

FLORA and FAUNA

Biodiversity Assessment Report

Gardens of Stone Multi-day Walk Section One.

Gardens of Stone State Conservation Area, NSW.

February 2024



Cover photograph: Character of the area Section One will traverse, from lookout on track.

Report produced at the request of the:

NSW National Parks and Wildlife Service

by

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Disclaimer

This document has been prepared in accordance with the brief provided by the NSW National Parks and Wildlife Service ('the client'). This study has relied upon information collected during the course of field investigations, and as available in current known literature and data sources. All findings, conclusions or recommendations contained within this document are based upon the abovementioned circumstances. The study has been prepared for use by the client, and no responsibility for its use by other parties is accepted by Lesryk Environmental Pty Ltd.

Please note that, given the dynamic nature of the relevant pieces of environmental legislation considered in this report, the authors consider that this report only has a 'shelf life' of six months. If a development application, review of environmental factors or statement of environmental effect is not submitted to a determining authority for consideration within this time frame, it is recommended that this report be reviewed and revised where required in light of any relevant legislative listings or changes.

This report is prepared in accordance with the 6th Edition of the Commonwealth of Australia (2002) Style Manual.

CONTENTS

1.	Introduction	2
2.	Activity scope.....	2
3.	Legislative requirements	4
4.	Natural values assessment	4
4.1.	Desktop analysis	4
4.1.1	Literature review and field guides	4
4.1.2	Vegetation mapping	7
4.1.3	Biodiversity Values Map	7
4.1.4	Threatened species	8
4.1.5	Critical habitat.....	8
4.2.	Gardens of Stone Plan of Management.....	12
4.3.	Landscape values	13
4.3.1	Existing environment	13
4.3.2	Geology and soil (including contamination)	13
4.3.3	Watercourse, waterbodies and wetlands	19
4.4.	Ecological values.....	20
4.4.1	Field survey methods	20
4.4.2	Limitations and assumptions	21
4.4.3	Results.....	22
4.4.3.1	Plant Community Types.....	22
4.4.3.2	Threatened Ecological Communities	23
4.4.3.3	Flora species recorded	24
4.4.3.4	Fauna species recorded	26
5.	Impact Assessment	30
5.1.	Application of avoid and minimise principles.....	30
5.2.	Application of mitigation measures	31
5.3.	Proposed Impact	35
5.3.1	Key Threatening Processes	35
5.4.	Legislative consideration	36
5.4.1	Commonwealth – <i>Environment Protection and Biodiversity Conservation Act 1999</i>	36
5.4.2	State – <i>Biodiversity Conservation Act 2016</i>	36
5.4.3	State – <i>Fisheries Management Act 1994</i>	37
5.4.4	SEPP (Biodiversity and Conservation) 2021	37
5.4.5	SEPP (Resilience and Hazards) 2021	38
5.4.6	Section 171(2) of the EP&A Regulation 2021	38
6.	Conclusion.....	41
7.	Recommendations.....	42
8.	Bibliography.....	44

Appendix 1. Threatened species likelihood of occurrence per BioNet Atlas and EPBC PMST	47
Appendix 2. Photographic record of area investigated	67
Appendix 3. Ecological Assessments	71
Appendix 4. Fauna species recorded	91

List of figures and tables

Figure 1. Proposal location.....	3
Figure 2. State Vegetation Type Mapping in the vicinity of the proposed track alignment.	9
Figure 3. Threatened flora species (previously recorded within 10 km) within activity vicinity.	10
Figure 4. Threatened fauna species (previously recorded within 10 km) within activity vicinity.	11
Figure 5. Watercourses.	14
Figure 6. Soil landscapes of study area.	15
Figure 7. Groundwater Dependent Ecosystems.	20
Figure 8. PCT 3945 Newnes Plateau Shrub Swamp in relation to the proposed track alignment.	24
Figure 9. Records of <i>Persoonia hindii</i> in relation to the proposed track alignment.....	25
Figure 10. Locations of recorded threatened fauna species.	27
 Table 1. Summary of legislative and policy requirements	 5
Table 2. Database searches	7
Table 3. Soil landscape properties of study area.....	16
Table 4. Plant Community Types	23
Table 5. GPS coordinates for recorded threatened fauna species.....	26

Acronyms & Abbreviations

Abbreviation	Definition
°C	Degrees Celsius
AOBV	Areas of Outstanding Biodiversity Value
BAR	Biodiversity Assessment Report
BC Act	NSW <i>Biodiversity Conservation Act 2016</i>
BDAR	Biodiversity Development Assessment Report
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DE	Commonwealth Department of the Environment (now known as DPE)
DEC	NSW Department of Environment and Conservation (now known as DPE)
DPE	NSW Department of Planning and Environment
DPI	NSW Department of Primary Industries
DSEWPC	Commonwealth Department of Sustainability, Environment, Water, Population and Communities (now DCCEEW)
EEC	Endangered Ecological Community
EPA	NSW Environmental Protection Authority
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
ESCP	Erosion Sediment and Control Plan
FM Act	NSW <i>Fisheries Management Act 1994</i>
GDE	Groundwater Dependent Ecosystems
ha	Hectares
KFH	Key Fish Habitat
KTP	Key Threatening Process
LEP	Local Environmental Plan
Lesryk	Lesryk Environmental Pty Ltd
LGA	Local Government Area
mm/cm/m/m ² /km	Millimetres, centimetres, metres, square metres, kilometres, hectares
MNES	Matters of National Environmental Significance
NPWS	NSW National Parks and Wildlife Service
NSW	New South Wales
OEH	NSW Office of Environment and Heritage (now known as DPE)
PCT	Plant Community Type
PMST	Protected Matters Search Tool
PoM	Plan of Management
RAMSAR	The Convention on Wetlands of International Importance
REF	Review of Environmental Factors
SCA	State Conservation Area
SEED	The Central Resource for Sharing and Enabling Environmental Data in NSW
SEPP	State Environmental Planning Policy
SIS	Species Impact Statement
SOS	Save Our Species
SVTM	NSW State Vegetation Type Map (release C1.1.M1)
TBDC	Threatened Biota Database Collection
TEC	Threatened Ecological Community
WoNS	Weeds of National Significance

Glossary

Proposal/proposed works	Scope of works as defined within the Request For Tender provided by NPWS.
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 (State of NSW and OEH 2018).
Study area	Means the subject site and any additional areas which are likely to be affected by the proposal, either directly or indirectly (State of NSW and OEH 2018). Refers to the area specified for the ecological and landscape desktop assessment only.
Study region	Is specified as a 10 km polygon around the outer edge of the defined construction activity footprint.
Impact footprint	Refers to the area of direct impacts associated with the proposal.
Direct impacts	Are those that directly affect the habitat of species and ecological communities and of individuals using the study area. They include, but are not limited to, death through predation, trampling, poisoning of the animal/plant itself and the removal of suitable habitat (State of NSW and OEH 2018).
Indirect impacts	Occur when project-related activities affect species or ecological communities in a manner other than direct loss within the subject site. Indirect impacts may sterilise or reduce the habitability of adjacent or connected habitats. Indirect impacts can include loss of individuals through starvation, exposure, predation by domestic and/or feral animals, loss of breeding opportunities, loss of shade/shelter, reduction in viability of adjacent habitat due to edge effects, deleterious hydrological changes, increased soil salinity, erosion, inhibition of nitrogen fixation, weed invasion, noise, light spill, fertiliser drift, or increased human activity within or directly adjacent to sensitive habitat areas (State of NSW and OEH 2018).
Areas of outstanding biodiversity	An area of outstanding biodiversity value is: <ul style="list-style-type: none"> • an area important at a State, national or global scale, and • an area that makes a significant contribution to the persistence of at least one of the following: <ul style="list-style-type: none"> • multiple species or at least one threatened species or ecological community • irreplaceable biological distinctiveness • ecological processes or ecological integrity • outstanding ecological value for education or scientific research. • The declaration of an area may relate, but is not limited, to protecting threatened species or ecological communities, connectivity, climate refuges and migratory species (BC Act 2016).
Important population	Is a population that is necessary for a species' long-term survival and recovery; this may include populations identified as such in recovery plans, and/or that are: <ul style="list-style-type: none"> • key source populations either for breeding or dispersal • populations that are necessary for maintaining genetic diversity, and/or • populations that are near the limit of the species range (DE 2013).
Local population	Is the population that occurs in the study area. The assessment of the local population may be extended to include individuals beyond the study area if it can be clearly demonstrated that contiguous or interconnecting parts of the population continue beyond the study area, according to the following definitions: <ul style="list-style-type: none"> • The <i>local population</i> of a threatened <i>plant</i> species comprises those individuals occurring in the study area or the cluster of individuals that extend into habitat adjoining and contiguous with the study area that could reasonably be expected to be cross-pollinating with those in the study area. • The <i>local population</i> of <i>resident fauna</i> species comprises those individuals known or likely to occur in the study area, as well as any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to utilise habitats in the study area. • The <i>local population</i> of <i>migratory or nomadic fauna</i> species comprises those individuals that are likely to occur in the study area from time to time or return year to year. (State of NSW and Office of Environment and Heritage 2018)
Invasive species	Is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources, or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.

Executive summary

NSW National Parks and Wildlife Service is proposing the construction of an approximately 12 kilometre long publicly accessible multi-day walking track with two associated helicopter landing pads in the Gardens of Stone State Conservation Area, NSW. This Biodiversity Assessment has been prepared to support a Review of Environmental Factors that is being prepared to assess the walking track and helicopter landing pad construction.

To assess the work proposed, an ecological investigation was conducted within and adjacent to those areas to be disturbed.

By the completion of the field investigation the following biota listed under NSW *Biodiversity Conservation Act 2016* were recorded or considered likely to occur at the subject site:

- Newnes Plateau Shrub Swamp in the Sydney Basin Bioregion – listed as an Endangered Ecological Community under this Act
- *Persoonia hindii* – Endangered
- Small Pale Grass-lily – Endangered
- Deane's Boronia – Vulnerable
- Flame Robin – Vulnerable
- Scarlet Robin – Vulnerable
- Varied Sittella – Vulnerable
- Gang-gang Cockatoo – Vulnerable.
- Blue Mountains Water Skink – Endangered
- Giant Dragonfly – Endangered.

The following Matters of National Environmental Significance listed on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* were also recorded or considered likely to occur within or near the proposal area:

- Temperate Highlands Peat Swamps on Sandstone – listed as an Endangered Ecological Community under this Act
- Deane's Boronia – Vulnerable
- Blue Mountains Water Skink – Endangered
- Gang-gang Cockatoo – Endangered.

With reference to the Significant Impact Guidelines provided under the EPBC Act, and Section 7.3 of the BC Act, assessments conducted that the proposed works would not significantly impact the recorded or potentially occurring threatened ecological communities, threatened species, or their habitats. As such, it is considered that the proposal (as assessed) is not a controlled action requiring referral to the Federal Minister for the Environment for further consideration or approval, nor is the preparation of a Significant Impact Statement (or alternatively, a Biodiversity Development Assessment Report were National Parks to choose that option) triggered.

Within, and adjacent to, the footprint of the proposal, Carne Creek is mapped as Key Fish Habitat. The proposed track alignment crosses this mapped area in two locations, and traverses the boundary of the mapping towards the southern end of the track. National Parks Wildlife Service (NPWS) must give the Minister administering the NSW *Fisheries Management Act 1994* written notice of the proposed work and consider any matters concerning the work raised in accordance with Section 199 of the Act.

Adoption of those mitigation measures recommended within Section 7 of this report will ensure the proposal does not cause an adverse impact on these environments.

With adherence to those recommendations provided in this report, no ecological constraints to the proposal proceeding as planned were identified or considered likely to occur.

1. Introduction

At the request of NPWS, Lesryk has conducted an ecological investigation within a portion of the Gardens of Stone SCA. The investigation has been conducted as NPWS are proposing to establish a publicly accessible multi-day walking track, the proposed alignment of this (as provided by NPWS at the commencement of the study), and a distance of up to 10 m either side of this, being traversed/inspected.

The proposed track would be about 12 km in length and includes dedicated helicopter landing pads (Figure 1). To permit the establishment of both the walking track and helicopter landing pads, a disturbance footprint of about 34,908 m² (3.49 ha) would be required.

During the construction phase of the project, it is expected that, either side of the proposed track's alignment, to permit the movement of machinery and personnel, an additional disturbance footprint of 1 m would be required. During this construction phase, 22,742 m² of vegetation would be potentially cleared. Post-establishment of the walking track, areas adjacent to the track would be permitted to naturally regenerate.

Based on the observations made during the field inspection, unassisted natural regeneration of those plants present is considered to be high.

Lesryk has been engaged to prepare this BAR to consider and assess all ecological matters affecting, or likely to affect, the environment as a result of the works required to construct the walking track. The BAR will contribute to, and inform, a REF that has been prepared for the proposal, this produced in compliance with the requirements of Division 5.1 of the EP&A Act.

The assessment of possible ecological impacts associated with the proposal is based on a field investigation of the study area, a literature review of previous studies conducted in both the region and this portion of the Gardens of Stone SCA, a review of standard databases and a consideration of the objectives of the EPBC, EP&A, BC and FM Acts, any relevant SEPP or other relevant legislation, policies and principles.

As the project is being assessed under Part 5 of the EP&A Act, in line with Section 7.8(2) of the BC Act, the proposal does not need to be assessed under Part 6 (the Biodiversity Offsets Scheme) of the BC Act. Hence, the application of the Biodiversity Assessment Method (Division 2, Part 6 of the BC Act) is not required.

Upon engagement, Lesryk was provided with an indicative alignment of the walking track. Subsequent to the conducting of the initial inspection of this, several ecological constraints, including the presence of threatened plants, were noted. This information was provided to NPWS, and, where these constraints were noted, NPWS realigned the track to avoid disturbance of these sites. Further realignments were also proposed by both NPWS and Lesryk following subsequent considerations and site inspections.

The alignment considered and assessed in this report has been developed, and refined, based on discussions held between NPWS and Lesryk, and is based on the outcomes of the field inspections. This alignment has been selected as it avoids a number of ecological constraints whilst also meeting the overall objective of the multiday walking track.

2. Activity scope

The proposed activity will include the construction of a walking track through the Gardens of Stone SCA (Figure 1).

Construction of tracks and ancillary facilities will be undertaken in accordance with the NPWS' Parks Facilities Manual and best practice standards.

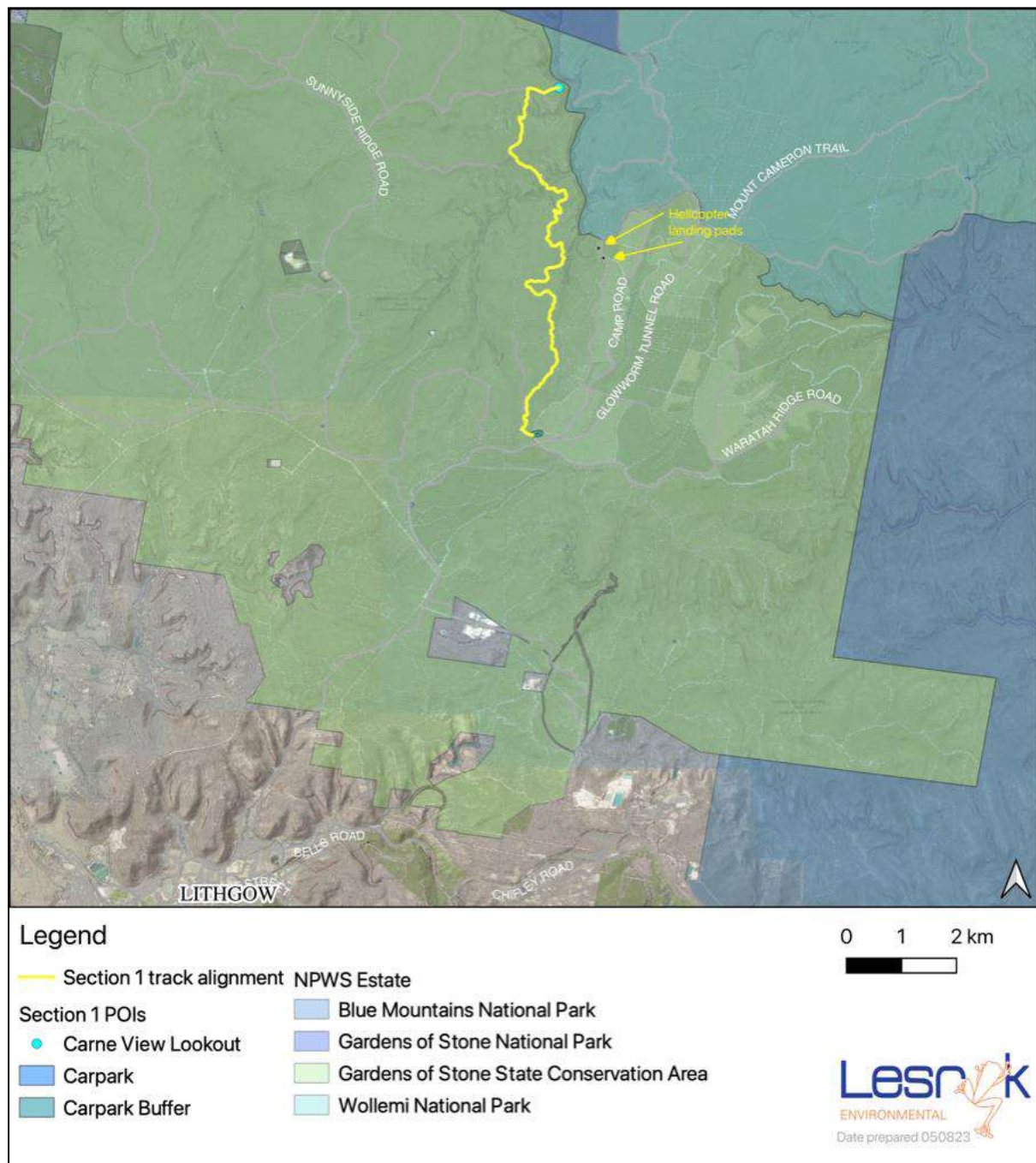


Figure 1. Proposal location.

The construction methods would include:

- Manual track construction
- Carved bedrock steps and ramps
- Excavation of ground debris
- Benching with the use of excavators and power tools
- Timber steps and drains
- Sandstone steps and drains
- Vegetation clearing
- Sandstone stepping stones.

