
proprieta

Habitat suitability for target fauna

[illegible]

Incidental fauna

observations/scats/traces:

rainbow bee eater
rain-bow lorniket
red butcher bird
zo-kunwa
cran
little lorniket
pewer

Willy Wagtail
greyish-brown
dusky throat

Characteristics		Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentartia)	>30cm diameter	0
	>15cm, <30cm diameter	0
	>10cm, <15cm diameter	0
	>5cm, <10cm diameter	2
	< 5cm diameter	2
Fallen logs (>10cm diam.)		3
Coarse woody debris (<10cm diam.)		3
Decorticating bark		2
Leaf litter (%)		60%
Bare ground (%)		10%
Grass (%)		
Soil cracks		0
Soil banks (eg. River banks/road cuttings, etc.)		5
Surface Rocks and/or Boulders		0
Wetlands (Y/N). If <u>yes</u> complete wetland Proforma		N
Weeds and non-native species (%)		30%, lowland
Rock Crevices		0
Flower Abundance (%)		5 bluegill
Fruit Abundance (%)		1
Water present (Y/N)		N

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

Fauna Proforma

Habitat characteristics

Habitat Features – Abundance:

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire	0
Grazing	0
Clearing	2 - logging
Erosion	1 drainage line

4T H2C
refer to flora
Proforma

Habitat suitability for target fauna

Species (EVNT) known from Region	Suitable habitat present	
What EVNT species are known from region (complete in rows below) – from database searches	Yes	No
Koala (habitat)	✓	
Delma		✓
Micro bats (small hollows)	✓	

Characteristics	Abundance (0-7)* or % within landscape
Hollows in trees and stags. (May include hollows in termentaria)	<div>>30cm diameter</div> <div>>15cm, <30cm diameter</div> <div>>10cm, <15cm diameter</div> <div>>5cm, <10cm diameter</div> <div>< 5cm diameter</div>
Fallen logs (>10cm diam.)	6
Coarse woody debris (<10cm diam.)	6
Decorticated bark	4
Leaf litter (%)	90%
Bare ground (%)	0
Grass (%)	10%
Soil cracks	0
Soil banks (eg. River banks/road cuttings, etc.)	5 drainage line
Surface Rocks and/or Boulders	5 drainage line
Wetlands (Y/N). If yes complete wetland Proforma	N
Weeds and non-native species (%)	lantana 5-10%
Rock Crevices	0
Flower Abundance (%)	0
Fruit Abundance (%)	0
Water present (Y/N)	N

Incidental fauna

observations/scats/traces:

Koala scat

* Note: 0 = absent; 1 = Rare; 2 = Rare to occasional; 3 = occasional; 4 = occasional to common; 5 = common; 6 = common to abundant; 7 = abundant

APPENDIX



Terrestrial and Aquatic Ecology Technical Report

Appendix J ARTC Environmental Offset Delivery Strategy QLD

HELIDON TO CALVERT ENVIRONMENTAL IMPACT STATEMENT



ENVIRONMENTAL OFFSET DELIVERY STRATEGY – QLD



Table of Contents

Glossary	4
Executive Summary	5
1 Introduction	7
1.1 Inland Rail Program in Queensland	7
1.2 Purpose	7
1.3 Scope	8
2 Queensland offset legislative requirements and delivery options	11
2.1 Commonwealth	11
2.1.1 Matters of national environmental significance	11
2.1.2 EPBC Act Offset Delivery Options	11
2.2 Queensland	12
2.2.1 Matters of state environmental significance	13
2.2.2 State Development and Public Works Organisation Act 1971	14
3 Queensland Environmental Offset Requirements	16
4 ARTC's Environmental Offset Delivery Strategy for Queensland	22
4.1 Application of Hierarchy and Confirmation of Offset Framework	22
4.2 Risk mitigation for offset delivery	23
4.3 Staging Offset Assessment and Delivery	23
4.3.1 Prior to Project Primary Approval – Development of Environmental Offset Proposal – January 2021	24
4.3.2 Post detailed ecological investigations – Development of the Preliminary Environmental Offset Delivery Plan – mid-2021	24
4.3.3 Prior to Construction Commencement – Submission and approval of Final Environmental Offset Delivery Plan and Offset Area Management Plan/s	25
4.3.4 Within 1 year of Construction Commencement – Offset Site Legally Secured	25
4.4 Co-location of Offset Requirements on Strategic Offset Sites	25
5 Strategic offset site identification	27
5.1 Methodology	27
5.2 Preliminary Offset Site Identification Results	27
5.3 Offset site selection and management principles	28
5.3.1 Suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the protected matters detailed in the Environmental Offset Delivery Plan	29
5.3.2 Suitable offsets must be built around direct offsets but may include other compensatory measures	30
5.3.3 Tenure for direct offsets	30
5.3.4 Suitable offsets must be in proportion to the level of statutory protection that applies to the protected matter	31
5.3.5 Suitable offsets must be of a size and scale proportionate to the residual impacts on the protected matter	31
5.3.6 Suitable offsets must effectively account for and manage the risks of the offset not succeeding	32
5.3.7 Suitable offsets must be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs	32
5.3.8 Links with Australian and State approval processes	33
5.3.9 Suitable offsets must be efficient, effective, timely, transparent, scientifically robust and reasonable	33
5.3.10 Suitable offsets must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced	33
6 Offset partnerships	47
7 Next steps	48
8 References	49

List of tables

Table 1 Queensland Projects Overview 9

Table 2 Potential MNES values impacted within Brigalow Belt and South East Queensland Bioregions..... 18

Table 3 Potential MSES values impacted within Brigalow Belt and South East Queensland Bioregions..... 20

Table 4 Summary of potential offset sites for Brigalow Belt bioregion impacts 34

Table 5 Summary of potential offset sites for South East Queensland bioregion impacts 39

List of figures

Figure 1 Inland Rail Project Location Overview for Queensland 10

Figure 2 Staging Offset Assessment and Delivery 26

Glossary

Specific terms and acronyms used throughout this strategy are listed and described in the table below.

Term / Acronym / Abbreviation	Definition
Australian Rail Track Corporation (ARTC)	Australian Government-owned corporation tasked with developing a 10-Year program to implement Inland Rail.
Conditions of Approval	The Conditions of Approval include the Coordinator-General's Imposed Conditions and, the EPBC Act Conditions of Approval, and any other relevant State approvals.
Inland Rail (IR) Program	The Inland Rail Program encompasses the design and construction of a new inland rail connection between Melbourne and Brisbane, via Wagga, Parkes, Moree, and Toowoomba.
Environmental Offset	Environmental offsets are measures that benefit biodiversity by compensating for the residual adverse impacts elsewhere of an action, such as clearing for development.
Primary Approval Document	The term 'Primary Approval Document' is used throughout this Strategy to collectively refer to the Environmental Impact Statements for each of the Projects.
Queensland Projects	B2G, G2H, H2C and C2K
B2G	Border to Gowrie
BVG	Broad Vegetation Group
C2K	Calvert to Kagaru
DBMP	Direct Benefit Management Plan
DES	Department of Environment and Science (Qld)
DAWE	Department of Agriculture, Water and Environment (Cmwth)
EIS	Environmental Impact Statement
EP Act	<i>Environmental Protection Act 1994 (Qld)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cmwth)</i>
EO Act	<i>Environmental Offsets Act 2014 (Qld)</i>
G2H	Gowrie to Helidon
H2C	Helidon to Calvert
km	Kilometres
K2ARB	Kagaru to Acacia Ridge and Bromelton
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NC Act	<i>Nature Conservation Act 1992 (Qld)</i>
NSW	New South Wales
RE	Regional Ecosystem
SDPWO Act	<i>State Development and Public Works Organisation Act 1971 (Qld)</i>
SEQ	South East Queensland
QEOP	Queensland Environmental Offsets Policy
Qld	Queensland

Executive Summary

ARTC's Inland Rail Program will generate environmental offset obligations within Queensland across Commonwealth and State jurisdictions due to unavoidable significant residual impacts on Matters of National, State and Local Environmental Significance (MNES, MSES and MLES).

Within Queensland, the Inland Rail Program is divided into five separate projects: Border to Gowrie (B2G); Gowrie to Helidon (G2H); Helidon to Calvert (H2C); Calver to Kagaru (C2K) and Kagaru to Acacia Ridge and Bromelton (K2ARB). The B2G, G2H, H2C and C2K projects are being progressed through the Environmental Impact Statement (EIS) process where, in relation to environmental offsets, environmental impacts will be assessed, and those significant residual impacts on MNES, MSES and/or MLES will be determined and quantified.

The K2ARB project does not currently form part of the Environmental Offset Delivery Strategy – Qld (Strategy). Initial assessments on MNES, MSES and MLES for the K2ARB project indicate that significant residual impacts to MNES, MSES and MLES are unlikely. If a significant residual impact on MNES, MSES and/or MLES is identified, this Strategy will be amended to include the project.

Environmental impact assessments to date have informed the preparation of this overarching Strategy recognising that each project EIS is being delivered according to separate yet inter-related schedules. Consequently, this Strategy will remain dynamic while project-wide environmental impact information is further progressed and better understood.

The overarching offset strategy for the Inland Program is to deliver a strategic, primarily land-based, offset portfolio that will seek to deliver a conservation outcome that improves or maintains the viability of impacted MNES, MSES and/or MLES.

The purpose of this Strategy is to identify an appropriate offset strategy in response to project impacts on MNES, MSES and/or MLES which could not be otherwise avoided or minimised by the relevant Inland Rail projects for Queensland.

The primary aim of the Strategy will be to identify a portfolio of offset properties that have potential to meet MNES, MSES and/or MLES offset obligations that are strategically located in proximity to the future rail corridor (impact area) and demonstrate offset availability. The Strategy will also identify offset properties that preferentially adjoin protected area estates, conservation reserves and / or large intact remnants and/or are located within proximity to bioregional corridors. Ongoing land management will be conducted according to Offset Area Management Plans which will seek to maximise landscape conservation outcomes by increasing habitat quality and availability of vegetation communities and habitats, reducing threats (such as weeds, feral animals, fire and clearing) while providing improved habitat and connectivity for MNES, MSES and/or MLES species within the region.

A high-level desktop assessment has been undertaken with the aim of identifying potential strategic offset sites that can meet the environmental offset requirements, at a Commonwealth and State level, as they are currently understood. A combination of eight potential offset sites for the Brigalow Belt bioregion and eleven potential offset sites for South east Queensland bioregion have been identified as having potential to meet all of the project's MNES and a large proportion of MSES offset requirements (as summarised in Tables 2 and 3). These properties have been identified through applying desktop information.

The offset desktop analysis and selection of priority offset sites under this initial assessment demonstrate the availability of particular ecosystems and habitats in the chosen study area for the impacted species. It also demonstrates feasibility of offset co-location across a variety of Commonwealth and State Government prescribed matters. Subsequent steps to finalise offset sites will include landholder engagement, ground-truthing to validate presence of MNES and MSES, and habitat quality assessments to confirm total offset areas needed and habitat quality gains that can be achieved.

Offset area management will depend on the final offset portfolio. Offset management may include weed control, feral animal control, fire management and restoration/revegetation. These actions may be implemented by landholders, accredited community based not for profit conservation organisations, an established conservation management entity, or a government based or supported organisation or a combination of these. Ongoing management of the offset portfolio will seek to foster community engagement and collaboration while achieving offset objectives and conservation outcomes under enduring arrangements. This provides avenues for community engagement, education as well as training around environmental conservation and restoration.

Environmental offsets for Inland Rail's Queensland components will recognise the environmental offset framework and hierarchy developed under the *Environmental Offsets Act 2014* (Qld) (EO Act), while delivering co-located offsets for MNES under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Environmental Offsets Policy. Accordingly, those remaining residual impacts to MSES and MLES identified by the State and Local Governments, will be delivered in consultation with the Office of the Coordinator General (OCG) and the Department of Environment and Science (DES), the Department of Agriculture and Fisheries (DAF) and the Department of Natural Resources, Mines and Energy (DNRME) in consideration of the Queensland Environmental Offset Policy (QEOP).

1 Introduction

1.1 Inland Rail Program in Queensland

The Australian Government has committed to delivering a significant piece of national transport infrastructure by constructing a high performance and direct interstate freight rail corridor between Melbourne and Brisbane. The Inland Rail Program (Inland Rail) involves the design and construction of a new inland rail connection, about 1,700 kilometres (km) in length, between Melbourne and Brisbane. The Australian Rail Track Corporation (ARTC) is the proponent for Inland Rail.

Inland Rail has been divided into 13 separate projects, five of which are located in Queensland as described in Table 1 Qld Inland Rail Overview and illustrated in Figure 1. Four of these projects, being; Border to Gowrie (B2G), Gowrie to Helidon (G2H), Helidon to Calvert (H2C) and Calvert to Kagaru (C2K), are presently being assessed by the Queensland Coordinator-General under the *State Development and Public Works Organisation Act 1971* (SDPWO Act) as coordinated projects for which an EIS is required. These same four projects have also been referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and determined to be controlled actions. They are being assessed under the Bilateral Agreement between State and Commonwealth governments, and separate approvals from the Commonwealth Environment Minister will be required.

The fifth project, K2ARB, is an enhancement project, and works will be primarily located within the existing rail corridor. This project has made application to be considered as a coordinated project for assessment by the Queensland Coordinator-General under the SDPWO Act. While it is expected that no significant impacts would occur to MNES, the project is likely to be referred under the EPBC Act.

Based on current information, it is likely four coordinated projects (B2G, G2H, H2C and C2K) will require environmental offsets due to significant residual impacts on Commonwealth and State MNES and MSES. Collectively, these four coordinated projects are referred to as the Queensland projects. Therefore, this strategy provides an assessment of these values, as they are currently understood, as well the offset framework relevant to offset regulation in Queensland, the proposed delivery options, and the proposed approach that ARTC will adopt for the Queensland projects.

