Department of Planning and Environment

June 2022

Snowy Strategic Activation Precinct

Biodiversity Assessment of Growth Sub-Precincts

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Snowy Strategic Activation Precinct
Biodiversity Assessment of Growth Sub-Precincts

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WSP acknowledge the Monero Ngarigo people as the traditional custodians of the Snowy Mountains Special Activation Precinct area. We acknowledge their ongoing connection to country and pay our respects to elders, past and present. We recognise the significance of the region to the Monero Ngarigo people, and value their ongoing connection to country and their contribution to this project. WSP is committed to engaging with and honouring Aboriginal and Torres Strait Islander peoples' unique cultural and spiritual relationships to the land and waters.

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Glossary

Term	Definition
BAM	Biodiversity Assessment Method 2020
BC Act	NSW Biodiversity Conservation Act 2016
Biodiversity offsets	Management actions that are undertaken to achieve a gain in biodiversity values on areas of land in order to compensate for losses to biodiversity values from the impacts of development.
DPE	Department of Planning and Environment (NSW)
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
Ha	Hectares
Habitat	An area or areas occupied, or periodically or occasionally occupied, by a species, population or ecological community, including any biotic or abiotic component.
Hollow bearing tree	A living or dead tree that has at least one hollow. A tree is considered to contain a hollow if: (a) the entrance can be seen; (b) the entrance width is at least 5cm; (c) the hollow appears to have depth (i.e. you cannot see solid wood beyond the entrance); (d) the hollow is at least 1m above the ground.
KNP	Kosciusko National Park
LGA	Local Government Area
Master Plan	Generic term for a Master Plan for each SAP (informed by Structure Plan). The Master Plan is a statutory document prepared by DPE at the conclusion of the technical studies.
Monero Ngarigo	Aboriginal linguistic group who traditionally occupied the eastern side of the Kosciuszko plateau and further north towards the Murrumbidgee River. The traditional custodians of the Snowy Mountains are the Monero Ngarigo People.
NPWS	National Parks and Wildlife Service
NSW	New South Wales
Plant community type	A NSW plant community type. Plant Community Types are the agreed foundation level for classifying vegetation in NSW and are intended to provide the most ecologically relevant grouping of plant species. Plant Community Types are described in the BioNet Vegetation Classification.
SAP	Special Activation Precinct
Snowy Mountains	The highest mountain range on the continent of mainland Australia, located in southern New South Wales and part of the larger Australian Alps and Great Dividing Range. The mountain range experiences large natural snowfalls every winter
SAP	Special Activation Precinct
Threatened ecological community (TEC)	Means a critically endangered ecological community, an endangered ecological community or a vulnerable ecological community listed in Schedule 2 of the BC Act.

1 Introduction

Special Activation Precincts (SAPs) are dedicated areas in regional NSW identified by the NSW Government to become thriving hubs. The SAP program facilitates job creation and economic development in these areas through infrastructure investment, streamlining planning approvals and investor attraction.

The SAP program adopts a collaborative and integrated whole-of-government approach, bringing together the local Council and a range of other relevant State and local agencies.

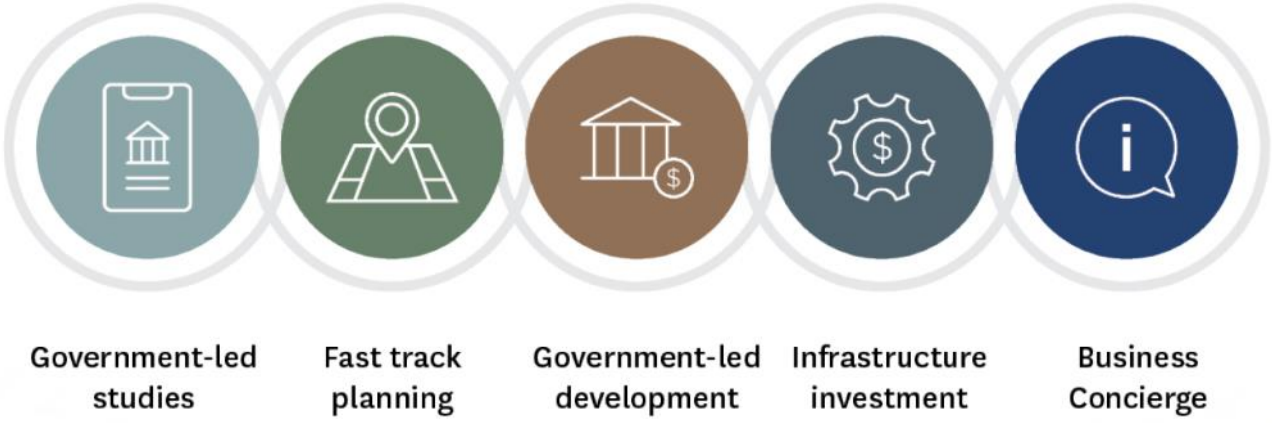
SAPs are unique to regional NSW. By focusing on planning and investment, their goal is to stimulate economic development and create jobs in line with the competitive advantages and economic strengths of a region.

On 15 November 2019, the NSW Government announced its commitment to investigating the Snowy Mountains SAP, to revitalise the Snowy Mountains into a year-round destination and Australia's Alpine Capital, with Jindabyne at its heart. The Snowy Mountains SAP is being delivered through the $4.2-billion Snowy Hydro Legacy Fund.

Different components of each SAP are led by different teams within the NSW Government:

- The **Department of Regional NSW** assesses potential locations for inclusion in the program and considers government investment for essential infrastructure to service the SAPs.
- The **NSW Department of Planning and Environment** (the Department) is responsible for the planning of SAPs. The Department leads the master planning process, including community and stakeholder engagement, the technical studies required to inform the preparation of a master plan and development of the simplified planning framework for each Precinct.
- The **Regional Growth NSW Development Corporation** (Regional Growth NSW) is responsible for delivering and implementing Special Activation Precincts. This includes attracting investment, providing support to businesses, developing enabling infrastructure, and creating strategic partnerships to foster education, training and collaboration opportunities.

The five core pillars of the Special Activation Precincts are:



The planning framework for each Special Activation Precinct includes three key parts:

State Environmental Planning Policy (Precincts Regional) 2021

- Requires that an Activation Precinct Certificate be sought prior to a development application or complying development certificate being issued, to ensure the development is consistent with the Master Plan and Delivery Plan.
- Provides zoning and land use controls for each Precinct.
- Identifies Exempt and Complying Development pathways for certain development.

Snowy River Local Environmental Plan 2013

- Identifies the Jindabyne Growth Precinct.
- Provides zoning and land use controls.

Special Activation Precinct Master Plans

- Made by the NSW Department of Planning and Environment and approved by the Minister.
- Identifies the Vision, Aspirations and Principles for the Precinct.
- Provides more detailed land use controls where required.
- Identifies Performance Criteria at a Precinct-scale for amenity, environmental performance and infrastructure provision.
- Identifies the matters to be addressed as part of the Delivery Plan.

Special Activation Precinct Delivery Plans

- Prepared by Regional Growth NSW and approved by the Planning Secretary.
- Identifies site-level development controls.
- Provides detailed strategies and plans for:
  - Aboriginal cultural heritage
  - environmental protection and management
  - protection of amenity
  - infrastructure and services
  - staging.
- Provides procedures for ongoing monitoring and reporting.

1.1 Snowy Mountains SAP

The Snowy Mountains are located in the south east of NSW and the region is one of Australia's most iconic natural environments. In addition to hosting some of Australia's premier alpine destinations, the Snowy Mountains is home to over 35,000 people and Australia's highest peak, Mount Kosciuszko.

The township of Jindabyne situated on Lake Jindabyne provides a hub for the region, with opportunities for tourism and facilities supporting the regional catchment. Jindabyne has evolved into the gateway to the Snowy Mountains and currently services 1.4 million visitors each year who travel to the region to enjoy its unique tourism and recreational offerings (Destination NSW, June 2020 report). There are approximately 35,500 residents of the Snowy Mountains, of which 3,500 residents live in Jindabyne (including Kalkite, East Jindabyne and Tyrolean Village).

The traditional custodians of the Snowy Mountains are the Monero Ngarigo people, in connection with the Walgalu, Ngunnawal and Bidhawal people. European settlers accessed the region in 1823, and between the late 1830s to 1957 the Monaro highland region was grazing by cattle and sheep. The original town of Jindabyne was settled in the 1840s on the banks of the Snowy River where the main river crossing took place. The old town disappeared under Lake Jindabyne in 1967.

1.2 Key objectives of the SAP

The Snowy Mountains region plays a crucial role within the regional and state economy, with its local population swelling with an additional 1.4 million international and domestic visitors each year (Destination NSW, June 2020 report). The region's unique natural environment allows locals and visitors to participate in a diverse array of recreational activities year-round, with many visitors still experiencing the region through the peak winter season.

The broad objectives and priorities for the Snowy Mountains SAP are to capitalise on the unique cultural and environmental attributes which attract 1.4 million visitors annually to the region, revitalise the Snowy Mountains into a year-round destination, and reaffirm Australia's Alpine Capital (Destination NSW, June 2020 report). The revitalisation is to focus on year-round adventure and eco-tourism, improving regional transport connectivity, shifting towards a carbon neutral region, increasing the lifestyle and wellbeing activities on offer, and supporting Jindabyne's growth as Australia's national winter sports training base. The broad conservation objective of the SAP is to avoid, maintain or improve the biodiversity values in the region.

1.3 Investigation area

The Snowy Mountains SAP Investigation Area encompasses 72,211 hectares of land and within this investigation area are several 'development opportunity areas' which were identified around and in Jindabyne, and within the Kosciuszko National Park (KNP).

This report assessed the Growth sub-precincts within the Jindabyne region, including:

- Jindabyne West sub-precinct
- East Jindabyne Sub-precinct
- Leesville Sub-precinct
- Barry Way South Sub-precinct
- Jindabyne Aerodrome Sub-precinct.

All these sub-precincts are within the South Eastern Highlands (Monaro subregion) IBRA region and the Jindabyne Plains Mitchell Landscape.

1.4 Purpose of this report

This study has been undertaken to support the SAP in its multidisciplinary approach for strategic planning in ensuring biodiversity constraints and opportunities are realised early on in the planning stage to achieve the desired outcomes.

The purpose of this report is to provide detailed analysis of the biodiversity present within each sub-precinct to guide decisions on developable areas and offset requirements as well as provide performance criteria/standards for development in each sub-precinct.

2 Methodology

The following methods have been undertaken in the preparation of this report. As discussed above in Section 1, this report assesses the Growth sub-precincts within the Jindabyne region:

- Jindabyne West sub-precinct
- East Jindabyne sub-precinct
- Leesville sub-precinct
- Barry Way South sub-precinct
- Jindabyne Aerodrome sub-precinct.

This report presents the ecological opportunities and constraints analysis of the Jindabyne Growth sub-precincts based on desktop review and site inspections including:

- Vegetation surveys, including a mixture of Vegetation Integrity Plots according to the method outlined in the Biodiversity Assessment Method 2020, and rapid data points used to aid in vegetation mapping and rapid identification of likely Plant Community Type and condition category.
- Fauna surveys including:
  - habitat assessment
  - diurnal bird surveys
  - frog and reptile (herpetofauna) searches.

All work was carried out under the appropriate licences, including a scientific licence as required under Part 2 of the BC Act (Licence Number: SL100630) and an Animal Research Authority.

Detailed methods for the assessment are described in the sections below.

2.1 Desktop review

The aim of the background research was to identify threatened flora and fauna species, populations and ecological communities, Commonwealth listed Migratory species or critical habitat recorded previously or predicted to occur in the locality of the investigation area. This allowed for known habitat characteristics of to be compared with those present within the Growth precinct.

Records of threatened species, populations and ecological communities known or predicted to occur in the locality of the investigation area were obtained from a range of databases and literature. The following information sources were used in the preparation of this report:

- aerial photographic imagery
- NSW Mitchell Landscapes 3.1
- Interim Biogeographic Regionalisation of Australia (IBRA version 7.0) (Department of Environment & Energy, 2016)
- Atlas of Groundwater Dependent Ecosystems (GDE) (Bureau of Meteorology, 2020)
- Directory of Important Wetlands of Australia (Department of Environment & Energy, 2020)
- Register of Declared Areas of Outstanding Biodiversity Value – Critical habitat declarations in NSW (Office of Environment Energy and Science, 2022)
- BioNet Threatened Species Profile Database (Office of Environment & Heritage 2022)
- Species Profiles and Threats Database (Department of the Environment and Energy 2022)
- PlantNet Database (Royal Botanic Gardens, 2020)
- EPBC Act Protected Matters Search Tool (Department of Agriculture, Water and the Environment, 2021)
- Atlas of Living Australia–interactive map search (Atlas of living Australia 2021).

The following vegetation mapping datasets and reports were reviewed:

- Eastern Bushlands Database VIS_ID 622 (Holme, 1993).
- Remote Sensing Mapping of Grassy Ecosystems in the Monaro VIS_ID 2513 (Walter and Schelling, 2004).
- Grassy ecosystems of the south eastern highlands: technical report: literature review, data audit, information gap analysis and research strategy. Grasslands, Pre-Settlement, South-eastern Highlands VIS_ID 4099 (Rehwinkel, 1997).
- Revision of Monaro Grassland Mapping (Rehwinkel, 2005).
- Monaro Grassland Mapping, 2005. VIS_ID 3915 (State Government of NSW and Department of Planning, Industry and Environment, 2013).
- Grasslands, Pre-Settlement, South-eastern Highlands. VIS_ID 4099 (State Government of NSW and Department of Planning, Industry and Environment 2015).
- Native Vegetation of the Southern Forests: South-east Highlands, Australian Alps, South-west Slopes, and SE Corner Bioregions VIS_ID 3858 & 3859 (Gellie, 2005).
- CRAFTI – Floristics and Structure, Southern CRA, Tumut Subregion VIS_ID 4141 and 4160 (Office of Environment and Heritage NSW, 1999).
- South East Local Land Services Biometric Vegetation Map, 2014. VIS_ID 4211 (EcoLogical Australia, 2014).
- CEEC: Monaro and Werriwa Tablelands Cool Temperate Grassy Woodlands v1.4 (State Government of NSW and Department of Planning, Industry and Environment 2019).

2.2 Vegetation surveys

Field survey was undertaken within the Growth precincts from 22 September–1 October 2021. The survey focused on mapping mostly native vegetation type, their condition and assessing the likelihood of threatened species to utilise habitats available within the study area. This was completed using a combination of the following methods:

- random meanders
- rapid point data collection
- BAM vegetation integrity plots.

2.2.1 Mapping of native vegetation zones

Field validation (ground-truthing) of the existing vegetation classifications and stratification was largely based on random meander surveys with BAM vegetation integrity plots undertaken in some sub-precincts (East Jindabyne, Leesville, and to a lesser extent Jindabyne West).

Field verification was used to confirm vegetation structure, dominant species, native diversity, condition, and presence of threatened ecological communities. This information was then used to validate and refine the existing vegetation mapping to determine their associated Plant Community Type (PCT) in accordance with the BioNet Vegetation Classification System.

Vegetation patches were then classified to a vegetation zone which is defined in the BAM as ‘an area of native vegetation on the study area that is the same PCT and has a similar broad condition state’. A broad condition state infers that the vegetation has a similar tree cover, shrub cover, ground cover, level of weed invasion, or combinations of these attributes which determine vegetation condition. Broad condition state is used for stratifying areas of the same PCT into a vegetation zone. Vegetation zones contain areas of PCTs that are similar to each other, but there is still some variation.

The Vegetation Zone stratification used the vegetation zone descriptors in Table 2.1.

Table 2.1 Vegetation zone descriptors for PCTs within the Growth precinct

Vegetation zone descriptors	Description
Good	Characterised by PCT 1191 (dominated by Snow Gum and/or Candlebark) with all structural layers intact, a species diversity typical of relatively undisturbed examples of the PCT, and limited weed invasion. This vegetation zone is reserved for the best condition patches of PCTs within the precinct.
Moderate	The PCT 1191 (dominated by Snow Gum and/or Candlebark) may have a missing structural layer, lower species diversity, disturbance by tracks or trails, or some weed invasion but overall is still in moderately good condition despite the disturbance.
Poor	PCT 1191 (dominated by Snow Gum and/or Candlebark) that may have missing structural layers, thinned canopy, low species diversity, and/or significant weed invasion.
Ribbon Gum variant_Good	This is PCT 1191 (dominated by Ribbon Gum) with all structural layers intact, a species diversity typical of relatively undisturbed examples of the PCT, and limited weed invasion. This vegetation zone is reserved for the best condition patches of PCTs within the precinct. This vegetation zone has been separated from PCT 1191 (dominated by Snow Gum and/or Candlebark) given the distinctive dominance of Ribbon Gum.
Ribbon Gum variant_Moderate	The PCT 1191 (dominated by Ribbon Gum) may have a missing structural layer, lower species diversity, disturbance by tracks or trails, or some weed invasion but overall is still in moderately good condition despite the disturbance. This vegetation zone has been separated from PCT 1191 (dominated by Snow Gum and/or Candlebark) given the distinctive dominance of Ribbon Gum.
Canopy trees	This Vegetation Zone is characterised by PCT 1191 (dominated by Snow Gum and/or Candlebark) that has individual old trees situated in grassland that is managed by mowing or slashing, essentially old trees over mown grass.
Ribbon Gum variant_Canopy trees	This Vegetation Zone is characterised by PCT 1191 (dominated by Ribbon Gum) that has individual old trees situated in grassland that is managed by mowing or slashing, essentially old trees over mown grass. This vegetation zone has been separated from PCT 1191 (dominated by Snow Gum and/or Candlebark) given the distinctive dominance of Ribbon Gum.
Native dominant grassland	Areas of grassland dominated by native species. Native species have >50% cover as recorded in BAM Plots. These grasslands still contain exotic species, and in some instances may contain a considerable exotic species cover, but native species were dominant at the time of survey.
Exotic dominant grassland	Areas of grassland dominated by exotic species. Exotic species have >50% cover as recorded in BAM Plots. These grasslands still contain native species, but annual or perennial exotic species were dominant at the time of survey.
Shrubland	This Vegetation Zone is a shrubland which is either naturally treeless or where the canopy has been removed (e.g., in easements under transmission lines). The shrublands are dominated by native species and so are classified as a modified shrubland version of the original PCT.
Rocky outcrop	This Vegetation Zone is the result of past clearing reducing the woodland structure to a low native shrubland, or scattered trees, that is persisting around granitoid boulders on the hills. The boulders have provided refuge for native shrubs to establish and grow under grazing pressure and therefore these areas possess a different species compliment and vegetation structure to surrounding grassland or forested areas.

Vegetation zone descriptors	Description
Revegetation	This Vegetation Zone is characterised by plantings of native species. The species are native and so have been assigned to a separate vegetation zone to recognise that these areas have been planted.
Poa variant_Good	Areas of PCT 1110 dominated by *Poa labillardierei* situated in drainage lines and lower slopes on heavier darker wetter soils. This vegetation zone is in good condition with a suite of grassland species typical of this plant community, dense cover of *Poa labillardierei,* and low levels of weed invasion. Part of the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands TEC.
Poa variant_Moderate	Areas of PCT 1110 dominated by *Poa labillardierei* situated in drainage lines and lower slopes on heavier darker wetter soils but the cover of *Poa labillardierei* tussocks is sparser. These areas have lower species diversity, disturbance by tracks or trails, or some weed invasion. Generally, still part of the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands TEC.
Poa variant_Poor	Areas of PCT 1110 dominated by *Poa labillardierei* situated in drainage lines and lower slopes on heavier darker wetter soils but the cover of *Poa labillardierei* tussocks is sparse and weed invasion is significant. This vegetation zone generally does not form part of the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands TEC due to poor condition of the vegetation.
Themeda variant_Good	Areas of PCT 1110 dominated by *Themeda triandra*, or with *Themeda triandra* as a significant component. The Themeda vegetation zone is in good condition with a suite of grassland species typical of this plant community and low levels of weed invasion. Part of the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands TEC.

2.2.2 Random meander survey

Random meander surveys are a variation of the transect type survey and were completed in accordance with the technique described by Cropper (1993) whereby the recorder walks in a random meander throughout the study area recording dominant and key plant species (e.g., threatened species, priority weeds), boundaries between various vegetation communities and condition of vegetation. The time spent in each vegetation community was proportional to the size of the community and its species richness.

Random meander surveys were conducted to undertake flora and fauna habitat assessments, vegetation mapping and opportunistically search for threatened species within area of suitable habitat. This involved two ecologists driving along the corridor and where habitat was observed to be potentially suitable, ecologists walked throughout these habitat patches looking for threatened species.

2.2.3 Rapid point assessment

Rapid point assessments were completed to validate and refine this existing vegetation classification to determine their associated PCT. Variable levels of information were collected at each Rapid Data Point. Data on geology, dominant canopy species, native species richness, vegetation structure, vegetation condition, and boundaries between vegetation types or zones were collected as required to aid in the preparation of the PCT and vegetation zone map. Rapid data point assessments were conducted across the study area and the location of Rapid Data Points collected during the survey are illustrated in Appendix A to Appendix E).

2.2.4 BAM vegetation integrity plots

Vegetation integrity plots were completed in accordance with BAM in areas of native grassland to determine consistency with threatened ecological communities. Thirty seven BAM plots were completed during the survey in the Growth precinct (see Table 2.2) and the location of the BAM Plots is illustrated in Appendix A to Appendix C. The data from each BAM Plot is provided in Appendix A to Appendix E.

Table 2.2 Summary of BAM Plots undertaken within the Growth precinct

Sub-precinct	PCT	Vegetation Zone	Plots	Number of plots
Jindabyne West sub-precinct	1191	Exotic dominant grassland	BruceGrss1, BruceGrss2, BruceGrss3, BruceGrss4, DNG11, DNG13	6
		Moderate	epauc9, epauc10, epauc11	3
		Revegetation	BReveg1, Breveg2, evim8	3
		Rocky outcrop	BruceB1, BruceB2, BruceB3, BruceB4	4
	1110	Themeda variant_Good	WCG1, SCRGrass2, DNG12	3
	TOTAL			**19**
East Jindabyne sub-precinct	1191	Native Dominant Grassland	EJGrass5	1
		Shrubland	EJReg1	1
		Moderate	EpaucWBanPl1, EpaucWBamPl2, EpaucWBamPl4	3
	1110	Themeda variant_Good	EJGrass1, EJGrass2, EJGrass4, DNGBaPl3	4
		Poa variant_Good	EJGrass3	1
	TOTAL			**10**
Leesville sub-precinct	1191	Good	LVSGCB1, EpucrubBamPl8, EpucrubBamPl9, EpucstellBamPl10	4
		Moderate	EpucrubBamPl6	1
		Exotic dominant grassland	LVGrass1	1
	1110	Poa variant_Good	LVGrass2	1
		Poa variant_Moderate	PoalabwetgrassPl7	1
	TOTAL			**8**

The following site attributes were recorded at each vegetation integrity plot location:

- Location (easting–northing grid type MGA 94, Zone 56).
- Vegetation structure and dominant species and vegetation condition. Vegetation structure was recorded through estimates of percentage foliage cover, average height and height range for each vegetation layer.
- Native and exotic species richness (within a 400-metre squared quadrat): This consisted of recording all species by systematically walking through each 20-metre x 20 metre plot. The cover and abundance (percentage of area of quadrat covered) of each species was estimated. The growth form, stratum/layer and whether each species was native/exotic/high threat weed was also recorded.

- Number of trees with hollows (1000 metre squared quadrat): This was the frequency of hollows within living and dead trees within each 50-metre x 20 metre plot. A hollow was only recorded if (a) the entrance could be seen: (b) the estimated entrance width was at least 5 centimetres across: (c) the hollow appeared to have depth: (d) the hollow was at least 1 metre above the ground and the (e) the centre of the tree was located within the sampled quadrat.
- Number of large trees and stem size diversity (1000 metre squared quadrat): tree stem size diversity was calculated by measuring the diameter at breast height (DBH) (i.e., 1.3 metre from the ground) of all living trees (>5 centimetre DBH) within each 50 metre x 20 metre plot. For multi-stemmed living trees, only the largest stem was included in the count. Number of large trees was determined by comparing living tree stem DBH against the PCTs benchmarks.
- Total length of fallen logs (1000 metre squared quadrat): This was the cumulative total of logs within each 50 metre x 20 metre plot with a diameter of at least 10 centimetres and a length of at least 0.5 metre.
- Litter cover: This comprised estimating the average percentage groundcover of litter (i.e. leaves, seeds, twigs, branchlets and branches with a diameter <10 centimetre which is detached from a living plant) from within five 1 metre x 1 metre sub-plots spaced evenly either side of the 50-metre central transect.
- Evaluation of regeneration: This was estimated as the presence/absence of overstorey species present at the site that was regenerating (i.e., saplings with a diameter at breast height ≤5 centimetre).

Prior to establishing plot survey locations, vegetation stratification was undertaken to provide a representative vegetation zone for sampling. Stratification involved marking waypoints and bearings randomly to provide a representative assessment of the vegetation integrity of the vegetation zone in the study area and establishing the required number of plots at some of these waypoints.

A schematic diagram illustrating the layout of each vegetation integrity plot is provided in Figure 2.1.

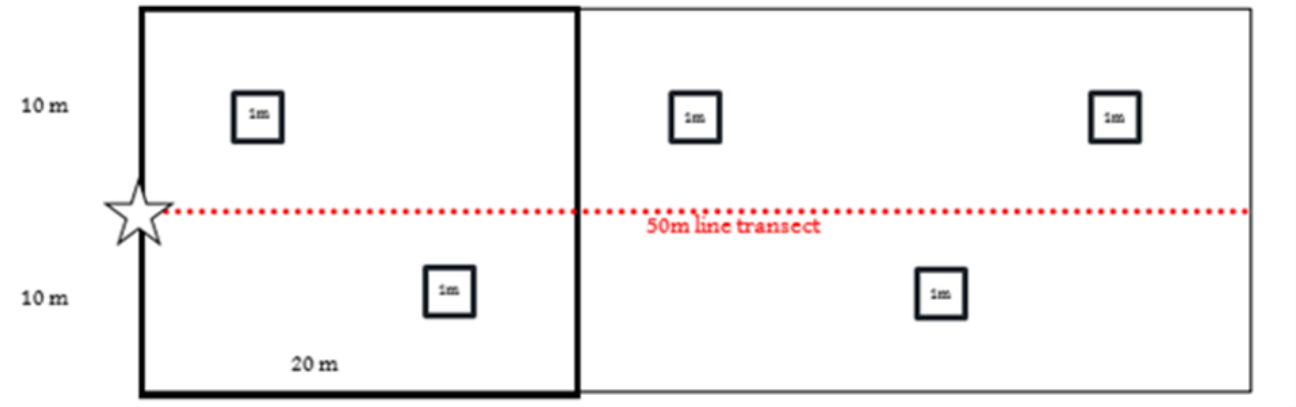


Figure 2.1 Vegetation integrity plot layout

2.2.5 Fauna surveys

2.2.5.1 Fauna habitat assessment

Fauna habitat assessments were undertaken to assess the likelihood of threatened species of animal (those species known or predicted to occur within the locality from the literature and database review) occurring within the investigation area. Fauna habitat assessments were the primary assessment tool in assessing whether threatened species were likely to occur. The fauna habitat characteristics assessed include:

- structure and floristics of the canopy, understorey and ground vegetation, including the presence of flowering and fruiting trees providing potential foraging resources
- presence of mistletoes providing potential foraging resources
- presence of hollow-bearing trees providing roosting and breeding habitat for arboreal mammals, birds and reptiles
- presence of the ground cover vegetation, leaf litter, rock outcrops and fallen timber and potential to provide protection for ground-dwelling mammals, reptiles and amphibians

- presence of waterways (ephemeral or permanent) and water bodies.
- presence of man-made structures (e.g., culverts) for roosting/breeding microchiropteran bats.

The locations of important habitat features were recorded including:

- hollow-bearing trees
- aquatic habitat
- rock outcrops
- habitat type boundaries.

Opportunistic observations of animals and signs of animal activity (e.g., feeding signs, scats) were also recorded.

2.2.5.2 Herpetofauna searches

Where habitat was considered suitable for potential of reptiles and amphibians active searches were conducted during the day. This involved looking for active specimens, turning over suitable ground shelter, such as fallen timber, sheets of iron, exposed rocks, raking debris, other debris, and peeling decorticating bark. Specimens would be either identified visually, by aural recognition of call (frogs only) or were collected and identified.

Herpetofauna surveys were completed by one or two persons in conjunction with other surveys and random meanders, with all ground shelter returned to their original position. Frogs and reptiles were also surveyed opportunistically during all other surveys in the investigation area. The results of the fauna surveys are outlined in Appendix F.

2.2.5.3 Diurnal bird surveys

Although most birds recorded during the surveys were opportunistic sightings, some formal 20-minute diurnal bird searches were completed within the Growth precinct area. These were completed by actively walking through the nominated site (transect) over a period of 20 minutes. All birds were identified to the species level, either through direct observation or identification of calls. Diurnal bird surveys were completed during different times of the day, but generally occurred during morning hours or evening. Birds were also recorded opportunistically during other on-site surveys. To aid identification of species, call playbacks were utilised to determine a reaction of a particular individual and assisted in drawing in individuals of threatened species when habitat was deemed suitable for a likelihood of occurrence. The results of the fauna surveys are outlined in Appendix F.

2.2.5.4 Opportunistic sightings

Opportunistic sightings of animals were recorded including birds, mammals, frogs, and reptiles. Evidence of animal activity, such as scats, diggings, scratch marks, nests/dreys, burrows etc., was also noted. This provided indirect information on animal presence and activity. This was particularly relevant to the consistent sightings of threatened bird species observed during the flora investigations. The results of the fauna surveys are outlined in Appendix F.

2.3 Identifying areas of biodiversity constraint

The precinct was divided into areas of biodiversity constraint so that the most important areas of biodiversity could be easily identified, and development can be directed towards areas of lower constraint. This is a key consideration when considering avoidance of biodiversity impacts at the planning stage. The biodiversity constraint categories are explained in Table 2.3.

Table 2.3 Definitions of biodiversity constraint categories

Biodiversity constraint category	Definition
High	The best condition patches of native vegetation that are present in the precinct and are the highest priority for avoidance. This includes: — the native vegetation patches that correspond to the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands TEC. — the patches of PCT 1191 which are part of the BC Act listed Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion TEC (a SAII entity) that are in Good condition. These areas appear to be relatively undisturbed or have recovered from disturbance and are dominated by native species. — areas considered likely to provide good habitat for threatened species.
Moderate	Patches of native vegetation that are still representative of TECs but are more disturbed and degraded when compared to the best condition patches found within the precinct. These areas should still be considered for avoidance but are not as high priority compared to areas of high constraint. This includes: — Disturbed versions of native vegetation that correspond to the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands TEC that are in Moderate to Poor condition and exotic dominant grasslands (dominated by annual weeds) that still meet condition criteria to be part of the TEC based on low percentage cover of perennial weeds and non-grass native species richness. These are the most disturbed patches of the TEC within the precinct and are subject to significant weed invasion. — Disturbed patches of PCT 1191 which are part of the BC Act listed Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion TEC (a SAII entity) that are in Moderate to Poor condition. This category includes most areas of Rocky outcrop, shrubland, revegetation, and native and exotic dominant grassland versions of PCT 1191. The most disturbed patches of the TEC within the precinct and are subject to significant weed invasion.
Low	This category includes the areas that are most suitable for development. Development should be directed towards these areas of Low biodiversity constraint in order to avoid detrimental biodiversity impacts. This includes: — Disturbed areas that are not consistent with native plant community types (miscellaneous ecosystems, including, exotic plantings and exotic pastures). — Non-native vegetation which is unlikely to provide habitat for Threatened fauna. — Vegetation zones where structure and composition have been significantly altered as a result of ongoing management, for example exotic dominant grasslands that do not meet criteria to be part of the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands TEC. — Vegetation zones that are in low condition and would not require offsets under the BC Act (have Vegetation Integrity scores of less than 17).

3 Jindabyne West sub-precinct

3.1 Field surveys

The methodology for these surveys is described in Section 2 with survey location mapping provided in Appendix A-2. Data from surveys within the sub-precinct are provided in Appendix A-1.

3.2 Existing environment

The Jindabyne West sub-precinct is a relatively undeveloped but disturbed site located to the west of the Jindabyne town centre. The landscape of the Jindabyne West sub-precinct is largely grassland on rolling hills, with areas of scattered trees and small stands of trees (*Eucalyptus pauciflora, Acacia melanoxylon, Acacia dealbata*) on hill tops, and areas of rocky granite outcrops.

