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BIODIVERSITY ASSESSMENT

Proposed Rezoning

4273 Goulburn Road, Crookwell, NSW.

Lot 24 DP 1119250

May 2022

Version	Final
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Project Number	140186_1

Contents

1. Introduction

1.1. Background

This report has been prepared by Macrozamia Environmental to support a planning proposal to rezone the subject lands from RU1 Primary Production to R5 Large Lot Residential and R2 Low Density Residential with lots sizes ranging from 800m^2 to 5850m^2.

The development site occurs on the eastern edge of the Town of Crookwell in gently undulating topography. The subject land and surrounding landscape is agricultural and has been cleared and subject to cultivation and grazing for many years. Few areas of remnant vegetation occur.

This Biodiversity Assessment considers the potential impacts of the proposal on biodiversity matters. The proposal requires changing the zoning of the lands that would subsequently allow the land to be subdivided and the creation of residential lots and associated roads and infrastructure. construction of roads. This assessment considers the impacts on biodiversity of all these components of the project, the concept plans at Appendix 3 of this report detail a conceptual design of subsequent land use that could result from the proposal.

The project site occurs in a rural area of the Southern Tablelands of NSW it is on the southeastern edge Crookwell adjoining the Crookwell Golf Club.

The area characterised by grazing land, agricultural enterprises and a rural town environment, the proposal location and study area are identified on Map 1-1 of this report and details are provided in Appendix 1 Concept Plans. Native woody vegetation occurs in the landscape as isolated remnants, corridors along roadsides and scattered paddock trees.

1.2. Site Description

The project site is located in a rural district, on the edge of a rural village, it is zoned RU1 Primary Production and adjoins the land use zones RE1 Public Recreation to the northwest, R5 Large Lot Residential to the southwest and RU1 Primary Production to the east. The project area is surrounded by agricultural lands and sparse rural dwellings to the north, east and south. To the west, the site adjoins the village environment of Crookwell. Goulburn Road, an important arterial road into Crookwell adjoins most of the northern boundary of the site and Grange Rd, a rural local road bounds most of the western and southern boundaries of the site.

The land has been cleared and is used for agriculture, existing internal and boundary fences and farm dams occur along with pine windbreaks and minimal remnant vegetation. There is a dwelling and several agricultural sheds, at the time of site inspection the site was being grazed by sheep and offered abundant improved pasture.

The subject site is zoned

Consistent with the Office of Environment and Heritage *Threatened Species Test of Significance Guidelines* (2018), in this report;

> ***Subject Site*** *means the area directly affected by the proposal. The subject site includes the footprint of the development and any ancillary works, facilities, accesses or hazard reduction zones that support the construction or operation of the development or activity.*

And

> ***Study Area*** *means the subject site and any additional areas which are likely to be affected by the proposal, either directly or indirectly. The study area should extend as far as is necessary to take all potential impacts into account.*

The *Subject Site* includes the development footprint of the proposal, the whole of Lot 24 DP

1119250.

The *Study Area* for this assessment includes the above Subject Site and a buffer of 10m.

The proposal location and study area are identified on Map 1-1 of this report and the proposal design is detailed in Appendix 1.

1.3. Aims of this Report

The purpose of this report is to identify and assess the terrestrial biodiversity, including flora, fauna and ecological communities occurring in the study area and the likely impacts of the proposed development on these matters, with consideration of the site's landscape context. This report addresses the legislative framework below;

i. The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

   a. Biodiversity Matters of National Environmental Significance

      Identification of protected matters at risk of impact and assessment of significance of any impact

ii. NSW *Biodiversity Conservation Act 2016* (BC Act)

   a. Part 4, Divisions 2 and 5

      Consideration of listed species, ecological communities and key threatening processes to be considered under s7.3

   b. Section 7.3

      Test of Significance, for determining whether proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats

iii. NSW *Environmental Planning and Assessment Act 1979* (EP&A Act)

   a. Part 5, Infrastructure and environmental impact assessment

iv. State Environmental Planning Policy (Biodiversity and Conservation) 2021 (NSW *State Environmental Planning Policy (Koala Habitat Protection) 2021* (Koala SEPP))

      Chapter 3/ Chapter 4

      Is the land potential koala habitat?

      Is the land core koala habitat?

      Can development consent be granted in relation to core koala habitat?

Section 6 of this Biodiversity Assessment addresses the Koala SEPP.

v. *Upper Lachlan Local Environmental Plan 2010* (LEP)

   Clause 6.2 Terrestrial Biodiversity

The objective of this clause is to maintain terrestrial biodiversity by;

- protecting native fauna and flora, and
- protecting the ecological processes necessary for their continued existence, and
- encouraging the conservation and recovery of native fauna and flora and their habitats.

The Clause applies to land identified as "*Biodiversity*" on the Terrestrial Biodiversity Map in the LEP. The whole of the subject site is mapped as such on this map. Therefore this Clause applies, it has been addressed throughout this report.

1.4. Description of Proposal

It is proposed to rezone the subject lands from RU1 Primary Production to R5 Large Lot Residential and R2 Low Density Residential with lots sizes ranging from 800m^2 to 5850m^2.

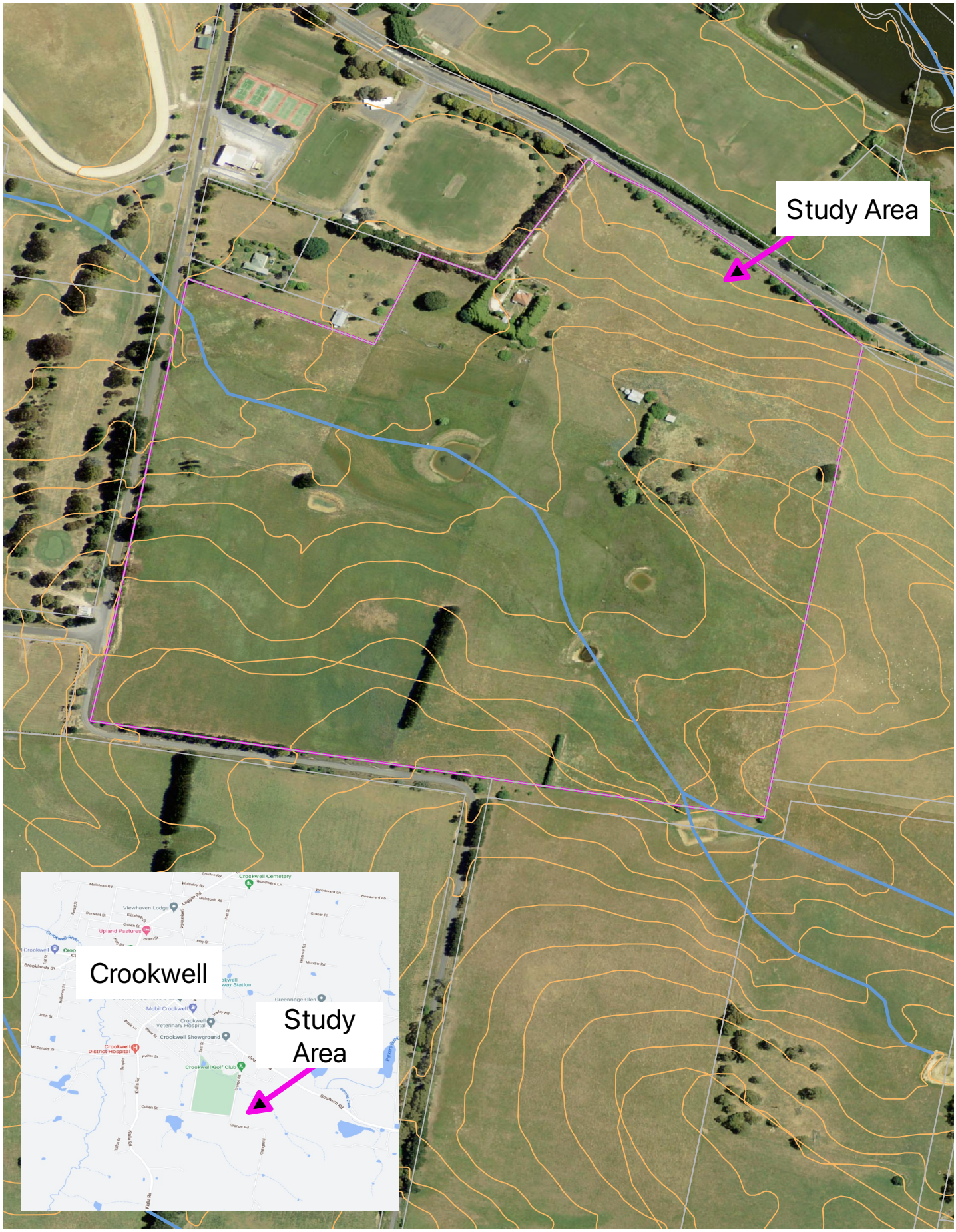
While this is entirely an administrative change it will allow the subsequent residential development of the subject land as conceptually proposed in Appendix 1.

