ESEA

Environmental Services & Education Australia

‘Middle Island’, Kurrajong Heights

Preliminary Biodiversity Assessment

Mountain Island Pty Ltd

22 April 2024

Version 2.0

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ESEA Project Manager	Clayton Woods
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22 April 2024

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Dear Mark

The Island Oasis Tourist Facility 'Middle Island' 278-278A Hermitage Road, Kurrajong Heights Preliminary Biodiversity Assessment

A preliminary biodiversity assessment has been conducted to identify potential environmental constraints that may impede the proposed future development of The Island Oasis tourist and resort facility at 'Middle Island' 278-278A Hermitage Road, Kurrajong Heights (the site).

ESEA understands that this letter will form part of a Scoping Report to obtain the Secretary's Environmental Assessment Requirements (SEARs) for the proposed development to be considered State Significant Development (SSD) in accordance with the NSW *Environmental Planning and Assessment Act 1979*.

This report provides information on the terrestrial biodiversity values within the proposed development area and assesses these values in relation to the NSW *Biodiversity Conservation Act 2016* (BC Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

CONTENTS

1 INTRODUCTION

1.1 Background

Mountain Island Pty Ltd are seeking Secretary's Environmental Assessment Requirements (SEAR's) for a State Significant tourist and resort facility at "Middle Island", 278-278A Hermitage Road, Kurrajong Heights (Lot 181 DP 701978). The land is in the local government area of The Hawkesbury City Council and is situated within land collectively known as ''The Islands''.

The proposed development seeks to create an innovative, environmentally sustainable, self-sufficient, master-planned community embracing and being sensitive to the natural features and resources of the site and surrounding area (Figure 1). The overall development is currently planned to comprise the following:

- 1 x clubhouse, totalling 1,321 m^2 developed floor area,
- 120 x lodge suites, totalling 5,160 m^2 developed floor area,
- 311 x luxury cabins, totalling 42,950 m^2 developed floor area,
- 400 x camping and caravan sites, totalling 36,300 m^2 developed floor area,
- 100 x glamping sites, totalling 28,170 m^2 developed floor area, and
- 6 x kitchen camp & common facilities, totalling 1,020 m^2 developed floor area.

Additional works will include the construction of new internal roadways, mountain biking and horse trails, cultural camps, ziplines, adventure playgrounds, escape mazes, and bushfire provisions including establishment of 100 m Asset Protection Zones (APZ) for the entire development. The total site area is 278.8 ha, with 126.6 ha within the APZ boundary.

1.2 Objective

Mountain Island Pty Ltd has requested that Environmental Services and Education Australia (ESEA) prepare a Preliminary Biodiversity Assessment for the subject site.

The purpose of this report is to provide initial advice about the biodiversity values of the area. ESEA understands that this report will form part of an application to obtain the SEARs for the proposed development to be considered an SSD in accordance with the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This report assesses any constraints which may affect future development at the subject site, determines the likely impacts of the works, and to support the SEARs application process.

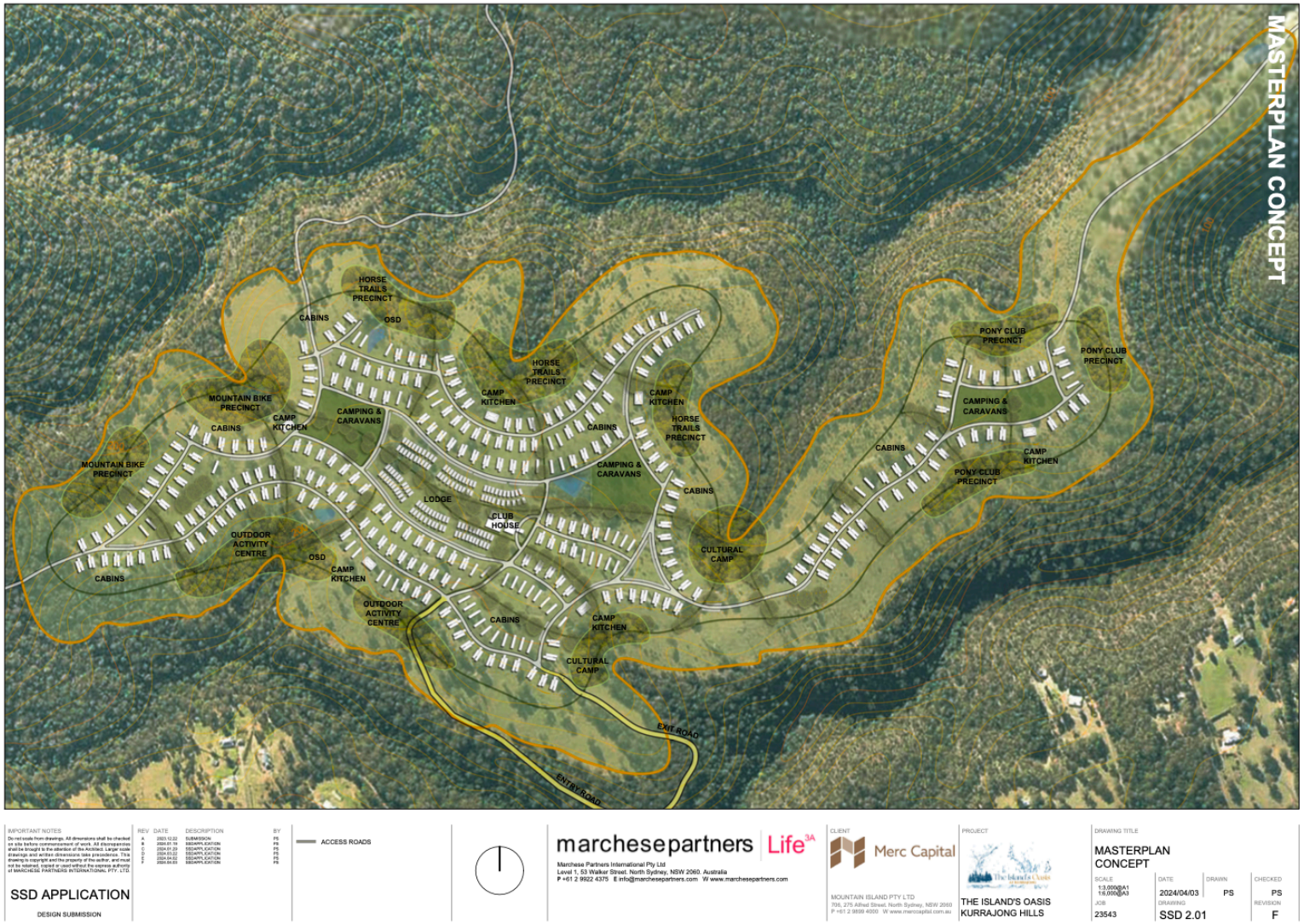

Figure 1 SSD Application Design Submission

2 SITE DESCRIPTION

2.1 Site Location and Background

The site, known as 'Middle Island' and is located at 278-278A Hermitage Road, Kurrajong Heights in the Hawkesbury City Council LGA (Figure 2). The following lots are included in the development proposal:

- Lot 181 DP 701978

The proposed development area is zoned C4 – Environmental Living under the *Hawkesbury Local Environment Plan 2012* (LEP) (Figure 3). Additional areas of the Lot are zoned C3 - Environmental Management - though these areas will not be subject to development. Middle Island has a site area of 278.8 ha. It is bounded by Middle Island Creek to the south, Big Island Creek to the north and Little Wheeny Creek (and Wollemi National Park) to the east. A grazing property is located on its western boundary.

Approximately 80 hectares of Middle Island is largely cleared grazing land that is managed as an Arabian horse stud, with the remainder being native bushland and creek gullies in variable condition. A single manager's residence is located on the subject land with ancillary rural buildings, fencing and farm dams. A small, disused sandstone quarry is located at its eastern tip (MetroMap 2023; NSW Sixmaps 2023).

Access to Middle Island comprises shared access to Hermitage Road with the adjacent community title large lot residential area located on what is locally known as 'Little Island'.