The existing environment of the Jindabyne West sub-precinct is described in Table 3.1.

Table 3.1 Summary of existing environment in Jindabyne West sub-precinct

Value	Description
Area (ha)	111 ha
IBRA Bioregion	South Eastern Highlands (Monaro subregion)
General description (topographic setting, geology and soils)	The Jindabyne West sub-precinct is undeveloped land to the west of the town centre representing the largest residential growth opportunity in Jindabyne. The sub-precinct is bound to the south by the future alignment of the Southern Connector Road, to the north by Kosciuszko Road and the Lake Jindabyne foreshore, and to the east by urban development and Barry Way (see Appendix A). The Jindabyne West sub-precinct consists of rolling hills with elevation varying from approximately 920 m to 1,020 m ASL. Geology is volcanic Leesville Granodiorite (Biotite Granodiorite) with Jindabyne Tonalite (Hornblende – Biotite Tonalite) in the east. Soils include shallow gravelly loams and texture-contrast soils (light textured topsoil overlying a clay subsoil - Chromosols). Geotechnical borehole logs from around the Jindabyne area indicate the soil is sandy silty clay and silty gravelly sand (decomposed granite). Heavier textured wetter soils occur in drainage lines and flat low points between ridges.
Rivers, streams and estuaries	There are no rivers or estuaries in the Jindabyne West sub-precinct. There is one mapped unnamed small first order stream (ephemeral) that drains north west to Widows Creek.
Wetlands and important wetlands	No wetlands of international or national importance are present. The edge of Lake Jindabyne is present approximately 150 m to the north of the Jindabyne West sub-precinct.
Habitat connectivity	The habitat within the Jindabyne West sub-precinct has limited physical connectivity to other habitats. However, connectivity exists for species that can utilise grasslands and the stands of trees and shrubs within the broader grassland do provide some functional connectivity from Lake Jindabyne in the north to the more heavily vegetated areas on the Mountain Bike and Adventure Park sub-precinct and the vegetation to the north of the Aerodrome.

Value	Description
Karst, caves, crevices, cliffs, rocks and other geological features of significance	There are no areas of karst, caves, cliffs, or other geological features of significance in the Jindabyne West sub-precinct. Rock outcropping is a common feature and provides a significant habitat resource for fauna with large surface boulders providing crevices and shelter sites.
Areas of Outstanding Biodiversity Value	No Areas of Outstanding Biodiversity Value occur within the Jindabyne West sub-precinct.
Plant Community Types	PCT 1191: Snow Gum – Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion. PCT 1110: River Tussock – Tall Sedge – Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion.
Threatened ecological communities BC Act	Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion (Critically Endangered BC Act). Natural Temperate Grassland of the South Eastern Highlands (Critically Endangered EPBC Act).
Threatened species habitats (Species credit species)	Based on the candidate species list (species credit species) returned for PCT 1191 and PCT 1110 by the BAM-C, and the limited field survey that has been undertaken in this sub-precinct to date, the following threatened species may have habitat in the Jindabyne West sub-precinct: — Plants including *Calotis glandulosa*, *Leucochrysum albicans* var. *tricolor*, *Prasophyllum petilum*, *Swainsona sericea*, and *Thesium australe*. — Mammals including Eastern Pygmy-possum and Southern Myotis. — Birds including Pink Robin. — Reptiles including Pink-tailed Legless Lizard and Striped Legless Lizard.
Serious and irreversible impact entities	Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion (Critically Endangered BC Act). *Calotis glandulosa* (potential habitat).

3.2.1 Plant community types

The type and distribution of the original vegetation that would have occurred in the Jindabyne West sub-precinct is difficult to determine given the years of agricultural use that have occurred which has resulted in considerably modified vegetation. Based on the field surveys undertaken to date and comparison of the site's geology, soils, elevation, and topography to similar less disturbed areas in the Jindabyne region, the Jindabyne West sub-precinct is considered to contain the following two PCTs:

- PCT 1191: Snow Gum – Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion.
- PCT 1110: River Tussock – Tall Sedge-Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion.

The distribution of the PCTs is illustrated in Appendix A. The PCTs and vegetation zones within the sub-precinct are summarised in Table 3.2 and described below.

Table 3.2 Plant community types and vegetation zones within Jindabyne West sub-precinct

Plant community type	Vegetation zone	Area in sub-precinct (ha)
PCT 1191	Native dominant grassland	0.07
	Exotic dominant grassland	40.73
	Good	1.15
	Moderate	7.04
	Poor	0.45
	Revegetation	1.68
	Rocky outcrop	26.02
	TOTAL	**77.14**
PCT 1110	Exotic dominant grassland	17.74
	Native dominant grassland	0.02
	Poa variant_Good	1.18
	Poa variant_Moderate	2.01
	Poa variant_Poor	0.01
	Themeda variant_Good	13.08
	TOTAL	**34.04**
Total native vegetation		**111.18**

3.2.1.1 PCT 1191: Snow Gum – Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion

The majority of the sub-precinct consists of Snow Gum – Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion (PCT 1191). The majority of this PCT is present in the form of 'secondary' or 'derived' grasslands.

A summary of the structure and floristics PCT 1191 within the sub-precinct in provided in Table 3.3.

Table 3.3 Floristic and structural summary of PCT 1191 within the Jindabyne West sub-precinct

Vegetation layer	Species recorded from the surveys
Tree canopy (upper stratum)	Trees – *Eucalyptus pauciflora, Acacia dealbata, Acacia melanoxylon* with *Eucalyptus viminalis, Eucalyptus bridgesiana, Eucalyptus rubida.*
Midstorey (mid-stratum)	Shrubs – *Melicytus angustifolius* subsp. *divaricatus, Pimelea pauciflora, Olearia phlogopappa, Bossiaea buxifolia, Brachyloma daphnoides.*

Vegetation layer	Species recorded from the surveys
Groundcovers (ground stratum)	Grass & grass like – *Austrostipa scabra, Rytidosperma* sp., *Rytidosperma tenuius, Anthosachne scabra, Poa sieberiana* var. *sieberiana, Poa meionectes, Lomandra longifolia, Themeda triandra, Panicum effusum, Luzula flaccida, Enneapogon nigricans, Carex inversa, Lepidosperma laterale, Lomandra glauca, Bothriochloa macra.* Forbs – *Geranium solanderi, Hydrocotyle laxiflora, Acaena ovina, Crassula sieberiana, Dichondra repens, Oxalis perennans, Plantago varia, Einadia nutans, Rumex brownii, Swainsona behriana, Senecio quadridentatus, Wahlenbergia communis, Bulbine bulbosa, Dianella longifolia, Cymbonotus* sp., *Asperula conferta, Cynoglossum suaveolens, Ammobium alatum, Vittadinia muelleri, Calotis anthemoides, Euchiton involucratus, Hovea heterophylla, Epilobium billardierianum.* Ferns – *Asplenium flabellifolium, Cheilanthes austrotenuifolia.* Other – *Convolvulus erubescens, Desmodium varians, Glycine clandestina.*
Exotic species	*Trifolium arvense, Avena barbata, Petrorhagia nanteuilii, Echium vulgare, Verbascum thapsus, Medicago lupulina, Aira elegantissima, Bromus hordeaceus, Vulpia myuros, Taraxacum officinale, Plantago lanceolata, Bromus rubens, Poa pratensis, Sonchus oleraceus, Arenaria leptoclados, Dactylis glomerata, Anagallis arvensis, Hirschfeldia incana, Erodium cicutarium, Marrubium vulgare, Anthoxanthum odoratum, Hypochaeris radicata, Salvia coccinea, Linaria arvensis, Hordeum* sp.
High Threat Weeds	*Rosa rubiginosa, Bromus diandrus, Acetosella vulgaris, Nassella trichotoma, Hypericum perforatum, Cotoneaster* sp., *Eragrostis curvula, Pyracantha* sp.

Photo 3.1 Typical rocky outcrop showing markedly different species composition and structure to surrounding grassland

Photo 3.2 Rocky outcrop showing typical landscape in Jindabyne West sub-precinct

Photo 3.3 Typical landscape showing Exotic dominant grassland on rolling hills

Photo 3.4 PCT 1191 on a low hill showing young *Eucalyptus pauciflora* trees

Within the sub-precinct, this plant community type occurs in seven different condition classes (vegetation zones):

- PCT 1191 (Good, Moderate, Poor, Revegetation): The treed areas within the sub-precinct, have been divided into three condition classes (Good, Moderate, Poor) based on conditions observed at the time of survey. There are also areas of revegetation on the Snowy Mountains Grammar School site that have been assigned to a separate revegetation vegetation zone to recognise that these areas have been planted with trees.
- PCT 1191 (Rocky outcrop): These areas of rocky outcrop have been separated out as a distinct vegetation zone as there elevated rocky areas contain a suite of species in the ground and midstory layers that are consistent with the treed areas. These rocky areas are different to that of the surrounding grasslands and are considered likely to have once contained trees.
- PCT 1191 (Native dominant grassland and Exotic dominant grassland): These areas of grassland that are considered likely to be 'secondary' or 'derived' grasslands (where the original tree and shrub layers have been cleared in the past, but ground cover species are consistent with woodland species) have been assigned to two different vegetation zones. These grassland areas are divided into 'Native dominant grassland' and 'Exotic dominant grassland' based on cover of native and exotic species as determined through BAM Plots. The grassland zones of PCT 1191, particularly the Exotic dominant grassland, have a lower diversity of native species, are generally dominated by exotic perennial and annual grasses and herbs, and contain a significant number of High Threat weed species (particularly *Rosa rubiginosa*, *Bromus diandrus*, *Acetosella vulgaris*, *Nassella trichotoma*, and *Hypericum perforatum*).

3.2.1.2 PCT 1110: River Tussock – Tall Sedge – Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion

As opposed to the grasslands that are likely to be 'secondary' or 'derived' grasslands from PCT 1191, the remaining grassland areas of the Jindabyne West sub-precinct, specifically the areas in the east and south of the Southern Connector Road corridor, are considered most likely to contain examples of a remnant natural grassland. These grassland areas would most closely resemble PCT1110: River Tussock-Tall Sedge - Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion. These grassland areas are generally situated on drainage lines, flats and foot slopes on wetter heavier soils. However, there are also some examples situated on the shallow gravelly soils on the hills. Different grassland variations occur on different soils and landscape positions. In the absence of any direct evidence to suggest that these areas originally contained a woodland tree layer and based on the floristic composition of these areas they have been assigned to PCT 1110.

A summary of the structure and floristics PCT 1110 within the sub-precinct in provided in Table 3.4. Limited field data collection has occurred in this PCT within the Jindabyne West sub-precinct to date so the summary provided in Table 3.4 should not be considered comprehensive.

Table 3.4 Floristic and structural summary of PCT 1110 within the Jindabyne West sub-precinct

Vegetation layer	Species recorded from the surveys
Tree canopy (upper stratum)	Trees – occasional scattered *Eucalyptus pauciflora.*
Midstorey (mid-stratum)	Shrubs – *Pimelea pauciflora, Leucopogon fletcheri* subsp. *brevisepalus*.
Groundcovers (ground stratum)	Grass & grass like – *Themeda triandra, Austrostipa* sp., *Rytidosperma* sp., *Poa* sp., *Panicum* sp., *Echinopogon* sp., *Carex breviculmis, Poa sieberiana, Anthosachne scabra, Rytidosperma tenuius, Austrostipa scabra, Carex inversa.* Forbs – *Dichondra repens, Euchiton* sp., *Oxalis perennans, Acaena ovina, Epilobium billardierianum, Wahlenbergia communis, Crassula sieberiana, Vittadinia muelleri, Dichondra* sp. A, *Ammobium alatum, Geranium solanderi, Hydrocotyle laxiflora, Vittadinia cuneata.* Other – *Convolvulus erubescens.*
Exotic species	*Trifolium arvense, Petrorhagia nanteuilii, Verbascum thapsus, Avena* sp., *Echium vulgare, Hypochaeris radicata, Vulpia myuros, Bromus hordeaceus, Anthoxanthum odoratum, Erodium cicutarium, Taraxacum officinale, Arenaria leptoclados, Linaria arvensis, Centaurium erythraea, Hypochaeris glabra, Plantago lanceolata, Poa pratensis, Potentilla recta.*
High Threat Weeds	*Acetosella vulgaris, Hypericum perforatum, Holcus lanatus, Rosa rubiginosa.*

Photo 3.5 PCT 1110 in the east showing dominance of *Themeda triandra*

Photo 3.6 PCT 1110 on the valley floor with heavier soils showing *Poa labillardierei*

Six PCT 1110 vegetation zones were mapped within the Jindabyne West sub-precinct:

- PCT 1110 (Poa variant Good, Moderate and Poor): The Poa variant is distinct in that this vegetation zone is situated in drainage lines and lower slopes on heavier darker wetter soils and is dominated by the species *Poa labillardierei*. The three condition classes have been determined based on aerial photography identifying areas of thick relatively continuous *Poa labillardierei* tussock cover (Good condition) and other areas where the cover of *Poa labillardierei* tussocks is more sparse (Moderate condition) and areas with considerable weed invasion (Poor condition) combined with on ground surveys. This vegetation zone is considered to be part of the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands TEC due to the patch being characterised by at least 50 % foliage cover of the ground of *Poa labillardierei*, generally in flats and drainage lines where this threatened ecological community naturally occurs.

- PCT 1110 (Themeda variant Good): The Themeda variant is in good condition with a suite of grassland species typical of this plant community and is situated on flatter and more gently sloping areas in the east and south of the Jindabyne West sub-precinct. The BAM Plots undertaken within this vegetation zone indicate that *Themeda triandra* is either the dominant grass species or is at least highly abundant. Trees and shrubs are generally absent from this vegetation zone with the exception of a few scattered individuals. This vegetation zone is considered to be part of the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands TEC due to the patch being characterised by at least 50 % foliage cover of the ground of *Themeda triandra*, or otherwise meeting Condition Thresholds for inclusion as part of the TEC.
- PCT 1191 (Native dominant grassland and Exotic dominant grassland): These areas of grassland are similar to the grassland versions of PCT 1191 but are in overall better condition based off the data collected during the field survey. BAM Plots within the vegetation zone were not done in the Jindabyne West sub-precinct but were completed in the adjacent Southern Connector Road to the north which forms part of the same vegetation patch. Discriminating between a patch of PCT 1191 in 'secondary' or 'derived' grassland form and PCT 1110 is difficult. PCT 1191 and PCT 1110 intergrade and the boundaries between the two PCTs are not often clear, particularly where there has been a long history of human disturbance such as in the Jindabyne West sub-precinct. Where the data suggests that the grassland was not evidently dominated by *Themeda triandra, Poa labillardierei* or *Carex bichenoviana* but percentage cover of native vascular plants is greater than the percentage cover of perennial exotic species, and the BAM Plot contained at least 8 non-grass native species, the grassland was assigned to PCT 1110 and either Native dominant grassland or Exotic dominant grassland based on cover of native and exotic species based on BAM Plots. Exotic dominant grasslands generally contain a high cover of annual weeds and few perennials weed species. These grassland areas are considered to be part of the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands TEC. This is in line with the advice provided by the Threatened Species Scientific Committee (2016) where they indicate that sites that are difficult to determine as natural or derived grassland should be considered to be part of TEC, if they otherwise meet the Description and Key Diagnostic Characteristics.

3.2.2 Threatened ecological communities

Two threatened ecological communities occur within this sub-precinct (Table 3.5).

Table 3.5 Threatened ecological communities within Jindabyne West sub-precinct

Threatened ecological community	PCT	EPBC Act	BC Act	Area in sub-precinct (ha)
Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion	PCT 1191	Not a TEC	Critically Endangered[1]	77.14 (includes 40.80 ha of 'derived' or 'secondary' grasslands)
Natural Temperate Grassland of the South Eastern Highlands	PCT 1110	Critically Endangered	Not a TEC	34.03 (includes grassland areas that meet condition thresholds)

(1) Serious and Irreversible Impact (SAII) entity. See Section 8.3.

Snow Gum – Candle Bark woodland (PCT 1191) forms part of the Critically Endangered Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion as listed under the BC Act. This listing includes the areas of PCT 1191 'secondary' or 'derived' grasslands that lack trees. The data collected during the field survey indicates that these PCT 1191 grassland areas in the Jindabyne West sub-precinct would not be considered part of the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands TEC due to not meeting Condition Thresholds for inclusion as part of the TEC. These grasslands are disturbed and form the lowest quality patches of vegetation within the Jindabyne West sub-precinct.

River Tussock – Tall Sedge – Kangaroo Grass moist grasslands (PCT 1110) were assessed as consistent with Natural Temperate Grassland of the South Eastern Highlands critically endangered ecological community listed under the EPBC

Act. The areas of Native dominant grassland and Exotic dominant grassland that meet the condition thresholds are considered to be part of this TEC.

3.3 Planned development

Planned development for the Jindabyne West sub-precinct consists of new development on currently undeveloped land which will consist of residential sub-division including a defined mixed use business and local service area. Areas of open space/green infrastructure are to be retained within the sub-division.

3.4 Opportunities and constraints

This sub-precinct has been subject to long history of agricultural grazing and as a result contains degraded areas. This in conjunction with location close to Jindabyne town centre provides opportunities for development. Areas of higher biodiversity value including stands of trees and areas of natural temperate grassland provide an opportunity for open space conservation reserves.

The area most suitable for development is to the north of the proposed Southern Connector Road (Lot 12 DP1241336) which is a disturbed landscape with small patches of PCT 1191 and rocky outcrops with shrubland, surrounded by Exotic dominant grassland subject to significant invasion by a number of High Threat Weeds. These grassland areas on Lot 12 DP1241336 do not meet the criteria to be part of the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands TEC and are considered to be 'secondary' or 'derived' grasslands and are generally dominated by exotic perennial and annual grasses and herbs. These grassland areas contain a high abundance and cover of High Threat weed species (particularly *Rosa rubiginosa, Bromus diandrus, Acetosella vulgaris, Nassella trichotoma,* and *Hypericum perforatum*).

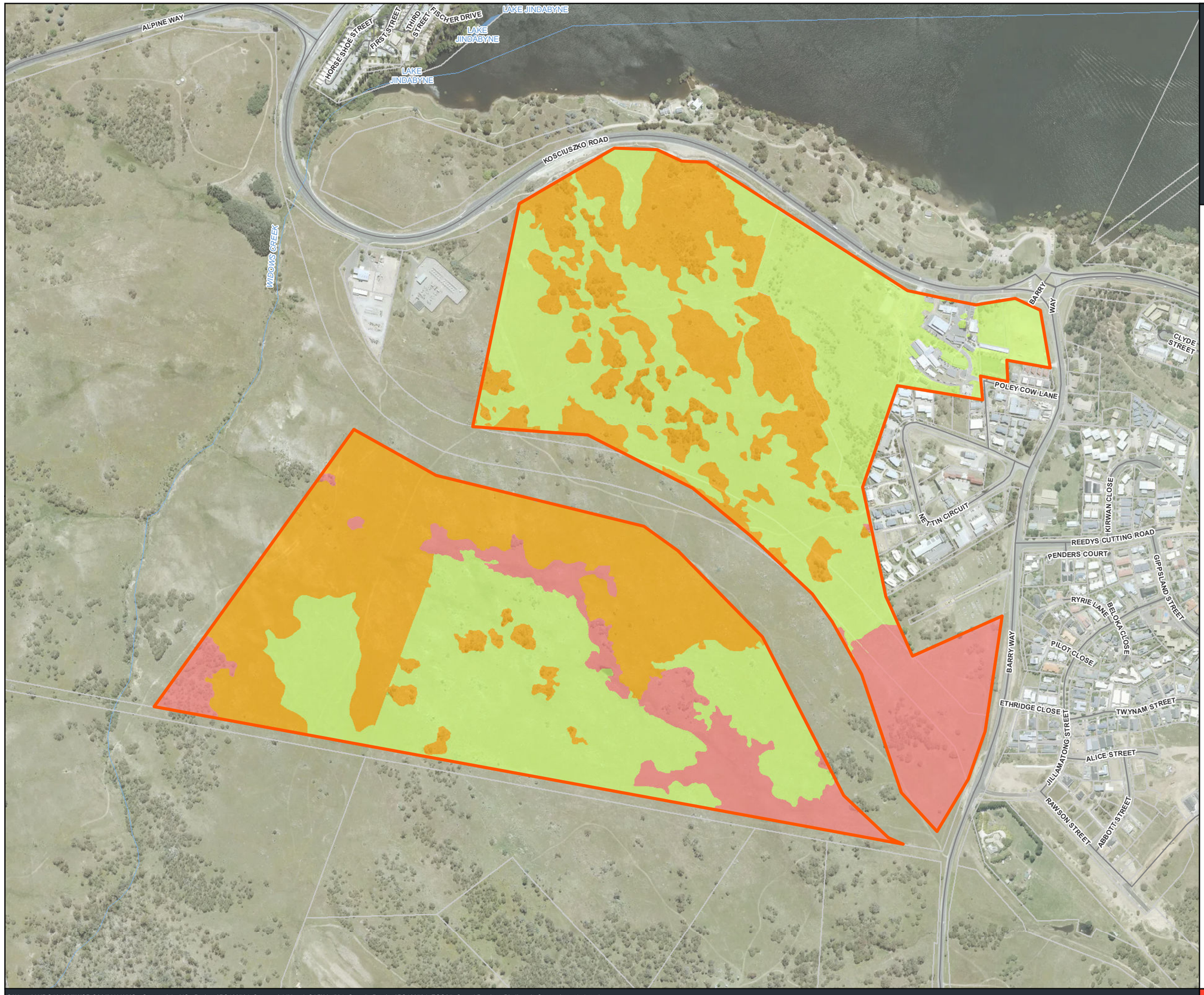
Although the Jindabyne West sub-precinct contains TECs in various forms, careful planning could retain areas of high biodiversity value. Avoiding impact to TECs is not possible in this sub-precinct given the broad definition of the BC Act listed Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion which includes 'secondary' or 'derived' grasslands and the cautious approach taken to assigning other areas of grassland to the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands community. However, avoiding impact to the areas of highest biodiversity value in terms of PCTs in good to moderate condition and focussing development on the PCT 1191 Exotic dominant grasslands and Native Dominant grasslands, and where necessary areas of Rocky outcrop, the biodiversity impacts in this sub-precinct can be minimised as these areas are in lower condition.

The focus in this sub-precinct should be on retaining the largest and best patches of Natural Temperate Grassland (PCT 1110) and PCT 1191 where possible while targeting development to the disturbed areas such as the area north of the Southern Connector Road alignment (i.e., Lot 12 DP1241336) and areas to the south of the Southern Connector Road alignment on Lot 10 DP1241336.

In summary the constraints and opportunities in this sub-precinct include:

- Constraints – Areas of potential Natural Temperate Grassland of the South Eastern Highlands TEC. Areas of PCT 1191 (Good, Moderate) which are the highest quality components of the BC Act listed Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion TEC in the sub-precinct. These areas are largely located in the south east of the sub-precinct adjacent to Barry Way and south of the Southern Connector Road alignment.
- Opportunities – Areas of Native dominant grassland and Exotic dominant grassland and PCT 1191 in Poor or otherwise modified condition classes are suitable for future development. Areas of higher biodiversity value including stands of trees and areas of natural temperate grassland provide an opportunity for open space conservation reserves and strategic revegetation could be undertaken to connect wildlife habitats.

Constraints mapping for the sub-precinct is provided in Figure 3.1.



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Snowy SAP - Biodiversity Constraints

Figure 3.1

Jindabyne West Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Waterbodies
- Watercourse
- Roads

Biodiversity Constraints

- High
- Moderate
- Low

0 0.15 0.3 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:7,000 Date: 4/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

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4 East Jindabyne sub-precinct

4.1 Field surveys

Surveys undertaken at this sub-precinct are shown in Appendix B-2. The methodology for these surveys is described in Section 2. Data from BAM Plots undertaken within the sub-precinct are provided in Appendix B

4.2 Existing environment

The East Jindabyne sub-precinct consists of undeveloped land at the eastern edge of Lake Jindabyne. The landscape of the East Jindabyne sub-precinct is largely grassland with small stands of trees (*Eucalyptus pauciflora, Eucalyptus stellulata, Eucalyptus viminalis Acacia melanoxylon, Acacia dealbata*) on the rocky hills.

The existing environment of the Jindabyne West sub-precinct is described in Table 4.1.

Table 4.1 Existing environment in East Jindabyne sub-precinct

Value	Description
Area (ha)	41.31 ha
IBRA Bioregion	South Eastern Highlands (Monaro subregion)
General description (topographic setting, geology and soils)	The East Jindabyne sub-precinct is undeveloped land at the eastern edge of Lake Jindabyne. The sub-precinct is situated to the south of the existing East Jindabyne village. The sub-precinct is situated on an elevated position with views of the lake and provides opportunities for a new residential growth area and a major public park. The sub-precinct is bound to the north by Old Kosciuszko Road, the east by Kosciuszko Road, Lake Jindabyne to the west (see Appendix B). The East Jindabyne sub-precinct consists of rolling hills increasing in elevation to the east varying from approximately 920 m to 960 m ASL. Geology is volcanic Bullenbalong Granodiorite (Biotite - Rich Granodiorite). Soils include shallow gravelly loams and texture-contrast soils (light textured topsoil overlying a clay subsoil-Chromosols). Geotechnical borehole logs from around the Jindabyne area indicate the soil is sandy silty clay and silty gravelly sand (decomposed granite). Heavier textured wetter soils occur in the lower flatter western area that contains grassland.
Rivers, streams and estuaries	There are no rivers or estuaries in the East Jindabyne sub-precinct. There are six mapped unnamed small first order streams (ephemeral) that drain to Lake Jindabyne.
Wetlands and important wetlands	No wetlands of international or national importance are present. The edge of Lake Jindabyne is present at the western border of the sub-precinct.
Habitat connectivity	The habitat within the East Jindabyne sub-precinct has limited physical connectivity to other habitats. The majority of the eastern shore of Lake Jindabyne to the north and south of the East Jindabyne sub-precinct is densely forested with the exception of the existing areas of urban development. The main physical forested north south local corridor is to the east of the East Jindabyne sub-precinct. However, connectivity exists for species that can utilise grasslands. The stands of trees and shrubs on the hill provide some functional connectivity for species moving north south along the edge of the lake.

Value	Description
Karst, caves, crevices, cliffs, rocks and other geological features of significance	There are no areas of karst, caves, cliffs, or other geological features of significance in the East Jindabyne sub-precinct. Rock outcropping is a common feature on the hill and provides a significant habitat resource for fauna with large surface boulders providing crevices and shelter sites.
Areas of Outstanding Biodiversity Value	No Areas of Outstanding Biodiversity Value occur within the East Jindabyne sub-precinct.
Plant Community Types	PCT 1191: Snow Gum - Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion PCT 1110: River Tussock - Tall Sedge - Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion
Threatened ecological communities BC Act	Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion (Critically Endangered BC Act) Natural Temperate Grassland of the South Eastern Highlands (Critically Endangered EPBC Act)
Threatened species habitats (Species credit species)	Based on the candidate species list returned for PCT 1191 and PCT 1110 by the BAM-C and the limited field survey that has been undertaken in this sub-precinct, the following threatened species may have habitat in the East Jindabyne sub-precinct: — Plants including *Calotis glandulosa*, *Leucochrysum albicans* var. *tricolor*, *Prasophyllum petilum*, *Swainsona sericea*, and *Thesium australe*. A sample of a *Swainsona* sp. collected from East Jindabyne that resembles the threatened species Swainsona sericea have been sent to the Royal Botanic Gardens for confirmation if identification (identification is pending). — Mammals including Eastern Pygmy-possum and Southern Myotis. — Birds including Pink Robin. — Reptiles including Pink-tailed Legless Lizard and Striped Legless Lizard.
Serious and irreversible impact entities	Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion (Critically Endangered BC Act). *Calotis glandulosa* (potential habitat).

4.2.1 Plant community types

The type and distribution of the original vegetation that would have occurred in the East Jindabyne sub-precinct is easier to determine based on the distinct landscape of this sub-precinct. Based on the field surveys undertaken to date and comparison of the site's geology, soils, elevation, and topography to similar less disturbed areas in the Jindabyne region, the sub-precinct is considered to currently contain the following two PCTs:

- PCT 1191: Snow Gum – Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion.
- PCT 1110: River Tussock – Tall Sedge – Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion.

The distribution of the PCTs is illustrated in Appendix B. The PCTs and vegetation zones within the sub-precinct are summarised in Table 3.2 and described below.

Table 4.2 Plant Community Types and vegetation zones within East Jindabyne sub-precinct

Plant community type	Vegetation zone	Area in sub-precinct (ha)
PCT 1191	Native dominant grassland	11.77
	Exotic dominant grassland	0.09
	Moderate	3.54
	Poor	0.11
	Rocky outcrop	3.47
	Shrubland	0.33
	TOTAL	**19.31**
PCT 1110	Poa variant_Good	6.41
	Themeda variant_Good	11.44
	TOTAL	**17.85**
Total native vegetation		**37.16**

4.2.1.1 PCT 1191: Snow Gum – Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion

Just over half of the native vegetation of the sub-precinct consists of Snow Gum - Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion (PCT 1191). A summary of the structure and floristics PCT 1191 within the sub-precinct in provided in Table 4.3. This data was collected in September, so the full range of species is unlikely to have been collected and several species were only able to be identified to genus level due to absence of reproductive material.

Table 4.3 Floristic and structural summary of PCT 1191 within the East Jindabyne sub-precinct

Vegetation layer	Species recorded from the surveys
Tree canopy (upper stratum)	Trees – *Eucalyptus pauciflora, Acacia dealbata.*
Midstorey (mid-stratum)	Shrubs – *Melicytus angustifolius* subsp. *divaricatus, Grevillea lanigera, Pimelea pauciflora, Cassinia sp., Cassinia longifolia, Mirbelia oxylobioides, Pimelea linifolia, Leucopogon fletcheri, Bossiaea buxifolia, Cassinia aculeata, Cryptandra amara, Leucopogon fletcheri* subsp. *brevisepalus.*
Groundcovers (ground stratum)	Grass & grass like – *Panicum* sp., *Rytidosperma* sp., *Themeda triandra, Poa sieberiana, Poa* sp., *Poa labillardierei, Anthosachne scabra, Dichelachne* sp., *Austrostipa* spp., *Carex inversa, Carex breviculmis, Echinopogon* sp. Forbs – *Senecio* sp., *Oxalis* sp., *Scleranthus diander, Geranium* sp., *Acaena* sp., *Dichondra repens, Bulbine bulbosa, Hypericum gramineum, Coronidium* sp., *Swainsona* sp., *Hydrocotyle laxiflora, Plantago* sp., *Asperula conferta, Cymbonotus lawsonianus, Swainsona behriana, Epilobium* sp. Ferns – *Asplenium flabellifolium.* Other – *Clematis leptophylla.*

Vegetation layer	Species recorded from the surveys
Exotic species	*Taraxacum officinale, Echium vulgare, Verbascum thapsus, Erodium cicutarium, Medicago* sp., *Trifolium arvense, Hypochaeris radicata, Dactylis glomerata, Plantago lanceolata, Anthoxanthum odoratum, Cirsium* sp., *Conium maculatum, Galium aparine, Veronica peregrina, Hirschfeldia incana, Avena* sp., *Centaurea solstitialis.*
High Threat Weeds	*Acetosella vulgaris, Cotoneaster* sp., *Pyracantha* sp., *Rosa rubiginosa, Rubus fruticosus* agg., *Hypericum perforatum.*

Within the sub-precinct, this plant community type occurs in six different condition classes (vegetation zones):

- PCT 1191 (Moderate, Poor): These woodland areas-limited to the higher elevation areas in the east and drainage lines and large stand adjacent to Kosciuszko Road (Moderate and Poor condition).
- PCT 1191 (Rocky outcrop): Similar to other areas around Jindabyne, the areas of rocky outcrop contain a suite of species that would be found in PCT 1191 that is different to that of the surrounding grasslands. The rocky outcrops warrant separation from grasslands and areas where the canopy is more intact as an individual vegetation zone (the rocky outcrop areas would have once contained trees).
- PCT 1191 (Shrubland): These areas contain dense regeneration of *Acacia dealbata* due to more recent disturbance and are structurally different from the other vegetation zones.
- PCT 1191 (Native dominant grassland and Exotic dominant grassland): Grassland areas that are considered likely to be ‘secondary’ or ‘derived’ grasslands (where the original tree and shrub layers have been cleared in the past). These PCT 1191 grasslands are further divided into Native dominant grassland and Exotic dominant grassland based on dominance of native and exotic species respectively as determined through BAM Plots. These grasslands are disturbed and form the lowest quality patches of vegetation within the East Jindabyne sub-precinct.