This concept would result in the establishment of 171 residential lots and one public recreation reserve, several road reserves and residential streets with landscaping and associated infrastructure including drainage, reticulated water and sewerage and power services.

Subsequently it is expected that each lot would eventually be developed with a residential dwelling, fencing landscaping and other associated developments permitted in a residential zoning.

Temporary facilities during construction would include erosion and sediment controls and stockpiling/ works compound facilities.

This Biodiversity Assessment considers the potential impact on flora and fauna of the proposal including matters protected under biodiversity conservation legislation. The impact assessment is based on construction requirements of the project including any removal of vegetation, earthworks, construction methodology, temporary facilities and intended subsequent land use.



Macrozamia Environmental

Map 1-1
Study Area and Locality

0 100 200 m

2. Methods

2.1. Literature and Database Review

The study area and its landscape context were considered through a literature and database review in preparation for field survey and to inform survey aims and threatened biodiversity assessments. Aerial photography, NSW Government GIS data and NSW & Commonwealth databases as well as Macrozamia Environmental's records from previous surveys all informed this review, the following sources being key to this assessment;

- Current versions of legislation referred to in section 1.3 of this Biodiversity Assessment, NSW Legislation website
- NSW ePlanning Spatial Viewer, NSW Department of Planning, Industry and Environment
- BioNet Atlas of NSW Wildlife, NSW Office of Environment and Heritage
- Threatened Biodiversity Profiles, NSW Office of Environment and Heritage
- NSW Vegetation Information System, NSW Office of Environment and Heritage
- Land and Property Information SIX Map Topographic and Cadastral Data for this Local Government Area, periodically updated on our GIS
- EPBC Protected Matters Search Tool, Commonwealth Department of Agriculture, Water and the Environment.

Wherever applicable, NSW and Commonwealth policies and guidelines have been adopted in the undertaking of this assessment, the following have been key to preparation of this report;

- Threatened Species Test of Significance Guidelines NSW Office of Environment and Heritage 2018
- The EPBC Act Matters of National Environmental Significance: Significant Impact Guidelines, Department of Environment, Water, Heritage and the Arts 2013.

Threatened species, populations and migratory species that were recorded within 10km of the study area in the BioNet Atlas of NSW Wildlife and listed in the EPBC Protected Matters Search Tool were considered for their likelihood of occurrence in the study area the following factors informed this assessment;

- The location, habitats and dates of records
- Habitat within the study area and habitats in the landscape including the continuity of suitable habitats for the matter under consideration
- Scientific literature pertaining to each matter and applying ecological knowledge to the assessment.

The potential for each threatened matter or migratory species to occur was then considered and the necessity for targeted field surveys was determined. Following field surveys and review of habitat occurring in the study area, the potential for species, communities or populations to use the study area or to be impacted directly or indirectly by the proposal was assessed, this assessment is summarised in the table at Appendix 2 of this report.

2.2. Field Survey

The study area was surveyed by an ecologist early afternoon of 9 May 2022. The day was cool and overcast though conducive to opportunistic fauna survey and of sufficient time to adequately assess each vegetation community throughout the study area. During site

inspections the study area was defined, vegetation communities mapped and notes made on the flora and fauna species identified within and adjacent to the impact area of the proposal, a photo/ videographic record including using drone photography was also made aiding in documenting the site characteristics.

2.3. Flora and Vegetation Communities

All flora and fauna species identified were recorded along with ecological communities and habitat components occurring on the site.

Flora was surveyed using the random meander technique focusing on each vegetation community occurring in the study area. Notes were made of individual plant species present and vegetation communities mapped and defined then compared with OEH defined Plant Community Types and checked against described listed vegetation communities.

Targeted surveys were undertaken for threatened species of plants that were considered to have potential to occur on the site based on desktop research or where habitats on site were found to be suitable.

Floral nomenclature is consistent with *The Plant Information Network System of The Royal Botanic Gardens and Domain Trust* PlantNET online resource.

2.4. Fauna and Fauna Habitats

Incidental fauna survey was undertaken for birds, amphibians, reptiles and mammals, which included opportunistic observations of fauna, active searching of signs of direct and indirect occurrence including scats, tracks, scratch & feeding marks, burrows, calls, pellets and remnants such as bones, fur and feathers.

Where suitable habitat components were present, targeted searches were undertaken for fauna presence or signs of past presence. For example loose rocks and timber were lifted in search of reptiles and rocky areas observing for basking reptiles, wet areas were approached quietly to listen for frogs and in suitable habitat bird calls were used for identification.

Habitat components that may be used for foraging, roosting, breeding or nesting by any potentially occurring fauna were considered, along with the continuity of habitat present within the study area as well as stepping stone or corridor habitat that may connect the study area to other parts of the landscape, particularly to areas of quality habitat or conservation areas.

Habitat surveys targeted tree hollows, stags, bird nests, possum dreys, decorticating bark, rock shelters, rock outcrops / crevices, mature / old growth trees, food species particularly nectar producing and palatable species such as mistletoes and proteaceae species.

Faunal nomenclature is consistent with;

- Cogger, H. (1992). Reptiles and Amphibians of Australia, Revised Edition. Reed, Sydney.
- Morcombe, M. (2000). Field Guide to Australian Birds. Steve Parish Publishing Pty Ltd, Queensland.
- Strahan, R. (1995). The Mammals of Australia. Australian Museum/Reed Books, Sydney.