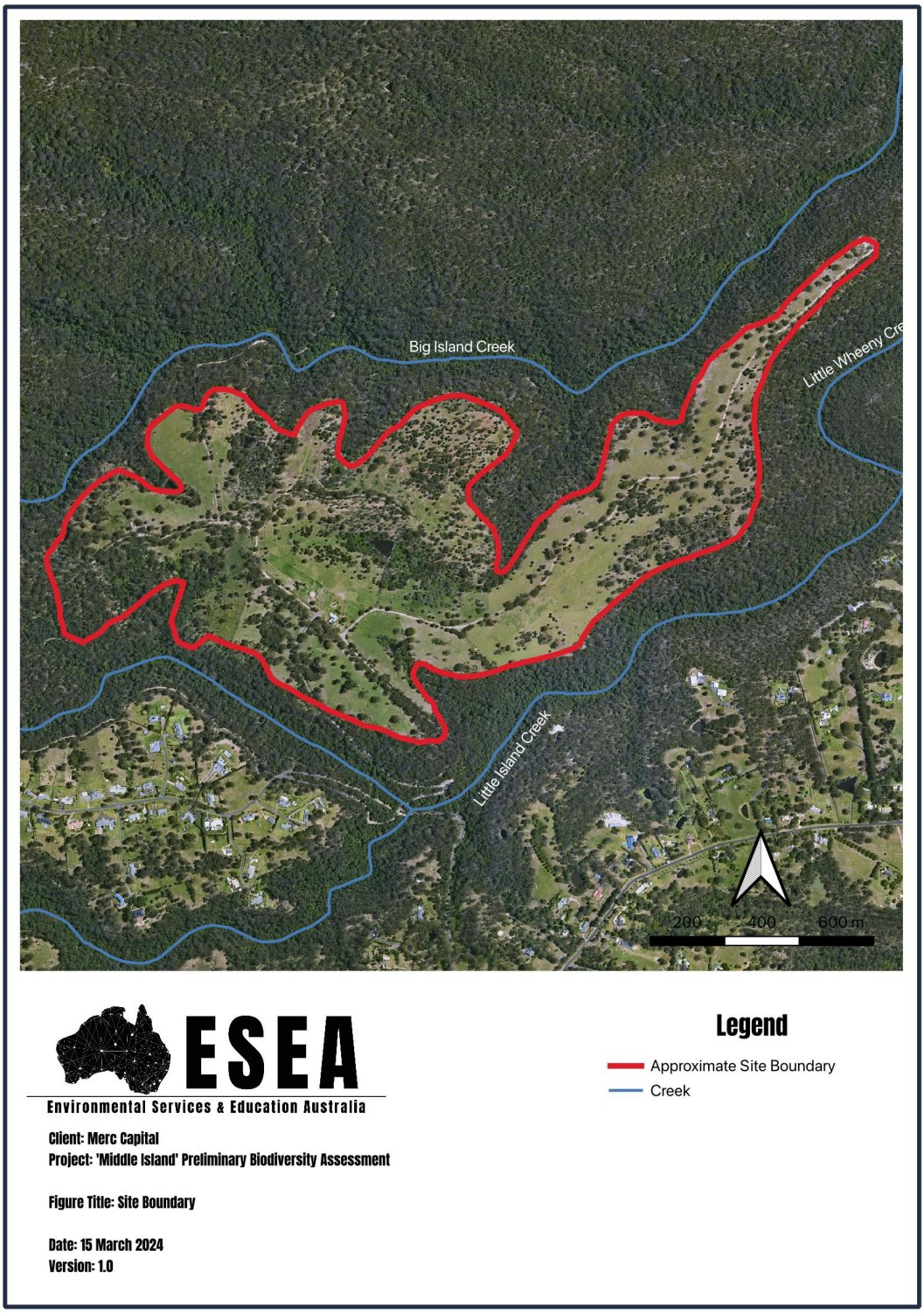

Figure 2 Site Characteristics

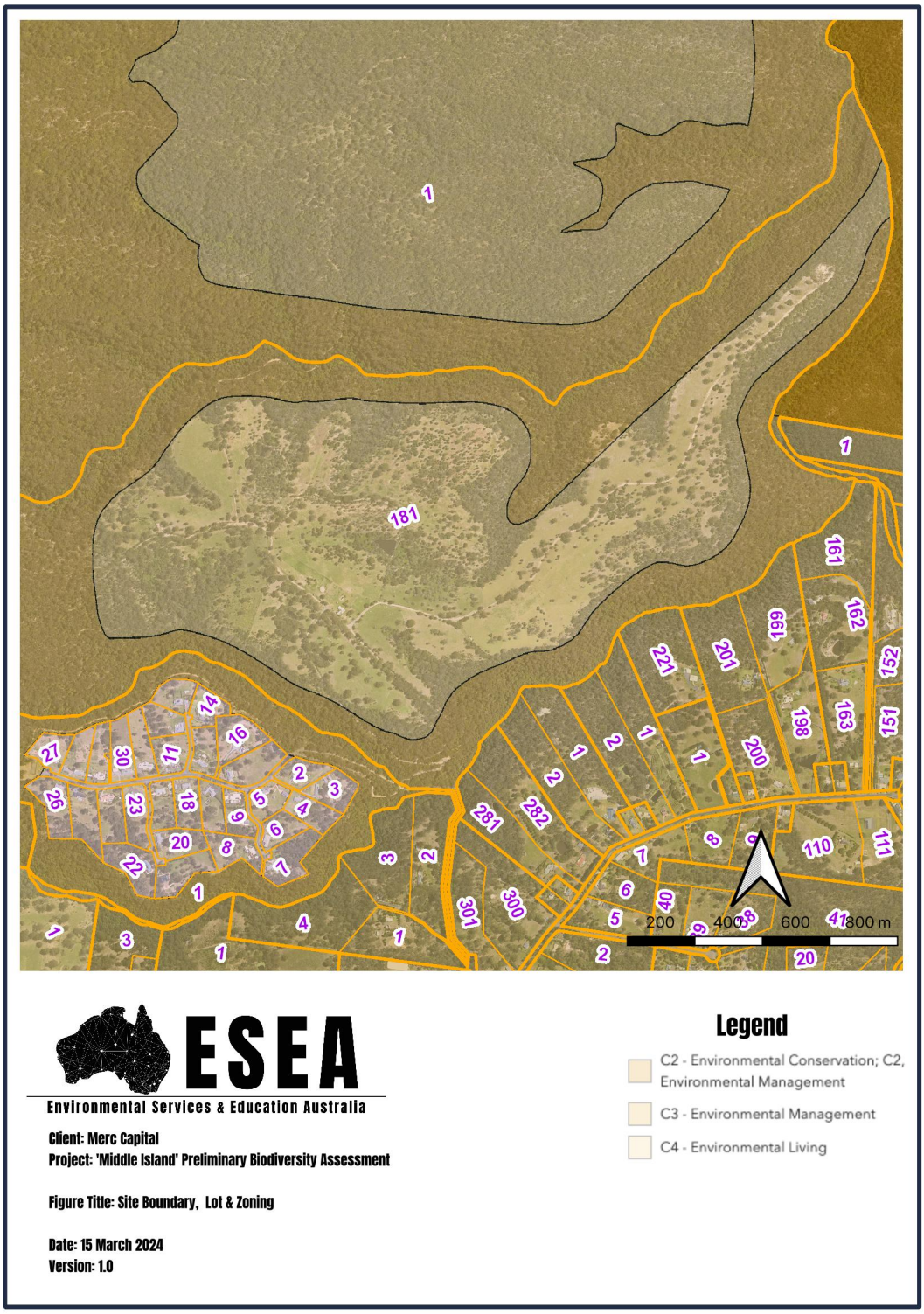

Figure 3 Site Boundary, Lot & Zoning

3 RELEVANT LEGISLATION

Legislation and policy relevant to the biodiversity component of works within the subject site are outlined below:

3.1 Environmental Protection and Biodiversity Conservation Act 1999

Under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), Commonwealth approval is required for certain actions which have, or may have, or are likely to have a significant impact on a Matters of National Environmental Significance (MNES). These matters are listed as:

- the world heritage values of a declared World Heritage property,
- the ecological character of a declared Ramsar wetland,
- a threatened species or endangered community listed under the Act,
- a migratory species listed under the Act, or
- the environment in a Commonwealth marine area or on Commonwealth Land.

A person must not, without an approval under the Act, take an action that has, or will have, or is likely to have, a significant impact on a MNES.

When approving developments, determining authorities should consider whether to allow actions that could significantly affect MNES or the environment of Commonwealth land. Commonwealth assessment will be required for proposed activities if they are considered likely to affect any MNES. If the assessment concludes there is a significant impact, then it will become a controlled action under the EPBC Act, and the proposal must be referred to the Commonwealth. Approval from the relevant Federal Minister is required for any actions that may have a significant impact on MNES, except in circumstances which are set out in the EPBC Act.

Approval from the Commonwealth Federal Minister is in addition to any approvals under NSW legislation unless the proposal sits under the NSW and Australian Governments' bilateral agreement established under the EPBC Act. The bilateral agreement accredits certain NSW assessment processes which allows the Australian Government Minister for the Environment to rely on NSW environmental impact assessment processes to assess actions under the EPBC Act.

Our desktop assessment shows that the World Heritage Property 'Greater Blue Mountains Area' and the National Heritage Place 'The Greater Blue Mountains Area' occurs within the property boundaries of Lot 181 DP 701978, but not within the bounds of the proposed works. As such, referral under the EPBC Act is considered appropriate in this instance. It is anticipated that potential impacts to MNES will be assessed in accordance with the NSW Assessment Bilateral Agreement therefore, allowing DPE to manage the assessment of the proposed development on behalf of the Commonwealth, including the issuing of the assessment requirements.

The subject site is not in proximity to any Wetlands of International Importance, Marine Parks, or Commonwealth Marine Areas.

3.2 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2015* (BC Act) provides a framework for the protection of biodiversity in NSW. It provides provisions for threatened species protection that must be considered by the determining authority during the development application process. Features covered by the Act include:

- the protection of animals and plants,
- areas of outstanding biodiversity value,
- key threatening processes,
- biodiversity conservation programs,
- biodiversity offset schemes,
- biodiversity certification,
- public consultation requirements,
- regulatory compliance and penalties.

It is typically a requirement under the BC Act that a Biodiversity Assessment be produced and included as part of the development application process. This provides an overview of the biodiversity values of a subject site, the likely impacts of the proposed development, and provides guidance on how a proponent can avoid and minimise potential biodiversity impacts. Where the proponent of a development activity can clearly demonstrate that the proposed development is not likely to have a significant effect on biodiversity, the determining authority may approve the works.

In accordance with Section 7.9(2) of the BC Act, any SSD application must:

> *be accompanied by a biodiversity development assessment report unless the Planning Agency Head and the Environment Agency Head determine that the proposed development is not likely to have any significant impact on biodiversity values.*

Therefore, a Biodiversity Development Assessment Report (BDAR) will be required to accompany the development proposal.

3.3 Fisheries Management Act 1994

The provisions of the *Fisheries Management Act 1994* (FM Act) relating to the development and approval processes operate similarly to the BC Act. The Act identifies threatened aquatic species, populations and ecological communities, and requires a test of significance if they are present within the subject site. Where significant impacts to any of these features are considered likely to occur, this triggers the need for a Species Impact Statement.

No Key Fish Habitat is present within, or in proximity to, the subject site.

3.4 Water Management Act 2000

The objectives of the *Water Management Act 2000* (WM Act) are to provide for the sustainable and integrated management of the water sources of the state for the benefit of both present and future generations and, in particular, ecologically sustainable development.

Under the WM Act, a Controlled Activity Approval (CAA) is required for activities which are carried out in, on, or under waterfront land, i.e., within 40 m of a waterway.

Multiple mapped hydrolines are present within the proposed development site (Figure 4). The proposed development will therefore be considered a Controlled Activity by DPE Water / Natural Resources Access Regulator (NRAR) and will require a CAA.

3.5 Hawkesbury Local Environmental Plan 2012

The current version of the *Hawkesbury Local Environmental Plan 2012* (LEP) came into effect on the 28th of February 2019. This plan aims to make local environmental planning provisions for land in the Hawkesbury LGA in accordance with the relevant standard environmental planning instrument.

The works are to be conducted as per C4 – Environmental Living zoned land. The objectives of this zone include:

- To provide for low-impact residential development in areas with special ecological, scientific or aesthetic values.
- To ensure that residential development does not have an adverse effect on those values.
- To restrict development on land that is inappropriate for development because of its physical characteristics or bushfire risk.
- To ensure that land uses are compatible with existing infrastructure, services and facilities and with the environmental capabilities of the land.
- To encourage existing sustainable agricultural activities.
- To ensure that development does not create or contribute to rural land use conflicts.
- To promote the conservation and enhancement of local native vegetation, including the habitat of threatened species, populations and ecological communities by encouraging development to occur in areas already cleared of vegetation.
- To ensure that development occurs in a way that does not have a significant adverse effect on water catchments, including surface and groundwater quality and flows, land surface conditions and important ecosystems such as waterways.