1.2 Purpose

This Strategy is an overarching document that applies to the Queensland projects and sets a high-level direction on how environmental offsets will be assessed and delivered. The Strategy demonstrates ARTC's commitment to delivering environmental offsets in accordance with relevant Commonwealth, State and Local Government (if applicable) offset requirements in a manner that allows for strategic alignment of the Queensland projects.

The coordination of offsets across the Queensland projects will deliver landscape scale outcomes and provide efficiencies in securing and managing offset sites. The Strategy outlines the proposed offset delivery pathway, the estimated biodiversity values required to be offset for each project based on impact assessments completed to date, and a preliminary offset portfolio feasibility assessment based on current offset assumptions. The Strategy is intended to set out a road map outlining future steps that will be taken to confirm and deliver environmental offsets for the Queensland projects of Inland Rail.

1.3 Scope

The scope of the Strategy incorporates:

Present (included in this Offset Strategy)

- ▶ An initial estimation of residual impacts on MNES and MSES based on current information as part of the Queensland project's EISs and offset requirements in response to those impacts
- ▶ Evaluation of the environmental offset frameworks applicable to Inland Rail in Queensland and available offset delivery options
- ▶ Preliminary identification of strategic offset sites that could be used to deliver the Queensland Project's offset obligations in order to demonstrate high-level offset strategy feasibility
- ▶ Detail the measures that will be implemented during different project phases to finalise and deliver the environmental offset requirements for the Queensland projects.

Medium term goals (prior to project approvals)

- ▶ Refinement and finalisation of environmental offset requirements for each project following additional field ecology surveys, refinement of significant impact assessments, and habitat quality assessments throughout the proposed alignment
- ▶ Outline a preferred offset delivery package for each relevant Inland Rail Queensland project and the justification for this approach
- ▶ Commencement of offset site negotiations including due diligence investigations
- ▶ Confirmation of suitable offset sites based on updated, field verified information and habitat quality assessments, including application of EPBC Act offsets assessment guide for MNES.

Considerations in the development of the offset delivery approach for the Queensland projects have included:

- ▶ Applicable legislative and policy requirements
- ▶ Staged nature of the Queensland projects and approvals
- ▶ Detailed design and construction phases
- ▶ The prescribed environmental matters at a Commonwealth, State and Local level, and extent of project significant, residual impacts
- ▶ Availability of viable offsets and opportunities to improve conservation outcomes including through co-location of offset values.

Further information on each Queensland project is provided in Table 1.

Table 1 Queensland Projects Overview

Queensland project	Overview	Applicable approvals & EPBC Act referral number (where relevant)
Border to Gowrie (B2G)	<p>Consists of approximately 216.2 km of new single-track railway, consisting of:</p> <ul style="list-style-type: none"> ▶ 7.0 km of standard gauge rail (1,435 mm) and ▶ 209.2 km of dual gauge rail (standard (1,435 mm) and narrow (1,067 mm) gauge). <p>The B2G project will consist of approximately 145.0 km of new rail corridor and approximately 71.2 km of existing rail corridor.</p> <p>A preferred alignment has been confirmed and environmental and planning approval processes commenced.</p>	<p>Coordinated Project EIS under SDPWO Act and Bilateral assessment under the EPBC Act (2018/8165).</p> <p>Controlling provisions for threatened species and communities.</p>
Gowrie to Helidon (G2H)	<p>Approximately 28km in length comprising sections of new track and upgraded track. A tunnel is proposed which will be approximately 6km in length, 13 bridges and viaduct structure.</p> <p>The topography of the Great Dividing Range crossing from Gowrie on the Toowoomba plateau to Helidon in the Lockyer Valley provides significant challenges.</p> <p>The proposed corridor connects to the existing rail line, with tie-in points designed to enable the project to proceed independently of the Helidon to Calvert and the Qld/NSW Border to Gowrie Inland Rail Projects.</p> <p>The preferred alignment is generally contained within the corridor protected under the <i>Transport Planning and Coordination Act 1994</i>.</p>	<p>Coordinated Project EIS under SDPWO Act and Bilateral assessment under the EPBC Act (2017/7882).</p> <p>Controlling provisions for threatened species and communities.</p>
Helidon to Calvert (H2C)	<p>Approximately 48km in length comprising sections of new track, upgraded tracks and tie-ins.</p> <p>New track goes through Gatton and the existing Gatton rail station, through Forest Hill and then deviates from the existing rail corridor to just north of Laidley Township. It then traverses east going through Little Liverpool Range (with steep topography) and on to Calvert.</p> <p>The preferred alignment is generally contained within the Gowrie to Grandchester Study corridor which was reserved as a future public passenger transport corridor.</p>	<p>Coordinated Project EIS under SDPWO Act and Bilateral assessment under the EPBC Act (2017/7883).</p> <p>Controlling provisions for threatened species and communities.</p>
Calvert to Kagaru (C2K)	<p>Approximately 53km of new dual gauge track.</p> <p>Will provide access to major proposed industrial development at Ebenezer and at Bromelton.</p> <p>The project was previously referred to as Southern Freight Rail Corridor and the rail corridor gazetted for future rail investigations.</p> <p>The preferred alignment is largely contained within the Southern Freight Rail Corridor protected as future railway land.</p>	<p>Coordinated Project EIS under SDPWO Act and Bilateral assessment under the EPBC Act (2017/7944).</p> <p>Controlling provisions for threatened species and communities.</p>

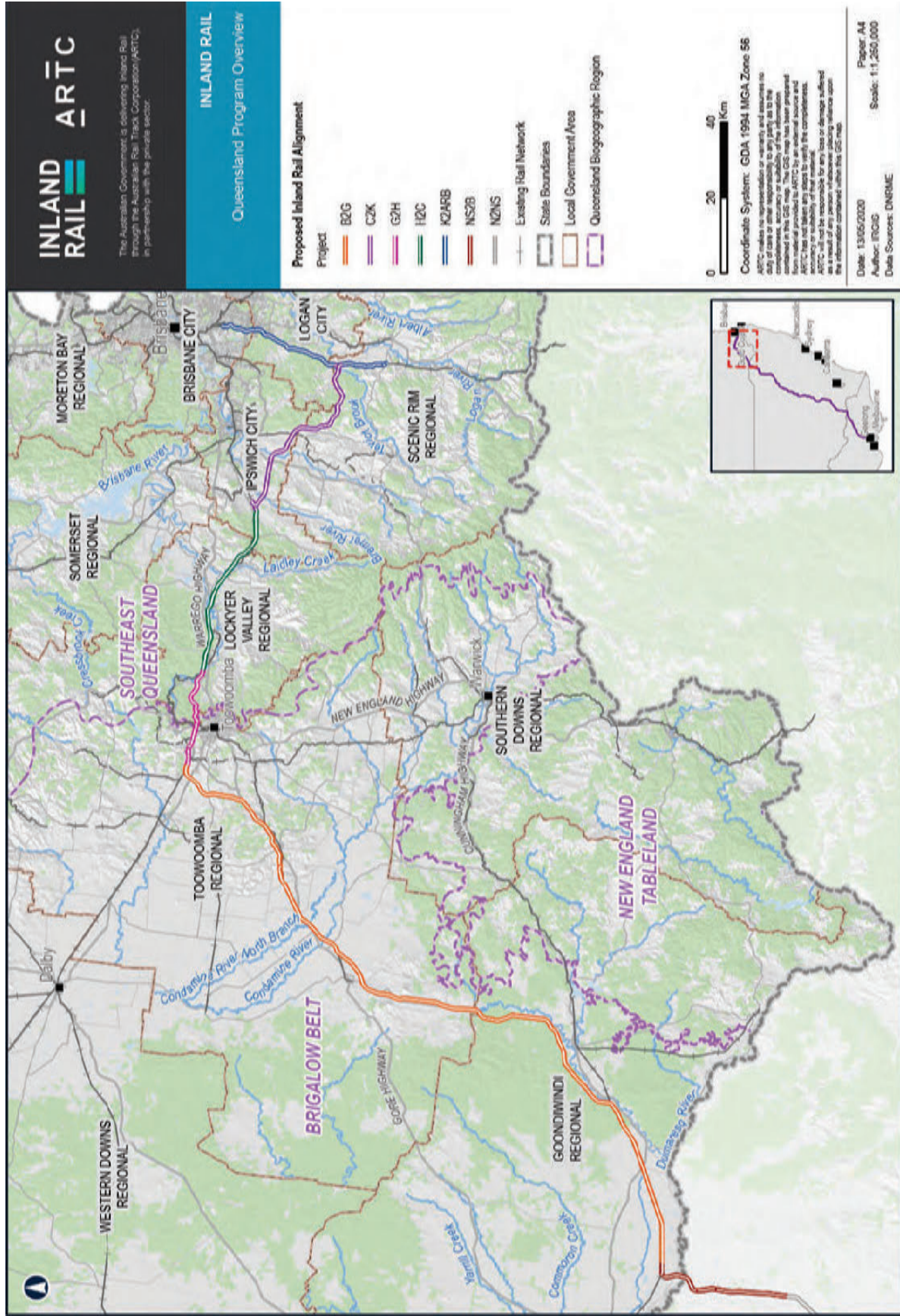


Figure 1 Inland Rail Project Location Overview for Queensland

2 Queensland offset legislative requirements and delivery options

The Queensland projects are being assessed and approved under both State and Commonwealth legislation including; EPBC Act and the SDPWO Act.

The following sections provide an overview of the Commonwealth and State environmental offset frameworks that will apply to the Queensland projects, and options available for the provision of environmental offsets.

2.1 Commonwealth

As part of the EIS process, ARTC will assess whether the Inland Rail Projects are likely to have a significant impact on MNES. If a significant residual impact is still predicted following the application of avoidance and mitigation measures, an environmental offset will be required to compensate for this loss. Offsets for significant residual impacts to MNES are determined and delivered in accordance with the EPBC Act Environmental Offsets Policy (DSEWPaC, 2012).

The EPBC Act Environmental Offsets Policy may only be applied to those projects that are designated a controlled action under section 75 of the EPBC Act. The Significant Impact Guidelines 1.1 - Matters of National Environmental Significance (the 'Significant Impact Guidelines') (DoE, 2013) will be applied to assess the significance of impacts to MNES. The Offsets Assessment Guide, which accompanies the EPBC Act Environmental Offsets Policy, has been developed in order to give effect to the requirements of that policy, utilising a balance sheet approach to measure impacts and offsets. It applies where the impacted protected matter is a threatened species or ecological community.

The Queensland Environmental Offsets Framework operates so that EPBC Act Environmental Offsets will take precedence over MSES and MLES, to avoid duplication of environmental offsets requirements. This allows a "packaging" approach to offsets to be adopted for MSES and MLES.

2.1.1 Matters of national environmental significance

The relevant controlling provisions subject to each EPBC Act referral decision for the Queensland projects are listed threatened species and ecological communities (sections 18 and 18A).

2.1.2 EPBC Act Offset Delivery Options

The EPBC Act Environmental Offsets Policy requires that offsets are built around direct, land-based solutions that protect and enhance threatened ecological communities and species habitats that are subject to significant residual impacts. At least 90% of a total offset requirement should deliver a conservation gain to the impacted MNES (i.e. like for like) through direct measures that are additional to what is already required, including improving condition of existing habitat and reducing threats or creating new habitat. The remaining 10% of an offset obligation can be indirect or supplementary measures that also relate to the impacted MNES such as research or threat abatement.

Deviation from the minimum of 90% direct offset requirement will only be considered where:

- ▶ It can be demonstrated that a greater benefit to the protected matter is likely to be achieved through increasing the proportion of other compensatory measures in an offsets package, or
- ▶ Scientific uncertainty is so high that it isn't possible to determine a direct offset that is likely to benefit the protected matter. For example, this can be the case in some poorly understood ecosystems in the Commonwealth marine environment (DSEWPaC, 2012)

All land-based offsets need to be legally secured for conservation purposes for at least the duration of the impact (which in this case will be perpetuity due to permanent nature of impacts). The offset land must be actively managed to improve ecological condition and provide a conservation gain for the impacted matter.

A conservation gain may be achieved by:

- ▶ Improving existing habitat for the protected matter
- ▶ Creating new habitat for the protected matter
- ▶ Reducing threats to the protected matter
- ▶ Increasing the values of a heritage place
- ▶ Averting the loss of a protected matter or its habitat that is under threat.

The offset must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced. Offsets should align with conservation priorities for the impacted protected matter and be tailored specifically to the attribute of the protected matter that is impacted in order to deliver a conservation gain. For instance, if the proposed action is likely to have impacts on foraging habitat for a particular protected matter, then the offset should create, improve, protect and/or manage foraging habitat.

Offsets that deliver social, economic and/or environmental co-benefits will be encouraged.

The Department of Agriculture, Water and Environment (DAWE) require that an offset proposal is provided during the decision-making stage which is considered in deciding whether the proposed action should be approved. There are two key types of information utilised in planning an offset proposal – determining what types of activities would be appropriate as offsets for a given impact and determining the specific size and scope of an offsets package. Matters to be assessed include specific attributes of the protected matter at the impact site including quality of habitat, duration of the impact and matters at the offset site such as conservation gain to be achieved, land tenure, time to achieve the specified conservation gain, and suitability of the location of the offset site (DSEWPaC, 2012).

The offset proposal is one of many considerations that are weighed at the decision stage in determining the overall acceptability of the proposed action, including economic and social matters. If approved, offset requirements may be included as a condition of approval under section 134 of the EPBC Act.

