



Koala Survey and Monitoring

Thermal koala survey

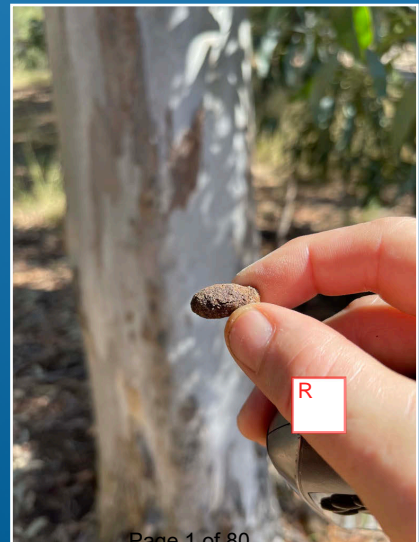
GREENRIDGE SITE Dec. 2021 - Jan. 2022



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Greenridge thermal drone survey

Background

Drones are increasingly being used for ecological applications such as surveys of flora and fauna and wildlife management activities. Surveys of koalas are ideally suited to thermal imaging drone surveys as they are cryptic in nature and the detection rate of koalas using traditional transect (ground) surveys can vary widely depending on factors such as the vegetation type and cover and the experience of the survey team.

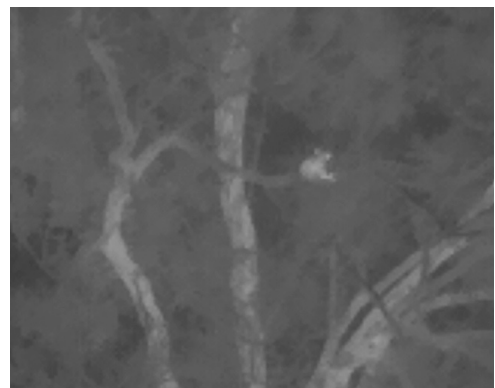
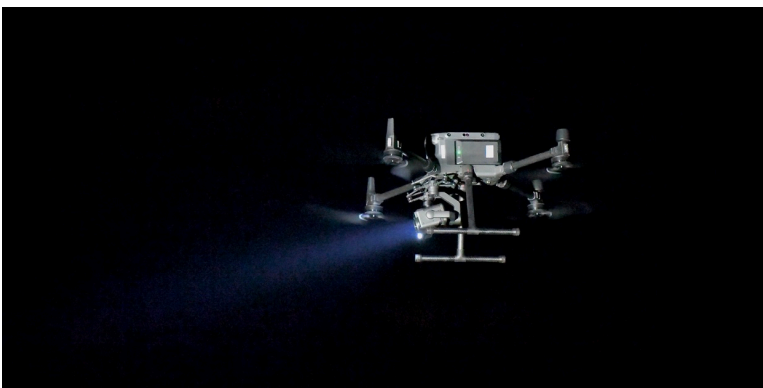
Endeavour Veterinary Ecology (EVE) was engaged by the Department of Transport and Main Roads to conduct koala surveys in areas within and adjacent to the Coomera Connector corridor. Surveys to determine the distribution and abundance, health, and reproductive status of local koala populations are essential to effectively understand and manage the long-term viability of these populations. EVE conducted surveys of the Pimpama River Conservation Area (PRCA) and Greenridge site to assess the distribution and estimate the number of koalas residing on the site. Both sites were surveyed as this area is somewhat isolated and the koala populations on both sites are closely linked and from an ecological perspective, can be considered a single population. The health of the PRCA koalas is being actively managed through capture, the fitting of monitoring devices and comprehensive health assessments and treatment of sick animals.

Methods

Drone surveys were conducted over 13 nights from 2 December 2021 to 10 February 2022, with the Greenridge site surveyed over 6 nights. All areas of koala habitat were surveyed, except for two small areas on the site (approx 9.5 ha in total) where site terrain made it difficult to maintain visual line of sight of the drone (a Civil Aviation Safety Authority (CASA) requirement). The area was divided into 6 discrete search polygons and each area was systematically searched in an 'up-and-back' lawn-mower pattern using a Matrice 300 RTK (M300) with H20T camera (dual optical and thermal).

Thermal heat signatures suggestive of koalas were investigated to positively identify the origin of the heat source. Where a koala was identified, the location of the koala was determined using a laser rangefinder and the GPS coordinates recorded in a spreadsheet and a reference screen shot of the koala with the coordinates was saved. Coordinates and drone flight paths were plotted on Google Earth and any obvious duplicate detections were deleted.

Detection rates were estimated based on the known locations of existing radio-tagged koalas and the proportion of animals detected or missed on any given night. We estimated our detection rate ranged between 0.65 and 0.85 (65% to 85% of koalas detected). As with traditional surveys, thermal drone detections of koalas are impeded by vegetation type/canopy density, the experience of the spotters, as well as environmental conditions where warm temperatures and water bodies can mask heat signatures by reducing the temperature differential between the environment and the koala.



Results

In total, 68 koalas were detected on site (Figure 1) during thermal drone surveys of areas of koala habitat. These detections were all positively identified as koalas using optical imaging. Based on our estimated detection rate where we know koalas are missed, the estimated numbers of koalas at the Greenridge site was estimated to be between 80 and 105 animals, where 68 detections at a detection rate of 85% equates to approximately 80 animals and a 65% detection rate equates to approximately 105 animals.

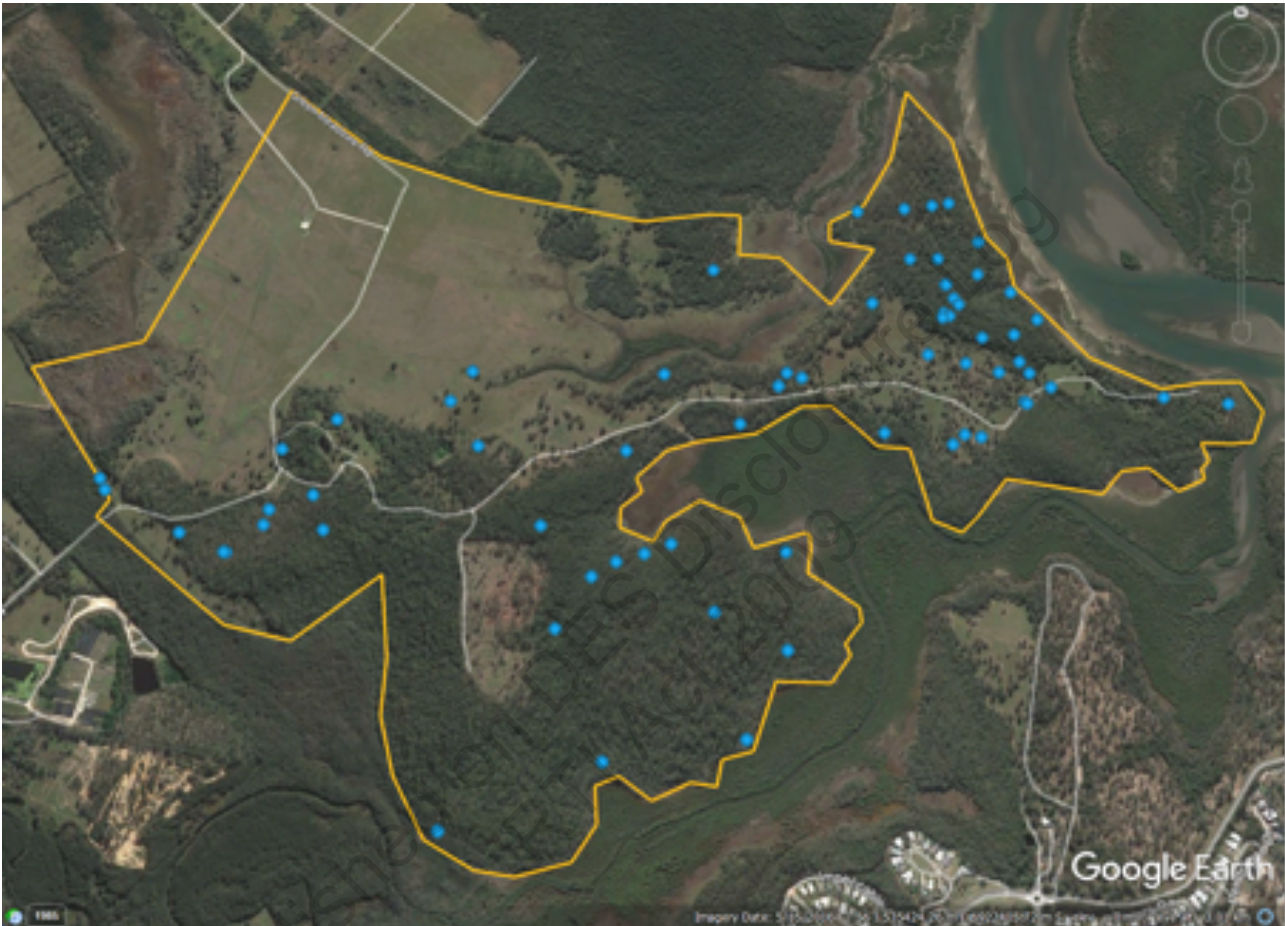


FIGURE 1. LOCATION OF THE 68 KOALAS DETECTED BY THERMAL DRONE SURVEYS IN THE GREENRIDGE SITE.

Discussion

Thermal drone surveys are becoming an increasingly common method of surveying flora and fauna. Koalas are ideally suited to night time thermal surveys as: 1. Animals are most active in the tops of the canopies feeding at night; and, 2. Koalas are a relatively large animal with an often-distinctive heat signature that can be detected well above the tree canopy by thermal cameras and can result in a greater detection of animals than traditional ground-based surveys. However, as is the case with any survey method, there are limitations to the use of thermal drones for koala population surveys where an understanding of detailed population metrics is required. Besides the legal requirements enforced by CASA around the use of drones, when koalas are detected, the assessment of the sex, reproductive and health status of the animal is often not possible. Ground-based field validation and monitoring of koalas is still an important component of koala population management.

In order to meet the requirements of the Coomera Connector (Stage 1) koala tagging and monitoring program, there may be a future need to access the Greenridge property for more detailed koala health assessments. Should additional ground-based fieldwork be required, TMR will liaise directly with the Greenridge landowner.

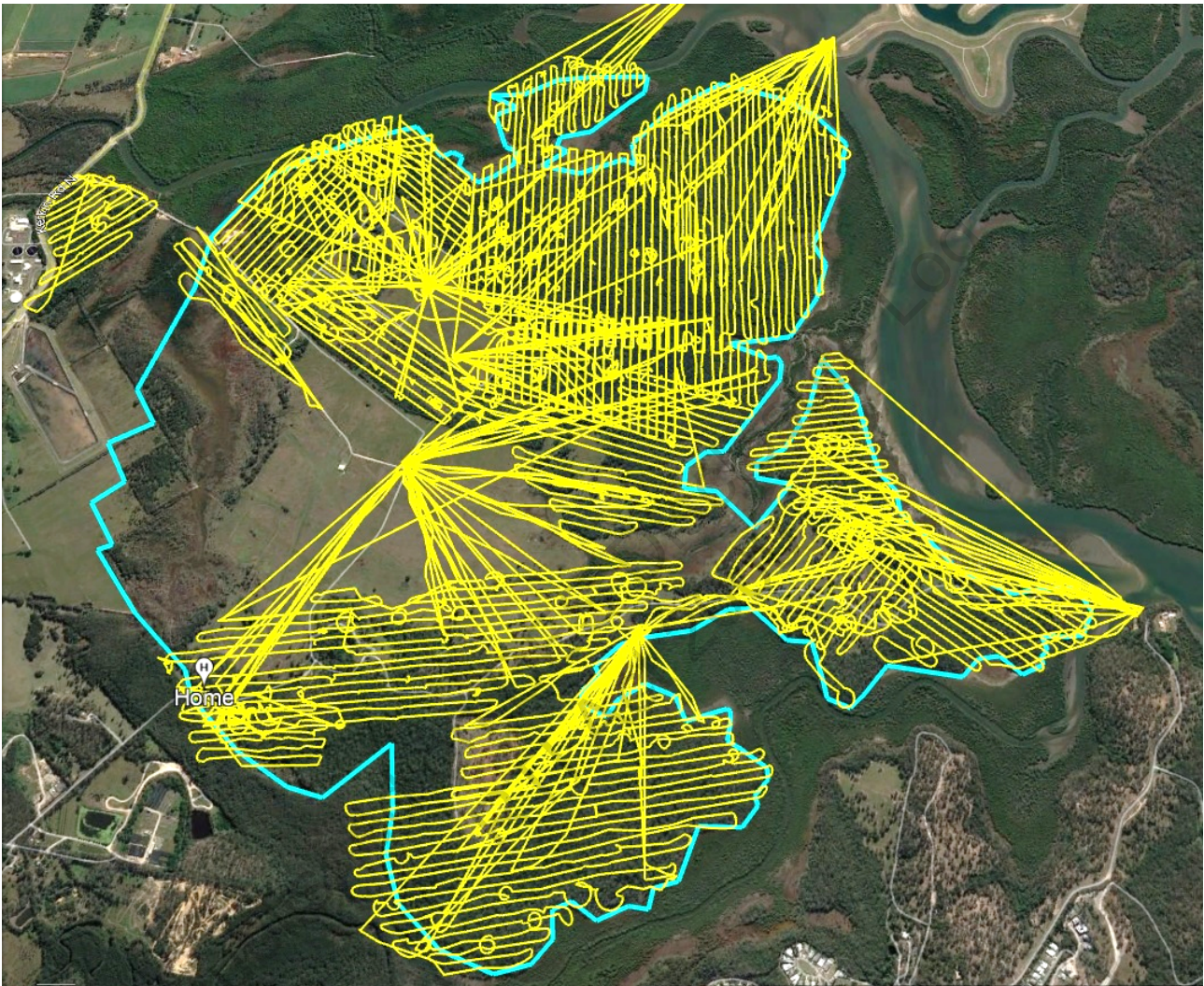


FIGURE 2. DRONE SURVEY TRANSECTS COVERED ALMOST ALL AREAS OF KOALA HABITAT WITHIN THE PRCA AND GREENRIDGE SITE.

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M or E:

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**GUIDELINES FOR THE CONTENT OF A DRAFT
PUBLIC ENVIRONMENT REPORT**

**Stage 1 Coomera Connector, Queensland
(EPBC 2020/8646)**

Department of Transport and Main Roads

***Environment Protection and Biodiversity
Conservation Act 1999***

GUIDELINES FOR A DRAFT PUBLIC ENVIRONMENT REPORT FOR STAGE 1 COOMERA CONNECTOR, QUEENSLAND

PREAMBLE

Department of Transport and Main Roads (the proponent), proposes construct a 17 km six-lane road from Oakey Creek Road, Coomera to Nerang-Broadbeach Road, Nerang and associated infrastructure.

On 3 June 2020, a validated proposal was referred to the Department of Agriculture, Water and the Environment (the Department) under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act).

On 14 August 2020, a delegate of the Minister determined the proposed action was a controlled action due to likely significant impacts on the following matters of national environmental significance (MNES) that are protected under Part 3 of the EPBC Act:

- Ramsar wetlands (sections 16 & 17B);
- Listed threatened species and communities (sections 18 & 18A); and
- Listed migratory species (sections 20 & 20A).

On 14 August 2020, a delegate of the Minister made the decision that the proposed action be assessed by Public Environment Report (PER).

Information about the action and its relevant impacts, is to be provided in the PER. This information should be sufficient to allow the Minister to make an informed decision on whether or not to approve, under Part 9 of the EPBC Act, the taking of the action for the purposes of each controlling provision.

GENERAL ADVICE ON GUIDELINES

GENERAL CONTENT

The PER must be a stand-alone document that primarily focuses on the MNES listed above. It should contain sufficient information to avoid the need to search out previous or supplementary reports, including any relevant technical reports for previous studies in relation to Stage 1 Coomera Connector, Queensland (the proposed action). The PER should take into consideration the EPBC Act Significant Impact Guidelines that can be downloaded from the following web site: <http://www.environment.gov.au/epbc/guidelines-policies.html>.

The PER should enable interested stakeholders and the Minister to understand the environmental consequences of the proposed action. Information provided in the PER should be objective, clear, and succinct and, where appropriate, be supported by maps, plans, diagrams or other descriptive detail. The body of the PER is to be written in a clear and concise style that is easily understood by the general reader. Technical jargon should be avoided wherever possible. Cross-referencing should be used to avoid unnecessary duplication of text but must be specific (e.g. section 1.1.1).

Detailed technical information, studies or investigations necessary to support the main text should be included as appendices to the PER. It is recommended that any additional supporting documentation and studies, reports or literature not normally available to the public from which information has been extracted be made available at appropriate locations during the period of public display of the PER.

After receiving the Ministers approval to publish the report, the proponent is required to make the PER available for a period of public comment. Specific instructions regarding publication requirements will be provided as part of the Minister's direction to publish.

If it is necessary to make use of material that is considered to be of a confidential nature, the proponent should consult with the Department on the preferred presentation of that material, before submitting it to the Minister for approval for publication.

The level of analysis and detail in the PER should reflect the level of significance of the expected impacts on the environment. Any and all unknown variables or assumptions made in the assessment must be clearly stated and discussed. Further, any claims made (e.g. regarding the presence/absence of protected matters, the efficacy of mitigation measures) need to be adequately justified and supported with evidence. The extent to which the limitations, if any, of available information may influence the conclusions of the environmental assessment should be discussed.

The proponent should ensure that the PER assesses compliance of the proposed action with principles of Ecological Sustainable Development as set out in the EPBC Act, and the objects of the Act at Attachment 1. A copy of Schedule 4 of the EPBC Regulations, *Matters to be addressed by draft public environment report and environmental impact statement* is at Attachment 2.

FORMAT AND STYLE

The PER should comprise three elements:

- the executive summary;
- the main text of the document; and
- appendices containing detailed technical information and other information that can be made publicly available.

The guidelines have been set out in a manner that may be adopted as the format for the PER. This format need not be followed where the required information can be more effectively presented in an alternative way. However, each of the elements must be addressed to meet the requirements of the EPBC Act and Regulations.

The PER should be written so that any conclusions reached can be independently assessed. To this end all sources must be appropriately referenced. The reference list should include the address of any Internet “web” pages used as data sources.

The main text of the PER should include a list of abbreviations, a glossary of terms and appendices containing:

- a copy of these guidelines;
- a list of persons and agencies consulted during the PER;
- contact details for the proponent; and,
- the names of the persons involved in preparing the PER and work done by each of these persons.

Maps, diagrams and other illustrative material should be included in the PER. The PER should be produced on A4 size paper capable of being photocopied, with maps and diagrams on A4 or A3 size and in colour where possible.

The proponent should consider the format and style of the document appropriate for publication on the Internet. The capacity of the website to store data and display the material may have some bearing on how the document is constructed.

PER CONTENT

The content below has been determined in accordance with the requirements under schedule 4 the *EPBC Regulations – matters that must be addressed in a PER and EIS*. The Department notes that some of the information may have been provided as part of the EPBC Referral. However, the PER is a standalone document and must address the requirements of the EPBC regulations. Specific content requirements have been included under each section, and text boxes have been provided for additional guidance relating to the proposed action.

In order to adequately assess the nature, severity and extent of likely impacts, and the adequacy of any proposed avoidance, mitigation and/or compensatory (offset) measures, relevant to the matters listed in the preamble, the following information is required:

1. DESCRIPTION OF THE PROPOSED ACTION

This should provide the background and context of the proposed action including:

- (a) the title of the proposed action;
- (b) the full name and postal address of the designated proponent;
- (c) a clear outline of the objective of the proposed action;
- (d) the location of the proposed action;
- (e) the background to the development of the proposed action;
- (f) how the proposed action relates to any other actions (of which the proponent should reasonably be aware) that have been, or are being, taken or that have been approved in the region affected by the proposed action;
- (g) the current status of the proposed action; and
- (h) the consequences of not proceeding with the proposed action.