Under C4 – Environmental Living zoning, camping grounds and caravan parks are permitted with consent.

The proposed development is in line with the above objectives of the Hawkesbury LEP, as the majority of the proposed works has been restricted to areas already cleared of vegetation. The proposed development has also restricted development in proximity to the three nearby creeks, therefore limiting adverse impacts on water catchments.

3.6 Hawkesbury Development Control Plan 2002

The aim of the *Hawkesbury Development Control Plan 2002* (DCP) is to allow detailed provisions to be made to control and guide development and subdivision within the Hawkesbury LGA.

Chapter 9 - Preservation of trees and vegetation includes provisions related to tree preservation. Under this clause, a person must not ringbark, cut down, top, lop, remove, injure or wilfully destroy “prescribed” trees or vegetation, without development consent or a permit being granted by Council.

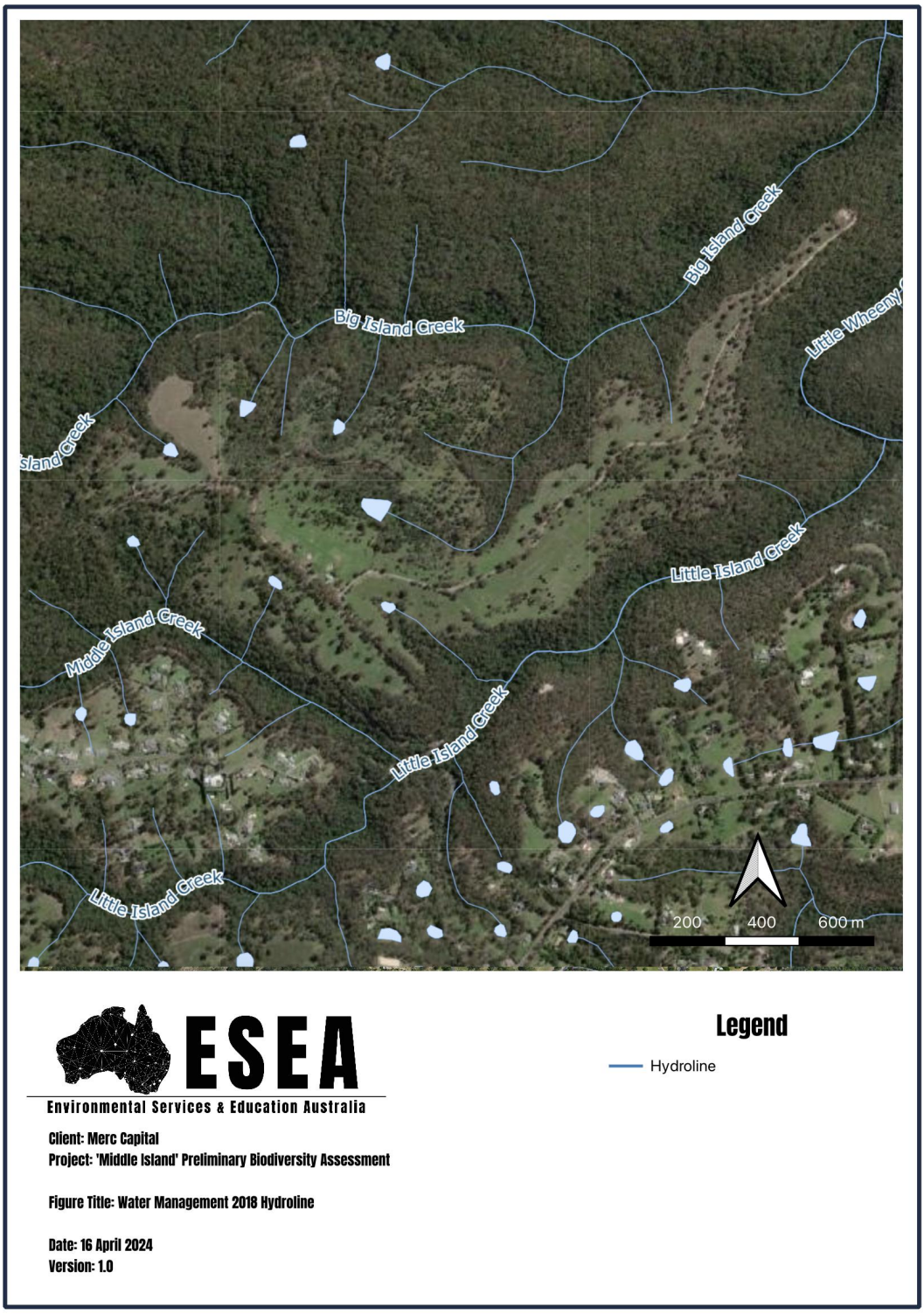

Figure 4 Water Management Hydrolines

4 DESKTOP RESEARCH AND ANALYSIS

ESEA has reviewed background information and data and undertaken searches of relevant online databases and mapping of the study area. Search tools used included:

- NSW Planning Portal (NSW DPE);
- NSW Biodiversity Values Map (NSW DPE);
- NSW State Vegetation Type Map (NSW DPE);
- BioNet Vegetation Classification (NSW OEH);
- BioNet Atlas of NSW Wildlife (NSW OEH);
- EPBC Protected Matters Search Tool (DAWE);
- Key Fish Habitat Mapping (NSW DPI); and,
- NSW Threatened Species Profile Database (DPIE 2020b).

4.1 Site Characteristics

Approximately 80 hectares of Middle Island is largely cleared grazing land that is managed as an Arabian horse stud, with the remainder being native bushland and creek gullies in variable condition. A single manager's residence is located on the subject land with ancillary rural buildings, fencing and farm dams. A small, disused sandstone quarry is located at its eastern tip (MetroMap 2023; NSW Sixmaps 2023).

4.2 Biodiversity Values and Vegetation Mapping

This section presents the results from the following searches:

- Biodiversity Values Map (NSW DPE);
- BioNet Vegetation Classification (NSW OEH); and
- NSW Historic Imagery (NSW Spatial Services).

4.2.1 Biodiversity Values Map

The Biodiversity Values Map is prepared by the Department of Planning and Environment under Part 7 of the BC Act. It identifies land with high biodiversity value that is particularly sensitive to impacts from development and clearing. The map forms part of the Biodiversity Offset Scheme (BOS) threshold, which is one of the triggers for determining whether the BOS applies to a clearing or development proposal.

Mapped Biodiversity Value areas are present within the subject site and will be impacted by the proposed works (Figure 5). As such, the proposed development triggers the BOS, and a BDAR is required to be submitted as part of any development application. The proposed development will be subject to offsetting requirmements.

4.2.2 BioNet Vegetation Classification

The NSW State Vegetation Type Map is a regional-scale map of NSW Plant Community Types. The map represents the current extent of each Plant Community Type (PCT), Vegetation Class and Vegetation Formation, across all tenures in NSW.

According to the NSW State Vegetation Type Mapping, the following PCTs are mapped as occurring within the subject site (Figure 6).

- PCT 3321 - Cumberland Shale-Sandstone Ironbark Forest (This PCT is associated with Shale Sandstone Transition Forest in the Sydney Basin Bioregion (Critically Endangered, BC Act; Critically Endangered, EPBC Act).
- PCT 3262 - Sydney Turpentine Ironbark Forest (This PCT is associated with Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion (Critically Endangered, BC Act) and Turpentine-Ironbark Forest of the Sydney Basin Bioregion (Critically Endangered, EPBC Act),
- PCT 3578 - Blue Mountains Low Heathy Woodland,
- PCT 3617 - Sydney Hinterland Peppermint-Apple Forest,
- PCT 3111 - Sydney Hinterland Grey Myrtle Riparian Forest,
- PCT 3622 - Sydney Hinterland Yellow Bloodwood Woodland,

An ecological onsite assessment was conducted to determine the presence and condition of native vegetation on site and if it conforms to any PCT. The results of this survey are presented in Section 5.

4.2.3 Previous Studies

Previous BioBanking Credit Reporting produced by GDH (2017) recorded the following vegetation communities within the western portion of the subject site – Noting the below BioMetric Vegetation Types were retired from the BioNet Vegetation Classification (previously known as VIS Classification) on 21 August 2017 and replaced with PCTs for the commencement of the BC Act.

- Smooth-barked Apple - Red Bloodwood - Sydney Peppermint heathy open forest on slopes of dry sandstone gullies of western and southern Sydney, Sydney Basin Bioregion, (HN586),
- Red Bloodwood - Grey Gum woodland on the edges of the Cumberland Plain, Sydney Basin Bioregion, (HN564),
- Narrow-leaved Ironbark - Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain, Sydney Basin Bioregion, (HN556),
- Turpentine - Smooth-barked Apple moist shrubby forest of the lower Blue Mountains, Sydney Basin Bioregion, (HN606),
- Coachwood - Lilly Pilly warm temperate rainforest in moist sandstone gullies, Sydney Basin Bioregion, (HN517).

These vegetation communities were assessed as part of a Biodiversity Stewardship Site Assessment (BSSA) and are within areas of the property that that are to be managed as a stewardship site, rather than being developed. These areas of the subject site produce credits which would be available to offset development impacts associated with the proposed Middle Island Tourism Development.

4.2.4 Terrestrial Biodiversity Map

As per the Hawkesbury LEP *Terrestrial Biodiversity Map Sheet BIO_003*, the Little Island Creek and Big Island Creek are mapped as ‘Connectivity Between Significant Vegetation’.

Before determining a development application for land to which this clause applies, the consent authority must consider -

- whether the development —
  - is likely to have any adverse impact on the condition, ecological value and significance of the fauna and flora on the land, and
  - is likely to have any adverse impact on the importance of the vegetation on the land to the habitat and survival of native fauna, and
  - has any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land, and
  - is likely to have any adverse impact on the habitat elements providing connectivity on the land.
- any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that —

- the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or
- if that impact cannot be reasonably avoided by adopting feasible alternatives—the development is designed, sited and will be managed to minimise that impact, or
- if that impact cannot be minimised—the development will be managed to mitigate that impact.