Photo 4.1 PCT 1191 in the west showing typical canopy of small trees and shrub layer

Photo 4.2 Rocky outcrop dominated by *Austrostipa* and exotics with scattered trees

Photo 4.3 Native dominant grassland on the hill in the western section

Photo 4.4 Regrowth Acacia dealbata in the eastern section

4.2.1.2 PCT 1110: River Tussock – Tall Sedge – Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion

The grassland area in the west of the East Jindabyne sub-precinct that borders Lake Jindabyne is a remnant natural grassland which would most closely resemble PCT 1110: River Tussock – Tall Sedge – Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion.

A summary of the structure and floristics PCT 1110 within the sub-precinct in provided in Table 4.4. This data was collected in September, so the full range of species is unlikely to have been collected and several species were only able to be identified to genus level due to absence of reproductive material.

Table 4.4 Floristic and structural summary of PCT 1110 within the East Jindabyne sub-precinct

Vegetation layer	Species recorded from the surveys
Tree canopy (upper stratum)	Trees – None.
Midstorey (mid-stratum)	Shrubs – *Leucopogon fletcheri, Melicytus angustifolius* subsp. *divaricatus.*
Groundcovers (ground stratum)	Grass & grass like - *Austrostipa scabra., Austrostipa* sp., *Themeda triandra, Poa labillardierei, Carex* sp., *Carex breviculmis, Rytidosperma* sp., *Panicum effusum, Anthosachne scabra, Enneapogon nigricans* Forbs - *Cymbonotus lawsonianus, Oreomyrrhis* sp., *Epilobium billardiereanum, Asperula conferta, Oxalis perennans., Geranium* sp., *Ammobium alatum., Chrysocephalum apiculatum., Vittadinia muelleri, Acaena ovina, Rumex brownii, Euchiton* sp., *Crassula sieberiana, Calotis* sp., *Dichondra repens* Ferns - *Asplenium flabellifolium, Cheilanthes sieberi* Other – *Convolvulus erubescens*
Exotic species	*Trifolium arvense, Echium vulgare, Taraxacum officinale, Verbascum thapsus, Erodium cicutarium, Hypochaeris radicata, Rumex* sp., *Cirsium vulgare, Petrorhagia* sp., *Onopordum acanthium, Marrubium vulgare, Linaria arvensis*
High Threat Weeds	*Acetosella vulgaris, Hypericum perforatum, Nassella trichotoma*

Two PCT 1110 vegetation zones were mapped within the East Jindabyne sub-precinct:

- PCT 1110 (Poa variant Good): The Poa variant is distinct in that this vegetation zone is situated on the lower lying areas on heavier darker wetter soils and is dominated by the species *Poa labillardierei*. This vegetation zone was mapped using aerial photography to identifying areas of thick relatively continuous *Poa labillardierei* tussock cover combined with on ground surveys. This vegetation zone is considered to be part of the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands TEC due to the patch being characterised by at least 50 % foliage cover of the ground of *Poa labillardierei*, generally in flats and drainage lines where this vegetation type naturally occurs.
- PCT 1110 (Themeda variant Good): The Themeda variant is in good condition with a suite of grassland species typical of PCT 1110 and is generally dominated by *Themeda triandra*, has *Themeda triandra* as a subdominant species, or a range of other native grasses. This vegetation zone is considered to be part of the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands TEC due to the patch being characterised by at least 50 % foliage cover of the ground of *Themeda triandra*, or otherwise meeting Condition Thresholds for inclusion as part of the TEC.

Photo 4.5 PCT 1110 showing dominance of *Poa labillardierei* on the flatter western edge of East Jindabyne on wetter heavier soils

Photo 4.6 PCT 1110 showing dominance of *Themeda triandra* on the flatter western edge of East Jindabyne

4.2.2 Threatened ecological communities

Two threatened ecological communities occur within this sub-precinct (Table 4.5).

PCT 1191 forms part of the Critically Endangered Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion as listed under the BC Act. This listing includes the areas of 'secondary' or 'derived' grasslands.

River Tussock-Tall Sedge – Kangaroo Grass moist grasslands (PCT 1110) were consistent with Natural Temperate Grassland of the South Eastern Highlands critically endangered ecological community listed under the EPBC Act.

Table 4.5 Threatened ecological communities within East Jindabyne sub-precinct

Threatened ecological community	PCT	EPBC Act	BC Act	Area in sub-precinct (ha)
Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion	PCT 1191	Not a TEC	Critically Endangered[1]	19.31 (includes 11.86 ha of 'derived' or 'secondary' grasslands)
Natural Temperate Grassland of the South Eastern Highlands (Critically Endangered)	PCT 1110	Critically Endangered	Not a TEC	17.85 (includes grassland areas that meet condition thresholds)

(1) Serious and Irreversible Impact (SAII) entity. See Section 8.3.

4.3 Planned development

Planned development for the East Jindabyne sub-precinct consists of new development on currently undeveloped land which will consist of residential sub-division including a defined mixed use business and local service area. Areas of open space/green infrastructure are to be retained within the sub-division.

4.4 Opportunities and constraints

This sub-precinct has had a long history of disturbance being situated adjacent to the original Kosciuszko Road. Despite this disturbance, the sub-precinct still contains a relatively large area of the EPBC Act listed critically endangered Natural Temperate Grassland of the South Eastern Highlands TEC and also the BC Act listed Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion which includes 'secondary' or 'derived' grasslands.

The area of EPBC Act listed critically endangered Natural Temperate Grassland of the South Eastern Highlands TEC provides an opportunity for a conservation of an important remnant of this community and creation of an area of open space reserve for the community. The area of PCT 1110 within the East Jindabyne sub-precinct represents one of the areas of highest biodiversity conservation value within the Snowy SAP Growth areas. To minimise impacts to the grassland TEC this area should be left undisturbed with the exception of formalising the existing pathways. Planting of trees and shrubs should be avoided in this area and infrastructure (including community parkland facilities) should be limited and restricted to disturbed margins or developed as part of a detailed conservation management plan. The PCT 1110 grassland provides the largest constraint to residential development in the East Jindabyne sub-precinct and one of the best opportunities for conservation and use of the site as an offset for development in other sub-precincts.

The area most suitable for residential development is on the hills and flat areas in the east of the sub-precinct either side of Jerrara Drive. These areas contain a disturbed landscape with small patches of PCT 1191, rocky outcrops, and shrubland, surrounded by Native Dominant grassland, Exotic dominant grassland, and Highly disturbed areas with little to no native vegetation. These areas are subject to significant invasion by a number of High Threat Weeds (particularly *Rosa rubiginosa*, *Bromus diandrus*, *Acetosella vulgaris*, *Nassella trichotoma*, and *Hypericum perforatum*). Focussing development on these areas would limit impacts to biodiversity.

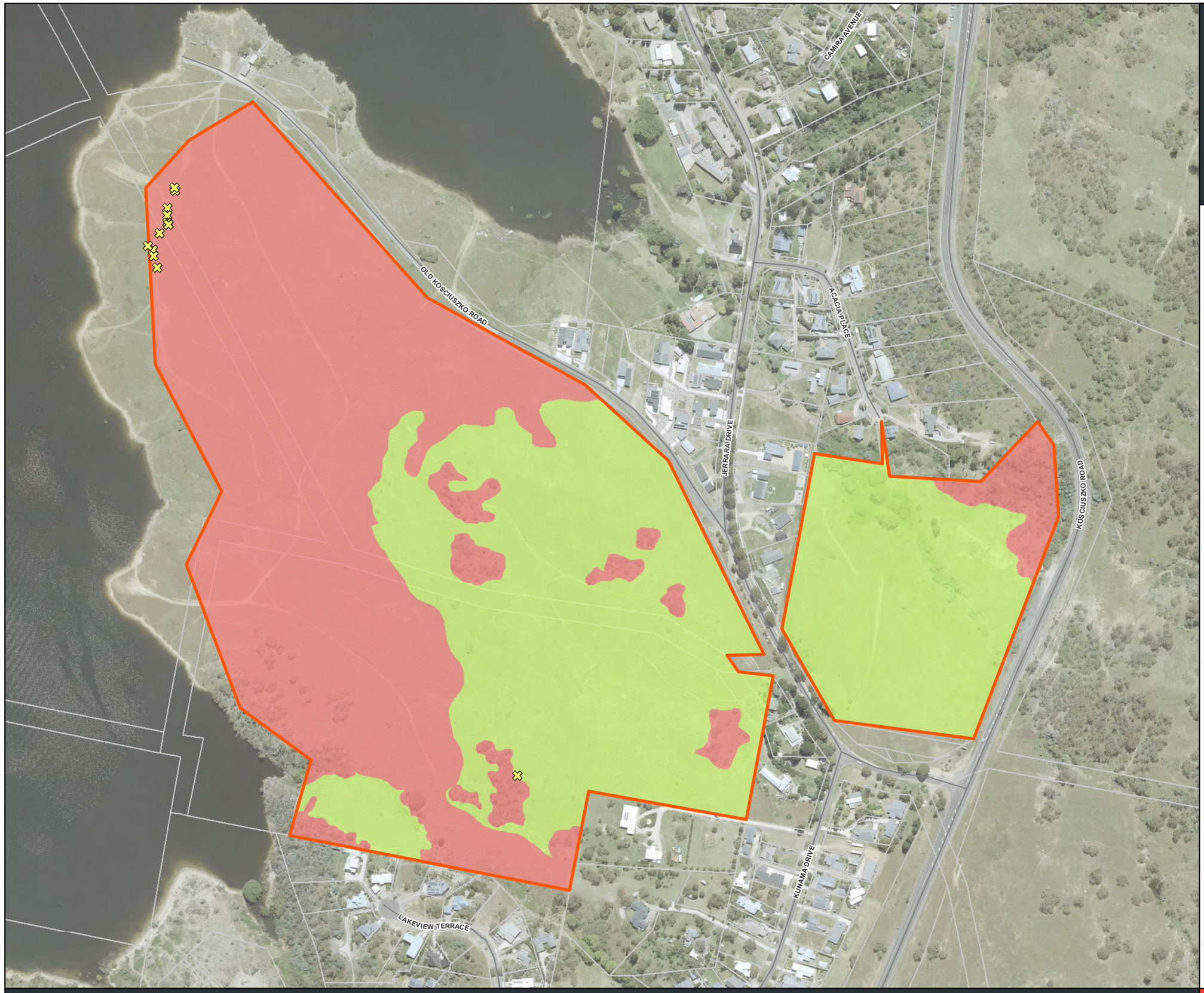
Much like the Jindabyne West sub-precinct, the East Jindabyne sub-precinct contains TECs in various forms. This does not however mean that development is entirely unsuitable for this sub-precinct. As such, careful planning should be done in an attempt to retain areas of high biodiversity value. In the case of the East Jindabyne sub-precinct the areas of high constraint are clear. The areas to avoid as far as possible include:

- The area of PCT 1100 in the west of the sub-precinct which meets criteria for EPBC Act listed Natural Temperate Grassland TEC.
- Stands of PCT 1191 that are located in the south of the sub-precinct, on the hills east of Jerrara Road, and the stand adjacent to Kosciuszko Road.

In summary the constraints and opportunities in this sub-precinct include:

- Constraints – Areas of potential Natural Temperate Grassland of the South Eastern Highlands TEC. Areas of PCT 1191 (Moderate) which are the highest quality components of the BC Act listed Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion TEC in the sub-precinct.
- Opportunities – Areas of Native dominant grassland and Exotic dominant grassland and PCT 1191 in Poor or otherwise modified condition classes are suitable for future development.
- Provides an opportunity for conservation of an important remnant of natural temperate grassland TEC and creation of an area of open space reserve for the community Provides high value offsets for development within this or other sub-precincts.

Constraints mapping for the sub-precinct is provided in Figure 4.1.



Snowy SAP - Biodiversity Constraints

Figure 4.1

East Jindabyne Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Roads

Threatened Flora

- *Swainsona sericea (potential)*

Biodiversity Constraints

- High
- Low

0 0.1 0.2 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:4,000 Date: 4/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

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5 Leesville sub-precinct

5.1 Field surveys

Surveys undertaken at this sub-precinct are shown in Appendix C-2. The methodology for these surveys is described in Section 2. Data from BAM Plots undertaken within the sub-precinct are provided in Appendix C.

5.2 Existing environment

The Leesville sub-precinct contains the Leesville Industrial Estate which is surrounded by native vegetation. The existing environment of the sub-precinct is described in Table 5.1.

Table 5.1 Existing environment in the Leesville sub-precinct

Value	Description
Area (ha)	57.84 ha
IBRA Bioregion	South Eastern Highlands (Monaro subregion)
General description (topographic setting, geology and soils)	The Leesville sub-precinct contains the Leesville Industrial Estate which is a key industrial and commercial area servicing Jindabyne and the wider Snowy Mountains region. The sub-precinct is bound to the south and west by the Barry Way South sub-precinct, to the north by bushland and Tinworth Drive, and to the east by Barry Way (see Appendix C). The topography of the eastern part of the Leesville sub-precinct is relatively flat adjacent to Barry Way increasing in altitude to the west. Elevation varies from approximately 1,000 m at Barry Way in the east to 1,060 mASL in the north western corner of the sub-precinct. Geology is volcanic Leesville Granodiorite (Biotite Granodiorite). Soils include shallow gravelly loams and texture-contrast soils (light textured topsoil overlying a clay subsoil – Chromosols). Darker coloured gritty uniform loams and clays in alluvium are present in areas along Lees Creek.
Rivers, streams and estuaries	There are no rivers or estuaries in the Leesville sub-precinct. There is one mapped named small first order stream, Lees Creek, that drains to the east of Barry Way.
Wetlands and important wetlands	No wetlands of international or national importance are present. The edge of Lake Jindabyne is present approximately 2 km to the north of the Leesville sub-precinct.
Habitat connectivity	The habitats within the Leesville sub-precinct forms part of the eastern edge of the larger block of forested habitat to the west that includes Round Hill and the ranges to the south west. Physical connectivity to the habitats to the west through the Barry Way South sub-precinct is largely intact despite previous farming activities and some low intensity development in this area.
Karst, caves, crevices, cliffs, rocks and other geological features of significance	There are no areas of karst, caves, cliffs, or other geological features of significance in the Leesville sub-precinct. Rock outcropping is a common feature in the north western section and provides a significant habitat resource for fauna with large surface boulders providing crevices and shelter sites.
Areas of Outstanding Biodiversity Value	No Areas of Outstanding Biodiversity Value occur within the Leesville sub-precinct.

Value	Description
Plant Community Types	PCT 1191: Snow Gum – Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion. PCT 1110: River Tussock – Tall Sedge – Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion.
Threatened ecological communities BC Act	Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion (Critically Endangered BC Act). Natural Temperate Grassland of the South Eastern Highlands (Critically Endangered EPBC Act).
Threatened species habitats (Species credit species)	Based on the candidate species list returned for PCT 1191 and PCT 1110 by the BAM-C and the limited field survey that has been undertaken in this sub-precinct, the following threatened species may have habitat in the Leesville sub-precinct: — Plants including *Calotis glandulosa*, *Leucochrysum albicans* var. *tricolor*, *Prasophyllum petilum*, *Swainsona sericea*, and *Thesium 30hapsus*. There is a record of *Swainsona sericea* from PCT 1191 from 2017 directly to the north of Leesville sub-precinct on Lot 192 DP1019526 (the location was visited during the September 2020 survey, but plants were not detected as it was too early in the season for flowering). — Mammals including Eastern Pygmy-possum and Southern Myotis. — Birds including Pink Robin, and potential breeding habitat for species including Gang-gang Cockatoo, Little Eagle, Barking Owl and Powerful Owl. — Reptiles including Pink-tailed Legless Lizard and Striped Legless Lizard.
Serious and irreversible impact entities	Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion (Critically Endangered BC Act). *Calotis glandulosa* (potential habitat).

5.2.1 Plant community type

The type and distribution of the existing vegetation in the Leesville sub-precinct is relatively easy to determine as it is largely unmodified. Based on the field surveys undertaken to date and comparison of the site's geology, soils, elevation, and topography to similar less disturbed areas in the Jindabyne region, the Leesville sub-precinct is considered to currently contain the following two PCTs:

- PCT 1191: Snow Gum – Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion.
- PCT 1110: River Tussock – Tall Sedge – Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion.

The distribution of the PCTs is illustrated in Appendix C. The PCTs and vegetation zones within the sub-precinct are summarised in Table 5.2 and described below.

Table 5.2 Plant community types and vegetation zones within the Leesville sub-precinct

Plant community type	Vegetation zone	Area in sub-precinct (ha)
PCT 1191	Native dominant grassland	1.03
	Exotic dominant grassland	8.04
	Good	17.78
	Moderate	3.42
	Revegetation	1.22
	TOTAL	**31.49**
PCT 1110	Poa Variant_Good	5.98
	Poa Variant_Moderate	1.27
	TOTAL	**7.25**
Total native vegetation		**38.77**

5.2.1.1 PCT 1191: Snow Gum – Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion

The western section of the sub-precinct contained contains a relatively large remnant of Snow Gum – Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion (PCT 1191). A summary of the structure and floristics PCT 1191 within the sub-precinct in provided in Table 5.3. This data was collected in September, so the full range of species is unlikely to have been collected and several species were only able to be identified to genus level due to absence of reproductive material.

Table 5.3 Floristic and structural summary of PCT 1191 within the Leesville sub-precinct

Vegetation layer	Species recorded from the surveys
Tree canopy (upper stratum)	Trees – *Eucalyptus pauciflora, Eucalyptus rubida, Acacia melanoxylon, Eucalyptus stellulata*
Midstorey (mid-stratum)	Shrubs – *Melicytus angustifolius* subsp. *Divaricatus, Pimelea pauciflora, Bossiaea buxifolia, Cryptandra amara, Leucopogon fletcheri* subsp. *Brevisepalus, Mirbelia oxylobioides*
Groundcovers (ground stratum)	Grass & grass like – *Cynodon dactylon, Poa sieberiana, Anthosachne scabra, Rytidosperma* sp., *Themeda triandra, Poa* sp., *Panicum effusum, Dichelachne* sp., *Carex breviculmis, Microlaena stipoides, Austrostipa* sp., *Echinopogon* sp. Forbs – *Oxalis perennans, Geranium* sp., *Hydrocotyle laxiflora, Asperula conferta, Asperula scoparia, Acaena ovina, Cymbonotus lawsonianus, Veronica 31hapsus31, Dichondra repens, Scleranthus singuliflorus, Scleranthus diander, Hovea heterophylla, Hypericum gramineum, Euchiton* sp., *Crassula sieberiana, Arthropodium* sp., *Plantago gaudichaudii, Brachyscome scapigera, Einadia nutans, Euchiton* sp., *Cynoglossum suaveolens, Senecio* sp., *Coronidium* sp., *Solenogyne* spp., *Hydrocotyle* sp.
Exotic species	*Erodium cicutarium, Cirsium vulgare, Echium vulgare, Verbascum 31hapsus, Dactylis glomerata, Plantago lanceolata, Trifolium repens, Trifolium arvense, Taraxacum officinale, Onopordum acanthium, Holcus lanatus, Hypochaeris radicata, Petrorhagia* sp., *Anthoxanthum odoratum,*
High Threat Weeds	*Rosa rubiginosa, Cenchrus clandestinum, Acetosella vulgaris, Hypericum perforatum*

Within the Leesville sub-precinct, this plant community type occurs in five different condition classes (vegetation zones):

- PCT 1191 (Good, Moderate): These areas of PCT 1191 are situated in the 'Western Industrial Growth Area' and 'Northern Industrial Growth Area'. The examples of PCT 1191 in the 'Western Industrial Growth Area' are some of the best condition examples of PCT 1191 observed within the Snowy SAP Growth area with large trees, intact structural layers, and good diversity of native species in the ground layer.
- PCT 1191 (Revegetation): These areas have resulted from plantings in the industrial estate. They consist of species native to the area and as such have been assigned to a separate vegetation zone.
- PCT 1191 (Native dominant grassland and Exotic dominant grassland): Grassland areas that are considered likely to be 'secondary' or 'derived' grasslands (where the original tree and shrub layers have been cleared in the past). These PCT 1191 grasslands are further divided into Native dominant grassland and Exotic dominant grassland based on dominance of native and exotic species respectively as determined through BAM Plots. These grasslands are disturbed and form the lowest quality patches of vegetation within the Leesville sub-precinct.

Photo 5.1 Exotic dominant grassland at the corner of Barry Way and Lee Avenue

Photo 5.2 PCT 1191 showing large *Eucalyptus rubida* trees to the north of Lee Avenue

Photo 5.3 Good condition *Eucalyptus pauciflora* and *E. rubida* dominant PCT 1191 in the western part of Leesville

Photo 5.4 An example of the smaller patches of PCT 1191 dominated by *Eucalyptus stellulata* in the western part of Leesville

5.2.1.2 PCT 1110: River Tussock – Tall Sedge – Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion

The 'Southern Industrial Growth Area' contains a relatively large rectangular example of a remnant natural grassland dominated by *Poa labillardierei* which most closely resemble PCT1110: River Tussock – Tall Sedge – Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion.

A summary of the structure and floristics PCT 1110 within the sub-precinct in provided in Table 5.4. This data was collected in September, so the full range of species is unlikely to have been collected and several species were only able to be identified to genus level due to absence of reproductive material. Species richness during the time of survey was low.

Table 5.4 Floristic and structural summary of PCT 1110 within the Leesville sub-precinct

Vegetation layer	species recorded from the surveys
Tree canopy (upper stratum)	Trees–None.
Midstorey (mid-stratum)	Shrubs–*Pimelea pauciflora.*
Groundcovers (ground stratum)	Grass & grass like – *Poa labillardierei, Themeda triandra, Juncus* sp., *Carex* sp., *Austrostipa* sp. Forbs-*Geranium* sp., *Oreomyrrhis* sp., *Asperula conferta, Dichondra repens, Epilobium billardiereanum, Acaena ovina.*
Exotic species	*Taraxacum officinale, Plantago lanceolata, Onopordum acanthium, Dactylis glomerata, Potentilla recta, Trifolium arvense, Hypochaeris radicata, Cirsium vulgare, Holcus lanatus.*
High Threat Weeds	None.

Two condition classes have been recognised based on levels of disturbance and weed invasion:

- PCT 1110 (Poa variant Good): This vegetation zone is dominated by native species including *Poa labillardierei, Themeda triandra, Juncus* sp., *Carex* sp., and *Austrostipa* sp and appeared to be in good condition despite low species richness likely due to an early season survey being undertaken in September 2021.
- PCT 1110 (Poa variant Moderate): This vegetation zone is located along the drainage line of Lees Creek and as such is subject to a higher level of weed invasion. This vegetation zone was mapped based off aerial photography and on ground observations. This vegetation zone contains higher cover of exotic species in particular *Dactylis glomerata*.

Both of these vegetation zones are considered to be part of the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands TEC due to the patch being characterised by at least 50 % foliage cover of the ground of *Poa labillardierei*, generally in flats and drainage lines where this vegetation type naturally occurs or otherwise meet Condition Thresholds.

Photo 5.5 PCT 1110 at the edge of Barry Way showing dominance of *Poa labillardierei*

Photo 5.6 PCT 1110 at the edge of Barry Way showing *Poa labillardierei* and *Carex* sp.

5.2.2 *Threatened ecological communities*

Two threatened ecological communities occur within this sub-precinct (Table 5.5).

PCT 1191 forms part of the Critically Endangered Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion as listed under the BC Act. This listing includes the areas of 'secondary' or 'derived' grasslands.

River Tussock – Tall Sedge – Kangaroo Grass moist grasslands (PCT 1110) were consistent with Natural Temperate Grassland of the South Eastern Highlands critically endangered ecological community listed under the EPBC Act.

Table 5.5 Threatened ecological communities within Leesville sub-precinct

Threatened ecological community	PCT	EPBC Act	BC Act	Area in sub-precinct (ha)
Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion	PCT 1191	Not a TEC	Critically Endangered[1]	31.49 (includes 9.07 ha of 'derived' or 'secondary' grasslands)
Natural Temperate Grassland of the South Eastern Highlands (Critically Endangered)	PCT 1110	Critically Endangered	Not a TEC	7.25 (includes grassland areas that meet condition thresholds)

(1) Serious and Irreversible Impact (SAII) entity. See Section 8.3.

5.3 Planned development

Planned development for the Leesville sub-precinct consists of new development on currently undeveloped land which will consist of industrial sub-division and development.

5.4 Opportunities and constraints

Leesville contains areas of high biodiversity value including a large area of Critically Endangered Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion ecological community as listed under the BC Act in good condition and Critically Endangered Natural Temperate Grassland of the South Eastern Highlands listed under the EPBC Act. As such, the opportunities and constraints in the Leesville sub-precinct are clear.

In summary the constraints and opportunities in this sub-precinct include:

- Constraints:
  - The ‘Western Industrial Growth Area’ contains one of the best condition examples of PCT 1191 observed within the Snowy SAP Growth area. This vegetation is part of the Critically Endangered Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion ecological community as listed under the BC Act. Expansion of the industrial estate has been approved. The remainder of PCT 1191 in the ‘Western Industrial Growth Area’ outside of the approved industrial expansion should be set aside for conservation purposes given its biodiversity value.
  - The rectangular area of PCT 1110 which corresponds to the EPBC Act listed Critically Endangered Natural Temperate Grassland of the South Eastern Highlands is unsuitable for industrial development from a biodiversity impact avoidance perspective. This area of grassland should be set aside for conservation purposes given its biodiversity value.
- Opportunities:
  - The ‘Northern Industrial Growth Area’ to the north of Lee Ave at the corner of Barry Way is the area most suitable for development due to past disturbance and lower condition. This area poses minimal biodiversity constraints however the large trees should be retained where possible and incorporated into any future design.
  - Provides an opportunity for conservation of important remnants of critically endangered communities the opportunity to provide high value offsets for development within this or other sub-precincts.

Constraints mapping for the sub-precinct is provided in Figure 5.1.

Snowy SAP - Biodiversity Constraints

Figure 5.1

Leesville Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Watercourse
- Roads

Threatened Flora Species

- *Swainsona sericea* (recorded 2017)

Biodiversity Constraints

- High
- Low

0 0.1 0.2 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:5,000 Date: 4/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

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6 Barry Way South Sub-precinct

6.1 Field surveys

Surveys undertaken at this sub-precinct are shown in Appendix D-1The methodology for these surveys is described in Section 2. Data from BAM Plots undertaken within the sub-precinct are provided in Appendix D.

6.2 Existing environment

The Barry Way South sub-precinct is variable in terms of biodiversity values due to its large size.

The existing environment of the sub-precinct is described in Table 6.1.

Table 6.1 Existing environment in Barry Way South sub-precinct

Value	Description
Area (ha)	427.46 ha
IBRA Bioregion	South Eastern Highlands (Monaro subregion)
General description (topographic setting, geology and soils)	The Barry Way South sub-precinct contains a number of locations along Barry Way, between the Sports and Education Precinct, Leesville and Moonbah that have been identified for rezoning to continue to support the growth associated with the Special Activation Precinct. The topography of the Barry Way South sub-precinct is variable with relatively flat terrain in the east adjacent to Barry Way with a gentle gradient to the west from approximately 1020 m to 1,060 m ASL. The terrain in the west then becomes steeper on the slopes of Round Hill from approximately 1,080 m to 1,180 m ASL. Geology is largely volcanic Mowambah Granodiorite (Biotite – Rich Granodiorite) with an area mapped as Leesville Granodiorite (Biotite Granodiorite) in the east towards Barry Way. Soils include shallow gravelly loams and texture-contrast soils (light textured topsoil overlying a clay subsoil – Chromosols). Darker coloured gritty uniform loams and clays in alluvium are present in low lying areas particularly along drainage lines.
Rivers, streams and estuaries	There are no rivers or estuaries in the Barry Way South sub-precinct. There is one mapped named small first order stream, Lees Creek, that begins in the Adventist Alpine Village. One mapped unnamed small first order stream that drains to Lees Creek is present on Lot 5 DP1254042. There are also four mapped unnamed small first order streams that turn into second order streams on Bungarra Alpine Centra and Redlands High Country Campus that flow into Lot 2 and Lot 3 DP1187832 and eventually into Cobbin Creek.
Wetlands and important wetlands	No wetlands of international or national importance are present. The edge of Lake Jindabyne is present approximately 2 km to the north of the Barry Way South sub-precinct.
Habitat connectivity	The habitats within the northern and western parts of the Barry Way South sub-precinct (west of Barry Way) form part of the eastern edge of the larger block of forested habitat to the west that includes Round Hill and the ranges to the south west. Physical connectivity to the habitats to the west is largely intact despite previous farming activities and some low intensity development in this area.

Value	Description
Karst, caves, crevices, cliffs, rocks and other geological features of significance	There are no areas of karst, caves, cliffs, or other geological features of significance in the Barry Way South sub-precinct. Rock outcropping is a common feature and provides a significant habitat resource for fauna with large surface boulders providing crevices and shelter sites.
Areas of Outstanding Biodiversity Value	No Areas of Outstanding Biodiversity Value occur within the Barry Way South sub-precinct.
Plant Community Types	PCT 1191: Snow Gum – Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion PCT 1110: River Tussock – Tall Sedge – Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion
Threatened ecological communities BC Act	Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion (Critically Endangered BC Act) Natural Temperate Grassland of the South Eastern Highlands (Critically Endangered EPBC Act)
Threatened species habitats (Species credit species)	A Threatened species *Eucalyptus nicholii* was recorded in the sub-precinct during the field surveys. This species only naturally occurs on the Northern Tablelands. This species was popular in landscaping. The plants recorded in the Alpine Adventist Village and Station Resort are plantings and are not naturally occurring. However, *Eucalyptus nicholii* is a threatened species listed under the BC Act and EPBC Act so the presence of this species must be considered. Another threatened plant species *Eucalyptus 38hapsus3838* was also found planted at the Station Resort. This species occurs in the South East Highlands but is not found naturally in the Jindabyne area with the BAM calculator indicating the geographic limitation for this species is "restricted to an area to the east of East of a line that runs north to south about 5 km west of Bungendore". *Eucalyptus 38hapsus3838* is a threatened species listed under the BC Act and EPBC Act so the presence of this species must be considered. Based on the candidate species list returned for PCT 1191 and PCT 1110 by the BAM-C and the limited field survey that has been undertaken in this sub-precinct, the following threatened species may have habitat in the Barry Way South sub-precinct: — Plants including *Calotis glandulosa*, *Leucochrysum albicans* var. *tricolor*, *Prasophyllum petilum*, *Swainsona sericea*, and *Thesium 38hapsus*. — Mammals including Eastern Pygmy-possum and Southern Myotis. — Birds including Pink Robin, and potential breeding habitat for species including Gang-gang Cockatoo, Little Eagle, Barking Owl and Powerful Owl. — Reptiles including Pink-tailed Legless Lizard and Striped Legless Lizard.
Serious and irreversible impact entities	Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion (Critically Endangered BC Act). *Calotis glandulosa* (potential habitat).

Photo 6.1 Rows of *Eucalyptus viminalis* along Tinworth Drive

Photo 6.2 *Eucalyptus viminalis* canopy trees over mown lawn at the Adventist Alpine Village

6.2.1 Plant community type

Some areas of the Barry way South sub-precinct such as The Station Resort have been heavily disturbed and modified so the type and distribution of the original vegetation that would have occurred is difficult to determine. Other areas such as those off Bungarra Lane and the Adventist Alpine Village that still contain a large portion of the original vegetation are easier to determine.

Based on the field surveys undertaken to date and comparison of the site's geology, soils, elevation, and topography to similar less disturbed areas in the Jindabyne region, the sub-precinct is considered to contain two Plant Community Types:

- PCT 1191: Snow Gum – Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion.
- PCT 1110: River Tussock – Tall Sedge-Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion.

The distribution of the PCTs is illustrated in Appendix D. The PCTs and vegetation zones within the sub-precinct are summarised in Table 6.2 and described below.

Table 6.2 Plant Community Types and vegetation zones within Barry Way South sub-precinct

Plant community type	Vegetation zone	Area in sub-precinct (ha)
PCT 1191	Native dominant grassland	108.14
	Exotic dominant grassland	59.75
	Canopy trees	0.36
	Good	69.18
	Moderate	39.54
	Poor	13.95
	Revegetation	3.47
	Ribbon Gum variant_Canopy trees	3.67
	Ribbon Gum variant_Good	26.31
	Ribbon Gum variant_Moderate	17.84

Plant community type	Vegetation zone	Area in sub-precinct (ha)
	Rocky outcrop	11.50
	Shrubland	7.32
	TOTAL	**361.03**
PCT 1110	Poa variant_Moderate	6.21
	Themeda variant_Good	5.83
	TOTAL	**12.04**
Total native vegetation		**373.07**

6.2.1.1 PCT 1191: Snow Gum – Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion

Snow Gum – Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion (PCT 1191) was the dominant community within this sub-precinct. A summary of the structure and floristics PCT 1191 within the sub-precinct in provided in Table 6.3. This data was collected in September via Rapid Data Points only and no detailed BAM Plots were undertaken within the Barry Way sub-precinct, so the full range of species is unlikely to have been collected.