1.1. Project details

All construction, operational and (if relevant) decommissioning components of the proposed action should be described in detail. This should include the precise location (including coordinates) of all works to be undertaken, structures to be built or elements of the proposed action that may have impacts on MNES.

The description of the proposed action must also include details on how the works are to be undertaken (including stages of development and their timing) and design parameters for those aspects of the structures or elements of the proposed action that may have relevant impacts.

Provide the total size (in hectares) of the project site and the total size (in hectares) of the disturbance footprint. If the disturbance footprint is the same as the project site this should be clearly stated.

1.2. Feasible alternatives

Any feasible alternatives to the proposed action to the extent reasonably practicable, including:

- (a) if relevant, the alternative of taking no action;
- (b) a comparative description of the impacts of each alternative on the MNES protected by controlling provisions of Part 3 of the EPBC Act for the action; and
- (c) sufficient detail to make clear why any alternative is preferred to another.

Short, medium and long-term advantages and disadvantages of the options should be discussed.

This section should also consider whether the proposed action will facilitate further growth, and indirectly cause increased pressure on MNES.

Wherever possible, mapping and figures should be included to describe any alternative measures/routes.

1.3. DESCRIPTION OF THE ENVIRONMENT

A description of the existing environment of the project site and the surrounding areas that may be affected by the action (this may include downstream of the project site). This should include details of the current and historical land use of the area.

2. MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

This section must provide the quantification of the extent of the MNES present both within and surrounding the proposed action site, details of the resources used to identify and assess the below MNES, and whether consultation was undertaken and/or advice sought from local community groups or experts. The description of MNES should focus on the following controlling provisions:

- Ramsar wetlands (sections 16 & 17B);
- Listed threatened species and communities (sections 18 & 18A); and
- Listed migratory species (sections 20 & 20A).

Output from the protected matters search tool must also be included as an appendix. This can be accessed at the following website: <http://environment.gov.au/epbc/protected-matters-search-tool>.

2.1. Moreton Bay Ramsar Wetland

2.1.1. Description

Describe each waterbody contributing to and within the Moreton Bay Ramsar Wetland likely to be impacted by the proposed action. Detail the environmental condition, as well as any MNES known to occur within the associated waterbodies and Moreton Bay Ramsar Wetland.

A description of the ecological character of the Moreton Bay Ramsar Wetland must be provided, including the following details:

- current status and condition of the Moreton Bay Ramsar Wetland, including the past and projected trends and existing threats, at both the project site scale and the whole of the Ramsar Wetland scale;
- Ramsar values (identified in the listing criteria in the Ramsar Information Sheet), critical components, processes and services of the Moreton Bay Ramsar Wetland (identified in the Draft Ecological Character Description (ECD) or final ECD if available). This includes:
 - extent and types of wetland habitats at the proposed action site and in areas that may be impacted by the proposed action;
 - extent and types of habitats at the proposed action site and in areas that may be impacted by the proposed action;

- threatened and listed migratory species numbers, distribution and site fidelity at the proposed action site and in areas that may be impacted by the proposed action;
- threatened ecological community locations;
- locations of feeding and roosting habitats and numbers of listed migratory birds, the behavioural ecology which links these habitats, their site fidelity and their usage of the area in regional context;
- water quality;
- soils and sediments, including acid sulfate soils (ASS) and potential acid sulfate soils (PASS);
- the scope, timing (survey season/s) and methodology for studies or surveys used to provide the above baseline information at the site and in areas that may be impacted by the project;
- how surveys were undertaken in accordance with relevant Commonwealth, State guidelines or best practice survey guidelines at the time of the surveys, or if relevant, the justification for divergence from relevant Commonwealth, State guidelines or best practice survey guidelines at the time of the surveys; and
- detail of any known or potential sources of contaminated land in the vicinity of the site. Describe the risk of the development activities leading to land becoming contaminated and the potential consequences to the ecological character of the Moreton Bay Ramsar site and dependant listed threatened species and communities and listed migratory species.

2.1.2. Impact assessment

Describe and assess the impacts (direct and indirect) to the Moreton Bay Ramsar Wetland giving consideration to relevant Departmental policies and guidelines, including the *Significant Impact Guidelines 1.1: Environment Protection and Biodiversity Conservation Act 1999* (2013). These guidelines can be found at the following website:

<http://www.environment.gov.au/epbc/publications/significant-impact-guidelines-11-matters-national-environmental-significance>.

The PER must include an assessment of both direct and indirect impacts as a result of the proposed action and associated impacts on the Moreton Bay Ramsar Wetland, and demonstrate the proposed action is consistent with the Ramsar concept of “wise use” of the Moreton Bay Ramsar Wetland. This must include an assessment of the barrier/edge effects of the proposed action on the Moreton Bay Ramsar Wetland and associated upstream waterbodies. Cumulative impacts also need to be considered, with further guidance provided in section 3.

The PER must also provide an assessment of direct and indirect impacts as a result of the proposed action and the associated impacts on listed threatened species and ecological communities, and listed migratory species (or their habitat) dependent on the Moreton Bay Ramsar Wetland. The PER should include the following:

This section must discuss, but not be limited to, the following potential impacts arising from the proposed action:

- clearing of habitat/vegetation within the Moreton Bay Ramsar Wetland boundary;
- changes to flood dynamics;
- erosion, nutrient enrichment and disturbance of contaminated sediments;
- changes to availability of foraging resources;
- disturbances to listed threatened and listed migratory species roosting/foraging habitat;
- increased predation;
- spread of weeds;
- spread of disease and/or pathogens; and
- increase in litter.

In addition to the above list, the proposed action involves the construction of structures and associated clearing and/or disturbance of a number of waterbodies within or directly upstream of the Moreton Bay Ramsar Wetland, some of which contain MNES or their habitat. The PER must discuss the direct and/or indirect impacts to surface water and ground water as a result of the proposed action.

2.1.2.1. Surface Water

This section must discuss a surface water quality monitoring program and water quality assessment and include, but not be limited to:

- (a) recent monitoring data provided from other nearby monitoring sites, including from representative control sites further upstream and downstream from the construction areas;
- (b) baseline data on the water quality of the water bodies to be used to determine any changes;
- (c) identification of the monitoring locations for discharge points during development and the ongoing future use of the site;
- (d) a stormwater runoff assessment including quantification of the volume and water quality of the discharge from the proposed action area at the point of entering natural surface waters, estimations of future runoff volumes into the waterbodies and consideration of risks due to hazardous substance spills;
- (e) details on the construction of the diversion channels and how they will be designed to minimise potential impacts to MNES;
- (f) assessment of risks associated with increased erosion due to changes to the landscape;
- (g) monitoring of sediment loads pre (baseline), during and post construction; and,
- (h) any relevant water quality objectives.

2.1.2.2. Ground Water

This section must discuss a ground water assessment and include, but not be limited to:

- (a) altered porosity and permeability associated with any land disturbance;

- (b) groundwater characteristics across the proposed action area including depth to groundwater, piezometric surfaces of aquifers at the site, groundwater gradients and hydrogeological parameters;
- (c) an assessment of potential changes to groundwater baseflow contributions to the Moreton Bay Ramsar Wetlands and waterways in the project area;
- (d) identification of any potential groundwater dependent ecosystems based on depth to groundwater;
- (e) an assessment of the effects of the proposed action on groundwater dependent ecosystems and flows into the waterways within and downstream of the project area.

If (c) identifies likely changes to ground water baseflow, provide groundwater modelling including but not limited to:

- hydrogeological conceptualisation(s) and geological investigations for the proposed action area;
- predictive numerical groundwater modelling;
- short-term and long-term impact assessments and analysis of modelling during both the construction and operational phases of the project;
- predictions of groundwater recovery and re-equilibration scenarios, including the influence on nearby groundwater dependent assets;
- measures to manage groundwater encountered during the construction process;
- any further data collection proposed to characterise groundwater chemistry and inform the installation of monitoring bores;
- details of dewatering techniques used – including information on the pre-drainage process, treatment and disposal of extracted groundwater;
- information on the impacts of dewatering, including an assessment of impacts to local aquifers including groundwater drawdown; and
- identification of any other groundwater extraction in the area and an assessment of the potential impacts of the proposed action on these users. Detail of cumulative impacts from the removal and lowering of groundwater (e.g. groundwater recharge, changes to baseflows and downstream impacts on the receiving environments).

2.1.3. Mitigation Measures

The PER must include detailed descriptions of measures proposed to be undertaken by the proponent to avoid, mitigate and manage relevant direct and indirect impacts the proposed action on the Moreton Bay Ramsar Wetland.

A risk assessment of impacts from the proposed action should be included, with associated mitigation measures.

The PER should also detail the likely effectiveness of the proposed mitigation measures, and the associated confidence in impact mitigation. Wherever possible, mitigation measures should be substantiated by referencing relevant guidelines, literature, or relevant case-studies.

Any specific action management plans to be implemented should be listed here.

Further guidance on mitigation measures is provided in section 4 of these guidelines.

2.1.4. Residual significant impact assessment

After consideration of proposed avoidance, mitigation and management measures, provide an assessment of the likelihood of residual significant impacts on the Moreton Bay Ramsar Wetland.

The PER must provide a clear and definitive conclusion of residual significant impacts on the Moreton Bay Ramsar Wetland to align with the *EPBC Act Environmental Offsets Policy* (2012).

Further guidance on environmental offsets is provided in section 5 of these guidelines.

2.2. Listed Threatened Species and Ecological Communities and listed Migratory Species

This section must address, at a minimum, the following listed threatened species and ecological communities and listed migratory species:

- Koala (*combined populations of QLD, NSW, and the ACT*) (*Phascolarctos cinereus*) – vulnerable;
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – vulnerable;
- Coastal Swamp Oak (*Casuarina glauca*) forest of New South Wales and South East Queensland ecological community – endangered;
- Eastern Curlew (*Hirundapus caudacutus*) – critically endangered, migratory;
- Australian Painted Snipe (*Rostratula australis*) – endangered, migratory;
- Regent Honeyeater (*Anthochaera phygia*) – critically endangered, migratory;
- White-throated Needletail (*Hirundapus caudacutus*) – vulnerable, migratory;
- Australasian Bittern (*Botaurus poiciloptilus*) – endangered, migratory;
- Bar-tailed Godwit (*Limosa lapponica baurei*) – vulnerable, migratory;
- Sharp-tailed Sandpiper (*Calidris acuminata*) –migratory;
- Red-necked stint (*Calidris ruficollis*) – migratory;
- Latham's Snipe (*Gallinago hardwickii*) – migratory;
- Bar-tailed Godwit (*Limosa lapponica*) – migratory;
- Black-face Monarch (*Monarcha melanops*) – migratory;
- Satin Flycatcher (*Myiagra cyanoleuca*) – migratory;
- Whimbrel (*Numenius phaeopus*) – migratory;
- Osprey (*Pandion haliaetus*) – migratory;
- Glossy Ibis (*Plegadis falcinellus*) – migratory;

- Grey Plover (*Pluvialis squatarola*) – migratory;
- Rufous Fantail (*Rhipidura rufifrons*) – migratory;
- Common Greenshank (*Tringa Nebularia*) – migratory; and,
- Marsh Sandpiper (*Tringa stagnatilis*) – migratory.

Note: The above list may not be a complete list of listed threatened species and ecological communities and listed migratory species that will or are likely to be impacted by the proposed action. It is the proponent's responsibility to ensure that any listed threatened species and ecological communities and listed migratory species at the time of the controlled action decision, which will or are likely to be impacted by the project, are assessed for the Minister's consideration. Any listing events (e.g. the listing or up-listing of a species) that occur after the controlled action decision do not affect the assessment and approval process.

2.2.1. Description

Describe each listed threatened species and ecological community and listed migratory species noted above (including EPBC Act listing status, abundance, distribution, ecology and habitat preferences of the species or communities, etc.).

2.2.2. Desktop analysis

Describe the desktop assessment methodology used to inform the field surveys within and/or adjacent to the project site.

This section must provide context to the proposed action area by discussing known historical records of listed threatened species and ecological communities and listed migratory species within the proposed action area and in the broader region.

2.2.3. Survey effort

Provide details of the scope, methodology, timing, prevailing weather and climate conditions, and effort of field surveys (undertaken by qualified species experts with demonstrated experience in detecting the above species) within and/or adjacent to the project site, affected areas of the Moreton Bay Ramsar Wetland and affected waterbodies within the catchment of the Moreton Bay Ramsar wetland. Provide details of:

- how surveys were undertaken in accordance with relevant Commonwealth, State guidelines or best practice survey guidelines at the time of the surveys; and
- if relevant, the justification for divergence from relevant Commonwealth, State guidelines or best practice survey guidelines at the time of the surveys.

Any anticipated future surveys to be conducted in relation to MNES, whether office-based or field-based, must also be discussed.

2.2.4. Survey outcomes

State the total number of records (individuals and evidence of presence) of listed threatened species and ecological communities and listed migratory species within and/or adjacent to the

project site, affected areas of the Moreton Bay Ramsar Wetland and affected waterbodies within the catchment of the Moreton Bay Ramsar wetland identified during surveys.

Provide maps identifying verified sightings of MNES during studies or surveys.

This section should include an assessment of the adequacy of any surveys undertaken (including survey effort and timing). In particular, the extent to which these surveys were appropriate and undertaken in accordance with the Department's relevant scientific and policy guidance (see <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>).

2.2.5. Habitat assessment

Provide a robust assessment of the potential habitat available within, adjacent to and downstream of the project site for listed threatened species and ecological communities and listed migratory species. Habitat assessments must be derived from information obtained from:

- field surveys and vegetation assessments;
- the Species Profile and Threats (SPRAT) Database;
- relevant Departmental documents (e.g. approved conservation advices, recovery plans, listing advices, referral guidelines, etc.); and
- published research and other relevant sources (where relevant).

The SPRAT Database can be accessed from the following website:

<http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>.

The habitat assessment must not just consider Queensland Regional Ecosystem (RE) mapping to determine habitat for listed threatened species and listed migratory species. The habitat assessments must consider the information in the SPRAT Database and relevant Departmental documents. Where habitat assessments depart from Departmental information, adequate justification must be provided to substantiate its suitability to the assessment.

Please note, where habitat for other listed threatened species and communities and listed migratory species is identified on site, an assessment must be undertaken regardless of whether or not the species was recorded. As such, the potential for occurrence of listed threatened species and communities and listed migratory species must also be considered and assessed.

At a minimum, the habitat assessment for each listed threatened species and ecological community and listed migratory species must:

- identify any specific habitat requirement/s (e.g. breeding, foraging, dispersal, known important habitat, suitable habitats, roosting, etc);
- prove an assessment of the quality and importance of known or potential habitat for the species or communities within the proposed action area and surrounding areas;
- discuss existing threats (e.g. feral predators, traffic, etc.) with reference to threats posed by the proposed action;
- consider the regional context, describing the connectivity of habitat in the broader landscape, providing maps wherever possible; and
- provide the total amount of each type of habitat (in hectares) in the project site.

The total amount of each type of habitat must also be presented on a map for each listed threatened species and ecological community and listed migratory species. Each map must:

- include an appropriate basemap that provides the geographical context of the project area in the surrounding environment (i.e. aerial imagery);
- be specific to the habitat assessment undertaken for each listed threatened species and ecological community and listed migratory species (i.e. not illustrate relevant Queensland regional ecosystems only);
- include an overlay of the proposed action disturbance footprint; and
- include known records of individuals (or evidence of individuals) derived from desktop analysis and/or field surveys.

2.2.6. Impact assessment

The PER must include a detailed assessment of all relevant direct and indirect, short and long-term impacts of the action on MNES during both the construction and operational phases of the action.

Relevant impacts are impacts that the action will have or is likely to have on MNES. This includes an assessment of the nature, likelihood, significance, and extent of impacts and whether any relevant impacts are likely to be unknown, unpredictable or irreversible.

The PER must quantify the area of impact for listed threatened species and ecological communities and listed migratory species. Details of the methodology used to determine the likely impacts to MNES as a result of the proposed action, as well as any technical data and other information should be provided.

Where seasonal avoidance is proposed to minimise impacts to important lifecycle stages/migratory periods, consideration of scheduling needs to be provided, i.e. Grey-headed Flying-fox breeding season and migratory bird season.

Wherever possible, this assessment must be substantiated by evidence (i.e. academic literature, case studies) and provide consideration to the SPRAT Database and relevant Departmental policies and guidelines, including the *Significant Impact Guidelines 1.1: Environment Protection and Biodiversity Conservation Act 1999* (2013). These guidelines can be found at the following website: <http://www.environment.gov.au/epbc/publications/significant-impact-guidelines-11-matters-national-environmental-significance>.

This section must discuss, but not be limited to, the potential impacts identified in Table 2 below. Cumulative impacts also need to be considered, with further detail provided in [section 3](#). It is the proponent's responsibility to ensure that any known or likely impacts to listed threatened species and ecological communities and listed migratory species are assessed for the Minister's consideration. Reference should be made to the above *Significant Impact Guidelines 1.1: Environment Protection and Biodiversity Conservation Act 1999* (2013), as well as any available SPRAT profiles, Conservation Advices, Recovery Plans and Threat Abatement Plans.

Where relevant to the potential impact, a risk assessment should be conducted and documented.

Table 2: Potential impacts

MNES	Potential impacts
Coastal Swamp Oak (<i>Casuarina glauca</i>) forest of New South Wales and South East Queensland endangered ecological community	<ul style="list-style-type: none"> • Loss of habitat • Habitat fragmentation • Increased spread of weed species, disease and/or pathogens • Modified abiotic factors necessary for the community's survival, including changes to tidal inundation, hydrology and nutrient enrichment and disturbance of contaminated sediments • Increased edge effects within 191.3 ha of Coastal Swamp Oak (<i>Casuarina glauca</i>) forest of New South Wales and South East Queensland endangered ecological community (5.8 per cent of the community) within 1 km of the proposed action.
Koala	<ul style="list-style-type: none"> • Loss of habitat • Habitat fragmentation • Vehicle strike • Edge effects and reduced size of quality interior habitat • Disturbance from pollution (sound, light etc.) • Impacts of groundwater drawdown on riparian habitat
Grey-headed Flying-Fox	<ul style="list-style-type: none"> • Loss of habitat, particularly spring and winter foraging habitat • Habitat fragmentation • Vehicle strike • Edge effects and reduced size of quality interior habitat • Impacts of groundwater drawdown on riparian habitat • Disturbance from pollution (sound, light etc.)

Listed Migratory species as listed in section 2.2	<ul style="list-style-type: none"> • Loss of roosting and foraging habitat • Vehicle strike • Disturbance from pollution (petrochemical, turbidity, sound, light etc.) • Edge effects (increased pest and human incursion etc.) • Impacts from road infrastructure and changes/stabilisation of water levels
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Noise impacts

The PER must include an assessment of the impacts of noise and vibration associated with the construction, and ongoing operations of the proposed action (e.g. vehicle traffic) on all MNES. This must include an assessment of short-term and long-term impacts, including measured background noise levels that take into account seasonal variations. The magnitude, duration and frequency of any vibration must be discussed.

The locations of sensitive sites must be identified on a map at a suitable scale. Details of the results of baseline monitoring of noise and vibration in the proposed vicinity of the proposed action must be included.

Sufficient data must be gathered to provide a baseline for later studies. The daily variation of background noise levels at nearby sensitive sites must be monitored and reported in the PER, with particular regard given to detailing variations at different periods of the night. Any current activities near the proposed action that may cause a background level of ground vibration must be described.