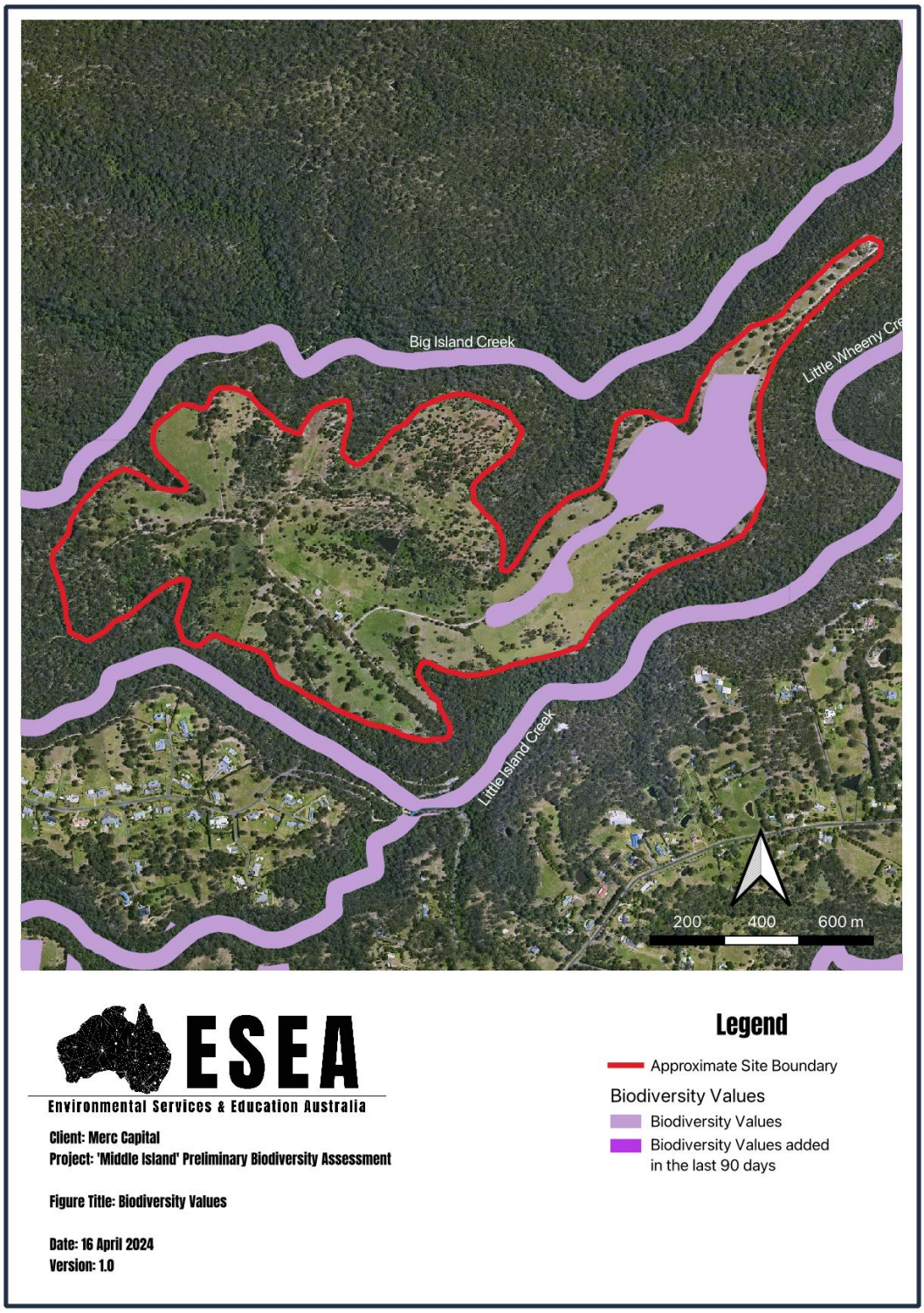

Figure 5 Biodiversity Values

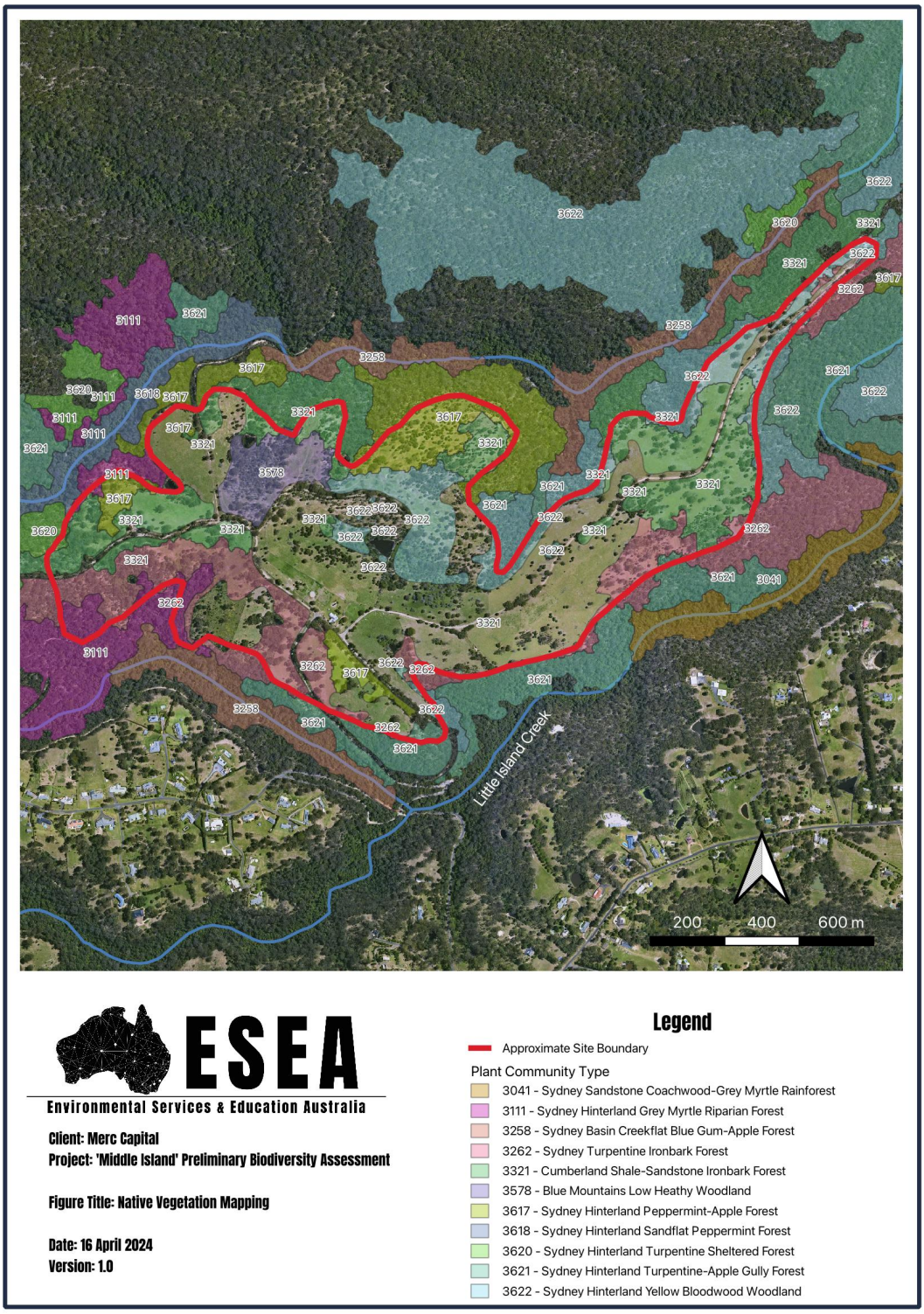

Figure 6 Native vegetation mapping

4.3 Threatened Species Assessment

This section presents the results from the following searches:

- BioNet Atlas of NSW Wildlife (NSW OEH);
- NSW SEED Database (NSW OEH);
- NSW Threatened Species Profile Database; and
- EPBC Protected Matters Search Tool (DAWE).

4.3.1 NSW Bionet Atlas and NSW Seed Portal

A search was conducted for records of threatened species using the NSW BioNet database. 404 records of 37 species were found within 10 kms of the subject site (Appendix A).

Analysis of the NSW BioNet Species Sightings database indicates that the following species have been previously recorded in very close proximity to the subject site (Figure 7):

- *Tylophora woollsii* (Cryptic Forest Twiner) (Endangered BC Act; Endangered EPBC Act),
- *Phascolarctos cinereus* (Koala) (Endangered BC Act; Endangered EPBC Act),
- *Pteropus poliocephalus* (Grey-headed Flying Fox) (Vulnerable BC Act; Vulnerable EPBC Act),
- *Ninox strenua* (Powerful Owl) (Vulnerable BC Act),
- *Leucopogon fletcheri subsp. Fletcheri* (Endangered BC Act),
- *Pommerhelix duralensis* (Dural Land Snail) (Endangered BC Act; Endangered EPBC Act),
- *Tetratheca glandulosa* (Vulnerable BC Act),
- *Petroica boodang* (Scarlet Robin) (Vulnerable BC Act),
- *Micronomus norfolkensis* (Eastern Coastal Freetail Bat) (Vulnerable BC Act),
- Zieria involucrate (Endangered BC Act; Vulnerable EPBC Act),
- Petrogale penicillate (Brush-tailed Rock Wallaby) (Endangered BC Act; Vulnerable EPBC Act),
- *Dillwynia tenuifolia* (Vulnerable BC Act),
- *Lathamus discolor* (Swift Parrot) (Endangered BC Act; Critically Endangered EPBC Act)

It is considered that these species have potential to occur within the subject site, as there is a very high level of connectivity between the areas where these species were sighted and the subject site. There is also a moderate amount potential habitat for these species within the subject site.

4.3.2 Likelihood of Occurrence

A Likelihood of Occurrence (Appendix A) has been compiled using information obtained from the NSW BioNet database, NSW Threatened Species Profile Database, and the site characteristics that have been assessed in the desktop review and site inspection. This informs which species have a high probability of occurring within the subject site and guides whether any targeted species surveys should be conducted as part of later assessments under the Biodiversity Assessment Method (BAM). The results of the assessment are presented in Appendix A and listed in Section 7 - Recommendations.

4.3.3 Matters of National Significance

The Commonwealth Government Department of Climate Change, Energy, the Environment and Water's Protected Matters Search Tool, summarises the matters of national environmental significance that may occur in, or may relate to, the subject site (Appendix B).