2.5. Survey Limitations

The flora survey aimed to record all the key and most frequent species occurring on the study area in order to accurately describe vegetation characteristics and classify plant community types present as well as all important weed species. Beyond this, as many flora species as practically could be recorded were however, a definitive list of the flora occurring in the study area cannot be derived without structured surveys over several seasons. Such survey effort is beyond the scope of this assessment given past land uses on the site, its degraded nature

and the nature of the proposal's impacts.

Despite these limitations the biodiversity assessment undertaken for flora, vegetation communities and fauna is adequate to undertake appropriate biodiversity impact assessment. Further flora species would be recorded during longer surveys over different seasons however sufficient data has been collected to detect flora and habitats of threatened matters.

Biodiversity survey following OEH's published threatened species survey and assessment guidelines was not undertaken as sufficient detail to determine the likelihood of occurrence of threatened species and communities as well as potentially occurring migratory species for the purposes of this assessment has been achieved through flora and habitat assessment during the field survey.

3. Results

3.1. Literature and Database Review

Desktop assessment has identified the following characteristics of the site;

Landform and drainage

The study area occurs at an elevation of 906 to 920m asl it is gently sloping to the north and northwest draining to farm dams and minor drainage depressions to Kiamma Creek and The Crookwell River. The catchment of the subject site is relatively small, and has almost entirely been cleared of native vegetation and used as managed pasture. A broad second order drainage depression passes through the site from southeast to northwest.

Soils and geology

The study area is mapped as the "*Taralga*" Soil Landscape by the *NSW eSpade* online soils mapping tool. It is characterised as occurring near Crookwell and Taralga on remnants of Tertiary lava flows on plateaux or valleys of gently undulating to undulating rises. Elevations are greater than 800 m. Slope gradients 2 – 15%. Local relief between 5 – 40 m. Drainage plans rather than incised stream channels, Olivine basalt and dolerite of Tertiary lava flows. Between Dalton and Crookwell the irregular surface displayed by the basalts suggests they are valley fills. Soils have formed in situ and from alluvial-colluvial material derived from the parent rock

Native vegetation on this soils landscape is described as brown barrel-ribbon gum community is typical. It is an intermediate sclerophyll forest vegetation type, with well-developed but discontinuous substratum of small trees and shrubs. Above 900 m snow gum communities may be found. Clearing of this community has been extensive, and it remains in its natural state only where slopes are extremely steep.

Environmental planning

Upper Lachlan Local Environmental Plan 2010 (LEP)

Clause 6.2 Terrestrial Biodiversity

The objective of this clause is to maintain terrestrial biodiversity by;

- protecting native fauna and flora, and
- protecting the ecological processes necessary for their continued existence, and
- encouraging the conservation and recovery of native fauna and flora and their habitats.

The Clause applies to land identified as "*Biodiversity*" on the Terrestrial Biodiversity Map in the LEP. The whole of the project area is mapped as such on this map. Therefore the following clauses apply;

(3) Before determining a development application for land to which this clause applies, the consent authority must consider any adverse impact from the proposed development on—

(a) a native ecological community, and

(b) the habitat of any threatened species, populations or ecological community, and

(c) a regionally significant species of fauna and flora or habitat, and

(d) a habitat element providing connectivity.

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

(a) the development is designed, sited and will be managed to avoid any adverse environmental impact, or

(b) if that impact cannot be avoided—the development is designed, sited and will be managed to minimise that impact, or

(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.

The matters highlighted in these clauses are addressed throughout this report

No other relevant local provisions of the LEP apply.

The *State Environmental Planning Policy (Biodiversity and Conservation) 2021* (Biodiversity and Conservation SEPP) consolidates, transfers and repeals provisions of 11 SEPPs designed to manage Biodiversity and Conservation issues. Of relevance to this project is;

The State Environmental Planning Policy (Biodiversity and Conservation) 2021

The State Environmental Planning Policy (Biodiversity and Conservation) 2021 (BC SEPP) consolidates several repealed SEPPs that help to manage conservation of biodiversity.

Chapter 3 Koala habitat protection 2020 of the BC SEPP applies to this project due to its land zoning.

This Chapter aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline—

(a) by requiring the preparation of plans of management before development consent can be granted in relation to areas of core koala habitat, and

(b) by encouraging the identification of areas of core koala habitat, and

(c) by encouraging the inclusion of areas of core koala habitat in environment protection zones.

Under this Chapter the following steps are to be taken;

3.6 Step 1—Is the land potential koala habitat?

(1) Before a council may grant consent to a development application for consent to carry out development on land to which this Part applies, the council must be satisfied as to whether or not the land is a potential koala habitat.

(2) The council may be satisfied as to whether or not land is a potential koala habitat only on information obtained by it, or by the applicant, from a person who is qualified and experienced in tree identification.

(3) If the council is satisfied—

(a) that the land is not a potential koala habitat, it is not prevented, because of this Chapter, from granting consent to the development application, or

(b) that the land is a potential koala habitat, it must comply with section 3.7.

3.7 Step 2—Is the land core koala habitat?

(1) Before a council may grant consent to a development application for consent to carry out development on land to which this Part applies that it is satisfied is a potential koala habitat, it must satisfy itself as to whether or not the land is a core koala habitat.

(2) The council may be satisfied as to whether or not land is a core koala habitat only on information obtained by it, or by the applicant, from a person with appropriate qualifications and experience in biological science and fauna survey and management.

(3) If the council is satisfied—

(a) that the land is not a core koala habitat, it is not prevented, because of this Chapter, from granting consent to the development application, or

(b) that the land is a core koala habitat, it must comply with section 3.8.

3.8 Step 3—Can development consent be granted in relation to core koala habitat?

(1) Before granting consent to a development application for consent to carry out development on land to which this Part applies that it is satisfied is a core koala habitat, there must be a plan of management prepared in accordance with Part 3 that applies to the land.

This SEPP is addressed in Section 6 of this report.

Threatened Biodiversity listed under;

The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) & NSW Biodiversity Conservation Act 2016 (BC Act)

Threatened biodiversity listed under both of these pieces of legislation have been considered together in Section 4, *Threatened Species Populations & Ecological Communities*, of this report which addresses findings of desktop review of threatened biodiversity.

Appendix 1 of this report presents these protected matters that have been considered in this assessment.

3.2. Vegetation communities and flora species

The study area occurs in an environment that has supported eucalypt dominated woodland and forest for many years prior to European settlement. Across much of the landscape these ecosystems have been progressively modified for farmland, residential use and harvested for timber.

The landscape of the project area has been extensively cleared, remnants of native woodland are sparse though do occur as isolated paddock trees often with no native understory or groundcover, fragmented native vegetation persists in along some watercourses and roadsides.

At the time of inspection the project area was being grazed by sheep and was well vegetated with pasture species, dominated by Phalaris (*Phalaris aquatica*). There are several windbreaks of Radiata Pine (*Pinus radiata*) and *Cupressus sp*. other exotic species, *Prunus sp*. *Populus sp* and *Salix sp*. also occur.

There is a small area of the site where scattered Candlebark (*E. rubida*) occur, there is no native understory or groundcover associated with this occurrence.

Along the drainage depression passing through the site, native species are most dominant and include *Carex spp*., *Eleocharis spp*. *Juncus sp*. and *Luzula sp*.

No flora species were recorded or considered likely to occur that are listed matters under the BC Act or the EPBC Act, no nearby records of threatened species occur.