2.2 Queensland

ARTC is committed to providing environmental offsets for significant residual impacts to MNES, and those MSES and MLES that are not assessed under the Commonwealth framework. The EO Act does not affect or limit the functions and powers of the Coordinator-General under the SDPWO Act, however ARTC will have regard to the principles of the QEOP in determining and implementing offset requirements for MSES and MLES.

For a prescribed activity, an environmental offset may be required as a condition of approval where, following consideration of avoidance and mitigation measures, the activity is likely to result in a significant residual impact on a prescribed environmental matter. For Inland Rail, applicable prescribed environmental matters to be assessed are referred to as MSES and MLES and are defined in the *Environmental Offsets Regulation 2014* (EO Regulation).

To counterbalance this loss, offsets, which can include improvement and protection of alternative sites and/or actions that improve environmental viability, can provide a conservation outcome that is equivalent to the environmental value being lost at the impact site. If a state or local administering agency decides to impose an offset condition on an authority, the offset must be delivered in accordance with the Queensland environmental offsets framework.

There is potential for environmental offsets to be conditioned by the Coordinator-General under the Primary Approval, and subsequently under various secondary State approvals including; clearing permits under the *Nature Conservation Act 1992* (NC Act) for unavoidable impacts to threatened flora species, impacts to fish passage under *Fisheries Act 1994* and clearing of remnant vegetation under *Planning Act 2016*. All of these prescribed biodiversity matters will be assessed as part of the primary and secondary approval processes and the offset delivery requirements are governed by the Queensland environmental offset framework.

The framework consists of:

- ▶ EO Act
- ▶ EO Regulation
- ▶ Queensland Environmental Offsets Policy (QEOP) (Version 1.8) (DES, 2020)
- ▶ Queensland Environmental Offsets Policy - Significant, Residual Impact Guideline (DEHP, 2014).

Pursuant to QEOP, all Queensland offsets will have regard to the following seven offset principles:

1. Offsets will not replace or undermine existing environmental standards or regulatory requirements or be used to allow development in areas otherwise prohibited through legislation or policy
2. Impacts must first be avoided, then mitigated, before considering the use of offsets for any remaining impact
3. Offsets must achieve a conservation outcome that counterbalances the significant residual impact for which the offset was required
4. Offsets must provide environmental values as similar as possible to those being lost
5. Offset provision must minimise the time-lag between the impact and delivery of the offset
6. Offsets must provide additional protection to environmental values at risk, or additional management actions to improve environmental values
7. Where legal security is required, offsets must be legally secured for the duration of the impact on the prescribed environmental matter.

2.2.1 Matters of state environmental significance

MSES are prescribed in Schedule 2 of the EO Regulation and include:

- ▶ Endangered and vulnerable flora and fauna species under NC Act and their habitats
- ▶ Special least concern fauna species under NC Act and their habitats
- ▶ Endangered and of concern REs under Vegetation Management Act 1999 (VM Act)
- ▶ Essential habitat (that has been mapped by DES)
- ▶ REs that intersect with wetlands and watercourses
- ▶ Connectivity areas for REs
- ▶ Wetlands in a wetland protection area, or of high ecological significance
- ▶ Wetlands or watercourses in high ecological value waters
- ▶ Protected areas (including nature refuges)
- ▶ Highly protected areas of a relevant Queensland marine park
- ▶ Marine plants within the meaning of the Fisheries Act 1994
- ▶ Declared fish habitat areas and waterways providing for fish passage
- ▶ Legally secured offset areas.

2.2.2 State Development and Public Works Organisation Act 1971

The Queensland projects are being assessed by the Coordinator-General as coordinated projects under the SDPWO Act. The EO Act does not affect or limit the functions or powers under the SDPWO Act of the Coordinator-General. In making decisions about environmental offset requirements under the SDPWO Act, the Coordinator-General may consider the environmental offsets framework but is not bound by its requirements.

To guide ARTC in how it will assess and identify a particular project's State environmental offset requirements, it is proposed the Queensland Environmental Offset Framework and overarching principles and delivery options will be considered, as outlined in the QEOP. However, given the size and scale of the Queensland projects, ARTC will seek a tailored offset delivery approach, in consultation with the Coordinator-General, in order to achieve a strategic offset settlement.

Qld Environmental Offsets Policy

Under the QEOP an offset may only be required where a prescribed activity is likely to result in a significant residual impact on a MSES. Two impact guidelines have been prepared by the State to support a determination as to whether an impact is 'significant' and therefore offsets required. The most applicable to Inland Rail is:

- ▶ The Queensland Environmental Offsets Policy: Significant Residual Impact Guideline which applies to development that requires an approval under *Environmental Protection Act 1994* (EP Act), *Nature Conservation Act 1992* (NC Act) or *Marine Parks Act 2004* (DEHP, 2014).

While the guideline may not specifically apply to coordinated projects it will be used to support an assessment of whether impacts from the project are likely to be 'significant' and require offsetting. This guideline would be applicable for secondary approvals (where required) under NC Act and EP Act.

To avoid duplication of offset conditions between State and Commonwealth, the Queensland State and Local Governments can only impose an offset condition in relation to a prescribed activity, if the same, or substantially the same impact and the same, or substantially the same matter, has not been subject to assessment under the EPBC Act for a controlled action.

Therefore, when developing a preferred offset delivery approach for the Queensland projects, preference will be to identify a process and tailored approach that will ensure MNES offsets comply with the EPBC Act Environmental Offsets Policy, and any remaining MSES (not directly associated with MNES) will be assessed and delivered in general accordance with the QEOP.

State Offset Delivery Options

Under the QEOP offset requirements can be satisfied through one or a combination of options which include:

- ▶ Proponent driven offset (primarily land-based and/or delivery of actions in a Direct Benefit Management Plan (DBMP))
- ▶ Financial settlement offset or
- ▶ A combination of the above.

Proponent-driven offsets

Land-based offsets

- ▶ Like the EPBC Act Offset Policy, QEOP specifies direct land-based offsets should make up 90% or more of the total offset requirement, unless otherwise agreed
- ▶ Direct land-based offsets are to provide environmental values as similar as possible to those being lost and may consist of remnant or non-remnant vegetation
- ▶ Where remnant vegetation is used, management actions are required to demonstrate additional habitat quality outcomes can be achieved. For example, Endangered and Of Concern Regional Ecosystem (RE) offsets must be of the same Broad Vegetation Group (BVG) as the impacted RE, of the same RE status, and within the same bioregion
- ▶ For flora and fauna species, the offset must contain or be capable of containing a self-sustaining population of that same impacted species
- ▶ The size of a land-based offset is governed by a range of factors including the quality of habitat impacted. Offset site size is generally determined through use of the Land-based Offsets Multiplier Calculator, which is habitat quality based, or using a rapid assessment, which caps the offset at a ratio of 1:4 (impact site only). Rapid assessment assumes an impact site quality score of 7 out of 10 which may not accurately reflect the actual habitat quality of the impact site and may present challenges in fulfilling offset obligations on an offset site
- ▶ Site-based habitat quality assessments for both the impact and offset sites are highly recommended where time permits
- ▶ The offset site is preferably located in a strategic offset investment corridor closest to the impacted site, and risks of a conservation outcome not being achieved are identified and mitigated.

Direct Benefit Management Plan

- ▶ Proponent-driven offsets can also be delivered through priority actions identified in a Direct Benefit Management Plan (DBMP)
- ▶ DBMPs are pre-approved packaged investments that outline priority actions to address threats to and provide substantial benefits for prescribed matters.

Financial Settlement

- ▶ A financial settlement payment can be used to meet an offset requirement for any MSES impacted by a development
- ▶ The required payment is calculated by applying the Financial Settlement Offset Calculation Methodology set out in the QEOP
- ▶ A financial settlement must be paid prior to project commencement
- ▶ Financial payments are made up of costs associated with on-ground land management, administration and landholder incentive payment
- ▶ Financial payments can be staged. The staging of offset delivery will need to be described and approved in an Offset Delivery Plan prior to project commencement.

3 Queensland Environmental Offset Requirements

Environmental impact assessments are being prepared for all Queensland projects. To date, there has been a range of targeted ecological surveys completed within the corridor to inform each Project's draft EIS. The assessments have included threatened species habitat modelling, informed by initial field ecology survey results, to predict habitat extent, disturbance and offset obligation.

For the purposes of this Strategy, environmental offset assessment information has been drawn from each draft EIS in order to identify those MNES and MSES values which may incur significant residual impacts and require offsets. Based on the MNES and MSES assessment methodology presented within each draft EIS, the extent of impacts presented within this Strategy should be considered as maximum potential extents as a number of species and communities have been identified as likely to be present in the absence of further field validation. As such, potential species and community habitats for the purpose of preliminary offset site identification have been extrapolated using regional ecosystem (RE) mapping until further field validation can be completed.

To better inform each project's impacts and offset requirements, ARTC will conduct further detailed ecological surveys which are scheduled to be finalised mid-2021. Information collected as part of these detailed investigations will support the confirmation of biodiversity values within the corridor, including their extent and ecological condition. Significant impact assessments for MNES, MSES and MLES will be subsequently refined and offset obligations quantified to establish a validated ecological impact / offset baseline.

Habitat quality assessments will be conducted according to the Department of Environment and Science (DES) *Guide to determining terrestrial habitat quality (Version 1.3, 2020)* (DES 2020b) for impact and offset site comparison as part of the planned detailed ecological surveys. Ecological impact and offset information derived from these investigations will also be used to inform the EIS assessment process as well as the development of the Preliminary Offset Delivery Plan. Accordingly, detailed offset calculations using the EPBC Act's Offset assessment guide have not been considered in this Strategy. However, the EPBC Act's Offset assessment guide will be applied following further detailed field assessments and will be included in a Preliminary Offset Delivery Plan scheduled for development mid-2021.

On this basis, those MNES and MSES values that may be required to be offset for each Queensland project is summarised in Table 2 and Table 3 for the Brigalow Belt and South East Queensland (SEQ) bioregions respectively. MNES are summarised in Table 2 with a breakdown of impacts for each project. MSES are summarised in Table 3 with a breakdown of impacts for each project. The information has been used to identify the type and number of ecological communities and species habitat that may require offsetting to inform ARTC's approach to offset delivery. It should be noted these values are preliminary and potential impact quantification will be refined following further detailed ecological assessments within the project alignment.

To maintain the intent of QEOP and avoid duplication of offset conditions between jurisdictions, MSES values which are also listed under EPBC Act are only presented in Table 2 as MNES. Vegetation communities and species which are State listed only, or are specific biodiversity values under QEOP, such as watercourse vegetation, are summarised in Table 3 and will be offset as MSES.

3.1 Identifying potential offset sites

ARTC has performed an assessment of offset availability and identification of potential offset sites that will deliver the Queensland project's offset requirements, as they are currently understood. The offset analysis has included identification of RE's that are known or likely to provide suitable habitat and were subsequently mapped using certified RE mapping (v11). Targeted RE's associated with remnant, high value regrowth (HVR) and unmapped regrowth were identified across a chosen study area of 100km either side of the project footprint and spatially clipped to the Brigalow Belt and South East Queensland bioregions. The results have provided a broad overview of offset availability for each of the offset values.

The potential to co-locate MNES and MSES values was then evaluated. This is shown in Table's 4 and 5 where 'offset groupings' have been categorised according to broad vegetation community associations, such as Brigalow TEC, which also provide habitat for a number of listed flora and fauna species. Priority offset properties were then selected through a process of ranking those which displayed collective characteristics such as; largest patch sizes of selected habitats, connectivity to existing protected areas and biodiversity corridors, proximity to records and availability of remnant, HVR and unmapped regrowth.

Table's 4 and 5 also present preliminary offset obligations recognising that baseline habitat and condition assessments for impact and offset sites have yet to occur. Adoption of a 1:4 ratio across all MNES and MSES to determine offset area obligation represents a conservative approach and final offset areas will be determined once habitat quality scoring has been completed.