Analysis of the Protected Matters Search Tool indicated that there are 6 listed threatened ecological communities, 57 listed threatened species, and 13 listed migratory species previously recorded within 10 km of the subject site. These have been considered herein as part of the PCT analysis and the Likelihood of Occurrence process.

One World Heritage Property, and one National Heritage Place occur within 10 km of the subject site. No Protected Marine Areas or Wetlands of international importance occur within 10km of the site.

4.4 Waterways and Key Fish Habitat

One of the objectives of the FM Act is to conserve key fish habitats. To achieve the objectives of the FM Act, DPI-Fisheries has identified 'Key Fish Habitats' – those aquatic habitats that are important to the sustainability of the recreational and commercial fishing industries, the maintenance of fish populations generally, and the survival and recovery of threatened aquatic species. Key Fish Habitat Mapping has been produced to provide guidance on the whereabouts of all Key Fish Habitat areas in NSW.

No Key Fish Habitat is mapped as occurring within, or in proximity to, the subject site.

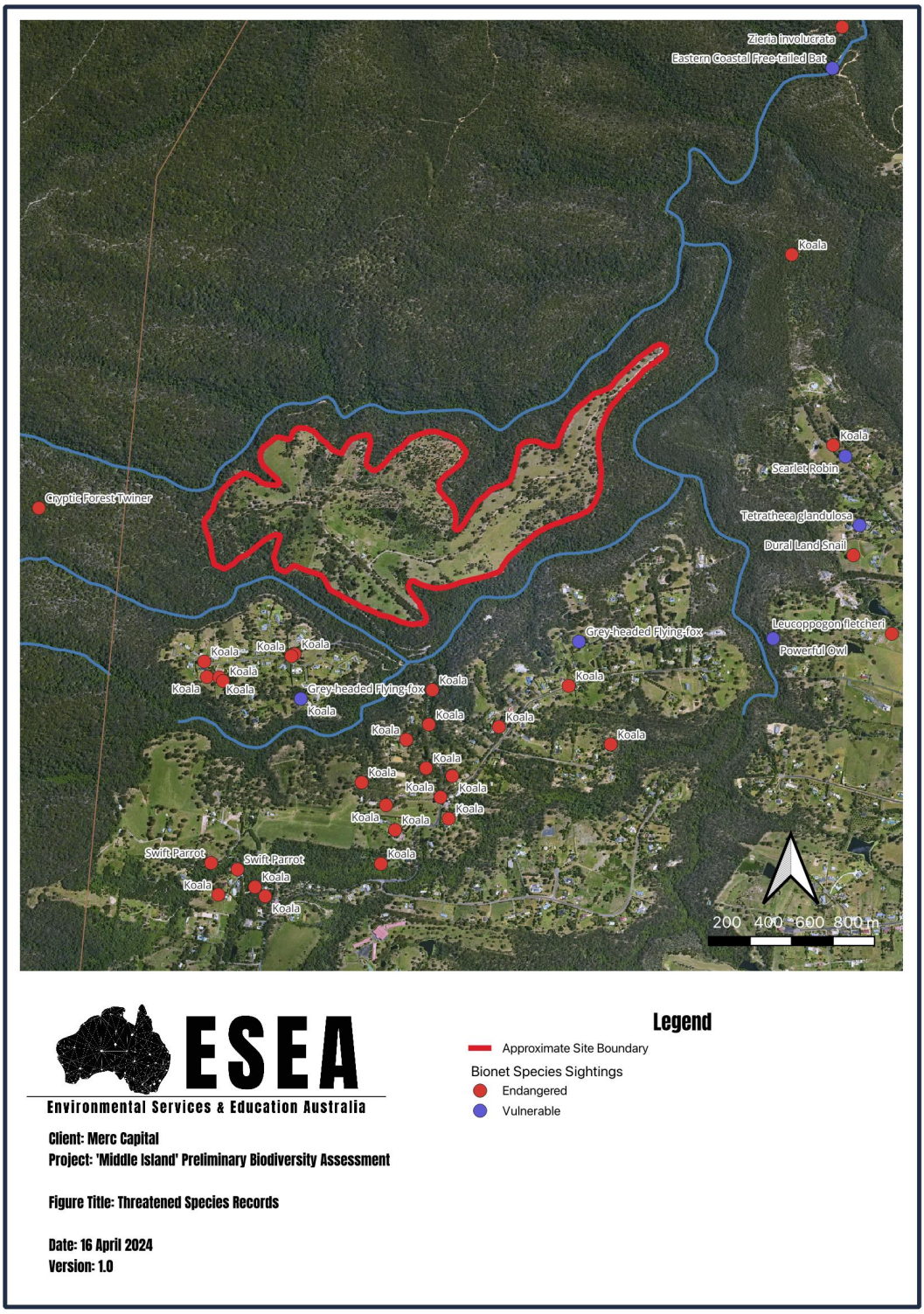

Figure 7 Threatened species sightings

5 FIELD ASSESSMENT

5.1 Methodology

An assessment of the site was undertaken on 4th April 2024 by ecologist, Clayton Woods (BSc Hons, Ecology and Environmental Science, 1st Class, University of Edinburgh). The survey comprised a walkthrough of the accessible vegetated areas of the site. Flora species were surveyed by stratum and were identified and recorded. An opportunistic fauna survey included searches for proxy evidence of fauna activity. An assessment of potential habitat features for threatened species, such as tree hollows or crevices in tree bark was also conducted.

5.2 Limitations

The site assessment was undertaken over a single day in autumn to detect potential fauna habitat. The weather conditions in April were cold (high of 18 degrees) and raining during the day. Other limitations include:

- many faunal species are cryptic and/or nocturnal and/or wide-ranging and mobile, they are unlikely to be detected even during seasonal surveys
- no animal trapping was undertaken
- no night-time surveys were conducted
- no Anabat/sound recordings were conducted

This assessment was not intended to provide an inventory of all species present across the study area but instead an overall assessment of the terrestrial biodiversity values of the study area with particular emphasis on threatened species, endangered ecological communities, and key fauna habitat features. It is important to note that some species may not have been detected in the study area during the inspection as they may be cryptic or seasonal and only detectable during flowering or during breeding. In this case the likelihood of their occurrence in the study area has been assessed based on the presence of potential habitat.

Apart from species definitely recorded from the site, there is no certainty as to the presence or absence of the species discussed. Therefore, it is important to adopt the precautionary principle such that it is assumed that any threatened species are likely to occur at the site if suitable habitat exists.

5.3 Results

5.3.1 Flora Survey

The site visit confirmed that native vegetation mapping (Figure 6) is largely reflective of the on-ground vegetation types. More intensive surveys, including the establishment of BAM plots, will confirm PCTs areas and boundaries.

In general, the vegetation of 'Middle Island' has been significantly simplified by high levels of disturbance associated with historic clearing and pasture improvements undertaken on most of the ridge top and plateau areas (Figure 8). These ridgetop and plateau areas continue to be grazed by horses and a large feral deer population. Scattered remnant native tree cover remains present in these areas and contains diversity high enough that these areas continue to meet the requirements be classified as the mapped PCTs (Figure 9). Notably, however, these ridge top and plateau areas

possesses very limited native mid-stratum and generally comprise introduced groundcover species. Vegetated areas adjoining the disturbed ridgetop and plateau areas are considered to be impacted from edge effects such as weed invasion and increased nutrient levels associated with pasture improvement works.

The cleared plateau areas are generally bordered by steep vegetated gullies. These gullies are not suitable for grazing, and as such have retained a continuous cover of trees with an established understorey and midstratum, considerable leaf litter, and fallen logs (Figure 10). These areas generally provide higher quality breeding, roosting and feeding habitat for a large number of fauna species.

Within the bounds of PCT 3321 - Cumberland Shale-Sandstone Ironbark Forest, native canopy species present primarily consisted of Kurrajong (*Brachychiton populneus*), Grey Gum (*Eucalyptus punctata*), Narrow-leaved Ironbark (*Eucalyptus creba*), Forest Red Gum (*Eucalyptus tereticornis*), Spotted Gum (*Corymbia maculata*), White Stringbark (*Eucalyptus globoidea*), and Thin-leaved Stringbark (*Eucalyptus eugenioides*). Native mid-stratum species include Parramatta Wattle (*Acacia parramattensis*), Black Sheoak (*Allocasuarina littoralis*), Turpentine (*Syncarpia glomulifera*), Pittosporum (*Pittosporum undulatum*) and acacia regrowth. Groundcover species included Rice flower (*Ozothamnus diosmifolius*) and a large number of introduced species, such as Cogon grass (*Imperata cylindrica*), and Bluestem (*Schizachyrium scoparium*). Significant Lantana (*Lantana camara*) growth is present throughout the area. Based on the above species list, this PCT is considered present within the subject site. The extent of the PCT within the subject site is largely consistent with PCT mapping.

Areas of PCT 3578 - Blue Mountains Low Heathy Woodland tend to occur adjacent cleared plateau areas and along ridgelines. In general, areas of this PCT were in poor condition compared to surrounding areas. This is likely due to horses and pastural activities introducing significantly more weeds into the area. Within the bounds of PCT 3578, native canopy species present include those diagnostic of PCT 3578, as well as species intergrading from nearby PCT 3321 i.e., Red Bloodwood (*Corymbia gummifera*), Kurrajong (*Brachychiton populneus*), and Forest Red Gum (*Eucalyptus tereticornis*). Native mid-stratum species include Narrow-leaved Wattle (*Acacia linearifolia*), Black Sheoak (*Allocasuarina littoralis*), Black Wattle (*Acacia mearnsii*). Groundcover species were largely introduced species, including large amounts of Marsh Bristlegrass (*Setaria parviflora*), Indian Weed (*Sigesbeckia orientalis*), Panic Veldtgrass (*Ehrharta erecta*), and Weeping Lovegrass (*Eragrostis curvula*) - though some native Gahnia (*Gahnia microstachya*) is present. Significant Lantana (*Lantana camara*) growth is present throughout the area.