Table 6.3 Floristic and structural summary of PCT 1191 within the Barry Way South sub-precinct

Vegetation layer	Species recorded from the surveys
Tree canopy (upper stratum)	Trees – *Eucalyptus pauciflora, Eucalyptus rubida, Eucalyptus viminalis, Acacia melanoxylon, Acacia dealbata, Eucalyptus stellulata.*
Midstorey (mid-stratum)	Shrubs – *Melicytus angustifolius* subsp. *Divaricatus, Mirbelia oxylobioides, Pimelea pauciflora, Bossiaea buxifolia, Cryptandra amara, Leucopogon fletcheri* subsp. *Brevisepalus, Exocarpus cupressiformis, Brachyloma daphnoides.*
Groundcovers (ground stratum)	Grass & grass like – *Cynodon dactylon, Poa sieberiana, Poa labillardierei, Anthosachne scabra, Rytidosperma* sp., *Themeda triandra, Panicum effusum, Dichelachne* sp., *Carex breviculmis, Microlaena stipoides, Austrostipa scabra, Echinopogon* sp. Forbs – *Oxalis perennans, Geranium* sp., *Hydrocotyle laxiflora, Asperula conferta, Asperula scoparia, Acaena ovina, Cymbonotus lawsonianus, Veronica 40hapsus40, Dichondra repens, Scleranthus singuliflorus, Hovea heterophylla, Euchiton* sp., *Crassula sieberiana, Brachyscome scapigera, Einadia nutans, Euchiton* sp., *Cynoglossum suaveolens, Senecio* sp., *Coronidium* sp., *Solenogyne* sp.
Exotic species	*Erodium cicutarium, Cirsium vulgare, Echium vulgare, Verbascum 40hapsus, Dactylis glomerata, Plantago lanceolata, Trifolium repens, Trifolium arvense, Taraxacum officinale, Onopordum acanthium, Holcus lanatus, Hypochaeris radicata, Petrorhagia* sp., *Anthoxanthum odoratum.*
High Threat Weeds	*Acetosella vulgaris, Cotoneaster sp., Pyracantha sp., Rosa rubiginosa, Rubus fruticosus agg., Hypericum perforatum, Bromus diandrus, Eragrostis curvula.*

PCT 1191 within the Barry Way South sub-precinct is quite variable in species composition and structure and as a consequence 12 vegetation zones have been assigned:

- PCT 1191 (Good, Moderate, Poor): Areas of vegetation dominated by *Eucalyptus pauciflora* and/or *Eucalyptus rubida* with or without small stands or individual trees of *Eucalyptus stellulata* in Good, Moderate and Poor condition.
- PCT 1191 (Ribbon Gum variant Good, Moderate and Canopy trees): Areas of vegetation dominated by *Eucalyptus viminalis* (Ribbon Gum) with sub-dominant trees including *Eucalyptus pauciflora* and/or *Eucalyptus rubida* with or without small stands or individual trees of *Eucalyptus stellulata*. Modified versions of this PCT exist where canopy trees exist over mown lawns and as such this was assigned to a separate vegetation zone to more intact examples.
- PCT 1191 (Areas of remnant canopy trees over maintained mown lawns – these represent a distinctly modified structural category and habitat
- PCT 1191 (Rocky outcrop): Rocky outcrops containing small trees and shrubs distinct from surrounding grassland areas (as is typical in the Jindabyne region) are present.
- PCT 1191 (Shrubland): Shrublands regenerating after disturbances or in power line easements are present. This included monocultures of *Pimelea pauciflora*.
- PCT 1191 (Revegetation): Plantings of native species have been undertaken in some areas and these are assigned to a Revegetation vegetation zone to recognise these areas.
- PCT 1191 (Native dominant grassland and Exotic dominant grassland): Grassland areas that are considered likely to be ‘secondary’ or ‘derived’ grasslands (where the original tree and shrub layers have been cleared in the past). These PCT 1191 grasslands are further divided into Native dominant grassland and Exotic dominant grassland based on dominance of native and exotic species respectively as determined through Rapid Data Point surveys. These grasslands are disturbed and form the lowest quality patches of vegetation within the Barry Way sub-precinct.

6.2.1.2 PCT 1110: River Tussock – Tall Sedge – Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion

Redlands High Country Campus and Lot 5 DP1254042 contain some areas of natural grassland which most closely resembles PCT1110: River Tussock – Tall Sedge – Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion. However, it should be noted that no detailed surveys such as BAM Plots have been undertaken in these areas. These grassland areas are however dominated by a suite of species typical of PCT 1110 and are either dominated by *Poa labillardierei* (mapped as Poa variant_Moderate) or *Themeda triandra* (mapped as Themeda variant_Good). Taking a cautious approach to assessment at this stage in the absence of survey data both of these vegetation zones are considered to be part of the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands TEC.

A summary of the structure and floristics PCT 1110 within the sub-precinct in provided in Table 6.4. This data was collected in September via Rapid Data Points only and no detailed BAM Plots were undertaken within the Barry Way sub-precinct, so the full range of species is unlikely to have been collected.

Table 6.4 Floristic and structural summary of PCT 1110 within the Barry Way South sub-precinct

Vegetation layer	Species recorded from the surveys
Tree canopy (upper stratum)	Trees–Scattered *Eucalyptus pauciflora* and *Eucalyptus stellulata*.
Midstorey (mid-stratum)	Shrubs–*Pimelea pauciflora, Melicytus angustifolius* subsp. *Divaricatus*
Groundcovers (ground stratum)	Grass & grass like-*Poa labillardierei, Poa* sp., *Themeda triandra, Juncus* sp., *Carex* sp., *Austrostipa* sp., *Anthosachne scabra*. Forbs-*Geranium* sp., *Oreomyrrhis* sp., *Asperula conferta, Dichondra repens, Epilobium billardiereanum, Acaena ovina.*
Exotic species	*Taraxacum officinale, Plantago lanceolata, Onopordum acanthium, Dactylis glomerata, Potentilla recta, Trifolium arvense, Hypochaeris radicata, Cirsium vulgare, Holcus lanatus, Anthoxanthum odoratum.*
High Threat Weeds	None recorded.

Two PCT 1110 vegetation zones were mapped within the Barry Way sub-precinct:

- PCT 1110 (Poa variant Moderate): The Poa variant is distinct in that this vegetation zone is situated on the lower lying areas on heavier darker wetter soils and is dominated by the species *Poa labillardierei*. This vegetation zone was mapped using aerial photography to identifying areas of thick relatively continuous *Poa labillardierei* tussock cover combined with on ground surveys. This vegetation zone is considered likely to be part of the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands TEC due to the patch being characterised by at least 50 % foliage cover of the ground of *Poa labillardierei*, generally in flats and drainage lines where this vegetation type naturally occurs (although note that no data has been collected in these areas).
- PCT 1110 (Themeda variant Good): The Themeda variant is in good condition with a suite of grassland species typical of PCT 1110 and appeared to be dominated by *Themeda triandra* at the time of survey. This vegetation zone is considered to be part of the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands TEC as the patch is likely to be characterised by at least 50 % foliage cover of the ground of *Themeda triandra* (although note that no data has been collected in these areas).

Photo 6.3 A patch of PCT 1110 dominated by *Poa* sp. on Lot 5 DP1254042

Photo 6.4 PCT 1110 on Lot 5 DP1254042 Moderate condition with mix of *Poa* spp. and *Themeda triandra*

Photo 6.5 PCT 1110 *Poa labillardierei* dominant grassland on heavy black soil at Redlands High Country Campus

Photo 6.6 PCT 1110 on Lot 5 DP1254042 adjacent to Leesville (grazed by sheep)

6.2.2 *Threatened ecological communities*

Two threatened ecological communities occur within this sub-precinct (Table 6.5).

Table 6.5 Threatened ecological communities within Barry Way South sub-precinct

Threatened ecological community	PCT	EPBC Act	BC Act	Area in sub-precinct (ha)
Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion	PCT 1191	Not a TEC	Critically Endangered[1]	361.03 (includes 167.89 ha of 'derived' or 'secondary' grasslands)
Natural Temperate Grassland of the South Eastern Highlands (Critically Endangered)	PCT 1110	Critically Endangered	Not a TEC	12.04

(1) Serious and Irreversible Impact (SAII) entity. See Section 8.3

6.3 Planned development

Planned development for the East Jindabyne sub-precinct consists of new development on currently undeveloped land and redevelopment/renewal of existing built form or assets. This will consist of a range of redevelopment and new development to support tourism and educational accommodation.

6.4 Opportunities and constraints

This sub-precinct is dominated by critically endangered Monaro Tableland Cool Temperate Grassy Woodland in various conditions and also contains some areas of natural temperate grassland. Despite this, the sub-precinct provides abundant opportunity for tourism development to be located in disturbed grassland areas or other poorer condition areas of PCT 1191.

As with the other sub-precincts in the Snowy SAP Growth area, the Barry Way South sub-precinct contains TECs in various forms. Careful planning can allow for development while retaining the areas of high biodiversity value in their current state. Avoiding impact to TECs is not possible in this sub-precinct given the broad definition of the BC Act listed Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion which includes

‘secondary’ or ‘derived’ grasslands. The cautious approach taken to assigning other areas of grassland to the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands community means that some areas have been identified as generally unsuitable for development at this stage based off Rapid Data Point surveys only. Detailed biodiversity surveys would be needed to properly determine if these areas of grassland meet EPBC Act condition thresholds.

Avoiding impact to the areas of highest biodiversity value in terms of PCTs in good to moderate condition and focussing development of tourist accommodation on the PCT 1191 Exotic dominant grasslands and Native Dominant grasslands, and where necessary areas of Rocky outcrop, the biodiversity impacts in this sub-precinct can be minimised as these areas are in lower condition.

Development opportunities within specific properties of the sub-precinct include:

- Adventist Alpine Village: Large areas of this property are able to support growth of accommodation from a biodiversity perspective. The focus should be on developing the central and eastern sections in Native dominant grassland. Any significant development such as buildings in the better condition woodland on the eastern slope of Round Hill on the western edge of the property should be avoided. Existing use in the western edge including walking and bike trails on Round Hill are relatively low impact given the existing disturbance that is present in the ground layer. Future trails should be carefully designed and sited to avoid removing large trees.
- Bungarra Alpine Centre and Zen: There is opportunity to develop further tourism infrastructure at these sites with minimal biodiversity impacts. The focus should be on directing development to the Exotic dominant grassland and Native dominant grassland areas and other Poor condition areas of PCT 1191. The disturbed edges and Moderate condition patches of vegetation could be developed sensitively for eco-tourism and accommodation. Any significant development such as buildings should be avoided in the good to moderate condition patches of PCT 1191 such as that on the slopes of Round Hill. Existing uses including walking and bike trails in the woodland are relatively low impact as ground cover is already disturbed with dominance of annual weeds and perennial grasses particularly *Anthoxanthum odoratum*. Future trails should be carefully designed and sited to avoid removing large trees.
- Redland School: This site has a large patch of PCT 1191 in good condition and also a patch of grassland (PCT 1110) that is likely to meet condition criteria to be part of the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands in a drainage line on heavy soil. Any future development should avoid the Good condition patches of PCT 1191 and the PCT 1110 patch. Development opportunities from a biodiversity perspective are more limited on the Redlands School site given the higher quality of vegetation but should be directed to the areas of Exotic dominant grassland and Native dominant grassland.
- Lot 2 and Lot 3 DP1187832: These Lots contains some good condition patches of PCT 1191 associated with drainage lines. However, there are some opportunities for development in the grassland areas. Development should avoid the good condition patches of PCT 1191 and should be directed to the areas of Native dominant grassland or Poor condition PCT 1191.
- Lot 5 DP1254042: Contains some good condition PCT 1191 which has already been subdivided to the north of Bungarra Lane. Site also contains what is likely to be natural grassland (PCT 1110). Future development should avoid the Good condition patches of PCT 1191 (apart from that already approved for subdivision) and the natural temperate grassland (PCT 1110). There is large scope to direct future development to the areas of Exotic dominant grassland and Native dominant grassland.
- The Station Resort – This site has the greatest opportunities within the sub-precinct in terms of limited impact to biodiversity values. Existing trees should be retained but grassland areas are generally suitable for development. The Station Resort contains a patch of PCT 1191 in the north that should be retained as it has very large old *Eucalyptus stellulata* trees on rocky ground which may provide important habitat for local fauna. The Exotic dominant grassland, Native dominant grassland, and Highly disturbed areas with no or limited native vegetation are suitable for development from a biodiversity impact avoidance perspective.

In summary the constraints and opportunities in this sub-precinct include:

- Constraints – Areas of potential Natural Temperate Grassland of the South Eastern Highlands TEC. Areas of PCT 1191 (Good, Moderate) and PCT 1191 (Ribbon Gum variant Good, Moderate) which are the highest quality components of the BC Act listed Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion TEC in the sub-precinct.
- Opportunities – Areas of Native dominant grassland and Exotic dominant grassland and PCT 1191 in Poor or otherwise modified condition classes are suitable for future tourism development. Continued use of existing trails and future trail construction unlikely to pose a significant constraint.

Constraints mapping for the sub-precinct is provided in Figure 6.1.

Snowy SAP - Biodiversity Constraints

Figure 6.1

Barry Way South Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Waterbodies
- Watercourse
- Roads

Threatened Flora Species

- *Eucalyptus nicholii*
- *Glycine sp.*
- *Swainsona sericea* (recorded 2017)

Biodiversity Constraints

- High
- Moderate
- Low

0 0.4 0.8 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:16,000 Date: 4/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

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7 Jindabyne Aerodrome Sub-precinct

7.1 Field surveys

Surveys undertaken at this sub-precinct are shown in Appendix E. The methodology for these surveys is described in Section 2. Data from BAM Plots undertaken within the sub-precinct are provided in Appendix E.

7.2 Existing environment

The Jindabyne Aerodrome sub-precinct contains the Jindabyne Aerodrome which is situated in a low valley between two hills. The type and distribution of the existing vegetation at the edges of the Jindabyne Aerodrome sub-precinct is relatively easy to determine as it is largely unmodified. However, the central runway area is considerably disturbed.

The existing environment of the sub-precinct is described in Table 7.1.

Table 7.1 Existing environment in Jindabyne Aerodrome sub-precinct

Value	Description
Area (ha)	51.49 ha
IBRA Bioregion	South Eastern Highlands (Monaro subregion)
General description (topographic setting, geology and soils)	The Jindabyne Aerodrome sub-precinct is located 3 kilometres southwest of the Jindabyne town centre. The sub-precinct is bound to the south by Tinworth Drive, the Barry Way South sub-precinct and the Mountain Bike and Adventure Park Sub-precinct to the west. Private land borders the Jindabyne Aerodrome sub-precinct to the north and east. The Jindabyne Aerodrome sub-precinct consists of a central valley with hills to the north and south. Elevation varies from approximately 1,020 m to 1,080 m ASL. Geology is volcanic Leesville Granodiorite (Biotite Granodiorite). Soils include shallow gravelly loams and texture-contrast soils (light textured topsoil overlying a clay subsoil-Chromosols).
Rivers, streams and estuaries	There are no rivers or estuaries in the Jindabyne Aerodrome sub-precinct. There are no mapped streams.
Wetlands and important wetlands	No wetlands of international or national importance are present. The edge of Lake Jindabyne is present approximately 1.6 km to the north of the Jindabyne Aerodrome sub-precinct.
Habitat connectivity	The habitat within the centre of the Jindabyne Aerodrome sub-precinct is grassland but the edges are forested and form part of the larger block of forested habitat to the west on the Mountain Bike and Adventure Park Sub-precinct that includes Round Hill and the ranges to the south west. Physical connectivity to these areas to the west is largely intact despite farming activities.
Karst, caves, crevices, cliffs, rocks and other geological features of significance	There are no areas of karst, caves, cliffs, or other geological features of significance in the Jindabyne Aerodrome sub-precinct. Rock outcropping is a common feature on the elevated areas at the edge of the sub-precinct and provides a significant habitat resource for fauna with large surface boulders providing crevices and shelter sites.
Areas of Outstanding Biodiversity Value	No Areas of Outstanding Biodiversity Value occur within the Jindabyne Aerodrome sub-precinct.

Value	Description
Plant Community Types	PCT 1191: Snow Gum – Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion PCT 1110: River Tussock-Tall Sedge – Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion
Threatened ecological communities BC Act	Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion (Critically Endangered BC Act) Natural Temperate Grassland of the South Eastern Highlands (Critically Endangered EPBC Act)
Threatened species habitats **(Species credit species)**	Based on the candidate species list returned for PCT 1191 and PCT 1110 by the BAM-C and the limited field survey that has been undertaken in this sub-precinct, the following threatened species may have habitat in the Jindabyne Aerodrome sub-precinct: — Plants including *Calotis glandulosa*, *Leucochrysum albicans* var. *tricolor*, *Prasophyllum petilum*, *Swainsona sericea*, and *Thesium australe*. — Mammals including Eastern Pygmy-possum. — Birds including Pink Robin, and potential breeding habitat for species including Gang-gang Cockatoo, Little Eagle, Barking Owl and Powerful Owl. — Reptiles including Pink-tailed Legless Lizard and Striped Legless Lizard.
Serious and irreversible impact entities	Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion (Critically Endangered BC Act). *Calotis glandulosa* (potential habitat).

7.2.1 Plant community type

Based on the field surveys undertaken to date and comparison of the site's geology, soils, elevation, and topography to similar less disturbed areas in the Jindabyne region, the Jindabyne Aerodrome sub-precinct is considered to currently contain the following two PCTs:

- PCT 1191: Snow Gum – Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion.
- PCT 1110: River Tussock – Tall Sedge – Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion.

The distribution of the PCTs is illustrated in Appendix E. The PCTs and vegetation zones within the sub-precinct are summarised in Table 7.2 and described below.

Table 7.2 Plant Community Types and vegetation zones within the Jindabyne Aerodrome sub-precinct

Plant community type	Vegetation zone	Area in sub-precinct (ha)
PCT 1191	Native dominant grassland	9.27
	Exotic dominant grassland	16.16
	Good	7.91
	Moderate	3.53
	Ribbon Gum variant_Good	2.87
	Ribbon Gum variant_Moderate	0.02

Plant community type	Vegetation zone	Area in sub-precinct (ha)
	Rocky outcrop	3.62
	Shrubland	0.14
	TOTAL	**43.52**
PCT 1110	Themeda variant_Good	2.05
	TOTAL	**2.05**
Total native vegetation		**45.57**

7.2.1.1 PCT 1191: Snow Gum – Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion

Snow Gum – Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion (PCT 1191) was the dominant community within this sub-precinct. A summary of the structure and floristics PCT 1191 within the sub-precinct in provided in Table 7.3. This data was collected in September via Rapid Data Points only and no detailed BAM Plots were undertaken within the Jindabyne Aerodrome sub-precinct, so the full range of species is unlikely to have been collected.

Table 7.3 Floristic and structural summary of PCT 1191 within the Jindabyne aerodrome sub-precinct

Vegetation layer	Species recorded from the surveys
Tree canopy (upper stratum)	Trees – *Eucalyptus pauciflora, Eucalyptus rubida, Eucalyptus viminalis, Acacia melanoxylon, Acacia dealbata, Eucalyptus stellulata.*
Midstorey (mid-stratum)	Shrubs – *Melicytus angustifolius* subsp. *divaricatus, Pimelea pauciflora, Bossiaea buxifolia, Cryptandra amara, Leucopogon fletcheri* subsp. *brevisepalus, Mirbelia oxylobioides.*
Groundcovers (ground stratum)	Grass & grass like – *Cynodon dactylon, Poa sieberiana, Anthosachne scabra, Rytidosperma* sp., *Themeda triandra, Poa* sp., *Panicum effusum, Dichelachne* sp., *Carex breviculmis, Microlaena stipoides, Austrostipa* sp., *Echinopogon* sp. Forbs – *Oxalis perennans, Geranium* sp., *Hydrocotyle laxiflora, Asperula conferta, Acaena ovina, Cymbonotus lawsonianus, Veronica plebeia, Dichondra repens, Scleranthus singuliflorus, Scleranthus diander, Hovea heterophylla, Euchiton* sp., *Crassula sieberiana, Brachyscome scapigera, Einadia nutans, Euchiton* sp., *Cynoglossum suaveolens, Senecio* spp., *Coronidium* sp., *Solenogyne* sp., *Hydrocotyle* sp.
Exotic species	*Erodium cicutarium, Cirsium vulgare, Echium vulgare, Verbascum thapsus, Dactylis glomerata, Plantago lanceolata, Trifolium repens, Trifolium arvense, Taraxacum officinale, Onopordum acanthium, Holcus lanatus, Hypochaeris radicata, Petrorhagia* sp., *Anthoxanthum odoratum, Pinus* sp.
High Threat Weeds	*Rosa rubiginosa, Cenchrus clandestinum, Acetosella vulgaris, Hypericum perforatum.*

PCT 1191 within the Jindabyne Aerodrome sub-precinct is quite variable in species composition and structure and as a consequence eight vegetation zones have been assigned:

- PCT 1191 (Good, Moderate): Areas of vegetation dominated by *Eucalyptus pauciflora* and/or *Eucalyptus rubida* with or without small stands or individual trees of *Eucalyptus stellulata* in Good and Moderate condition.
- PCT 1191 (Ribbon Gum variant Good, Moderate): Areas of vegetation dominated by *Eucalyptus viminalis* (Ribbon Gum) with sub-dominant trees including *Eucalyptus pauciflora* and/or *Eucalyptus rubida* with or without small stands or individual trees of *Eucalyptus stellulata*.

- PCT 1191 (Rocky outcrop): Rocky outcrops containing small trees and shrubs distinct from surrounding grassland areas (as is typical in the Jindabyne region) are present.
- PCT 1191 (Shrubland): Shrublands regenerating after disturbances.
- PCT 1191 (Native dominant grassland and Exotic dominant grassland): Grassland areas that are considered likely to be 'secondary' or 'derived' grasslands (where the original tree and shrub layers have been cleared in the past). These PCT 1191 grasslands are further divided into Native dominant grassland and Exotic dominant grassland based on dominance of native and exotic species respectively as determined through Rapid Data Point surveys. These grasslands are disturbed and form the lowest quality patches of vegetation within the Jindabyne Aerodrome sub-precinct.

Photo 7.1 Exotic dominant grassland at the Aerodrome

Photo 7.2 PCT 1191 north of Tinworth Drive at the Aerodrome

Photo 7.3 Rocky PCT 1191 dominated by *Eucalyptus pauciflora* at the Aerodrome

Photo 7.4 The runway showing adjacent exotic dominant ground layer

Photo 7.5 Exotic dominant grassland in the north of the Aerodrome adjacent to Touchdown Cottages

Photo 7.6 PCT 1191 Ribbon Gum variant north of Tinworth Drive

7.2.1.2 PCT 1110: River Tussock – Tall Sedge – Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion

At either end of the runway there is what appears to be natural grassland which would most closely resemble PCT1110: River Tussock-Tall Sedge-Kangaroo Grass moist grasslands of the South Eastern Highlands Bioregion. However, it should be noted that no detailed surveys such as BAM Plots have been undertaken in these areas. These grassland areas are however dominated by a suite of species typical of PCT 1110 and are dominated by *Themeda triandra* (mapped as Themeda variant_Good). Taking a cautious approach to assessment at this stage in the absence of survey data this vegetation zone is considered to be part of the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands TEC.

A summary of the structure and floristics PCT 1110 within the sub-precinct in provided in Table 7.4. This data was collected in September via Rapid Data Points only and no detailed BAM Plots were undertaken within the Jindabyne Aerodrome sub-precinct, so the full range of species is unlikely to have been collected.

Table 7.4 Floristic and structural summary of PCT 1110 within the Jindabyne aerodrome sub-precinct

Vegetation layer	Species recorded from the surveys
Tree canopy (upper stratum)	Trees–None.
Midstorey (mid-stratum)	Shrubs–None.
Groundcovers (ground stratum)	Grass & grass like - *Themeda triandra, Juncus* sp., *Carex* sp., *Austrostipa* sp. Forbs - *Geranium* sp., *Oreomyrrhis* sp., *Asperula conferta, Dichondra repens, Epilobium billardiereanum, Acaena ovina.*
Exotic species	*Taraxacum officinale, Plantago lanceolata, Onopordum acanthium, Dactylis glomerata, Potentilla recta, Trifolium arvense, Hypochaeris radicata, Cirsium vulgare, Holcus lanatus.*
High Threat Weeds	*Acetosella vulgaris, Hypericum perforatum.*

Photo 7.7 PCT 1110 dominated by *Themeda triandra* in the Jindabyne Aerodrome precinct

Photo 7.8 PCT 1110 at the southern end of the runway in the Jindabyne Aerodrome precinct

7.2.2 Threatened ecological communities

Two threatened ecological communities occur within this sub-precinct (Table 7.5).

Table 7.5 Threatened ecological communities within the Jindabyne Aerodrome sub-precinct

Threatened ecological community	PCT	EPBC Act	BC Act	Area in sub-precinct (ha)
Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion	PCT 1191	Not a TEC	Critically Endangered[1]	43.52 (includes 25.43 ha of 'derived' or 'secondary' grasslands)
Natural Temperate Grassland of the South Eastern Highlands (Critically Endangered)	PCT 1110	Critically Endangered	Not a TEC	2.05

(1) Serious and Irreversible Impact (SAII) entity. See Section 8.3.

7.3 Planned development

Planned development for the East Jindabyne sub-precinct consists of new development on disturbed land which will consist of ongoing existing use and aviation related development.

7.4 Opportunities and constraints

This sub-precinct is dominated by critically endangered Monaro Tableland Cool Temperate Grassy Woodland in various conditions and contains some areas of grassland that is likely to be natural temperate grassland given the landscape position and apparent dominance of *Themeda triandra*. Despite this, the sub-precinct provides opportunity for future development including expansion of the existing runway.

Careful planning can allow for development while retaining the areas of high biodiversity value in their current state. Avoiding impact to TECs is not possible in this sub-precinct given the broad definition of the BC Act listed Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion which includes 'secondary' or 'derived' grasslands.

Future development should avoid the treed areas at the edge of the sub-precinct. The edges of the Jindabyne Aerodrome sub-precinct contain remnants of PCT 1191 (dominated by *Eucalyptus pauciflora* and/or *Eucalyptus rubida*) in Good and

Moderate condition and areas dominated by *Eucalyptus viminalis* (Ribbon Gum) in good condition. Avoidance of impacts to these areas at the edge of the Jindabyne Aerodrome precinct should be a priority.

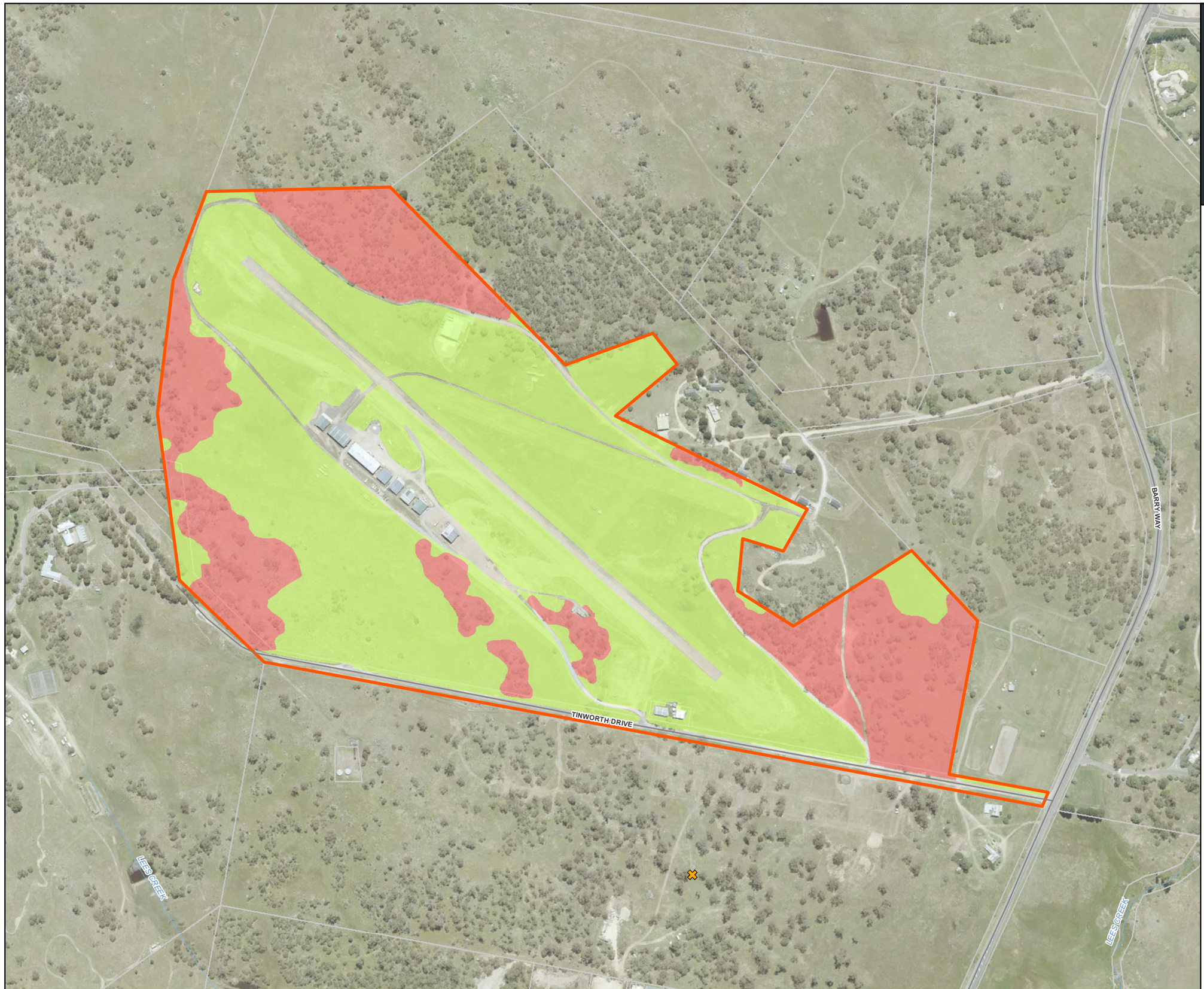
At either end of the runway the grassland that is dominated by *Themeda triandra* is likely to be part of the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands ecological community (listed as Critically Endangered). The cautious approach taken to assigning these areas of grassland to the EPBC Act listed Natural Temperate Grassland of the South Eastern Highlands community means that these areas generally would be identified as unsuitable for development. However, given the relatively small size of these grassland areas and their position at either end of a working runway means that any planned future runway extension would impact this vegetation (impact is unavoidable). However, from a biodiversity perspective, future extension of the existing runway is preferable to construction of an entirely new longer runway within the precinct. Furthermore, the potential impact to this TEC is unlikely to result in a significant impact to the TEC given the limited impacts that would likely occur. As such, these areas are identified as low constraint.

The identification of this TEC within the Jindabyne Aerodrome sub-precinct at this stage based off Rapid Data Point surveys only. Detailed biodiversity surveys would be needed to properly determine if these areas of grassland meet EPBC Act condition thresholds.

In summary the constraints and opportunities in this sub-precinct include:

- Constraints – The edges of the Jindabyne Aerodrome sub-precinct contain remnants of PCT 1191 in Good and Moderate condition and areas dominated by Eucalyptus viminalis (Ribbon Gum) in good condition which are the highest quality components of the BC Act listed Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion TEC in the sub-precinct.
- Opportunities – Areas of Native dominant grassland and Exotic dominant grassland. Areas of potential Natural Temperate Grassland of the South Eastern Highlands at either end of the runway not likely to pose a significant constraint.

Constraints mapping for the sub-precinct is provided in Figure 7.1.



Snowy SAP - Biodiversity Constraints

Figure 7.1

Jindabyne Aerodrome Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Watercourse
- Roads

Threatened Flora Species

- *Swainsona sericea* (recorded 2017)

Biodiversity Constraints

- High
- Low

0 0.1 0.2 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:5,000 Date: 4/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

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8 Planning considerations

8.1 EPBC Act referral

The Growth precinct contains some areas of native vegetation that are part of the Natural Temperate Grassland of the South Eastern Highlands critically endangered ecological community listed under the EPBC Act. This TEC is present in all of the sub-precincts. However, the largest and best quality examples are in the East Jindabyne, Leesville, and Jindabyne West sub-precincts with smaller and more disturbed examples found in the Aerodrome and Barry Way South sub-precincts.