Table 2 Potential MNES values impacted within Brigalow Belt and South East Queensland Bioregions

Anticipated MNES Significant Residual Impact (ha) within the Brigalow Belt and South East Queensland Bioregions						
MNES	EPBC Act Status	B2G	G2H	H2C	C2K	Total significant, residual impact area across the Queensland projects (ha)
TEC's						
Swamp tea-tree (<i>Melaleuca irbyana</i>) forest of Southeast Queensland	Endangered	-	-	-	30.46	30.46
Brigalow (<i>Acacia harpophylla</i>) dominant and co-dominant)	Endangered	62.89	-	-	-	62.89
Weeping Myall Woodlands	Endangered	81.92	-	-	-	81.92
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	81.92	-	-	-	81.92
Threatened Flora Species						
<i>Dichanthium queenslandicum</i> (King blue- grass)	Endangered	5.29	-	-	-	5.29
<i>Homopholis belsonii</i> (Belson's panic)	Vulnerable	3.19	-	-	-	3.19
<i>Lepidium monoplocoides</i> (Winged peppercress)	Endangered	40.91	-	-	-	40.91
<i>Notelaea lloydii</i> (Lloyd's olive)	Vulnerable	-	-	21.26	26.77	48.03
<i>Picris evae</i> (A hawkweed)	Vulnerable	18.68		-	-	18.68
<i>Rhaponticum australe</i> (Austral cornflower)	Vulnerable	2.29		-	-	2.29
<i>Sophora fraseri</i> (Brush sophora)	Vulnerable	-	2.36	-	-	2.36

Anticipated MNES Significant Residual Impact (ha) within the Brigalow Belt and South East Queensland Bioregions							
MNES	EPBC Act Status	B2G	G2H	H2C	C2K	Total significant, residual impact area across the Queensland projects (ha)	
Threatened Fauna Species							
<i>Anomalopus mackayi</i> (Five-clawed worm-skink)	Vulnerable	16.68	-	-	-	16.68	
<i>Dasyurus maculatus maculatus</i> (Spotted-tailed quoll)	Endangered	15.49	24.46	1.59	6.92	48.46	
<i>Delma torquata</i> (Collared delma)	Vulnerable	295.76	197.41	85.33	9.56	588.06	
<i>Erythroriorchis radiatus</i> (Red goshawk)	Vulnerable	-		4.15	77.25	81.4	
<i>Furina dunmalli</i> (Dunmall's snake)	Vulnerable	298.85	-	-	-	298.85	
<i>Lathamus discolor</i> (Swift Parrot)	Critically Endangered	-	-	13.34	11.74	25.08	
<i>Petrogale penicillata</i> (Brush-tailed rock-wallaby)	Vulnerable	-	-	4.88	-	4.88	
<i>Phascolarctos cinereus</i> (Koala)	Vulnerable	481.05	157.39	98.66	124.31	861.41	
<i>Pteropus poliocephalus</i> (Grey-headed flying-fox)	Vulnerable	-	201.19	99.46	71.44	372.09	
<i>Rostratula australis</i> (Australian painted snipe)	Endangered	-	-	15.43	34.55	49.98	
<i>Turnix melanogaster</i> (Black-breasted button quail)	Vulnerable	-	9.18	-	-	9.18	
<i>Tympanocryptis condaminensis</i> (Condamine earless dragon)	Endangered	17.93		-	-	17.93	

Table 3 Potential MSES values impacted within Brigalow Belt and South East Queensland Bioregions

Anticipated MSES Significant Residual Impact (ha) within the Brigalow Belt and South East Queensland Bioregions						
MSES	NC / VMA Act Status	B2G	G2H	H2C	C2K	Total impact area across the Queensland projects (ha)
Regulated vegetation						
Prescribed RE	Endangered	62.74	9.8	-	10.56	83.1
Prescribed RE	Of Concern	151.50	89.62	-	9.02	250.14
Watercourse RE	-	43.88	4.3	0.77	16.09	65.04
Wetland RE	-	-	-	-	13.40	13.40
Essential Habitat	-	117.31	112.36	95.66	25.89	351.22
Connectivity areas						
Landscape fragmentation tool	-	560.51	122.87	-	27.29	710.67
Wetlands and watercourses						
No impact anticipated	-	-	-	-	-	
Designated precinct in a strategic environmental area						
No impact anticipated	-	-	-	-	-	
Protected wildlife habitat						
<i>Acanthophs antarcticus</i> (Common death adder)	Vulnerable	540.87		-	-	540.87
<i>Callitris baileyi</i> (Bailey's cypress)	Near Threatened	-	108.47	28.4	11.43	148.30
<i>Calyptorhynchus lathami lathami</i> (Glossy black-cockatoo)	Vulnerable	480.86	21.58	45.11	50.63	598.18
<i>Caustis blakei subsp. macrantha</i> (Caustis)	Vulnerable	-	10.41	-	-	10.41
<i>Cyperus clarus</i> (a sedge)	Vulnerable	974.12	-	-	-	974.12
<i>Falco hypoleucos</i> (Grey falcon)	Vulnerable	-	134.49	-	-	134.49
<i>Marsdenia coronata</i> (Slender milkvine)	Vulnerable	-	51.02	-	61.85	112.87
<i>Melaleuca irbyana</i> (Swamp tea-tree)	Endangered	-	-	128.78	237.73	366.51

Anticipated MSES Significant Residual Impact (ha) within the Brigalow Belt and South East Queensland Bioregions							
<i>Ninox strenua</i> (Powerful owl)	Vulnerable	-	101.1	28.63	21.54	151.27	
<i>Picris barbarorum</i> (Tall hawkweed)	Vulnerable	567.49	-	-	-	567.49	
<i>Ornithorhynchus anatinus</i> (Platypus)	Special Least Concern	-	-	47.77	-	47.77	
<i>Tachyglossus aculeatus</i> (Short-beaked Echidna)	Special Least Concern	-	-	75.71	-	75.71	
Koala habitat (<i>Nature Conservation (Koala) Conservation Plan</i> 2017 mapping)	-	81.73	303.33	-	-	385.06	
Protected areas							
No impact anticipated	-	-	-	-	-		
Highly protected zones of state marine parks							
No impact anticipated	-	-	-	-	-		
Fish habitat areas							
No impact anticipated	-	-	-	-	-		
Waterways providing for fish passage							
No impact anticipated	-	-	-	-	-		
Marine plants							
No impact anticipated	-	-	-	-	-		
Legally secured offset areas							
No impact anticipated	-	-	-	-	-		

4 ARTC's Environmental Offset Delivery Strategy for Queensland

ARTC's overarching strategy is to deliver a strategic land-based offset portfolio that will contribute to an overall conservation outcome to improve the protection, management and viability of impacted MNES, MSES and MLES values. Community consultation and collaboration to ensure these values are managed and maintained is central to this strategy. ARTC propose to combine environmental offset requirements across each Queensland project, within the relevant bioregion, and pool offset values to enable larger strategic environmental offset sites to be delivered.

The primary aim of the Strategy will be to identify a portfolio of offset properties that meet MNES, MSES and MLES offset obligations that are strategically located in proximity to the future rail corridor (impact area). The Strategy will also aim to secure offset properties that preferentially adjoin protected area estates, conservation reserves and / or large intact remnants which are located within prioritised offset hubs and / or bioregional corridors. Ongoing land management will be conducted according to approved Offset Area Management Plans which will seek to maximise landscape conservation outcomes by increasing resilience of self-sustaining communities and populations whilst also seeking to achieve habitat quality gains at the offset site and improved connectivity within the region.

Offset area management will depend on the final offset portfolio, however, may include management by a landholder, an accredited community based not for profit conservation organisation, an established conservation management entity, government based or supported organisation, or a combination of these. Management actions are likely to include weed control, feral animal control, fire management, restoration and/or revegetation. Ongoing management of the offset portfolio will seek to foster community collaboration while achieving offset objectives and conservation outcomes under enduring arrangements such as covenants bound on title.

This Strategy recognises that the EIS and detailed design phase for each Queensland project is operating under progressive delivery schedules however offset site optimisation and determination will be performed collectively based on the best quantitative and qualitative information available at the time. As a result, land-based offsets may be generated that can be drawn down by each project progressively.

ARTC is seeking to avoid, minimise and mitigate environmental impacts to the greatest extent possible when identifying a preferred alignment, locating ancillary infrastructure and undertaking construction and operation for each project. For example, in sections of C2K, a realignment of the rail corridor was undertaken to avoid impacting significant biodiversity values including koala habitat. However, this also presented challenges for other threatened species and communities, resulting in unavoidable impacts to the *Melaleuca irbyana* TEC.

ARTC has identified opportunities to further minimise the impact footprint through design innovation on the Queensland projects. While there are opportunities to minimise impacts, there are also challenges as ARTC is constrained to the proposed rail alignment, as well as topographical and engineering constraints. Consequently, there are fewer opportunities to avoid impacts on biodiversity values in some areas. These avoidance and mitigation strategies are outlined within each draft EIS.

The following sections summarise the key offset delivery principles ARTC will be looking to achieve.

4.1 Application of Hierarchy and Confirmation of Offset Framework

ARTC propose that environmental offsets be assessed so that the offset requirements for the EPBC Act approval take precedence over State approvals, and offsets are rationalised for the same or substantially the same matter and the same or substantially the same impact assessed by the Commonwealth. On this basis, delivering offsets for MNES will also deliver conservation outcomes for State MSES and Local prescribed MLES values.

In line with this approach, ARTC will initially assess each project's offset requirements under the EPBC Act Significant Impact Guideline for MNES. An assessment of MSES and MLES will follow, in accordance with QEOP's Significant Residual Impact Guideline, to identify those MSES and MLES values that will be significantly impacted by a project, and which of those are relevantly associated with MNES. Matters of environmental significance that are only identified as MSES and MLES values will be delivered in consultation with the Coordinator-General, DES, DAF and DRNME where relevant. ARTC may consider financial settlement for these residual matters in accordance with the QEOP.

4.2 Risk mitigation for offset delivery

There are challenges and risks in delivering environmental offsets. These will be evaluated by ARTC and mitigation measures put in place at key stages and decision-making points. Risks include:

- ▶ Delivering offsets that accurately reflect the significant residual impacts on MNES, MSES and MLES
- ▶ Being able to identify suitable offset sites that support biodiversity values and areas required, particularly within the nominated offset hubs and corridors by DES
- ▶ Liaising with landholders and successfully securing offset arrangements
- ▶ Finalising legal security in a timely manner
- ▶ Addressing refinements to the offset requirements as the projects progress through the design phase and ensuring that offset sites identified earlier in the process have adequate representation including offset quantum and condition
- ▶ Achieving the set conservation outcomes for a particular matter over the agreed management timeframes.

Risk mitigation measures will include that ARTC commence offset site identification early in the process and do so in liaison with a number of stakeholders and land managers. A number of offset site options will be explored to ensure there are adequate contingencies should one or more sites not progress. ARTC will also ensure the refined impact assessments based on ground validation are informing offset site selection process and regular consultation occurs with regulators to ensure the offset process is discussed and agreed to as far as practicable. ARTC will look to secure land-based offsets that are known to support the relevant matters and the conservation gains proposed will be achieved through sound management measures tailored to the species and/or community with regular monitoring, and clear performance outcomes set. Offset sites will be legally secured as soon as practically possible, though acknowledging that elements of tenure negotiation and related administrative aspects may be beyond the control and influence of ARTC.

4.3 Staging Offset Assessment and Delivery

There are three main phases of delivery for each project; approvals phase, detailed design phase, and construction phase.

The approvals phase predominantly relates to the primary approvals such as EPBC Act and Coordinator-General's evaluation report for each EIS. Secondary approvals, which may also trigger offset obligations for MSES, such as the NC Act for listed flora species, will generally be obtained after the primary approvals have been granted. Therefore, the process of confirming significant residual impacts and environmental offset requirements will occur in a progressive manner, and there will need to be some flexibility to allow for impacts to be refined as ARTC work to confirm the footprint once a construction contractor is appointed and detailed design occurs.

ARTC propose a tailored approach to finalising and delivering the environmental offset requirements due to the scale and complexity of the project and delivery. This approach will also enable ARTC to maximise environmental outcomes that can be achieved through combining the Queensland project's offset requirements into two main bioregions (Brigalow Belt and SEQ).

For transparency, separate Environmental Offset Proposals will accompany each project to identify the likely environmental offset requirements for each relevant project. Once the full offset package is understood an Environmental Offset Delivery Plan will be prepared outlining the offsets to be delivered for all the Queensland projects. This approach is described below and summarised in Figure 2.

4.3.1 Prior to Project Primary Approval – Development of Environmental Offset Proposal – January 2021

- ▶ The impacts presented within each Environmental Offset Proposal will be subsequently refined and verified through supplementary field ecology surveys and condition assessments and consolidated within the Preliminary Environmental Offset Delivery Plan.
- ▶ Each Environmental Offset Proposal will summarise predicted offset values at a Commonwealth, State and Local level, upper disturbance limits, outlining the preferred offset approach, identifying offset site availability and timing for offset delivery. While each project will be evaluated separately, the offset delivery approach will take into consideration a coordinated offset package for Queensland as a whole.
- ▶ Land-based offset site options will be further refined, identified and discussed with regulators.
- ▶ ARTC will initiate the landholder engagement process and undertake preliminary assessment of potential offset sites to understand offset site suitability.

4.3.2 Post detailed ecological investigations – Development of the Preliminary Environmental Offset Delivery Plan – mid-2021

- ▶ As a result of subsequent field survey and verification, the extent of significant residual impacts will be refined for MNES, MSES and MLES prior to and including early detailed design phases. Depending upon detailed design, the total extent of impacts may be reduced, and some biodiversity values avoided altogether.
- ▶ Revised clearing limits and environmental offset requirements will be confirmed for each project.
- ▶ ARTC will confirm shortlisted offset site/s to meet a project's requirements, and any other supplementary measures proposed for the relevant project.
- ▶ Detailed ecological surveys will commence on the shortlisted offset sites to confirm presence of targeted biodiversity values, assess habitat quality and determine management actions required.
- ▶ Landholder discussions including seeking in-principle agreement will continue and be ongoing throughout the offset delivery program.
- ▶ Offset calculator assessments will be prepared (assessing impact site and offset site), using applicable assessment tools, to confirm final offset areas needed (ratios).
- ▶ During offset site analysis, ARTC will look to combine environmental offset requirements across the Queensland projects to increase conservation outcomes that can be achieved to optimise offset delivery. This may for example, include all koala habitat impacts are pooled and ARTC seeks to meet these offset requirements across a small number of larger offset sites. Co-location of offset values may also occur, for example, offsetting an Of Concern RE with Koala and Collared Delma habitat where the vegetation community provides the required habitat values for the species.
- ▶ The above information will be outlined in a preliminary Environmental Offset Delivery Plan (EODP).
- ▶ The preliminary EODP will be provided to DAWE, Coordinator-General, DES, DAF and DNRME for consultation.
- ▶ Offset Area Management Plan preparation will commence.
- ▶ MSES and MLES offset financial payments, where applicable, will be made prior to construction.

4.3.3 Prior to Construction Commencement – Submission and approval of Final Environmental Offset Delivery Plan and Offset Area Management Plan/s

- ▶ Seek approval of the finalised Environmental Offset Delivery Plan from Commonwealth and State Government.
- ▶ Environmental Offset Delivery Plan will include details of conservation outcomes to be achieved, management actions to be undertaken, risks and corrective actions, ecological monitoring and reporting.
- ▶ Offset Area Management Plan/s will be finalised and submitted for Commonwealth and State Government approval.
- ▶ Offset site negotiation will be finalised and conservation covenanting processes will commence.
- ▶ Offset site management has commenced.