More detailed information is provided in the NPWS Parks Facilities Manual, Chapter 5.

Construction assumptions related to the walking track include:

- Walking track width will be 900 mm
- To permit construction, up to 1 m either side of the track may be disturbed to enable machinery to move freely around the site
- Locally acquired materials will be used during construction
- Cleared materials will be reused on, or close to, the site
- Stockpile sites would be located at the walking track entrance, with helicopter operations managing drops on the walking track with a 5 m accuracy.

3. Legislative requirements

A number of Commonwealth, State and local Acts, policies and/or documents are relevant to the proposal and its possible impact on the ecology of both the subject site and its locality. The most relevant of these are listed in Table 1.

4. Natural values assessment

4.1. Desktop analysis

4.1.1 Literature review and field guides

Prior to conducting any on-site investigations, known databases and/or those previous studies conducted in the surrounding region were reviewed, these consulted to identify matters such as: the diversity of ecological communities, flora and fauna species known for, or potentially occurring in, proximity to the track surveyed, the presence of any significant habitats, areas of outstanding biodiversity value, and so forth.

The identification of those known or potentially occurring native species and communities within this portion of the Gardens of Stone SCA, particularly those listed under the Schedules to the EPBC, BC and FM Acts, thereby permits the tailoring of field survey strategies to the detection of these plants and animals, their vegetation associations and/or necessary habitat requirements. By identifying likely species, particularly any threatened plants and animals, either the most appropriate species-specific survey techniques may be selected [should their associated vegetation communities/habitat requirements be present] or a precautionary approach adopted.

The conducting of a literature search also ensures that the results from surveys conducted during different climatic, seasonal and date periods are considered and drawn upon as required. This approach therefore increases the probability of considering the presence of, and possible impacts on, all known and likely native species, particularly any plants and animals that are of State and/or national conservation concern. This approach also avoids issues inherent with a one off 'snap shot' study.

A list of databases, dates these were accessed, and the search area employed is provided in Table 2. Additional databases, reports and documents referred to as provided within the bibliography section of this report.

All these databases and reports were reviewed and drawn upon where relevant. Whilst reviewing these documents, particular attention was paid to identifying relevant ecological matters listed under the Schedules of the EPBC, BC and FM Acts, plants, animals and ecological communities that have been recorded in the region and which may occur along, or in the vicinity of, the proposed track alignment area.

Table 1. Summary of legislative and policy requirements

Level	Relevant Legislation/Policy	Relevance to study area
Commonwealth	<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Under this Act an action will require approval from the Minister if the action has, will have, or is likely to have, a significant impact on a matter of national environmental significance. Matters of national environmental significance include listed threatened species and ecological communities, and those migratory species protected under international agreements. Where found, the assessment criteria relevant to this Act will be drawn upon to determine whether there would be a significant effect on these species and communities and hence whether referral to the Federal Environment Minister is required.
State	<i>NSW Environmental Planning and Assessment Act 1979</i>	Part 4 of this Act requires that a determination be made as to whether a proposed action is likely to significantly affect threatened species or ecological communities, or their habitats listed on Schedule 1 and 2 of the BC Act. Where found, the assessment criteria under Part 7 Section 7.3 of the BC Act (the 'Assessment of Significance') will be drawn upon to determine whether there would be a significant effect on these species and, hence, whether a SIS [or alternatively, a Biodiversity Development Assessment Report] is required.
	<i>NSW Biodiversity Conservation Act 2016</i>	<p>The purpose of this Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. This Act defines those species listed as protected in NSW.</p> <p>Part 7.2 of this Act requires assessment of whether a development or activity is "likely to significantly affect threatened species."</p>
	<i>NSW National Parks and Wildlife Act 1974</i>	<p>(1) The purpose of reserving land as a state conservation area is to identify, protect and conserve areas—</p> <ul style="list-style-type: none"> a) that contain significant or representative ecosystems, landforms or natural phenomena or places of cultural significance, and b) that are capable of providing opportunities for sustainable visitor or tourist use and enjoyment, the sustainable use of buildings and structures or research, and c) that are capable of providing opportunities for uses permitted under other provisions of this Act in such areas, including uses permitted under section 47J, <p>so as to enable those areas to be managed in accordance with subsection (2).</p> <p>The proposed activity is designed to minimise impacts on the natural environment and on European and Aboriginal cultural resources, whilst providing sustainable visitor use of the site, and is therefore consistent with objects of the Act under s.2A(1)(a) and (c). The activity is consistent with s.2A(1)(d) which provides for the management of land reserved under this Act in accordance with the management principles applicable for a State Conservation Area, as set out in s.30G of the Act.</p>

Level	Relevant Legislation/Policy	Relevance to study area
	NSW <i>Biosecurity Act 2015</i>	<p>Part 3, Clause 22 of this Act states 'any person who deals with biosecurity matter or a carrier and who knows, or ought reasonably to know, the biosecurity risk posed or likely to be posed by the biosecurity matter, carrier or dealing has a biosecurity duty to ensure that, so far as is reasonably practicable, the biosecurity risk is prevented, eliminated or minimised'.</p> <p>This includes pest animal and plants species as defined under Clause 15 of the Act and anything declared by the regulations to be a pest for the purposes of this Act.</p>
	NSW <i>Fisheries Management Act 1994</i>	<p>The object of this Act is to conserve, develop and share the fishery resources of the state for the benefit of present and future generations. In particular, the Act aims to:</p> <ul style="list-style-type: none"> a) conserve fish stocks and key fish habitats b) conserve threatened species, populations and ecological communities of fish and marine vegetation c) promote ecologically sustainable development, including the conservation of biological diversity. <p>Under Section 199 of the Act, a local government authority must, before it carries out or authorises the carrying out of dredging or reclamation work:</p> <ul style="list-style-type: none"> • give the Minister written notice of the proposed work, and • consider any matters concerning the proposed work that are raised by the Minister within 28 days after the giving of the notice (or such other period as is agreed between the Minister and the public authority).
	State Environmental Planning Policy (Biodiversity Conservation) 2021	Chapter 4 of this SEPP requires consideration of whether a proposal will affect Core Koala habitat as defined in the SEPP. If so, a plan of management for the Koala must be prepared in accordance with Part 4.3 of the SEPP.
	State Environmental Planning Policy (Resilience and Hazards) 2021	<p>The objectives of Chapter 2 Coastal Management of the SEPP include:</p> <ul style="list-style-type: none"> • managing development in the coastal zone and protecting the environmental assets of the coast, • establishing a framework for land use planning to guide decision-making in the coastal zone • mapping the 4 coastal management areas which comprise the NSW coastal zone, in accordance with the definitions in the <i>Coastal Management Act 2016</i>. <p>Division 1 Coastal wetlands and littoral rainforest area, Division 2 Coastal vulnerability area, Division 3 Coastal environment area and Division 4 Coastal use area requires consideration of whether a proposal on land that is within/in proximity to these four coastal management areas is likely to cause an adverse impact.</p>

Table 2. Database searches

Database/information source	Date accessed	Search area
PMST (DCCEEW 2023a)	May 2023	10 km buffer on study area
Register of Critical Habitat (DCCEEW 2023c)	May 2023	Study area
BioNet Atlas database and Threatened Biota Database Collection (DPE 2023a)	May 2023	10 km buffer on study area
AOBV (DPE 2023b)	May 2023	Study area
Biodiversity Values Map and Threshold Tool (NSW Government 2023b)	May 2023	Study area
NSW WeedWise: Priority weeds for the Central Tablelands (including Lithgow City LGA) (DPI 2023a)	May 2023	Central Tablelands
SVTM (NSW Government & DPE 2022)	May 2023	Study area
BioNet Vegetation Classification database (NSW Government 2023c)	May 2023	N/A

Nomenclature follows that within the EPBC, BC and FM Acts, or texts provided within Section 8 of this report.

It is noted that the current accepted scientific names for some of the threatened fauna species previously recorded in this locality are not consistent with the names used/provided under either the EPBC or BC Acts. In these instances, nomenclature used within this report follows the current approved scientific conventions.

4.1.2 Vegetation mapping

The PCTs in the study area were reviewed with reference to the SVTM (State Government of NSW and DPE 2022) (Figure 2). The alignment of the proposed walking track traverses the following PCTs:

- PCT 3687 Newnes Plateau Peppermint-Ash Tall Forest
- 3688 Newnes Plateau Silvertop Ash Woodland
- 3691 Upper Blue Mountains Fringing Swamp Woodland
- 3694 Upper Blue Mountains Ridgetop Woodland
- 3695 Western Blue Mountains Peppermint Sheltered Forest
- 3696 Western Blue Mountains Rocky Scribbly Gum Woodland
- 3862 Newnes Plateau Rockplate Heath
- 3865 Western Blue Mountains Pagoda Scrub
- 3945 Newnes Plateau Shrub Swamp.

Of these, Newnes Plateau Shrub Swamp is listed as:

- an EEC on the BC Act
- is part of the EPBC Act listed EEC Temperate Highlands Peat Swamps on Sandstone (THPSS) (Refer to s.4.4.3.2 of this report).

4.1.3 Biodiversity Values Map

As a consequence of their EEC status, areas mapped as Newnes Plateau Shrub Swamp on the SVTM are included on the Biodiversity Values Map (NSW Government 2023b). As Part 5 developments are not subject to consideration of Section 7.3 of the Biodiversity Conservation Regulation, no assessment is required in relation to Section 7.1(1)(b) of this regulation.

4.1.4 Threatened species

A review of the DCCEEW's PMST and DPE's BioNet Atlas databases (DCCEEW 2023a, DPE 2023a) identified 43 threatened flora species and 72 threatened fauna species listed under the Schedules of the EPBC, FM and/or BC Acts that have been previously recorded, or are considered to have habitat, within a 10 km radius of the study area (Appendix 1). Figures 3 and 4 indicate those species previously recorded within a 10 km radius around the proposal area per the BioNet Atlas (note: some species' locations overlap due to having the same GPS coordinate on BioNet Atlas where one 'record' may account for several animals/plants).

Based on a consideration of the habitat needs of those threatened species listed in Appendix 1 (as provided in standard texts/online profiles – refer to the references section for those used), combined with a desk-top review of the PCTs present (these also indicating the likely fauna habitats that may occur), there is the potential for some of the species in Appendix 1 to be present in the vicinity of the proposal area. As such, during the course of the field investigations, consideration was given to identifying the presence of these species, or occurrences of their necessary vegetation associations/habitats, within the study area.

Targeted surveys for hollow-dependent species were not conducted during the investigation; therefore, the presence of such species is assumed based on the adoption of the precautionary approach. Several threatened hollow-dependent Yangochiroptera (insectivorous bats [hereafter referred to as microbats]) have been previously recorded within 10 km of the site surveyed (DPE 2023a) (Appendix 1); however, as no tree removal is required to achieve the objectives of the proposal, this group of animals is not considered to be directly or indirectly impacted by the proposed track works.

Whilst previously recorded within and/or predicted as having habitat within 10 km of the study area, the majority of species listed in Appendix 1 would not occur within, or be reliant upon, the habitats observed within the proposed impact footprint. Some individuals may traverse, fly over, forage or occur within the site on occasion (e.g., the Spotted-tailed Quoll *Dasyurus maculatus*, Grey-headed Flying-fox¹ *Pteropus poliocephalus*, Powerful Owl *Ninox strenua*, Square-tailed Kite *Lophoictinia isura*, Little Eagle *Hieraaetus morphnoides* and so forth); however, within the proposed walking track impact footprint, no significant resources for these animals [such as hollow-bearing trees, mature woodlands and so forth] are present, nor would any occurrences of these be adversely impacted by the proposal.

Whilst locally viable populations are known (predicted) to occur within the Gardens of Stone SCA, the scale of work proposed is not considered to have an adverse impact on any of these species or their lifecycle requirements. The proposed work would not cause the local extinction of these species, nor would it present any significant barriers to their movement patterns. Beyond the existing conditions presented within the site, the work will not fragment or isolate any of their habitat areas. These animals are expected to be tolerant of the current disturbance cause by the creation of an unauthorised motorcycle track and, post-work, are expected to be present within, and disperse across, both the proposed walking track and surrounding area.

4.1.5 Critical habitat

Through reference to the Australian Government's Register of Critical Habitat (DCCEEW 2023c), and the AOBV register (DPE 2023c) (in conjunction with Part 3 of the Biodiversity Conservation Regulation 2017), per listings provided under the EPBC and BC Acts, no gazetted areas of critical habitat or AOBV for any terrestrial species or communities occur within or near the proposal area.

¹ Reference to the National Flying-fox monitoring viewer (DCCEEW 2023d), did not indicate the presence of any active or historic flying-fox camps within, or in proximity to, the walking track alignment surveyed.

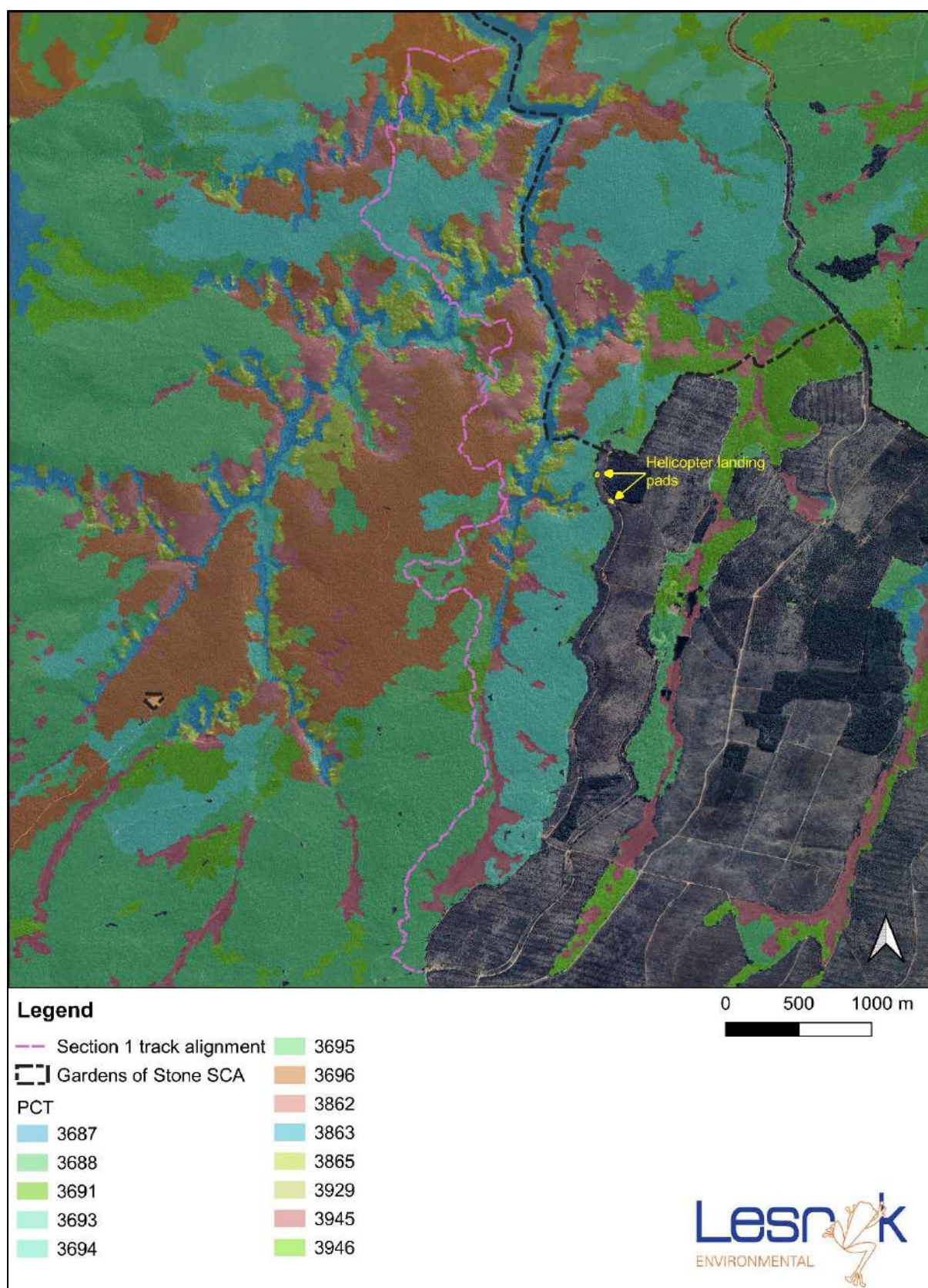


Figure 2. State Vegetation Type Mapping in the vicinity of the proposed track alignment.