The Growth precinct also provides potential habitat for EPBC Act listed threatened species including *Calotis glandulosa, Leucochrysum albicans* var. *tricolor, Prasophyllum petilum, Swainsona sericea*, and *Thesium australe*. Habitat for these species is present in the form of PCT 1191 and PCT 1110. *Swainsona sericea* has been recorded in PCT 1191 to the north of the Leesville sub-precinct, and a *Swainsona* specimen collected from East Jindabyne during the surveys resembles the threatened species *Swainsona sericea* (samples have been sent to the Royal Botanic Gardens for confirmation of identification). The EPBC Act listed tree species *Eucalyptus nicholii* and *Eucalyptus aggregata* were also recorded during the field survey, but these are planted trees outside of their natural distribution.

These listed TECs and threatened species are Matters of National Environmental Significance. A person must not take an action that has, will have, or is likely to have a significant impact on any Matters of National Environmental Significance without approval from the Australian Government Minister for the Environment. If a development within the Growth precinct is likely to have a significant impact on a matter of national environmental significance such as the Natural Temperate Grassland of the South Eastern Highlands critically endangered ecological community, an EPBC Act listed threatened species, or listed Migratory species, the action needs to be referred to determine whether or not a proposed action will need formal assessment and approval under the EPBC Act. If the Minister decides that significant impacts are likely, then the action requires approval under the EPBC Act. The action is then referred to as a controlled action.

There is a key opportunity in the Masterplanning process to avoid potential impacts to Matters of National Environmental significance in the form of the Natural Temperate Grassland of the South Eastern Highlands critically endangered ecological community and habitat for EPBC Act listed threatened species including *Calotis glandulosa, Leucochrysum albicans* var. *tricolor, Prasophyllum petilum, Swainsona sericea*, and *Thesium australe* (i.e. PCT 1191 and PCT 1110).

8.2 Biodiversity offset scheme

Entry to the Biodiversity Offset Scheme (BOS) is triggered by developments, projects and activities that meet certain thresholds for significant impacts on biodiversity, or on an opt-in basis. The BOS applies to a local development assessed under Part 4 of the *Environmental Planning and Assessment Act 1979* that triggers the BOS threshold or is likely to significantly affect threatened species based on the test of significance in section 7.3 of the BC Act. Future development within the Growth precinct would require assessment against the BOS thresholds to determine whether the BOS would apply to the particular development at the development application stage.

Under the BOS, applications for development or clearing approvals must set out how impacts on biodiversity will be avoided and minimised. Residual impacts can be offset by the purchase and/or retirement of biodiversity credits or payment to the Biodiversity Conservation Fund.

Impact to areas identified as High biodiversity constraint would require significant offsets. As such, avoidance of these areas should be considered in this early stage. Areas identified as Moderate constraint would likely require less offsets, while the areas identified as Low constraint may not require any offsets at all (note that this needs to be determined on an individual basis for a development).

The presence of serious and irreversible impact (SAII) entities within the Growth precinct means that for Part 4 development (that is not State Significant Development or State Significant Infrastructure), the approval authority must not grant approval if they determine the proposal is likely to have a serious and irreversible impact on biodiversity values. This is discussed further in Section 8.3. Due to the presence of SAII entities in the Growth precinct, Biodiversity Certification may be the best process for biodiversity assessment. Biodiversity Certification offers a streamlined biodiversity assessment process for areas of land that are proposed for development that identifies areas that can be developed after they are certified, and measures implemented to offset the impacts of development. Where land is certified, development may proceed without the need for future site by site assessment. Biocertification is most appropriate to use in strategic land use planning at the landscape scale and as the consent authority must not grant approval if they determine the proposal is likely to have a serious and irreversible impact on biodiversity values may be a viable option for the Growth precinct.

8.3 Serious and irreversible impact entities

The Biodiversity Offsets Scheme recognises that there are some types of serious and irreversible impacts that the community expects will not occur except where the consent authority considers that this type of impact is outweighed by the social and economic benefits that the development will deliver to the State. The approval authority is responsible for deciding whether an impact is serious and irreversible. This decision is made in accordance with principles set out in clause 6.7 of the Biodiversity Conservation Regulation 2017. Table 8.1 sets out the effect of a serious and irreversible impact for different types of development and activities if assessment is required under the Biodiversity Offsets Scheme.

The decision maker determines if a proposal is likely to have a serious and irreversible impact by:

- Identifying the relevant entity at risk of a SAII:
  - In this case Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion and *Calotis glandulosa*.
- Evaluating the extinction risk of the SAII entity to be impacted:
  - Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion is listed as Critically Endangered under the BC Act so is facing an extremely high risk of extinction in Australia in the immediate future.
  - *Calotis glandulosa* is listed as Vulnerable under the BC Act and is facing a high risk of extinction in New South Wales in the medium-term future.
- Considering the measures taken to avoid, minimise and mitigate impacts on the entity:
  - Avoiding impacts at the planning stage is the most effective.
- Evaluating the serious and irreversible impact:
  - Where a proposed impact has been identified as potentially serious and irreversible the decision-maker must review the additional information provided for all entities at risk of a SAII by the assessor in the BAR that is prepared for the individual development. The decision-maker will use the impact assessment information to decide if the proposal is likely to increase the extinction risk of any of the relevant entities and whether impacts/losses/declines are likely to be serious and irreversible.
- Decision making:
  - Where the decision-maker is of the opinion that a proposal is likely to have a serious and irreversible impact on biodiversity values, the BC Act and the LLS Act set out the following requirements (outlined in Table 8.1; see also Section 8.2) in relation to any approval or consent of the proposal.

Serious and irreversible impacts are important to consider for the Growth precinct. For Part 4 developments, the approval authority must not grant approval if they determine the proposal is likely to have a serious and irreversible impact on biodiversity values. This makes avoiding impacts to SAII entities an important consideration.

Table 8.1 Effect of a serious and irreversible impact

Type of development or activity	Effect of serious and irreversible impacts
— Part 4 development (that is not State Significant Development or State Significant Infrastructure) — Clearing proposals (LLS Act and State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017)	The approval authority must not grant approval if they determine the proposal is likely to have a serious and irreversible impact on biodiversity values.
— State Significant Development — State Significant Infrastructure — Part 5 activities (where a proponent chooses to opt in to the Biodiversity Offsets Scheme) — Biodiversity Certification	The approval authority can approve a proposal which is likely to have serious and irreversible impacts. The approval authority must take those impacts into consideration and determine whether there are any additional and appropriate measures that will minimise those impacts if approval is to be granted.

The list of species (including endangered populations) and threatened ecological communities that are at risk of a serious and irreversible impact is generally updated biannually. The list of threatened ecological communities that are at risk of a serious and irreversible impact includes:

- Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion which is found throughout the Growth precinct. PCTs consistent with this TEC that are located in the Growth precinct include PCT 1191: Snow Gum – Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion.
- *Calotis glandulosa*, a species that is considered likely to have suitable habitat in the Growth precinct based on the presence of an associated PCT (in the form of PCT 1191) is included on the list of species that are at risk of a serious and irreversible impact.

Sections 3 to 7 provide a summary for each sub-precinct on the presence and extent of SAII entities Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion. This community also provides the potential habitat for *Calotis glandulosa*.

9 Masterplanning

An evidenced based approach should be adopted to determine the best outcome and to provide a clear pathway for the right types of future development, in the right locations. This process should seek to avoid and minimise impacts to biodiversity with a focus on mapping areas best suited to future development and expansion. This includes already disturbed areas of existing development, cleared areas, and areas supporting exotic vegetation. Areas of good condition vegetation have the highest biodiversity values and development in these areas should be avoided or minimised.

The following recommendations are provided to guide the master planning for the project.

When considering the development location and impacts it is important to consider all the elements required including associated infrastructure (e.g., roads, utilities) as well as asset protection zones.

With a focus on avoiding and minimising impacts on biodiversity, development is therefore best suited to areas that are already disturbed including areas of existing development, cleared areas, and areas supporting exotic vegetation. It is acknowledged however that some disturbed areas may still contain constraints such as threatened fauna habitat and hydrological functions important for surrounding vegetation communities which may require avoidance or minimisation/mitigation.

The following considerations should be made to minimise impacts to biodiversity as far as reasonably practicable:

- development within areas of high conservation value (natural temperate grassland and good condition vegetation) is avoided or minimised and offset
- focussing or keeping development within already disturbed areas as far as possible
- locating development nearby existing infrastructure to limit the need for additional impacts associated with creation of infrastructure and services (e.g., roads and utilities)
- maintaining a buffer between high ecological constraints and development. A buffer of 30 m should be applied, or for specific species as specified in the Threatened Species Database
- co-locating (and infill) developments as to minimise the spread of impacts on biodiversity values.

9.1 Aims

The aim of the SAP should be to avoid, conserve and enhance biodiversity values of the region. Specifically, the aims should be to:

- preserve the Precinct's landscape, cultural, heritage and biodiversity values
- avoid impacts to SAII entities
- avoid or minimise impacts to threatened ecological communities
- minimise the removal of remnant vegetation wherever possible
- preserve and rehabilitate natural waterways, which contribute to the area's character and biodiversity
- prioritise new development in areas of low ecological value
- maintain and improve green connections across the Precinct, including strategic revegetation to connect wildlife habitats and provide steppingstone linkages for mobile fauna
- improve water quality and reduce stormwater run-off through passive landscape design
- minimise impacts to important habitats such as rocky outcropping.

9.2 Performance criteria

1. Development focussed in areas of low ecological constraint.
2. Development may occur in areas of high ecological value (natural temperate grassland and good condition vegetation) if it is for essential infrastructure or where it can be demonstrated that impacts are minimal and will be appropriately offset.
3. The subdivision of land may allow for the removal of some areas of high ecological value. The subdivision of land should consider the future uses of land and how biodiversity values can be retained. This may include the provision of vegetation links, the enhancement of riparian corridors and the retention and integration of smaller remnant vegetation areas and paddock trees with green infrastructure and active transport connections. Development should be designed to ensure connectivity through the landscape including corridors linking the lake foreshore with areas of high altitude.
4. Development should be designed to be sympathetic to the biodiversity constraints.
5. Development should be designed to ensure connectivity through the landscape including corridors linking the lake foreshore with areas of high altitude.
6. Development should be concentrated in and around already disturbed areas. Co-locating (and infill) developments to minimise the spread of impacts on biodiversity values
7. Where possible, development should provide a suitable buffer between areas of high ecological values and buildings and structures.
8. Development should be focused on colocation and infill development to minimise the spread of impacts on biodiversity values.
9. Development should minimise the clearing of vegetation, such as existing native vegetation and paddock trees, and important habitat areas, such as rocky outcrops.
10. Tree plantings of endemic local species is encouraged to create green networks that support wildlife corridors and vegetation stepping stones for fauna movement. These species should be from a genetic source (usually seed) that have been assessed as being able to grow comfortably in the conditions projected from the present day to the end of the life of the tree.
11. Riparian corridors must be preserved and revegetated where possible. Setbacks to the corridors are to be provided in accordance with the Guidelines for Controlled Activities on Waterfront Land (2018, NRAR).

9.3 Supporting provisions to be developed

1. Development to minimise impacts to natural temperate grassland and good condition vegetation by altering the development proposal. A suitable buffer must be provided around retained to ensure its protection both during the short-term construction phase of development and in the long-term use of the area.
2. Further assessment for threatened biodiversity should be undertaken when specific impacts are known for sites that have not been surveyed and/or where there is potential habitat for threatened species.
3. A Management Plan that incorporates the biodiversity aims should be developed as part of the Delivery Plan or DCP. This plan should address:

    a. The retention and maintenance of existing native vegetation and areas of high ecological constraint.
    b. Additional planting and the creation of connections, wildlife corridors and vegetation stepping stones, where possible.
    c. Areas for new public open spaces, publicly accessible areas or paths, including appropriate management strategies for these areas.
    d. Riparian corridors, setbacks and design objectives for development interfacing with watercourses.
    e. Plantings along road reserves that address visual amenity, public amenity considerations and road safety.
    f. Client ready species which are locally endemic to the Region.
    g. The mitigation of urban heat island impacts, particularly in the Town Centre.
    h. Connection and Return to Connection, including through, but not limited to, landscape design.
    i. Site-based setbacks, landscaping and public domain requirements.
    j. How vegetation clearing and biodiversity offsets will be managed (either across Precincts, Sub-Precincts or on a development-by-development basis).

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10.5 Field survey limitations

No sampling technique can eliminate the possibility that a species is present on a site. For example, some species of plant may be present in the soil seed bank and some fauna species use habitats on a sporadic or seasonal basis and may not be present on-site during surveys. The conclusions in this report are based upon previous studies, data acquired for the site and the biodiversity field surveys and are, therefore, merely indicative of the environmental condition of the site at the time of preparing the report, including the presence or otherwise of species. Also, it should be recognised that site conditions, including the presence of threatened species, can change with time.

A limitation of the surveys and this assessment is that the vegetation zone mapping in the sub-precinct are derived from aerial photographic interpretation and rapid data points. BAM plots were limited to areas of higher condition grassland to determine consistency with threatened ecological communities.

Surveys were undertaken outside optimal survey season for a number of species which are difficult to detect outside these times including *Rytidosperma vickeryae* or *Carex raleighii.* Weather conditions including temperature are critical to fauna surveys, particularly in the sub-alpine and alpine areas. Targeted season surveys for candidate threatened species have not been undertaken for this BDAR and have been recommended where potential habitat occurs.

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Appendix A

Jindabyne west sub-precinct

APPENDIX A-1
Jindabyne West sub-precinct flora survey data

Veg Zone = PCT1191 Moderate			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: epauc9			39	21	3	2	5	10	1	0	18	5
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			95.4	44.1	32.2	3	4.7	3.9	0.3	0	51.3	6.2
Asplenium flabellifolium	0.3	20	EG						0.3			
Trifolium arvense	20	1000	EX								20	
Avena barbata	5	300	EX								5	
Petrorhagia nanteuilii	10	1000	EX								10	
Echium vulgare	5	500	EX								5	
Verbascum thapsus	0.3	10	EX								0.3	
Medicago lupulina	0.3	100	EX								0.3	
Aira elegantissima	0.2	10	EX								0.2	
Bromus hordeaceus	0.3	20	EX								0.3	
Vulpia myuros	2	200	EX								2	
Taraxacum officinale	0.3	30	EX								0.3	
Plantago lanceolata	1	0.1	EX								1	
Bromus rubens	0.2	10	EX								0.2	
Poa pratensis	0.5	20	EX								0.5	
Geranium solanderi	0.5	50	FG					0.5				
Hydrocotyle laxiflora	0.3	20	FG					0.3				
Acaena ovina	1	50	FG					1				
Crassula sieberiana	0.2	20	FG					0.2				
Dichondra repens	0.3	100	FG					0.3				
Oxalis perennans	0.2	30	FG					0.2				
Plantago varia	1	30	FG					1				
Einadia nutans	0.1	5	FG					0.1				
Rumex brownii	0.2	2	FG					0.2				
Swainsona behriana	0.1	3	FG					0.1				
Austrostipa scabra	3	200	GG				3					
Rytidosperma sp.	0.2	8	GG				0.2					
Elymus scaber	0.3	10	GG				0.3					
Poa sieberiana var. *sieberiana*	1	50	GG				1					
Poa meionectes	0.2	10	GG				0.2					
Rosa rubiginosa	1	6	HT									1
Bromus diandrus	1	100	HT									1
Acetosella vulgaris	0.2	20	HT									0.2
Nassella trichotoma	2	50	HT									2
Hypericum perforatum	2	100	HT									2
Melicytus angustifolius subsp. *divaricatus*	2	6	SG			2						
Pimelea pauciflora	1	6	SG			1						
Eucalyptus pauciflora	30	12	TG		30							
Acacia dealbata	2	6	TG		2							
Acacia melanoxylon	0.2	1	TG		0.2							

Veg Zone = PCT1191 Moderate			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: epauc10			32	18	2	1	5	7	2	1	14	3
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			110.6	79.8	31	30	9.2	9.1	0.2	0.3	30.8	8
Cheilanthes austrotenuifolia	0.1	3	EG						0.1			
Asplenium flabellifolium	0.1	2	EG						0.1			
Medicago lupulina	0.1	10	EX								0.1	
Petrorhagia nanteuilii	3	200	EX								3	
Sonchus oleraceus	10	200	EX								10	
Echium vulgare	3	100	EX								3	
Avena barbata	0.5	50	EX								0.5	
Verbascum thapsus	0.5	20	EX								0.5	
Trifolium arvense	5	300	EX								5	
Arenaria leptoclados	0.3	10	EX								0.3	
Vulpia myuros	0.2	10	EX								0.2	
Dactylis glomerata	0.1	3	EX								0.1	
Anagallis arvensis	0.1	10	EX								0.1	
Geranium solanderi var. *solanderi*	1	50	FG					1				
Senecio quadridentatus	5	100	FG					5				
Hydrocotyle laxiflora	1	100	FG					1				
Oxalis perennans	0.3	30	FG					0.3				
Wahlenbergia communis	1	50	FG					1				
Bulbine bulbosa	0.5	20	FG					0.5				
Einadia nutans	0.3	50	FG					0.3				
Lomandra longifolia	3	200	GG				3					
Poa sieberiana	5	200	GG				5					
Themeda triandra	0.5	30	GG				0.5					
Panicum effusum	0.5	20	GG				0.5					
Austrostipa scabra	0.2	20	GG				0.2					
Rosa rubiginosa	3	30	HT									3
Bromus diandrus	3	100	HT									3
Cotoneaster sp.	2	3	HT									2
Convolvulus erubescens	0.3	30	OG							0.3		
Melicytus angustifolius subsp. *divaricatus*	30	300	SG			30						
Eucalyptus pauciflora	30	16	TG		30							
Acacia dealbata	1	4	TG		1							

Veg Zone = PCT1191 Moderate			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: epauc11			43	26	2	4	6	11	2	1	17	4
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			102.7	74.2	41	7	17.6	7.9	0.6	0.1	23	7.5
Asplenium flabellifolium	0.5	20	EG						0.5			
Cheilanthes austrotenuifolia	0.1	8	EG						0.1			
Trifolium arvense	5	300	EX								0.5	
Petrorhagia nanteuilii	5	300	EX								5	
Bromus hordeaceus	2	100	EX								2	
Vulpia myuros	1	50	EX								1	
Echium vulgare	3	100	EX								3	
Avena barbata	2	200	EX								2	
Bromus rubens	0.2	10	EX								0.2	
Verbascum thapsus	0.5	10	EX								0.5	
Hirschfeldia incana	0.3	5	EX								0.3	
Medicago lupulina	0.2	20	EX								0.2	
Aira elegantissima	0.2	5	EX								0.2	
Arenaria leptoclados	0.1	3	EX								0.1	
Taraxacum officinale	0.5	20	EX								0.5	
Rumex brownii	0.1	2	FG					0.1				
Dianella longifolia	0.1	1	FG					0.1				
Senecio quadridentatus	3	30	FG					3				
Geranium solanderi	1	100	FG					1				
Hydrocotyle laxiflora	1	150	FG					1				
Oxalis perennans	0.3	20	FG					0.3				
Acaena ovina	0.2	10	FG					1				
Dichondra repens	0.3	50	FG					0.3				
Einadia nutans	0.5	100	FG					0.5				
Wahlenbergia communis	0.5	30	FG					0.5				
Cymbonotus sp.	0.1	2	FG					0.1				
Luzula flaccida	0.1	2	GG				0.1					
Lomandra longifolia	10	300	GG				10					
Poa sieberiana var. *sieberiana*	5	200	GG				5					
Panicum effusum	1	50	GG				1					
Austrostipa scabra	0.5	50	GG				0.5					
Themeda triandra	1	50	GG				1					
Acetosella vulgaris	0.3	50	HT									0.5
Bromus diandrus	2	100	HT									2
Hypericum perforatum	2	50	HT									2
Rosa rubiginosa	3	20	HT									3
Convolvulus erubescens	0.1	3	OG							0.1		
Melicytus angustifolius subsp. *divaricatus*	5	50	SG			5						
Olearia phlogopappa	0.5	1	SG			0.5						
Bossiaea buxifolia	0.5	20	SG			0.5						
Pimelea pauciflora	1	6	SG			1						
Eucalyptus pauciflora	40	15	TG		40							
Acacia dealbata	3	20	TG		1							

Veg Zone = PCT1191 Revegetation			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: evim8			33	17	3	0	6	7	0	1	15	4
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			109.3	50.8	40	0	6.7	4	0	0.1	61.2	5.6
Avena barbata	2	100	EX								2	
Trifolium arvense	40	1000	EX								40	
Echium vulgare	5	300	EX								5	
Verbascum thapsus	1	50	EX								1	
Vulpia myuros	2	100	EX								2	
Petrorhagia nanteuilii	5	500	EX								5	
Erodium cicutarium	0.1	3	EX								0.1	
Bromus hordeaceus	0.2	10	EX								0.1	
Plantago lanceolata	0.1	2	EX								0.2	
Marrubium vulgare	0.1	1	EX								0.1	
Medicago lupulina	0.2	30	EX								0.1	
Senecio quadridentatus	0.2	2	FG					0.2				
Oxalis perennans	1	100	FG					1				
Asperula conferta	1	30	FG					1				
Dichondra repens	0.5	100	FG					1				
Wahlenbergia communis	0.2	10	FG					0.5				
Acaena ovina	0.1	1	FG					0.2				
Cynoglossum suaveolens	0.1	2	FG					0.1				
Panicum effusum	0.2	5	GG				0.2					
Austrostipa scabra	0.5	20	GG				0.5					
Poa sieberiana var. *sieberiana*	5	150	GG				5					
Enneapogon nigricans	0.3	10	GG									
Themeda triandra	0.5	20	GG				0.3					
Carex inversa	0.2	10	GG				0.5					
Rytidosperma sp.	0.1	3	GG				0.2					
Hypericum perforatum	5	100	HT									5
Acetosella vulgaris	0.2	10	HT									0.2
Eragrostis curvula	0.2	3	HT									0.2
Rosa rubiginosa	0.1	2	HT									0.2
Convolvulus erubescens	0.2	10	OG							0.1		
Eucalyptus viminalis	30	25	TG		30							
Eucalyptus bridgesiana	5	3	TG		5							
Eucalyptus rubida	3	2	TG		5							

Veg Zone = PCT1191 Revegetation			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: Breveg1			21	8	2	0	4	2	0	0	13	3
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			104.1	20.5	10	0	10.3	0.2	0	0	83.6	2.6
Trifolium arvense	20	200	EX								20	
Verbascum thapsus	0.1	10	EX								0.1	
Petrorhagia nanteuilii	0.1	100	EX								0.1	
Anthoxanthum odoratum	0.3	50	EX								0.3	
Avena barbata	60	500	EX								60	
Hypochaeris radicata	0.1	1	EX								0.1	
Echium vulgare	0.1	10	EX								0.1	
Medicago lupulina	0.1	1	EX								0.1	
Vulpia myuros	0.1	10	EX								0.1	
Erodium cicutarium	0.1	10	EX								0.1	
Oxalis perennans	0.1	10	FG					0.1				
Ammobium alatum	0.1	1	FG					0.1				
Elymus scaber	0.1	10	GG				0.1					
Carex inversa	0.1	10	GG				0.1					
Rytidosperma tenuius	10	200	GG				10					
Austrostipa scabra	0.1	20	GG				0.1					
Rosa rubiginosa	0.5	10	HT									0.5
Eragrostis curvula	0.1	1	HT									0.1
Bromus diandrus	2	50	HT									2
Eucalyptus viminalis	5	5	TG		5							
Eucalyptus rubida	5	7	TG		5							

Veg Zone = PCT1191 Revegetation			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: Breveg2			26	13	2	0	5	5	0	2	12	2
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			78.2	36.3	15	0	20.5	0.6	0	0.3	41.8	0.7
Petrorhagia nanteuilii	0.2	50	EX								0.2	
Salvia coccinea	0.1	1	EX								0.1	
Trifolium arvense	40	200	EX								40	
Echium vulgare	0.1	20	EX								0.1	
Verbascum thapsus	0.1	5	EX								0.1	
Vulpia myuros	0.2	50	EX								0.2	
Linaria arvensis	0.1	1	EX								0.1	
Anthoxanthum odoratum	0.1	1	EX								0.1	
Aira elegantissima	0.1	1	EX								0.1	
Avena barbata	0.1	20	EX								0.1	
Vittadinia muelleri	0.1	5	FG					0.1				
Wahlenbergia communis	0.2	10	FG					0.2				
Crassula sieberiana	0.1	10	FG					0.1				
Senecio quadridentatus	0.1	1	FG					0.1				
Calotis anthemoides	0.1	1	FG					0.1				
Themeda triandra	10	1000	GG				10					
Poa sieberiana	0.2	20	GG				0.2					
Elymus scaber	0.2	20	GG				0.2					
Rytidosperma tenuius	0.1	10	GG				0.1					
Austrostipa scabra	10	200	GG				10					
Rosa rubiginosa	0.2	9	HT									0.2
Hypericum perforatum	0.5	50	HT									0.5
Desmodium varians	0.2	50	OG							0.2		
Convolvulus erubescens	0.1	1	OG							0.1		
Eucalyptus rubida	10	10	TG		10							
Eucalyptus viminalis	5	2	TG		5							

Veg Zone = PCT1191 Rocky outcrop			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: BruceB1			40	23	1	2	8	8	2	2	17	4
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			65.4	43.2	0.3	0.6	41.1	0.8	0.2	0.2	22.2	0.8
Cheilanthes austrotenuifolia	0.1	50	EG						0.1			
Asplenium flabellifolium	0.1	10	EG						0.1			
Trifolium arvense	20	200	EX								20	
Echium vulgare	0.1	5	EX								0.1	
Petrorhagia nanteuilii	0.2	50	EX								0.2	
Bromus hordeaceus	0.1	10	EX								0.1	
Avena sp.	0.1	10	EX								0.1	
Vulpia myuros	0.2	20	EX								0.2	
Linaria arvensis	0.1	50	EX								0.1	
Desmodium varians	0.1	20	EX								0.1	
Salvia coccinea	0.1	5	EX								0.1	
Hypochaeris radicata	0.1	20	EX								0.1	
Verbascum thapsus	0.1	1	EX								0.1	
Taraxacum officinale	0.1	1	EX								0.1	
Aira elegantissima	0.1	10	EX								0.1	
Wahlenbergia communis	0.1	10	FG					0.1				
Hydrocotyle laxiflora	0.1	10	FG					0.1				
Senecio quadridentatus	0.1	2	FG					0.1				
Oxalis perennans	0.1	20	FG					0.1				
Crassula sieberiana	0.1	50	FG					0.1				
Dianella longifolia	0.1	10	FG					0.1				
Geranium solanderi	0.1	20	FG					0.1				
Acaena ovina	0.1	1	FG					0.1				
Themeda triandra	40	400	GG				40					
Poa sieberiana	0.2	20	GG				0.2					
Elymus scaber	0.1	1	GG				0.1					
Austrostipa scabra	0.2	20	GG				0.2					
Rytidosperma tenuius	0.2	30	GG				0.2					
Lomandra longifolia	0.2	6	GG				0.2					
Panicum effusum	0.1	10	GG				0.1					
Carex inversa	0.1	10	GG				0.1					
Rosa rubiginosa	0.5	15	HT									0.5
Hypericum perforatum	0.1	20	HT									0.1
Pyracantha sp. *(P. angustifolia, P. crenatoserrata, P. crenulata and P. rogersiana)*	0.1	1	HT									0.1
Acetosella vulgaris	0.1	1	HT									0.1
Convolvulus erubescens	0.1	1	OG							0.1		
Glycine clandestina	0.1	10	OG							0.1		
Pimelea pauciflora	0.1	1	SG			0.1						
Melicytus angustifolius subsp. *divaricatus*	0.5	10	SG			0.5						
Acacia dealbata	0.3	4	TG		0.3							

Veg Zone = PCT1191 Rocky outcrop			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: BruceB2			32	18	0	3	6	6	1	2	14	4
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			46.1	13.4	0	1.2	11.3	0.6	0.1	0.2	32.7	10.5
Asplenium flabellifolium	0.1	10	EG						0.1			
Verbascum thapsus	0.1	10	EX								0.1	
Echium vulgare	0.5	200	EX								0.5	
Trifolium arvense	20	200	EX								20	
Petrorhagia nanteuilii	0.5	100	EX								0.5	
Hypochaeris radicata	0.1	20	EX								0.1	
Aira elegantissima	0.1	20	EX								0.1	
Vulpia myuros	0.5	200	EX								0.5	
Taraxacum officinale	0.1	1	EX								0.1	
Bromus hordeaceus	0.2	50	EX								0.2	
Avena barbata	0.1	5	EX								0.1	
Bulbine bulbosa	0.1	1	FG					0.1				
Acaena ovina	0.1	1	FG					0.1				
Crassula sieberiana	0.1	100	FG					0.1				
Oxalis perennans	0.1	20	FG					0.1				
Dianella longifolia	0.1	10	FG					0.1				
Euchiton involucratus	0.1	1	FG					0.1				
Lomandra longifolia	0.5	10	GG				0.5					
Themeda triandra	5	100	GG				5					
Poa sieberiana	0.2	20	GG				0.2					
Austrostipa scabra	0.5	100	GG				0.5					
Rytidosperma tenuius	5	300	GG				5					
Panicum effusum	0.1	10	GG				0.1					
Rosa rubiginosa	0.3	5	HT									0.3
Hypericum perforatum	10	50	HT									10
Acetosella vulgaris	0.1	10	HT									0.1
Pyracantha sp.	0.1	1	HT									0.1
Convolvulus erubescens	0.1	10	OG							0.1		
Desmodium varians	0.1	10	OG							0.1		
Pimelea pauciflora	0.1	1	SG			0.1						
Melicytus angustifolius subsp. *divaricatus*	1	10	SG			1						
Brachyloma daphnoides	0.1	1	SG			0.1						

Veg Zone = PCT1191 Rocky outcrop			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: BruceB3			36	22	0	2	7	9	2	2	14	3
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			30.9	27.6	0	0.3	26	0.9	0.2	0.2	3.3	0.4
Asplenium flabellifolium	0.1	10	EG						0.1			
Cheilanthes austrotenuifolia	0.1	5	EG						0.1			
Petrorhagia nanteuilii	0.1	100	EX								0.1	
Trifolium arvense	1	200	EX								1	
Verbascum thapsus	0.1	10	EX								0.1	
Linaria arvensis	0.1	50	EX								0.1	
Erodium cicutarium	0.1	1	EX								0.1	
Echium vulgare	0.1	10	EX								0.1	
Avena barbata	0.1	2	EX								0.1	
Hypochaeris radicata	0.1	1	EX								0.1	
Aira elegantissima	0.1	1	EX								0.1	
Vulpia myuros	1	100	EX								1	
Bromus hordeaceus	0.1	20	EX								0.1	
Wahlenbergia communis	0.1	1	FG					0.1				
Geranium solanderi	0.1	10	FG					0.1				
Hydrocotyle laxiflora	0.1	1	FG					0.1				
Acaena ovina	0.1	10	FG					0.1				
Epilobium billardierianum	0.1	10	FG					0.1				
Crassula sieberiana	0.1	200	FG					0.1				
Oxalis perennans	0.1	1	FG					0.1				
Hovea heterophylla	0.1	2	FG					0.1				
Dichondra repens	0.1	1	FG					0.1				
Lomandra longifolia	0.5	20	GG				0.5					
Lepidosperma laterale	0.1	3	GG				0.1					
Themeda triandra	20	300	GG				20					
Carex inversa	0.2	100	GG				0.2					
Austrostipa scabra	5	50	GG				5					
Poa sieberiana	0.1	1	GG				0.1					
Panicum effusum	0.1	5	GG				0.1					
Rosa rubiginosa	0.2	20	HT									0.2
Acetosella vulgaris	0.1	5	HT									0.1
Hypericum perforatum	0.1	50	HT									0.1
Convolvulus erubescens	0.1	10	OG							0.1		
Desmodium varians	0.1	2	OG							0.1		
Melicytus angustifolius subsp. *divaricatus*	0.2	10	SG			0.2						
Brachyloma daphnoides	0.1	10	SG			0.1						