Lighting impacts

The PER must include an assessment of the potential impacts of increased lighting associated with construction and operation of the proposed action on MNES (in particular migratory birds). This assessment must provide details of the lighting used, and the effects of lighting on listed threatened species and ecological communities and listed migratory species.

2.2.7. Mitigation measures

The PER must include detailed descriptions of measures proposed to be undertaken by the proponent to avoid, mitigate and manage relevant impacts of all stages of the action on listed threatened species and ecological communities and listed migratory species.

The PER should also detail the likely effectiveness of the proposed mitigation measures, and the associated confidence in impact mitigation. Wherever possible, mitigation measures should be substantiated by referencing relevant guidelines, literature, and relevant case-studies.

Please note the SPRAT Database may provide some relevant mitigation measures for listed threatened species and ecological communities and listed migratory species.

Any specific action management plans to be implemented should be listed here.

Further guidance on mitigation measures is provided in section 4 of these guidelines.

2.2.8. Residual significant impact assessment

After consideration of proposed avoidance, mitigation and management measures, provide an assessment of the likelihood of residual significant impacts on relevant listed threatened species and ecological communities, and listed migratory species.

The PER must provide a clear and definitive conclusion of residual significant impacts on relevant listed threatened species and ecological communities and listed migratory species to align with the *EPBC Act Environmental Offsets Policy (2012)*.

Further guidance on environmental offsets is provided in section 5 of these guidelines.

3. CUMULATIVE IMPACTS

The PER should identify and address cumulative impacts, where potential project impacts are in addition to existing impacts of other activities (including known potential future expansions or developments by the proponent and other proponents in the region and vicinity).

The PER should also address the potential cumulative impact of the proposed action on ecosystem resilience. The cumulative effects of climate change impacts on the environment must also be considered in the assessment of ecosystem resilience, especially the potential changes to wetland distribution and extent.

The PER should also provide a detailed assessment of any likely impact that this proposed action may facilitate on relevant MNES at the local, regional, state and national scale.

An assessment also needs to be provided to determine whether the proposed action will facilitate further urban growth and contribute to increased pressure on MNES (i.e. is further growth and associated development pressures on MNES likely without the proposed action).

4. PROPOSED AVOIDANCE AND MITIGATION MEASURES

The PER must provide information on proposed avoidance, safeguards and mitigation measures to deal with the relevant impacts of the proposed action on MNES, including those required by other Commonwealth, State and local government approvals. Committed language (e.g. 'will') rather than non-committal language (e.g. 'may', 'where possible', 'if required', etc.) must be used.

The proposed measures must consider the 'S.M.A.R.T' principle:

S – Specific (what and how)

M – Measurable (baseline information, number/value, auditable)

A – Achievable (timeframe, money, personnel)

R – Relevant (conservation advices, recovery plans, threat abatement plans)

T – Time-bound (specific timeframe to complete).

Specific and detailed descriptions of proposed measures must be provided and substantiated, based on best available practices, and must include the following elements:

- (a) A consolidated list of mitigation measures proposed to be undertaken to prevent, minimise or compensate for the relevant impacts of the action, including:
- a description of the environmental outcomes the measures are expected to achieve including details of any baseline data or proposed monitoring to demonstrate progress towards achieving these outcomes;
 - a description of proposed safeguards and mitigation measures to deal with relevant impacts of the action;
 - any statutory or policy basis for the proposed measures, including reference to the SPRAT Database and relevant approved Conservation Advices, and a discussion on whether the proposed measures are consistent with relevant Recovery Plans and Threat Abatement Plans;
 - information on the timing, frequency, and duration of the measures to be implemented;
 - an assessment of the predicted effectiveness and environmental outcomes of the proposed measures; and
 - an actual or estimated cost of the mitigation measures.
- (b) A detailed outline of an Environmental Management Plan (EMP) that sets out the framework for management, mitigation and monitoring of relevant impacts of the action, including any provisions for independent environmental auditing.

The EMP needs to address the project phases (construction, operation) separately. It must state the environmental objectives, performance criteria, monitoring, reporting, corrective action, responsibility, and timing for each environmental issue, including any provisions for independent environmental auditing.

The EMP should also describe contingencies for events such as failure of mitigation measures, heavy or prolonged rainfall, pollution runoff from incidents etc.

- (c) The name of the agency responsible for endorsing or approving each mitigation measure or monitoring program.

5. ENVIRONMENTAL OFFSETS

The PER must include an assessment of the likelihood of residual significant impacts occurring on MNES after avoidance, mitigation and management measures relating to the proposed action have been applied.

Where residual significant impacts remain after consideration of avoidance and mitigation measures, an environmental offset will be required to compensate for the impacts in accordance with the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy* (EPBC Offsets Policy). Offsets must be specific to the MNES

being impacted and must improve or maintain the viability of the MNES. Offsets do not reduce the impacts of an action and are not intended to make proposed actions with unacceptable impacts acceptable. They simply provide an additional tool that can be used during project design and the PER process.

Proposed offset:

If any residual significant impact to MNES is identified, the PER must include proposed offsets. A proposed offset must include:

- details of how the environmental offset/s meets the requirements of the Department's *EPBC Act Environmental Offsets Policy* (2012), including the *Offsets assessment guide* (2012), available at: www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy;
- information about how the proposed offset/s area provides connectivity with other relevant habitats and biodiversity corridors;
- the methodology, with justification and supporting evidence, used to inform the inputs of the *Offsets assessment guide* in relation to the impact site for each relevant MNES, including:
 - total area of habitat (in hectares);
 - habitat quality (e.g. using the Queensland Government *Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy* (2020)). This guide can be found at the following website: https://environment.des.qld.gov.au/data/assets/pdf_file/0017/102833/habitat-quality-assessment-guide-v1-3.pdf.
- the methodology, with justification and supporting evidence, used to inform the inputs of the *Offsets assessment guide* in relation to each potential offset area for each relevant MNES, including:
 - time over which loss is averted (max. 20 years);
 - time until ecological benefit;
 - risk of loss (%) without offset;
 - risk of loss (%) with offset;
 - confidence in result (%).
- evidence that the relevant MNES, and/or their habitat, is present in the potential offset area/s; and
- details of the mechanism to legally secure the environmental offset/s (under Queensland legislation or equivalent) to provide enduring protection for the offset area/s against development incompatible with conservation.

Please note, where offset area/s have been nominated, the Department is likely to require that an Offset Area Management Plan (OAMP) be approved and implemented prior to the commencement of the action to align with the *EPBC Act Environmental Offsets Policy*. Legal

security of the offset area is generally required within 12 months of the date of approval of the OAMP.

The OAMP must include information to demonstrate how the environmental offset/s compensate for residual significant impacts of the proposed action on relevant MNES, and/or their habitat, in accordance with the principles of the *EPBC Act Environmental Offsets Policy* and all requirements of the *Offsets assessment guide*. The OAMP must include, at a minimum:

- a description of the offset area/s, including location, size, condition, environmental values present and surrounding land uses;
- baseline data and other supporting evidence, including the ecological field data, that documents the presence of the relevant MNES, and the quality of their habitat within the offset area/s;
- an assessment of the site habitat quality for the offset area/s using an appropriate methodology, with justification and supporting evidence, (e.g. using the *Queensland Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy*;
- details of how the offset area/s will provide connectivity with other habitats and biodiversity corridors and/or will contribute to a larger strategic offset for the relevant listed threatened species and communities;
- maps and shapefiles to clearly define the location and boundaries of the offset area/s, accompanied by the offset attributes (e.g. physical address of the offset area/s, coordinates of the boundary points in decimal degrees, the listed threatened species and communities, and listed migratory species that the environmental offset/s compensates for, and the size of the environmental offset/s in hectares);
- specific offset completion criteria derived from the site habitat quality to demonstrate the improvement in the quality of habitat in the offset area/s over a 20-year period;
- details of the management actions, and timeframes for implementation, to be carried out to meet the offset completion criteria;
- interim milestones that set targets at 5-yearly intervals for progress towards achieving the offset completion criteria;
- details of the nature, timing and frequency of monitoring to inform progress against achieving the 5-yearly interim milestones (the frequency of monitoring must be sufficient to track progress towards each set of milestones, and sufficient to determine whether the offset area/s are likely to achieve those milestones in adequate time to implement all necessary corrective actions);
- proposed timing for the submission of monitoring reports which provide evidence demonstrating whether the interim milestones have been achieved;
- timing for the implementation of corrective actions if monitoring activities indicate the interim milestones have not been achieved;

- risk analysis and a risk management and mitigation strategy for all risks to the successful implementation of the OAMP and timely achievement of the offset completion criteria, including a rating of all initial and post-mitigation residual risks in accordance with a risk assessment matrix;
- if proposed for listed threatened species and communities and listed migratory species, evidence of how the management actions and corrective actions take into account relevant approved conservation advices and are consistent with relevant recovery plans and threat abatement plans; and
- details of the legal mechanism for legally securing the proposed offset area/s, such that legal security remains in force over the offset area/s for the duration of the impact to provide enduring protection for the offset area/s against development incompatible with conservation.

The draft Offset Management Plan must be prepared by a suitably qualified person and in accordance with the Department's *Environmental Management Plan Guidelines* (2014), available at: www.environment.gov.au/epbc/publications/environmental-management-plan-guidelines.

Please note, the Department expects that an EPBC Act protected matter is present in the proposed offset area/s if it is present in the project site to align with the *EPBC Act Environmental Offsets Policy*.

Supporting evidence must be included in the OAMP to justify how proposed management action/s are additional to the existing requirements of the landholder in managing their land (e.g. weed and pest management requirements under the *Biosecurity Act 2014* (Qld), existing grazing regimes, etc.) as required by the *EPBC Act Environmental Offsets Policy*.

The OAMP must include robust scientific evidence (e.g. published research, pilot studies, previously successful projects/programs, etc.) to demonstrate how success of proposed measures will be achieved to create, revegetate, regenerate and/or improve habitat (e.g. tree planting, nest boxes, artificial hollows, etc.) in the proposed offset area/s for a listed threatened species or ecological community and listed migratory species.

Where the proposed offset area/s supports an environmental offset for multiple MNES, proposed management action/s for one protected matter must not be detrimental (i.e. have an impact) to other protected matters.

Where an offset is proposed, with a completed *Offsets assessment guide* calculation, all inputs must be supported by robust scientific evidence and/or supporting evidence (e.g. historical grazing regimes, satellite imagery, statements from landholders, etc.).

Please note, it is the Department's expectation that the agreed inputs into the *Offsets assessment guide* are specified in the conditions of approval where the action is approved, subject to conditions, under the EPBC Act.

Draft Biodiversity Offset Strategy:

Where an offset area has not yet been finalised, the PER must alternatively provide a draft Biodiversity Offset Strategy. The Biodiversity Offsets Strategy must provide discussion regarding how the potential offset area will align with the *EPBC Act Environmental Offsets Policy*. It can be high level, outlining the general overarching strategy for delivering a required offset, including the approach used for determining a suitable offset area that achieves the requirements (e.g. connectivity, presence of relevant MNES, etc.).

6. ENVIRONMENTAL OUTCOMES

The PER should provide information on the outcomes that the proponent will achieve for MNES. Outcomes need to be specific, measurable, and achievable, and must be based on robust baseline data. To allow application of outcomes-based conditions, the PER should include:

- (a) consideration of the *Outcomes-based conditions policy 2016* and *Outcomes-based conditions guidance 2016*, with suitable justification for considerations identified in the policy and guidance;
- (b) the specific environmental outcomes to be achieved, and reasoning for these in reference to relevant Recovery Plans, Conservation Advices and Threat Abatement Plans; and
- (c) for each proposed outcome:
 - o the risks associated with achieving the outcome;
 - o the measurability of the outcome, including all suitable performance measures;
 - o appropriate baseline data upon which the outcome has been defined and justified;
 - o the likely impacts that the proposed outcome will address;
 - o demonstrated willingness and capability of achieving the outcome;
 - o commitments to independent and periodic audits of performance towards achieving outcomes; and
 - o details of proposed management to achieve the outcome including, but not limited to, performance indicators, periodic milestones, proposed monitoring and adaptive management, and record keeping, publication and reporting processes.

7. OTHER APPROVALS AND CONDITIONS

The PER must include information on any other requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action. This must include:

- (a) details of any local or State Government planning scheme, or plan or policy under any local or State Government planning system that deals with the proposed action, including:
 - what environmental assessment of the proposed action has been, or is being, carried out under the scheme, plan or policy; and
 - how the scheme provides for the prevention, minimisation and management of any relevant impacts;

- (b) a description of any approval that has been obtained from a State, Territory or Commonwealth agency or authority (other than an approval under the EPBC Act), including any conditions that apply to the action;
- (c) a statement identifying any additional approval that is required; and
- (d) a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.

8 CONSULTATION

Any consultation about the action, including:

- (a) any consultation that has already taken place;
- (b) proposed consultation about relevant impacts of the action;
- (c) if there has been consultation about the proposed action, any documented response to, or result of, the consultation; and
- (d) identification of affected parties, including a statement mentioning any communities that may be affected and describing their views.

9 ENVIRONMENTAL RECORD OF PERSON(S) PROPOSING TO TAKE THE ACTION

The information provided must include details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:

- (a) the person proposing to take the action; and
- (b) for an action for which a person has applied for a permit, the person making the application.

If the person proposing to take the action is a corporation, details of the corporation's environmental policy and planning framework must also be included.

10 ECONOMIC AND SOCIAL MATTERS

The economic and social impacts of the action, both positive and negative, must be analysed. Matters of interest may include:

- details of any public consultation activities undertaken, and their outcomes;
- projected economic costs and benefits of the project, including the basis for their estimation through cost/benefit analysis or similar studies; and
- employment opportunities expected to be generated by the project (including construction and operational phases).

Economic and social impacts should be considered at the local, regional and national levels. Details of the relevant cost and benefits of alternative options to the proposed action, as identified in section 1.2 above, should also be included.

11 INFORMATION SOURCES PROVIDED IN THE PER

For information referenced in the PER, provide:

- (a) the source of the information;
- (b) how recent the information is;
- (c) how the reliability of the information was tested; and
- (d) what uncertainties (if any) are in the information.

12 CONCLUSION

An overall conclusion as to the environmental acceptability of the proposed action should be provided, including discussion on compliance with principles of environmentally sustainable development and the objects and requirements of the EPBC Act. Reasons justifying undertaking the proposed action in the manner proposed should also be outlined.

Measures proposed or required by way of offset for any unavoidable impacts on MNES, and the relative degree of compensation, should be restated here.

ATTACHMENT 1

THE OBJECTS AND PRINCIPLES OF THE ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999 SECTIONS 3 AND 3A

3 Objects of the Act

- (a) to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance;
- (b) to promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources;
- (c) to promote the conservation of biodiversity;
- (d) to promote a co-operative approach to the protection and management of the environment involving governments, the community, land-holders and indigenous peoples;
- (e) to assist in the co-operative implementation of Australia's international environmental responsibilities;
- (f) to recognise the role of indigenous people in the conservation and ecologically sustainable use of Australia's biodiversity; and
- (g) to promote the use of indigenous peoples' knowledge of biodiversity with the involvement of, and in co-operation with, the owners of the knowledge.

3A Principles of Ecologically Sustainable Development

The following principles are principles of ecologically sustainable development.

- (a) Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.
- (b) If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- (c) The principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
- (d) The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.
- (e) Improved valuation, pricing and incentive mechanisms should be promoted.

ATTACHMENT 2

MATTERS THAT MUST BE ADDRESSED IN A PER AND EIS (SCHEDULE 4 OF THE EPBC REGULATIONS 2000)

1 General information

1.01 The background of the action including:

- (a) the title of the action;
- (b) the full name and postal address of the designated proponent;
- (c) a clear outline of the objective of the action;
- (d) the location of the action;
- (e) the background to the development of the action;
- (f) how the action relates to any other actions (of which the proponent should reasonably be aware) that have been, or are being, taken or that have been approved in the region affected by the action;
- (g) the current status of the action; and
- (h) the consequences of not proceeding with the action.

2 Description

2.01 A description of the action, including:

- (a) all the components of the action;
- (b) the precise location of any works to be undertaken, structures to be built or elements of the action that may have relevant impacts;
- (c) how the works are to be undertaken and design parameters for those aspects of the structures or elements of the action that may have relevant impacts;
- (d) relevant impacts of the action;
- (e) proposed safeguards and mitigation measures to deal with relevant impacts of the action;
- (f) any other requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action;
- (g) to the extent reasonably practicable, any feasible alternatives to the action, including:
 - (i) if relevant, the alternative of taking no action;

- (ii) a comparative description of the impacts of each alternative on the matters protected by the controlling provisions for the action; and
 - (iii) sufficient detail to make clear why any alternative is preferred to another;
- (h) any consultation about the action, including:
- (i) any consultation that has already taken place;
 - (ii) proposed consultation about relevant impacts of the action; and
 - (iii) if there has been consultation about the proposed action — any documented response to, or result of, the consultation; and
- (i) identification of affected parties, including a statement mentioning any communities that may be affected and describing their views.

3 Relevant impacts

3.01 Information given under paragraph 2.01(d) must include

- (a) a description of the relevant impacts of the action;
- (b) a detailed assessment of the nature and extent of the likely short term and long term relevant impacts;
- (c) a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;
- (d) analysis of the significance of the relevant impacts; and
- (e) any technical data and other information used or needed to make a detailed assessment of the relevant impacts.

4 Proposed safeguards and mitigation measures

4.01 Information given under paragraph 2.01(e) must include:

- (a) a description, and an assessment of the expected or predicted effectiveness of, the mitigation measures;
- (b) any statutory or policy basis for the mitigation measures;
- (c) the cost of the mitigation measures;
- (d) an outline of an environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action, including any provisions for independent environmental auditing;
- (e) the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program; and

- (f) a consolidated list of mitigation measures proposed to be undertaken to prevent, minimise or compensate for the relevant impacts of the action, including mitigation measures proposed to be taken by State governments, local governments or the proponent.

5 Other Approvals and Conditions

5.01 Information given under paragraph 2.01(f) must include:

- (a) details of any local or State government planning scheme, or plan or policy under any local or State government planning system that deals with the proposed action, including:
 - (i) what environmental assessment of the proposed action has been, or is being carried out under the scheme, plan or policy; and
 - (ii) how the scheme provides for the prevention, minimisation and management of any relevant impacts;
- (b) a description of any approval that has been obtained from a State, Territory or Commonwealth agency or authority (other than an approval under the Act), including any conditions that apply to the action;
- (c) a statement identifying any additional approval that is required; and
- (d) a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.

6 Environmental record of person proposing to take the action

6.01 Details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:

- (a) the person proposing to take the action; and
- (b) for an action for which a person has applied for a permit, the person making the application.

6.02 If the person proposing to take the action is a corporation — details of the corporation's environmental policy and planning framework.

7 Information sources

7.01 For information given the PER must state:

- (a) the source of the information; and
- (b) how recent the information is; and
- (c) how the reliability of the information was tested; and
- (d) what uncertainties (if any) are in the information.

Koala Advisory Council - Meeting 14

Agenda item 9: Translocation policy, and guidance material for release of rehabilitated koalas in SEQ.

Recommendations

1. That KAC **notes** the two projects related to the movement of koalas that the Department of Environment and Science (DES) is currently progressing, specifically:
 - a. development of a new policy regarding protected animal translocations.
 - b. development of new guidance material for release of rehabilitated koalas in South East Queensland (SEQ).