Within the bounds of PCT 3258, native canopy species present primarily consisted of Rough-barked Apple (*Angophora floribunda*), Kurrajong (*Brachychiton populneus*), Sydney Blue Gum (*Eucalyptus saligna*), Thin-leaved Stingybark (*Eucalyptus eugenioides*), and Narrow-leaved Ironbark (*Eucalyptus creba*). Groundcover species in this area largely comprised Cogon Grass (*Imperata cylindrica*), Lovegrass (*Eragrostis curvula*), Panic Veldtgrass (*Ehrharta erecta*), Bluestem (*Schizachyrium scoparium*), and Indian Pennywort (*Centella asiatica*). Significant Lantana (*Lantana camara*) growth is present throughout the area.

Within the bounds of PCT 3258, native canopy species present include Narrow-leaved Ironbark (*Eucalyptus creba*), Thin-leaved stringbark (*Eucalyptus eugenioides*), Sydney Blue Gum (*Eucalyptus saligna*) and Yellow Box (*Eucalyptus melliodora*). Midstratum species included Parramatta Wattle (*Acacia parramattensis*). Based on the above species list, these PCTs are considered present within

the subject site. Native vegetation presence within the subject site is largely consistent with PCT mapping.

5.3.2 Fauna Survey

Given the sites diversity of intact PCTs, high degree of connectivity, and large extent of native vegetation cover, it is considered likely that some of the threatened species listed in Section 4.3.1 are present within the subject site. Notably, the subject site contains a significant number of hollow-bearing trees and stags (Figure 11), which provide nesting and roosting habitat for numerous threatened species.

A brief survey for hollow-bearing trees was conducted. The position of these are indicated in Figure 12. A more intensive hollow-bearing tree survey will be conducted as part of the BAM assessment, and a hollow-bearing tree replacement strategy may be recommended.

The site survey found that there are existing waterbodies and drainage lines present within the subject site. These may provide breeding habitat for frogs, and may also constitute feeding habitat for bats.

No potential fauna habitat features, such as rocky outcrops, cliffs or bushrock, were noted as occurring within the subject site. No Grey-headed Flying-fox encampments were noted as occurring within the subject site.

Figure 8 Historically cleared ridgetop area

Figure 9 Scattered native canopy trees in ridgetop area

Figure 10 Higher quality remnant vegetation within gully

Figure 11 Example of dead stag present within the subject site

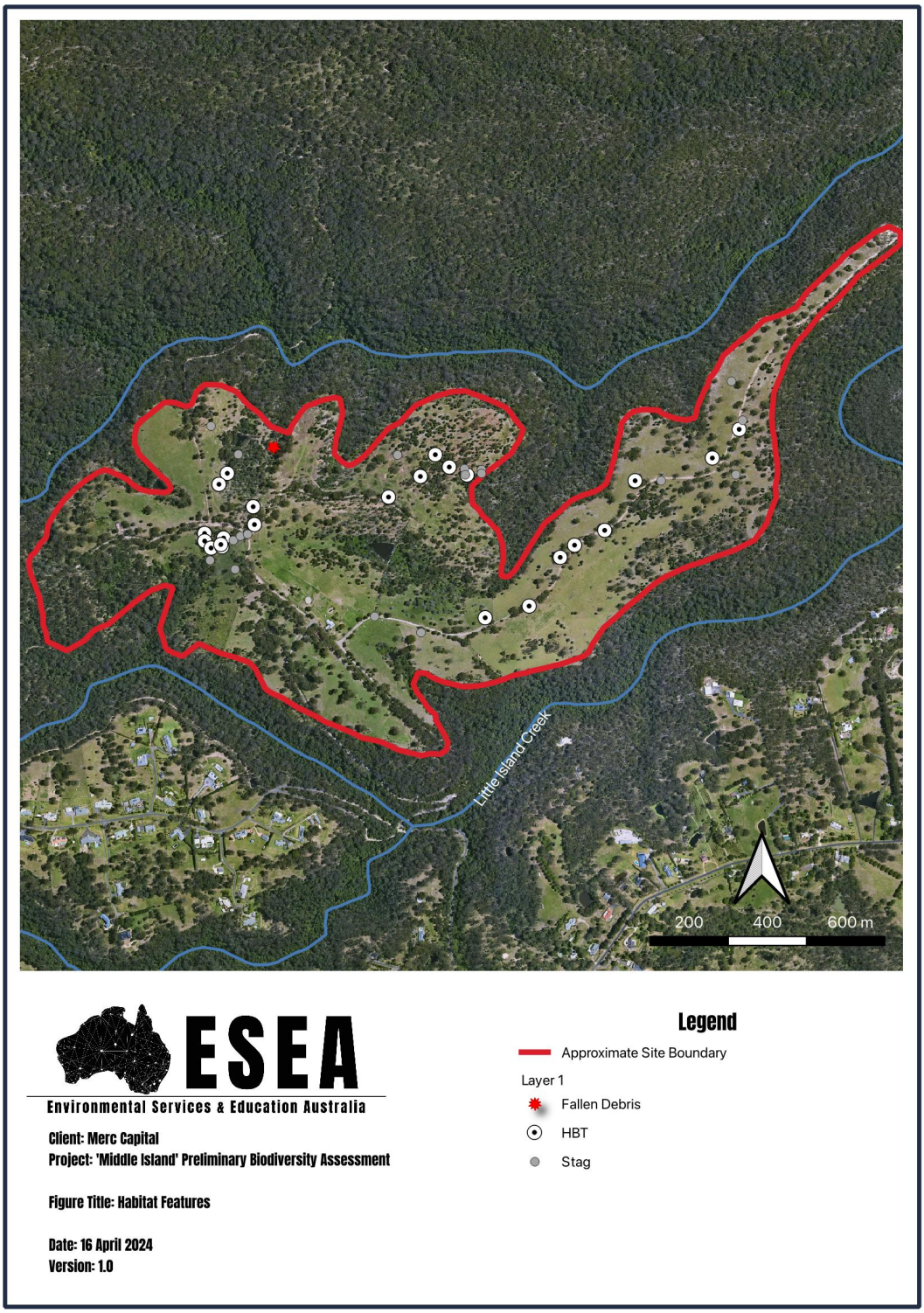

Figure 12 Habitat features within the subject site

6 POTENTIAL IMPACTS

Direct and indirect impacts during the construction phase that will need to be considered include vegetation clearing, sedimentation, dust deposition, erosion, weed introduction and/or spread, introduction of competitive feral fauna, vehicle/machinery strike, light and noise pollution, and vibration from the movement of equipment and vehicles. Whilst many of the proposed development precincts are located on land that has long since been cleared for agricultural purposes, potential impacts on remnant native vegetation and isolated trees may still occur. This is particularly true for areas of remnant native vegetation that will be subject to thinning and management as part of bushfire Asset Protection Zones.

Potential impacts of the proposed development will include:

- Impacts on scattered canopy trees of PCT 3321 - Cumberland Shale-Sandstone Ironbark Forest (This PCT is associated with Shale Sandstone Transition Forest in the Sydney Basin Bioregion (Critically Endangered, BC Act; Critically Endangered, EPBC Act). This PCT remains present in larges areas along the ridge tops and plateaus of the project site and will be subject to the greatest amount of vegetation loss. This PCT will likely be subject to extensive tree clearing, bulk earthworks, and machinery activity.
- Likely small area of removal to PCT 3262 - Sydney Turpentine Ironbark Forest (This PCT is associated with Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion (Critically Endangered, BC Act) and Turpentine-Ironbark Forest of the Sydney Basin Bioregion (Critically Endangered, EPBC Act). This PCT is present along site access roads and may be impacted during infrastructure upgrade works.
- Likely impacts on PCT 3578 and 3622, which are present over a large area of the subject site and are within the footprint of proposed works. These PCTs will likely be subject to extensive tree clearing, bulk earthworks, and machinery activity.
- Potential minor impacts on PCT 3617 and 3111, which occur within gullies and are generally outside the bounds of the development. However, these PCTs will likely be subject to impacts from minor encroachment, sedimentation, dust deposition, potential introduction of weed species etc.

Noting the above, the proposed development has the ability to be refined further to mitigate potential impacts on remnant native vegetation and isolated trees. Therefore, biodiversity impacts will be further avoided and minimised through the refinement of the development concept plan through the SEARs and EIS process.

Indirect impacts during the operational phase of the proposed development should be considered and avoided. This includes the continuation of indirect impacts associated with weed spread and operational noise pollution. The key receptors for these potential impacts are nearby ecosystems, vegetation communities, flora, and fauna.

7 RECOMMENDATIONS

7.1 Requirements for further assessment under the BC Act

The proposed development triggers the Biodiversity Offset Scheme (BOS), and as such impacts on biodiversity will be assessed following the Biodiversity Assessment Method (BAM) and be recorded within a Biodiversity Development Assessment Report (BDAR).

Under the BAM, any proposed development must follow the hierarchy of avoid, minimise, mitigate, offset, whereby offsetting shall only occur following all efforts to first avoid, minimise and mitigate any environmental impacts.

Following the BAM hierarchy, the following recommendations are applicable to the proposed development: -

- Minimise vegetation clearing – areas of high conservation value and/or native vegetation should be strategically avoided.
- Use previously disturbed land –the proposed development should be located on previously cultivated or disturbed land.
- Minimise direct and indirect impacts – as far as possible, the development should be located away from identified significant biodiversity values such as threatened ecological communities and threatened species habitat.
- Adopt a flexible approach to design – the current master plan should respond to identified biodiversity impacts and constraints.

In accordance with the Likelihood of Occurrence Table (Appendix A) and BAM, Table 4 outlines the species predicted to occur within the study area (i.e., candidate species). This species list may be subject to change following input of plot data collected under the BAM, as required during the preparation of a BDAR report. These species may be subject to targeted survey, during the preparation of the BDAR, to confirm presence within the subject area. Otherwise, species presence can be assumed, and credit offsetting would likely be required.