3.3. Fauna and Fauna Habitat

Due to the limited survey period and lack of habitat diversity, few fauna were found using the site, however, the potential for fauna to use the site, particularly threatened species has been

considered based on the habitats present.

The study area offers few habitat components that would support the habitation, foraging and movement of native fauna. Trees supporting fissures, large and small hollows are present and suited to small birds, arboreal mammals and tree roosting bats. They are however isolated from other areas of habitat significantly limiting the range of fauna that may use them.

Foraging habitat is generally suited to fauna well adapted to agricultural environments, the site lacks diversity and abundance of nectar and fruit producing shrubs. Mistletoes are not uncommon in eucalypt trees across the study area and wattles are widespread in road reserves offering sap as a nutrition source. Standing and fallen dead timber is also a valuable habitat component present in the study area in a small area.

Seasonally flowering/ fruiting grasses a food source for short periods of the year which are an important part of the diet of many insects and birds particularly.

Insectivorous birds and bats as well as other carnivorous fauna are generally also able to forage across this site particularly at warmer times of the year during periods of greater biotic activity.

The farm dams and the drainage depression in the study area offer a water resource to all fauna and microclimates and habitats for a wider variety of species particularly native birds, reptiles and amphibians.

Other important habitat components including rocky areas and termite mounds occur occasionally.

Continuity across the study area as well as beyond the study area across the landscape is poor impediments include, minor roads, cleared paddocks and rural fences.

No fauna species or fauna habitats were recorded or considered likely to be impacted that are listed matters under the BC Act or the EPBC Act.

3.4. Impacts

The proposal's impacts on biodiversity are minimal, the project is largely restricted to areas already impacted by heavy cultivation and other ongoing agricultural practices.

The conceptual subdivision design including lot layout, have been designed and sited to minimise impacts to biodiversity. Biodiversity impacts to agricultural pasture are insignificant.

4. Threatened Species, Populations and Ecological Communities

The BC Act provides a series of native vegetation clearing thresholds and the Biodiversity Values Map (BVM) to determine the necessity for the impacts on biodiversity of a development to be assessed using the BC Act's Biodiversity Assessment Method (BAM).

While the BC Act could accommodate assessment of biodiversity for this planning proposal through the Biodiversity certification scheme, it was considered that this does not offer benefits over assessment of a subsequent subdivision through the Biodiversity Development Assessment Report process due to the small scale of the proposal and it being a single landholding.

The site is not mapped on the BVM however clearing required for the conceptual subdivision would trigger the BAM threshold and require a Biodiversity Development Assessment Report to accompany any future DA for that concept.

Where there is potential for BC Act listed matters (species, populations or ecological communities) to be impacted by the proposal a test of significance must be undertaken to determine the significance of any impact.

The potential for protected matters occurring in the area to be impacted has been assessed in the threatened matter evaluations table at Appendix 1 of this report.

The findings of this assessment are as follows;

4.1. Threatened species

Appendix 1 addressed several listed species that have been recorded within 10km of the study area in the past or considered to have some potential to occur on the site.

No threatened species were considered likely to occur on the site and be impacted by the proposal.

4.2. Endangered Populations

No Endangered Populations listed under the BC Act have been considered likely to be at risk of impact by the proposal.

4.3. Endangered Ecological Communities

No listed communities listed under the BC Act have been considered likely to be at risk of impact by the proposal.

5. Environment Protection and Biodiversity Conservation Act 1999

The *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) specifies that approval is required from the Commonwealth Minister for the Environment for actions that have, will have or are likely to have a significant impact on a matter of "national environmental significance".

The Act identifies nine matters of national environmental significance being:

1) World Heritage properties
2) National heritage places
3) Wetlands of international importance (Ramsar wetlands)
4) Threatened species and ecological communities
5) Migratory species
6) Commonwealth marine areas
7) Nuclear actions (including uranium mining)
8) Great Barrier Reef Marine Park
9) Water impacts from coal seam gas and large coal mining actions

Matters number 4 (Threatened species, ecological communities) and 5 (Migratory species) are relevant to this proposal.

5.1. Threatened Species & Ecological Communities:

Threatened species listed under this act have been considered in the Appendix 1 assessment along with NSW BC Act listed species.

The Commonwealth Environment Department protected matters search tool was used to highlight any maters of national environmental significance that could be of concern. No matters were considered likely to be impacted by the proposal.

5.2. Migratory Species:

In addition to threatened species and ecological communities, the EPBC Act allows for the listing of internationally protected migratory species, i.e. species listed under the Japan-Australia Migratory Bird Agreement (JAMBA), the China - Australia Migratory Bird Agreement (CAMBA) and the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

No protected migratory species were observed on site at the time of this assessment or considered likely to occur on the site or rely on resources provided by its habitat.

6. State Environmental Planning Policy (Biodiversity and Conservation) 2021

The State Environmental Planning Policy (Biodiversity and Conservation) 2021 (BC SEPP) consolidates several repealed SEPPs that help to manage conservation of biodiversity.

Chapter 3 Koala habitat protection 2020 of the BC SEPP applies to this project due to its rural zoning.

This Chapter aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline—

(a) by requiring the preparation of plans of management before development consent can be granted in relation to areas of core koala habitat, and

(b) by encouraging the identification of areas of core koala habitat, and

(c) by encouraging the inclusion of areas of core koala habitat in environment protection zones.

Under this Chapter the following steps are to be taken;

3.6 Step 1—Is the land potential koala habitat?

(1) Before a council may grant consent to a development application for consent to carry out development on land to which this Part applies, the council must be satisfied as to whether or not the land is a potential koala habitat.

(2) The council may be satisfied as to whether or not land is a potential koala habitat only on information obtained by it, or by the applicant, from a person who is qualified and experienced in tree identification.

(3) If the council is satisfied—

(a) that the land is not a potential koala habitat, it is not prevented, because of this Chapter, from granting consent to the development application, or

(b) that the land is a potential koala habitat, it must comply with section 3.7.

3.7 Step 2—Is the land core koala habitat?

(1) Before a council may grant consent to a development application for consent to carry out development on land to which this Part applies that it is satisfied is a potential koala habitat, it must satisfy itself as to whether or not the land is a core koala habitat.

(2) The council may be satisfied as to whether or not land is a core koala habitat only on information obtained by it, or by the applicant, from a person with appropriate qualifications and experience in biological science and fauna survey and management.

(3) If the council is satisfied—

(a) that the land is not a core koala habitat, it is not prevented, because of this Chapter, from granting consent to the development application, or

(b) that the land is a core koala habitat, it must comply with section 3.8.

3.8 Step 3—Can development consent be granted in relation to core koala habitat?

> *(1) Before granting consent to a development application for consent to carry out development on land to which this Part applies that it is satisfied is a core koala habitat, there must be a plan of management prepared in accordance with Part 3 that applies to the land.*

Vegetation in the landscape may be used by Koalas however habitat is poor and sparse. There are no nearby recent koala sightings and no recent recordings of the Koala occur in the Bionet wildlife atlas.

The vegetation in the project area is therefore not core Koala habitat, trees may be of use to Koalas however it is unlikely there is a resident local population.

The proposal will not require the removal of no Koala habitat.

Consequently the *development is likely to have low or no impact on Koalas or Koala habitat*.