Key issues

1. Following the November KAC meeting, DES has undertaken consultation with key conservation groups, nature conservancies, academics, local governments, relevant Queensland Government officers, other state jurisdictions, Commonwealth Department of Agriculture, Water and Environment, SEQ wildlife hospitals, a large proportion of the koala carers in SEQ, and welfare organisations.
2. Consultation involved:
 - a. inviting 110 stakeholders to comment on the translocation policy discussion paper (as previously presented to KAC) resulting in meetings with 39 stakeholders and written feedback from 24 stakeholders; and
 - b. 19 meetings regarding the development of guidance material for release of rehabilitated koalas in SEQ, including all twelve SEQ local governments, the SEQ wildlife hospital network and 19 SEQ koala carers.

Protected Animal Translocation Policy

3. In relation to the proposed Protected Animal Translocation Policy, the key themes emerging from consultation were:
 - a. The proposed policy position was generally well received and seen as an important step for establishing consistency and transparency in decision making for proposed translocations in Queensland.
 - b. Amendments to the introduction section of the policy were requested and have been made to ensure close alignment with terminology used in the IUCN Guidelines for reintroductions and other conservation translocations and the Commonwealth Government's Policy Statement - Translocation of Listed Threatened Species, including reference and links to relevant Commonwealth and IUCN frameworks.
 - c. Draft amendments have been made to establish a clearer distinction between translocations for conservation purposes and all other proposed translocations (e.g. salvage or conflict translocations) due to the range of higher risks associated with other translocation types.
 - d. An additional section has been added to clarify that the policy does not provide new avenues to facilitate development or other commercial interests, nor reduce any potential mitigation, offset or compensation obligations for impacts to habitat.
 - e. Various minor improvements to wording have been made throughout the proposed policy to improve clarity and rigour.
4. Only one stakeholder was not supportive of the policy position to date citing concerns with broader koala protection and conservation. These comments could not be addressed within the scope of the proposed Protected Animal Translocation Policy.
5. DES has met with stakeholders that provided significant comments that were within the scope of the policy to ensure that identified issues have been adequately addressed.

6. Finalisation of the policy would complete action 3.6 of the SEQ Koala Conservation Strategy.
3.6 The Queensland Government will develop a new koala translocation policy based on International Union for Conservation of Nature best-practice guidelines and investigate where translocation could support reintroduction of koalas to empty habitat.

Guidance material for release of rehabilitated koalas in SEQ

1. In relation to the proposed new guidance material for koala carers in SEQ, the key themes emerging from consultation were that the SEQ Wildlife Hospital Network (as well as carers and relevant local government officers) would support:
 - a. Agreed criteria for deciding which koalas should go back to exactly where they were collected, and which should go to an alternative release site.
 - b. An easily amendable, non-regulatory map, showing potential alternative release sites. The map could be agreed between DES and local governments (preferably at manager/senior officer level to ensure it can be responsive), with advice able to be input by the SEQ wildlife hospital network and koala carers.
 - c. Better data on where rehabilitated koalas move after their release (e.g. an SEQ collaring/tagging program for rehabilitated koalas).
 - d. Potential amendments to the prescribed release site requirements for rehabilitated koalas under the Nature Conservation (Koala) Conservation Plan 2017 (prescribed natural habitat) that provide more flexibility to carers when selecting suitable sites that maximise a released koala's likelihood of establishing a home range and surviving.
2. DES is currently working on a project to address theme (a) and (b) above by developing a mapping product and guideline that can be used to assist carers when selecting suitable release sites for rehabilitated koalas.
3. A conceptual diagram is provided to show how DES is envisaging the mapping and guideline could be delivered and operationalised, for noting and any comments by KAC members. The development of the QKoala App is underway and an update brought to the next KAC meeting. See Attachment 1.
4. Delivery of these initiatives aligns with action 3.6 of the SEQ Koala Conservation Strategy.
3.7 The Queensland Government, in partnership with the SEQ Wildlife Hospital Network, will develop and deliver training and information for koala carers and veterinarians.

Next steps

New Protected Animal Translocation Policy

- Receive any final comments on the draft policy from targeted stakeholder meetings.
- Address final comments, perform quality checks, provide to KAC for information and seek approvals.
- Publish the policy, potentially as an Interim Policy to provide an opportunity for further stakeholder comments and refinement over the next 12 months.
- Prepare guidance materials to implement the policy.

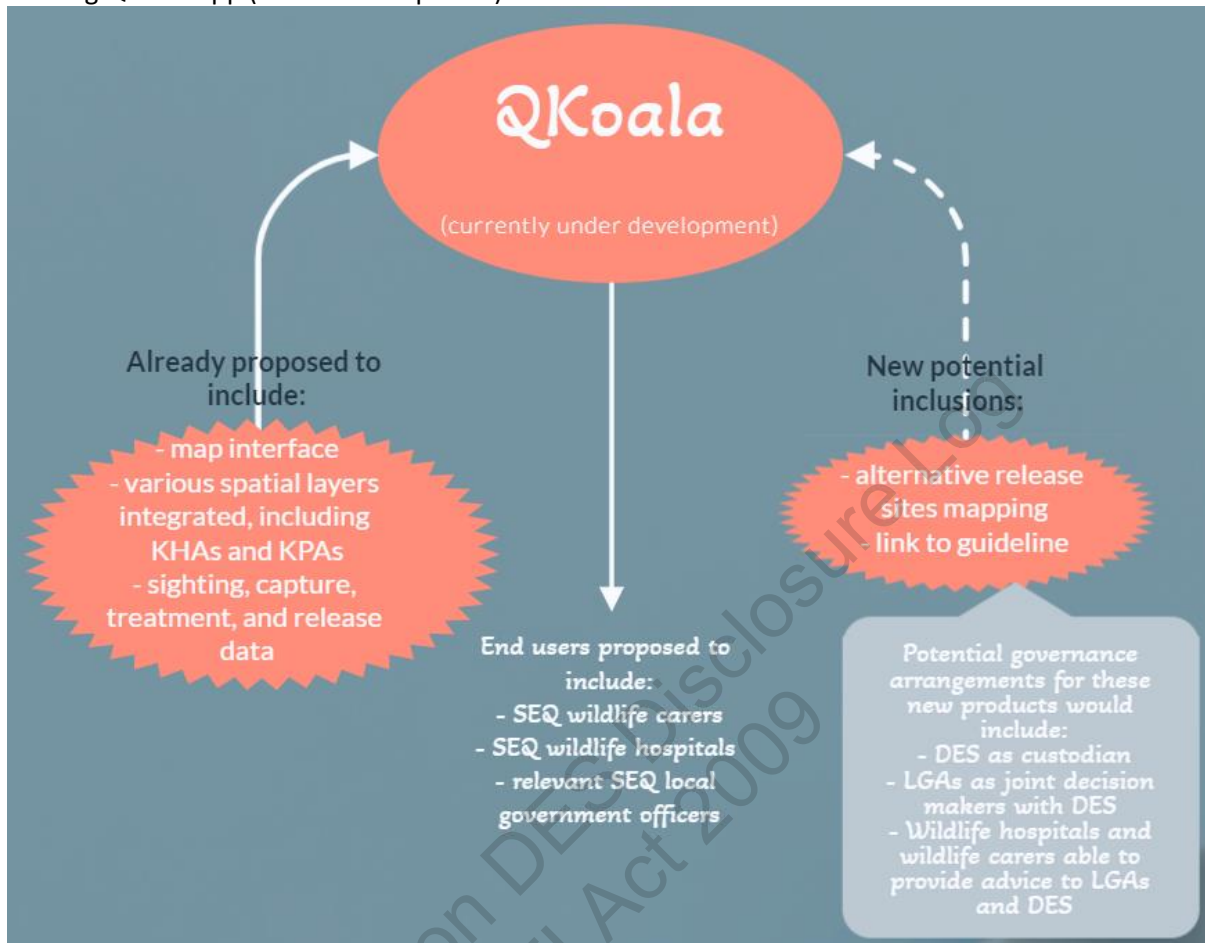
New guidance material for release of rehabilitated koalas in SEQ

- Continue development of release sites mapping and guideline to address consultation themes and ongoing consultation with SEQ wildlife hospitals, SEQ wildlife carers, and SEQ local governments.

Attachment 1 – Conceptual diagram: Guidance material for release of rehabilitated koalas in SEQ

Attachment 1

Conceptual diagram showing how new guidance material could potentially be integrated into existing QKoala app (under development).





Queensland Government

Department of Environment and Science

Environmental Reports

Matters of State Environmental Significance

For the selected area of interest
Lot: 3 Plan: RP50178

Published on DES Disclosure Log
RTI Act 2009

Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the point of interest.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

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

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

Please direct queries about these reports to: Planning.Support@des.qld.gov.au

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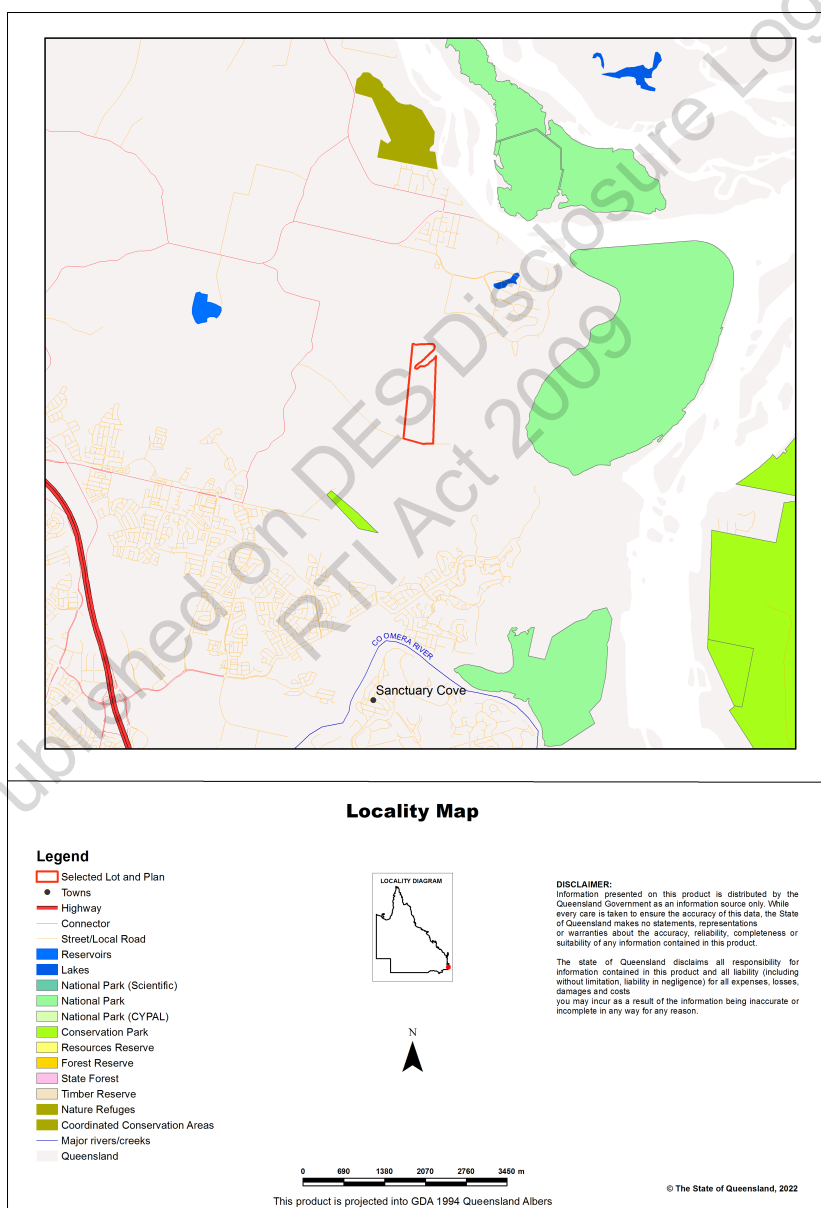
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Assessment Area Details

The following table provides an overview of the area of interest (AOI) with respect to selected topographic and environmental values.

Table 1: Summary table, details for AOI Lot: 3 Plan: RP50178

Size (ha)	70.51
Local Government(s)	Gold Coast City
Bioregion(s)	Southeast Queensland
Subregion(s)	Sunshine Coast - Gold Coast Lowlands
Catchment(s)	South Coast



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	0.0 ha	0.0 %
1c Protected Areas- special wildlife reserves	0.0 ha	0.0 %
2 State Marine Parks- highly protected zones	0.0 ha	0.0 %
3 Fish habitat areas (A and B areas)	0.0 ha	0.0 %
4 Strategic Environmental Areas (SEA)	0.0 ha	0.0 %
5 High Ecological Significance wetlands on the map of Referable Wetlands	16.2 ha	23.0%
6a High Ecological Value (HEV) wetlands	0.0 ha	0.0 %
6b High Ecological Value (HEV) waterways **	0.0 km	Not applicable
7a Threatened (endangered or vulnerable) wildlife	66.34 ha	94.1%
7b Special least concern animals	66.34 ha	94.1%
7c i Koala habitat area - core (SEQ)	54.56 ha	77.4%
7c ii Koala habitat area - locally refined (SEQ)	0.0 ha	0.0 %
8a Regulated Vegetation - Endangered/Of concern in Category B (remnant)	9.96 ha	14.1%
8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth)	0.0 ha	0.0 %
8c Regulated Vegetation - Category R (GBR riverine regrowth)	0.0 ha	0.0 %
8d Regulated Vegetation - Essential habitat	66.34 ha	94.1%
8e Regulated Vegetation - intersecting a watercourse **	0.0 km	Not applicable
8f Regulated Vegetation - within 100m of a Vegetation Management Wetland	20.4 ha	28.9%
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

(no results)

1c. Protected Areas - special wildlife reserves

(no results)

2. State Marine Parks - highly protected zones

(no results)

3. Fish habitat areas (A and B areas)

(no results)

Refer to **Map 1 - MSES - State Conservation Areas** for an overview of the relevant MSES.

MSES - Wetlands and Waterways

4. Strategic Environmental Areas (SEA)

(no results)

5. High Ecological Significance wetlands on the Map of Queensland Wetland Environmental Values

Natural wetlands that are 'High Ecological Significance' (HES) on the Map of Queensland Wetland Environmental Values are present.

6a. Wetlands in High Ecological Value (HEV) waters

(no results)

6b. Waterways in High Ecological Value (HEV) waters

(no results)

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	None
<i>Casuarus casuarus johnsonii</i>	Sthn population cassowary	E	None
<i>Crinia tinnula</i>	Wallum froglet	V	Core
<i>Denisonia maculata</i>	Ornamental snake	V	None
<i>Litoria freycineti</i>	Wallum rocketfrog	V	None
<i>Litoria olongburensis</i>	Wallum sedgefrog	V	Core
<i>Melaleuca irbyana</i>		E	None
<i>Petaurus gracilis</i>	Mahogany Glider	E	None
<i>Petrogale persephone</i>	Proserpine rock-wallaby	E	None
<i>Phascolarctos 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	Core

*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>Limosa lapponica baueri</i>	Western Alaskan bar-tailed godwit	V	V	M-C/J/R/B/E
<i>Numenius madagascariensis</i>	eastern curlew	E	CE	M-C/J/R/B/E
<i>Calidris ferruginea</i>	curlew sandpiper	E	CE	M-C/J/R/B/E
<i>Charadrius mongolus</i>	lesser sand plover	E	E	M-C/J/R/B/E

Special least concern animal species records

Scientific name	Common name	Migratory status
<i>Tachyglossus aculeatus</i>	short-beaked echidna	
<i>Numenius phaeopus</i>	whimbrel	M-C/J/R/B/E

Scientific name	Common name	Migratory status
<i>Calidris acuminata</i>	sharp-tailed sandpiper	M-C/J/R/B/E
<i>Tringa brevipes</i>	grey-tailed tattler	M-C/J/R/B/E
<i>Tringa stagnatilis</i>	marsh sandpiper	M-C/J/R/B/E
<i>Tringa nebularia</i>	common greenshank	M-C/J/R/B/E
<i>Limosa limosa</i>	black-tailed godwit	M-C/J/R/B/E
<i>Xenus cinereus</i>	terek sandpiper	M-C/J/R/B/E
<i>Actitis hypoleucos</i>	common sandpiper	M-C/J/R/B/E
<i>Pluvialis fulva</i>	Pacific golden plover	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
12.1.1	O-dom	rem_oc
12.3.20	E-dom	rem_end

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

Not applicable

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

Not applicable

8d. Regulated Vegetation - Essential habitat

Values are present

8e. Regulated Vegetation - intersecting a watercourse**

(no results)

8f. Regulated Vegetation - within 100m of a Vegetation Management wetland

Regulated vegetation map category	Map number
B	9542

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.

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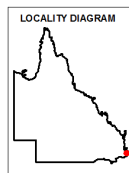
Map 1 - MSES - State Conservation Areas



MSES - State Conservation Areas

Area of Interest

- Selected Lot and Plan
- ▲ Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Protected area (estates, nature refuges, special wildlife reserves)
- Declared fish habitat area (A and B areas)
- Marine park (highly protected)



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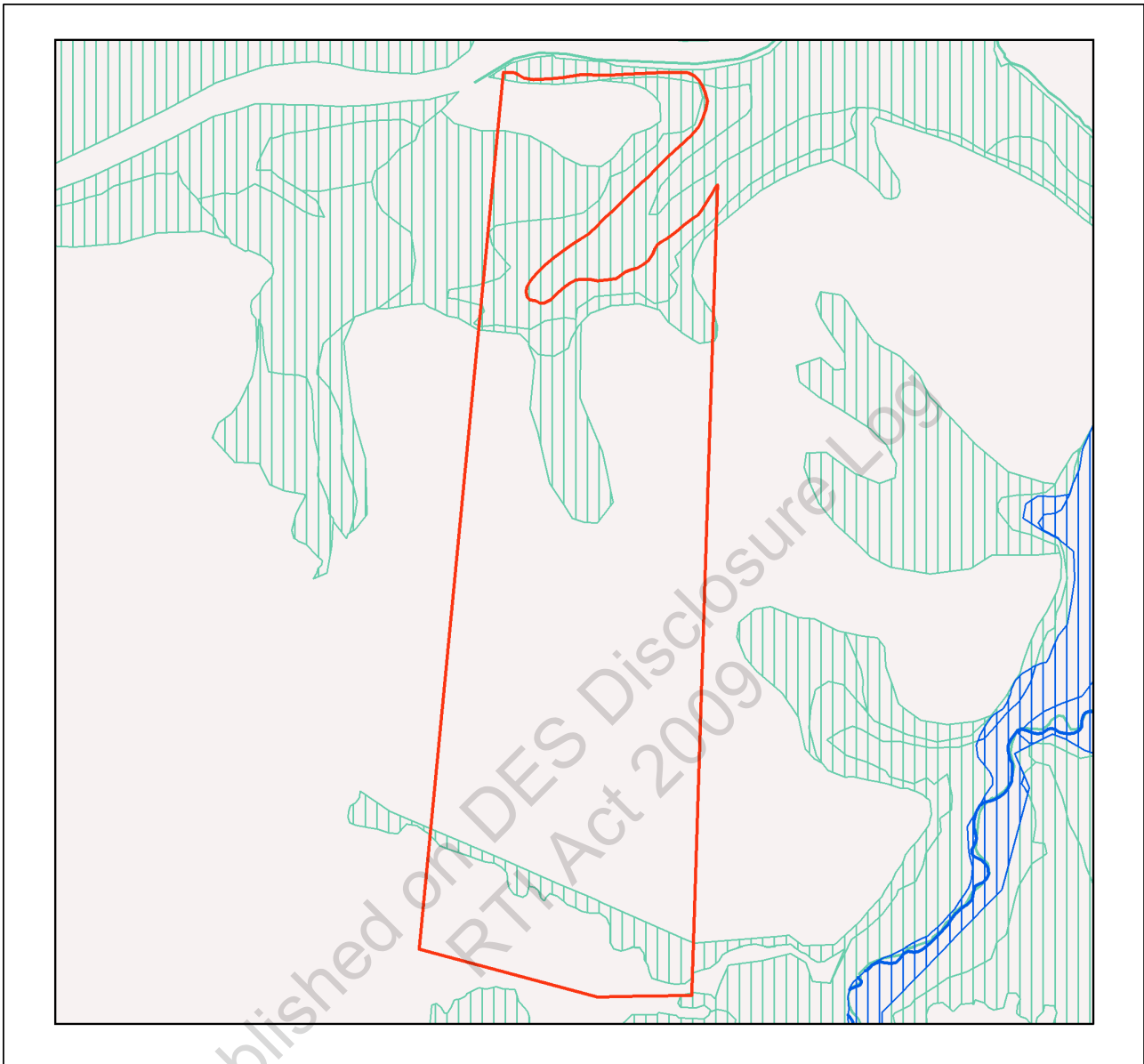