Scientific Name	Common Name	Survey Period
Lathamus discolor	Swift Parrot	Nil
Callocephalon fimbriatum	Gang-gang Cockatoo	Oct - Jan
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	Jan - Sept
Petroica boodang	Scarlet Robin	All year
Haliaeetus leucogaster	White-bellied Sea-Eagle	Jul - Dec
Hieraaetus morphnoides	Little Eagle	Aug - Oct
Lophoictinia isura	Square-tailed Kite	Sep - Jan

Ninox strenua	Powerful Owl	Jan - Aug
Phascolarctos cinereus	Koala	All year
Cercartetus nanus	Eastern Pygmy-possum	Oct - Mar
Petrogale penicillata	Brush-tailed Rock-wallaby	All year
Pteropus poliocephalus	Grey-headed Flying-fox	Oct - Dec
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	Nov - Dec
Chalinolobus dwyeri	Large-eared Pied Bat	Nov - Dec
Miniopterus australis	Little Bent-winged Bat	Dec - Feb
Miniopterus orianae oceanensis	Large Bent-winged Bat	Dec - Feb
Myotis macropus	Southern Myotis	Oct - Mar
Pommerhelix duralensis	Dural Land Snail	All year
Heleioporus australiacus	Giant Burrowing Frog	Sep - May
Litoria littlejohni	Littlejohn's Tree Frog	Jul - Nov
Hoplocephalus bungaroides	Broad-headed Snake	Dec- Feb +Aug - Sep
Tetratheca glandulosa		Aug - Nov
Leucopogon fletcheri subsp. fletcheri		Aug - Sep
Zieria involucrata		All year
Acacia bynoeana	Bynoe's Wattle	All year
Acacia pubescens	Downy Wattle	All year
Dillwynia tenuifolia		Aug - Dec
Epacris purpurascens var. purpurascens		Sep - Oct
Grammitis stenophylla	Narrow-leaf Finger Fern	All year
Grevillea parviflora subsp. parviflora	Small-flower Grevillea	Aug - Nov
Hibbertia puberula	Hibbertia puberula	Oct - Dec

Hibbertia superans	Hibbertia superans	Jul - Dec
Leucopogon exolasius	Woronora Beard-heath	Aug - Sep

7.2 Requirements for further assessment under the EPBC Act

An assessment of impacts upon MNES should be undertaken during the preparation of the BDAR for the proposed development. To satisfy the requirements of the EPBC Act, a referral to the Commonwealth Minister for the Environment may be required if there is potential to have a significant impact on MNES. It is anticipated that potential impacts to MNES will be assessed in accordance with the NSW Assessment Bilateral Agreement therefore, allowing DPE to manage the assessment of the proposed development on behalf of the Commonwealth, including the issuing of the assessment requirements for the EIS.

7.3 Environmental protection measures

As per the Hawkesbury DCP, future development should try, as far as reasonably possible to avoid the removal of native tree species. The siting and layout of development at the initial concept stage considers the location of these trees and favours their preservation.

Development should generally be located on the disturbed ridge tops and upper slopes, with vegetation removal only occurring around the periphery of the already disturbed areas. The natural vegetation of the lower slopes and riparian areas should be maintained and improved under various forms of conservation agreements in consultation with the NSW Department of Climate Change, Energy, the Environment and Water.

Measures will be taken to protect existing vegetation designated for retention against damage and destruction during construction. These measures may include the installation of protective fencing to delineate Tree Protection Zones and environmental 'No-Go' zones. Protective fencing should be installed prior to any works commencing and should not be removed or altered until the completion of construction works. No vehicular or pedestrian access, trenching or soil excavation is to occur within the Tree Protection Zone. Shade cloth or similar should be attached to protective fencing to reduce the impacts of wind-blown dust, other particulate matter, or liquids into the protected area, as these may negatively impact tree health. In addition, appropriate tree protection signage should be attached to the protective fencing.

Creek corridors should be preserved and upgraded. Water quality must be managed through a combination of erosion and sediment control techniques, and by minimising disturbance to environmentally sensitive areas. Apart from infrastructure connections, all work should be set back significantly from top of bank riparian zones.

7.4 Hollow replacement strategy

A hollow-bearing tree replacement strategy is recommended, whereby any hollow-bearing trees removed from the site are replaced with relatively sized artificial nest boxes at a minimum 1:1 replacement ratio. This should also investigate opportunities to relocate and reuse significant hollow-bearing tree features and hollows into the surrounding vegetated areas of the property.

8 CONCLUSIONS

- Areas mapped on the Biodiversity Values Map are present within the subject site.
- Several plant communities (PCTs) are mapped as occurring within the subject site and were confirmed to be present during the site assessment. These include:
  - PCT 3321 - Cumberland Shale-Sandstone Ironbark Forest (This PCT is associated with Shale Sandstone Transition Forest in the Sydney Basin Bioregion (Critically Endangered, BC Act; Critically Endangered, EPBC Act).
  - PCT 3262 - Sydney Turpentine Ironbark Forest (This PCT is associated with Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion (Critically Endangered, BC Act) and Turpentine-Ironbark Forest of the Sydney Basin Bioregion (Critically Endangered, EPBC Act),
  - PCT 3578 - Blue Mountains Low Heathy Woodland,
  - PCT 3617 - Sydney Hinterland Peppermint-Apple Forest,
  - PCT 3111 - Sydney Hinterland Grey Myrtle Riparian Forest,
  - PCT 3622 - Sydney Hinterland Yellow Bloodwood Woodland,
- Threatened fauna species are considered highly likely to occur within the subject site due to previously being recorded in close proximity to the subject site, and due to having potential habitat within the site. These threatened species may be subject to offsetting requirements unless targeted species surveys are conducted to prove that they do not occur in the area.
- No Key Fish habitat is present within the subject site or the immediate surrounding area.
- Mapped waterlines are present within the proposed development site. The proposed development will therefore be considered a Controlled Activity by DPE Water / Natural Resources Access Regulator (NRAR) and will require a Controlled Activity Approval.
- The proposed development triggers the Biodiversity Offset Scheme (BOS), and as such, a Biodiversity Development Assessment Report (BDAR) is required to be produced and submitted as part of the EIS.
- The BDAR report will assess the impact of the proposed development after avoidance and mitigation methods are implemented, and will calculate the offsetting requirements under the BOS.
- A referral to the Commonwealth Minister for the Environment may be required if there is potential to have a significant impact on Matters of National Environmental Significance (MNES). It is anticipated that potential impacts to MNES will be assessed in accordance with the NSW Assessment Bilateral Agreement therefore, allowing DPE to manage the assessment of the proposed development on behalf of the Commonwealth.

9 EIS ASSESSMENT APPROACH

An assessment under the Biodiversity Offset Scheme using the BAM (2020) will be undertaken and a BDAR will be prepared and included in the EIS to address impacts to threatened ecological communities and species protected by the BC Act.

An assessment of impacts upon MNES will be undertaken during the preparation of the BDAR for the proposed development.

To satisfy the requirements of the EPBC Act, a referral to the Commonwealth Minister for the Environment may be required if there is potential to have a significant impact on MNES. It is anticipated that potential impacts to MNES will be assessed in accordance with the NSW Assessment Bilateral Agreement therefore, allowing DPE to manage the assessment of the proposed development on behalf of the Commonwealth, including the issuing of the assessment requirements for the EIS

We trust the above is of assistance and enables the Department of Planning and Environment to issue SEARs for the proposed tourist development.

Yours sincerely

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APPENDIX A - LIKELIHOOD OF OCCURRENCE

Class	Family	Scientific Name	Common Name	NSW status	Comm. status	Records	Description	Likelihood of Occurrence
Reptilia	Elapidae	^*Hoplocephalus bungaroides*	Broad-headed Snake	E1,P,2	E	1	Shelters in rock crevices and under flat sandstone rocks on exposed cliff edges during autumn, winter and spring. Moves from the sandstone rocks to shelters in cervices or hollows in large trees within 500m of escarpments in summer.	Low (Low number of records, limited potential habitat present)
Aves	Accipitridae	*Hieraaetus morphnoides*	Little Eagle	V,P		1	Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.	Moderate (Low number of previous records, but potential habitat present).
Aves	Accipitridae	^^*Lophoictinia isura*	Square-tailed Kite	V,P,3		1	Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses. In arid north-western NSW, has been observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland. Appears to occupy large hunting ranges of more than 100 km^2.	Moderate (Low number of previous records, but potential habitat present).
Aves	Cacatuidae	^*Calyptorhynchus lathami lathami*	South-eastern Glossy Black-Cockatoo	V,P,2	V	1	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak and Forest Sheoak are important foods. Dependent on large hollow-bearing eucalypts for nest sites.	Moderate (Low number of previous records, but potential habitat present).

Aves	Psittacidae	*Lathamus discolor*	Swift Parrot	E1,P	CE	7	Migrates to the Australian south-east mainland between February and October. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany, Spotted Gum, Red Bloodwood, Forest Red Gum, Mugga Ironbark, and White Box.	High (Previously sighted in close proximity, potential feeding habitat present)
Aves	Strigidae	^^*Ninox strenua*	Powerful Owl	V,P,3		8	The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats.	High (Previously sighted in close proximity, potential feeding and nesting habitat present)
Aves	Tytonidae	^^*Tyto novaehollandiae*	Masked Owl	V,P,3		1	Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides.	Moderate (Low number of previous records, but potential habitat present).

Aves	Meliphagidae	*^Anthochaera phrygia*	Regent Honeyeater	E4A,P,2	CE	1	The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. Every few years non-breeding flocks are seen foraging in flowering coastal Swamp Mahogany and Spotted Gum forests, particularly on the central coast and occasionally on the upper north coast. Birds are occasionally seen on the south coast. The Regent Honeyeater is a generalist forager, although it feeds mainly on the nectar from a relatively small number of eucalypts that produce high volumes of nectar. Key eucalypt species include Mugga Ironbark, Yellow Box, White Box and Swamp Mahogany.	Low (Low number of previous records, limited potential habitat present).
Aves	Meliphagidae	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	V,P		1	Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark, White Box, Inland Grey Box, Yellow Box, Blakely's Red Gum and Forest Red Gum. Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees.	Low (Low number of previous records, limited potential habitat present).
Aves	Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella	V,P		4	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland.	Moderate (Low number of previous records, but potential habitat present).

Aves	Pachycephalidae	*Pachycephala olivacea*	Olive Whistler	V,P		3	Mostly inhabit wet forests above about 500m. During the winter months they may move to lower altitudes.	Low (Low number of previous records, limited potential habitat present)
Aves	Artamidae	*Artamus cyanopterus cyanopterus*	Dusky Woodswallow	V,P		1	Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest.	Moderate (Low number of previous records, but potential habitat present).
Aves	Petroicidae	*Petroica boodang*	Scarlet Robin	V,P		6	The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. The Scarlet Robin is primarily a resident in forests and woodlands, but some adults and young birds disperse to more open habitats after breeding. In autumn and winter many Scarlet Robins live in open grassy woodlands, and grasslands or grazed paddocks with scattered trees. The Scarlet Robin breeds on ridges, hills and foothills of the western slopes, the Great Dividing Range and eastern coastal regions; this species is occasionally found up to 1000 metres in altitude.	High (previously recorded in close proximity, and potential habitat present).