Veg Zone = PCT1191 Rocky outcrop			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: BruceB4			35	23	1	1	8	9	2	2	12	5
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			25.1	15.1	2	1	10.8	0.9	0.2	0.2	10	8.2
Cheilanthes austrotenuifolia	0.1	20	EG						0.1			
Asplenium flabellifolium	0.1	20	EG						0.1			
Echium vulgare	0.1	50	EX								0.1	
Avena barbata	0.5	200	EX								0.5	
Trifolium arvense	0.2	100	EX								0.2	
Petrorhagia nanteuilii	0.2	200	EX								0.2	
Verbascum thapsus	0.2	20	EX								0.2	
Hordeum sp.	0.1	100	EX								0.1	
Vulpia myuros	0.5	100	EX								0.5	
Euchiton involucratus	0.1	1	FG					0.1				
Wahlenbergia communis	0.1	20	FG					0.1				
Oxalis perennans	0.1	10	FG					0.1				
Crassula sieberiana	0.1	50	FG					0.1				
Senecio quadridentatus	0.1	1	FG					0.1				
Rumex brownii	0.1	1	FG					0.1				
Einadia nutans	0.1	1	FG					0.1				
Geranium solanderi	0.1	1	FG					0.1				
Hydrocotyle laxiflora	0.1	1	FG					0.1				
Lomandra longifolia	5	50	GG				5					
Themeda triandra	2	200	GG				2					
Poa sieberiana	0.1	5	GG				0.1					
Rytidosperma tenuius	2	200	GG				2					
Carex inversa	1	500	GG				1					
Austrostipa scabra	0.5	100	GG				0.5					
Panicum effusum	0.1	1	GG				0.1					
Lomandra glauca	0.1	10	GG				0.1					
Cotoneaster sp.	5	7	HT									5
Rosa rubiginosa	2	6	HT									2
Pyracantha sp.	1	3	HT									1
Hypericum perforatum	0.1	5	HT									0.1
Bromus diandrus	0.1	10	HT									0.1
Convolvulus erubescens	0.1	10	OG							0.1		
Desmodium varians	0.1	1	OG							0.1		
Melicytus angustifolius subsp. *divaricatus*	1	10	SG			1						
Acacia dealbata	2	10	TG		2							

Veg Zone = PCT1191 Native dominant grassland			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: BruceGrass1			25	10	0	0	6	4	0	0	15	3
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			88.2	11.5	0	0	11.1	0.4	0	0	76.7	0.4
Verbascum thapsus	0.1	7	EX								0.1	
Avena barbata	20	200	EX								20	
Vulpia myuros	50	400	EX								50	
Petrorhagia nanteuilii	0.5	100	EX								0.5	
Bromus hordeaceus	5	200	EX								5	
Trifolium arvense	0.1	20	EX								0.1	
Echium vulgare	0.1	5	EX								0.1	
Erodium cicutarium	0.1	10	EX								0.1	
Arenaria leptoclados	0.1	5	EX								0.1	
Anthoxanthum odoratum	0.1	10	EX								0.1	
Hypochaeris radicata	0.1	2	EX								0.1	
Taraxacum officinale	0.1	4	EX								0.1	
Crassula sieberiana	0.1	15	FG					0.1				
Ammobium alatum	0.1	2	FG					0.1				
Oxalis perennans	0.1	1	FG					0.1				
Acaena ovina	0.1	1	FG					0.1				
Poa labillardierei	0.1	1	GG				0.1					
Rytidosperma tenuius	10	500	GG				10					
Austrostipa scabra	0.2	20	GG				0.2					
Bothriochloa macra	0.5	100	GG				0.5					
Carex inversa	0.2	50	GG				0.2					
Panicum effusum	0.1	1	GG				0.1					
Acetosella vulgaris	0.1	10	HT									0.1
Hypericum perforatum	0.1	5	HT									0.1
Bromus diandrus	0.2	50	HT									0.2

Veg Zone = PCT1191 Native dominant grassland			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: BruceGrass2			21	9	0	0	5	3	0	1	12	3
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			22.9	11	0	0	10.6	0.3	0	0.1	11.9	0.3
Echium vulgare	0.1	50	EX								0.1	
Verbascum thapsus	0.1	5	EX								0.1	
Petrorhagia nanteuilii	0.5	100	EX								0.5	
Vulpia myuros	0.1	100	EX								0.1	
Bromus hordeaceus	10	300	EX								10	
Trifolium arvense	0.5	100	EX								0.5	
Linaria arvensis	0.1	20	EX								0.1	
Taraxacum officinale	0.1	1	EX								0.1	
Medicago lupulina	0.1	1	EX								0.1	
Rumex brownii	0.1	1	FG					0.1				
Oxalis perennans	0.1	20	FG					0.1				
Euchiton involucratus	0.1	1	FG					0.1				
Austrostipa scabra	0.2	100	GG				0.2					
Elymus scaber	0.2	50	GG				0.2					
Rytidosperma tenuius	10	500	GG				10					
Poa sieberiana	0.1	50	GG				0.1					
Poa labillardierei	0.1	1	GG				0.1					
Rosa rubiginosa	0.1	1	HT									0.1
Hypericum perforatum	0.1	100	HT									0.1
Acetosella vulgaris	0.1	10	HT									0.1
Convolvulus erubescens	0.1	10	OG							0.1		

Veg Zone = PCT1191 Native dominant grassland			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: BruceGrass3			24	8	0	1	5	2	0	0	16	3
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			74.1	31.8	0	0.1	31.5	0.2	0	0	42.3	0.7
Verbascum thapsus	0.1	10	EX								0.1	
Avena sp.	40	500	EX								40	
Echium vulgare	0.2	30	EX								0.2	
Petrorhagia nanteuilii	0.3	200	EX								0.3	
Trifolium arvense	0.2	50	EX								0.2	
Hirschfeldia incana	0.1	10	EX								0.1	
Rumex crispus	0.1	1	EX								0.1	
Anthoxanthum odoratum	0.1	10	EX								0.1	
Bromus hordeaceus	0.1	20	EX								0.1	
Vulpia myuros	0.1	10	EX								0.1	
Verbascum virgatum	0.1	1	EX								0.1	
Anagallis arvensis	0.1	1	EX								0.1	
Hypochaeris radicata	0.1	2	EX								0.1	
Oxalis perennans	0.1	20	FG					0.1				
Crassula sieberiana	0.1	50	FG					0.1				
Austrostipa scabra	30	200	GG				30					
Carex inversa	0.1	20	GG				0.1					
Rytidosperma tenuius	1	100	GG				1					
Bothriochloa macra	0.3	100	GG				0.3					
Lomandra longifolia	0.1	1	GG				0.1					
Rosa rubiginosa	0.5	6	HT									0.5
Hypericum perforatum	0.1	5	HT									0.1
Bromus diandrus	0.1	10	HT									0.1
Pimelea pauciflora	0.1	5	SG			0.1						

Veg Zone = PCT1191 Native dominant grassland			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: BruceGrass4			24	10	0	0	6	3	0	1	13	3
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			117.8	10.7	0	0	10.3	0.3	0	0.1	107	25.2
Verbascum thapsus	1	60	EX								1	
Hypochaeris radicata	0.1	2	EX								0.1	
Avena barbata	60	500	EX								60	
Petrorhagia nanteuilii	0.2	200	EX								0.2	
Trifolium arvense	20	100	EX								20	
Bromus hordeaceus	0.1	100	EX								0.1	
Anthoxanthum odoratum	0.1	100	EX								0.1	
Echium vulgare	0.1	10	EX								0.1	
Hirschfeldia incana	0.1	1	EX								0.1	
Vulpia myuros	0.1	10	EX								0.1	
Acaena ovina	0.1	2	FG					0.1				
Senecio quadridentatus	0.1	1	FG									
Oxalis perennans	0.1	10	FG					0.1				
Ammobium alatum	0.1	3	FG					0.1				
Themeda triandra	5	200	GG				5					
Rytidosperma tenuius	2	200	GG				2					
Bothriochloa macra	3	100	GG				3					
Poa sieberiana	0.1	1	GG				0.1					
Elymus scaber	0.1	10	GG				0.1					
Austrostipa scabra	0.1	1	GG				0.1					
Rosa rubiginosa	20	11	HT									20
Hypericum perforatum	5	50	HT									5
Nassella trichotoma	0.2	5	HT									0.2
Convolvulus erubescens	0.1	1	OG							0.1		

Veg Zone = PCT1191 Native dominant grassland			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: DNG11			23	13	0	0	7	6	0	0	10	3
Species	Cover	Abundance	Sum cover	Cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			76.5	33	0	0	31.7	1.3	0	0	43.5	31.2
Poaceae sp. - *inadequate material for ID*	5	1000	EX								5	
Taraxacum officinale	2	150	EX								2	
Trifolium arvense	3	1000	EX								3	
Verbascum thapsus	0.5	30	EX								0.5	
Medicago sp.	1	200	EX								1	
grass tuft died off. Possibly Dactylis glomerata - inadequate material for ID	0.5	20	EX								0.5	
Hypochaeris radicata	0.3	30	EX								0.3	
basal tuft (possibly Coronidium scorp/mont) - inadequate material for ID	0.2	4	FG					0.2				
Euchiton sp.	0.3	100	FG					0.3				
Geranium sp.	0.3	50	FG					0.3				
Dichondra repens	0.2	50	FG					0.2				
Acaena sp.	0.2	20	FG					0.2				
Cymbonotus sp.	0.1	3	FG					0.1				
Poa sp.	10	1000	GG				10					
Austrostipa sp.	15	2000	GG				15					
Rytidosperma sp.	1	30	GG				1					
Elymus scaber	5	300	GG				5					
Echinopogon sp.	0.1	2	GG				0.1					
Panicum sp.	0.3	30	GG				0.3					
Poa sp.	0.3	4	GG				0.3					
Hypericum perforatum	30	1000	HT									30
Acetosella vulgaris	1	200	HT									1
Rosa rubiginosa	0.2	2	HT									0.2

Veg Zone = PCT1110 Themeda variant_Good			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: WCG1			28	13	0	0	5	7	0	1	15	2
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			109.1	36.6	0	0	35.8	0.7	0	0.1	72.5	0.2
Trifolium arvense	70	400	EX								70	
Petrorhagia nanteuilii	0.2	100	EX								0.2	
Verbascum thapsus	0.1	10	EX								0.1	
Avena sp.	0.1	2	EX								0.1	
Echium vulgare	0.1	5	EX								0.1	
Hypochaeris radicata	0.1	10	EX								0.1	
Vulpia myuros	1	200	EX								1	
Bromus hordeaceus	0.1	10	EX								0.1	
Anthoxanthum odoratum	0.2	50	EX								0.2	
Erodium cicutarium	0.1	50	EX								0.1	
Taraxacum officinale	0.1	1	EX								0.1	
Arenaria leptoclados	0.1	1	EX								0.1	
Linaria arvensis	0.1	1	EX								0.1	
Oxalis perennans	0.1	10	FG					0.1				
Acaena ovina	0.1	10	FG					0.1				
Epilobium billardierianum	0.1	10	FG					0.1				
Wahlenbergia communis	0.1	10	FG					0.1				
Crassula sieberiana	0.1	200	FG					0.1				
Vittadinia muelleri	0.1	1	FG					0.1				
Dichondra sp. A	0.1	10	FG					0.1				
Themeda triandra	30	200	GG				30					
Rytidosperma tenuius	5	300	GG				5					
Poa sieberiana	0.5	20	GG				0.5					
Austrostipa scabra	0.2	50	GG				0.2					
Carex inversa	0.1	20	GG				0.1					
Acetosella vulgaris	0.1	20	HT									0.1
Rosa rubiginosa	0.1	1	HT									0.1
Convolvulus erubescens	0.1	20	OG							0.1		

Veg Zone = PCT1110 Themeda variant_Good			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: DNG12			24	16	0	1	9	6	0	0	8	3
Species	Cover	Abundance	Sum cover	Cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			91.1	80.8	0	0.3	76.7	3.8	0	0	10.3	2.7
Verbascum thapsus	5	200	EX								5	
Trifolium sp.	2	2000	EX								2	
basal tuft - young? Prob. Exotic - narrow concave leaves - inadequate material for ID	0.2	50	EX								0.2	
Poaceae sp.	0.2	10	EX								0.2	
Hypochaeris radicata	0.2	20	EX								0.2	
Acaena sp.	1	200	FG					1				
Epilobium sp.	0.5	50	FG					0.5				
basal tuft - young? (poss. Coronidium sp.) - inadequate material for ID	0.2	50	FG					0.2				
Dichondra repens	1	400	FG					1				
Euchiton sp.	0.1	20	FG					0.1				
basal tuft - 5 veined glossy leaves? Asteraceae? - inadequate material for ID	1	300	FG					1				
Themeda triandra	40	1000	GG				40					
Austrostipa sp.	15	1000	GG				15					
Rytidosperma sp.	5	300	GG				5					
Poa sp.	5	50	GG				5					
Panicum sp.	5	200	GG				5					
Echinopogon sp.	0.5	10	GG				0.5					
Carex breviculmis	0.2	20	GG				0.2					
Poa sieberiana	5	150	GG				5					
Elymus scaber	1	100	GG				1					
Acetosella vulgaris	2	500	HT									2
Hypericum perforatum	0.5	50	HT									0.5
Holcus lanatus	0.2	10	HT									0.2
Pimelea pauciflora	0.3	1	SG			0.3						

Veg Zone = PCT1110 Themeda variant_Good			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: SCRGrass2			26	14	1	1	3	8	0	1	12	2
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			116.1	100.6	2	0.1	95	3.4	0	0.1	15.5	1.1
Aira elegantissima	0.1	70	EX								0.1	
Bromus hordeaceus	1	100	EX								1	
Centaurium erythraea	0.5	100	EX								0.5	
Hypochaeris glabra	1	200	EX								1	
Plantago lanceolata	0.1	1	EX								0.1	
Poa pratensis	1	100	EX								1	
Potentilla recta	0.1	1	EX								0.1	
Trifolium arvense	0.2	20	EX								0.2	
Verbascum Thapsus	0.4	50	EX								0.4	
Vulpia myuros	10	2000	EX								10	
Acaena ovina	0.5	50	FG					0.5				
Ammobium alatum	0.1	10	FG					0.1				
Dichondra sp. A	0.2	20	FG					0.2				
Epilobium billardierianum	2	50	FG					2				
Geranium solanderi	0.2	40	FG					0.2				
Hydrocotyle laxiflora	0.1	1	FG					0.1				
Oxalis perennans	0.2	40	FG					0.2				
Vittadinia cuneata	0.1	10	FG					0.1				
Austrostipa sp.	5	500	GG				5					
Poa sieberiana	10	500	GG				10					
Themeda triandra	80	2000	GG				80					
Acetosella vulgaris	1	50	HT									1
Hypericum perforatum	0.1	10	HT									0.1
Convolvulus erubescens	0.1	10	OG							0.1		
Leucopogon fletcheri subsp. *brevisepalus*	0.1	1	SG			0.1						
Eucalyptus pauciflora	2	8	TG		2							

APPENDIX A-2
Jindabyne West sub-precinct mapping

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Snowy SAP - Field Survey Effort

Figure A.1

Jindabyne West Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Waterbodies
- Watercourse
- Roads

Field Suvey Effort

- BAM Plot
- Rapid Data Points

Fauna Habitat Assessment Sites

- Herpetofauna survey
- Reptile search

0 0.15 0.3 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:7,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

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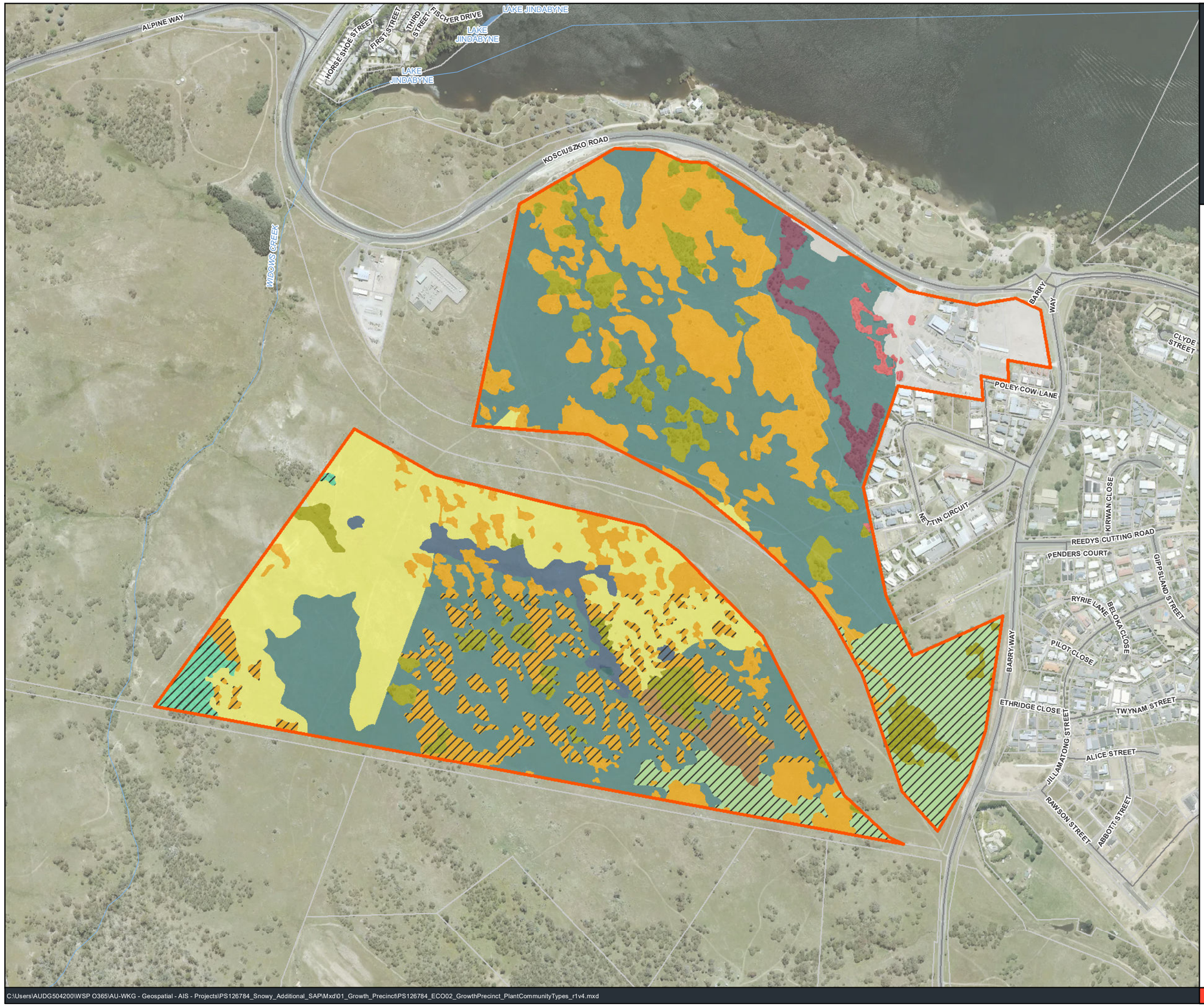


Snowy SAP - Plant Community Types

Figure A.2

Jindabyne West Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Waterbodies
- Watercourse
- Roads

Plant Community Types and Vegetation Zones

- PCT 1191, Good
- PCT 1191, Native dominant grassland
- PCT 1191, Rocky outcrop
- PCT 1191, Exotic dominant grassland
- PCT 1191, Poor
- PCT 1191, Moderate
- PCT 1191, Revegetation
- PCT 1110, Themeda variant (Good)
- PCT 1110, Poa variant (Good)
- PCT 1110, Poa variant (Moderate)
- PCT 1110, Poa variant (Poor)
- PCT 1110, Native dominant grassland
- PCT 1110, Exotic dominant grassland
- Miscellaneous/exotic

0 0.15 0.3 km

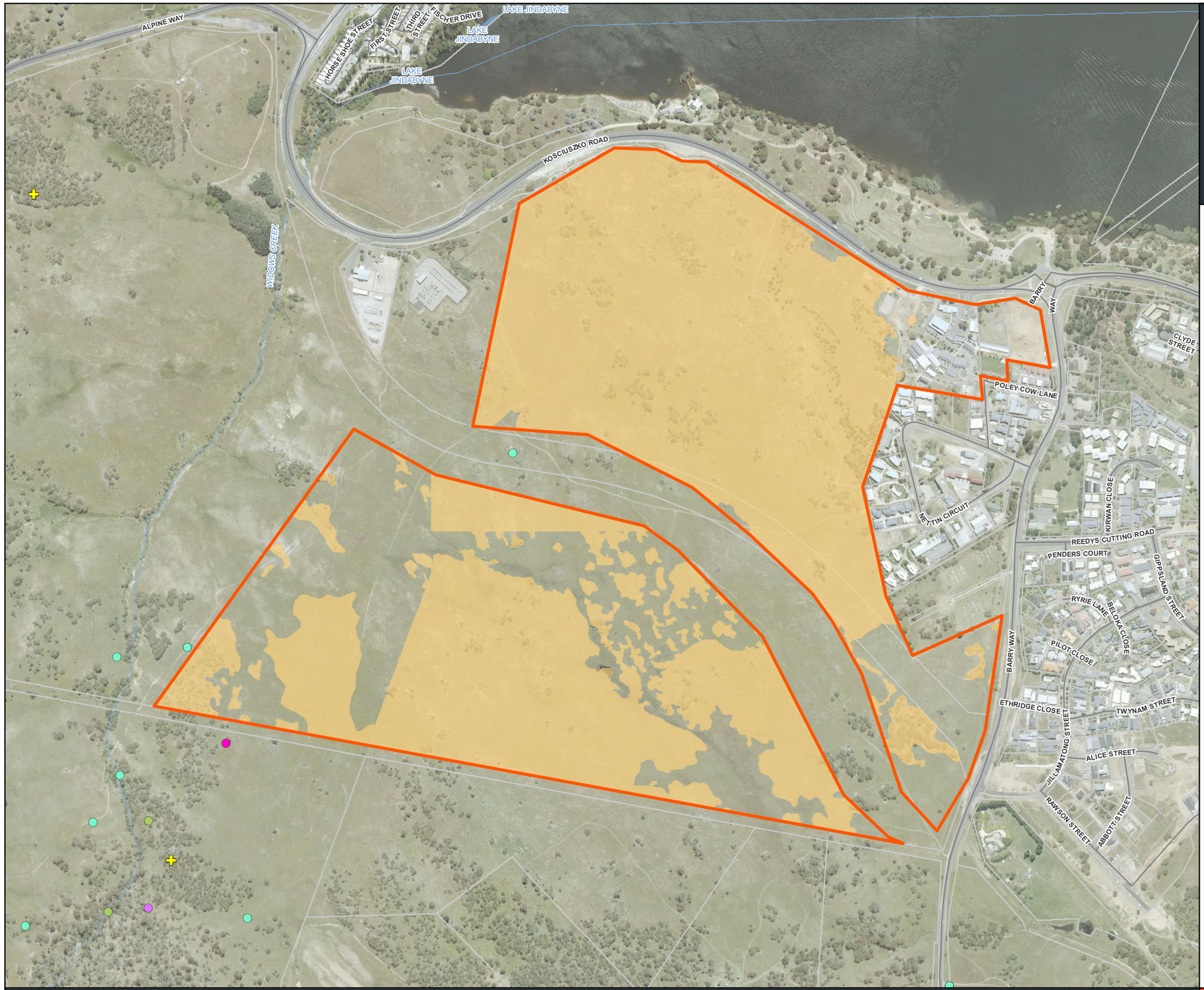
Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:7,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

C:\Users\AUDG504200\WSP O365\AU-WKG - Geospatial - AIS - Projects\PS126784_Snowy_Additional_SAP\Mxd\01_Growth_Precinct\PS126784_ECO02_GrowthPrecinct_PlantCommunityTypes_r1v4.mxd



Snowy SAP - BC Act Listed Biodiversity

Figure A.3

Jindabyne West Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Waterbodies
- Watercourse
- Roads
- Hollow-bearing tree

Threatened Fauna Species

- Dusky Woodswallow
- Satin flycatcher
- Rufous fantail
- Little Eagle

Threatened Ecological Communities (BC Act)

- Monaro Tableland Cool Temperate Grassy Woodland in The South Eastern Highlands Bioregion

0 0.15 0.3 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:7,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

Snowy SAP - EPBC Act Listed Biodiversity

Figure A.4

Jindabyne West Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Waterbodies
- Watercourse
- Roads

Threatened Ecological Communities (EPBC Act)

- Natural Temperate Grassland of the South Eastern Highlands

0 0.15 0.3 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:7,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

C:\Users\AUDG504200\WSP O365\AU-WKG - Geospatial - AIS - Projects\PS126784_Snowy_Additional_SAP\Mxd\01_Growth_Precinct\PS126784_ECO04_GrowthPrecinct_ThreatenedEcologicalCommunities_EPBCAct_r1v4.mxd

APPENDIX A-3
Jindabyne West sub-precinct BAM candidate species report

BAM Candidate Species Report

Proposal Details

Assessment Id 00023687/BAAS17060/22/00031129	Proposal Name Jindabyne West	BAM data last updated * 24/11/2021
Assessor Name Lukas Leslie Clews	Report Created 15/02/2022	BAM Data version * 50
Assessor Number BAAS17060	Assessment Type Biocertification	BAM Case Status Open
Assessment Revision 0	Date Finalised To be finalised	

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

List of Species Requiring Survey

Name	Presence	Survey Months
Thesium australe Austral Toadflax		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Gentiana baeuerlenii Baeuerlen's Gentian		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Ninox connivens Barking Owl		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Eucalyptus aggregata Black Gum		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Diuris aequalis Buttercup Doubletail		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Rutidosis leptorrhynchoides Button Wrinklewort		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Dodonaea procumbens Creeping Hop-bush		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Commersonia prostrata Dwarf Kerrawang		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Cercartetus nanus Eastern Pygmy-possum		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Callocephalon fimbriatum Gang-gang Cockatoo		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Calyptorhynchus lathami Glossy Black-Cockatoo		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Petauroides volans Greater Glider		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Litoria aurea Green and Golden Bell Frog		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Leucochrysum albicans var. tricolor Hoary Sunray		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Phascolarctos cinereus Koala		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Miniopterus orianae oceanensis Large Bent-winged Bat		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Hieraaetus morphnoides Little Eagle		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Calotis glandulosa Mauve Burr-daisy		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Eucalyptus macarthurii Paddys River Box, Camden Woollybutt		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Petroica rodinogaster Pink Robin		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Aprasia parapulchella Pink-tailed Legless Lizard		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Ninox strenua Powerful Owl		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Anthochaera phrygia Regent Honeyeater		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Euphrasia scabra Rough Eyebright		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Swainsona sericea Silky Swainson-pea		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Litoria raniformis Southern Bell Frog		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Myotis macropus Southern Myotis		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Delma impar Striped Legless Lizard		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Prasophyllum petilum Tarengo Leek Orchid		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Caladenia tessellata Thick Lip Spider Orchid		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Haliaeetus leucogaster White-bellied Sea-Eagle		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Threatened species Manually Added

None added

Appendix B

East Jindabyne sub-precinct

APPENDIX B-1
East Jindabyne sub-precinct flora survey data

Veg Zone = PCT1191 Moderate			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: EpaucWBAMPl1			36	28	2	6	9	9	1	1	8	2
Species	Cover	Abundance	Sum cover	Cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			96.3	87.5	35	18.6	22.7	9	0.2	2	8.8	0.6
Asplenium flabellifolium	0.2	6	EG						0.2			
Taraxacum officinale	0.3	2	EX								0.3	
Echium vulgare	0.3	10	EX								0.3	
Verbascum thapsus	5	100	EX								5	
Erodium cicutarium	0.3	4	EX								0.3	
Medicago sp.	0.3	20	EX								0.3	
Trifolium arvense	2	50	EX								2	
Senecio sp.	3	150	FG					3				
Oxalis sp.	1	150	FG					1				
Scleranthus diander	1	4	FG					1				
Geranium sp.	2	10	FG					2				
Acaena sp.	1	20	FG					1				
Dichondra repens	0.3	50	FG					0.3				
Bulbine bulbosa	0.1	1	FG					0.1				
Hypericum gramineum	0.1	2	FG					0.1				
Coronidium sp.	0.5	50	FG					0.5				
Panicum sp.	2	50	GG				2					
Rytidosperma sp.	5	200	GG				5					
Themeda triandra	10	150	GG				10					
Poa sp.	2	20	GG				2					
Elymus scaber	0.5	20	GG				0.5					
Dichelachne sp.	0.5	10	GG				0.5					
Poa sp.	0.5	20	GG				0.5					
Austrostipa sp.	2	30	GG				2					
Carex inversa	0.2	2	GG				0.2					
Acetosella vulgaris	0.1	1	HT									0.1
Cotoneaster sp.	0.5	3	HT									0.5
Clematis leptophylla	2	5	OG							2		
Melicytus angustifolius subsp. *divaricatus*	10	30	SG			10						
Grevillea lanigera	3	3	SG			3						
Pimelea pauciflora	0.2	2	SG			0.2						
Cassinia sp.	5	15	SG			5						
Cassinia longifolia	0.3	2	SG			0.3						
Mirbelia oxylobioides	0.1	1	SG			0.1						
Eucalyptus pauciflora	30	16	TG		30							
Acacia dealbata	5	3	TG		5							

Veg Zone = PCT1191 Moderate			**Covers**	**Native**	Trees	Shrubs	Grass	Forb	Fern	Other	**Exotic**	HighThreat
			# spp	**Count**	Count	Count	Count	Count	Count	Count	**Count**	Count
BAM Plot: EpaucWBAMPl2			**39**	**30**	2	5	10	13	0	0	**9**	2
Species	**Cover**	**Abundance**	**Sum cover**	**Cover**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			89.8	**83.3**	33	7.6	38.1	4.6	0	0	**6.5**	1.2
Trifolium arvense	0.5	30	EX								0.5	
Hypochaeris radicata	0.3	20	EX								0.3	
Verbascum thapsus	2	150	EX								2	
Dactylis glomerata	1	30	EX								1	
Plantago lanceolata	1	50	EX								1	
Anthoxanthum odoratum	0.3	10	EX								0.3	
Taraxacum officinale	0.2	20	EX								0.2	
Dichondra repens	1	300	FG					1				
Senecio sp.	0.5	50	FG					0.5				
Swainsona sp.	0.2	10	FG					0.2				
Senecio sp. *2*	0.2	3	FG					0.2				
Acaena sp.	0.5	50	FG					0.5				
Geranium sp.	0.5	50	FG					0.5				
Hydrocotyle laxiflora	0.3	30	FG					0.3				
Plantago sp.	0.5	20	FG					0.5				
Asperula conferta	0.2	10	FG					0.2				
Hypericum gramineum	0.1	10	FG					0.1				
Cymbonotus sp.	0.2	20	FG					0.2				
Swainsona behriana	0.1	4	FG					0.1				
Coronidium sp.	0.3	10	FG					0.3				
Themeda triandra	20	2000	GG				20					
Poa sieberiana	2	30	GG				2					
Panicum sp.	3	150	GG				3					
Austrostipa sp.	10	300	GG				10					
Dichelachne sp.	1	50	GG				1					
Elymus scaber	1	30	GG				1					
Poa labillardierei	0.5	5	GG				0.5					
Carex sp.	0.3	10	GG				0.3					
Carex breviculmis	0.1	5	GG				0.1					
Echinopogon sp.	0.2	10	GG				0.2					
Acetosella vulgaris	1	150	HT									1
Pyracantha sp.	0.2	1	HT									0.2
Melicytus angustifolius subsp. *divaricatus*	5	10	SG			5						
Pimelea pauciflora	2	20	SG			2						
Pimelea linifolia	0.1	2	SG			0.1						
Leucopogon fletcheri	0.3	3	SG			0.3						
Bossiaea buxifolia	0.2	2	SG			0.2						
Eucalyptus pauciflora	30	23	TG		30							
Acacia dealbata	3	6	TG		3							