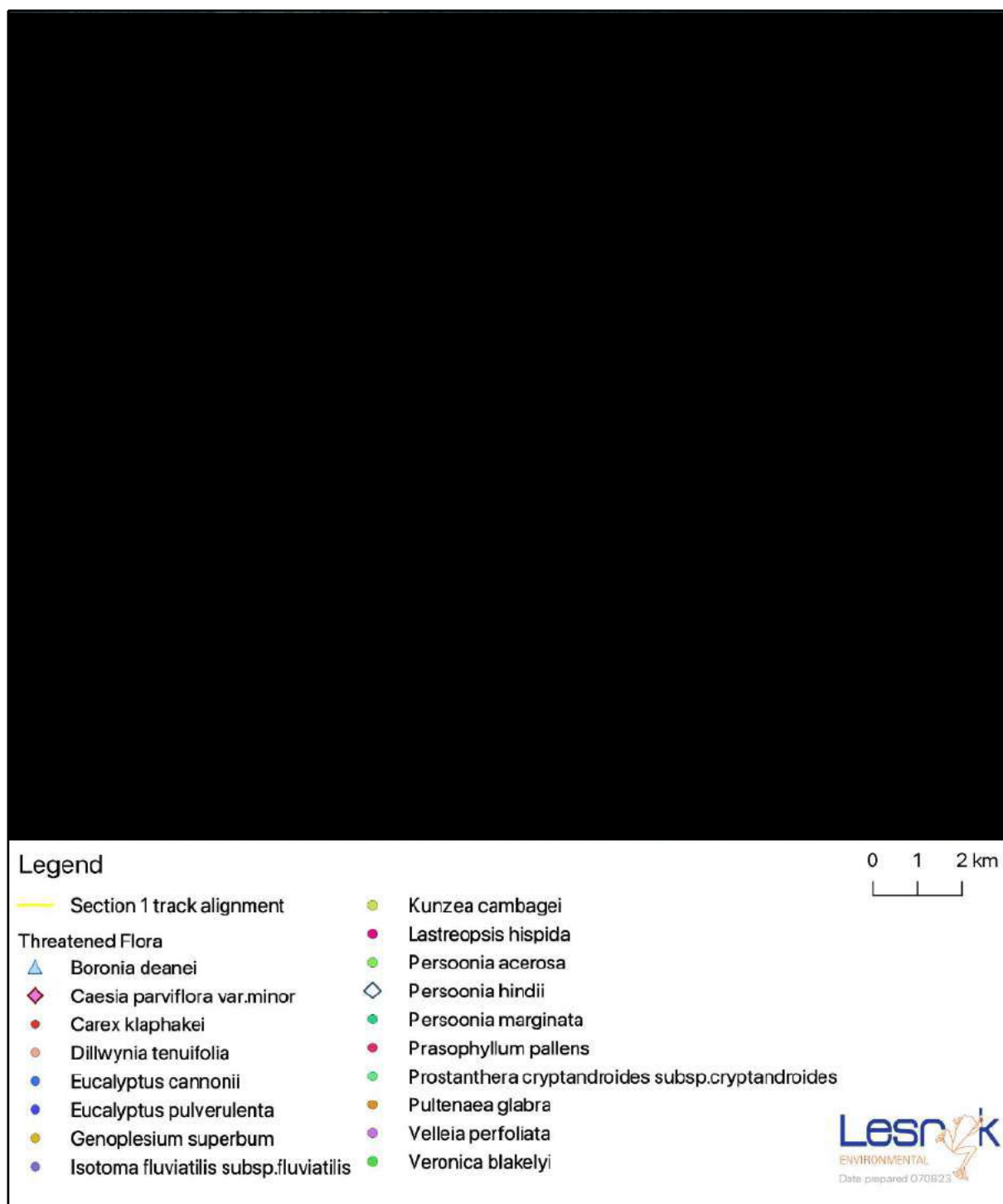


Figure 3. Threatened flora species (previously recorded within 10 km) within activity vicinity.



Figure 4. Threatened fauna species (previously recorded within 10 km) within activity vicinity.

4.2. Gardens of Stone Plan of Management

NPWS has prepared a Plan of Management for the Gardens of Stone SCA (NPWS 2022). The plan provides a summary of the park's most significant values and provides an overview of the primary factors that are expected to influence management. The plan also defines the desired outcomes of management and initial actions that will be implemented to achieve those outcomes (NPWS 2022 p 1).

The Plan of Management has been reviewed and drawn upon as required.

Management outcomes and actions of the PoM that are applicable to the proposal include:

- Supporting Wiradjuri aspirations for Country
- Setting a sound foundation for the conservation of biodiversity
- Assisting the recovery of a landscape under stress
- Establishing a major new visitor destination in the Blue Mountains, one of the identified Actions being:
 - Multi-day walk – Design and develop a multi-day walk that provides camping for independent walkers and scope for leased, low-impact, serviced accommodation.

The PoM *'provides for the development of a multi-day walk and associated camping areas that will be publicly accessible. Low-impact, small-scale accommodation may be developed as an alternative for walkers and operated under a lease or licence by a private sector partner. Any future accommodation on the multi-day walk will be sited and designed to ensure that it has a minimal visual and environmental impact and does not compromise the experience of walkers. The approval of all development within the park will be subject to environmental and cultural assessment processes as specified under the EP&A Act (NPWS 2022 pg 11).*

The current ecological investigation has been conducted in response to the above.

The PoM notes *'The complex rocky landforms of the upland plateau provide a diversity of habitats for plants and animals, resulting in rich biodiversity. Key flora and fauna values include:*

- over 1,000 plant species
- 33 vegetation communities, 3 of which are threatened [being]:
 - White Box – Yellow Box – Blakelys Red Gum Woodland Endangered Ecological Community (EEC)
 - Newnes Plateau Shrub Swamps EEC
 - Montane Peatlands and Swamps of the New England Tableland, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions EEC
- 16 vegetation communities that are of limited distribution or were previously unrepresented in the reserve system
- 25 threatened plant species including the Newnes Plateau geebung which is an endemic species only found on the Newnes Plateau and Deane's boronia, a swamp-dependent shrub that has a substantial range representation within the reserve
- over 300 vertebrate animal species
- 42 threatened animal species including the giant dragonfly, koala, spotted-tailed quoll, Blue Mountains water skink, broad-headed snake, regent honeyeater, scarlet robin and several species of microbats.

In conducting the site inspections, a consideration of these matters, and any potential impacts on those TEC and threatened species previously recorded in the Gardens of Stone SCA was conducted.

4.3. Landscape values

4.3.1 Existing environment

The proposed walking track is located within the Gardens of Stone SCA, north-east of Lithgow (Figure 1). The disturbance footprint would be about 34,908 m² (assuming a 12 km track length and 2.9 m wide clearing).

The proposed alignment would generally mirror that of an existing, 1 m wide, unauthorised motorcycle track, and a 4 m wide fire trail that NPWS manages.

The locality in which the walking track would be established is characterised by intact woodland, open forest and heath, a number of these habitats traversed by numerous unauthorised vehicular access trails (such as the unauthorised motorcycle track).

A large swamp, covering some 26.6 ha and known in some publications as Barrier Swamp, lies parallel to the southern half of the proposed walking track alignment with its three western arms extending into the alignment.

Further to the east is former forestry land, this regenerating after the harvesting of exotic pines (this conducted in the past decade).

The proposed walking track alignment traverses one named waterway, Carne Creek, this present in the northern half of the area investigated (Figure 5). Multiple ephemeral drainage lines that feed this creek would also be traversed. No further waterways are present within the site (refer to Section 4.2.3 of this report for further details).

According to monthly rainfall figures from Lithgow², the mean annual rainfall experienced by the study region is 792.7 mm, with the greatest falls of 85.7 mm recorded in January (Bureau of Meteorology 2023a). January is the warmest month with a mean maximum of 26.3°C, whilst July is the coolest month with a mean minimum of 10.9°C.

For reference, a photographic record of the area investigated has been provided (Appendix 2).

4.3.2 Geology and soil (including contamination)

The Wallerawang 1:100,000 Soil Landscape map sheet (King 1992), and the SEED Dataset mapping (State Government and DPE 1993), identifies that the investigated area is located within the following soil landscapes (Figure 6):

- Deanes Creek
- Hassans Walls
- Medlow Bath
- Mount Sinai
- Newnes Plateau
- Warragamba
- Wollangambe.

The properties of these soil landscapes are detailed in Table 3.

Natural elevations within the area investigated range from 911 m to 1124 m Above Sea Level.

² The nearest operating weather station.

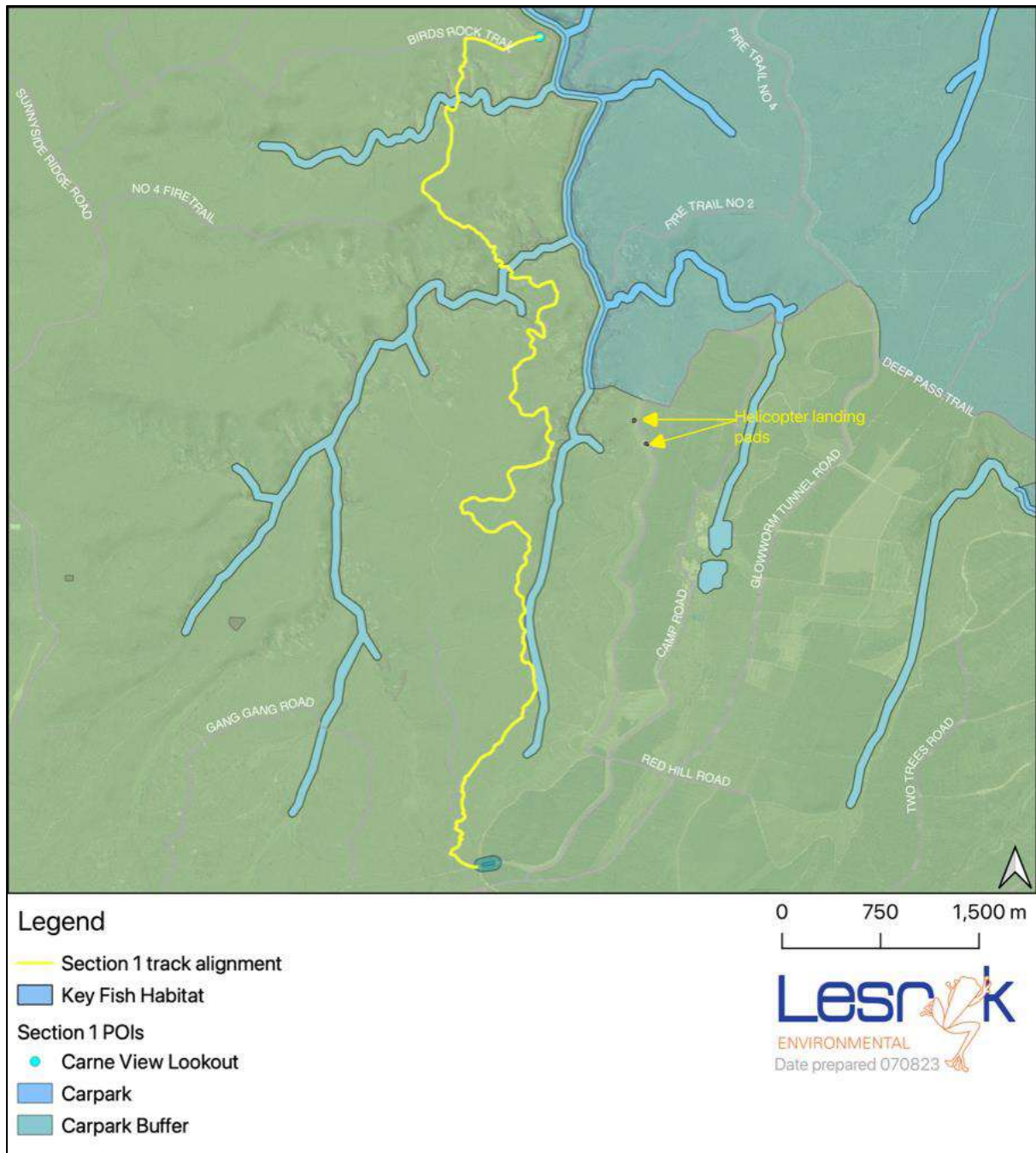


Figure 5. Watercourses.

The proposal will include some earthworks. If this was to coincide with a wet weather event, erosion may occur where surface runoff is concentrated. Environmental safeguards and mitigation measures are identified in Section 5.3 of this report, including the establishment of sediment fencing/structures where required in accordance with Landcom's (2004) 'Managing Urban Stormwater: Soils and Construction' (the Blue Book).

The construction of the walking track would be in compliance with NPWS Walking Tracks Policy (DPE 2023c). This policy is prepared within reference to Australian Standard 2156 which sets out 6 classes of walking track.

With regard to the EPA Contaminated Land Record [search area: Lithgow City Council] (EPA 2023), the investigated site is not identified as supporting any land that is contaminated.

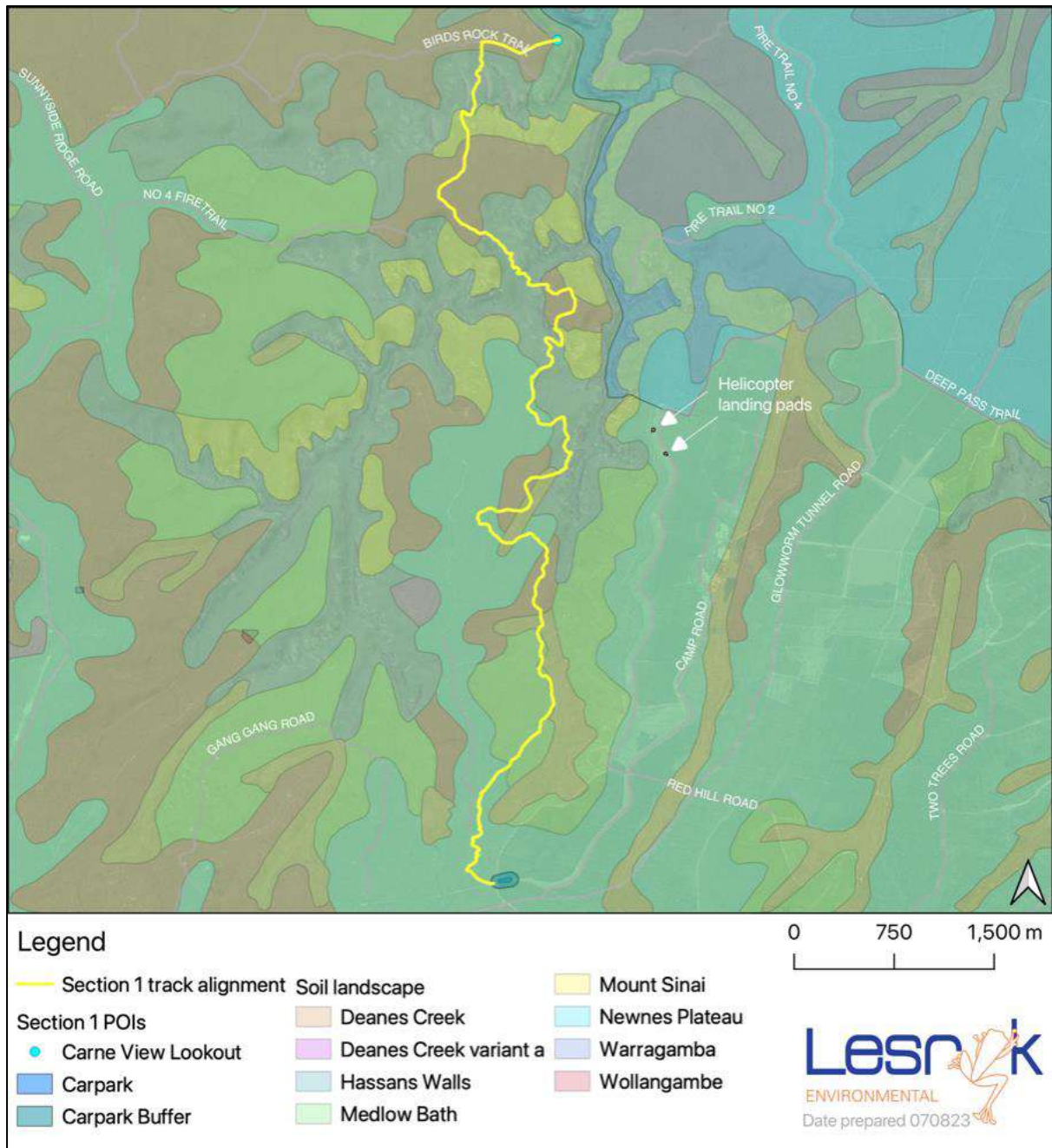


Figure 6. Soil landscapes of study area.

Acid Sulfate Soil

Reference to Acid Sulfate Soil SEED Dataset mapping (State Government of NSW and DPE 2023c) identifies that the site is not mapped as any class of Acid Sulfate Soil.

Table 3. Soil landscape properties of study area.

Soil landscape	Geology	Topography	Soils	Limitations
Deanes Creek	Narrabeen Group Sandstones, in particular the Banks Wall Sandstone Member—friable sandstones, claystone and conglomerate. Swamp location may be related to either the occurrence of major fracture zones in the sandstones (Pecover 1984) or impermeable clay lenses in the Narrabeen Group Sandstones (Fairley and Moore 1989).	Level to gently inclined narrow, linear headwater valley swamps. Slope gradients are typically <5%. Local relief is up to 30 m. Elevation is generally >1 000 m. Gently convex in cross-section, the swamps maintain a permanent watertable about 60 cm below the soil surface which may rise to or above the surface during prolonged periods of wet weather.	Moderately deep waterlogged Humic Gleys and Grey Earths near and along drainage lines with shallow to moderately deep Peaty Sands and Earthy Sands on swamp margins.	Permanently high watertables and periodic to permanent waterlogging, acid soils of low fertility, high run-on, high foundation hazard.
Hassans Walls	Cliffs composed of Narrabeen Group sandstones— quartz-lithic sandstones and quartz sandstones, interbedded with thin red, grey and green claystone, shale and occasional conglomerate and ironstone lenses. Soil materials of the colluvial sideslopes beneath the exposed cliff lines are underlain by Permian sediments belonging to the Illawarra Coal Measures and the Shoalhaven Group. Sandstone, shale, siltstone, claystone, conglomerate, coal, and torbanite are the main rock types.	Precipitous sandstone cliffs, often 100 – 200 m, are formed above steep to very steep colluvial sideslopes. Slope gradients are mostly >40% becoming gentler on lower slopes and narrow drainage flats. Local relief is >100 m. Elevation varies from about 280 m to >1 000 m. Drainage patterns are parallel.	Shallow discontinuous Lithosols/ Siliceous Sands on small rocky ledges on cliffs; moderately deep stony Lithosols/ Siliceous Sands on upper slopes and recently deposited talus; moderately deep Yellow Podzolic Soils and Brown Podzolic Soils on lower slopes; shallow Sands/Lithosols along narrow steep deeply incised drainage lines and moderately deep Sands/Lithosols along narrow drainage flats.	Severe rock fall hazard, steep slopes, extreme water erosion hazard, mass movement hazard, severe foundation hazard, rock outcrop and localised shallow soils, high run-on, localised non-cohesive soils, mine subsidence district.