Mammalia	Dasyuridae	*Dasyurus maculatus*	Spotted-tailed Quoll	V,P	E	7	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites.	Moderate (Low number of previous records, but potential habitat present).
Mammalia	Phascolarctidae	*Phascolarctos cinereus*	Koala	E1,P	E	257	Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species.	High (Numerous previous sightings in close proximity, and potential habitat present).
Mammalia	Burramyidae	*Cercartetus nanus*	Eastern Pygmy-possum	V,P		2	Found in a broad range of habitats from rainforest through sclerophyll forest and woodland to heath, but in most areas woodlands and heath appear to be preferred. Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes; an important pollinator of heathland plants such as banksias; soft fruits are eaten when flowers are unavailable.	Moderate (Low number of previous records, but potential habitat present).
Mammalia	Petauridae	*Petaurus australis*	Yellow-bellied Glider	V,P	V	2	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south.	Moderate (Low number of previous records, but potential habitat present).

Mammalia	Petauridae	*Petaurus norfolcensis*	Squirrel Glider	V,P		3	Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey.	Low (Low number of previous records, limited potential habitat present).
Mammalia	Macropodidae	*Petrogale penicillata*	Brush-tailed Rock-wallaby	E1,P	V	1	Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. Shelter or bask during the day in rock crevices, caves and overhangs and are most active at night when foraging.	High (Low number of previous sightings, but previously recorded in close proximity, and potential habitat present).
Mammalia	Pteropodidae	*Pteropus poliocephalus*	Grey-headed Flying-fox	V,P	V	22	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	High (Numerous previous sightings in close proximity, and potential habitat present).

Mammalia	Emballonuridae	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V,P		2	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.	Moderate (Low number of previous records, but potential habitat present).
Mammalia	Molossidae	*Micronomus norfolkensis*	Eastern Coastal Free-tailed Bat	V,P		9	Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures.	High (Low number of previous sightings, but previously recorded in close proximity, and potential habitat present).
Mammalia	Vespertilionidae	*Chalinolobus dwyeri*	Large-eared Pied Bat	V,P	E	2	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin, frequenting low to mid-elevation dry open forest and woodland close to these features. Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in sandstone caves and overhangs. They remain loyal to the same cave over many years. Found in well-timbered areas containing gullies.	Moderate (Low number of previous records, but potential habitat present).

Mammalia	Vespertilionidae	*Falsistrellus tasmaniensis*	Eastern False Pipistrelle	V,P		3	Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings.	Moderate (Low number of previous records, but potential habitat present).
Mammalia	Vespertilionidae	*Myotis macropus*	Southern Myotis	V,P		6	Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage.	Moderate (Low number of previous records, but potential habitat present).
Mammalia	Vespertilionidae	*Scoteanax rueppellii*	Greater Broad-nosed Bat	V,P		5	Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species.	Moderate (Low number of previous records, but potential habitat present).
Mammalia	Vespertilionidae	*Vespadelus troughtoni*	Eastern Cave Bat	V,P		1	Very little is known about the biology of this uncommon species. A cave-roosting species that is usually found in dry open forest and woodland, near cliffs or rocky overhangs; has been recorded roosting in disused mine workings, occasionally in colonies of up to 500 individuals. Occasionally found along cliff-lines in wet eucalypt forest and rainforest.	Moderate (Low number of previous records, but potential habitat present).

Mammalia	Miniopteridae	*Miniopterus australis*	Little Bent-winged Bat	V,P		3	Inhabits moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas. Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats.	Moderate (Low number of previous records, but potential habitat present).
Mammalia	Miniopteridae	*Miniopterus orianae oceanensis*	Large Bent-winged Bat	V,P		17	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.	Low (Low number of previous records, limited potential habitat present).
Gastropoda	Camaenidae	*Meridolum corneovirens*	Cumberland Plain Land Snail	E1		3	Primarily inhabits Cumberland Plain Woodland. This community is a grassy, open woodland with occasional dense patches of shrubs. It is also known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest, which are also listed communities.	Low (Low number of previous records, limited potential habitat present).

Gastropoda	Camaenidae	*Pommerhelix duralensis*	Dural Land Snail	E1	E	1	The species has a strong affinity for communities in the interface region between shale-derived and sandstone-derived soils, with forested habitats that have good native cover and woody debris. It favours sheltering under rocks or inside curled-up bark. It does not burrow nor climb. The species has also been observed resting in exposed areas, such as on exposed rock or leaf litter, however it will also shelter beneath leaves, rocks and light woody debris.	High (Previously recorded in close proximity and potential habitat present).
Flora	Elaeocarpaceae	*Tetratheca glandulosa*		V		2	Associated with shale-sandstone transition habitat where shale-cappings occur over sandstone, with associated soil landscapes such as Lucas Heights, Gymea, Lambert and Faulconbridge. Topographically, the plant occupies ridgetops, upper-slopes and to a lesser extent mid-slope sandstone benches. Soils are generally shallow, consisting of a yellow, clayey/sandy loam. Stony lateritic fragments are also common in the soil profile on many of these ridgetops.	High (Previously recorded in close proximity and potential habitat present).
Flora	Ericaceae	*Leucopogon fletcheri subsp. fletcheri*		E1		2	Occurs in dry eucalypt woodland or in shrubland on clayey lateritic soils, generally on flat to gently sloping terrain along ridges and spurs.	(Previously recorded in close proximity and potential habitat present).

Flora	Fabaceae (Faboideae)	*Dillwynia tenuifolia*		V		1	In western Sydney, may be locally abundant particularly within scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays. May also be common in transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland. At Yengo, is reported to occur in disturbed escarpment woodland on Narrabeen sandstone.	Moderate (Low number of previous sightings, but potential habitat present).
Flora	Myrtaceae	*Rhodamnia rubescens*	Scrub Turpentine	E4A	CE	10	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	Low (Low number of previous sightings, limited potential habitat present).
Flora	Myrtaceae	*Syzygium paniculatum*	Magenta Lilly Pilly	E1	V	3	On the south coast the Magenta Lilly Pilly occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest. On the central coast Magenta Lilly Pilly occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities.	Low (Low number of previous sightings, limited potential habitat present).

Flora	Rutaceae	*Zieria involucrata*		E1	V	4	Occurs primarily on Hawkesbury sandstone. Also occurs on Narrabeen Group sandstone and on Quaternary alluvium. Found primarily in sheltered forests on mid- to lower slopes and valleys, e.g. in or adjacent to gullies which support sheltered forest, although some populations extend upslope into drier vegetation. Also known from at least two atypical ridgetop locations. The canopy typically includes Syncarpia glomulifera subsp. glomulifera (Turpentine), Angophora costata (Smooth-barked Apple), Eucalyptus agglomerata (Blue-leaved Stringybark) and Allocasuarina torulosa (Forest Oak).	High (Previously recorded in close proximity and potential habitat present).

APPENDIX B - PROTECTED MATTERS SEARCH

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 15-Apr-2024

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	1
National Heritage Places:	1
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	57
Listed Migratory Species:	13

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	20
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	1
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	2
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties [Resource Information]

Name	State	Legal Status
Greater Blue Mountains Area	NSW	Declared property

National Heritage Places [Resource Information]

Name	State	Legal Status
Natural		
The Greater Blue Mountains Area	NSW	Listed place

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion	Endangered	Community may occur within area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community may occur within area
Shale Sandstone Transition Forest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area
Turpentine-Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion	Endangered	Community may occur within area
Western Sydney Dry Rainforest and Moist Woodland on Shale	Critically Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Anthochaera phrygia		
Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat likely to occur within area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat likely to occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat likely to occur within area
FISH		
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
FROG		
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat likely to occur within area
Litoria littlejohni Northern Heath Frog, Littlejohn's Tree Frog [64733]	Endangered	Species or species habitat may occur within area
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat may occur within area
MAMMAL		

Scientific Name	Threatened Category	Presence Text
Chalinolobus dwyeri		
Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat likely to occur within area
Dasyurus maculatus maculatus (SE mainland population)		
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Notamacropus parma		
Parma Wallaby [89289]	Vulnerable	Species or species habitat may occur within area
Petauroides volans		
Greater Glider (southern and central) [254]	Endangered	Species or species habitat likely to occur within area
Petaurus australis australis		
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area
Petrogale penicillata		
Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area
Pseudomys novaehollandiae		
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
PLANT		
Acacia bynoeana		
Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat may occur within area
Acacia gordonii		
[5031]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Acrophyllum australe [3983]	Vulnerable	Species or species habitat may occur within area
Allocasuarina glareicola [21932]	Endangered	Species or species habitat may occur within area
Asterolasia elegans [56780]	Endangered	Species or species habitat may occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area
Genoplesium baueri Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid [7528]	Endangered	Species or species habitat may occur within area
Hibbertia acaulothrix [87409]	Endangered	Species or species habitat may occur within area
Hibbertia cistiflora subsp. quadristaminea [91164]	Endangered	Species or species habitat may occur within area
Homoranthus darwinioides [12974]	Vulnerable	Species or species habitat likely to occur within area
Melaleuca deanei Deane's Melaleuca [5818]	Vulnerable	Species or species habitat may occur within area
Olearia cordata [6710]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat may occur within area
Persoonia acerosa Needle Geebung [7232]	Vulnerable	Species or species habitat likely to occur within area
Persoonia hirsuta Hairy Geebung, Hairy Persoonia [19006]	Endangered	Species or species habitat likely to occur within area
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat likely to occur within area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat may occur within area
Thelymitra kangaloonica Kangaloon Sun Orchid [81861]	Critically Endangered	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area
Wollemia nobilis Wollemi Pine [64545]	Critically Endangered	Species or species habitat likely to occur within area
Zieria involucrata [3087]	Vulnerable	Species or species habitat may occur within area
REPTILE		
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hoplocephalus bungaroides Broad-headed Snake [1182]	Endangered	Species or species habitat likely to occur within area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area overfly marine area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat may occur within area overfly marine area

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State
Wollemi	National Park	NSW

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
Subdivision of Lot 24 DP 751649 and Lot 111 DP 1039639, Old Bells Line of Road,	2003/1139	Not Controlled Action	Completed

Bioregional Assessments		[Resource Information]
SubRegion	BioRegion	Website
Sydney	Sydney Basin	BA website

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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