7. NSW Fisheries Management Act 1994

The Fisheries Management Act 1994 provides for the protection of fish and marine vegetation, endangered populations and ecological communities by a listing process. No species, populations or communities listed under this act were recorded on site at the time of this assessment or are considered likely to occur on this site. No Tests of Significance have been prepared for species protected by this act in relation to the proposed development, the proposal is unlikely to have any impact on fish habitats.

8. Assessment of the Biodiversity Impact

Considering the information detailed above that has been summarised from information collected during field and desktop investigations and assessments of significance for threatened species and communities the following final assessments are made.

8.1. Direct Impacts

Proposed works are restricted to highly modified agricultural paddocks of limited biodiversity value. Candlebark trees may require removal, however the concept design will attempt to retain these trees within the subdivision design.

No important habitat features will be modified by the proposal.

8.2. Indirect Impacts

There is a risk that plant and equipment used for the works may transport weed material on the site or from other sites. Impact mitigation measures in Section 9 of this report address this risk along with the small risk of impacts on receiving waters.

8.3. Potential Impacts on Flora

Vegetation impacts will not significantly impact any threatened flora or endangered ecological communities.

Vegetation impacted is of biodiversity value however it is a very small component of habitat available in the local area.

The proposal will not involve the removal of any significant vegetation, plant habitats or significantly degrade the ecological value of the study area.

8.4. Potential Impacts on Fauna and Habitat

No areas of important habitat or unique habitat components will be removed as part of this proposal.

The impact of the proposal on fauna populations and their habitats is considered likely to be insignificant. This is largely due to the limited value of habitat currently available on the site as well as the minor impact of the works.

No listed threatened fauna or their habitats are considered at risk of impact by this proposal.

9. Impact Mitigation Measures

The following impact mitigation measures are recommended for adoption to reduce the likelihood of any negative impacts on flora and fauna associated with this proposal both in the short and long term.

9.1 For any subsequent development of the site, the proponent must ensure that they do not import weed material to or from the project area, for example, in or on plant and equipment used on the site. At a minimum the following actions will be undertaken to achieve this;

a) In order to manage the risk of indirect impacts of invasive species establishing in the project area, a weed management plan will be prepared and implemented to ensure the project does not increase the occurrence of weed species on the site or adjoining land the plan will incorporate the following practices;

- Plant and equipment will be cleaned prior to entering any part of the site ensuring no mud/ soil or vegetation material is imported into the area
- The site manager will ensure that procedures are in place to ensure plant and equipment entering the site are clean and free of mud, soil and vegetation material.

9.2 For any further development of the site post rezoning, the biodiversity impacts of the proposal must be adequately assessed and addressed under the policy and statutory environment at the time. Under the current environment, subdivision of the site would require;

- The preparation of a Biodiversity Development Assessment Report under the NSW BAM including the necessary offsetting that this process requires for impacts to native vegetation.

10. Conclusion

This report has assessed the flora and fauna associated with this site and the extent and nature of impacts on biodiversity of the planning proposal.

No threatened matters were considered at risk of impact by the proposal.

It is essential that this report's impact mitigation measures be implemented in order to manage potential weed issues on the site and ensure that adjoining lands are not impacted.

Any subsequent development of the site in accordance with the proposed concept would require a Biodiversity Development Assessment Report under the NSW BAM. This would not preclude the development of the land and should not be a restriction to the current planning proposal.

There are no other biodiversity issues associated with this proposal and if the impact mitigation measures recommended by this report are implemented the overall impact of this proposal on flora and fauna will be negligible.

11. References

- Cogger, H. (1992). *Reptiles and Amphibians of Australia,* Revised Edition. Reed, Sydney.
- Commonwealth of Australia (1999). *Environment Protection and Biodiversity Conservation Act 1999*. Commonwealth Government, Canberra.
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Appendix 1 – Subdivision Concept Plans

			Surveyed : Southern Cross Consulting Surveyors	SCALE 1:1500	LATERALS ENGINEERING & MANAGEMENT	Sheet Subject SUBDIVISION DESIGN TOPOGRAPHIC DETAIL
			Designed : T Dodson			
			Drawn : K Allen			
			Checked : T Dodson			
			Datum : AHD	Sheet No. 1 / No. of Sheets / Sheet size A1	1s t Floor, s5 Montague Street Goulburn NSW 2580 Ph: 4821 0973 Fax: 4822 0777 48 Johns Riv er Road, Johns River NSW 2443 Mobile 0427 210 973	Approved : ..... Director of Engineering ..... Date
A	Original	21/1/2022	Laterals Ref : 2129			
Issue	Amendment	Date				

UPPER LACHLAN SHIRE COUNCIL
LOT 24 DP 1119250
4273 GOULBURN ROAD, CROOKWELL
SUBDIVISION CONCEPT

Appendix 2 – Threatened Matter Evaluations Table

Appendix 1 Threatened Matter Evaluations Table

The following table present the evaluations for threatened species, endangered ecological communities and endangered populations found either

1. Within a 5km buffer of the study site in the Atlas of NSW Wildlife (Bionet).
2. Identified as potentially occurring in the area by the Commonwealth EPBC Protected Matters Search Tool.
3. Considered to have potential to occur in the landscape given habitats available

The assessment of potential for impact to the species or ecological community is based on the nature of the proposal, it's direct and indirect impacts and the ecology of the species. Where a potential impact to a threatened species, ecological community or endangered populations has been identified, an Assessment of Significance (AoS) has been completed.

Abbreviations

E: listed as endangered under either the NSW Biodiversity Conservation Act 2016 (BC Act) or the Commonwealth Environment Protection & Biodiversity Conservation Act 1999 (EPBC Act) (depending on the table column E is placed in).

V: listed as vulnerable under either the BC Act or EPBC Act (depending on the table column V is placed in).

EEC: listed as an Endangered Ecological Community under the BC Act.

CE: listed as Critically Endangered under the EPBC Act.

M: Marine or Migratory Species under the EPBC Act.

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Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Fauna						
Birds						
Anthochaera Phrygia Regent Honeyeater	The regent honeyeater inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. The Regent Honeyeater is a generalist forager, although it feeds mainly on the nectar from a relatively small number of eucalypts that produce high volumes of nectar. Key eucalypt species include Mugga Ironbark, Yellow Box, White Box and Swamp Mahogany. Also utilises *E. microcarpa, E. punctata, E. polyanthemos, E. moluccana, Corymbia robusta, E. crebra, E. caleyi, Corymbia maculata, E. mckieana, E. macrorhyncha, E. laevopinea*, and *Angophora floribunda*. Nectar and fruit from the mistletoes *Amyema miquelii, A. pendula and A. cambagei* are also utilised. When nectar is scarce lerp and honeydew can comprise a large proportion of the diet.	CE	CE	Present	Possible	No, no important habitat impacted
Callocephalon fimbriatum Gang-gang Cockatoo	In spring and summer, the species is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. May also occur in sub-alpine Snow Gum (*Eucalyptus pauciflora*) woodland and occasionally in temperate rainforests. Favours old growth forest and woodland attributes for nesting and roosting. Feed mainly on seeds of native and introduced trees and shrubs, with a preference for eucalypts, wattles and introduced hawthorns. They will also eat berries, fruits, nuts and insects and their larvae. Nests are located in hollows that are 10 cm in diameter or larger and at least 9 m above the ground in eucalypts.	V		Absent	Unlikely	No
Calyptorhynchus lathami	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak	V		Absent	Unlikely	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Glossy Black-Cockatoo	(*Allocasuarina littoralis*) and Forest Sheoak (*A. torulosa*) are important foods. Inland populations feed on a wide range of sheoaks, including Drooping Sheoak, *Allocasuaraina diminuta*, and *A. gymnathera*. Belah (*Casuarina cristata*) is also utilised and may be a critical food source for some populations. Feeds almost exclusively on the seeds of several species of she-oak (*Casuarina* and *Allocasuarina* species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites.					
Chthonicola sagittata Speckled Warbler	The Speckled Warbler lives in a wide range of *Eucalyptus* dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area. The diet consists of seeds and insects, with most foraging taking place on the ground around tussocks and under bushes and trees. Pairs are sedentary and occupy a breeding territory of about ten hectares, with a slightly larger home-range when not breeding.	V		Present	Possible	No, no important habitat impacted
Climacteris picumnus victoriae Brown Treecreeper (eastern subspecies)	Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains.	V		Present	Possible	No, no important habitat impacted