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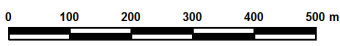
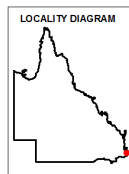
Map 2 - MSES - Wetlands and Waterways



MSES - Wetlands and Waterways

Area of Interest

- Selected Lot and Plan
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Declared high ecological value waters (watercourse)
- Strategic environmental area (designated precinct)
- Declared high ecological value waters (wetland)
- High ecological significance wetlands



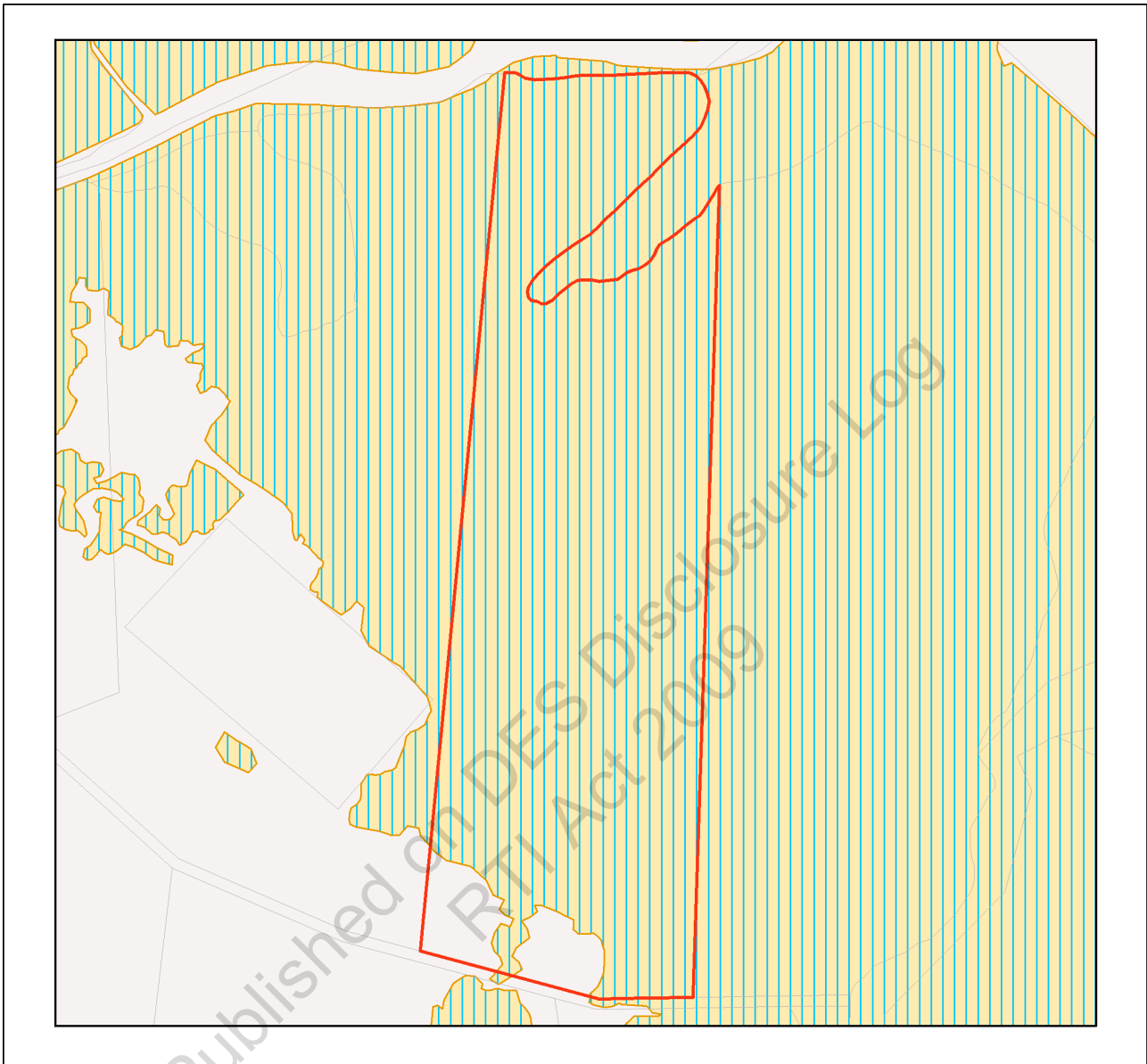
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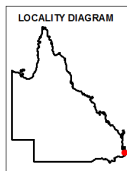
Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals



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

Area of Interest

- Selected Lot and Plan
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Wildlife habitat (special least concern)
- Wildlife habitat (endangered or vulnerable)



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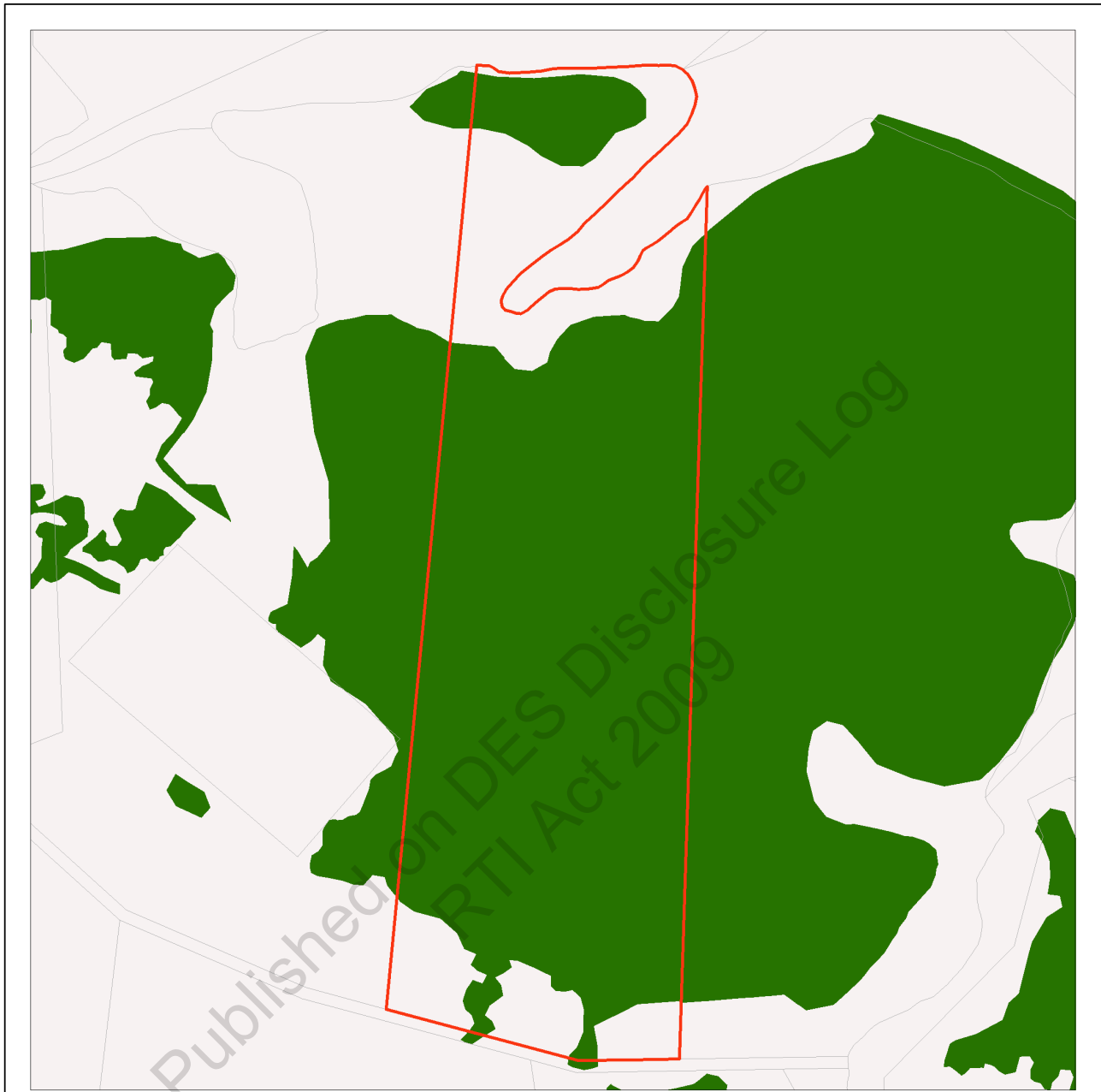


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Map 3b - MSES - Species - Koala habitat area (SEQ)



**MSES - Species
Koala habitat area (SEQ)**

Area of Interest

- Selected Lot and Plan
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Koala habitat area (core)
- Koala habitat area (locally refined)



The koala habitat mapping within South East Queensland uses regional ecosystem linework compiled at a scale varying from 1:25,000 to 1:100,000. Linework should be used as a guide only. The positional accuracy of regional ecosystem data mapped at a scale of 1:100,000 is +/- 100 metres.



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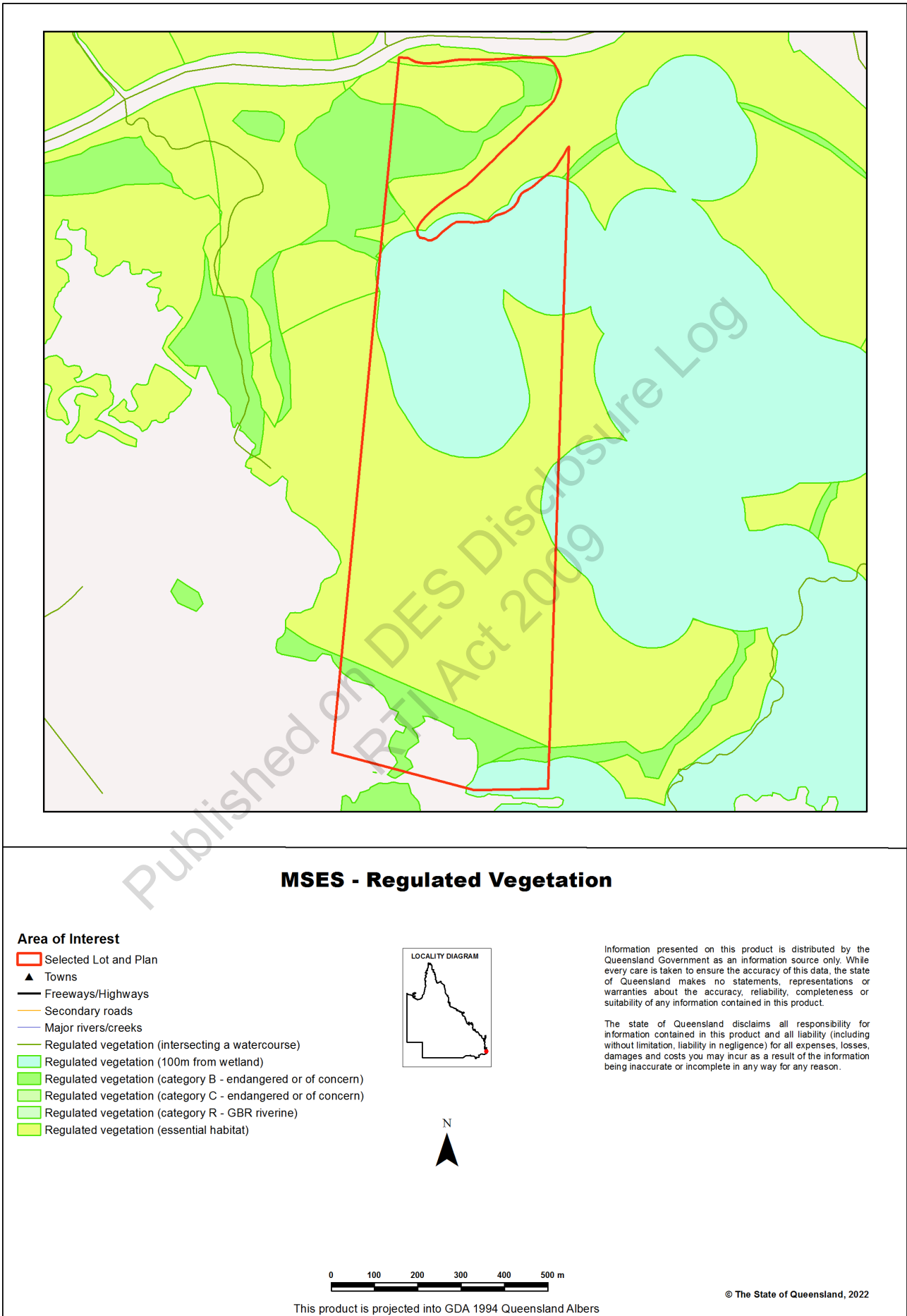
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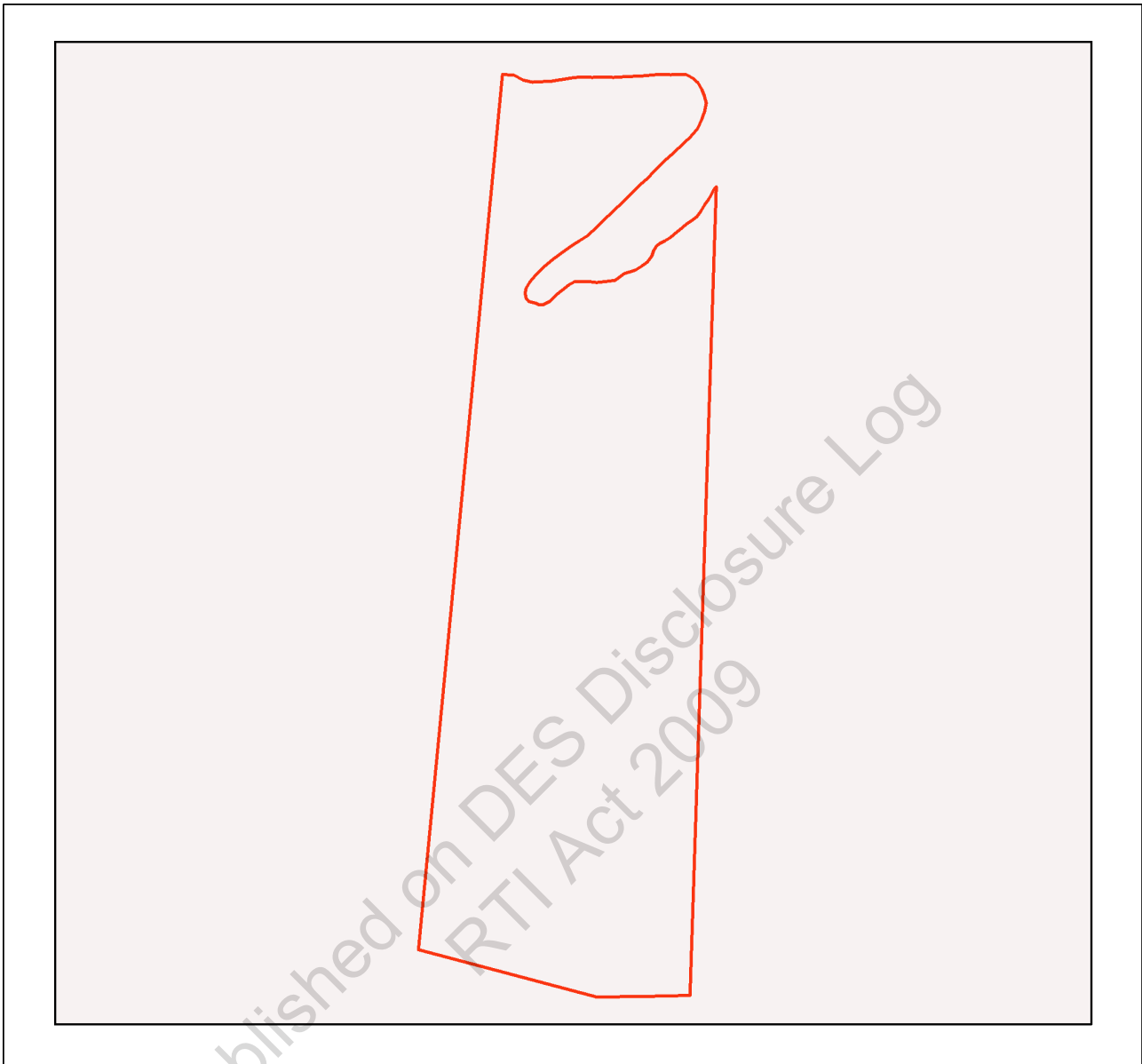
The represented layers for SEQ 'koala habitat area-core' and 'koala habitat area- locally refined' in MSES are sourced directly from the regulatory mapping under the Nature Conservation (Koala) Conservation Plan 2017. Whilst every effort is made to ensure the information remains current, there may be delays between updating versions. Please refer to the original mapping for the most recent version. See <https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping>



Map 4 - MSES - Regulated Vegetation



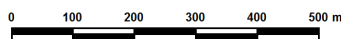
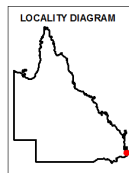
Map 5 - MSES - Offset Areas



MSES - Offsets

Area of Interest

- Selected Lot and Plan
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Legally secured offset area (offset register)
- Legally secured offset area (vegetation offsets)



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Appendices

Appendix 1 - Matters of State Environmental Significance (MSES) methodology

MSES mapping is a regional-scale representation of the definition for MSES under the State Planning Policy (SPP). The compiled MSES mapping product is a guide to assist planning and development assessment decision-making. Its primary purpose is to support implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations. Similarly, the SPP biodiversity policy does not override or replace specific requirements of other Acts or regulations.

The Queensland Government's "Method for mapping - matters of state environmental significance for use in land use planning and development assessment" can be downloaded from:

<http://www.ehp.qld.gov.au/land/natural-resource/method-mapping-mses.html> .

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Appendix 2 - Source Data

The datasets listed below are available on request from:

<http://qldspatial.information.qld.gov.au/catalogue/custom/index.page>

- Matters of State environmental significance

Note: MSES mapping is not based on new or unique data. The primary mapping product draws data from a number of underlying environment databases and geo-referenced information sources. MSES mapping is a versioned product that is updated generally on a twice-yearly basis to incorporate the changes to underlying data sources. Several components of MSES mapping made for the current version may differ from the current underlying data sources. To ensure accuracy, or proper representation of MSES values, it is strongly recommended that users refer to the underlying data sources and review the current definition of MSES in the State Planning Policy, before applying the MSES mapping.