Soil landscape	Geology	Topography	Soils	Limitations
Medlow Bath	Narrabeen Group, particularly the Banks Wall Sandstone, Mount York Claystone and Burra-Moko Head Sandstone Members—quartz-lithic sandstones and quartz sandstone interbedded with thin red, grey and green claystone, shale and occasional conglomerate and ironstone lenses. Small outliers of Hawkesbury Sandstone occur in places, particularly in the north-eastern part of the map sheet.	Gently undulating to rolling rises and low hills on sandstone plateau surfaces. Crests are broad (>50 m), rounded and convex. Sideslopes are gently undulating to rolling. Local relief is 20 – 50 m. Slope gradients range from 10 – 20%. Elevation is generally >850 m. Rock outcrop is occasionally present on crests.	Moderately deep Earthy Sands and Yellow Earths on crests. Moderately deep <100 cm Yellow Earths and Earthy Sands on sideslopes. Shallow Lithosols/Siliceous Sands associated with rock outcrop.	Shallow stony acid soils of very low fertility, very high potential aluminium toxicity and moderate erodibility; localised rock outcrop.
Mount Sinai	Narrabeen Group including the Banks Wall Sandstone, Mount York Claystone and Burra-Moko Head Sandstone Members of the Grose Sandstone Formation and the underlying Caley Formation. Lithology is predominately quartz sandstone and quartz-lithic sandstone occasionally interbedded with thin ironstone, conglomerate, red, grey and green claystone and shale lenses.	Undulating rises to rolling low hills. Local relief 0–40 m. Elevation range 0–49 m. Broad crests and long gently inclined slopes. Drainage lines very widely spaced to sparse. Minor bedrock outcrop of ferruginized sediments (ironpan) on some crests.	Very shallow stony sands, Lithosols on crests and sideslopes with rocky benches; shallow Earthy Sands and occasional Yellow Earths on insides of benches and in deeply weathered joint lines in the Narrabeen Group sandstones; shallow Earthy Sands in narrow incised valleys	Extreme water erosion hazard, rock outcrop, steep slopes, rock fall hazard, wind erosion hazard; stony, shallow, acid, non-cohesive highly permeable soils of low fertility.
Newnes Plateau	Underlain by the friable Banks Wall Sandstone and Mount York Claystone Members of the Grose Sandstone. Parts of the northern end of the Newnes Plateau upon which this landscape occurs may also be underlain by thin outliers of Hawkesbury Sandstone. Lithology of the parent material is predominately	Broad (up to 3 km), level and gently inclined plateau surfaces. Slope gradients range up to 10%, with local relief <20 m and elevation typically >1 000 m. Small windblown dunes occur on parts of the Newnes Plateau (Tulau 1989) and at Gaspers Mountain airstrip. Swampy drainage depressions are common. Localised	Shallow Sands/Lithosols on crests associated with rock outcrop; moderately deep Earthy Sands on gently inclined sideslopes and Leached Sands near drainage depressions; moderately deep Yellow Earths as-	Acid, highly permeable, stony soils of low fertility, low water-holding capacity, high potential aluminium toxicity and localised shallow soils.

Soil landscape	Geology	Topography	Soils	Limitations
	quartz sandstone and quartz-lithic sand- stone interbedded with thin red, grey and green claystone, shale and occasional conglomerate and ironstone lenses. Deep weathering of sandstone beds is widespread.	sandstone outcrops are rare on ridges.	sociated with shale/ironstone lenses; deep Earthy Sands on deeply weathered friable sandstones.	
Warragamba	Narrabeen Group—fine-grained lithic sandstone occasionally interbedded with thin shale lenses.	The dominant landforms are moderate to very steep slopes. Local relief is 50 – 150 m, slope gradients are >35%. Elevation is mostly <700 m. Sloping narrow ridges 10 – 20 m wide. Narrow sandstone and colluvial benches occur on the slopes which contain sandstone boulders. Small cliffs and scarps on some steeper slopes. Narrow boulder filled drainage lines are typical on slopes.	Shallow to deep Lithosols on crests and ridges; Brown Earths Red Podzolic Soils on upper slopes, Yellow Podzolic Soils on lower slopes.	Mass movement hazard, steep slopes, severe water erosion hazard, rock fall hazard, acid stony soils of low fertility, rock outcrop.
Wollangambe	Narrabeen Group—quartz sandstone and quartz-lithic sandstone interbedded with thin red, grey and green claystone, shale and occasional conglomerate and ironstone lenses. Thin outliers of Hawkesbury Sandstone in the north-eastern corner of the map sheet may occur.	Rounded crests and moderately to steeply inclined sideslopes. Crests are narrow (<50 m) and convex. Localised rock outcrop in the form of small benches, cliffs and low broken scarps (generally <25 m). Local relief is <100 m. Slopes are generally <35%. Elevation is generally >600 m.	shallow Siliceous Sands/Lithosols Earthy Sands and Yellow Earths on crests; moderately deep Earthy Sands Yellow Earths and Red Earths on sideslopes; moderately deep Yellow Podzolic Soils and Gleyed Podzolic Soils developed over shale lenses; shallow Siliceous Sands/Lithosols on small rock ledges and low broken scarps.	High to severe water erosion hazard, steep slopes, shallow soils, localised rock fall hazard, localised rock outcrop, low soil fertility.

4.3.3 Watercourse, waterbodies and wetlands

One mapped waterway, Carne Creek, intersects with the walking track (Figure 5). At the time of the investigation, Carne Creek was flowing moderately. The creek was generally 1-1.5 m wide with a rocky bed and was densely lined by vegetation. Refer to Appendix 2 for photographs.

Reference to the DPI's Fisheries NSW Spatial Data Portal [layer: Hawkesbury Nepean] (DPI 2023b) indicates Carne Creek is mapped as KFH, this waterway being a fourth order stream (Figure 5). The proposed track alignment crosses KFH in two locations, and traverses the boundary of the mapping towards the southern end of the track.

No fish passage would be blocked, and no fish habitat significantly affected, therefore no permits (e.g., s.205 or 219) in accordance with the FM Act are necessary. No threatened species or populations listed under the FM Act were recorded or considered likely to occur in proximity to the proposed walking track; therefore, no assessments referencing the criteria listed under Part 7A, Division 12, s.221ZV of this Act (these commonly referred to as the seven-part test) were conducted.

As works will be undertaken near KFH that meets the definitions of Dredging and reclamation, NPWS must give the Minister administering the FM Act written notice of the proposed work and consider any matters concerning the work raised in accordance with s.199, Part 7 Division 3 'Dredging and reclamation' of the FM Act.

In reference to s.2.7 of SEPP (Resilience and Hazards) 2021, utilising the [repealed] SEPP (Coastal Management) 2018 SEED Dataset mapping (State Government of NSW and DPE 2022b), the study area is not mapped as Coastal Wetland or Littoral Rainforest. Additionally, reference to s.2.10 and s.2.11 of SEPP (Resilience and Hazards) 2021, the walking track is not present in any Coastal Environments or Coastal Use Areas

No nationally important RAMSAR wetlands are identified within, or near to, the study area (DCCEEW 2023a).

Reference to the Bureau of Meteorology GDE Atlas (Bureau of Meteorology 2023b) identified mapped areas of High, Medium and Low potential Terrestrial GDE within the study area (Figure 7). The high potential GDEs that the proposed track would traverse are analogous to the mapped areas of Newnes Plateau Shrub Swamp (See Section 4.1.2).

GDEs are communities of plants, animals and other organisms whose extent and life processes are dependent on groundwater. In reference to the DPI's (Office of Water) Risk Assessment guidelines for GDE (Serov *et al.* 2012), the proposed walking track construction would not have any direct or indirect impact on a water source or aquifer structure, nor would it involve groundwater extraction.

With the adoption of mitigation measures, the construction and operation of the proposed walking track would not contribute to the off-site movement of sediment.

Standard Erosion Sediment Control measures would be carried out and supervised by engaged contractors to ensure negligible impact on nearby waterways. Sedimentation fencing/structures (e.g., sandbags) would be erected/installed where ground disturbance is predicted, prior to the commencement, and kept in place for the duration, of the proposed work. During the works, these would be inspected and maintained (e.g., sediment build up cleared) as required.

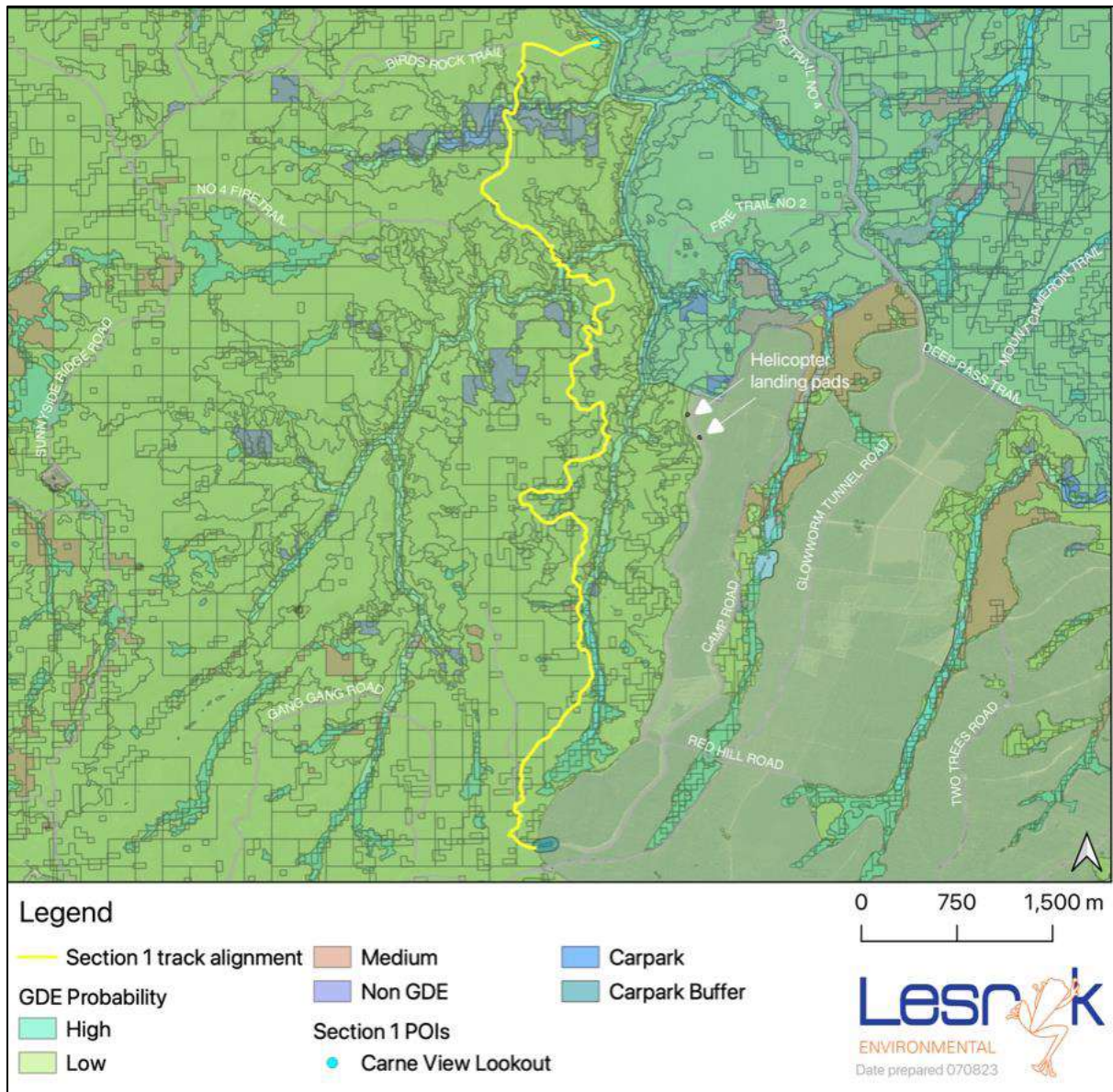


Figure 7. Groundwater Dependent Ecosystems.

4.4. Ecological values

4.4.1 Field survey methods

The alignment of the proposed track was traversed and surveyed on 25 May 2023 by Paul Burcher (B.App.Sc.) [Botanist], Harry Engel (B.Mar.Sc.) [Ecologist], and Isabel Burcher (B.Sc.) [Research Assistant], and on 9 June and 24 July³ by Paul Burcher and Harry Engel.

The purpose of the site investigation was to:

- identify any plants, animals, fauna habitats or vegetation communities that are of regional, State and/or national conservation significance as listed under the Schedules to the EPBC and BC Acts
- assess the structure of fauna habitats and vegetation communities present within, and adjacent to, the site.

³ The inspection conducted on 24 July was in response to a realignment of the track based on the outcomes of the initial inspections and feedback provided to NPWS.

Whilst conducting the habitat assessments, efforts were made to identify features such as known vegetation associations, geological features, feed trees, mature trees with hollows, connectivity of fauna corridors, aquatic environments, caves or suitable cave-substitutes and other habitat features important to the lifecycle requirements of those threatened plants and animals previously recorded within 10 km of the study area (as listed in Appendix 1).

The survey methods employed during the field investigation were:

- the identification of those plants within the area of likely disturbance, including both direct and indirect impact
- the identification of the structure of those vegetation communities and fauna habitats present
- the direct observation of those fauna species present within, or adjacent to, the proposed walking track alignment
 - It is noted that, if a 'large' dragonfly or water skink was observed, a precautionary approach was adopted and these were considered to be records of those threatened species known to occur within the surrounding conservation reserve
- diurnal call identifications of any vocal fauna species present within, or adjacent to, the subject site; with all calls being identified in the field
- inspections of any potential cave-substitutes (i.e., abandoned buildings) to detect the presence of microbats (or evidence to suggest their presence i.e., guano or staining), a hand-held torch being used to assist this method
- the identification of any indirect evidence such as tracks, scats, diggings and scratchings that would suggest the presence of any fauna species
- leaf litter and ground debris searches for any sheltering reptiles, amphibians
- targeted searches for species of State and national conservation concern, or their likely habitat areas, that were identified during the literature review stage of the project.

The investigations lasted for approximately 51 person hours (cumulative). Given the size of the study area, the scale of the proposed work, the extent of disturbance and considering the condition of those fauna habitats and vegetation communities likely to be disturbed, this level of survey effort is considered adequate when endeavoring to determine the species and ecological communities present, and their conservation status.

The survey methods employed, and level of effort required, were determined in consideration of, and generally based on, the descriptions provided in:

- *Surveying threatened plants and their habitats – NSW survey guide for the Biodiversity Assessment Method* (State of NSW and DPIE 2020)
- *Threatened Species Survey and Assessment: Guidelines for developments and activities* [Working draft] (DEC 2004)
- The DEWHA survey guidelines for Australia's threatened bats, bird and frogs (DEWHA 2010a, DEWHA 2010b, DEWHA 2010c)
- The DSEWPC survey guidelines for Australia's threatened mammals and reptiles (DSEWPC 2011a, DSEWPC 2011b).

4.4.2 Limitations and assumptions

During the course of the field inspections, no adverse weather conditions or seasonal constraints were encountered. For reference, the weather conditions experienced during the field investigations were generally warm temperatures (maximum ~21°C), overcast skies (60-100% cloud cover), with moderate breezes.

Access to all parts of the walking track alignment provided by NPWS, and as realigned based on the findings of the initial ecological inspection and internal NPWS planning decisions, was possible, thereby ensuring that all portions being treated were sampled. Site visibility was generally good. However, some sections had extremely dense post-fire regrowth that inhibited visibility.

The survey was conducted in winter which is outside the TBDC (DPE 2023a) recommended survey period for three of the threatened plant species listed in Appendix 1 that were considered to have a high likelihood of occurring within, and close to, the proposed walking track alignment namely:

- Small Pale Grass-lily (*Caesia parviflora* var. *minor*)
- Deane's Boronia (*Boronia deanei*)
- *Veronica blakelyi*.

Of these three species, it is considered that *Veronica blakelyi* would be readily recognisable outside its flowering period. A precautionary approach has been taken in relation to the presence of Deane's Boronia and the Small Pale Grass-lily.

The winter timing is also expected to negate detection of species such as the Blue Mountains Water Skink (*Eulamprus leuraensis*) and Giant Dragonfly (*Petalura gigantea*). The recommended survey periods for these animals is between October and March (DSEWPC 2011b, OEH 2023, DPE 2023a).

Within the impact footprint, no significant habitat features for those nocturnal species known to occur within this portion of the Lithgow City Council LGA, particularly those listed under the EPBC and/or BC Acts, were observed. Hollow-bearing trees were noted during the course of the diurnal surveys, none being adversely affected by the scope of work proposed.

While not considered to compromise the scientific rigour of the field assessment, as no hollow-bearing trees are to be cleared, targeted species-specific surveys for hollow-dependent fauna (e.g. echolocation detection, call playbacks and so forth) were not a component of this ecological study. In addition, employment of techniques, such as pitfall trapping for the Blue Mountains Water Skink [DSEWPC 2011b] and walking transects of the Giant Dragonfly [Baird 2012]), were not a component of this ecological study.

In order to overcome any of the 'limitations' encountered:

- database searches were conducted for threatened species and ecological communities known to occur within both Gardens of Stone SCA and the region
- a precautionary approach was adopted where necessary (i.e., suitable habitat for those threatened species known to occur, or that have been previously recorded within the surrounding locality, was identified)
- as stated above, if a 'large' dragonfly or water skink was observed, a precautionary approach was adopted and these animals were considered to be the Blue Mountains Water Skink and Giant Dragonfly.

Not all animals and plants can be fully accounted for within the area investigated. The presence of threatened species is not static; it changes over time, often in response to longer term natural forces that can, at any time, be dramatically influenced by human-made disturbances.

This report is based upon data acquired from the current investigation; however, it should be recognised that the data gathered is indicative of the environmental conditions of the site at the time the field work was conducted.

4.4.3 Results

For the purpose of this assessment, the focus was to identify threatened species and confirm the PCTs present. It was not considered appropriate to provide an exhaustive list of all plants or animals present in proximity to the track alignments surveyed.

4.4.3.1 Plant Community Types

The SVTM vegetation mapping (Figure 2) was found to be reasonably accurate though some anomalies were recorded. These were in relation to fire trails that were mapped as vegetated and the perceived boundaries of Newnes Plateau Shrub Swamp. The proposed track route traverses approximately 150 m of this PCT in a gully north of Carne Creek (Appendix 2; Plate 3).

In total, nine PCTs are within the proposed works footprint and would be impacted by the tracks construction (Table 4).