Veg Zone = PCT1191 Moderate			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: EpaucWBAMPl4			34	21	2	4	7	7	0	1	13	4
Species	Cover	Abundance	Sum cover	Cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			99.8	84.4	55	3.8	21.5	3.9	0	0.2	15.4	5.6
Taraxacum officinale	1	20	EX								1	
Cirsium sp.	0.3	5	EX								0.3	
Poaceae sp. *exotic tuft - inadequate material for ID*	2	50	EX								2	
Conium maculatum	2	20	EX								2	
Verbascum thapsus	3	100	EX								3	
Galium aparine	0.3	10	EX								0.3	
Veronica peregrina	0.5	30	EX								0.5	
Trifolium arvense	0.2	20	EX								0.2	
Echium sp.	0.5	50	EX								0.5	
Acaena sp.	0.5	30	FG					0.5				
Geranium sp.	0.5	50	FG					0.5				
Senecio sp.	2	30	FG					2				
Cymbonotus lawsonianus	0.5	10	FG					0.5				
Epilobium sp.	0.1	2	FG					0.1				
Dichondra repens	0.2	30	FG					0.2				
Hypericum gramineum	0.1	2	FG					0.1				
Poa sieberiana	10	150	GG				10					
Elymus scaber	1	20	GG				1					
Themeda triandra	5	200	GG				5					
Poa sp.	5	20	GG				5					
Dichelachne sp.	0.1	2	GG				0.1					
Poaceae sp.	0.3	30	GG				0.3					
Carex breviculmis	0.1	3	GG				0.1					
Rosa rubiginosa	0.2	3	HT									0.2
Rubus fruticosus agg.	5	20	HT									5
Cotoneaster sp.	0.2	1	HT									0.2
Acetosella vulgaris	0.2	20	HT									0.2
Clematis leptophylla	0.2	3	OG							0.2		
Pimelea pauciflora	3	20	SG			3						
Cassinia aculeata	0.5	2	SG			0.5						
Cryptandra amara	0.2	20	SG			0.2						
Leucopogon fletcheri subsp. *brevisepalus*	0.1	3	SG			0.1						
Eucalyptus pauciflora	40	12	TG		40							
Acacia dealbata	15	14	TG		15							

Veg Zone = PCT1191 Shrubland			**Covers**	**Native**	Trees	Shrubs	Grass	Forb	Fern	Other	**Exotic**	HighThreat
			# spp	**Count**	Count	Count	Count	Count	Count	Count	**Count**	Count
BAM Plot: EJReg1			**18**	**10**	1	1	4	4	0	0	**8**	2
Species	**Cover**	**Abundance**	**Sum cover**	**Cover**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			62.8	**56.3**	50	0.1	5.7	0.5	0	0	**6.5**	0.4
Hordeum sp.	0.1	1	EX								0.1	
Thin green Poaceae - inadequate material for ID	5	1500	EX								5	
Trifolium arvense	0.3	100	EX								0.3	
Echium vulgare	0.2	10	EX								0.2	
Anagallis arvensis	0.3	25	EX								0.3	
Verbascum thapsus	0.2	10	EX								0.2	
Crassula sieberiana	0.2	120	FG					0.2				
Caladenia sp.	0.1	20	FG					0.1				
Epilobium billardierianum	0.1	10	FG					0.1				
Acaena ovina	0.1	3	FG					0.1				
Panicum effusum	0	20	GG				0					
Rytidosperma sp.	5	500	GG				5					
Austrostipa sp.	0.2	20	GG				0.2					
Enneapogon nigricans	0.5	200	GG				0.5					
Hypericum perforatum	0.1	10	HT									0.1
Acetosella vulgaris	0.3	25	HT									0.3
Pimelea pauciflora	0.1	1	SG			0.1						
Acacia dealbata	50	500	TG		50							

Veg Zone = PCT1191 Native dominant grassland			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: EJGrass5			13	7	0	0	7	0	0	0	6	1
Species	Cover	Abundance	Sum cover	Cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			88.4	82.5	0	0	82.5	0	0	0	5.9	0.2
Verbascum thapsus	0.3	20	EX								0.3	
Trifolium arvense	5	1000	EX								5	
Hirschfeldia incana	0.1	1	EX								0.1	
Avena sp.	0.2	20	EX								0.2	
Centaurea solstitialis	0.1	1	EX								0.1	
Austrostipa sp.	30	200	GG				30					
Panicum effusum	40	500	GG				40					
Poa sp. *- inadequate material for ID*	0.2	2	GG				0.2					
Austrostipa scabra	0.1	10	GG				0.1					
Enneapogon nigricans	2	200	GG				2					
Rytidosperma sp.	10	1000	GG				10					
Austrostipa sp. 2 - inadequate material for ID	0.2	5	GG				0.2					
Hypericum perforatum	0.2	20	HT									0.2

Veg Zone = PCT1110 Themeda variant_Good			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: DNGBAMPl3			27	17	0	0	7	10	0	0	10	0
Species	Cover	Abundance	Sum cover	Cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			106	80.9	0	0	76.5	4.4	0	0	25.1	0
Trifolium arvense	15	2000	EX								15	
Echium vulgare	5	500	EX								5	
Taraxacum officinale	1	20	EX								1	
Verbascum thapsus	3	50	EX								3	
Forb seedling - inadequate material for ID	0.1	1	EX								0.1	
Erodium cicutarium	0.2	20	EX								0.2	
Rosette weed	0.1	1	EX								0.1	
Hypochaeris radicata	0.3	6	EX								0.3	
Rumex sp.	0.2	2	EX								0.2	
Cirsium vulgare	0.2	10	EX								0.2	
Cymbonotus sp.	3	100	FG					3				
Oreomyrrhis sp.	0.1	2	FG					0.1				
Epilobium sp.	0.2	20	FG					0.2				
Asperula conferta	0.1	1	FG					0.1				
Asteraceae sp. - *inadequate material for ID*	0.2	10	FG					0.2				
Oxalis sp.	0.2	10	FG					0.2				
Acaena sp.	0.2	10	FG					0.2				
Geranium sp.	0.1	10	FG					0.1				
Ammobium sp.	0.1	2	FG					0.1				
Chrysocephalum sp.	0.2	20	FG					0.2				
Austrostipa sp.	40	2000	GG				40					
Themeda triandra	30	1000	GG				30					
Panicum sp.	2	50	GG				2					
Elymus scaber	2	50	GG				2					
Poaceae sp.	2	50	GG				2					
Poa sp.	0.3	3	GG				0.3					
Carex sp.	0.2	20	GG				0.2					

Veg Zone = PCT1110 Themeda variant_Good			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: EJGrass1			15	10	0	0	6	4	0	0	5	0
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			97.9	58.9	0	0	57.6	1.3	0	0	39	0
Verbascum thapsus	3	200	EX								3	
Echium vulgare	15	500	EX								15	
Trifolium arvense	20	2000	EX								20	
Hypochaeris radicata	0.5	50	EX								0.5	
Petrorhagia sp.	0.5	50	EX								0.5	
Vittadinia sp.	1	200	FG					1				
Acaena ovina	0.1	10	FG					0.1				
Rumex brownii	0.1	1	FG					0.1				
Asperula conferta	0.1	10	FG					0.1				
Rytidosperma sp. - inadequate material for ID	30	2000	GG				30					
Panicum effusum	25	1000	GG				25					
Austrostipa sp. - inadequate material for ID	1	50	GG				1					
Enneapogon nigricans	0.1	10	GG				0.1					
Poa sp. - inadequate material for ID	0.5	20	GG				0.5					
Anthosachne scaber	1	100	GG				1					

Veg Zone = PCT1110 Themeda variant_Good			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: EJGrass2			24	15	0	1	6	7	0	1	9	3
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			97	83.2	0	0.3	81.1	1.7	0	0.1	13.8	1.2
Verbascum thapsus	0.5	20	EX								0.5	
Echium vulgare	0.5	20	EX								0.5	
Trifolium arvense	10	1000	EX								10	
Hypochaeris radicata	0.5	50	EX								0.5	
Petrorhagia sp.	0.1	10	EX								0.1	
Thin Poaceae sp. - inadequate material for ID	1	1000	EX								1	
Cymbonotus lawsonianus	0.2	10	FG					0.2				
oxalis perennans	0.1	10	FG					0.1				
Euchiton sp.	0.1	10	FG					0.1				
Vittadinia muelleri	0.1	20	FG					0.1				
Crassula sieberiana	1	40	FG					1				
Acaena ovina	0.1	10	FG					0.1				
Oreomyrrhis sp.	0.1	1	FG					0.1				
Themeda triandra	80	2000	GG				80					
Panicum effusum	0.5	30	GG				0.5					
Austrostipa sp. - inadequate material for ID	0.2	10	GG				0.2					
Poa sp.	0.2	5	GG				0.2					
Enneapogon nigricans	0.1	10	GG				0.1					
Rytidosperma sp.	0.1	5	GG				0.1					
Acetosella vulgaris	1	50	HT									1
Hypericum perforatum	0.1	10	HT									0.1
Nassella trichotoma	0.1	2	HT									0.1
Convolvulus sp.	0.1	10	OG							0.1		
Leucopogon sp.	0.3	10	SG			0.3						

Veg Zone = PCT1110 Themeda variant_Good			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: EJGrass4			23	16	0	2	5	7	2	0	7	0
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			80.7	45.3	0	0.6	43.2	1.3	0.2	0	35.4	0
Asplenium flabellifolium	0.1	10	EG						0.1			
Cheilanthes sieberi	0.1	10	EG						0.1			
Verbascum thapsus	10	200	EX								10	
Erodium sp.	0.1	10	EX								0.1	
Trifolium arvense	10	2000	EX								10	
Echium vulgare	15	500	EX								15	
Marrubium vulgare	0.1	10	EX								0.1	
Petrorhagia sp.	0.1	20	EX								0.1	
Linaria sp.	0.1	20	EX								0.1	
Oxalis perennans	0.2	50	FG					0.2				
Cymbonotus lawsonianus	0.2	20	FG					0.2				
Crassula sieberiana	0.3	200	FG					0.3				
Acaena ovina	0.1	10	FG					0.1				
Dichondra repens	0.3	50	FG					0.3				
Epilobium billardiereanum	0.1	5	FG					0.1				
Rumex brownii	0.1	1	FG					0.1				
Austrostipa sp. - inadequate material for ID	40	500	GG				40					
Carex breviculmis	1	150	GG				1					
Themeda triandra	1	25	GG				1					
Panicum effusum	0.2	20	GG				0.2					
Enneapogon nigricans	1	50	GG				1					
Melicytus angustifolius subsp. *divaricatus*	0.5	3	SG			0.5						
Leucopogon fletcheri	0.1	2	SG			0.1						

Veg Zone = PCT1110 Poa variant_Good			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: EJGrass3			26	14	0	0	4	10	0	0	12	2
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			88.2	83	0	0	81.1	1.9	0	0	5.2	0.2
Verbascum thapsus	1	100	EX								1	
Verbascum sp.	0.2	20	EX								0.2	
Echium vulgare	0.5	50	EX								0.5	
Trifolium arvense	2	1000	EX								2	
Taraxacum officinale	0.2	20	EX								0.2	
Caryophyllaceae sp. Arenaria? - inadequate material for ID	0.2	50	EX								0.2	
Thin Poaceae sp. - inadequate material for ID	0.4	100	EX								0.4	
Petrorhagia sp.	0.2	50	EX								0.2	
Hypochaeris radicata	0.2	20	EX								0.2	
Onopordum acanthium	0.1	1	EX								0.1	
Vittadinia sp.	0.2	20	FG					0.2				
Calotis sp.	0.2	20	FG					0.2				
Euchiton sp.	0.2	20	FG					0.2				
Acaena ovina	0.4	20	FG					0.4				
Cymbonotus lawsonianus	0.3	20	FG					0.3				
Oreomyrrhis sp.	0.2	20	FG					0.2				
Geranium sp.	0.1	10	FG					0.1				
Asperula conferta	0.1	20	FG					0.1				
Woolly linear leaf daisy - inadequate material for ID	0.1	1	FG					0.1				
Dichondra repens	0.1	5	FG					0.1				
Poa labillardierei	80	2000	GG				80					
Austrostipa scabra	0.5	100	GG				0.5					
Panicum effusum	0.5	100	GG				0.5					
Anthosachne scaber	0.1	1	GG				0.1					
Hypericum perforatum	0.1	10	HT									0.1
Acetosella vulgaris	0.1	10	HT									0.1

APPENDIX B-2
East Jindabyne sub-precinct mapping

wsp

Snowy SAP - Field Survey Effort

Figure B.1

East Jindabyne Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Roads

Field Survey Effort

- BAM Plot
- Rapid Data Points

0 0.1 0.2 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:4,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

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Snowy SAP - Plant Community Types

Figure B.2

East Jindabyne Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Roads

Plant Community Types and Vegetation Zones

- PCT 1191, Native dominant grassland
- PCT 1191, Rocky outcrop
- PCT 1191, Shrubland
- PCT 1191, Exotic dominant grassland
- PCT 1191, Poor
- PCT 1191, Moderate
- PCT 1110, Themeda variant (Good)
- PCT 1110, Poa variant (Good)
- Miscellaneous/exotic

0 0.1 0.2 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:4,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

Snowy SAP - BC Act Listed Biodiversity

Figure B.3

East Jindabyne Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Roads

Threatened Flora Species

- *Swainsona sericea (potential)*

Threatened Ecological Communities (BC Act)

- Monaro Tableland Cool Temperate Grassy Woodland in The South Eastern Highlands Bioregion

0 0.1 0.2 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:4,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

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Snowy SAP - EPBC Act Listed Biodiversity

Figure B.4

East Jindabyne Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Roads

Threatened Flora Species

- *Swainsona sericea (potential)*

Threatened Ecological Communities (EPBC Act)

- Natural Temperate Grassland of the South Eastern Highlands

0 0.1 0.2 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:4,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

APPENDIX B-3
East Jindabyne sub-precinct
BAM candidate species report

BAM Candidate Species Report

Proposal Details

Assessment Id 00023687/BAAS17060/22/00031127	Proposal Name Snowy SAP East Jindabyne	BAM data last updated * 24/11/2021
Assessor Name Lukas Leslie Clews	Report Created 15/02/2022	BAM Data version * 50
Assessor Number BAAS17060	Assessment Type Biocertification	BAM Case Status Open
Assessment Revision 0	Date Finalised To be finalised	

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

List of Species Requiring Survey

Name	Presence	Survey Months
Thesium australe Austral Toadflax		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Gentiana baeuerlenii Baeuerlen's Gentian		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Ninox connivens Barking Owl		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Eucalyptus aggregata Black Gum		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Diuris aequalis Buttercup Doubletail		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Rutidosis leptorrhynchoides Button Wrinklewort		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Dodonaea procumbens Creeping Hop-bush		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Commersonia prostrata Dwarf Kerrawang		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Cercartetus nanus Eastern Pygmy-possum		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Callocephalon fimbriatum Gang-gang Cockatoo		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Calyptorhynchus lathami Glossy Black-Cockatoo		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Petauroides volans Greater Glider		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Litoria aurea Green and Golden Bell Frog		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Leucochrysum albicans var. tricolor Hoary Sunray		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Phascolarctos cinereus Koala		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Miniopterus orianae oceanensis Large Bent-winged Bat		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Hieraaetus morphnoides Little Eagle		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Calotis glandulosa Mauve Burr-daisy		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Eucalyptus macarthurii Paddys River Box, Camden Woollybutt		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Petroica rodinogaster Pink Robin		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Aprasia parapulchella Pink-tailed Legless Lizard		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Ninox strenua Powerful Owl		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Anthochaera phrygia Regent Honeyeater		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Euphrasia scabra Rough Eyebright		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Swainsona sericea Silky Swainson-pea		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Litoria raniformis Southern Bell Frog		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Myotis macropus Southern Myotis		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Delma impar Striped Legless Lizard		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Prasophyllum petilum Tarengo Leek Orchid		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Caladenia tessellata Thick Lip Spider Orchid		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Haliaeetus leucogaster White-bellied Sea-Eagle		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Threatened species Manually Added

None added

Appendix C

Leesville sub-precinct

APPENDIX C-1
Leesville sub-precinct flora survey data

Veg Zone = PCT1191 Moderate			**Covers**	**Native**	Trees	Shrubs	Grass	Forb	Fern	Other	**Exotic**	HighThreat
			# spp	**Count**	Count	Count	Count	Count	Count	Count	**Count**	Count
BAM Plot: EPaucrubBAMPl6			**27**	**12**	2	0	7	3	0	0	**15**	4
Species	**Cover**	**Abundance**	**Sum cover**	**Cover**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			129.7	**61.8**	25	0	36.5	0.3	0	0	**67.9**	45.4
Erodium cicutarium	0.3	10	EX								0.3	
Cirsium sp.	0.5	20	EX								0.5	
Echium sp.	1	50	EX								1	
Verbascum thapsus	3	30	EX								3	
Dactylis glomerata	1	30	EX								1	
Plantago lanceolata	10	500	EX								10	
Trifolium repens	2	300	EX								2	
Trifolium arvense	0.5	50	EX								0.5	
Poaceae sp. *- inadequate material for ID*	2	200	EX								2	
Taraxacum officinale	0.2	10	EX								0.2	
Onopordum acanthium	2	50	EX								2	
Oxalis sp.	0.1	4	FG					0.1				
Geranium sp.	0.1	10	FG					0.1				
Hydrocotyle sp.	0.1	3	FG					0.1				
Cynodon dactylon	30	5000	GG				30					
Poa sieberiana	5	200	GG				5					
Elymus scaber	0.3	50	GG				0.3					
Rytidosperma sp.	0.2	10	GG				0.2					
Themeda triandra	0.3	20	GG				0.3					
Poa sp.	0.5	10	GG				0.5					
Panicum sp.	0.2	10	GG				0.2					
Rosa rubiginosa	0.2	2	HT									0.2
Cenchrus clandestinum	25	2000	HT									25
Holcus lanatus	20	300	HT									20
Acetosella vulgaris	0.2	10	HT									0.2
Eucalyptus pauciflora	5	1	TG		5							
Eucalyptus rubida	20	2	TG		20							

Veg Zone = PCT1191 Good			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: EPaucrubBAMPl8			33	25	2	4	8	11	0	0	8	2
Species	Cover	Abundance	Sum cover	Cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			107.9	81.8	30.3	1.9	44	5.6	0	0	26.1	2.2
Plantago lanceolata	15	1000	EX								15	
Verbascum thapsus	3	200	EX								3	
Trifolium sp.	0.3	50	EX								0.3	
Poaceae sp. - *inadequate material for ID*	5	500	EX								5	
Taraxacum officinale	0.3	20	EX								0.3	
Trifolium arvense	0.3	200	EX								0.3	
Geranium sp.	0.5	30	FG					0.5				
Hydrocotyle sp.	0.5	30	FG					0.5				
Asperula conferta	0.2	30	FG					0.2				
Acaena sp.	0.2	20	FG					0.2				
Cymbonotus sp.	3	150	FG					3				
Basal rosette - inadequate material for ID	0.5	100	FG					0.5				
Veronica plebeia	0.1	2	FG					0.1				
Dichondra repens	0.1	3	FG					0.1				
Scleranthus singuliflorus	0.2	1	FG					0.2				
Hovea heterophylla	0.2	3	FG					0.2				
Hypericum gramineum	0.1	1	FG					0.1				
Themeda triandra	15	300	GG				15					
Poa sieberiana	15	300	GG				15					
Dichelachne sp.	1	30	GG				1					
Panicum sp.	1	50	GG				1					
Poa sp.	10	300	GG				10					
Rytidosperma sp.	1	50	GG				1					
Austrostipa sp.	0.5	20	GG				0.5					
Elymus scaber	0.5	20	GG				0.5					
Cenchrus clandestinum	2	200	HT									2
Rosa rubiginosa	0.2	1	HT									0.2
Melicytus angustifolius subsp. *divaricatus*	1	2	SG			1						
Pimelea pauciflora	0.5	2	SG			0.5						
Bossiaea buxifolia	0.2	1	SG			0.2						
Cryptandra amara	0.2	10	SG			0.2						
Eucalyptus pauciflora	30	28	TG		30							
Eucalyptus rubida	0.3	1	TG		0.3							

Veg Zone = PCT1191 Good			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: EPaucrubBAMPl9			30	20	2	1	6	11	0	0	10	1
Species	Cover	Abundance	Sum cover	Cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			134.8	123.7	40	0.2	80.5	3	0	0	11.1	0.2
Trifolium sp.	0.2	50	EX								0.2	
Trifolium repens	0.1	20	EX								0.1	
Plantago sp.	5	1000	EX								5	
Poaceae sp. - *inadequate material for ID*	2	200	EX								2	
Rytidosperma sp.	1	50	EX								1	
Cirsium vulgare	0.3	10	EX								0.3	
Verbascum thapsus	2	100	EX								2	
Erodium sp.	0.1	3	EX								0.1	
Hypochaeris radicata	0.2	20	EX								0.2	
Euchiton sp.	0.2	20	FG					0.2				
Acaena sp.	0.3	30	FG					0.3				
Asperula conferta	0.2	30	FG					0.2				
Cymbonotus sp.	1	200	FG					1				
Cynoglossum suaveolens	0.5	6	FG					0.5				
Hydrocotyle sp.	0.2	30	FG					0.2				
Geranium sp.	0.2	30	FG					0.2				
Senecio sp.	0.1	2	FG					0.1				
Coronidium sp.	0.1	1	FG					0.1				
Veronica plebeia	0.1	1	FG					0.1				
Scleranthus diander	0.1	1	FG					0.1				
Poa sp.	60	2000	GG				60					
Themeda triandra	15	300	GG				15					
Austrostipa sp.	2	100	GG				2					
Panicum sp.	1	50	GG				1					
Anthosachne scaber	0.5	30	GG				0.5					
Poa sieberiana	2	150	GG				2					
Acetosella vulgaris	0.2	10	HT									0.2
Leucopogon fletcheri subsp. *brevisepalus*	0.2	1	SG			0.2						
Eucalyptus pauciflora	25	11	TG		25							
Eucalyptus rubida	15	2	TG		15							

Veg Zone = PCT1191 Good			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: EPaucrubBAMPl10			33	25	3	3	9	10	0	0	8	1
Species	Cover	Abundance	Sum cover	Cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			128.9	115.5	40.3	0.9	71.7	2.6	0	0	13.4	0.1
Plantago sp.	2	300	EX								2	
Hypochaeris radicata	0.3	20	EX								0.3	
Verbascum thapsus	5	300	EX								5	
Trifolium arvense	0.3	100	EX								0.3	
Cirsium vulgare	0.5	20	EX								0.5	
Poaceae sp. - *inadequate material for ID*	5	100	EX								5	
Taraxacum officinale	0.2	4	EX								0.2	
Geranium sp.	0.5	100	FG					0.5				
Asperula conferta	0.3	100	FG					0.3				
Euchiton sp.	0.2	30	FG					0.2				
Solenogyne sp.	0.1	1	FG					0.1				
Hydrocotyle sp.	0.3	30	FG					0.3				
Cynoglossum suaveolens	0.1	2	FG					0.1				
Scleranthus singuliflorus	0.2	1	FG					0.2				
Cymbonotus sp.	0.5	50	FG					0.5				
Senecio sp.	0.2	1	FG					0.2				
Hovea heterophylla	0.2	2	FG					0.2				
Poa sp.	60	2000	GG				60					
Poa sieberiana	2	150	GG				2					
Themeda triandra	5	200	GG				5					
Panicum sp.	1	5	GG				1					
Rytidosperma sp.	2	50	GG				2					
Elymus scaber	0.3	10	GG				0.3					
Austrostipa sp.	1	30	GG				1					
Dichelachne sp.	0.2	6	GG				0.2					
Echinopogon sp.	0.2	2	GG				0.2					
Rosa rubiginosa	0.1	1	HT									0.1
Pimelea pauciflora	0.5	3	SG			0.5						
Cryptandra amara	0.2	2	SG			0.2						
Mirbelia oxylobioides	0.2	1	SG			0.2						
Eucalyptus pauciflora	10	8	TG		10							
Eucalyptus stellulata	30	15	TG		30							
Eucalyptus rubida	0.3	1	TG		0.3							

Veg Zone = PCT1191 Good			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: LVSGCB1			38	25	3	2	7	13	0	0	13	3
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			123.9	118.9	46	0.4	68.5	4	0	0	5	0.4
Verbascum thapsus	1	50	EX								1	
Hypochaeris radicata	0.2	20	EX								0.2	
Trifolium arvense	1	200	EX								1	
Petrorhagia sp.	0.3	50	EX								0.3	
Plantago lanceolata	0.2	10	EX								0.2	
Anthoxanthum odoratum	1	50	EX								1	
Taraxacum officinale	0.3	25	EX								0.3	
Cirsium vulgare	0.3	20	EX								0.3	
Poaceae sp. - inadequate material for ID	0.2	100	EX								0.2	
Echium vulgare	0.1	1	EX								0.1	
Dichondra repens	0.5	50	FG					0.5				
Euchiton sp.	0.2	20	FG					0.2				
Acaena ovina	1	100	FG					1				
Crassula sieberiana	0.2	50	FG					0.2				
Hydrocotyle laxiflora	0.5	200	FG					0.5				
Arthropodium sp.	0.3	25	FG					0.3				
Geranium sp.	0.2	20	FG					0.2				
Oxalis perennans	0.4	150	FG					0.4				
Asperula scoparia	0.2	50	FG					0.2				
Plantago gaudichaudii	0.1	10	FG					0.1				
Brachyscome scapigera	0.1	10	FG					0.1				
Cymbonotus lawsonianus	0.1	5	FG					0.1				
Einadia nutans	0.2	10	FG					0.2				
Austrostipa sp. - inadequate material for ID	25	500	GG				25					
Panicum effusum	1	50	GG				1					
Carex breviculmis	1	500	GG				1					
Microlaena stipoides	20	2000	GG				20					
Poa sp. - inadequate material for ID	0.5	5	GG				0.5					
Themeda triandra	1	50	GG				1					
Poa sieberiana	20	300	GG				20					
Acetosella vulgaris	0.2	20	HT									0.2
Rosa rubiginosa	0.1	1	HT									0.1
Hypericum perforatum	0.1	5	HT									0.1
Pimelea pauciflora	0.3	4	SG			0.3						
Melicytus angustifolius	0.1	1	SG			0.1						
Eucalyptus rubida	30	5	TG		30							
Eucalyptus pauciflora	15	20	TG		15							
Acacia melanoxylon	1	1	TG		1							

Veg Zone = PCT1191 Exotic dominant grassland			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: LVGrass1			19	8	0	0	3	5	0	0	11	2
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			98.9	16.9	0	0	16.2	0.7	0	0	82	0.2
Trifolium arvense	40	2000	EX								40	
Potentilla recta	15	1000	EX								15	
Cirsium vulgare	1	50	EX								1	
Trifolium repens	20	1000	EX								20	
Plantago lanceolata	5	250	EX								5	
Hirschfeldia incana	0.2	25	EX								0.2	
Poaceae sp. - inadequate material for ID	0.3	50	EX								0.3	
Hypochaeris radicata	0.2	20	EX								0.2	
Caryophyllaceae sp. - inadequate material for ID	0.1	10	EX								0.1	
Epilobium billardierianum	0.2	20	FG					0.2				
Asperula conferta	0.2	50	FG					0.2				
Ranunculus sp.	0.1	10	FG					0.1				
Geranium sp.	0.1	15	FG					0.1				
Acaena ovina	0.1	10	FG					0.1				
Austrostipa sp.	15	500	GG				15					
Panicum effusum	0.2	10	GG				0.2					
Rytidosperma sp.	1	100	GG				1					
Nassella trichotoma	0.1	1	HT									0.1
Hypericum perforatum	0.1	1	HT									0.1

Veg Zone = PCT1110 Poa variant_Good			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: LVGrass2			18	10	0	1	4	5	0	0	8	0
Species	Cover	Abundance	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			110.7	92.9	0	0.1	91	1.8	0	0	17.8	0
Potentilla recta	0.5	25	EX								0.5	
Trifolium arvense	15	500	EX								15	
Hypochaeris radicata	0.3	25	EX								0.3	
Plantago lanceolata	0.5	20	EX								0.5	
Cirsium vulgare	0.2	10	EX								0.2	
Taraxacum officinale	0.5	50	EX								0.5	
Poaceae sp. - inadequate material for ID	0.5	100	EX								0.5	
Holcus lanatus	0.3	20	EX								0.3	
Asperula conferta	0.5	200	FG					0.5				
Dichondra repens	1	100	FG					1				
Epilobium billardiereanum	0.1	10	FG					0.1				
Acaena ovina	0.1	10	FG					0.1				
Geranium sp.	0.1	10	FG					0.1				
Poa labillardierei	10	300	GG				10					
Austrostipa SP.	40	2000	GG				40					
Themeda triandra	1	40	GG				1					
Carex bichenoviana	40	2000	GG				40					
Pimelea sp.	0.1	2	SG			0.1						

Veg Zone = PCT1110 Poa variant_Moderate			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
BAM Plot: PoalabwetgreassPl7			12	7	0	0	5	2	0	0	5	0
Species	Cover	Abundance	Sum cover	Cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			143.2	115.7	0	0	115.4	0.3	0	0	27.5	0
Poaceae sp. - *inadequate material for ID*	5	30	EX								5	
Taraxacum officinale	0.2	30	EX								0.2	
Plantago lanceolata	2	200	EX								2	
Onopordum acanthium	0.3	6	EX								0.3	
Dactylis glomerata	20	300	EX								20	
Geranium sp.	0.2	30	FG					0.2				
Oreomyrrhis sp.	0.1	1	FG					0.1				
Poa labillardierei	80	2000	GG				80					
Themeda triandra	0.1	1	GG				0.1					
Juncus sp.	0.3	10	GG				0.3					
Carex sp.	30	1000	GG				30					
Austrostipa sp.	5	200	GG				5					

APPENDIX C-2
Leesville sub-precinct mapping

Snowy SAP - Field Survey Effort

Figure C.1

Leesville Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Watercourse
- Roads

Field Suvey Effort

- BAM Plot
- Rapid Data Points

0 0.1 0.2 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:5,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

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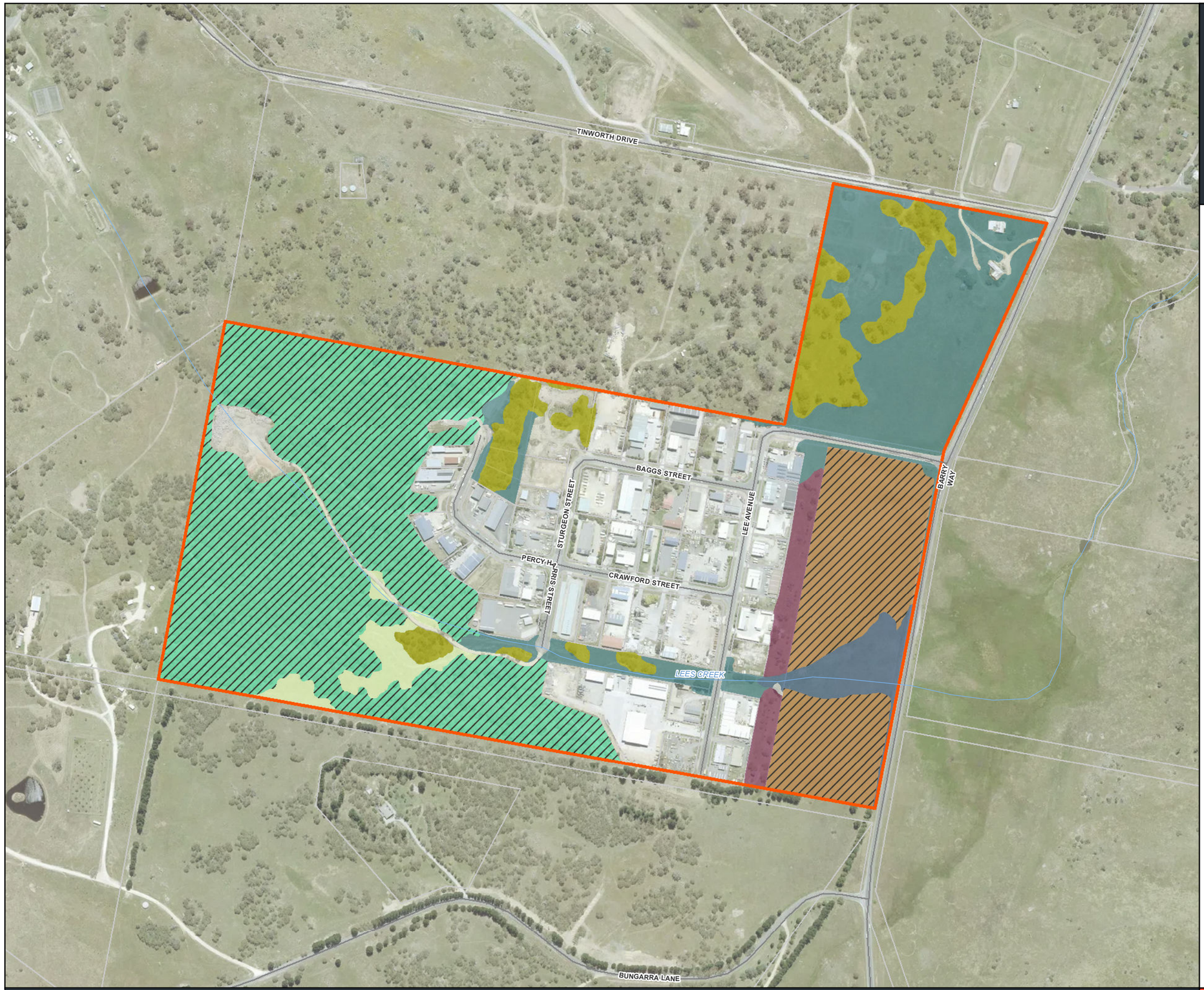