4.3.4 Within 1 year of Construction Commencement – Offset Site Legally Secured

- ▶ All offset sites identified in the approved Environmental Offset Delivery Plan and Offset Area Management Plan/s will be legally secured under a legally binding mechanism within one year of construction commencement. Additional time may be needed for formal conservation covenanting and related administrative processes to occur. For example, enactment under a statutory instrument.
- ▶ There are a number of options for legally securing an offset site, including offset protection area under the EO Act, voluntary declaration under the *Vegetation Management Act 1999*, protected area under the NC Act, statutory covenants under the *Land Title Act 1994* or provisions under the EPBC Act. All options will be considered, and the final instruments chosen will depend on circumstances for each offset site.
- ▶ Due to the nature of the impacts and operational environment, legal security will be for at least the duration of the impact and the type of enduring covenants will be negotiated depending on the circumstances for each offset site.

4.4 Co-location of Offset Requirements on Strategic Offset Sites

ARTC's overarching objective is to deliver the Queensland project's environmental offset requirements through strategic land-based offsets. The primary focus will be identifying strategic offset sites that contain the required MNES, MSES and MLES values, based on bioregions, proximity to the rail corridor and are prioritised in offset hubs and corridors identified by DES in the Brigalow Belt and SEQ bioregions.

This approach should result in fewer but larger offset sites to be protected and managed and preferably will build resilience within the protected area estate and enhance biodiversity corridors. This approach will allow ARTC to pool offset requirements across Queensland projects, maximise conservation outcomes that can be achieved across the Inland Rail Program and increase efficiencies for delivery and management.

As the Queensland projects may progress across slightly different timeframes for construction commencement, when identifying offset sites, it will be ensured that a site or sites can cater to the upper disturbance limits that have been predicted. On this basis, the offset portfolio will be available for each relevant project to draw down their environmental offset obligations in accordance with the Environmental Offset Delivery Plan.



Figure 2 Staging Offset Assessment and Delivery

5 Strategic offset site identification

5.1 Methodology

An initial desktop assessment has been undertaken with the aim of identifying potential strategic offset sites that can meet the Queensland project's environmental offset requirements as they are currently understood. The intent of this initial investigation was to assess land-based offset feasibility as well as offset portfolio optimisation. Offset portfolio optimisation was initially established to identify areas where maximum co-location of offset values may be achieved, and preference given to patches of threatened species habitat and ecosystems that are of a large size and strategically located to ensure connectivity such as adjoining protected area estates, conservation reserves and / or bioregional corridors.

For some values a combination of properties may be required to meet the total offset area needed. Further offset portfolio optimisation will occur as assessments progress to include landholder engagement and ground-truthing to validate suitability of properties.

Specific property address and lot on plan details have been withheld for the purpose of this offset feasibility assessment to preserve landholder privacy during this early stage of the assessment process.

5.2 Preliminary Offset Site Identification Results

Eight preliminary offset sites for the Brigalow Belt bioregion and eleven preliminary offset sites for the South East Queensland bioregion have been identified through initial desktop offset analysis and optimisation assessments. The combination of these 19 sites are expected to meet all MNES offset requirements and a large proportion of the estimated MSES offset requirements as they are currently understood. The properties summarised have been shortlisted due to containing large areas of the required offset values, in a number of instances there are records on the property or nearby, they are strategically located, and provide opportunities to co-locate a number of MNES and MSES values within the same areas of bushland or property. The offset analysis and properties shortlisted demonstrate that there are large areas of suitable vegetation and habitats available in the landscape, not too far from impact areas, and the offset areas can be placed on strategically located properties to maximise conservation outcomes and connectivity.

While certain impacted vegetation communities are more geographically restricted in their distribution, and some species are specialised in their habitat requirements, offset groupings have been adopted to assist locate suitable offset sites. Considerations have included RE's that have the potential to support a number of species, locations where a species or community is known to occur, size of potential habitat areas available and connectivity in the landscape.

The offset sites identified under this assessment do not necessarily represent the final offset sites or definitively reflect all MNES, MSES and MLES offset requirements however demonstrates the feasibility of offset co-location across a variety of prescribed matters. Each offset site may contain several cadastral parcels however would be assessed as one 'offset site' as they are located adjacent to each other and databases suggest are owned by the one landowner.

Further offset site optimisation on revised MNES, MSES and MLES impact information will be subsequently undertaken in order to generate an up to date offset feasibility property portfolio. Results of the updated offset property feasibility assessment will be discussed with relevant Commonwealth and State Government departments which will facilitate the development of the Preliminary Environmental Offset Delivery Plan.

A high-level summary of the 19 shortlisted offset sites, offset values they contain, and area available, is provided in Table 4 and Table 5.

Based on the selected offset properties, and habitat areas estimated as available, there are some MSES values which have not been fully acquitted by the chosen properties. Desktop analysis across the broader study area has demonstrated that there is more than adequate availability for each offset value, but due to the nature of some values, such as RE's which are restricted in range, or fauna species with specialised habitat requirements, based on a desktop assessment, they don't currently occur in shortlisted properties chosen at present.

The following offset values are currently showing a shortfall:

- ▶ *Cyperus clarus*
- ▶ Grey falcon
- ▶ Powerful owl
- ▶ Platypus
- ▶ Slender milkvine
- ▶ Endangered RE12.3.18
- ▶ Of Concern RE12.3.8
- ▶ Of Concern RE12.9-10.16

There are a number of steps that will address where shortfalls are currently showing. These are:

- ▶ Supplementary field ecology surveys of impact areas may identify a reduced extent of the MNES and/or MSES values. Supplementary field ecology surveys for the Queensland projects are due for completion mid-2021;
- ▶ Ground-truthing of offset sites may identify additional suitable areas of ecological communities and/or species habitats are present;
- ▶ Habitat quality scoring on impact and offset areas may determine less area is required (currently 1:4 ratio has been applied across all values);
- ▶ Additional offset properties may be added to the offset portfolio to make up any identified shortfalls;
- ▶ Indirect offsets may be considered where less than 10% of the total offset requirement needs to be made up;
- ▶ For MSES shortfalls ARTC will consider financial payments to DES.

MSES wetlands, watercourse vegetation, connectivity and essential habitat will be co-located across the offset property portfolio with other suitable MNES and MSES values. For example, under QEOP connectivity offsets are to be provided at a 1:1 ratio utilising regrowth vegetation. Regrowth vegetation that provides important connections between other remnant tracts, along watercourses, or may be adjacent to an existing protected area, will be used to offset connectivity. All nominated offset properties contain stream orders and there will be watercourse vegetation that can be used, particularly where offset values include riparian RE's such as 11.3.2, 12.3.3 etc. Confirmation of which properties these MSES values will be offset on, and how much area is required, will be provided post ground-truthing being undertaken of preferred offset sites and habitat quality scoring completed.

5.3 Offset site selection and management principles

Offset sites identified through the offset property feasibility assessment process will be assessed to meet the principles of the EPBC Act Environmental Offset Policy and to be consistent with the QEOP.

Each proposed offset property will be assessed against the following criteria and an initial assessment of the identified potential offset sites under the policy principles is provided below.

5.3.1 Suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the protected matters detailed in the Environmental Offset Delivery Plan.

ARTC's overarching strategy is to deliver a strategic land-based offset portfolio that will contribute to an overall conservation outcome to improve the protection, management and viability of impacted MNES, MSES and MLES values. Offset properties will support those ecological communities and species habitats that have been impacted providing a 'like for like' conservation outcome. The properties will deliver an overall conservation outcome for those MNES (Table 2) and/or MSES values (Table 3) required to be offset through:

- ▶ Improving ecological condition of vegetation communities and species habitats through land management activities such as weed control, pest animal management, grazing management and fire management;
- ▶ Restoration of degraded vegetation and habitats including areas affected by erosion, fragmentation, and/or lack of microhabitats such as native groundcover and fallen woody debris
- ▶ Revegetation of vegetation communities and species habitats increasing their extent;
- ▶ Removal and/or reduction of threats such as preventing clearing of regrowth, managing the risk of wildfires, limiting the cropping of native grasslands;
- ▶ Monitoring and research to improve knowledge and understanding of habitat restoration techniques; and species utilisation of habitats or other compensatory measures tailored to the particular MNES or MSES.

Preference will be given to offset properties that adjoin protected area estates, conservation reserves and / or large intact remnants which are located within prioritised offset hubs and / or bioregional corridors. Offset sites will preferentially include a diverse range of offset requirements such as TEC's and endangered or of concern ecological communities that also support threatened species habitats and may include ecological values such as watercourse vegetation, wetlands and improve connectivity. Offset areas will be targeted to consist of a combination of remnant and regrowth vegetation and historically cleared land that can be restored/revegetated to improve habitat quality, connectivity and functionality. These habitat quality gains will be measured by applying the *Guide to determining terrestrial habitat quality* (DES, 2020).

The chosen potential offset sites were selected as they support functional vegetation communities (remnant, high value regrowth (HVR) and unmapped regrowth) that can be managed to build resilience, improve connectivity and achieve habitat quality gains. Habitat quality gains may include human induced restoration of non-remnant communities (regrowth management) through to replanting programs depending upon the targeted impacted matters. Ongoing land management will be conducted according to approved Offset Area Management Plan/s which will seek to maximise landscape conservation outcomes by increasing resilience of self-sustaining communities and populations while providing improved habitat and connectivity for impacted MNES, MSES and MLES species within the region. Offset management on the properties will include weed control, fire management including managing fuel loads to prevent hot bushfires, pest animal control, fencing, grazing management, revegetation (where this is suitable such as koala habitat or seeding of native grasses), erosion management etc.

Ground-truthing of each proposed offset property will occur to validate suitability of vegetation communities and species habitats, to assess starting habitat quality, confirm management actions required and ascertain habitat quality gains that can be achieved.

The covenanting mechanism will be tailored to the relevant protected matter/s and property and will be established to limit, to the extent possible, future adverse development potential. The protection of the offset area will remain on title to bind any future landowners.

5.3.2 Suitable offsets must be built around direct offsets but may include other compensatory measures

ARTC's overarching strategy is to deliver a strategic land-based offset portfolio that will contribute to an overall conservation outcome to improve the protection, management and viability of impacted MNES, MSES and MLES values. Currently it is expected that direct offsets will meet 100% of MNES offset requirements and deliver over 90% of the project's MSES offset requirements.

The potential offset properties presented within this Strategy support those ecological communities and species habitats that have been impacted providing a 'like for like' conservation outcome. The properties will deliver an overall conservation outcome for those MNES and/or MSES values required to be offset through:

- ▶ Improving ecological condition of vegetation communities and species habitats;
- ▶ Restoration of degraded vegetation and habitats;
- ▶ Revegetation of vegetation communities increasing their extent;
- ▶ Removal and/or reduction in threats such as from weeds, fire, pest animals;
- ▶ Removal of ear-marked development pressure;
- ▶ Monitoring and research to improve knowledge and understanding of habitat restoration techniques, a species utilisation of habitats or other compensatory measures tailored to the particularly MNES or MSES.

Opportunity for indirect offsets will be explored, consistent with the EPBC Act Environmental Offset Policy, particularly around research opportunities for key threatened species such as Koalas or species such as Condamine earless dragon where research is required to identify more about its distribution and population size, habitats and breeding. These measures may be proposed should land-based offsets not quite meet 100% of total obligation under calculator. Indirect offsets will be informed by key priority actions defined in approved recovery plans, threat abatement plans, conservation advice, ecological character descriptions or approved Commonwealth / State management plans.

5.3.3 Tenure for direct offsets

There are a number of options to legally secure an offset site, including an offset protection area under the EO Act, voluntary declaration under the *Vegetation Management Act 1999*, a protected area under the NC Act, statutory covenants under the *Land Title Act 1994* or provisions under the EPBC Act. All enduring options that are governed by legislation will be considered, and the final instrument chosen will depend on circumstances for each offset site including land tenure, landowners, and the MNES and MSES subject to management and protection.

Offset sites will be selected on the basis of ecological characteristics, opportunity for maintaining and/or improving the viability of the protected matter and those threatening processes which may undermine the future resilience of those matters if not managed and protected under an offset arrangement. Any land use or tenure inconsistent with delivering conservation outcomes will be considered during offset site selection process such as mining or petroleum leases and excluded from consideration where possible.

The Offset Area Management Plan/s will be linked to the agreed offset securing mechanism which will drive monitoring, assessment, compliance and reporting requirements.

A landowner will have a legal obligation to manage their property in accordance with the approved management plan. This may include stopping activities that could degrade the offset values (e.g. logging in bushland) or reduction of stocking rates and pulse grazing.

5.3.4 Suitable offsets must be in proportion to the level of statutory protection that applies to the protected matter

The land-based offsets proposed will meet the EPBC Environmental Offsets Policy and Offsets Assessment Guide which considers the status of the impacted MNES being offset. The status of the MNES is considered by the calculator in determining the extent of offset area required.

For MSES the offsets will comply with the Qld Environmental Offsets Policy.

Habitat quality of the impact areas and offset site will be determined using the Queensland State Government's Guide to determining terrestrial habitat quality - Methods for assessing habitat quality under the Queensland Environmental Offsets Policy (Version 1.3 February 2020) (DES, 2020b). Habitat quality values derived from the impact areas and offset sites will form an important component in determining the extent of offset area required through application of the EPBC Act's Offsets assessment guide.

5.3.5 Suitable offsets must be of a size and scale proportionate to the residual impacts on the protected matter

Offset sites will be assessed proportionate to the size and scale of the residual significant impacts determined by detailed field-based ecological assessments in order to maintain and/or improve the viability and resilience of the protected matter/s. The assessment will consider:

- ▶ The level of statutory protection applied to the protected matter
- ▶ Particular attributes of the protected matter (for example site condition, context and type of habitat for species i.e. breeding habitat or foraging habitat)
- ▶ Quality or importance of the nature of the impacts on the protected matter and their future viability
- ▶ Temporal nature of the impacts
- ▶ Confidence in the habitat quality gains proposed
- ▶ Predicted time to generate a conservation gain.