Table 4. Plant Community Types

PCT	Conservation status	Estimated area of PCT to be removed/modified (m ²)
3945 Newnes Plateau Shrub Swamp	Part of BC Act listed EEC Newnes Plateau Shrub Swamp in the Sydney Basin Bioregion and the EPBC Act EEC Temperate Highland Peat Swamps on Sandstone.	300
3688 Newnes Plateau Silvertop Ash Woodland	Not listed on the BC Act or EPBC Act	3737
3691 Upper Blue Mountains Fringing Swamp Woodland	"	685
3695 Western Blue Mountains Peppermint Sheltered Forest	"	4492
3696 Western Blue Mountains Rocky Scribbly Gum Woodland	"	6212
3862 Newnes Plateau Rockplate Heath	"	2016
3694 Upper Blue Mountains Ridgetop Woodland	"	3208
3865 Western Blue Mountains Pagoda Scrub	"	1640
3687 Western Blue Mountains Peppermint-Ash Tall Forest	"	450
Total		22742

4.4.3.2 Threatened Ecological Communities

PCT 3945 Newnes Plateau Shrub Swamp, which the proposed track route traverse at four locations (Figure 8), is part of the:

- BC Act listed EEC Newnes Plateau Shrub Swamp in the Sydney Basin Bioregion
- EPBC Act EEC Temperate Highland Peat Swamps on Sandstone.

The track alignment has been designed to minimise impacts on the TEC.

Whilst realignments near this PCT, to further consider the impact the proposal may have on the TECs, assessments drawing on the EPBC Act's Significant Impact Guidelines (DE 2013) and the criteria provided under Section 7.3 of the BC Act have been conducted (Appendix 3). These concluded that referral of the proposal as a controlled action to the Federal Minister of the Environment is not required, nor is the preparation of a SIS/BDAR needed.



Figure 8. PCT 3945 Newnes Plateau Shrub Swamp in relation to the proposed track alignment.

4.4.3.3 Flora species recorded

One flora species detected during the survey, *Persoonia hindii*, is listed as endangered on the BC Act. This species was found at numerous locations adjacent to the southern half of the extant motorcycle track (Figure 9). The species is clonal and can spread over large areas, meaning that what appears to be many individual plants at one location may be comprised of a combination of ramets (emergent stems joined underground) and genets (separate genetically distinct plants) (OEH 2023). In association with track design staff, the track alignment will be modified during the works to avoid removal of this plant.

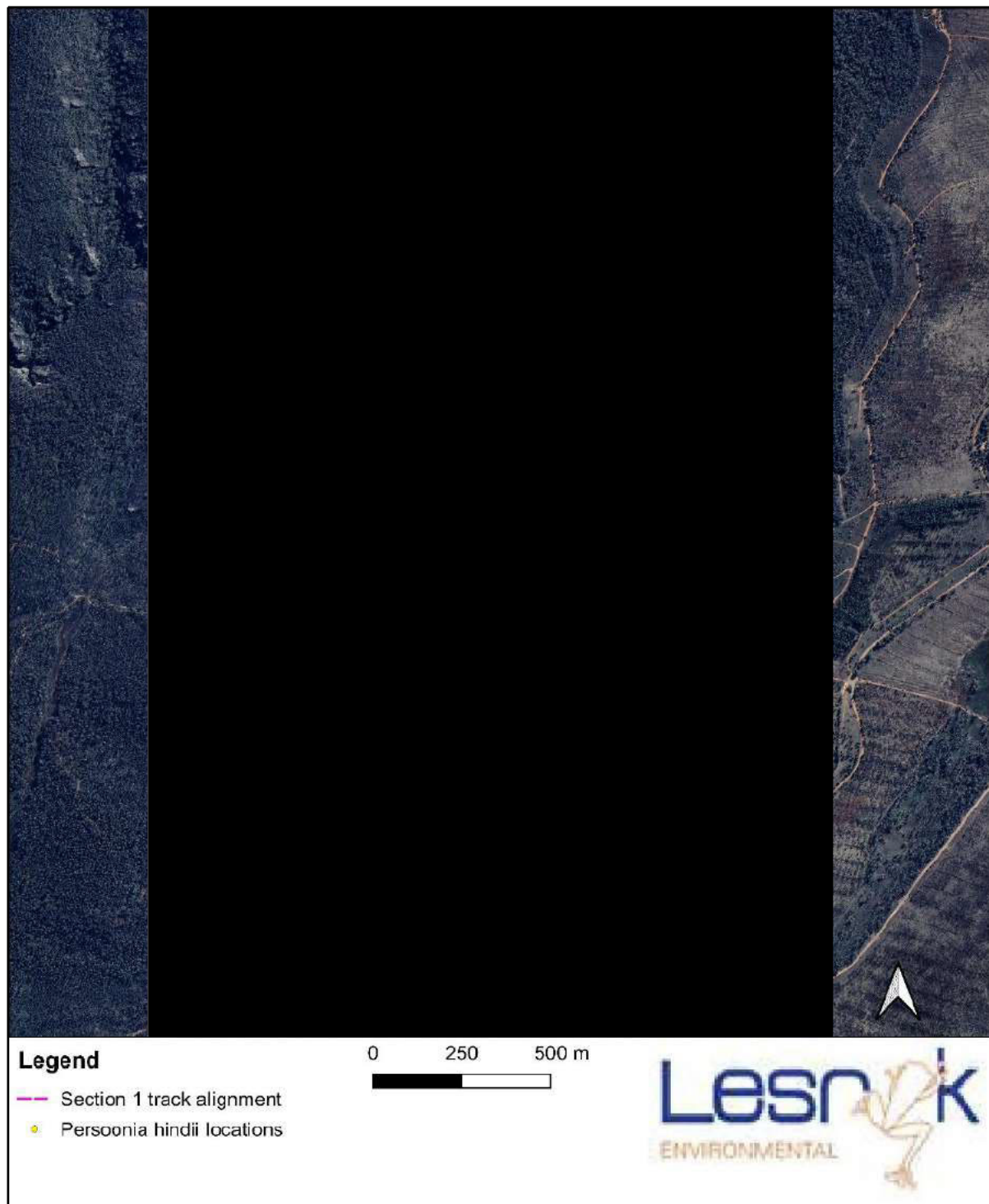


Figure 9. Records of *Persoonia hindii* in relation to the proposed track alignment.

In addition to this species, it is considered necessary to adopt the precautionary approach to the potential presence of the following flora species as they have been recorded in proximity to the proposed track alignment and suitable habitat is present along it:

- Deane's Boronia – Vulnerable, EPBC Act and BC Act
- Small Pale Grass-lily – Vulnerable BC Act.

To consider the impact the proposal may have on these threatened flora species, assessments drawing on the EPBC Act's Significant Impact Guidelines (DE 2013) and the criteria provided under Section 7.3 of the BC Act have been conducted (Appendix 3).

These concluded that referral of the proposal as a controlled action to the Federal Minister of the Environment is not required, nor is the preparation of a SIS/BDAR needed.

Weeds of significance

Under the *Biosecurity Act 2015* 'all plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.'

No Priority Weeds or other weeds of regional concern (DPI 2023a), under Schedule 3 of the NSW Biosecurity Regulation 2017 and weeds listed as WoNS (WA 2023) were recorded at the site.

4.4.3.4 Fauna species recorded

By the completion of the field investigation, eight native mammals, 35 native birds, one amphibian and one exotic species had been detected (Appendix 4), four of which are listed as under the EPBC and/or BC Acts:

- Varied Sittella (*Daphoenositta chrysoptera*) – listed as Vulnerable under the BC Act
- Flame Robin (*Petroica phoenicea*) – Vulnerable BC Act
- Scarlet Robin (*Petroica boodang*) – Vulnerable BC Act
- Gang-gang Cockatoo (*Callocephalon fimbriatum*) – Vulnerable BC Act, Endangered EPBC Act.

The locations where the individuals observed were recorded are identified in Table 5 and Figure 10.

Table 5. GPS coordinates for recorded threatened fauna species

Species		Easting	Northing
Woodland bird species	Flame Robin	238362	6301431
		241480	6302640
	Varied Sittella	241977	6304077
		241927	6303288
	Scarlet Robin	241960	6304014
		241920	6303280
Gang-gang Cockatoo		241493	6302843

The proposal would clear vegetation that is available to the species listed in Table 5. The vegetation that would be cleared includes areas that provides foraging opportunities for these birds.

This bushland could also be occupied during the woodland bird's breeding periods. Though considered during the course of the field survey, no cup shaped nests that may indicate birds are breeding near the alignment surveyed were noted.

As no mature trees are being cleared, no habitat that could be used for breeding by the Gang-gang Cockatoo would be affected.

Based on consultation of the BioNet Atlas, a review of the Gardens of Stone PoM, and considering the findings of the field surveys, it is assumed that both the Blue Mountains Water Skink and Giant Dragonfly would occur as resident populations in proximity to those sections of the proposed walking track that are present near the Newnes Plateau Shrub Swamp. Being associated with swamp environments, both have the potential to be adversely affected (indirectly) by the undertaking of the proposed works.

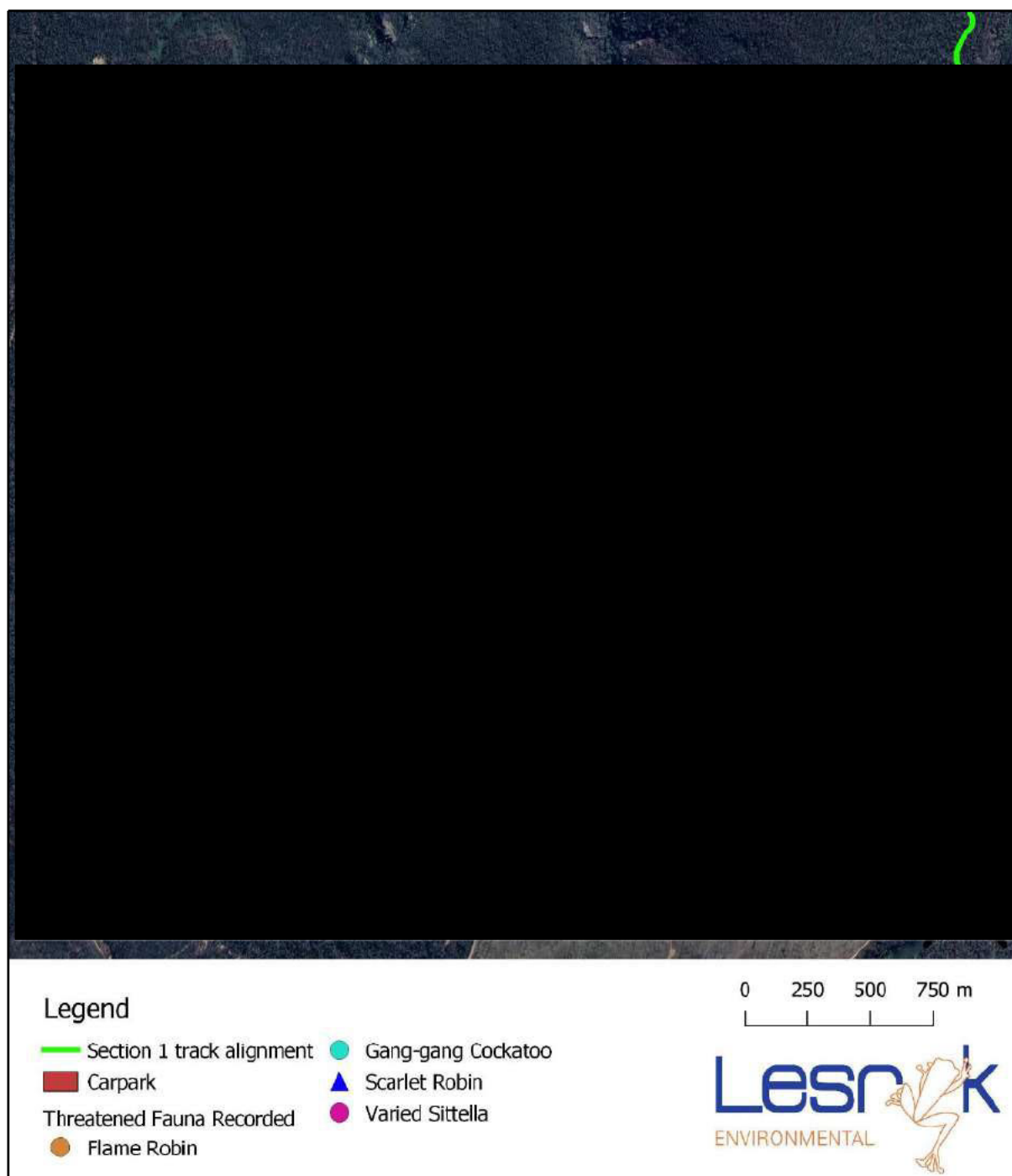


Figure 10. Locations of recorded threatened fauna species.

A number of threats to the Blue Mountains Water Skink and Giant Dragonfly have been identified (DCCEEW 2023b, OEH 2023a), including but not limited to:

- Degradation of wetland habitat
- Weed invasion and the resulting changes to vegetation structure to sites near developed areas, disturbance from recreational users of swamps (e.g. walkers, mountain bike riders, four wheel drive enthusiasts), pollution and sedimentation (including stormwater run-off)
- The naturally fragmented nature of the habitat places many populations at risk, due to their isolation and small size.

Considering the nature of the existing motorbike track, combined with the realignment of the walking track near the occurrences of Newnes Plateau Shrub Swamp, it is not considered that the proposal would significantly contribute to these threatening processes or have an adverse cumulative effect when combined with the current situation. In the sections where the proposed alignment still traverses the swamp, sandstone steppingstones are being utilised. This will permit the natural regeneration of the existing degraded unauthorised vehicle track and provide opportunities for the unrestricted dispersal and movement of ground traversing species such as the Blue Mountains Water Skink.

To consider the impact the proposal may have on the Flame Robin, Scarlet Robin, Varied Sittella, Gang-gang Cockatoo, Blue Mountains Water Skink and Giant Dragonfly, assessments referencing the criteria provided under the EBBC Act's Significant Impact Guidelines and/or Section 7.3 of the BC Act (the Assessment of Significance), have been conducted (Appendix 3). These assessments concluded that the proposal is unlikely to significantly affect the recorded or predicted threatened species or their habitat. Consequently, the proposal is not a controlled action requiring referral to the Federal Minister for the Environment and the preparation of a SIS is not triggered.

Those non-threatened native species recorded are all protected, as defined by the BC Act, but considered to be common to abundant throughout, and well conserved within, the surrounding region. Within the surrounding areas, these animals have been recorded in association with a range of woodland and fauna habitats (DPE 2023a). These species would not be solely reliant upon the habitats that are present within the alignment of the proposed walking track, such that the permanent or temporary disturbance of these would threaten the local or regional occurrence of these animals. The works proposed would not affect any significant areas of habitat occupied by these animals, nor would the establishment and operation of the walking track cause any to become locally extinct. The animals recorded are all expected to be present within, and beyond the limits of, the proposal area post-establishment of the walking track.

It is acknowledged that targeted surveys for nocturnal and hollow-dependent species were not conducted during the investigation; therefore, their presence is assumed based on the adoption of the precautionary approach. Several threatened species, such as cave and hollow-dependent microbats, ground-traversing mammals and the raptors have been previously recorded within 10 km of the site surveyed (DPE 2023a) (Appendix 2); however, as no suitable habitat for these animals was observed within the alignment of the walking track, these animals are not considered to be directly or indirectly impacted by the proposed track work. As such, no further assessments are considered necessary.

During the course of the field investigations, no large stick nests indicative of those produced by raptors, and no white-wash or similar, were noted. In addition, within the development footprint, no evidence of the permanent occupation of these sites by a resident animal (such as the observation of a nesting drey) was recorded.

4.3.3.5 Habitat types for native fauna species

Five habitat types available to native fauna were recorded within the area surveyed, these being:

- Disturbed environment
- Eucalypt woodland
- Heathland
- Shrub Swamp
- Aquatic environment.

For reference, a description of these is provided below. It is recommended these descriptions be read in conjunction with reference to the photographic record provided (Appendix 2).

Considering the character of the existing unauthorised motorcycle track, the overall extent of disturbance is considered to be minimal.

Disturbed environment

This habitat type includes the existing network of the unsealed fire trails and heavily utilised unauthorised motorcycle tracks, that have been modified, and previously cleared. These areas are either generally devoid of native vegetation, or support high density layers of grasses and forbs.

It is acknowledged that along the proposed walking track alignment surveyed, edge vegetation had been removed. The immediate edge of the tracks where the majority of the work is proposed is generally already cleared, comprising of mostly only scattered native groundcover plants.

The disturbed environment is of little to no ecological value and dominates the proposal footprint.

Eucalypt woodland

This habitat type dominates the study area, with tree heights to 30 m and of varying canopy coverage. A high-density understorey of native shrubs to 2 m high is present; with a ground cover layer comprised of native grass and forbs to about 50 cm tall, with leaf litter, ground debris and some surface rock common.

To conform to the proposed track requirements, the understorey present adjacent to the existing unauthorised vehicle trail is expected to be trimmed/pruned to permit the necessary works to be undertaken. No mature trees will be removed to achieve the scope of works proposed.

During the field investigations, hollow-bearing trees available for a number of mammal species, hollow-dependent microbats and several native birds were observed within the surrounding area; however, as none were located within the impact footprint of the proposal, the proposed work would not result in the removal of any hollow-bearing trees.

The association of the woodlands and hollow-bearing trees would be of value to a number of threatened species that have been previously recorded in the Gardens of Stone NP. That stated, as no significant resources for these species are to be removed or indirectly disturbed, the local viability of their populations would not be affected by the scope of the new walking track.

Heathland

Heathlands that support a high-density layer of native shrubs that are between 0.5 and 1.5 m in height were observed adjacent to several of the existing unauthorised motorcycle tracks surveyed. The ground cover, is composed of native grasses and forbs. Some surface rock, and natural ground debris, is present.

Shrub swamp

This is a unique habitat located in the gully adjacent to a large portion of the proposed walking track. At two locations, the proposed track alignment crosses this habitat type. The shrub swamp is characterised by a spongy layer that is on top of a layer of peat. Generally, it supports a high density of sedges, graminoids forbs and shrubs 0.5 – 1 m in height, with isolated emergent trees.

The sections that are included in the alignment of the proposed walking track are currently degraded due to what appears regular use by unauthorised vehicles. This has resulted in the spongy moss layer to be extremely degraded and in some spots missing altogether.

Aquatic environment

Several mapped waterways, and drainage lines, intersect with the alignment of the proposed walking track.

This environment has previously been detailed within Section 4.3.3 of this report.

No major areas of aquatic habitat are to be removed, modified, or disturbed. The work proposed within the vicinity of these waterways is not considered to result in any fish species, aquatic-associated

animals or their populations becoming extinct in the locality. The proposed walking track would not establish any barriers to the movement patterns or interbreeding requirements of any native plants and animals (including aquatic species), nor further fragment or isolate any of their habitat areas.