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Daphoenositta chrysoptera Varied Sittella	The varied sitella inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and *Acacia* woodland. Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy.	V		Present	Possible, records in district	No
Glossopsitta pusilla Little Lorikeet	Forages primarily in the canopy of open *Eucalyptus* forest and woodland, yet also finds food in *Angophora, Melaleuca* and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species. Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards. Roosts in treetops, often distant from feeding areas. Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts. Entrance is small (3 cm) and usually high above the ground (2–15 m). Riparian trees often chosen, including species like *Allocasuarina*.	V		Absent	Unlikely	No
Grantiella picta Painted Honeyeater	Inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus *Amyema*. Insects and nectar from mistletoe or eucalypts are occasionally eaten. Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches.	V	V	Absent	Unlikely	No
Hieraaetus morphnoides Little Eagle	Occupies open eucalypt forest, woodland or open woodland. Sheoak or *Acacia* woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter. Lays two or three eggs during spring, and young fledge in early summer. Preys on birds, reptiles and mammals, occasionally adding large	V		Absent	Unlikely	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
	insects and carrion.					
Lathamus discolour Swift Parrot	On the Australian mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens*. Commonly used lerp infested trees include Inland Grey Box *E. microcarpa*, Grey Box *E. moluccana* and Blackbutt *E. pilularis*. Return to some foraging sites on a cyclic basis depending on food availability.	E	CE	Absent	Unlikely	No
Melanodryas cucullata cucullata Hooded Robin (south-eastern form)	Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. Often perches on low dead stumps and fallen timber or on low-hanging branches. Territories range from around 10 ha during the breeding season, to 30 ha in the non-breeding season.	V		Present	Possible	No, no important habitat impacted
Melithreptus gularis gularis Black-chinned Honeyeater (eastern subspecies)	Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (*Eucalyptus sideroxylon*), White Box (*E. albens*), Inland Grey Box (*E. microcarpa*), Yellow Box (*E. melliodora*), Blakely's Red Gum (*E. blakelyi*) and Forest Red Gum (*E. tereticornis*). Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees. Feeding territories are large making the species locally nomadic. The Black-chinned Honeyeater tends to occur in the largest woodland patches in the landscape as birds forage over large home ranges of at least 5 hectares.	V		Present	Possible	No, no important habitat impacted
Neophema pulchella	Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland. Prefers to feed in the	V		Present	Possible	No, no important