Preference will be given to offset properties that adjoin protected area estates, conservation reserves and / or large intact remnants which are located within prioritised offset hubs and / or bioregional corridors. Offset sites will preferentially include a diverse range of offset requirements such as TEC's and endangered or of concern ecological communities that also support threatened species habitats and may include ecological values such as watercourse vegetation, wetlands and improve connectivity. Offset areas will also likely consist of a combination of remnant and regrowth vegetation and cleared land that can be restored or revegetated to improve habitat quality.

The EPBC offsets calculator inputs will determine the final size of offset area needed to satisfy the policy requirements. To support an initial assessment of the extent of offset areas that may be needed for each MNES and MSES value, a 1:4 ratio was applied.

5.3.6 Suitable offsets must effectively account for and manage the risks of the offset not succeeding

A risk-based approach incorporating the precautionary principle will form an integral component in the offset site selection process and offset area management principles, objectives and outcomes which articulate clear and definable acceptance criteria. A risk matrix will be developed for each offset site that will identify the risks of the offset not succeeding including protection of the offset and habitat quality gains.

Relevant actions to manage risk include:

- ▶ Selecting sites that avoid conflicts with future development including mining leases;
- ▶ Selecting sites which are not isolated to maximise connectivity potential in the landscape;
- ▶ Utilising functioning ecosystems including a combination of remnant and regrowth;
- ▶ Legally securing the offset area on title;
- ▶ Restricting access;
- ▶ Weed monitoring and control;
- ▶ Grazing management;
- ▶ Pest fauna management;
- ▶ Fuel load management and fire management.

5.3.7 Suitable offsets must be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs

Offset sites will be selected on the basis that they will generate conservation outcomes for the protected matter/s impacted, acknowledging the nature and scale of the proposed action, which would generate beneficial species specific or vegetation community outcomes above and beyond existing statutory and planning requirements associated with the land parcel. This includes existing State and Local Government laws and planning regulations associated with the land parcel and its associated ecological values and threat abatement measures (including biosecurity obligations).

The land-based offsets will provide significant 'additionality' to what is required by law or planning regulation. Currently the proposed offset properties include unprotected regrowth which can be lawfully cleared. Agricultural practices also occur such as grazing and cropping which have the potential to degrade the offset values. A number of weeds and pest animals are also not required to be managed under Qld legislation and therefore would continue to degrade ecological condition of the sites.

In Queensland there are no existing land management obligations that prescribe or exclude fire. Hot fires and too frequent fires have the potential to degrade and destroy MNES and MSES habitat values including brigalow, hollow-bearing trees and regenerating trees.

'Additional' actions that may be implemented include protecting and managing unmapped regrowth, removing or reducing grazing levels, actively improving condition of remnant vegetation through weed control, undertaking supplementary tree plantings and reducing feral animals and fuel loads.

5.3.8 Links with Australian and State approval processes

ARTC is committed to providing environmental offsets for residual significant impacts to MNES and those MSES and MLES that are not assessed under the Commonwealth framework. The EO Act does not affect or limit the functions and powers of the Coordinator-General under the SDPWO Act, however ARTC will have regard to the principles of the QEOP in determining and implementing offset requirements for MSES and MLES.

Land-based offsets that comply with the EPBC Act Environmental Offsets Policy will form the initial focus for delivering the project's Queensland environmental offset requirements. Land-based offsets will be strategically located and co-locate a number of the project's MNES, MSES and MLES offset requirements. Financial settlement payments may be considered for those residual MSES and MLES matters that cannot be co-located with MNES matters according to the QEOP. Any financial settlement payment for MSES and/or MLES will be calculated by applying the Financial Settlement Offset Calculation Methodology set out in the QEOP. Financial settlement will be paid prior to the commencement of the relevant impact.

5.3.9 Suitable offsets must be efficient, effective, timely, transparent, scientifically robust and reasonable

The proposed offset package and governance framework will be efficient, effective, timely, scientifically robust and transparent in design and implementation.

ARTC will seek approval of the Environmental Offset Delivery Plan and associated Offset Area Management Plan/s prior to construction commencement. Offset area management will be initiated prior to construction commencement to reduce the time lag between project impacts and agreed offset objectives. The Offset Area Management Plan/s will be scientifically robust, based on ground truthed surveys consistent with applicable and relevant Australian and State Government survey guidelines specific for the protected matter/s. Monitoring and management measures associated with the Offset Area Management Plan/s will be outcome driven with definable acceptance / completion criteria to minimise risk of failure.

This Strategy represents a cost-effective approach to providing a direct offset, achieved through implementing widely applied and verified management strategies that are consistent with Conservation Advice statements as to threats which require intervention.

The offset outcomes will be delivered progressively over 20 years and maintained an agreed period of time. Legal security of the offsets will occur within 12 months of offset management plans being approved.

Implementation of the offset management plans will be monitored and reported in annual compliance reports. There is strong evidence to demonstrate the likelihood of the offset achieving improvement in TEC and MNES habitat condition (DoE 2013; Ponce-Reyes et al. 2016).

There will be annual monitoring and reviews of the offset activities and annual reports prepared.

5.3.10 Suitable offsets must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced

The Offset Area Management Plan/s will define appropriate and transparent governance arrangements which will include defining roles and responsibilities of all responsible and accountable parties associated with offset delivery including on-ground management, monitoring and reporting.

The Offset Area Management Plan/s will define:

- ▶ Conservation outcomes and associated management actions;
- ▶ Monitoring activities and timeframes;
- ▶ Performance criteria to be achieved for each MNES and interim milestones;
- ▶ Corrective actions and triggers for corrective actions;
- ▶ Auditing and reporting.

The approved Environmental Offset Delivery Plan and Offset Area Management Plan/s will be made available on Inland Rail's website for public viewing.

Table 4 Summary of potential offset sites for Brigalow Belt bioregion impacts

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments
Brigalow grouping													
Brigalow TEC	251.56			1,260	<p>The property is located in the Brigalow Belt bioregion, , Qld. The property contains patches of brigalow vegetation including approx. 370 ha of remnant RE11.9.5 Acacia harpophylla and/ or Casuarina cristata open forest on fine-grained sedimentary rocks and RE11.4.9 Acacia harpophylla shrubby woodland with Terminalia oblongata on Cainozoic clay plains.</p> <p>There are also large areas of unmapped regrowth (>800ha) which are likely to support brigalow communities (aligned with RE11.9.5).</p> <p>Preference would be to offset those areas of remnant and regrowth brigalow which are and/or have connections along creeklines and to existing intact bushland areas to maximise connectivity.</p>								
Dunmalls snake	1,195.4			1,260	<p>The property is located in the Brigalow Belt bioregion and within the species modelled distribution. Dunmall's Snake is found in open forest, particularly brigalow Acacia harpophylla forest and woodland growing on floodplains of deep-cracking black clay and clay loam soils. The property contains large areas of brigalow woodland both remnant and regrowth.</p> <p>There is likely to be suitable micro-habitat for the species in remnant patches and more advanced regrowth areas.</p>								
Belson's panic	12.76			1,485.90	<p>The property is likely to support suitable habitat for Belson's panic including <i>Casuarina cristata</i> and <i>Acacia harpophylla</i> woodlands. The species has a preference for shady areas in these communities. RE11.9.5 is known to support the species. RE11.3.18 is also mapped on the property which provides suitable habitat.</p> <p>There is a record of the species directly to the north of , within a small patch of RE11.9.5.</p>								

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments
Grassland grouping													
King bluegrass	21.16			751.97	<p>The property is large and made up of a number of land parcels. It is located in the Brigalow Belt bioregion, , Qld. It is likely to support suitable habitat for King bluegrass as it contains native grasslands and open grassy woodland being; RE11.8.5, 11.8.5a and 11.8.11. These grasslands and open grassy woodlands are known to provide suitable habitat for the species.</p> <p>The property is mapped as containing remnant and regrowth open grassy woodlands as well as non-remnant grasslands with potential for restoration. The area is within the species known distribution.</p>								
Hawkweed	74.72			748	<p>The property is located in the Brigalow Belt bioregion, , Qld. The property is likely to support suitable habitat for Hawkweed as it supports eucalypt open woodlands with a grassy understorey being; RE11.3.2, 11.3.18, 11.3.21, 11.8.5 and 11.8.5a which are known to support the species.</p> <p>The property contains patches of remnant and regrowth communities.</p> <p>Records of the species exists to the north and east of the property.</p>								
Austral Cornflower	9.16			729.13	<p>The property is located in the Brigalow Belt bioregion, , Qld. The property is likely to support suitable habitat for Austral Cornflower as it occurs in woodland and grasslands associated with various eucalypt species. RE11.3.4 and 11.8.5 are known to support the species.</p> <p>The property contains patches of remnant, high value regrowth and regrowth communities.</p> <p>Records of the species exist on the eastern boundary of the property and also to north, east and south.</p>								
Tall Hawkweed	2269.96			3025.53	<p>The property is located in the Brigalow Belt bioregion, , Qld. The property is likely to support suitable habitat for Tall Hawkweed as it occurs on floodplains on heavier alluvial soils. RE11.3.2, 11.3.4 and 11.5.1 are known to support the species.</p> <p>The property supports large areas of remnant woodlands including patches of 11.5.1, 11.3.2 and 11.3.4 adjacent to watercourses.</p>								
Cyperus clarus (a sedge)	3896.48			729.43	<p>The property is located in the Brigalow Belt bioregion, , Qld. The property is likely to support suitable habitat for <i>Cyperus clarus</i> as it occurs in grassland and open woodland. RE11.8.5 and 11.8.11 are known to support the species.</p> <p>The property contains patches of remnant, high value regrowth and regrowth communities.</p> <p>Records of the species exists property.</p>								

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments
Condamine Earless Dragon	71.72			23.02	<p>The property is located in the Brigalow Belt bioregion, . Qld. The property is likely to support suitable habitat for Condamine Earless Dragon as it occurs in native grasslands and open grassy woodlands. RE11.3.21, 11.3.4 and 11.8.11 are known to support the species.</p> <p>The property contains patches of remnant, high value regrowth and non-remnant grasslands with potential for restoration.</p> <p>The southern portions of the property are .</p> <p>There is a record of the species .</p>			145.92	<p>The property is located in the Brigalow Belt bioregion, . Qld. The property is likely to support suitable habitat for the species as it can occur in communities including RE11.3.2, 11.3.4 and 11.3.25.</p>				
Five-clawed Worm Skink	66.72			720.55	<p>The property is located in the Brigalow Belt bioregion, . Qld. The property is likely to support suitable habitat for Five-clawed Worm Skink as it occurs in grasslands and woodlands. RE11.3.21, 11.3.25 and 11.8.5 are known to support the species.</p> <p>The property contains patches of remnant, high value regrowth and regrowth communities. There is likely to be suitable microhabitat for the species particularly in those remnant and advanced regrowth areas.</p> <p>The of the property are located in a state significant biodiversity corridor.</p>								
Common death adder	2,163.48			780.68	<p>The property is located in the Brigalow Belt bioregion, . Qld.</p> <p>The species is found in a wide variety of habitats in association with deep leaf litter, including wet sclerophyll forests, woodlands and grasslands.</p> <p>The property supports large tracts of woodlands including 11.8.5, 11.8.5a, 11.3.21.</p> <p>The of the property are located in a state significant biodiversity corridor.</p>	Wyong		1,763	<p>The property contains large areas of remnant woodlands and some regrowth vegetation that have potential to provide suitable habitat for the species.</p> <p>The species is found in a wide variety of habitats in association with deep leaf litter, including wet sclerophyll forests, woodlands and grasslands.</p> <p>The property is strategically located within a state significant biodiversity corridor .</p>				
Eucalypt woodland grouping													
Poplar Box/Weeping Myall TEC	327.68			3.18	<p>This is a large property situated in the Brigalow Belt bioregion. Qld.</p> <p>The property contains large areas of remnant eucalypt woodlands (>3,000 ha) and unmapped regrowth eucalypt woodlands (>350ha). This includes riparian areas with potential to support RE11.3.2 which are associated with Poplar Box TEC and Weeping Myall TEC.</p> <p>The larger watercourses are on north-eastern boundary and offset may consist of managing regrowth RE11.3.2 and potentially revegetation.</p> <p>The property is strategically state significant biodiversity corridor .</p>			44.24	<p>The property is located in the Brigalow Belt bioregion, . Qld. The property contains areas of Poplar Box (<i>Eucalyptus populnea</i>) including approximately 44.24 ha of remnant RE11.3.2 <i>Eucalyptus populnea</i> woodland on alluvial plains.</p> <p>Preference would be those areas of Poplar Box which are adjacent to and/or have connections along creeklines and to existing intact bushland areas to maximise connectivity.</p>			157	<p>The property is situated north of Inglewood and directly .</p> <p>The property is mapped as containing large areas of HVR and unmapped regrowth of 11.3.2. There are large areas on land zone 3 and a stream order 4 through .</p> <p>The property is located directly adjacent .</p>