Structures associated with the proposed walking track that are located at the intersection of these waterways would generally include sandstone steppingstones. Whilst the proposal does involve works within these environments, it does not involve:

- An overall reduction in water quality
- The permanent obstruction of fish passage
- The use of explosives and other dangerous substances.

5. Impact Assessment

5.1. Application of avoid and minimise principles

The proposed walking track, this generally following the existing alignment of an unauthorised motorcycle track, was chosen by NPWS with an objective of avoiding ecological values of importance within the Gardens of Stone SCA wherever possible. The use of the existing disturbed track would minimise vegetation clearance and habitat disturbance requirements.

The ultimate track alignment has been determined based on the identification, and a consideration, of any ecological constraints, and NPWS objective to avoiding a significant disturbance of these. The track alignment assessed has been developed based on the outcomes of the field surveys. As discussed in Section 4.4, the track alignment has been modified to avoid or minimise impacts on species or communities of conservation concern, namely *Persoonia hindii* and Newnes Plateau Shrub Swamp/Temperate Highlands Peat Swamps on Sandstone.

No clearing of mature trees, including those that are hollow-bearing, would be required as part of the proposed track works. To avoid further vegetation removal, vehicles are to use the existing network of tracks during the construction works; while any temporary stockpiles are to be located in existing disturbed/cleared areas.

The proposed construction footprint, broadly limited to the existing alignment determined by NPWS and revised in sections following input from Lesryk based on the outcomes of the field surveys, was determined with an objective to minimise impact on the ecological values of the site wherever possible. The use of existing trails, and the realignment of various sections, would minimise clearance requirements and/or adverse habitat impact.

5.2. Application of mitigation measures

Impact On	Reasons	Impact Level	Safeguards/Mitigation Measures	Responsibility
General				
All environmental factors	Noncompliance with mitigation measures below	–	<ul style="list-style-type: none"> A CEMP is to be prepared for the proposal. As part of the 'site induction' all personnel are to be briefed of site sensitivities (e.g. areas of Newnes Plateau Shrub Swamp, the presence of <i>Persoonia hindii</i> and habitat for both the Blue Mountains Water Skink and Giant Dragonfly) prior to entering the work area. 	NPWS Project Manager and Principal Contractor
Soil and Erosion				
Soil and landscape	Limit impact of soil disturbing activities on the landscape.	Low	<ul style="list-style-type: none"> The construction of the walking track is to be in compliance with NPWS Walking Tracks Policy (DPE 2023c). Construction should be undertaken sequentially along the track, with exposed/disturbed areas being compacted and stabilised. Sediment fencing/structures (e.g., sandbags) should be established as required prior to the commencement, and kept in place for the duration, of the proposed work in accordance with Landcom (2004) 'Soils and Construction: Managing Urban Stormwater' (the Blue Book). These are to be maintained and will not be removed until the work is complete or the area is stabilised. Where applicable, scheduled inspections of these will be made to ensure compliance. Restrict the location of any temporary stockpile site to existing cleared areas located at least 50 m away from waterways, roads, slopes steeper than 10 percent, and areas of concentrated water flow. Avoid unnecessary soil disturbance. Removed native vegetation is to be mulched and/or utilised as brush matting, to encourage natural regeneration where required. Disturbed surfaces would be compacted prior to the end of the work day or before rainfall to minimise potential for erosion and sedimentation during construction. Uncontaminated surplus spoil will be retained and used on-site where applicable. 	NPWS Project Manager and Principal Contractor

Impact On	Reasons	Impact Level	Safeguards/Mitigation Measures	Responsibility
Water				
Water quality	Limit impact on water quality of nearby drainage lines	Low	<ul style="list-style-type: none"> In accordance with s.199 of the FM Act, NPWS (as proponent) must consult with DPI Fisheries prior to construction commencing. Pending consultation with DPI, the following best practice measures may be required when conducting work in the vicinity of the identified waterways: <ul style="list-style-type: none"> Environmental safeguards (e.g., sediment fences, etc.) are to be installed consistent with Landcom (2004) to ensure that there is no impact to the adjacent aquatic environment. Any material removed from a waterway that is to be temporarily deposited or stockpiled on land is to be located well away from the waterway and is to be contained by appropriate erosion and sediment control devices. Damage to existing native riparian vegetation is to be avoided or minimised, and any damage caused is to be restored. When machinery is working on site, spill kits suitable for the containment of fuel and oils spills must be available. DPI Fisheries (1800 043 536) to be immediately notified of any fish kills in the vicinity of the work. In such cases, all work other than emergency response procedures are to cease until the issue is rectified and written approval to proceed is provided by DPI Fisheries. If required, refuelling of machinery is to occur within an impervious bunded area located more than 50 m from any drainage line to prevent the escape of substances into the surrounding environment. 	NPWS Project Manager and Principal Contractor
Flora and fauna	Reduce impact to flora and fauna	Low	<ul style="list-style-type: none"> Clearing of native vegetation/plants would not be more than that required to permit the scope of work. Near the occurrences of the Newnes Plateau Shrub Swamp, the track would be slightly elevated off the ground and constructed stepping stones. This would permit ground traversing fauna to negotiate the walking track unrestricted and enable light to penetrate and promote the growth of ground cover plants. Construction should be undertaken sequentially along the track, with exposed/disturbed areas being compacted and stabilised. As works progress along the proposed track alignment, NPWS or similar qualified personnel should conduct pre-clearing inspections of each planned section (i.e. works that are planned to progress the 	NPWS Project Manager Principal Contractor Qualified botanist Qualified ecologist

Impact On	Reasons	Impact Level	Safeguards/Mitigation Measures	Responsibility
			<p>track over the next several days will affect areas A, B and C, these being checked before works commence). These should be conducted to determine any unexpected finds and permit any slight track deviations/realignments.</p> <ul style="list-style-type: none"> Known locations of <i>Persoonia hindii</i> would be marked on plans provided to the works contractor. Contract staff would be briefed by NPWS staff of the conservation significance of <i>Persoonia hindii</i>, its indicative features and the need to avoid removal and/or direct/indirect disturbance Known <i>Persoonia hindii</i> habitat adjacent to the track would be temporarily marked with exclusion tape or similar where necessary. Sufficient buffers beyond the plants recorded, these being in the order of 10 m, will be established to prevent the individuals present being indirectly affected To permit future maintenance works to be conducted, the <i>Persoonia hindii</i> locations will be included in the NSW BioNet and any internal NPWS databases No mature or hollow-bearing trees are to be removed or indirectly disturbed. If high value trees are identified as a significant hazard due to changing conditions, assessments must be completed by a suitably qualified arborist and managed with input from an experienced ecologist. All vehicles/machinery would enter the site via the existing trail network and stabilised access areas to prevent the introduction and spread of weed propagules and/or pathogens. Refrain from parking any vehicle/storing machinery near tree trunks. Where possible, construction machinery should be washed prior to entering and leaving work sites to ensure weed propagules are not transported. The proposed activity has the potential to introduce the plant pathogens <i>Phytophthora cinnamomi</i> and Myrtle Rust. In particular, the BC Act listed <i>Persoonia hindii</i>, is at risk of infection by <i>Phytophthora</i>. Work must therefore avoid the potential spread of plant pathogens as far as possible, with contractors adhering to the following hygiene protocols: <ul style="list-style-type: none"> Before entering and leaving the work site, workers are to remove excess soil and mud and then spray boots, tools, gloves and small equipment with recommended disinfectant supplied by the 	

Impact On	Reasons	Impact Level	Safeguards/Mitigation Measures	Responsibility
			<p>contractor (70% Methylated spirits / 30% Water) until runoff is clear.</p> <ul style="list-style-type: none"> • Avoid unnecessary soil disturbance. • In addition to these work-related hygiene protocols, boot cleaning devices should be installed at each end of the multi-day walk to prevent visitors spreading plant pathogens. • Inadvertent disturbed areas not part of the proposed scope of work will be permitted to naturally revegetate. • Any animals injured during the proposed work would be collected and taken to a local veterinarian or wildlife carer for treatment • Once rehabilitated, native animals must be released at their point of capture. • It is expected injured exotic fauna would be ethically treated. 	
Waste Management and Minimisation				
Waste management	Minimise waste during construction and dispose of waste responsibly	Low	<ul style="list-style-type: none"> • Surplus spoil and other material would be disposed of appropriately at a licensed landfill facility. • Recycling methods will be enacted where applicable. • Personal rubbish is to be collected and deposited into a NPWS serviced bin. • Visual inspections of the site are to be made at the completion of the work to ensure no urban refuse remains. 	NPWS Project Manager and Principal Contractor

5.3. Proposed Impact

Based on a worst-case estimate, the proposed establishment and operation of the walking track is expected to result in a total direct and indirect impact of 3.49 ha, inclusive of disturbance/removal of about 2.27 ha of native vegetation that is composed of:

- The approximate 12 km length x optimal 0.9 m track width, 640 m of which at the northern end uses the existing Birds Rock fire trail to Carne View Lookout
- Disturbance/removal of 2.27 ha of trail side vegetation (along 12 km length x 2 m edge width (1m each side))
 - Including 300 m² of the recorded TECs
- Compound/stockpile sites (these predominantly located in existing clearings or NPWS facilities).
- Two helicopter landing pads 35 m² in size (these requiring no vegetation clearing).

Existing sections of the 'motor-cycle' track that are wider than 0.9 m would be rehabilitated, which to some degree would off-set the loss of vegetation represented by the track's construction.

5.3.1 Key Threatening Processes

Of the KTP listed under the EPBC, BC and/or FM Acts, those that are relevant to the proposal are identified below. Based on the adherence of those recommendations provided in Section 5.3 and 7 of this report, the proposal can proceed as planned without contributing to, or increasing the impact of, the following KTPs:

- *Clearing of native vegetation* (BC Act)

Based on a worst-case estimate, works associated with the proposed track would require a total disturbance footprint of 3.48 ha, this requiring the clearing of 2.27 ha of vegetation. It is expected that, during the construction of the walking track, 2.27 ha of trail side vegetation would require disturbance/removal; and including the up to 300 m² from the Newnes Plateau Shrub Swamp TEC. Given that the vegetation in the alignment is already cleared to some degree by the extant motorcycle track and that there is more extensive and better-quality resources adjacent to and beyond the limits of the proposed walking track, the loss of this amount of native vegetation is not considered to significantly contribute to this KTP. As mentioned above, existing sections of the track that are wider than 0.9 m would be rehabilitated, which to some degree would off-set the loss of vegetation represented by the track's construction.

- *Degradation of native riparian vegetation along NSW water courses* (FM Act)

This threatening process applies to all NSW waterways, not only those where listed threatened species are present. In proximity to the waterways/drainage lines present within the study area, the native riparian vegetation present will not be significantly disturbed by the proposal. As the investigated walking track essentially follows the alignment of a degraded and disturbed motorcycle track, and given the existing condition of the waterways/drainage lines present, the removal of some vegetation is not expected to cause the further instability of any waterway's banks or reduce the quality of the water. As such, the work is not considered to contribute significantly to this KTP.

- *Infection of native plants by *Phytophthora cinnamomi** (BC Act)
- *Dieback caused by the root-rot fungus (*Phytophthora cinnamomi*)* (EPBC Act)
- *Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae (Myrtle Rust)* (BC Act).

The proposed activity has the potential to introduce these pathogens that live in soils and plant roots and is the key organism associated with the dieback of native plant species in Australia. Plants of the Proteaceae family, which includes the BC Act listed endangered species *Persoonia hindii*, are particularly susceptible to *Phytophthora*.

Work must therefore avoid the potential spread of these organisms as far as possible, with contractors adhering to the following hygiene protocols:

- Before entering and leaving the work site, workers are to remove excess soil and mud and then spray boots, tools, gloves and small equipment with recommended disinfectant supplied by the contractor (70% Methylated spirits / 30% Water) until runoff is clear.
- Avoid unnecessary soil disturbance.

5.4. Legislative consideration

5.4.1 Commonwealth – *Environment Protection and Biodiversity Conservation Act 1999*

By the completion of the field investigation, the following MNES had been recorded, or were considered likely to occur, within or near the proposal area:

- Temperate Highlands Peat Swamps on Sandstone – endangered ecological community
- Deane's Boronia – vulnerable species
- Blue Mountains Water Skink – endangered species
- Gang-gang Cockatoo – endangered species.

Assessments in accordance with the significant impact guidelines prepared under the Act (DE 2013) were undertaken on each of these MNES (Appendix 3). It was concluded that, provided the recommended mitigative measures were undertaken, the proposed works would not have a significant impact on Temperate Highlands Peat Swamps on Sandstone, Deane's Boronia, the Blue Mountains Water Skink or the Gang-gang Cockatoo. As such, the proposal is not a controlled action that requires referral to the Federal Minister for the Environment for further consideration or approval.

5.4.2 State – *Biodiversity Conservation Act 2016*

By the completion of the field investigation the following biota listed under this Act were recorded:

- Newnes Plateau Shrub Swamp – endangered ecological community
- *Persoonia hindii* - endangered species
- Flame Robin – vulnerable species
- Scarlet Robin – vulnerable species
- Varied Sittella – vulnerable species
- Gang-gang Cockatoo – vulnerable species.

As they have been previously recorded within the locality, and as suitable habitat is present, it is considered necessary to adopt the precautionary approach to the potential presence of the:

- Small Pale Grass-lily – endangered species
- Deane's Boronia – vulnerable species
- Blue Mountains Water Skink – endangered species
- Giant Dragonfly – endangered species.

Impact assessments for the EEC and recorded/predicted species were conducted with reference to s.7.3 of the BC Act, these concluding that the proposal is unlikely to significantly affect the threatened species, the ecological community, or their habitats (Appendix 3). As such, the preparation of a SIS/BDAR that further considers the impact of the proposal on these entities is not required, and the BOS is not triggered.

5.4.3 State – Fisheries Management Act 1994

With regard to Part 7 Division 3, it is considered that the construction of the walking track where it intersects with 'water land', conforms to 'Dredging and reclamation', as defined by the FM Act:

Dredging work —

- (a) any work that involves excavating water land
- (b) any work that involves moving material on water land or removing material from water land.

Reclamation work —

- (a) using any material (such as sand, soil, silt, gravel, concrete, oyster shells, tyres, timber or rocks) to fill in or reclaim water land, or
- (b) depositing any such material on water land for the purpose of constructing anything over water land (such as a bridge), or
- (c) draining water from water land for the purpose of its reclamation.

Water land is land submerged by water –

- (a) whether permanently or intermittently
- (b) whether forming an artificial or natural body of water.

In accordance with s.199 of the FM Act, the proponent must, before it carries out or authorises the work:

- (a) give the Minister written notice of the proposed work, and
- (b) consider any matters concerning the proposed work that are raised by the Minister within 28 days after the giving of the notice (or such other period as is agreed between the Minister and the public authority).

NPWS (as the proponent) must consult with DPI Fisheries prior to construction commencing.

With reference to s.4.2.3 of this report, as no threatened species or populations listed under the FM Act were recorded or considered likely to occur in proximity to the proposed work, reference to the assessment criteria listed under s.221ZV (Part 7A) of this Act is not required. The proposal would not have a significant impact on any threatened aquatic species, their populations, ecological communities or habitats. As such, the preparation of a SIS that further considers the impact of the proposal on fish is not triggered.

Furthermore, as the proposal does not involve harm to marine vegetation or obstruction of fish passage, permits under s.205 and s.210 of the FM Act, respectively, are not necessary.

5.4.4 SEPP (Biodiversity and Conservation) 2021

This Policy seeks to encourage the proper conservation and management of areas that provide habitat for Koalas.

In accordance with Chapter 4 'Koala habitat protection 2021' of the BCSEPP, City of Lithgow LGA is identified under Schedule 2 of this SEPP as land to which this chapter applies, and part of the Central and Southern Tablelands Central Coast Koala management area. This Policy seeks to encourage the proper conservation and management of areas that provide habitat for Koalas.

Relevant to the proposal, s.4.4(3)(a) of Chapter 4 'Koala Habitat Protection 2021' of the SEPP states that this chapter does not apply to *land dedicated or reserved under the NPW Act, or acquired under Part 11 of that Act*. That stated, it is NPWS policy to remain consistent with any Koala Plan of Management and landscape management of Koalas and their habitat.

It is acknowledged that no Koala Plan of Management exists for the locality.

No evidence (i.e., sightings, scats etc.) to suggest that the area investigated supported a resident Koala population were identified.

In accordance with the following definitions provided under Chapter 4, s.4.2 of the SEPP, the areas affected by the walking track are not considered to constitute Core Koala habitat:

- a) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable Koala habitat and where Koalas are recorded as being present at the time of assessment of the land as highly suitable Koala habitat, or
- b) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable Koala habitat and where Koalas have been recorded as being present in the previous 18 years.

The proposal would not require the preparation of a Plan of Management for the conservation and management of areas of Koala habitat. The work will not require the adoption of any mitigation measures relevant to this species.

5.4.5 SEPP (Resilience and Hazards) 2021

In reference to s.2.7 of SEPP (Resilience and Hazards) 2021, utilising the [repealed] SEPP (Coastal Management) 2018 SEED Dataset mapping (State Government of NSW and DPE 2022b), the study area is not mapped as Coastal Wetland or Littoral Rainforest. Additionally, reference to s.2.10 and s.2.11 of SEPP (Resilience and Hazards) 2021, the walking track is not present in any Coastal Environments or Coastal Use Areas

5.4.6 Section 171(2) of the EP&A Regulation 2021

Section 171(2) of the EP&A Regulation 2021 sets out 18 factors that need to be considered when assessing environmental impact under Part 5 of the EP&A Act. These factors are addressed in this report and relevant sections are listed in Table 6.