Snowy SAP - Plant Community Types

Figure C.2

Leesville Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Watercourse
- Roads

Plant Community Types and Vegetation Zones

- PCT 1191, Good
- PCT 1191, Native dominant grassland
- PCT 1191, Exotic dominant grassland
- PCT 1191, Moderate
- PCT 1191, Revegetation
- PCT 1110, Poa variant (Good)
- PCT 1110, Poa variant (Moderate)
- Miscellaneous/exotic

0 0.1 0.2 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:5,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

wsp

Snowy SAP - BC Act Listed Biodiversity

Figure C.3

Leesville Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Watercourse
- Roads
- Hollow-bearing tree

Threatened Flora Species

- *Swainsona sericea* (recorded 2017)

Threatened Fauna Species

- Dusky Woodswallow
- Little Eagle
- Flame Robin

Threatened Ecological Communities (BC Act)

- Monaro Tableland Cool Temperate Grassy Woodland in The South Eastern Highlands Bioregion

0 0.1 0.2 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:5,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

Snowy SAP - EPBC Act Listed Biodiversity

Figure C.4

Leesville Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Watercourse
- Roads

Threatened Flora Species

- *Swainsona sericea* (recorded 2017)

Threatened Ecological Communities (EPBC Act)

- Natural Temperate Grassland of the South Eastern Highlands

0 0.1 0.2 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:5,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

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APPENDIX C-3
Leesville sub-precinct BAM candidate species report

BAM Candidate Species Report

Proposal Details

Assessment Id 00023687/BAAS17060/22/00031128	Proposal Name Leesville	BAM data last updated * 24/11/2021
Assessor Name Lukas Leslie Clews	Report Created 15/02/2022	BAM Data version * 50
Assessor Number BAAS17060	Assessment Type Biocertification	BAM Case Status Open
Assessment Revision 0	Date Finalised To be finalised	

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

List of Species Requiring Survey

Name	Presence	Survey Months
Thesium australe Austral Toadflax		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Gentiana baeuerlenii Baeuerlen's Gentian		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Ninox connivens Barking Owl		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Eucalyptus aggregata Black Gum		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Diuris aequalis Buttercup Doubletail		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Rutidosis leptorrhynchoides Button Wrinklewort		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Dodonaea procumbens Creeping Hop-bush		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Commersonia prostrata Dwarf Kerrawang		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Cercartetus nanus Eastern Pygmy-possum		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Callocephalon fimbriatum Gang-gang Cockatoo		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Calyptorhynchus lathami Glossy Black-Cockatoo		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Petauroides volans Greater Glider		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Litoria aurea Green and Golden Bell Frog		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Leucochrysum albicans var. tricolor Hoary Sunray		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Phascolarctos cinereus Koala		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Miniopterus orianae oceanensis Large Bent-winged Bat		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Hieraaetus morphnoides Little Eagle		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Calotis glandulosa Mauve Burr-daisy		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Eucalyptus macarthurii Paddys River Box, Camden Woollybutt		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Petroica rodinogaster Pink Robin		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Aprasia parapulchella Pink-tailed Legless Lizard		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Ninox strenua Powerful Owl		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Anthochaera phrygia Regent Honeyeater		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Euphrasia scabra Rough Eyebright		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Swainsona sericea Silky Swainson-pea		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Litoria raniformis Southern Bell Frog		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Myotis macropus Southern Myotis		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Delma impar Striped Legless Lizard		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Prasophyllum petilum Tarengo Leek Orchid		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Caladenia tessellata Thick Lip Spider Orchid		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Haliaeetus leucogaster White-bellied Sea-Eagle		☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

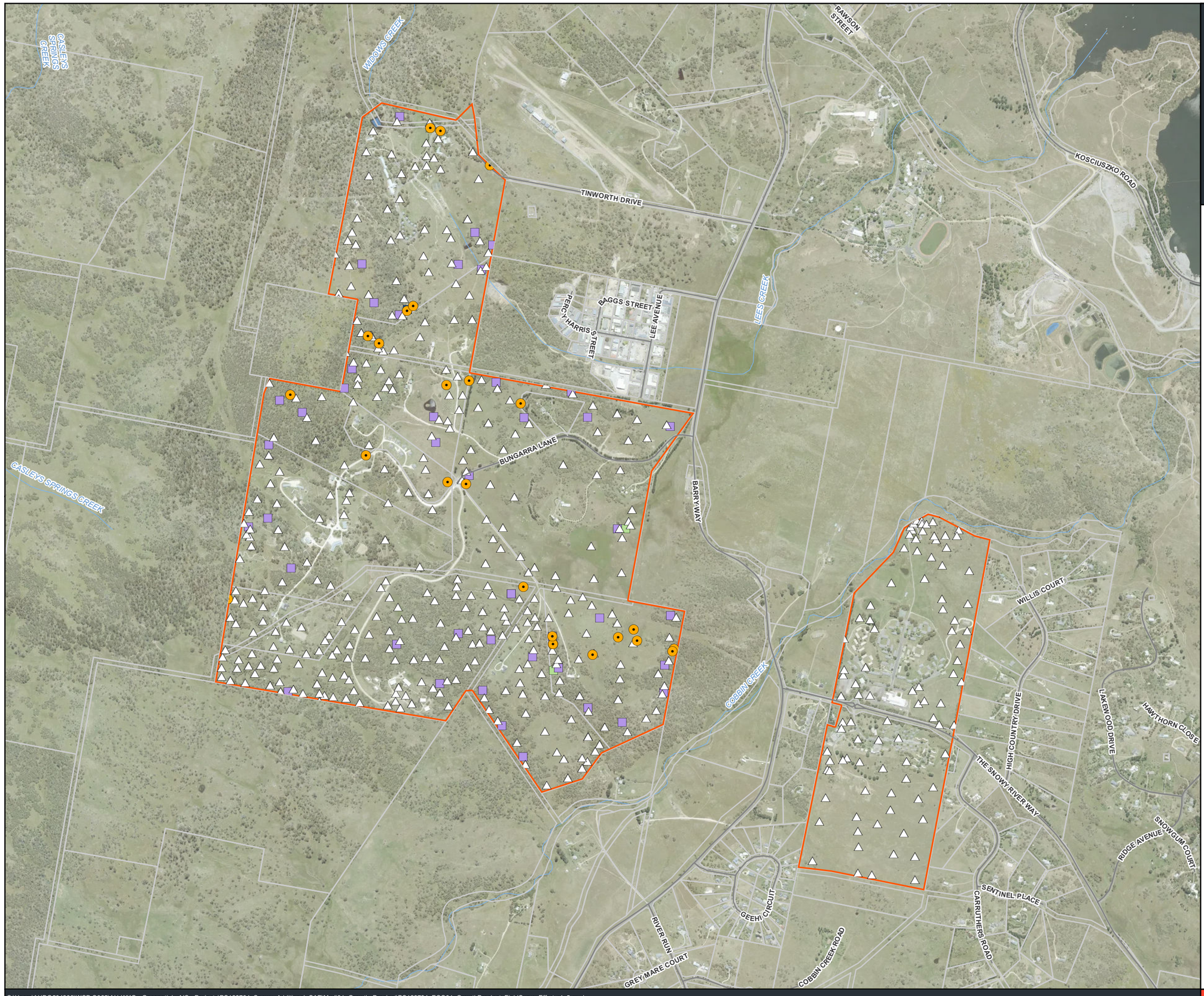
Threatened species Manually Added

None added

Appendix D

Barry Way South sub-precinct

APPENDIX D-1
Barry Way South sub-precinct mapping



Snowy SAP - Field Survey Effort

Figure D.1

Barry Way South Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Waterbodies
- Watercourse
- Roads

Field Suvey Effort

- Rapid Data Points

Fauna Habitat Assessment Sites

- Bird survey
- Frog survey
- Reptile search

0 0.4 0.8 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:16,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

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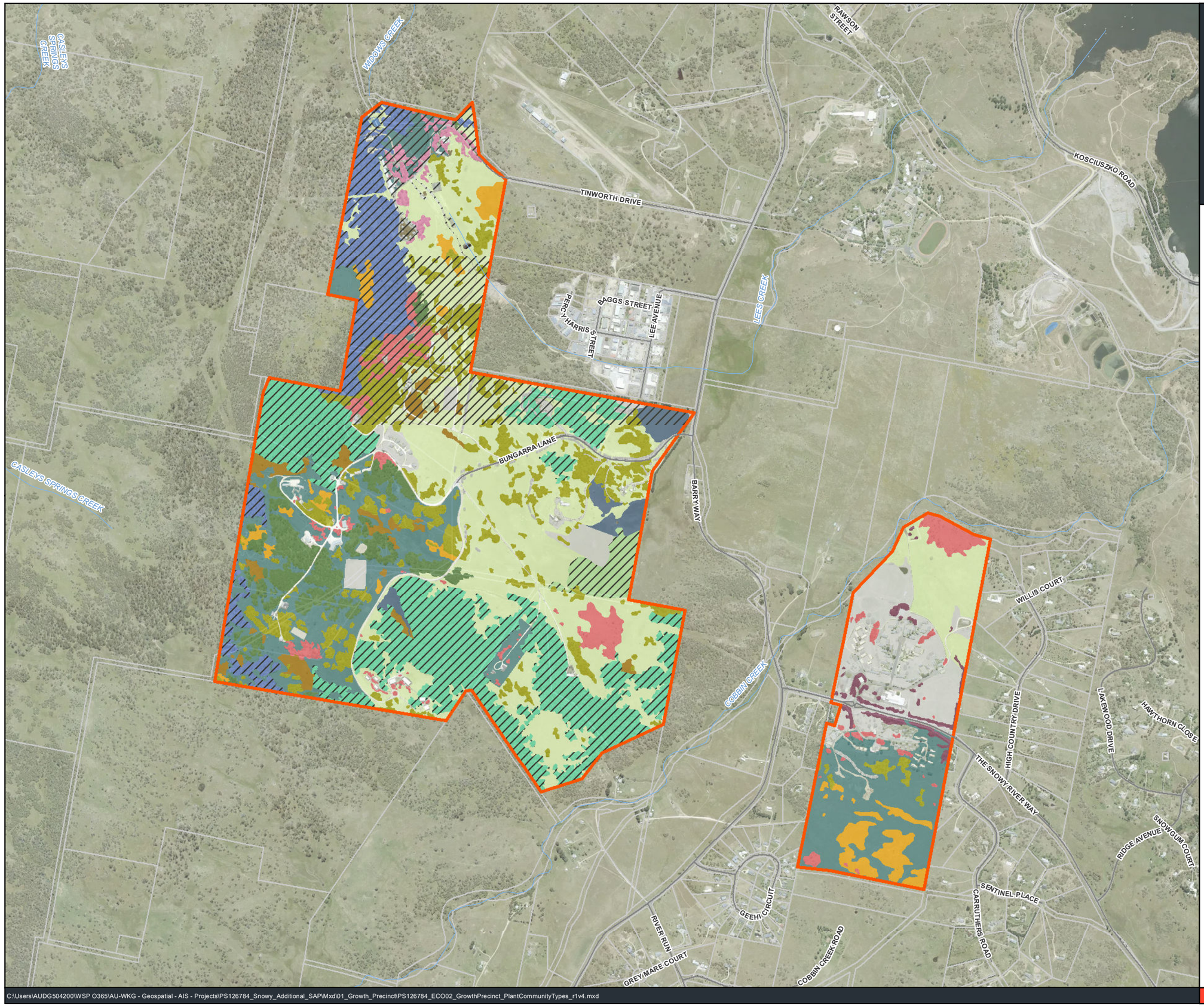

Snowy SAP - Plant Community Types

Figure D.2

Barry Way South Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Waterbodies
- Watercourse
- Roads

Plant Community Types and Vegetation Zones

- PCT 1191, Ribbon Gum variant (Good)
- PCT 1191, Ribbon Gum variant (Moderate)
- PCT 1191, Ribbon Gum variant (Canopy trees)
- PCT 1191, Good
- PCT 1191, Native dominant grassland
- PCT 1191, Rocky outcrop
- PCT 1191, Shrubland
- PCT 1191, Exotic dominant grassland
- PCT 1191, Poor
- PCT 1191, Moderate
- PCT 1191, Canopy trees
- PCT 1191, Revegetation
- PCT 1110, Themeda variant (Good)
- PCT 1110, Poa variant (Moderate)
- Miscellaneous/exotic

0 0.4 0.8 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:16,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

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Snowy SAP - BC Act Listed Biodiversity

Figure D.3

Barry Way South Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Waterbodies
- Watercourse
- Roads
- Hollow-bearing tree

Threatened Flora Species

- *Eucalyptus aggregata*
- *Eucalyptus aggregata and Eucalyptus nicholii*
- *Eucalyptus nicholii*
- *Glycine sp.*
- *Swainsona sericea* (recorded 2017)

Threatened Fauna Species

- Dusky Woodswallow
- Satin flycatcher
- Rufous fantail
- Gang-gang Cockatoo
- Varied Sittella
- Little Eagle
- Little Eagle (Active Nest)
- Stick Nest (potential Little Eagle)
- Hooded Robin
- Flame Robin

Threatened Ecological Communities (BC Act)

- Monaro Tableland Cool Temperate Grassy Woodland in The South Eastern Highlands Bioregion

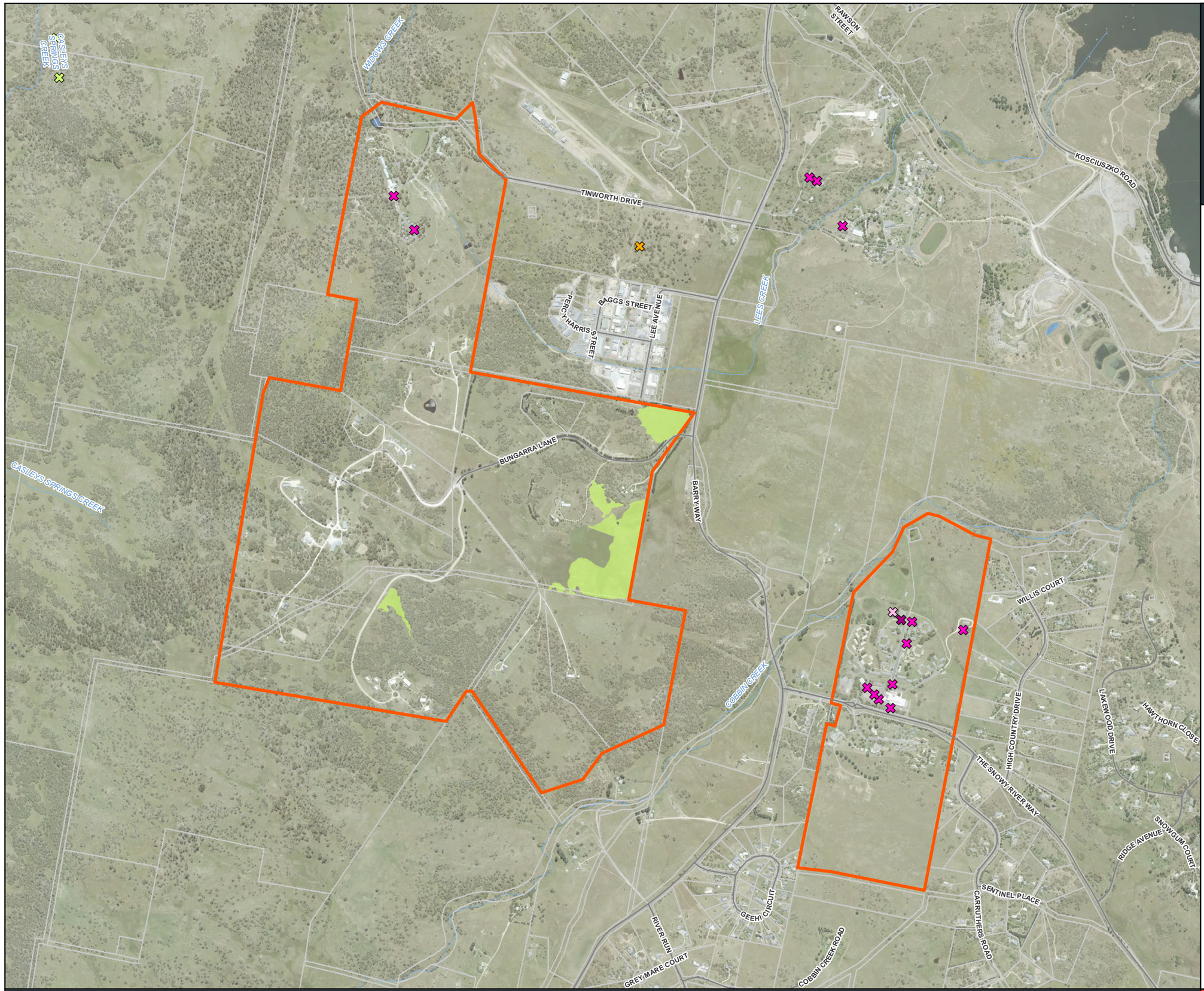
0 0.4 0.8 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:16,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap



Snowy SAP - EPBC Act Listed Biodiversity

Figure D.4

Barry Way South Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Waterbodies
- Watercourse
- Roads

Threatened Flora Species

- *Eucalyptus aggregata*
- *Eucalyptus aggregata and Eucalyptus nicholii*
- *Eucalyptus nicholii*
- *Glycine sp.*
- *Swainsona sericea* (recorded 2017)

Threatened Ecological Communities

(EPBC Act)

- Natural Temperate Grassland of the South Eastern Highlands

0 0.4 0.8 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:16,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

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Appendix E

Jindabyne Aerodrome sub-precinct

APPENDIX E-1
Jindabyne aerodrome sub-precinct mapping

Snowy SAP - Field Survey Effort

Figure E.1

Jindabyne Aerodrome Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Watercourse
- Roads

Field Suvey Effort

- Rapid Data Points

Fauna Habitat Assessment

- Bird survey
- Reptile search

0 0.1 0.2 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:5,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

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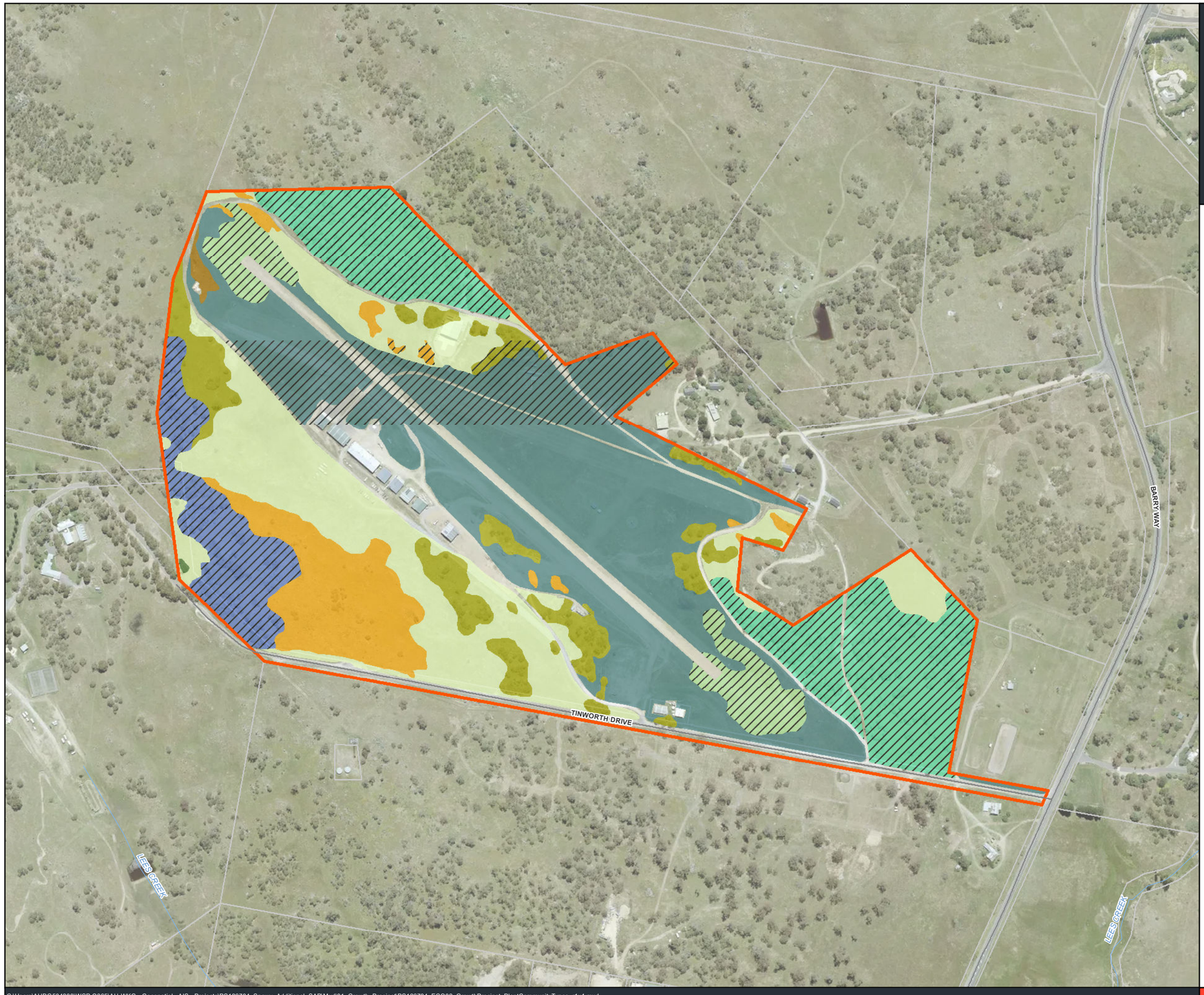

Snowy SAP - Plant Community Types

Figure E.2

Jindabyne Aerodrome Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Watercourse
- Roads

Plant Community Types and Vegetation Zones

- PCT 1191, Ribbon Gum variant (Good)
- PCT 1191, Ribbon Gum variant (Moderate)
- PCT 1191, Ribbon Gum variant (Canopy trees)
- PCT 1191, Good
- PCT 1191, Native dominant grassland
- PCT 1191, Rocky outcrop
- PCT 1191, Shrubland
- PCT 1191, Exotic dominant grassland
- PCT 1191, Moderate
- PCT 1110, Themeda variant (Good)

0 0.1 0.2 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:5,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

Snowy SAP - BC Act Listed Biodiversity

Figure E.3

Jindabyne Aerodrome Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Watercourse
- Roads
- Hollow-bearing tree

Threatened Flora Species

- *Swainsona sericea* (recorded 2017)

Threatened Fauna Species

- Dusky Woodswallow
- Gang-gang Cockatoo
- Little Eagle
- Little Eagle (Active Nest)
- Flame Robin

Threatened Ecological Communities (BC Act)

- Monaro Tableland Cool Temperate Grassy Woodland in The South Eastern Highlands Bioregion

0 0.1 0.2 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:5,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

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Snowy SAP - EPBC Act Listed Biodiversity

Figure E.4

Jindabyne Aerodrome Sub-precinct
Jindabyne Growth Areas (LEP Amendment)

Legend

- Precinct Boundary
- Cadastre
- Watercourse
- Roads

Threatened Flora Species

- *Swainsona sericea* (recorded 2017)

Threatened Ecological Communities (EPBC Act)

- Natural Temperate Grassland of the South Eastern Highlands

0 0.1 0.2 km

Coordinate system: GDA 1994 MGA Zone 55

Scale ratio correct when printed at A3

1:5,000 Date: 1/04/2022

Data sources: - NSWSS, Geoscience Australia, DPIE, Metromap

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Appendix F

Fauna survey results

Table F.1 Fauna species recorded in the Growth precinct

Family	Common name	Scientific name
Amphibians		
Hylidae	Brown Tree Frog	*Litoria ewingii*
Hylidae	Lesueur' s Frog	*Litoria lesueuri*
Hylidae	Peron's Tree Frog	*Litoria peronii*
Hylidae	Verreaux's Frog	*Litoria verreauxii verreauxii*
Limnodynastidae	Brown-striped Frog	*Limnodynastes peronii*
Limnodynastidae	Eastern Banjo Frog	*Limnodynastes dumerilii*
Limnodynastidae	Spotted Grass Frog	*Limnodynastes tasmaniensis*
Myobatrachidae	Common Froglet	*Crinia signifera*
Myobatrachidae	Eastern Sign-bearing Froglet	*Crinia parinsignifera*
Birds		
Acanthizidae	Brown Thornbill	*Acanthiza pusilla*
Acanthizidae	Buff-rumped Thornbill	*Acanthiza reguloides*
Acanthizidae	Southern Whiteface	*Aphelocephala leucopsis*
Acanthizidae	Striated Thornbill	*Acanthiza lineata*
Acanthizidae	Weebill	*Smicrornis brevirostris*
Acanthizidae	White-browed Scrubwren	*Sericornis (Sericornis) frontalis*
Acanthizidae	White-throated Gerygone	*Gerygone olivacea*
Acanthizidae	Yellow Thornbill	*Acanthiza nana*
Accipitridae	Black-shouldered Kite	*Elanus axillaris*
Accipitridae	Brown Goshawk	*Accipiter fasciatus*
Accipitridae	Collared Sparrowhawk	*Accipiter cirrocephalus*
Accipitridae	Little Eagle	*Hieraaetus morphnoides*
Accipitridae	Wedge-tailed Eagle	*Aquila audax*
Accipitridae	Whistling Kite	*Haliastur sphenurus*
Alcedinidae	Kookaburra	*Dacelo (Dacelo) novaeguineae*
Alcedinidae	Sacred Kingfisher	*Todiramphus (Todiramphus) sanctus*
Ardeidae	White-faced Heron	*Egretta novaehollandiae*
Artamidae	Australian Magpie	*Gymnorhina tibicen*
Artamidae	Dusky Woodswallow	*Artamus cyanopterus*
Artamidae	Grey Butcherbird	*Cracticus torquatus*
Artamidae	Masked Woodswallow	*Artamus personatus*

Family	Common name	Scientific name
Artamidae	Pied Currawong	*Strepera graculina*
Cacatuidae	Galah	*Eolophus roseicapilla*
Cacatuidae	Gang-gang Cockatoo	*Callocephalon fimbriatum*
Cacatuidae	Little Corella	*Cacatua sanguinea*
Cacatuidae	Sulphur-crested Cockatoo	*Cacatua galerita*
Cacatuidae	Yellow-tailed Black-cockatoo	*Calyptorhynchus funereus*
Campephagidae	Black-faced cuckoo-shrike	*Coracina novaehollandiae*
Campephagidae	White-winged Triller	*Lalage sueurii*
Casuariidae	Emu	*Dromaius novaehollandiae*
Charadriidae	Masked Lapwing	*Vanellus miles*
Climacteridae	White-throated Treecreeper	*Cormobates leucophaea*
Columbidae	Common Bronzewing	*Phaps chalcoptera*
Columbidae	Crested Pigeon	*Ocyphaps lophotes*
Columbidae	Rock Dove	*Columba livia*
Corcoracidae	White-winged Chough	*Corcorax melanorhamphos*
Corvidae	Australian Raven	*Corvus coronoides*
Corvidae	Little Raven	*Corvus mellori*
Cuculidae	Brush Cuckoo	*Cacomantis variolosus*
Cuculidae	Channel-billed Cuckoo	*Scythrops novaehollandiae*
Cuculidae	Fan-tailed Cuckoo	*Cacomantis flabelliformis*
Cuculidae	Pallid Cuckoo	*Cacomantis pallidus*
Cuculidae	Shining Bronze-cuckoo	*Chalcites lucidus*
Estrildidae	Red-browed Finch	*Neochmia temporalis*
Falconidae	Brown Falcon	*Falco berigora*
Falconidae	Nankeen Kestrel	*Falco cenchroides*
Fringillidae	Goldfinch	*Carduelis carduelis*
Hirundinidae	Tree Martin	*Petrochelidon nigricans*
Hirundinidae	Welcome Swallow	*Hirundo neoxena*
Maluridae	Superb Fairy-wren	*Malurus cyaneus*
Meliphagidae	Brown-headed Honeyeater	*Melithreptus brevirostris*
Meliphagidae	Noisy Friarbird	*Philemon corniculatus*
Meliphagidae	Noisy Miner	*Manorina melanocephala*
Meliphagidae	Red wattlebird	*Anthochaera carunculata*

Family	Common name	Scientific name
Meliphagidae	White-eared Honeyeater	*Nesophilus leucotis*
Meliphagidae	White-naped Honeyeater	*Melithreptus lunatus*
Meliphagidae	Yellow-faced Honeyeater	*Caligavis chrysops*
Monarchidae	Magpie-lark	*Grallina cyanoleuca*
Monarchidae	Satin Flycatcher	*Myiagra cyanoleuca*
Motacillidae	Australian Pipit	*Anthus novaeseelandiae*
Nectariniidae	Mistletoebird	*Dicaeum hirundinaceum*
Neosittidae	Varied Sittella	*Daphoenositta chrysoptera*
Oriolidae	Olive-backed Oriole	*Oriolus sagittatus*
Pachycephalidae	Crested Shrike-tit	*Falcunculus frontatus*
Pachycephalidae	Golden Whistler	*Pachycephala pectoralis*
Pachycephalidae	Grey Shrike-thrush	*Colluricincla harmonica*
Pachycephalidae	Rufous Whistler	*Pachycephala rufiventris*
Pardalotidae	Spotted Pardalote	*Pardalotus punctatus*
Pardalotidae	Striated Pardalote	*Pardalotus striatus*
Passeridae	House sparrow	*Passer domesticus*
Pelecanidae	Australian pelican	*Pelecanus conspicillatus*
Petroicidae	Eastern Yellow Robin	*Eopsaltria australis*
Petroicidae	Flame Robin	*Petroica phoenicea*
Petroicidae	Hooded Robin	*Melanodryas cucullata*
Petroicidae	Jacky Winter	*Microeca fascinans*
Petroicidae	Rose Robin	*Petroica rosea*
Petroicidae	Scarlet Robin	*Petroica boodang*
Podargidae	Tawny Frogmouth	*Podargus strigoides*
Psittacidae	Australian King-parrot	*Alisterus scapularis*
Psittacidae	Budgerigar	*Melopsittacus undulatus*
Psittacidae	Crimson Rosella	*Platycercus elegans*
Psittacidae	Eastern Rosella	*Platycercus eximius*
Psittacidae	Red-rumped Parrot	*Psephotus haematonotus*
Ptilonorhynchidae	Satin Bowerbird	*Ptilonorhynchus violaceus*
Rhipiduridae	Grey Fantail	*Rhipidura albiscapa*
Rhipiduridae	Willie Wagtail	*Rhipidura leucophrys*
Sturnidae	Starling	*Sturnus vulgaris*

Family	Common name	Scientific name
Threskiornithidae	Australian White Ibis	*Threskiornis moluccus*
Threskiornithidae	Straw-necked Ibis	*Threskiornis spinicollis*
Timaliidae	Silvereye	*Zosterops lateralis*
Turdidae	Blackbird	*Turdus merula*
Mammals		
Bovidae	Goat	*Capra hircus*
Canidae	Fox	*Vulpes vulpes*
Cervidae	Sambar Deer	*Rusa unicolor*
Leporidae	Rabbit	*Oryctolagus cuniculus*
Macropodidae	Eastern Grey Kangaroo	*Macropus giganteus*
Macropodidae	Red-necked Wallaby	*Macropus rufogriseus*
Macropodidae	Swamp Wallaby	*Wallabia bicolor*
Tachyglossidae	Short-beaked Echidna	*Tachyglossus aculeatus*
Vombatidae	Common Wombat	*Vombatus ursinus*
Reptiles		
Agamidae	Jacky Lizard	*Amphibolurus muricatus*
Elapidae	Eastern Brown Snake	*Pseudonaja textilis*
Elapidae	Highlands Copperhead	*Austrelaps ramsayi*
Elapidae	Red-bellied Black Snake	*Pseudechis porphyriacus*
Scincidae	Blotched Blue-tongue	*Tiliqua nigrolutea*
Scincidae	Copper-tailed Skink	*Ctenotus taeniolatus*
Scincidae	Cunningham's Skink	*Egernia cunninghami*
Scincidae	Eastern Blue-tongue	*Tiliqua scincoides*
Scincidae	Eastern Three-lined Skink	*Acritoscincus duperreyi*
Scincidae	Pale-flecked Garden Sunskink	*Lampropholis guichenoti*
Scincidae	Red-throated Skink	*Acritoscincus platynotus*
Scincidae	Shingle-back	*Tiliqua rugosa*
Scincidae	Tussock Skink	*Pseudemoia pagenstecheri*
Scincidae	White's Skink	*Liopholis whitii*

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