Individual MSES layers can be attributed to the following source data available at QSpatial:

MSES layers	current QSpatial data (http://qspatial.information.qld.gov.au)
Protected Areas-Estates, Nature Refuges, Special Wildlife Reserves	- Protected areas of Queensland - Nature Refuges - Queensland - Special Wildlife Reserves- Queensland
Marine Park-Highly Protected Zones	Moreton Bay marine park zoning 2008
Fish Habitat Areas	Queensland fish habitat areas
Strategic Environmental Areas-designated	Regional Planning Interests Act - Strategic Environmental Areas
HES wetlands	Map of Queensland Wetland Environmental Values
Wetlands in HEV waters	HEV waters: - EPP Water intent for waters Source Wetlands: - Queensland Wetland Mapping (Current version 5) Source Watercourses: - Vegetation management watercourse and drainage feature map (1:100000 and 1:250000)
Wildlife habitat (threatened and special least concern)	-WildNet database species records - habitat suitability models (various) - SEQ koala habitat areas under the Koala Conservation Plan 2019
VMA regulated regional ecosystems	Vegetation management regional ecosystem and remnant map
VMA Essential Habitat	Vegetation management - essential habitat map
VMA Wetlands	Vegetation management wetlands map
Legally secured offsets	Vegetation Management Act property maps of assessable vegetation. For offset register data-contact DES
Regulated Vegetation Map	Vegetation management - regulated vegetation management map

Appendix 3 - Acronyms and Abbreviations

AOI	- Area of Interest
DES	- Department of Environment and Science
EP Act	- <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>

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Queensland Government

Department of Environment and Science

Environmental Reports

Regional Ecosystems

Biodiversity Status

For the selected area of interest
Lot: 3 Plan: RP50178

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

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

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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: Lot: 3 Plan: RP50178

Size (ha)	70.51
Local Government(s)	Gold Coast City
Bioregion(s)	Southeast Queensland
Subregion(s)	Sunshine Coast - Gold Coast Lowlands
Catchment(s)	South Coast

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	3.32	4.71
Of concern	54.3	77.02
No concern at present	8.72	12.37
Total remnant vegetation	66.34	94.09

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 2020) 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 Resources 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
12.1.1	Casuarina glauca woodland on margins of marine clay plains	Of concern	6.64	9.42
12.1.2	Saltpan vegetation including grassland, herbland and sedgeland on marine clay plains	No concern at present	4.77	6.77
12.1.3	Mangrove shrubland to low closed forest on marine clay plains and estuaries	No concern at present	0.37	0.52
12.2.5	Corymbia intermedia +/- Lophostemon confertus +/- Banksia spp. +/- Callitris columellaris open forest on beach ridges usually in southern half of bioregion	Of concern	47.66	67.59
12.2.7	Melaleuca quinquenervia or rarely M. dealbata open forest on sand plains	No concern at present	3.58	5.08
12.3.20	Melaleuca quinquenervia, Casuarina glauca +/- Eucalyptus tereticornis, E. siderophloia, M. styphelioides open forest on low coastal alluvial plains	Endangered	3.32	4.71
non-remnant	None	None	4.17	5.91

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
12.1.1	Pre-clearing 6000 ha; Remnant 2019 3000 ha	28a	Intertidal	High
12.1.2	Pre-clearing 32000 ha; Remnant 2019 27000 ha	35b	Intertidal	High
12.1.3	Pre-clearing 54000 ha; Remnant 2019 52000 ha	35a	Intertidal	High

Regional Ecosystem	Remnant Extent	BVG (1 Million)	Wetland	Representation in protected estate
12.2.5	Pre-clearing 16000 ha; Remnant 2019 11000 ha	9f	Contains Palustrine	High
12.2.7	Pre-clearing 31000 ha; Remnant 2019 19000 ha	22a	Palustrine	High
12.3.20	Pre-clearing 16000 ha; Remnant 2019 3000 ha	22a	Palustrine	Low
non-remnant	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
12.1.1	Provides estuarine wetland habitat.
12.1.2	Habitat for threatened fauna species including the false water-rat <i>Xeromys myoides</i> in the southern part of the bioregion particularly in areas immediately adjacent to mangroves, 12.1.3. (Van Dyck and Gynther, 1996, 2003).
12.1.3	Habitat for threatened fauna species including the false water-rat <i>Xeromys myoides</i> in the southern part of the bioregion particularly in areas immediately adjacent to saltpans, 12.1.2. (Van Dyck and Gynther, 1996, 2003). 12.1.3a: Habitat for threatened fauna species including the false water-rat <i>Xeromys myoides</i> in the southern part of the bioregion particularly in areas immediately adjacent to saltpans, 12.1.2. (Van Dyck and Gynther, 1996, 2003). 12.1.3b: Habitat for threatened fauna species including the false water-rat <i>Xeromys myoides</i> in the southern part of the bioregion particularly in areas immediately adjacent to saltpans, 12.1.2. (Van Dyck and Gynther, 1996, 2003). 12.1.3c: Habitat for threatened fauna species including the false water-rat <i>Xeromys myoides</i> in the southern part of the bioregion particularly in areas immediately adjacent to saltpans, 12.1.2. (Van Dyck and Gynther, 1996, 2003). 12.1.3d: Habitat for threatened fauna species including the false water-rat <i>Xeromys myoides</i> in the southern part of the bioregion particularly in areas immediately adjacent to saltpans, 12.1.2. (Van Dyck and Gynther, 1996, 2003). 12.1.3e: Habitat for threatened fauna species including the false water-rat <i>Xeromys myoides</i> in the southern part of the bioregion particularly in areas immediately adjacent to saltpans, 12.1.2. (Van Dyck and Gynther, 1996, 2003).
12.2.5	Potential habitat for NCA listed species: <i>Acacia attenuata</i> , <i>Acacia baueri</i> subsp. <i>baueri</i> , <i>Boronia rivularis</i> , <i>Durringtonia paludosa</i> , <i>Glycine argyrea</i> , <i>Macarthuria complanata</i> , <i>Maundia triglochoides</i> , <i>Persicaria elatior</i> , <i>Phaius australis</i> . This ecosystem is also known to provide suitable habitat for koalas (<i>Phascolarctos cinereus</i>).
12.2.7	Habitat for threatened plant species including <i>Phaius australis</i> , <i>P. bernaysii</i> and near threatened species including <i>Durringtonia paludosa</i> . This ecosystem is also known to provide suitable habitat for koalas (<i>Phascolarctos cinereus</i>). 12.2.7a: This ecosystem is known to provide suitable habitat for koalas (<i>Phascolarctos cinereus</i>). 12.2.7c: This ecosystem is known to provide suitable habitat for koalas (<i>Phascolarctos cinereus</i>).

Regional Ecosystem	Special Values
12.3.20	Potential habitat for NCA listed species: <i>Acacia attenuata</i> , <i>Allocasuarina emuina</i> , <i>Lenwebbia</i> sp. (Blackall Range P.R.Sharpe 5387), <i>Maundia triglochinoidea</i> , <i>Persicaria elatior</i> , <i>Phaius australis</i> , <i>Phaius bernaysii</i> , <i>Symplocos harroldii</i> , <i>Tecomanthe hillii</i> . This ecosystem is known to provide suitable habitat for koalas (<i>Phascolarctos cinereus</i>).
non-remnant	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	4.17	5.91
22a	Open forests and woodlands dominated by <i>Melaleuca quinquenervia</i> (swamp paperbark) in seasonally inundated lowland coastal areas and swamps. (land zones 3, 2, 1, [11]) (SEQ, WET, CQC, CYP, [BRB])	6.9	9.78
28a	Complex of open shrubland to closed shrubland, grassland, low woodland and open forest, on strand and foredunes. Includes pure stands of <i>Casuarina equisetifolia</i> (coastal sheoak). (land zones 2, 1) (GUP, SEQ, [BRB, CYP, WET, CQC])	6.64	9.42
35a	Closed forests and low closed forests dominated by mangroves. (land zone 1) (CYP, GUP, BRB, SEQ, WET, CQC)	0.37	0.52
35b	Bare salt pans ± areas of <i>Tecticornia</i> spp. (samphire) sparse forbland and/or <i>Xerochloa imberbis</i> or <i>Sporobolus virginicus</i> (sand couch) tussock grassland. (land zone 1) (GUP, BRB, CYP, SEQ, [CQC, WET])	4.77	6.77
9f	Woodlands dominated by <i>Corymbia</i> spp. e.g.: <i>C. intermedia</i> (pink bloodwood), <i>C. tessellaris</i> (Moreton Bay ash) and/or <i>Eucalyptus</i> spp. (<i>E. racemosa</i> , <i>E. tereticornis</i> (blue gum)), frequently with <i>Banksia</i> spp., <i>Acacia</i> spp. and <i>Callitris columellaris</i> (white cypress pine) on coastal dunes and beach ridges. (land zone 2) (SEQ)	47.66	67.59

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. 2020 (PDF)* section 3.3 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/>

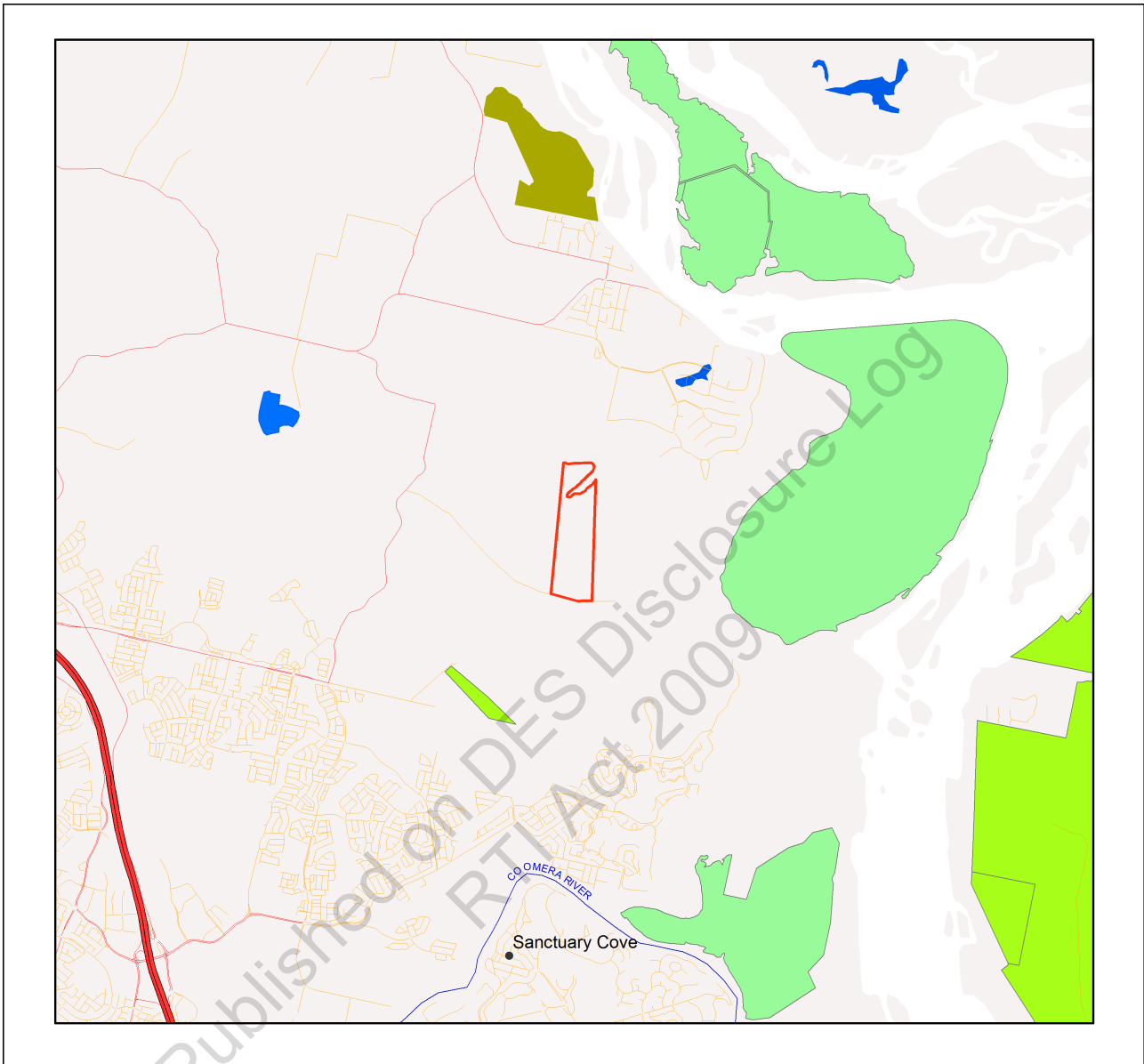
Benchmarks are based on a combination of quantitative and qualitative information and should be used as a guide only. Benchmarks are specific to one regional ecosystem vegetation community, however, the natural variability in structure and floristic composition under a range of climatic and natural disturbance 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
12.1.1	Available	Available
12.1.2	Not currently available	Available
12.1.3	Not currently available	Not currently available
12.2.5	Available	Available
12.2.7	Available	Available
12.3.20	Not currently available	Available
non-remnant	Not currently available	Not currently available

Maps

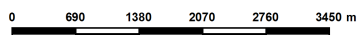
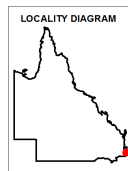
Map 1 - Location



Locality Map

Legend

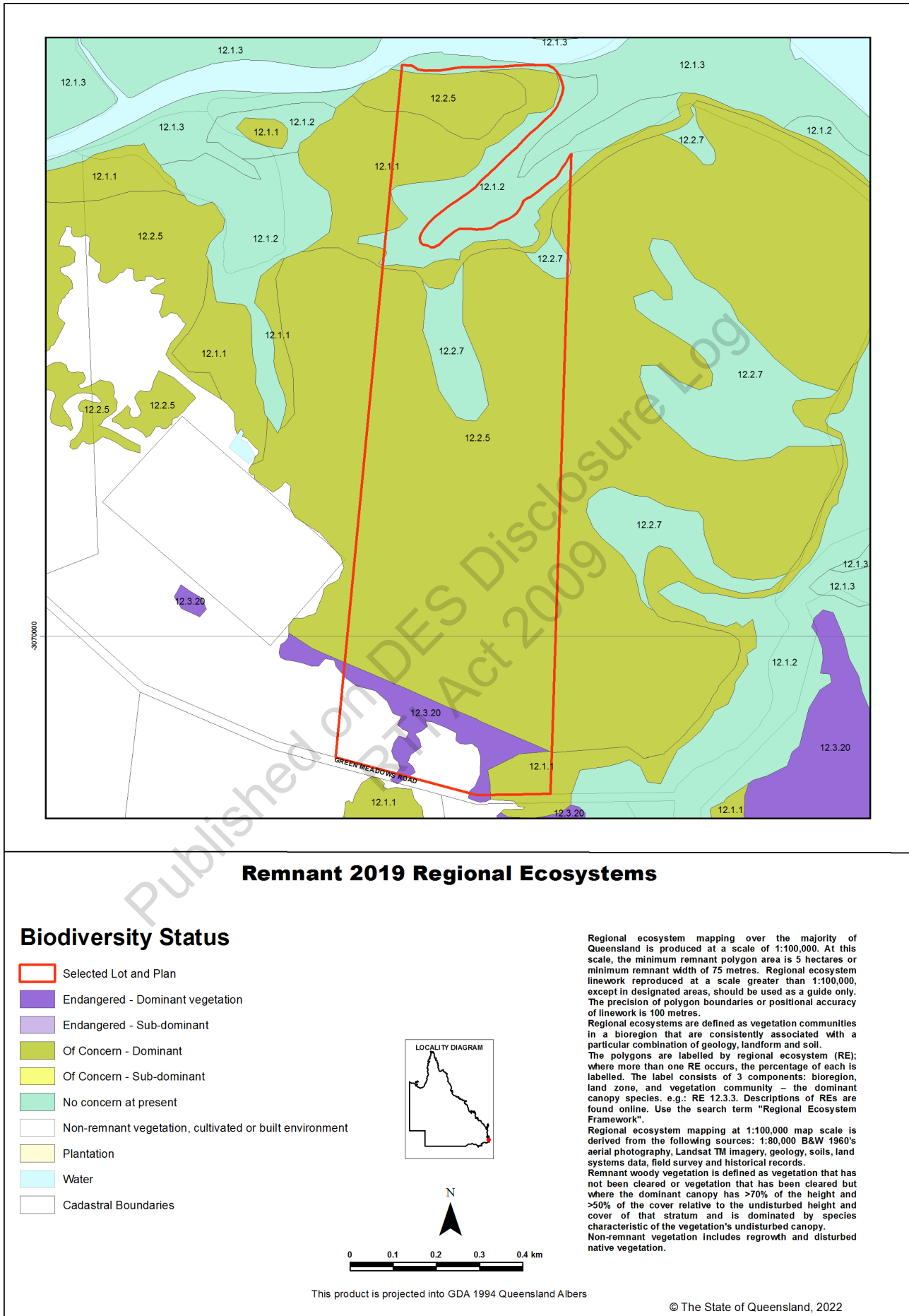
- Selected Lot and Plan
- Towns
- Highway
- Connector
- Street/Local Road
- Reservoirs
- Lakes
- National Park (Scientific)
- National Park
- National Park (CYPAL)
- Conservation Park
- Resources Reserve
- Forest Reserve
- State Forest
- Timber Reserve
- Nature Refuges
- Coordinated Conservation Areas
- Major rivers/creeks
- Queensland



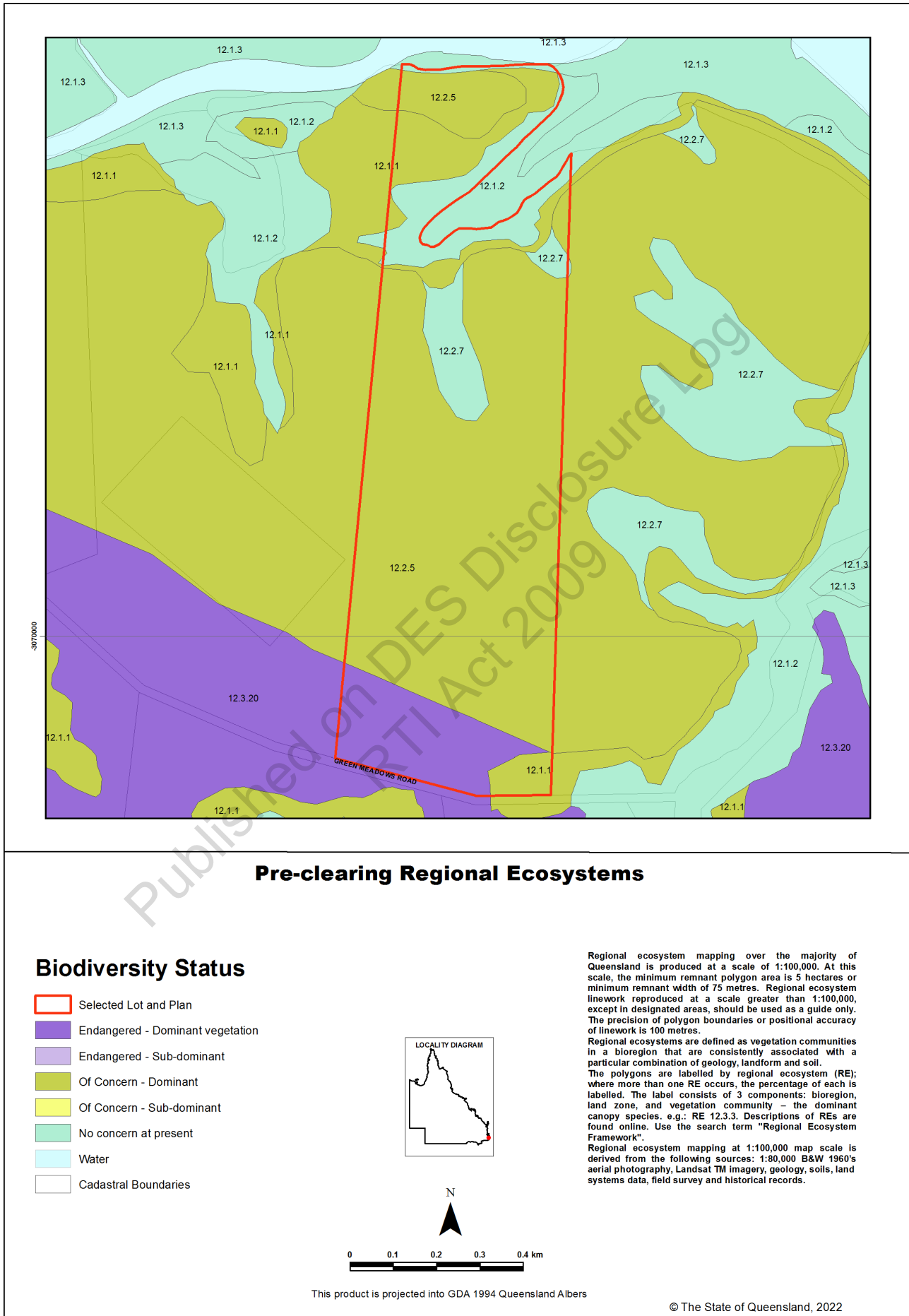
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Map 2 - Remnant 2019 regional ecosystems