Table 1. Clause 171 Assessment

Clause 171 Factors		Impact
(a)	Any environmental impact on the community? The proposed work is not considered to have an adverse environmental impact on the local community. The walking track will provide opportunities for visitors to undertake multi-day walks within the Garden of Stone SCA.	Positive
(b)	Any transformation of the locality? The establishment of the walking track will formalise an unauthorized motorcycle track. As such, there would not be a dramatic transformation of the locality. The formalisation of the motorcycle track would provide opportunities for site management and provide opportunities for addressing any degraded areas that were the result of the unauthorized use of the trail.	Low
(c)	Any environmental impact on the ecosystems of the locality? The alignment of the walking track has been selected to a) formalize the former motor bike track and b) avoid those areas that were identified as environmental constraints.	Low / Positive

Clause 171 Factors		Impact
	<p>Rather, the proposal, being fire trail upgrade work, would have a positive effect on the condition of the investigated fire trails, and the surrounding environment.</p> <p>Provided the specified mitigation measures are adhered to, the proposed work is not expected to result in any negative environmental impact on the ecosystems of the locality.</p>	
(d)	<p>Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality?</p> <p>Aesthetically, the alignment of the walking track will formalize the former motor bike track. Generally occurring within the alignment of the former motor cycle track, and through the realignment of section of this to avoid any environmental constraints, overall, there would be no significant reduction of recreational, scientific or other environmental qualities or values of the locality.</p> <p>There may be short-term and minor disruptions during the course of the proposed work; however, in operation, there will be no long-term impacts.</p>	Negligible
(e)	<p>Any effects on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?</p> <p>Considering the alignment selected, the establishment of the multi-day walking track will not have an effect in regards to these matters.</p>	Low
(f)	<p>Any impact on the habitat of protected fauna (within the meaning of the <i>Biodiversity Conservation Act 2016</i>)?</p> <p>Six fauna species listed as either Endangered or Vulnerable under this Act were recorded, or considered present based on the occurrence of suitable habitat, being the:</p> <ul style="list-style-type: none"> • Flame Robin – Vulnerable • Scarlet Robin – Vulnerable • Varied Sittella – Vulnerable • Gang-gang Cockatoo – Vulnerable. • Blue Mountains Water Skink – Endangered • Giant Dragonfly – Endangered. <p>Assessments drawing on the criteria provided under s.7.3 of the BC Act (Appendix 4) concluded that the proposal would not have a significant impact on these species, their habitats or the viability of their local population.</p> <p>With reference to the remaining threatened fauna species previously recorded within 10 km of the study area (Appendix 2), no significant habitat resources for these species' lifecycle requirements would be adversely impacted by the proposal.</p>	Low
(g)	<p>Any endangering of any species of animal, plant or other form of life whether living on land, in water or in the air?</p>	Low

Clause 171 Factors		Impact
	The track has been realigned to avoid those threatened plants recorded and the habitats of the threatened species detected or predicted to occur. As such, there will not be any endangering of any species of animal, plant or other form of life whether living on land, in water or in the air	
(h)	Any long-term effects on the environment? No aspect of the proposed work is considered to result in any negative long-term effects on the environment.	Negligible
(i)	Any degradation of the quality of the environment? The proposed walking track is not considered to degrade the quality of the environment. Provided the specified mitigation measures are adhered to, the proposed work is not expected to result in any risks to the quality of the environment.	Negligible / Positive
(j)	Any risk to the safety of the environment? Provided the specified mitigation measures are adhered to, the proposed work is not expected to result in any risks to the safety of the environment.	Negligible
(k)	Any reduction in the range of beneficial uses of the environment? The establishment of the walking track would not have an affect in regards to this matter.	Negligible
(l)	Any pollution of the environment? During construction there may occur a minor, temporary elevation in noise, dust and/or exhaust emissions as a result of the use of machinery and the presence of personnel during the course of the work. Provided the specified mitigation measures are adhered to, the proposed work is not expected to result in any significant adverse pollution of the environment.	Low
(m)	Any environmental problems associated with the disposal of waste? Waste associated with the proposal is expected to be limited to weed and any surplus spoil/materials that would be disposed of appropriately at a licensed landfill facility. Provided the specified mitigation measures are adhered to, the proposed work is not expected to result in any environmental problems associated with the disposal of waste.	Negligible
(n)	Any increased demands on resources (natural or otherwise) that are or are likely to become in short supply? The proposed work would not result in an increased demand on resources (natural or otherwise).	Negligible

Clause 171 Factors		Impact
(o)	Any cumulative environmental effect with other existing or likely future activities? The proposed walking track would not have an adverse cumulative environmental effect with an existing, or any future, activity.	Negligible
(p)	Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? The proposal would not have an adverse impact on coastal processes or coastal hazards.	Not applicable
(q)	Any applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1?	Not applicable
(r)	Any other relevant environmental factors?	Not applicable

6. Conclusion

NPWS is proposing the development of a publicly accessible, multi-day ~12 km walk with associated camping areas through the Gardens of Stone SCA. In compliance with the requirements of Division 5.1 of the EP&A Act, a REF is being prepared to assess the works, the BAR informing this document.

Based on a 1.5-metre disturbance width, the footprint of the proposed walking track (based on a worst-case scenario) is estimated to be 1.66 ha. Apart from some diversions to improve visitor experience, the proposed track generally follows an existing motorcycle track and a fire trail. Accordingly, vegetation removal has been minimised and the actual disturbance footprint would be considerably less than this.

By the completion of the field investigation, the following MNES had been recorded or were considered likely to occur within or near the proposal area:

- Temperate Highlands Peat Swamps on Sandstone – listed as an endangered ecological community
- Deane's Boronia – listed as a vulnerable species
- Gang-gang Cockatoo – listed as an endangered species
- Blue Mountains Water Skink – listed as an endangered species.

Assessments drawing on the EPBC Act's Significant Impact Guidelines (DE 2013) were conducted on Temperate Highlands Peat Swamps on Sandstone, Deane's Boronia, Gang-gang Cockatoo, and the Blue Mountains Water Skink. It was found the proposal would not have a significant impact on the EEC, Deane's Boronia, Gang-gang Cockatoo or the Blue Mountains Water Skink. The proposal is not a controlled action requiring referral to the Federal Minister for the Environment.

The proposed work has the potential to affect the following biota listed on the BC Act:

- Newnes Plateau Shrub Swamp in the Sydney Basin Bioregion – listed as an endangered ecological community
- *Persoonia hindii* – listed as an endangered species
- Deane's Boronia – listed as a vulnerable species
- Small Pale Grass-lily – listed as an endangered species
- Flame Robin – listed as a vulnerable species
- Scarlet Robin – listed as a vulnerable species
- Varied Sittella – listed as a vulnerable species
- Blue Mountains Water Skink - listed as an endangered species

- Giant Dragonfly - listed as an endangered species
- Gang-gang Cockatoo - listed as a vulnerable species.

Assessments drawing on the criteria provided under section 7.3 of the BC Act were undertaken on the community and each of these species. It was found that, provided the recommended mitigative measures were undertaken, the proposed work would not significantly affect the community, the species, or their habitats. As such, the preparation of a SIS/BDAR is not required.

Lithgow LGA is subject to Chapter 4 'Koala habitat protection 2021' of SEPP (Biodiversity and Conservation) 2021; however, in accordance with s.4.2 of the policy, the study area is not considered to constitute Core Koala habitat. Furthermore, Section 4.4(3), despite subclause (1) states this chapter does not apply to 'land dedicated or reserved under the *National Parks and Wildlife Act 1974*, or acquired under Part 11 of that Act'.

The adoption of those mitigation measures provided would ensure that the proposal is conducted in an ecologically sustainable manner and there would be no significant impact to any EPBC or BC Act listed TEC or threatened species.

With adherence to those recommendations provided in this report, no ecological constraints to the proposal proceeding as planned were identified or considered likely to occur.

7. Recommendations

In line with the objectives 1.3(b) and 1.3(e) of the EP&A Act, the following recommendations are provided:

- Prior to construction of the track, pre-clearing surveys for Deane's Boronia and Pale Grass-lily be undertaken
- A CEMP is to be prepared for the proposal.
- As part of the 'site induction' all personnel are to be briefed regarding site sensitivities (e.g. areas of Newnes Plateau Shrub Swamp, the presence of *Persoonia hindii*, areas of Newnes Plateau Shrub Swamp and habitat for both the Blue Mountains Water Skink and Giant Dragonfly) prior to entering the work area.
- Known locations of *Persoonia hindii*, the Blue Mountains Water Skink and Giant Dragonfly would be marked on the works plans, as would Deane's Boronia and any additional Pale Grass-lily records should they be detected during pre-clearing surveys.
- Known *Persoonia hindii*, the Blue Mountains Water Skink and Giant Dragonfly habitat adjacent to the track would be marked with exclusion tape (or similar) where necessary.
- Before entering and leaving the work site, workers are to remove excess soil and mud and then spray boots, tools, gloves and small equipment with recommended disinfectant supplied by the contractor (70% Methylated spirits / 30% Water) until runoff is clear.
- Boot cleaning devices should be installed at each end of the multi-day walk to prevent visitors spreading plant pathogens.
- Unnecessary soil disturbance is to be avoided.
- Sediment fencing/structures (e.g., sandbags) will be established as required prior to the commencement, and kept in place for the duration, of the proposed work in accordance with Landcom (2004) 'Soils and Construction: Managing Urban Stormwater' (the Blue Book). These are to be maintained and will not be removed until the work is complete, or the area is stabilised.
- Where applicable, scheduled inspections of these will be made to ensure compliance.
- Restrict the location of any temporary stockpile site to existing cleared areas located at least 50 m away from waterways, roads, slopes steeper than 10 percent, and areas of concentrated water flow.
- Avoid unnecessary soil disturbance.

- Disturbed surfaces would be compacted prior to the end of the workday or before rainfall to minimise potential for erosion and sedimentation during construction.
- Uncontaminated surplus spoil will be retained and used on-site where applicable.
- In accordance with s.199 of the FM Act, NPWS (as proponent) must consult with DPI Fisheries prior to construction commencing.
- Damage to existing native riparian vegetation is to be avoided or minimised, and any damage caused is to be restored.
- Pending consultation with DPI, the following best practice measures may be required when conducting work in the vicinity of the identified waterways:
 - Environmental safeguards (e.g., sediment fences, etc.) are to be installed consistent with Landcom (2004) to ensure that there is no impact to the adjacent aquatic environment.
 - Any material removed from a waterway that is to be temporarily deposited or stockpiled on land is to be located well away from the waterway and is to be contained by appropriate erosion and sediment control devices.
 - Damage to existing native riparian vegetation is to be avoided or minimised, and any damage caused is to be restored.
 - When machinery is working on site, spill kits suitable for the containment of fuel and oils spills must be available.
- DPI Fisheries (1800 043 536) to be immediately notified of any fish kills in the vicinity of the work. In such cases, all work other than emergency response procedures are to cease until the issue is rectified and written approval to proceed is provided by DPI Fisheries
- If required, refuelling of machinery is to occur within an impervious bunded area located more than 50 m from any drainage line to prevent the escape of substances into the surrounding environment.
- Clearing of native vegetation/plants would not be more than that required to permit the scope of work.
- No mature or hollow-bearing trees are to be removed or indirectly disturbed. If high value trees are identified as a significant hazard due to changing conditions, assessments must be completed by a suitably qualified arborist and managed with input from an experienced ecologist.
- Vegetation removal work is not to be conducted during periods of high winds.
- All vehicles/machinery would enter the site via the existing trail network and stabilised access areas to prevent the introduction and spread of weed propagules and/or pathogens.
- Refrain from parking any vehicle/storing machinery near tree trunks.
- Where possible, construction machinery will be washed prior to entering and leaving site to ensure weed propagules are not transported.
- Any animals injured during the proposed work would be collected and taken to a local veterinarian or wildlife carer for treatment
- Once rehabilitated, native animals must be released at their point of capture.
- It is expected injured exotic species would be ethically treated.
- Waste Management and Minimisation
 - Weed contaminated green waste and any surplus spoil and other materials would be disposed of appropriately at a licensed landfill facility.
 - Recycling methods will be enacted where applicable.
 - Personal rubbish is to be collected and deposited into a NPWS serviced bin.
 - Visual inspections of the site are to be made at the completion of the work to ensure no urban refuse remains.

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Appendix 1. Threatened species likelihood of occurrence per BioNet Atlas and EPBC PMST

Key

V - vulnerable E - endangered CE - critically endangered M - migratory

A State or nationally listed threatened species is considered to have a:

- **High** likelihood of occurrence if it has been recorded within 10 km of the study area and there is either suitable habitat present or the potential for the species to fly over the site (while species may fly over, it is acknowledged that for some species no suitable habitat will be present within the study area).
- **Moderate** likelihood of occurrence if they have a predicted occurrence (via the PMST or BioNet Atlas geographic search) and there is either suitable habitat present or the potential for the species to fly over the site (while species may fly over, it is acknowledged that for some species no suitable habitat will be present within the study area).
- **Low** likelihood of occurrence if suitable habitat for an animal is not present regardless of whether they have been recorded within 10 km or have a predicted occurrence.

Note: Species underlined are those which only the EPBC PMST predicted as having habitat in the search area. All other species have been recorded within 10 km of the study area.

As these habitats are not present, no pelagic or estuarine species have been considered in the following table.

Given that the proposed work is not located within the Commonwealth marine area, this being from 3 to 200 nautical miles from the coast, no species listed as marine under the EPBC Act have been considered; nor has the marine status of any species been acknowledged.

* - habitat requirements were generally extracted from DCCEEW (2023b), OEH (2023), Harden (1992-2002), Frith (2007), Churchill (2008), Cogger (2014) and Van Dyck and Strahan (2008) with other references used being identified in the bibliography.

Species	Status EPBC BC		Habitat	Source of Records	Likelihood of Occurrence	Assessment Required?
<u>Acacia bynoeana</u>	V	V	Heath or dry sclerophyll forest on sandy soils preferring open, sometimes slightly disturbed sites such as trail margins, edges of roadside spoil mounds and in recently burnt patches. Not associated with any PCTs that occur at the subject site.	PMST	Low. Habitat absent.	No
<i>Acacia meiantha</i>	E	E	Only known from three disjunct locations - Clarence, Mullions Range State Forest north of Orange and Carcalgong (west of Rylstone). The Clarence population occurs in an open eucalypt forest (<i>Eucalyptus dives</i> and <i>E. sieberi</i>) and in an adjacent area of mainly shrubs, where tree overstorey has been cleared near power lines. Dense shrub layer is dominated by <i>Leptospermum trinervium</i> with <i>L. obovatum</i> , <i>Phyllota squarrosa</i> , <i>Banksia spinulosa</i> and <i>Isopogon anemonifolia</i> . Associated with PCTs 3688, 3691, 3694 and 3945.	Bionet (131)	Moderate. Some suitable habitat present. Not detected during targeted surveys.	No
<u>Thick-leaf Star-hair</u> <u><i>Astrotricha crassifolia</i></u>	V	V	Occurs near Patonga (Gosford LGA), and in Royal NP and on the Woronora Plateau There is also a record from near Glen Davis (Lithgow LGA). Occurs in dry sclerophyll woodland on sandstone. Not associated with any PCTs that occur at the subject site.	PMST	Low. Site outside species' restricted distribution area	No
Deane's Boronia <i>Boronia deanei</i>	V	V	Grows in wet heath, often at the margins of open forest adjoining swamps or along streams. Also found in drier open forest on poorly drained peat soils over granite or sandstone. Associated with PCTs 3687, 3688, 3691, 3694, 3862 and 3945. Recorded close to proposed walking track alignment.	Bionet (1794)	High.	Yes
Small Pale Grass-lily <i>Caesia parviflora</i> var. <i>minor</i>		E	Heath, woodland and forest on sandstone. Associated with PCTs 3687, 3688, 3945. Recorded close to proposed track alignment near North Ridge Road.	Bionet (169)	High.	Yes
Klaphake's Sedge <i>Carex klaphakei</i>		E	Found in only three locations, from the Blue Mountains (at Blackheath and Mt Werong) to the Southern Highlands (at Penrose). Grows with other native sedges and rushes in swamps on sandstone at altitudes of greater than 600 m. Not associated with any PCTs that occur at the subject site.	Bionet (14)	Low. Some suitable habitat present but subject site is beyond species' distribution limit.	No
<u><i>Cryptostylis hunteriana</i></u>	V	V	Occurs in a range of communities, including swamp-heath and woodland. Not associated with any PCTs that occur at the subject site.	PMST	Low. Habitat absent.	No
<u>White-flowered Waxplant</u> <u><i>Cynanchum elegans</i></u>	E	E	Usually occurs on the edge of dry rainforest vegetation but also in littoral rainforest, coastal scrub and aligned open forest and woodland. Not associated with any PCTs that occur at the subject site.	PMST	Low. Habitat absent.	No

Species	Status EPBC BC	Habitat	Source of Records	Likelihood of Occurrence	Assessment Required?	
<i>Dillwynia tenuifolia</i>		V	Usually occurs in Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays. Suspect outlying records of what is a western Sydney lower Blue Mountains species. Associated with PCTs 3688 and 3862.	Bionet (2)	Low.	No
<i>Eucalyptus aggregata</i>	V	V	Alluvial soils, on cold, poorly-drained flats and hollows adjacent to creeks and small rivers often with <i>Eucalyptus pauciflora</i> , <i>E. viminalis</i> , <i>E. rubida</i> , <i>E. stellulata</i> and <i>E. ovata</i> . Not associated with any PCTs that occur at the subject site.	PMST	Low.	No
<i>Eucalyptus cannonii</i> ⁴		V	Restricted to an area of about 100km by 60km in the central tablelands of NSW between Bathurst-Lithgow and Mudgee-Bylong. Within this area the species is often locally frequent. It occurs in association with a range of eucalypts including the similar but more common Red Stringybark, with which it often hybridises. Associated with PCT 3696.	Bionet (7)	Low. Some suitable habitat but locality beyond species' range.	No
<i>Eucalyptus pulverulenta</i>	V	V	Occurs as an understorey plant in open forest, typically dominated by Brittle Gum (<i>Eucalyptus mannifera</i>), Red Stringybark (<i>E. macrorhyncha</i>), Broad-leafed Peppermint (<i>E. dives</i>), Silvertop Ash (<i>E. sieberi</i>) and Apple Box (<i>E. bridgesiana</i>). Not associated with any PCTs that occur at the subject site.	Bionet (1)	Low.	No
<i>Eucalyptus robertsonii</i> subsp. <i>hemisphaerica</i>	V	V	Known only from the central tablelands of NSW, at small disjunct localities from north of Orange to Burruga, where it is locally frequent in grassy or dry sclerophyll woodland or forest, on lighter soils and often on granite. Usually found in closed grassy woodlands in locally sheltered sites. Habitats include quartzite ridges, upper slopes and a slight rise of shallow clay over volcanics. Not associated with any PCTs that occur at the subject site.	PMST	Low.	No
<i>Euphrasia arguta</i>	CE	CE	Rediscovered after 100 years near Nundle in 2008 but historically recorded in grassy country near Bathurst. Not associated with any PCTs that occur at the subject site.	PMST	Low. Habitat absent.	No
Superb Midge Orchid <i>Genoplesium superbum</i>	E		Restricted to the Central and Southern Tablelands of NSW where it has been recorded from two locations near Nerriga and north of Wallerawang. Occurs predominantly in wet heathland on shallow soils above a sandstone cap but has also been found in open woodland interspersed with heath and dry open shrubby woodland. Associated with PCT 3688.	Bionet (2)	Low. Restricted distribution.	No

⁴ Recently removed from the EPBC Act.