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments
Poplar Box/Weeping Myall TEC (continued)				146.2	This is a large property situated in Brigalow Belt bioregion, Qld. The property contains large areas with potential to support unmapped regrowth and restoration of RE11.3.2. This RE is associated with Poplar Box and Weeping Myall TEC. These potential TEC areas are adjacent to .			5.86	The property is located in the Brigalow Belt bioregion, Qld. The property is mapped as containing areas with potential for restoration of RE11.3.2. This RE is associated with Poplar Box and Weeping Myall TEC.				
Of Concern RE11.3.4	56.96			91.44	The property supports small patches of remnant 11.3.4. It is also mapped as containing mixed polygons 11.3.2/11.3.4/11.9.7 as HVR and unmapped regrowth. Ground-truthing would need to occur to determine extent of 11.3.2, 11.3.4 and 11.9.7 on the property. The property is situated . There is a large patch of remnant 11.3.4 to north of property.								
Of Concern RE11.5.14	198.84			974	The property is situated in the Brigalow Belt bioregion, . The property contains large areas of remnant RE 11.5.14 and non-remnant grasslands associated with this RE. The remnant areas are connected to other large areas of these grasslands to the south and west. Restoration of these grasslands is likely to be required based on current land uses in the area which include cropping and grazing.								
Of Concern RE11.9.7	21.32			16.44	The property supports areas of RE11.9.7 as HVR and unmapped regrowth. The RE is within mixed polygons of 11.3.2/11.3.4/11.9.7. Ground-truthing would need to occur to determine extent of 11.3.2, 11.3.4 and 11.9.7 on the property.			211.10	The property is located in the Brigalow Belt bioregion, north-west of Inglewood. The property supports large areas of RE11.9.7 including remnant and unmapped regrowth. The property is strategically located .				
Koala	1924.20			1,763	Koala habitat on the property consists of large areas of remnant and regrowth eucalypt woodlands including RE11.3.2, 11.3.25, 11.5.4 and 11.5.20. The vegetation communities being 11.3.2 Eucalyptus populnea woodland on alluvial plains and 11.3.25 Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines occur on alluvial areas adjacent to watercourses and consist of regrowth vegetation. These regrowth habitats would be managed and potential revegetation of koala habitat trees undertaken to improve connectivity. Remnant woodlands are dominated by RE11.5.20 Eucalyptus moluccana and/or E. microcarpa and/or E. woollsiana +/- E. crebra woodland or RE11.5.4 Eucalyptus chloroclada, Callitris glaucophylla, C. endlicheri, Angophora leiocarpa woodland on Cainozoic sand plains. These are known to support the species. There are koala records which are connected through remnant patches of woodland.			448	The property is located in the Brigalow Belt bioregion, Qld. The property contains areas of Poplar Box (<i>Eucalyptus populnea</i>) including approximately 44.24 ha of remnant RE11.3.2 <i>Eucalyptus populnea</i> woodland on alluvial plains. The property contains areas of open woodland associated with RE11.3.4 and 11.3.25 which occur on the property are known to support the species. The riparian vegetation communities on the property will provide preferred foraging resources and movement corridors for the species. Preference would be those areas of Poplar Box which are adjacent and/or have connections along creeklines and to existing intact bushland areas to maximise connectivity.				

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments
Spotted tail quoll	61.96			101.68	<p>The property is located in the Brigalow Belt bioregion, , Qld. The property contains areas of open woodland. RE11.3.4 and 11.3.25 which occur on the property are known to support the species.</p> <p>The property contains patches of remnant communities. There is likely to be suitable denning habitat for the species.</p>								
Collared delma	1183.04			676.84	<p>The property is located in the Brigalow Belt bioregion.</p> <p>The property supports woodlands on land zones 3 and 9 with potential to support the species including 11.3.2 and 11.9.7.</p> <p>This species predominately inhabits eucalypt-dominated woodlands and open forests on land zones 3, 9 and 10. The presence of terrestrial microhabitat is critical for this species occurrence. Microhabitat attributes of which it shows strong associations with include rocky substrates, woody debris, and deep leaf litter (DAWE 2020).</p> <p>There is a collared delma record on the northern boundary of the property</p> <p>The property is strategically</p>		448.00	<p>The property is located in the Brigalow Belt bioregion, . Qld. The property contains areas Poplar Box woodland. RE11.3.2 is known to support the species.</p> <p>The property contains patches of remnant communities. There is likely to be suitable microhabitat present for the species.</p>			151.89	<p>The property is situated</p> <p>The property is mapped as containing large areas of HVR and unmapped regrowth of 11.3.2. There are large areas on land zone 3 and a stream order 4</p> <p>The property is located directly adjacent to large intact remnant areas</p>	
Glossy black cockatoo	1923.44			1,756	<p>This is a large property situated in the Brigalow Belt bioregion, . Qld.</p> <p>The species is known to be associated with RE11.5.4. This community supports foraging species including <i>Callitris glaucophylla</i>, <i>Angophora leiocarpa</i>, +/- <i>A. floribunda</i> with a low tree layer dominated by species such as <i>Allocasuarina luehmannii</i>, <i>A. inophloia</i> and <i>Callitris endlicheri</i>.</p> <p>There are records of Glossy black cockatoo</p> <p>An additional biodiversity value of the property is it contains records of Brush-tailed rock wallaby and <i>Macrozamia machinii</i> both listed as vulnerable under NC Act.</p>			1,053.06	<p>The property is located in the Brigalow Belt bioregion, .</p> <p>The property supports vegetation communities that provide suitable foraging resources for the species including RE's 11.3.14, 11.3.18, 11.5.1, 11.9.5.</p> <p>The property contains large areas of remnant, HVR and unmapped regrowth which are likely to provide foraging and denning habitat for the species.</p> <p>The property is strategically located</p>			974	<p>The property is situated in the Brigalow Belt bioregion, .</p> <p>The property contains large areas associated with RE 11.5.14 including remnant and regrowth. The remnant areas are connected to other large areas of these grasslands/shrublands to the south and west.</p> <p>The community includes scattered trees and shrubs or patches of shrubland to low open woodland of <i>Allocasuarina luehmannii</i> which are used by the species.</p> <p>Restoration of these grasslands is likely to be required based on current land uses in the area which include cropping and grazing.</p>
Winged Peppercreess	163.64			1,756	<p>This is a large property situated in the Brigalow Belt bioregion, . Qld.</p> <p>The species is known to be associated with RE11.5.4. <i>Eucalyptus chloroclada</i>, <i>Callitris glaucophylla</i>, <i>C. endlicheri</i>, <i>Angophora leiocarpa</i> woodland on Cainozoic sand plains and/or remnant surfaces.</p> <p>There are large areas of remnant RE11.5.4 mapped on the property and unmapped regrowth that are likely to provide suitable habitat for the species.</p>								

Table 5 Summary of potential offset sites for South East Queensland bioregion impacts

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments		Property name	Lot and Plan	Area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments
Melaleuca irbyana grouping														
Swamp tea-tree (Melaleuca irbyana) forest of Southeast Queensland (TEC)	121.84			91.49	<p>in the South east Queensland bioregion. The property is situated within an area where <i>M. irbyana</i> TEC areas are known to occur. The property supports vegetation communities that consist of RE12.9-10.11 and 12.9-10.27 and 12.3.19. These areas of vegetation include remnant, HVR and unmapped regrowth. These patches of vegetation would be managed to enhance habitat quality and ensure the vegetation meets TEC criteria.</p> <p>The property is strategically located in and areas of <i>M. irbyana</i> communities are also connected to other potential habitats for the TEC. The property is</p>			69.74	<p>in the South east Queensland bioregion. The property is situated within an area where <i>M. irbyana</i> TEC areas are known to occur. The property supports vegetation communities including RE12.9-10.11 and 12.9-10.27 and 12.3.19. These areas of vegetation include remnant, HVR and unmapped regrowth. The property is strategically located and areas of <i>M. irbyana</i> communities on the site are connected to other potential habitats for the TEC. The property is</p>			111.56	<p>in the South east Queensland bioregion. The property is situated within an area where <i>M.irbyana</i> TEC areas are known to occur. The property supports areas of remnant, HVR and regrowth RE12.9-10.11, 12.3.19 and 12.9-10.27 which may support the TEC. The property is strategically</p>	
Melaleuca irbyana (Swamp tea-tree)	1,466.04			257.78	<p>The properties are located in South east Queensland bioregion</p> <p>The properties contain mapped essential habitat for the species. Vegetation communities include remnant, HVR and unmapped regrowth patches of 12.9-10.27 and 12.9-10.11.</p> <p>These are an area where there is potential for large areas of the individual species to occur.</p>			707.00	<p>The properties are located in South east Queensland bioregion</p> <p>The properties contain vegetation communities including RE12.3.19, 12.9-10.27 and 12.9-10.11. There are large patches of HVR, some remnant patches and unmapped regrowth. Some properties contain mapped essential habitat for <i>M. irbyana</i>.</p> <p>These are a area where there is potential for large areas of the individual species to occur.</p>			229.11	<p>These properties are located</p> <p>The properties are mapped as supporting RE's 12.9-10.11 and 12.9-10.27 known to provide suitable habitat for the species.</p> <p>is potential for large areas of the individual species to occur.</p>	
Melaleuca irbyana (Swamp tea-tree) (continued)				91.49	<p>in the South east Queensland bioregion. The property is situated within an area where <i>M. irbyana</i> is known to occur. The property supports large areas of suitable habitat including RE12.9-10.11 and 12.9-10.27 and 12.3.19. These areas of vegetation include remnant, HVR and unmapped regrowth. The species is likely to be present across the property.</p> <p>The property is strategically located in a regional corridor and areas of suitable habitat for M. irbyana are also connected to other potential habitats for the species and associated TEC. The property is</p>			69.74	<p>in the South east Queensland bioregion. The property is situated within an area where <i>M. irbyana</i> populations are known to occur. The property supports large areas of suitable habitat for the species including RE12.9-10.11, 12.9-10.27 and 12.3.19. Areas of vegetation include remnant, HVR and unmapped regrowth. The species is likely to be present across the property.</p> <p>The property is strategically located and areas of <i>M. irbyana</i> habitat are connected to other potential habitats for the species. The property is</p>			111.56	<p>in the South east Queensland bioregion. The property is situated within an area where populations of <i>M.irbyana</i> are known to occur. The property supports areas of remnant, HVR and regrowth RE12.9-10.11, 12.3.19 and 12.9-10.27 which are known to support the species. The species is likely to be present across the property. The property is strategically</p>	

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments		Property name	Lot and Plan	Area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments
Endangered RE12.3.19	42.68			1.78	<p>in the South east Queensland bioregion. The property supports small patches of RE12.3.19. The property is strategically located and areas of suitable habitat for <i>M. irbyana</i> are also connected to other potential habitats for the species and associated TEC.</p>				1.2	<p>the South east Queensland bioregion. The property is situated within an area where <i>M. irbyana</i> populations are known to occur. The property supports small patches of RE12.3.19 which are unmapped regrowth. The property is strategically located and areas of <i>M. irbyana</i> habitat are connected to other potential habitats for the species.</p>			41.38	<p>in the South east Queensland bioregion. The property is situated within an area where populations of <i>M. irbyana</i> are known to occur. The property supports areas of remnant, HVR and regrowth RE12.3.19. The property is strategically</p>
Endangered RE12.9-10.11	45.2			40.33	<p>in the South east Queensland bioregion. The property supports large areas of RE12.9-10.11, including remnant, HVR and unmapped regrowth. The property is strategically located in a regional corridor and areas of suitable habitat for <i>M. irbyana</i> are also connected to other potential habitats for the species and associated TEC.</p>				11.39	<p>the South east Queensland bioregion. The property is situated within an area where <i>M. irbyana</i> populations are known to occur. The property supports patches of RE12.9-10.11. Areas of vegetation include remnant, HVR and unmapped regrowth. The property is strategically located and areas of <i>M. irbyana</i> habitat are connected to other potential habitats for the species. The property</p>				
Endangered RE12.9-10.27	120.48			102.52	<p>in the South east Queensland bioregion. The property is situated within an area where <i>M. irbyana</i> is known to occur. The property supports large patches of RE12.9-10.27, including remnant, HVR and unmapped regrowth. The property is strategically located and areas of suitable habitat for <i>M. irbyana</i> are also connected to other potential habitats for the species and associated TEC. The property is</p>				58.22	<p>the South east Queensland bioregion. The property is situated within an area where <i>M. irbyana</i> populations are known to occur. The property supports large areas of 12.9-10.27. Areas of vegetation include remnant, HVR and unmapped regrowth. The property is strategically located and areas of <i>M. irbyana</i> habitat are connected to other potential habitats for the species. The property is</p>				
Vine scrub grouping														
Brush sophora	9.44			126.35	<p>in the South east Queensland bioregion Laidley. The property supports suitable habitat for the species associated with RE12.8.21. Vegetation communities consist of remnant and unmapped regrowth. The property is State significant biodiversity corridor.</p>									

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments		Property name	Lot and Plan	Area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments
Black-breasted button quail	36.72			221.18	<p>in the South east Queensland bioregion .</p> <p>The property provides suitable habitat for the species associated with RE12.8.21 and 12.9-10.15. Vegetation communities consist of remnant, HVR and unmapped regrowth.</p> <p>The property is strategically State significant biodiversity corridor.</p>									
Endangered RE12.8.21	9.44			126.35	<p>in the South east Queensland bioregion .</p> <p>The property supports remnant and unmapped regrowth of RE12.8.21.</p> <p>The property is State significant biodiversity corridor.</p>									
Endangered RE12.9-10.15	25.68			94.83	<p>in the South east Queensland bioregion .</p> <p>The property is mapped as containing areas of remnant, HVR and unmapped regrowth associated with RE12.9-10.15.</p> <p>The property is strategically State significant biodiversity corridor. 12.9-10.15 is mapped in mixed polygons as the dominant RE. Therefore ground-truthing will be required to determine the extent present.</p>									
Eucalypt woodland grouping														
Lloyd's Olive	192.12			1,742.52	<p>in the South east Queensland bioregion, .</p> <p>The property is State significant biodiversity corridor.</p> <p>The property contains large patches of RE12.9-10.2 and smaller patches of RE12.9-10.17 which are known to provide suitable habitat for Lloyd's Olive. There are records of the species in similar vegetation communities.</p>									