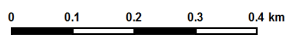
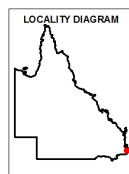
Map 3 - Pre-clearing regional ecosystems



Pre-clearing Regional Ecosystems

Biodiversity Status

- Selected Lot and Plan
- Endangered - Dominant vegetation
- Endangered - Sub-dominant
- Of Concern - Dominant
- Of Concern - Sub-dominant
- No concern at present
- Water
- Cadastral Boundaries



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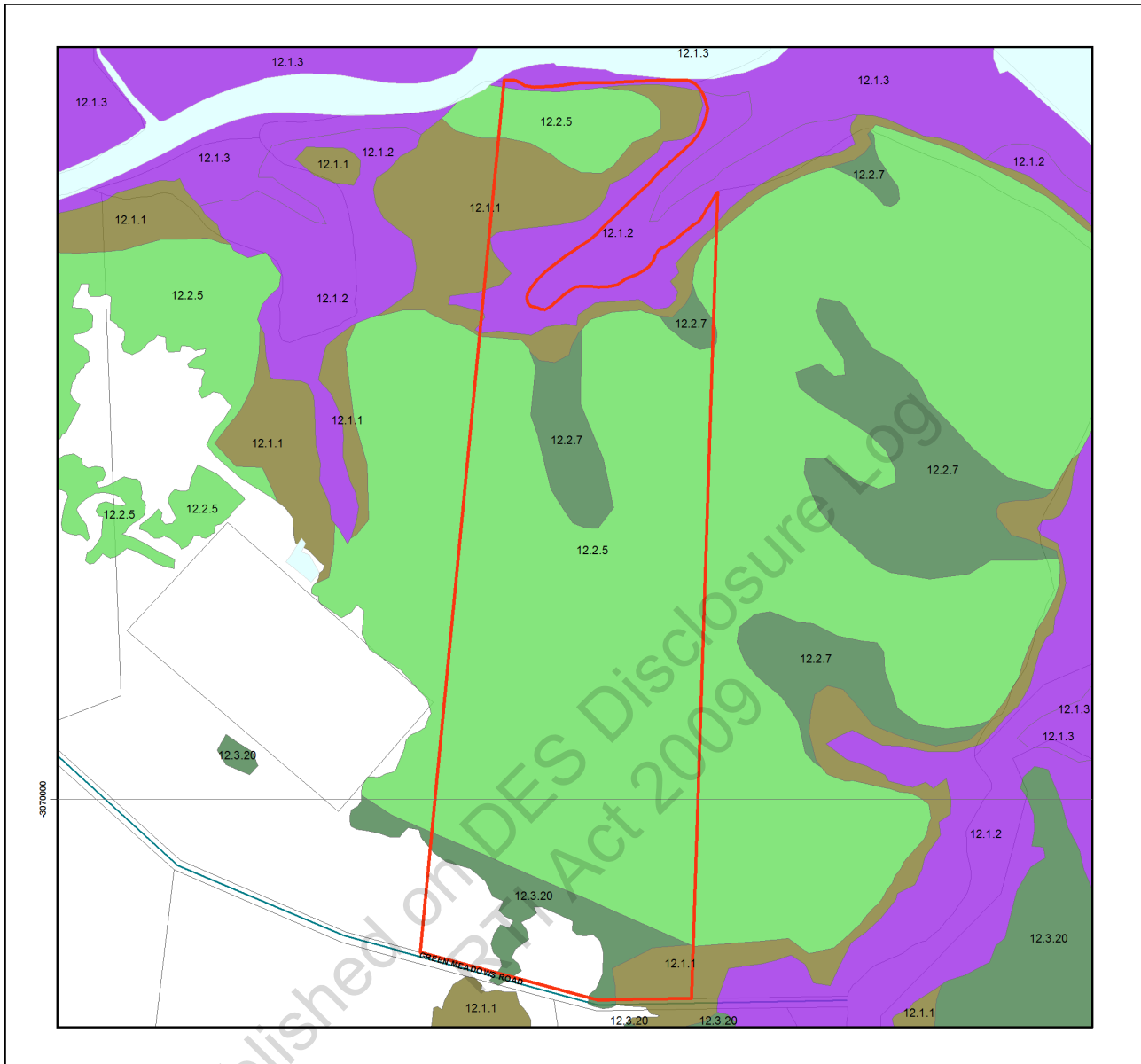
Regional ecosystem mapping over the majority of Queensland is produced at a scale of 1:100,000. At this scale, the minimum remnant polygon area is 5 hectares or minimum remnant width of 75 metres. Regional ecosystem linework reproduced at a scale greater than 1:100,000, except in designated areas, should be used as a guide only. The precision of polygon boundaries or positional accuracy of linework is 100 metres.

Regional ecosystems are defined as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil.

The polygons are labelled by regional ecosystem (RE); where more than one RE occurs, the percentage of each is labelled. The label consists of 3 components: bioregion, land zone, and vegetation community – the dominant canopy species. e.g.: RE 12.3.3. Descriptions of REs are found online. Use the search term "Regional Ecosystem Framework".

Regional ecosystem mapping at 1:100,000 map scale is derived from the following sources: 1:80,000 B&W 1960's aerial photography, Landsat TM imagery, geology, soils, land systems data, field survey and historical records.

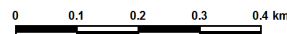
Map 4 - Remnant 2019 regional ecosystems by BVG (5M)



Remnant 2019 Regional Ecosystems coloured by Broad Vegetation Groups

Broad Vegetation Groups BVG5M Description (BVG1M codes)

- Selected Lot and Plan
- 1. Rainforests and scrubs (1-7b)
- 2. Wet eucalypt open forests (8-8b)
- 3. Eucalypt woodlands to open forests (mainly eastern Qld) (9-15b)
- 4. Eucalypt open forests to woodlands on floodplains (16-16d)
- 5. Eucalypt dry woodlands on inland depositional plains (17-18d)
- 6. Eucalypt low open woodlands usually with spinifex understorey (19-19d)
- 7. Callitris woodland - open forests (20a)
- 8. Melaleuca open woodlands on depositional plains (21-22c)
- 9. Acacia aneura (mulga) dominated open forests, woodlands and shrublands (23-23b)
- 10. Other acacia dominated open forests, woodlands and shrublands (24-26a)
- 11. Mixed species woodlands, open woodland - (inland bioregions) includes wooded downs (27-27c)
- 12. Other coastal communities or heaths (28-29b)
- 13. Tussock grasslands, forblands (30-32b)
- 14. Hummock grasslands (33-33b)
- 15. Wetlands (swamps and lakes) (34-34g)
- 16. Mangroves and saltmarshes (35-35b)
- Non-remnant vegetation, cultivated or built environment
- Water
- Cadastral Boundaries



This product is projected into GDA 1994 Queensland Albers

Broad Vegetation Groups (BVG) of Queensland are applied by look up table to the regional ecosystem vegetation communities. Each polygon is coloured by the dominant BVG5M and the component regional ecosystems labelled. Where more than one regional ecosystem occurs, the percentage of each is labelled.

Regional ecosystem mapping over the majority of Queensland is produced at a scale of 1:100,000. At this scale, the minimum remnant polygon area is 5 hectares or minimum remnant width of 75 metres. Regional ecosystem linework reproduced at a scale greater than 1:100,000, except in designated areas, should be used as a guide only. The precision of polygon boundaries or positional accuracy of linework is 100 metres.

Regional ecosystems are defined as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil.

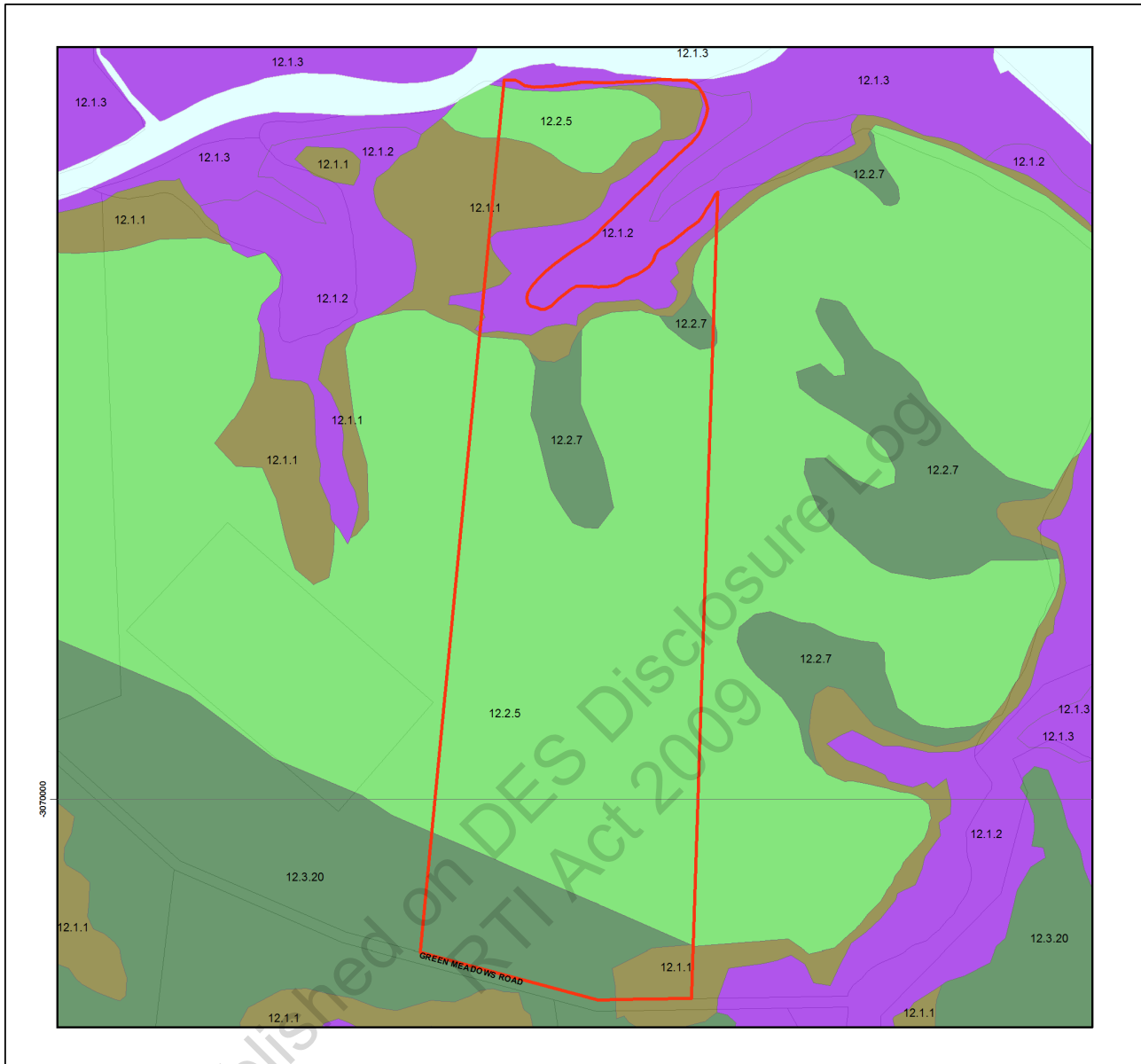
The label consists of 3 components: bioregion, land zone, and vegetation community – the dominant canopy species. e.g.: RE 12.3.3. Descriptions of REs are found online. Use the search term "Regional Ecosystem Framework". Regional ecosystem mapping at 1:100,000 map scale is derived from the following sources: 1:80,000 B&W 1960's aerial photography, Landsat TM imagery, geology, soils, land systems data, field survey and historical records.

Remnant woody vegetation is defined as vegetation that has not been cleared or vegetation that has been cleared but where the dominant canopy has >70% of the height and >50% of the cover relative to the undisturbed height and cover of that stratum and is dominated by species characteristic of the vegetation's undisturbed canopy.

Non-remnant vegetation includes regrowth and disturbed native vegetation.

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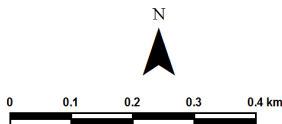
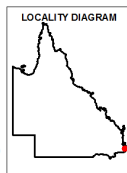
Map 5 - Pre-clearing regional ecosystems by BVG (5M)



Pre-clearing Regional Ecosystems coloured by Broad Vegetation Groups

Broad Vegetation Groups BVG5M Description (BVG1M codes)

- Selected Lot and Plan
- 1. Rainforests and scrubs (1-7b)
- 2. Wet eucalypt open forests (8-8b)
- 3. Eucalypt woodlands to open forests (mainly eastern Qld) (9-15b)
- 4. Eucalypt open forests to woodlands on floodplains (16-16d)
- 5. Eucalypt dry woodlands on inland depositional plains (17-18d)
- 6. Eucalypt low open woodlands usually with spinifex understorey (19-19d)
- 7. Callitris woodland - open forests (20a)
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- 9. Acacia aneura (mulga) dominated open forests, woodlands and shrublands (23-23b)
- 10. Other acacia dominated open forests, woodlands and shrublands (24-26a)
- 11. Mixed species woodlands, open woodland - (inland bioregions) includes wooded downs (27-27c)
- 12. Other coastal communities or heaths (28-29b)
- 13. Tussock grasslands, forblands (30-32b)
- 14. Hummock grasslands (33-33b)
- 15. Wetlands (swamps and lakes) (34-34g)
- 16. Mangroves and saltmarshes (35-35b)
- Water
- Cadastral Boundaries



This product is projected into GDA 1994 Queensland Albers

Broad Vegetation Groups (BVG) of Queensland are applied by look up table to the regional ecosystem vegetation communities. Each polygon is coloured by the dominant BVG5M and the component regional ecosystems labelled. Where more than one regional ecosystem occurs, the percentage of each is labelled.

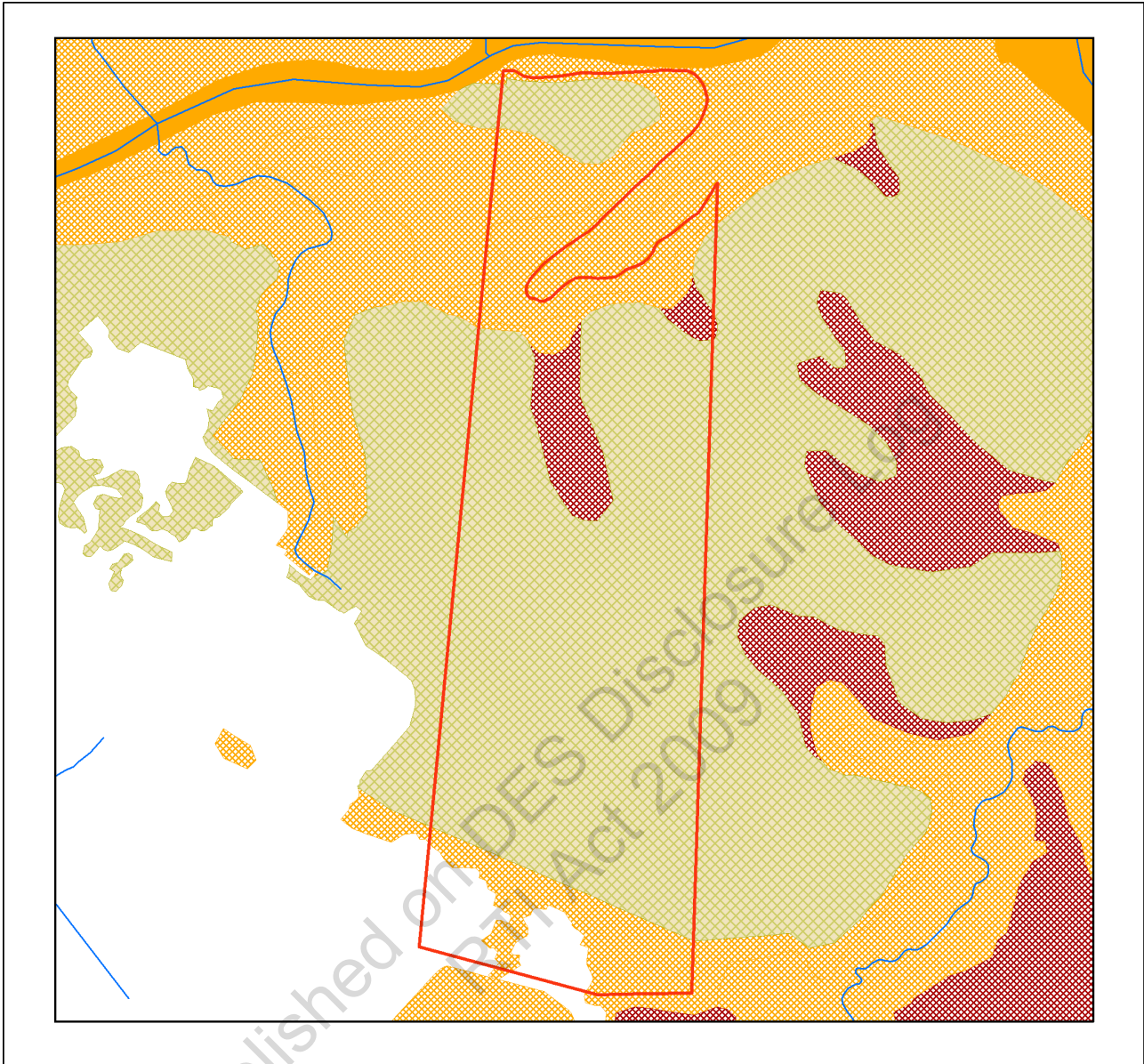
Regional ecosystem mapping over the majority of Queensland is produced at a scale of 1:100,000. At this scale, the minimum remnant polygon area is 5 hectares or minimum remnant width of 75 metres. Regional ecosystem linework reproduced at a scale greater than 1:100,000, except in designated areas, should be used as a guide only. The precision of polygon boundaries or positional accuracy of linework is 100 metres.

Regional ecosystems are defined as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil.

The label consists of 3 components: bioregion, land zone, and vegetation community – the dominant canopy species. e.g.: RE 12.3.3. Descriptions of REs are found online. Use the search term "Regional Ecosystem Framework". Regional ecosystem mapping at 1:100,000 map scale is derived from the following sources: 1:80,000 B&W 1960's aerial photography, Landsat TM imagery, geology, soils, land systems data, field survey and historical records.