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Turquoise Parrot	shade of a tree and spends most of the day on the ground searching for the seeds or grasses and herbaceous plants, or browsing on vegetable matter. Nests in tree hollows, logs or posts, from August to December.					habitat impacted
Ninox connivens Barking Owl	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey on these fertile soils. Roost in shaded portions of tree canopies, including tall midstorey trees with dense foliage such as *Acacia* and *Casuarina* species. Preferentially hunts small arboreal mammals such as Squirrel Gliders and Ringtail Possums, but when loss of tree hollows decreases these prey populations the owl becomes more reliant on birds, invertebrates and terrestrial mammals such as rodents and rabbits. Requires very large permanent territories in most habitats due to sparse prey densities. Monogamous pairs hunt over as much as 6000 hectares, with 2000 hectares being more typical in NSW habitats.	V		Absent	Unlikely	No
Ninox strenua Powerful Owl	The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. It requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. It roosts by day in dense vegetation comprising species such as Turpentine *Syncarpia glomulifera*, Black She-oak *Allocasuarina littoralis*, Blackwood *Acacia melanoxylon*, Rough-barked Apple *Angophora floribunda*, Cherry Ballart *Exocarpus cupressiformis* and a number of eucalypt species. The main prey	V		Absent	Unlikely	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
	items are medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider. As most prey species require hollows and a shrub layer, these are important habitat components for the owl. In good habitats 400 ha can support a pair of Powerful Owls; where hollow trees and prey have been depleted the owls need up to 4000 ha. Powerful Owls nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old.					
Tyto novaehollandiae Masked Owl	Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides. The typical diet consists of tree-dwelling and ground mammals, especially rats. Pairs have a large home-range of 500 to 1000 hectares. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.	V		Absent	Unlikely	No
Numenius madagascariensis Eastern Curlew	In Australia, the eastern curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass.		CE, Migratory	Absent	Unlikely	No
Petroica phoenicea Flame Robin	Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. The groundlayer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense. Occasionally occurs in temperate rainforest, and also in herbfields, heathlands, shrublands and sedgelands at high altitudes. In winter lives in dry forests, open woodlands and in pastures and native grasslands, with or without scattered trees.	V		Present	Possible	No, no important habitat impacted
Polytelis swainsonii Superb Parrot	Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. In the Riverina the birds nest in the hollows of large trees (dead or alive) mainly in tall riparian River		V	Absent	Unlikely	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
	Red Gum Forest or Woodland. On the South West Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box. May forage up to 10 km from nesting sites, primarily in grassy box woodland. Feed in trees and understorey shrubs and on the ground and their diet consists mainly of grass seeds and herbaceous plants. Also eaten are fruits, berries, nectar, buds, flowers, insects and grain.					
Rostratula australis Australian Painted Snipe	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds.	E	E	Absent	Unlikely	No
Stagonopleura guttata Diamond Firetail	Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum *Eucalyptus pauciflora* Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland. Feeds exclusively on the ground, on ripe and partly-ripe grass and herb seeds and green leaves, and on insects (especially in the breeding season).	V		Present	Possible	No, no important habitat impacted
Mammals						
Cercartetus nanus Eastern Pygmy-possum	Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest. Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes; soft fruits	V		Absent	Unlikely	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
	are eaten when flowers are unavailable. Also feeds on insects throughout the year; this feed source may be more important in habitats where flowers are less abundant such as wet forests. Shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, Ringtail Possum dreys or thickets of vegetation, (e.g. grass-tree skirts).					
Myotis macropus Southern Myotis	Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface.	V		Absent	Unlikely	No
Chalinolobus dwyeri Large-eared Pied Bat	It is generally rare with a very patchy distribution in NSW. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin, frequenting low to mid-elevation dry open forest and woodland close to these features. Found in well-timbered areas containing gullies. This species probably forages for small, flying insects below the forest canopy.	V	V	Absent	Unlikely	No
Scoteanax rueppellii Greater Broad-nosed Bat	Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species.	V		Absent	Unlikely	No
Falsistrellus tasmaniensis Eastern False Pipistrelle	Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings. Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy.	V		Absent	Unlikely	No
Miniopterus schreibersii oceanensis Eastern	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and	V		Absent	Unlikely	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Bentwing-bat	rearing of young. Maternity caves have very specific temperature and humidity regimes. Hunt in forested areas, catching moths and other flying insects above the tree top.					
Petauroides volans Greater Glider	The Greater Glider occurs in eucalypt forests and woodlands. Feeds exclusively on eucalypt leaves, buds, flowers and mistletoe. Shelter during the day in tree hollows and will use up to 18 hollows in their home range. Occupy a relatively small home range with an average size of 1 to 3 ha.		V	Absent	Unlikely	No
Petaurus australis Yellow-bellied Glider	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. It inhabits a wide range of forest types but prefers resource rich forests where mature trees provide nesting hollows and tree species composition provides year-round continuity of food resources. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south. Feed primarily on plant and insect exudates, including nectar, sap, honeydew and manna with pollen and insects providing protein. Den, often in family groups, in hollows of large trees. Very mobile and occupy large home ranges between 20 to 85 ha.	V		Absent	Unlikely	No
Petaurus norfolcensis Squirrel Glider	Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey. Require abundant tree hollows for refuge and nest sites. Diet varies seasonally and consists of *Acacia* gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein.	V		Absent	Unlikely	No
Petrogale penicillata Brush-tailed Rock-wallaby	Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. Browse on vegetation in and adjacent to rocky areas eating grasses and forbs as well as the foliage and fruits of shrubs	E	V	Absent	Unlikely	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
	and trees. Highly territorial and have strong site fidelity with an average home range size of about 15 ha.					
Phascolarctos cinereus Koala	Inhabits a range of eucalypt forest and woodland communities, including coastal forests, the woodlands of the tablelands and western slopes, and the riparian communities of the western plains. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Inactive for most of the day, feeding and moving mostly at night. Spend most of their time in trees, but will descend and traverse open ground to move between trees. Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size.	V	V	Present	Possible	No, no important habitat impacted
Pteropus poliocephalus Grey-headed Flying-fox	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Can travel up to 50 km from the camp to forage; commuting distances are more often <20 km. Feed on the nectar and pollen of native trees, in particular *Eucalyptus, Melaleuca* and *Banksia*, and fruits of rainforest trees and vines.	V	V	Present	Possible	No, no important habitat impacted
Dasyurus maculatus Spotted-tailed Quoll	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. A generalist predator with a preference for medium-sized (500g-5kg) mammals. Consumes a variety of prey, including gliders, possums, small wallabies, rats, birds, bandicoots, rabbits, reptiles and insects. Females occupy home ranges up to about 750 hectares and males up to 3500 hectares. Are known to traverse their home ranges along densely vegetated creeklines.	V	E	Absent	Unlikely	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Amphibians						
Heleioporus australiacus Giant Burrowing Frog	Found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based. Whilst in non-breeding habitat it burrows below the soil surface or in the leaf litter. Individuals move into the breeding site either immediately before or following heavy rain and occupy these sites for up to 10 days. When breeding, frogs will call from open spaces, under vegetation or rocks or from within burrows in the creek bank. Breeding habitat of this species is generally soaks or pools within first or second order streams. They are also commonly recorded from 'hanging swamp' seepage lines and where small pools form. The Giant Burrowing Frog has a generalist diet; they eat mainly invertebrates including ants, beetles, cockroaches, spiders, centipedes and scorpions.	V	V	Absent	Unlikely	No
Litoria aurea Green and Golden Bell Frog	Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (*Typha* spp.) or spikerushes (*Eleocharis* spp.). Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (*Gambusia holbrooki*), have a grassy area nearby and diurnal sheltering sites available. Some sites, particularly in the Greater Sydney region occur in highly disturbed areas.		V	Absent	Unlikely	No
Litoria booroolongensis Booroolong Frog	Live along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses. Adults occur on or near cobble banks and other rock structures within stream margins. Shelter under rocks or amongst vegetation near the ground on the stream edge.	E	E	Absent	Unlikely	No
Litoria littlejohni Littlejohn's Tree Frog, Health Frog	The majority of records are from within the Sydney Basin Bioregion with only scattered records south to the Victorian border and this species has not been recorded in southern NSW within the last decade. Records are isolated and tend to be at high altitude. This species breeds in the upper reaches of permanent streams and in perched swamps. Non-breeding habitat is heath based forests and woodlands where it shelters under leaf litter		V	Absent	Unlikely	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
	and low vegetation, and hunts for invertebrate prey either in shrubs or on the ground.					
Mixophyes balbus Stuttering Frog	In recent surveys it has only been recorded at three locations south of Sydney. Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range. Outside the breeding season adults live in deep leaf litter and thick understorey vegetation on the forest floor. Breed in streams during summer after heavy rain.	E	V	Absent	Unlikely	No
Reptiles						
Aprasia parapulchella Pink-tailed Legless Lizard	Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (*Themeda australis*). Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks. Commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks.	V	V	Absent	Unlikely	No
Delma impar Striped Legless Lizard	Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. Also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland. Habitat is where grassland is dominated by perennial, tussock-forming grasses such as Kangaroo Grass *Themeda australis*, spear-grasses *Austrostipa* spp. and poa tussocks *Poa* spp., and occasionally wallaby grasses. Sometimes found in grasslands with significant amounts of surface rocks, which are used for shelter.		V	Unlikely	Unlikely	No
Varanus rosenbergi Rosenberg's Goanna	Found in heath, open forest and woodland. Associated with termites, the mounds of which this species nests in; termite mounds are a critical habitat component. Individuals require large areas of habitat. Feeds on carrion, birds, eggs, reptiles and small mammals. Shelters in hollow logs, rock crevices and in burrows, which they may dig for themselves, or they may use other species' burrows, such as rabbit warrens. Generally slow moving; on the tablelands likely only to be seen on the hottest days.	V		Present	Possible	No, no important habitat impacted