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments		Property name	Lot and Plan	Area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments
Spotted-tailed quoll	131.88			794.99	<p>The property is located in the South east Queensland bioregion, </p> <p>The property </p> <p>The property contains patches of RE12.3.3, 12.3.3d, and larger patches of 12.9-10.17 which are known to provide suitable habitat for Spotted-tailed quoll.</p> <p>There are records of the species </p>									
Collared delma	1169.20			772	<p>The property is located in the South east Queensland bioregion, </p> <p>The property contains large tracts of remnant woodlands, HVR woodlands and unmapped regrowth associated with REs 12.3.3, 12.9-10.2, 12.9-10.7, 12.9-10.5a. These communities are known to provide suitable habitat for the species.</p> <p>There are records of the species </p>			886.00	<p>The property is located in the South east Queensland bioregion </p> <p>The property contains large patches of remnant RE12.9-10.2 and RE12.9-10.5 which are known to support the species. There is also approximately 10 ha of regrowth.</p> <p>There are records of Collared Delma </p>					
Red goshawk	325.60			1,415.62	<p>The property is located in the South east Queensland bioregion</p> <p>The property is </p> <p>The property contains patches of RE12.3.3, 12.3.3d, and large patches of 12.9-10.2 which are known to provide suitable habitat for Red Goshawk. There </p> <p>including riparian woodlands with potential to support populations of the species.</p>									
Swift parrot	100.32			2,146.84	<p>The property is located in the South east Queensland bioregion, </p> <p>The property is </p> <p>The property contains patches of RE12.3.3, 12.3.3d, 12.9-10.17 and large patches of 12.9-10.2 which are known to provide suitable habitat for Swift parrot.</p>									

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments		Property name	Lot and Plan	Area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments
Brush-tailed rock wallaby	19.52			200	<p>The property is located in the South east Queensland bioregion, [REDACTED]</p> <p>The property is [REDACTED]</p> <p>The property contains suitable habitat for the species associated with REs12.9-10.3 and 12.9-10.6. These RE's are within mixed polygons so the extent of suitable habitat will need to be ground-truthed.</p>									
Koala	1521.44			1,180.95	<p>The property is located in the South east Queensland bioregion, [REDACTED]</p> <p>The property is [REDACTED]</p> <p>The property contains patches of RE12.3.3, 12.3.3d, 12.9-10.17 and areas of RE12.8.16 which are known to provide suitable habitat for Koalas.</p> <p>There are a large number of Koala records [REDACTED]</p> <p>[REDACTED] There are also a high number of records in non-remnant areas.</p>			280	<p>The property is located in the South east Queensland bioregion, [REDACTED]</p> <p>There are large areas of eucalypt woodlands including remnant, HVR and unmapped regrowth. RE's include RE12.3.3, 12.3.7, 12.9-10.2, 12.9-10.7</p> <p>There is essential habitat for Koalas mapped on the property.</p>			546.11	<p>[REDACTED]</p> <p>mapped State significant biodiversity corridor.</p> <p>Property contains areas of remnant, HVR and unmapped regrowth including communities that provide suitable foraging habitat for the species.</p>	
Grey-headed flying fox	1488.36			1,180.95	<p>The property is located in the South east Queensland bioregion, [REDACTED]</p> <p>The property is [REDACTED]</p> <p>The property contains patches of RE12.3.3, 12.3.3d, 12.9-10.17 and areas of RE12.8.16 which are known to provide suitable habitat for Grey-headed flying fox.</p>			91.75	<p>The property is located in the South east Queensland bioregion, [REDACTED]</p> <p>There are large areas of eucalypt woodlands including remnant, HVR and unmapped regrowth. RE's include RE12.3.3, 12.3.7, 12.9-10.7. These communities are known to provide preferred foraging resources for the species.</p>			656.21	<p>[REDACTED]</p> <p>mapped State significant biodiversity corridor.</p> <p>Property contains areas of remnant, HVR and unmapped regrowth including communities that provide suitable foraging habitat for the species.</p>	
Australian painted snipe	199.92			67.18	<p>The property is located in the South east Queensland bioregion, [REDACTED]</p> <p>The property is [REDACTED]</p> <p>The property contains patches of RE12.3.3, 12.3.3d in the lower lying areas of the property adjacent to creeks which can support suitable habitat for the species.</p>			21.30	<p>The property is located in the South east Queensland bioregion, [REDACTED]</p> <p>There are riparian woodlands and floodplain areas that have potential to provide suitable habitat for the species associated with RE12.3.3 and 12.3.7.</p>			56.38	<p>[REDACTED]</p> <p>mapped State significant biodiversity corridor.</p> <p>The property contains some areas of remnant and HVR woodlands as well as unmapped regrowth. Potential habitat for the Australian Painted Snipe is associated with lower lying floodplains and riparian areas associated with RE12.3.3 and 12.3.7.</p>	

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments		Property name	Lot and Plan	Area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments
Australian painted snipe (continued)				32.6	<p>in the South east Queensland</p> <p>The property supports regrowth vegetation of RE12.3.3. These floodplain and riparian areas have potential to provide suitable habitat for the species.</p>				96.2	<p>in the South east Queensland bioregion.</p> <p>The property contains large areas of RE12.3.3. These floodplain and riparian areas have potential to provide suitable habitat for the species. The communities include HVR and unmapped regrowth.</p>				
Grey falcon	537.96			88.82	<p>The property is located in the South east Queensland bioregion,</p> <p>The property is</p> <p>The property contains patches of RE12.3.3, 12.3.3d in the lower lying areas of the property adjacent to creeks.</p>				21.30	<p>The property is located in the South east Queensland bioregion,</p> <p>There are riparian woodlands that have potential to provide suitable habitat for the species associated with RE12.3.3 and 12.3.7.</p>				
Powerful owl	605.08													
Glossy black cockatoo	469.28			189.75	<p>State significant biodiversity corridor.</p> <p>Property contains areas of remnant, HVR and unmapped regrowth including communities that provide suitable foraging habitat for the species. These are associated with RE12.8.14.</p>				310.83	<p>in the South east Queensland bioregion</p> <p>The property supports suitable habitat for the species associated with RE12.9-10.6 and 12.8.14. Vegetation communities consist of remnant and regrowth.</p> <p>The property is</p> <p>State significant biodiversity corridor.</p>				
Bailey's cypress	593.20			1,052.03	<p>The property is located in the South east Queensland bioregion,</p> <p>The</p> <p>The vegetation communities on the property that are known to provide suitable habitat are; RE12.8.16 and 12.9-10.17.</p>									

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments		Property name	Lot and Plan	Area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments
Caustis blakei subsp. macrantha	41.64			232.58	The property is located in the South east Queensland bioregion, There are large areas of eucalypt woodlands including remnant, HVR and unmapped regrowth. RE's include RE12.3.3, 12.3.7, 12.9-10.2, 12.9-10.7. These communities are known to support preferred habitat for the species.									
Short-beaked Echidna	302.84			2,146.84	The property is located in the South east Queensland bioregion. The property is The vegetation communities on the property are known to provide suitable habitat for the Short-beaked Echidna.									
Platypus	191.08	-			Habitat availability will be assessed subsequent to field validation									
Slender milkvine	451.48	-												
Of Concern RE 12.3.8	3			0.48	in the South east Queensland bioregion. The property is situated within an area where M. irbyana populations are known to occur. The property supports very small area of RE12.3.8. The property is a regional corridor. The property									
Of Concern RE 12.9-10.3	0.2			1.89	in the South east Queensland bioregion. The property supports small patches of high value regrowth and unmapped regrowth of RE12.9-10.3. The property is 12.9-10.3 is mapped in as the fourth RE mixed polygons. Therefore ground-truthing will be required to determine the extent present.									

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments		Property name	Lot and Plan	Area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments
Of Concern RE 12.9-10.7	595.68			1048.24	<p>The property is located in the South east Queensland bioregion.</p> <p>The property supports remnant and unmapped regrowth of RE12.9-10.7.</p> <p>The property is</p> <p>12.9-10.7 is mapped in mixed polygons as a secondary RE. Therefore ground-truthing will be required to determine the extent present.</p>									
Endangered RE12.3.3	27.44			78.97	<p>The property is located in the South east Queensland bioregion.</p> <p>The property supports remnant and unmapped regrowth of RE12.3.3.</p> <p>The property is</p> <p>12.3.3 is mapped in mixed polygons as a dominant RE. Therefore ground-truthing will be required to determine the extent present.</p>									
Endangered RE12.3.3d	24.36			24.59	<p>to a mapped State significant biodiversity corridor. The property supports high value regrowth and unmapped regrowth of RE12.3.3d.</p> <p>12.3.3d is mapped in mixed polygons. Therefore ground-truthing will be required to determine the extent present.</p>									
Endangered RE12.3.18	30.16			8.25	<p>the South east Queensland bioregion. The property supports areas of remnant, HVR and unmapped regrowth RE12.3.18.</p> <p>The property State significant biodiversity corridor.</p>									
Of concern RE12.9-10.16	18.32	-												

6 Offset partnerships

ARTC is committed to achieving enduring and meaningful conservation outcomes through the delivery of environmental offsets in the local regions where impacts occur. ARTC will seek to establish and foster working partnerships with key organisations who can assist in the delivery of environmental offsets and provide value adds such as social benefits by involving local communities.

Partnerships may include:

- ▶ Securing and managing land for conservation
- ▶ Revegetation and restoration
- ▶ Targeted pest and weed management programs
- ▶ Education and raising awareness of key biodiversity values in the local regions of the project
- ▶ Research associated with key threatened species and or vegetation communities.

Options for offset partnerships are being explored and will be outlined in greater detail in the Environmental Offset Proposals.

ARTC is also seeking to maximise the social and community benefits of the environmental offset investments by working with relevant Aboriginal groups, local government, community groups, Natural Resource Management Catchment Groups and conservation organisations to support both the site selection process, and the ongoing management and monitoring of these offset sites. ARTC has commenced consultation with stakeholder groups and will continue to do so through the project approval and offset process to explore these opportunities.

7 Next steps

ARTC is committed to providing environmental offsets for significant residual impacts to MNES and those MSES and MLES that are not assessed under the Commonwealth framework. The EO Act does not affect or limit the functions and powers of the Coordinator-General under the SDPWO Act, however ARTC will have regard to the principles of the QEOP in determining and implementing offset requirements for MSES and MLES.

Land-based offsets that comply with the EPBC Act Environmental Offsets Policy will form the initial focus for delivering the project's Queensland environmental offset requirements. Land-based offsets will be strategically located and co-locate a number of the project's MNES, MSES and MLES offset requirements. Larger offset sites will be preferentially identified that contain sufficient area of the required values to meet the total Queensland Inland Rail project requirements.

This Strategy applies across all relevant Queensland projects. While the offset properties identified under this Strategy are preliminary, further offset site optimisation on revised MNES, MSES and MLES impact information will be subsequently undertaken in order to generate an up to date offset property portfolio. Landholder engagement and ground-truthing will need to occur to assist finalising offset sites and total offset areas required.

Project specific Environmental Offset Proposals will be finalised by the end of January 2021 to identify the likely environmental offset requirements at a project level. An Environmental Offset Delivery Plan will be prepared during 2021 outlining the final offset package to be delivered for all Queensland projects once all offset requirements are determined.

Regular communication and progress updates will be provided to government agencies including seeking feedback on proposed offset sites and conservation outcomes to be achieved. Specifically, this will include the following key steps:

- ▶ Undertake further offset site optimisation on revised MNES, MSES and MLES impact information to generate an up to date offset feasibility assessment.
- ▶ Undertake additional seasonal ecological assessments within target areas of the project alignment to progress the understanding of validated impacts on MNES, MSES and MLES including assessing habitat quality for future offset site condition comparison.
- ▶ Continue to consult with DAWE and OCG on the proposed approach for the assessment and delivery of environmental offsets for Queensland projects.
- ▶ Consult with stakeholders to identify opportunities for collaboration and partnerships.
- ▶ Select potential offset properties that contain the required offset values across Queensland projects and engage with landowners as early as possible to understand options available.
- ▶ Finalise a shortlist of preferred offset sites and begin preliminary ground truthing. Ground-truthing will include validation of the presence of offset values, confirming suitability of the site, assessing habitat quality and determining management actions.
- ▶ Prepare required documentation according to Figure 2, Staging Offset Assessment and Delivery, at key milestones to gain regulator feedback and endorsement of the offset package.

8 References

Department of Environment and Heritage Protection (DEHP) (2014). *Queensland Environmental Offsets Policy: Significant Residual Impact Guideline. Prepared by Biodiversity Integration and Offsets, Ecosystem Outcomes*, Department of Environment and Heritage Protection.

Department of Environment and Science (DES) (2020a). *Queensland Environmental Offsets Policy (Version 1.8). Prepared by Conservation Policy and Planning, Department of Environment and Science*.

Department of Environment and Science (DES) (2020b). *Guide to determining terrestrial habitat quality (Version 1.3, 2020)*.

Department of the Environment (DoE) (2013). *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance*. Commonwealth of Australia.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPoC) (2012). *Environment Protection and Biodiversity Conservation Act 1999 –Environmental Offsets Policy*. Commonwealth Government.

Department of State Development and Infrastructure Planning (DSDIP) (2014) *Significant Residual Impact Guideline for projects that require an authority under the Sustainable Planning Act 2009*. State of Queensland, Department of State Development, Infrastructure and Planning.

Neldner, V.J., Niehus, R.E., Wilson, B.A., McDonald, W.J.F., Ford, A.J. and Accad, A. (2019) *The Vegetation of Queensland. Description of Broad Vegetation Groups. Version 4.0*. Queensland Herbarium, Department of Environment and Science.

State Development and Public Works Organisation Act 1971.

Transport Infrastructure Act 1994.