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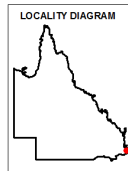
Map 6 - Wetlands and waterways



Queensland Wetland Data

Legend

- Selected Lot and Plan
- ▲ 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)



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.

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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

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Neldner, V.J., Wilson, B.A., Dillewaard, H.A., Ryan, T.S., Butler, D.W., McDonald, W.J.F., Addicott, E.P. and Appelman, C.N. (2020). Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland. Version 5.1. Updated March 2020. Queensland Herbarium, Queensland Department of Environment and Science, Brisbane.

<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 2019 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

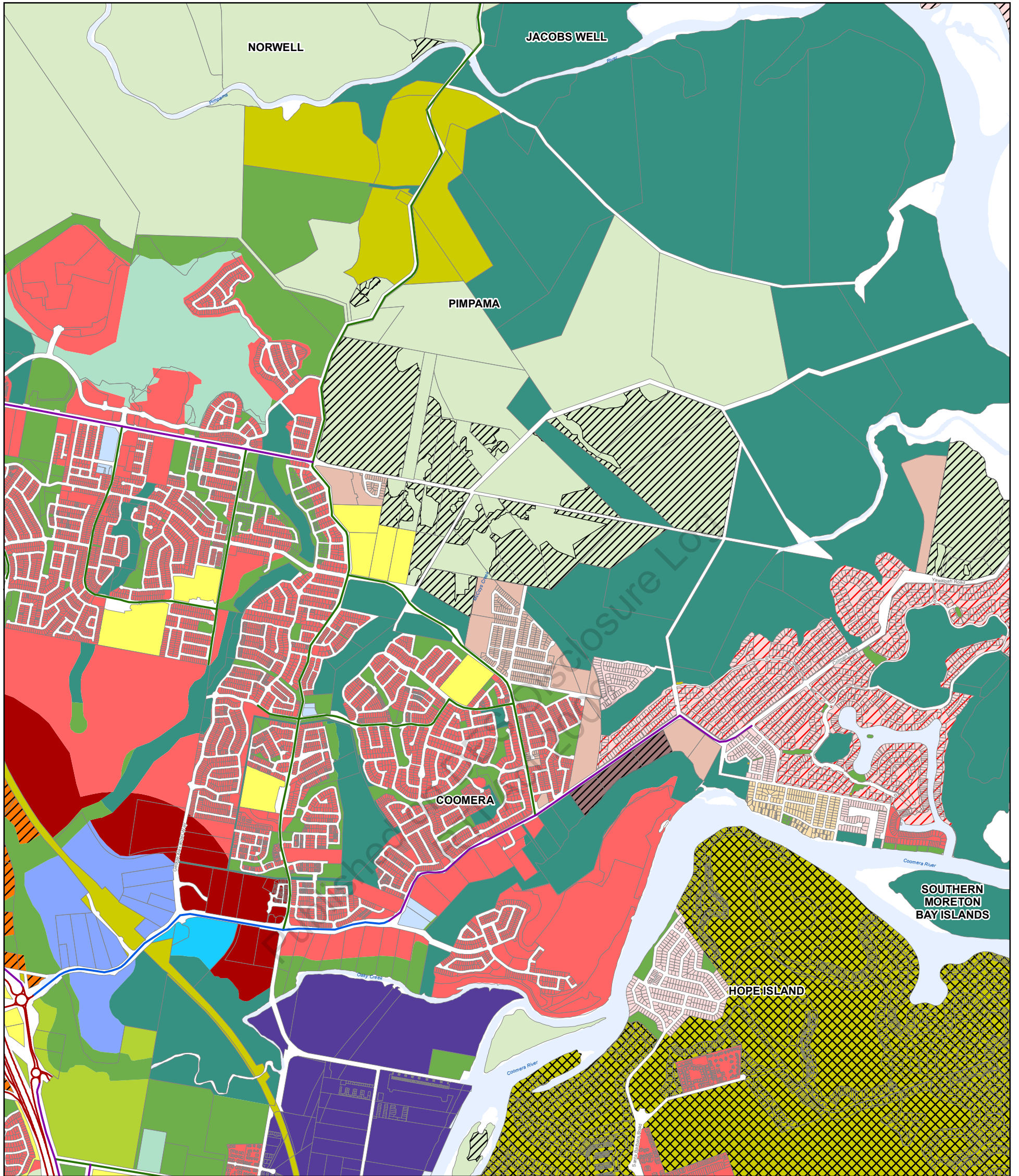
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Appendix 2 - Acronyms and Abbreviations

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>

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Zone map - map 14 Coomera



<p>Residential zones category</p> <ul style="list-style-type: none"> Low density residential Low density residential, Large lot precinct Low density residential, Calypso Bay precinct Medium density residential Medium density residential, Calypso Bay precinct High density residential <p>Centres zones category</p> <ul style="list-style-type: none"> Centre Neighbourhood centre Neighbourhood centre, West Burleigh historic township precinct <p>Recreation zones category</p> <ul style="list-style-type: none"> Sport and recreation Sport and recreation, Bond University precinct Sport and recreation, Bundall equestrian area precinct Open space 	<p>Environment zones category</p> <ul style="list-style-type: none"> Conservation <p>Industry zones category</p> <ul style="list-style-type: none"> Low impact industry Low impact industry, Future low impact industry precinct Medium impact industry Medium impact industry, Future medium impact industry precinct High impact industry High impact industry, Future high impact industry precinct Waterfront and marine industry Waterfront and marine industry, The Spit marine industry precinct <p>Tourism zones category</p> <ul style="list-style-type: none"> Major tourism Major tourism, Island resorts precinct Major tourism, Sea World precinct Major tourism, The Spit northern tourism precinct Major tourism, The Spit eastern tourism precinct 	<p>Other zones category</p> <ul style="list-style-type: none"> Major tourism, The Spit southern tourism precinct Major tourism, Wildlife park precinct Community facilities Emerging community Extractive industry Extractive industry, Extractive industry indicative buffer Innovation Innovation, Bond University precinct Innovation, Gold Coast cultural precinct Limited development (constrained land) Mixed use Mixed use, Bermuda Point precinct Mixed use, Fringe business precinct 	<p>Functional road hierarchy</p> <ul style="list-style-type: none"> Arterial road Sub-arterial road Distributor road State road 	<p>Rural</p> <ul style="list-style-type: none"> Rural, Rural landscape and environment precinct Rural residential Rural residential, Rural residential landscape and environment precinct Special purpose Special purpose, Special development areas precinct Township Township, Commercial precinct Township, Large lot precinct Unzoned 	<p>Property boundaries</p> <ul style="list-style-type: none"> Property boundaries Local government area boundary Waterway or waterbody 	<p>City Plan</p> <p>Disclaimer: © City of Gold Coast, Queensland 2020 or © State of Queensland 2020. No warranty given in relation to the data (including accuracy, reliability, completeness or suitability) and no liability accepted (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws.</p> <p>Map version - 7 01 Oct 2020 Data source: Zone - CoGC Functional road hierarchy - CoGC & State Waterways - CoGC Cadastre (Jan 2020) - State</p> <p>0 250 500 m Approx scale @ A3 1:25,000</p> <p>Projection: MGA94 Zone 56</p> <p>CITY OF GOLD COAST</p>
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WildNet Records Conservation Significant Species List - INTERNAL

Report created: 09/05/2022 20:10:23

WILDCSINT-Greenridge

Summary Information

The following table provides an overview of the area of interest: Lot: 3 Plan: RP50178, Lot: 4 Plan: RP50178.

Table 1. Area of interest details

Size (ha)	160.88
Local Government(s)	Gold Coast City
Bioregion(s)	Southeast Queensland
Subregion(s)	Sunshine Coast - Gold Coast Lowlands
Catchment(s)	South Coast

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.

Introduction

This WildNet Records Conservation Significant Species List - INTERNAL report is derived from an extract of wildlife records from the WildNet database that is generated weekly. The extract contains the WildNet wildlife records that are not classed as erroneous or duplicate, that have a location precision equal to or less than 10000 metres and that do not have a count of zero. The WildNet database is managed by Science Information Services within the Department of Environment and Science. Refer to Links and Support Section for information about how to access WildNet data. Other internal and external data sources may provide additional information on species occurrence within your area of interest.

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 conservation significant species is not listed in this report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area. It is recommended that you also access other internal and external data sources for species information in your area of interest.

2. Species data

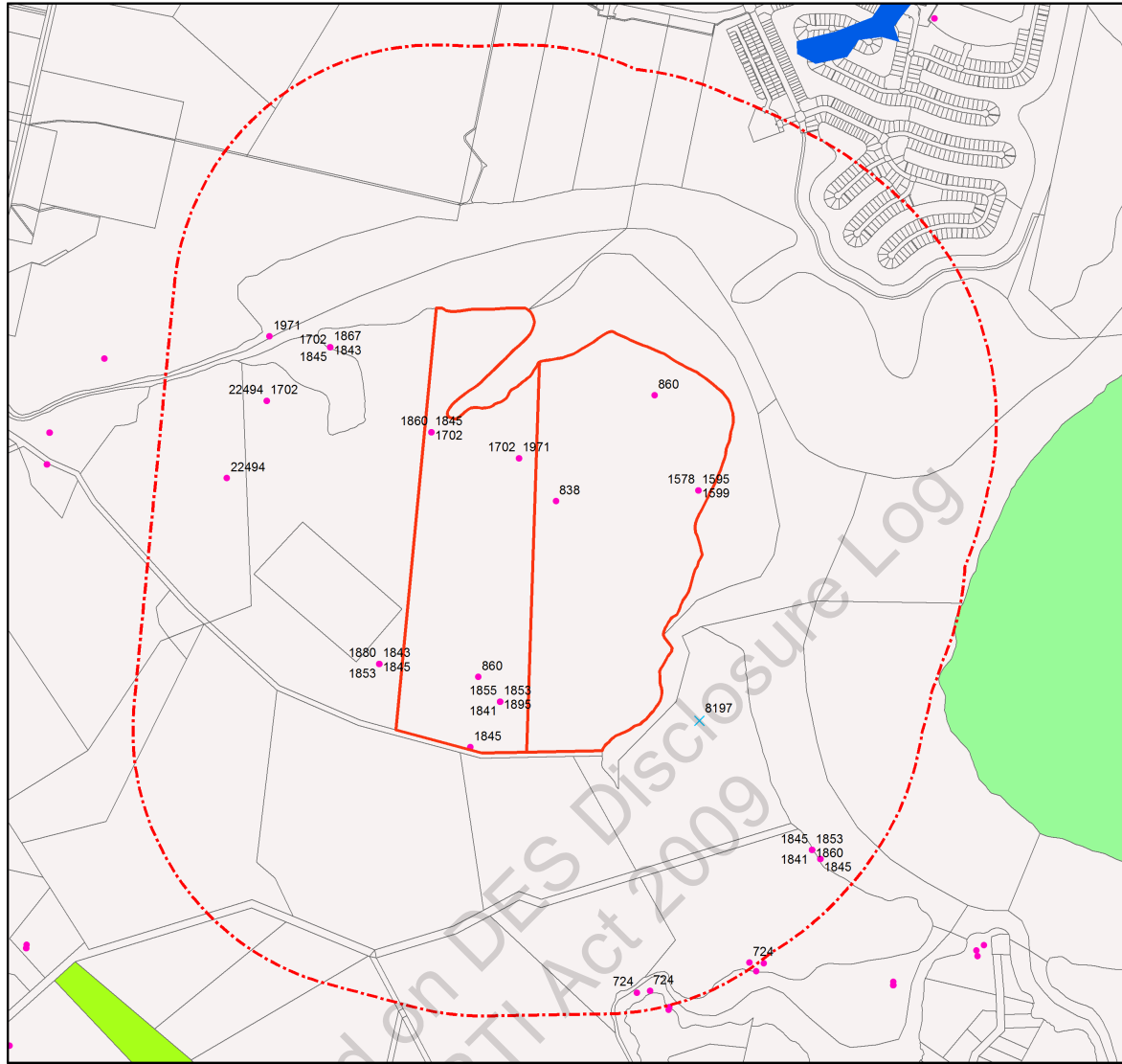
The locations of the conservation significant species are mapped in Map 1.

A summary of the conservation significant species recorded within the area of interest is presented in Table 2.

A summary of the conservation significant species recorded within the one kilometre buffer around the area of interest is presented in Table 3.

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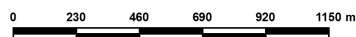
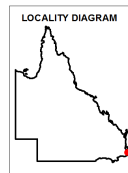
Map 1. Conservation Significant Species Locations



Conservation Significant Species Locations

Legend

- 1 kilometre buffer
- Selected Lot and Plan
- Animal locations with associated Taxon Id
- Plant locations with associated Taxon Id
- Towns
- Cadastral line
- Property boundaries shown are provided as a locational aid only
- Major rivers/creeks
- Reservoirs
- Lakes
- National Park (Scientific)
- National Park
- National Park (CYPAL)
- Conservation Park
- Resources Reserve
- Forest Reserve
- State Forest
- Timber Reserve
- World Heritage Areas
- Nature Refuges
- Queensland



This product is projected into GDA 1994 Queensland Albers

Disclaimer:

The process of collating and vetting data is ongoing and it is possible the information given is not complete. The information provided should only be used for the project for which it was requested and it should be appropriately acknowledged as being derived from WildNet when it is used.

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Table 2. Conservation significant species recorded within the area of interest

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1702	Animalia	Aves	Accipitridae	<i>Pandion cristatus</i>	eastern osprey	SL	None	0	3	11/03/2006
1971	Animalia	Aves	Apodidae	<i>Hirundapus caudacutus</i>	white-throated needletail	V	V	0	1	25/01/2006
1895	Animalia	Aves	Laridae	<i>Thalasseus bergii</i>	crested tern	SL	None	0	1	11/03/2006
1595	Animalia	Aves	Monarchidae	<i>Monarcha melanopsis</i>	black-faced monarch	SL	None	0	1	10/11/2000
1599	Animalia	Aves	Monarchidae	<i>Myiagra cyanoleuca</i>	satin flycatcher	SL	None	0	1	10/11/2000
1578	Animalia	Aves	Rhipiduridae	<i>Rhipidura rufifrons</i>	rufous fantail	SL	None	0	1	10/11/2000
1874	Animalia	Aves	Scolopacidae	<i>Calidris acuminata</i>	sharp-tailed sandpiper	SL	None	0	1	11/03/2006
1867	Animalia	Aves	Scolopacidae	<i>Limosa lapponica baueri</i>	Western Alaskan bar-tailed godwit	V	V	0	1	11/03/2006
1855	Animalia	Aves	Scolopacidae	<i>Limosa limosa</i>	black-tailed godwit	SL	None	0	1	11/03/2006
1843	Animalia	Aves	Scolopacidae	<i>Numenius madagascariensis</i>	eastern curlew	E	CE	0	1	11/03/2006
1845	Animalia	Aves	Scolopacidae	<i>Numenius phaeopus</i>	whimbrel	SL	None	0	3	12/03/2006
1860	Animalia	Aves	Scolopacidae	<i>Tringa brevipes</i>	grey-tailed tattler	SL	None	0	2	11/03/2006
1853	Animalia	Aves	Scolopacidae	<i>Tringa nebularia</i>	common greenshank	SL	None	0	1	11/03/2006
1841	Animalia	Aves	Scolopacidae	<i>Tringa stagnatilis</i>	marsh sandpiper	SL	None	0	1	11/03/2006
1827	Animalia	Aves	Scolopacidae	<i>Xenus cinereus</i>	terek sandpiper	SL	None	0	1	11/03/2006
860	Animalia	Mammalia	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala	E	E	0	2	18/09/2020
838	Animalia	Mammalia	Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna	SL	None	0	1	04/05/2013

Table 3. Conservation significant species recorded within the one kilometre buffer area

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1702	Animalia	Aves	Accipitridae	<i>Pandion cristatus</i>	eastern osprey	SL	None	0	2	16/03/2007
1971	Animalia	Aves	Apodidae	<i>Hirundapus caudacutus</i>	white-throated needletail	V	V	0	2	17/01/2018
22494	Animalia	Aves	Cacatuidae	<i>Calyptorhynchus lathami lathami</i>	glossy black-cockatoo (eastern)	V	None	0	3	16/03/2007
1886	Animalia	Aves	Laridae	<i>Gelochelidon nilotica</i>	gull-billed tern	SL	None	0	2	04/12/2019
1880	Animalia	Aves	Scolopacidae	<i>Calidris ruficollis</i>	red-necked stint	SL	None	0	1	13/01/2008

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1867	Animalia	Aves	Scolopacidae	<i>Limosa lapponica baueri</i>	Western Alaskan bar-tailed godwit	V	V	0	8	04/12/2019
1843	Animalia	Aves	Scolopacidae	<i>Numenius madagascariensis</i>	eastern curlew	E	CE	0	8	04/12/2019
1845	Animalia	Aves	Scolopacidae	<i>Numenius phaeopus</i>	whimbrel	SL	None	0	8	04/12/2019
1860	Animalia	Aves	Scolopacidae	<i>Tringa brevipes</i>	grey-tailed tattler	SL	None	0	3	04/12/2019
1853	Animalia	Aves	Scolopacidae	<i>Tringa nebularia</i>	common greenshank	SL	None	0	3	29/01/2009
1841	Animalia	Aves	Scolopacidae	<i>Tringa stagnatilis</i>	marsh sandpiper	SL	None	0	1	13/01/2008
1827	Animalia	Aves	Scolopacidae	<i>Xenus cinereus</i>	terek sandpiper	SL	None	0	4	04/12/2019
724	Animalia	Mammalia	Muridae	<i>Xeromys myoides</i>	water mouse	V	V	0	3	15/03/2016
8197	Plantae	Equisetopsida	Orchidaceae	<i>Geodorum densiflorum</i>	pink nodding orchid	SL	None	1	1	11/05/2005

Species table headings and codes

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

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

EPBC: Australian conservation status of the taxon under the *Environment Protection and Biodiversity Conservation Act 1999* (Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Vulnerable (V), and Extinct in the Wild (XW)).

Specimens: The number of specimen-backed records of the taxon.

Records: The total number of records of the taxon.

Last record: Date of latest record of the taxon.

Links and Support

Staff can use the [WildNet application](#) to access wildlife and reserve information and generate species lists. Wildlife records can be accessed and exported from the WildNet application by users with Confidential Sightings Access. Use the Species Lists module to generate Species Lists for a range of area types including protected areas, nature refuges and State Forests and access species records. Use the Sighting Search module to generate species lists for areas defined by coordinates and access the species records.

A subset of WildNet records can also be viewed with other spatial information via the [WildMap](#) application by staff that have access to the LANDS network.

Other Maps Online reports based on WildNet data and other biodiversity data can be generated via also available from [WildMap](#), or the [Report Request Page](#) on [encompass](#).

External clients should be directed to the [WildNet database webpage](#) to access application and products that deliver WildNet data approved for release to externals.

Further information about accessing WildNet applications and products or providing wildlife records can be obtained from the [WildNet Program SharePoint site](#) or the WildNet Team WildNet@des.qld.gov.au.

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Greenridge - East Commera

PKA, KHA, KHRA Mapping

27°48'10" S 153°19'43" E

27°48'10" S 153°22'57" E



27°50'23" S 153°19'43" E

27°50'23" S 153°22'57" E

Legend located on next page



Scale: 1:18055

Printed at: A3

Print date: 13/10/2021

Datum: Geocentric Datum of Australia 1994

Projection: Web Mercator EPSG 102100

For more information, visit <https://qld.gov.au/help-info/contact-us.html>

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