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
Fish						
Macquaria australasica Macquarie Perch	While extant populations are still found across the Murray-Darling Basin and in an east coast catchment, populations are often small and geographically separated. In New South Wales, extant populations are known to occur in the upper reaches of the Lachlan, Murrumbidgee and Murray catchments in the Murray-Darling Basin, and in the Hawkesbury/Nepean catchment on the east coast. Macquarie perch spawn at sites located at the downstream end of pools, with eggs then drifting downstream to lodge amongst gravel in riffles.	E	E	Absent, no permanent waterways in study area.	No	No
Flora						
Bossiaea oligosperma Few-seeded Bossiaea	The Few-seeded Bossiaea is known from two disjunct areas - the lower Blue Mountains in the Warragamba area and the Windellama area in Goulburn Mulwaree LGA, where it is locally abundant. Occurs on stony slopes or ridges on sandstone in the Yerranderie area. Occurs in low woodland on loamy soil in the Windellama area.	V	V	Absent	Unlikely	No
Caladenia tessellate Thick-lipped Spider-orchid	The Thick Lip Spider Orchid is known from the Sydney area, Wyong, Ulladulla and Braidwood in NSW. Populations in Kiama and Queanbeyan are presumed extinct. Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil. The single leaf regrows each year. Flowers appear between September and November.		V	Absent	Unlikely	No
Diuris aequalis Buttercup Doubletail	The Buttercup Doubletail has been recorded in Kanangra-Boyd National Park, Gurnang State Forest, towards Wombeyan Caves, the Taralga - Goulburn area, and the ranges between Braidwood, Tarago and Bungendore. Recorded in forest, low open woodland	E	V	Absent	Unlikely	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
	with grassy understorey and secondary grassland on the higher parts of the Southern and Central Tablelands (especially on the Great Dividing Range). Leaves die back each year and re-sprout just before flowering. Populations tend to contain few, scattered individuals; despite extensive surveys, only about 200 plants in total, from 20 populations are known.					
Diuris tricolor Pine Donkey Orchid	The Pine Donkey Orchid grows in sclerophyll forest among grass, often with native Cypress Pine (*Callitris* spp.). The species is usually recorded from disturbed habitats. Associated species include *Callitris glaucophylla, Eucalyptus populnea, Eucalyptus intertexta*, Ironbark and *Acacia* shrubland. The understorey is often grassy with herbaceous plants such as *Bulbine* species. Usually flowers between early September to late October. The species is a tuberous, deciduous terrestrial orchid and the flowers have a pleasant, light sweet scent. It is found in sandy soils, either on flats or small rises.	V		Absent	Unlikely	No
Eucalyptus macarthurii Paddys River Box, Camden Woollybutt	Paddys River Box is currently recorded from the Moss Vale District to Kanangra Boyd National Park. In the Southern Highlands it occurs often as isolated individuals in, or on the edges, of paddocks. Occurs on grassy woodland on relatively fertile soils on broad cold flats.	E	E	Absent	Unlikely	No
Eucalyptus aggregata Black Gum	Black Gum is a small to medium-sized woodland tree growing to 18 m tall. The the bark on the trunk and main branches is dark greyish-black, deeply fibrous or flaky. The bark does not shed annually. Only the uppermost branches and twigs have smooth whitish, cream or greyish bark that sheds yearly. The juvenile leaves are narrow or oval-shaped, dull green and arranged opposite to one another. Black Gum is found in the NSW Central and Southern Tablelands, with small isolated populations in Victoria and the ACT. In NSW it occurs in the South Eastern Highlands Bioregion and on the western fringe of the Sydney Basin Bioregion. Black Gum has a moderately narrow distribution, occurring mainly in the wetter,	V	V	Absent	Unlikely	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
	cooler and higher parts of the tablelands, for example in the Blayney, Crookwell, Goulburn, Braidwood and Bungendore districts. Grows in the lowest parts of the landscape. Grows on alluvial soils, on cold, poorly-drained flats and hollows adjacent to creeks and small rivers.					
Swainsona sericea Silky Swainson-pea	Silky Swainson-pea has been recorded from the Northern Tablelands to the Southern Tablelands and further inland on the slopes and plains. Found in Natural Temperate Grassland and Snow Gum *Eucalyptus pauciflora* Woodland on the Monaro. Found in Box-Gum Woodland in the Southern Tablelands and South West Slopes. Sometimes found in association with cypress-pines *Callitris* spp.	V		Absent	Unlikely	No
Thesium austral Austral Toadflax	Austral Toad-flax is found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Often found in association with Kangaroo Grass (*Themeda australis*).		V	Absent	Unlikely	No
Ecological Communities						
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Commonwealth) *White Box Yellow Box Blakely's Red Gum Woodland (NSW)*	Box – Gum Grassy Woodlands and Derived Grasslands are characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs, and the dominance, or prior dominance, of White Box, Yellow Box or Blakely's Red Gum trees. The tree-cover is generally discontinuous and consists of widely-spaced trees of medium height in which the canopies are clearly separated. Associated and occasionally co-dominant trees include, but are not restricted to: Grey Box (*Eucalyptus microcarpa*), Fuzzy Box (*E. conica*), Apple Box (*E. bridgesiana*), Red Box (*E. polyanthemos*), Red Stringybark (*E. macrorhyncha*), White Cypress Pine (*Callitris glaucophylla*), Black Cypress Pine (*C. enderlicheri*), Long-leaved Box (*E. gonicalyx*), New England Stringybark (*E. calignosa*), Brittle Gum (*E. mannifera*), Candlebark (*E. rubida*), Argyle Apple (*E. cinerea*), Kurrajong (*Brachychiton*	EEC	CE	Occurs in district	Does not occur onsite	No Impact

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
	populneus) and Drooping She-oak (*Allocasuarina verticillata*). The understorey in intact sites is characterised by native grasses and a high diversity of herbs; the most commonly encountered include Kangaroo Grass (*Themeda australis*), Poa Tussock (*Poa sieberiana*), wallaby grasses (*Austrodanthonia* spp.), spear-grasses (*Austrostipa* spp.), Common Everlasting (*Chrysocephalum apiculatum*), Scrambled Eggs (*Goodenia pinnatifida*), Small St John's Wort (*Hypericum gramineum*), Narrow-leafed New Holland Daisy (*Vittadinia muelleri*) and blue-bells (*Wahlenbergia* spp.). This ecological community occurs in areas where rainfall is between 400 and 1200 mm per annum, on moderate to highly fertile soils where resources such as water and nutrients are abundant.					
Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions	Characterised by the presence or prior occurrence of Snow Gum, Candlebark, Ribbon Gum and/or Black Sallee trees. The trees may occur as pure stands, mixtures of the four species or in mixtures with other trees, including wattles. Commonly co-occurring eucalypts include Apple Box (*Eucalyptus bridgesiana*), Swamp Gum (*E. ovata*), Black Gum (*E. aggregata*), Mountain Gum (*E. dalrympleana*), Broad-leaved Peppermint (*E. dives*) and Narrow-leaved Peppermint (*E. radiata*) and commonly occurring tree-layer or mid-layer wattles include Blackwood (*Acacia melanoxylon*) and Silver Wattle (*A. dealbata*). The understorey in intact sites is characterised by native grasses and a high diversity of herbs; commonly encountered include Kangaroo Grass (*Themeda australis*), Common Snow-grass (*Poa sieberiana*), River Tussock (*Poa labillardierei*), Short Snow-grass (*Poa meionectes*), various wallaby-grasses (*Rytidosperma* spp.), various spear-grasses (*Austrostipa* spp.), Common Everlasting (*Chrysocephalum apiculatum*), Scaly-buttons (*Leptorhynchos squamatus*), Common Woodruff (*Asperula conferta*), Wattle Mat-rush (*Lomandra filiformis*), St John's Wort (*Hypericum*	EEC		Absent	No	No

Species name	Habitat requirements	TSC Act status	EPBC Act status	Presence of habitat	Likelihood of occurrence	Potential impact
	gramineum), Stinking Pennywort (*Hydrocotyle laxiflora*) and Slender Tick-trefoil (*Desmodium varians*). Shrubs are generally sparse or absent, though they may be locally common. Sub-shrubs (woody species <0.5 m tall) may be common. The most common shrubs and sub-shrubs include Gruggly-bush (*Melicytus* sp. 'Snowfields'), Urn Heath (*Melichrus urceolatus*), Sweet Bursaria (*Bursaria spinosa*) and Mountain Mirbelia (*Mirbelia oxylobioides*).					