Species	Status EPBC BC		Habitat	Source of Records	Likelihood of Occurrence	Assessment Required?
<u>Wingless Raspwort</u> <u>Haloragis exalata</u> subsp. <u>exalata</u>	V	V	Appears to require protected and shaded damp situations in riparian habitats. Not associated with any PCTs that occur at the subject site.	PMST	Low. Habitat absent.	No
<u>Haloragodendron lucasii</u>	E	E	Known locations of this species are confined to a very narrow distribution on the north shore of Sydney. Associated with dry sclerophyll forest. Reported to grow in moist sandy loam soils in sheltered aspects, and on gentle slopes below cliff-lines near creeks in low open woodland. Not associated with any PCTs that occur at the subject site.	PMST	Low. Site outside species' distribution.	No
<u>Homoranthus darwinioides</u>	V	V	Occurs from Putty to the Dubbo district. It is found west of Muswellbrook between Merriwa and Bylong, and north of Muswellbrook to Goonoo SCA. Grows in various woodland habitats with shrubby understoreys, usually in gravely sandy soils. Associated species include <i>Callitris endlicheri</i> , <i>Eucalyptus crebra</i> , <i>E. fibrosa</i> , <i>C. trachyphloia</i> , <i>E. beyeri</i> subsp. <i>illaquens</i> , <i>E. dwyeri</i> , <i>E. rossii</i> , <i>Leptospermum divaricatum</i> , <i>Melaleuca uncinata</i> , <i>Calytrix tetragona</i> , <i>Allocasuarina</i> spp. and <i>Micromyrtus</i> spp. Not associated with any PCTs that occur at the subject site.	PMST	Low	No
<u>Isopogon fletcheri</u>	V	V	Restricted to a very small area in the Blackheath district of the Blue Mountains on the Central Tablelands. Restricted to moist sheltered cliffs within the spray zone of a waterfall. Grows in dry sclerophyll forest and heath on sandstone and is confined to sheltered moist positions. Associated with PCTs 3694 and 3862.	PMST	Low. No nearby records	No
<u>Isotoma fluviatilis</u> subsp. <u>fluviatilis</u>		X	Currently known from only two adjacent sites on a single private property at Erskine Park in the Penrith LGA. Known to grow in damp places, on the Cumberland Plain, including freshwater wetland, grassland/alluvial woodland and an alluvial woodland/shale plains woodland ecotone. Not associated with any PCTs that occur at the subject site.	Bionet (1)	Low	No
<u>Kunzea cambagei</u>	V	V	It mainly occurs in the western and southern parts of the Blue Mountains, NSW, mainly the Yerranderie/Mt Werong area, but populations are also located west of Berrima, along the Wingecarribee River. Restricted to damp, sandy soils in wet heath or mallee open scrub at higher altitudes on sandstone outcrops or Silurian group sediments. Associated with PCT 3694.	Bionet (19)	Moderate. Some suitable habitat present. Not detected during targeted survey.	No

Species	Status EPBC BC		Habitat	Source of Records	Likelihood of Occurrence	Assessment Required?
<u>Leionema lachnaeoides</u>	E	E	Populations occur on exposed sandstone cliff tops and terraces, at 960 - 1000m altitude and with aspects from south-east to south-west. Habitat vegetation is montane heath. Associated with PCTs 3688, 3694, 3696, 3862 and 3865.	PMST	Low. No nearby records	No
<u>Leucochrysum albicans</u> var. <u>tricolor</u>	E		Woodland and open forest communities at relatively high elevations in woodland and open forest communities, in an area roughly bounded by Goulburn, Albury and Bega. Not associated with any PCTs that occur at the subject site.	PMST	Low. Habitat absent	No
Biconvex Paperbark <i>Melaleuca biconvexa</i>	V	V	Scattered and dispersed populations of this species are found in the Jervis Bay area in the south and the Gosford-Wyong area in the north. Generally, grows in damp places, often near streams or low-lying areas on alluvial soils of low slopes or sheltered aspects. Suspect record well outside species' range. Not associated with any PCTs that occur at the subject site.	Bionet (1)	Low. Habitat absent.	No
Needle Geebung <i>Persoonia acerosa</i>	V	V	The Needle Geebung has been recorded only on the central coast and in the Blue Mountains, from Mt Tomah in the north to as far south as Hill Top where it is now believed to be extinct. Occurs in dry sclerophyll forest, scrubby low-woodland and heath on low fertility soils. Associated with PCTs 3688, 3691, 3694 and 3862.	Bionet (5)	Low. Some suitable habitat but locality beyond species' range.	No
<i>Persoonia hindii</i>	E		Restricted to the Newnes Plateau where it occurs in dry sclerophyll forests and woodlands on sandy soils. Grows in dense low heath, often along seepage lines, in moist to wet shallow sandy soils over sandstone, mostly at altitudes greater than 900 m above sea level. Associated with PCTs 3687, 3688, 3691, 3696, 3862 and 3945.	Bionet (1103)	High. Recorded at subject site during targeted survey.	Yes
Hairy Geebung <u><i>Persoonia hirsuta</i></u>	E	E	Occurs from Singleton in the north, along the east coast to Hilltop in the south west, Dombarton in the south east and the Blue Mountains to the west. Has a large area of occurrence, but occurs in small populations or isolated individuals, increasing the species' fragmentation in the landscape. Found in clayey and sandy soils in dry sclerophyll open forest, woodland and heath, primarily on the Mittagong Formation and on the upper Hawkesbury Sandstone. Associated with PCT 3695.	PMST	Low. Some suitable habitat but locality beyond species' range.	No
Clandulla Geebung <i>Persoonia marginata</i>	V	V	Occurs between Kandos and Clarence in the western Blue Mountains. Populations are largely disjunct and include Clandulla, Ben Bullen and Sunny Corner State Forests; isolated populations have also been recorded from Turon and Gardens of Stone National Parks. Grows in dry sclerophyll forest and	Bionet (4)	Moderate. Some suitable habitat present. Not detected during targeted survey.	No

Species	Status EPBC BC		Habitat	Source of Records	Likelihood of Occurrence	Assessment Required?
			woodland communities on sandstone. Associated with PCTs 3687, 3688 and 3694.			
<u>Brown Pomaderris</u> <u>Pomaderris brunnea</u>	V	V	found in a very limited area around the Colo, Nepean and Hawkesbury Rivers, including the Bargo area and near Camden. Grows in moist woodland or forest on clay and alluvial soils of flood plains and creek lines. Not associated with any PCTs that occur at the subject site.	PMST	Low. Habitat absent	No
<u>Cotoneaster Pomaderris</u> <u>Pomaderris cotoneaster</u>	E	E	Recorded in a range of habitats in predominantly forested country. The habitats include forest with deep, friable soil, amongst rock beside a creek, on rocky forested slopes and in steep gullies between sandstone cliffs. Not associated with any PCTs that occur at the subject site.	PMST	Low. Habitat absent	No
<u>Slaty Leek Orchid</u> <u>Prasophyllum fuscum</u>	CE	V	Taxonomically uncertain species. Grows in moist heath, often along seepage lines. Not associated with any PCTs that occur at the subject site.	PMST	Low. Habitat absent	No
<u>Tarengo Leek Orchid</u> <u>Prasophyllum petilum</u>	E	E	Restricted to five known sites in NSW: Boorowa, Queanbeyan area, Ilford, Delegate and Muswellbrook. It also occurs at Hall in the Australian Capital Territory. Grows in Natural Temperate Grassland and Black Gum grassy woodland. Not associated with any PCTs that occur at the subject site.	PMST	Low. Habitat absent	No
<u>Musty Leek Orchid</u> <u>Prasophyllum pallens</u>	V		Known only from four distinct populations: Mt Banks and Mt Hay in Blue Mountains National Park, and near the townships of Blackheath and Wentworth Falls. Associated with PCT 3694.	Bionet (82)	Low. Restricted distribution.	No
<u>Prasophyllum sp Wybong</u>	V	CE	Known from known from seven populations in eastern NSW near Ilford, Premer, Muswellbrook, Wybong, Yeoval, Inverell and Tenterfield. Occurs in open eucalypt woodland and grassland. Not associated with any PCTs that occur at the subject site.	PMST	Low. Habitat absent.	No
<u>Prostanthera cryptandroides</u> <u>subsp. cryptandroides</u>	V	V	Occurs between Lithgow and Sandy Hollow. Local records are from Newnes Plateau in upland swamp. Elsewhere it occurs in a range of dry sclerophyll forest communities. Associated with PCTs 3696 and 3865.	Bionet (1)	Moderate. Some suitable habitat present. Not detected during targeted survey.	No
<u>Pultenaea glabra</u>	V	V	Swamp margins, hill slopes, gullies and creek banks and occurs within dry sclerophyll forest and tall damp heath on sandstone in the upper Blue Mountains. Associated with PCT 3694.	Bionet (1)	Low. Some suitable habitat but locality beyond species' range.	No.
<u>Pultenaea parrisiae</u>	V	V	Known only from far north-east Gippsland (in Victoria) and three sites in NSW (Wadbilliga Trig area and two sites south of Nalbaugh). Grows in moist heathlands in loam soils, sometimes	PMST	Low. Habitat absent.	No

Species	Status EPBC BC		Habitat	Source of Records	Likelihood of Occurrence	Assessment Required?
			at the margins of woodlands. Also in riparian vegetation. Not associated with any PCTs that occur at the subject site.			
<u>Eastern Underground Orchid</u> <u>Rhizanthella slateri</u>	V	E	Habitat requirements are poorly understood and no particular vegetation type has been associated with the species, although it is known to occur in sclerophyll forest. Not associated with any PCTs that occur at the subject site.	PMST	Low. Habitat absent.	No
<u>Thesium australe</u>	V	V	Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Often found in association with Kangaroo Grass (<i>Themeda australis</i>). Not associated with any PCTs that occur at the subject site.	PMST	Low. Habitat absent.	No
<u>Wollemi Pine</u> <u>Wollemia nobilis</u>	CE	CE	Restricted to remote canyons in the Wollemi National Park, north-west of Sydney. Occurs in warm temperate rainforest and rainforest margins in remote sandstone canyons. Not associated with any PCTs that occur at the subject site.	PMST	Low. Habitat absent.	No
<i>Velleia perfoliata</i>	V	V	Found in shallow depressions on Hawkesbury sandstone shelves, on rocky hill sides, under cliffs or on rocky/sandy soils along tracks and trails. Associated with PCT 3862.	Bionet 4)	Moderate. Some suitable habitat present.	No
<i>Veronica (Derwentia) blakelyi</i>	V	V	Restricted to eucalypt forest, often in moist areas in the western Blue Mountains, near Clarence, near Mt Horrible, on Nullo Mountain and in the Coricudgy Range. Associated with PCTs 3687, 3688 and 3691.	Bionet (208)	Moderate. Some suitable habitat present. Not detected during targeted survey.	No
<u>Swamp Everlasting</u> <u>Xerochrysum palustre</u>		V	Found in Kosciuszko National Park and the eastern escarpment south of Badja. Also found in eastern Victoria. Grows in wetlands including sedge-swamps and shallow freshwater marshes, often on heavy black clay soils. Not associated with any PCTs that occur at the subject site.	PMST	Low. Subject site outside species' distribution.	No
FAUNA						
REPTILES						
Broad-headed Snake <i>Hoplocephalus bungaroides</i>	V	E	This species is restricted to the sandstone ranges in the Sydney Basin and within a radius of approximately 200 km of Sydney where it occurs in rocky outcrops and adjacent sclerophyll forest and woodland.	Bionet (6)	Low. No suitable habitat.	No
Rosenberg's Goanna <i>Varanus rosenbergi</i>		V	Dry sclerophyll forests, woodlands and heathlands particularly those that occur on sandy or calcareous soils. Forages on insects, smaller reptiles and their eggs, spiders, small mammals, bird eggs and chicks.	Bionet (5)	Moderate. Suitable habitat present, but extent of works proposed will not adversely affect this species particularly as it is an upgrading of an existing unauthorised vehicle track.	No

Species	Status EPBC BC		Habitat	Source of Records	Likelihood of Occurrence	Assessment Required?
					Species would be easily negotiating and traversing the current site condition. No significant resources for this species was identified within the ultimate alignment selected.	
Blue Mountains Water Skink <i>Eulamprus leuraensis</i>	E	E	Restricted to sedge and shrub swamps in the middle and upper Blue Mountains from Hazelbrook in the south-east to the Newnes Plateau in the north-west.	Bionet (718)	High. Precautionary approach adopted	Yes
<u>Striped Legless Lizard</u> <i>Delma impar</i>	V	V	Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component.	PMST	Low. No suitable habitat..	No
<u>Pink-tailed Worm-lizard</u> <i>Aprasia parapulchella</i>	V	V	Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (<i>Themeda australis</i>). Sites are typically well-drained, with rocky outcrops or scattered, partially buried rocks.	PMST	Low. No suitable habitat.	No
FROGS						
<u>Giant Burrowing Frog</u> <i>Heleioporus australiacus</i>	V	V	Restricted to areas of Hawkesbury Sandstone, this frog prefers sandstone ridge top habitat and broader upland valleys that run through heathland and woodland. Small semi-permanent to slightly flowing streams.	PMST	Moderate. would not be effected beyond current levels of disturbance, should the proposal proceed as planned works would not have a significant effect on any ephemeral drainage lines and use of the walking track would not result in any contaminants entering any of the waterways present	No
Stuttering Frog <i>Mixophyes balbus</i>	V	E	Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range.	Bionet (1)	Low. No suitable habitat.	No
Red-crowned Toadlet <i>Pseudophryne australis</i>		V	Occurs in open forests, mostly on Hawkesbury and Narrabeen Sandstones. Inhabits periodically wet drainage lines below sandstone ridges that often have shale lenses or cappings.	Bionet (4)	Moderate. would not be effected beyond current levels of disturbance, should the proposal proceed as planned works would not have a significant effect on any	No

Species	Status EPBC BC		Habitat	Source of Records	Likelihood of Occurrence	Assessment Required?
					ephemeral drainage lines and use of the walking track would not result in any contaminants entering any of the waterways present	
<u>Booroolong Frog</u> <i>Litoria booroolongensis</i>	V	V	Restricted to NSW and north-eastern Victoria, predominantly along the western-flowing streams of the Great Dividing Range. It lives along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses.	PMST	Moderate. would not be effected beyond current levels of disturbance, should the proposal proceed as planned works would not have a significant effect on any ephemeral drainage lines and use of the walking track would not result in any contaminants entering any of the waterways present	No
Heath Frog <i>Litoria littlejohnii</i>	V	V	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 and low vegetation	Bionet (1)	Low. No suitable habitat. Alignment determined that avoids any areas that could be occupied by this species	No
BIRDS						
<u>Malleefowl</u> <i>Leipoa ocellata</i>	V	E	Predominantly inhabit mallee communities, preferring the tall, dense and floristically-rich mallee found in higher rainfall (300 - 450 mm mean annual rainfall) areas.	PMST	Low. No suitable habitat.	No
<u>Australasian Bittern</u> <i>Botaurus poiciloptilus</i>	E	E	Occupies shallow, vegetated freshwater or brackish swamps, usually dominated by tall, dense reed beds of <i>Typha</i> sp., <i>Juncus</i> sp. and <i>Phragmites</i> sp. Nests on platforms of reeds and rushes, usually built over water in dense cover.	PMST	Low. No suitable habitat.	No
Fork-tailed Swift <i>Apus pacificus</i>	M		Breeds Siberia, Himalayas & Japan, migrates to Australia during Oct-April where it feeds on insects over a variety of habitats	Bionet (2)	Moderate. Highly likely to fly over site but would not be adversely affected by scope of works.	No
White-throated Needletail <i>Hirundapus caudacutus</i>	M, V		Breeds Siberia, Himalayas & Japan, migrates to Australia during Oct-April where it feeds on insects over a variety of habitats	Bionet (28)	Moderate. Highly likely to fly over site but would not be adversely affected by scope of works.	No

Species	Status EPBC BC		Habitat	Source of Records	Likelihood of Occurrence	Assessment Required?
<u>Grey Falcon</u> <i>Falco hypoleucos</i>	V	E	Sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast.	PMST	Low. No suitable habitat.	No
<u>Australian Painted Snipe</u> <i>Rostratula australis</i>	E	V	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	PMST	Low. No suitable habitat.	No
<u>Latham's Snipe</u> <i>Gallinago hardwickii</i>	M		Boggy pastures, edges of wetlands, sewage and other ponds	PMST	Low. No suitable habitat.	No
<u>Little Eagle</u> <i>Hieraetus morphnoides</i>		V	Plains, foothills, open forests, woodlands and scrublands. For nest sites it requires a tall living tree within a remnant patch, where pairs build a large stick nest in winter and lay in early spring.	Bionet (7)	Moderate. Highly likely to fly over site but would not be adversely affected by scope of works.	No
<u>Square-tailed Kite</u> <i>Lophoictinia isura</i>		V	Coastal and sub-coastal open forests and woodlands. In south-eastern Australia it is a spring-summer breeding migrant, probably wintering in the tropics. Estimates of home ranges for breeding pairs varies depending on geographical location but appear to be in the order of 5 km to 10 km.	Bionet (2)	Moderate. Highly likely to fly over site but would not be adversely affected by scope of works.	No
<u>Gang-gang Cockatoo</u> <i>Callocephalon fimbriatum</i>	V	V	In summer, this species is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In winter, may occur at lower altitudes in drier more open eucalypt forests and woodlands, and often found in urban areas. It moves to lower altitudes in winter, preferring more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas. Favours old growth attributes for nesting and roosting	Bionet (448)	High. Recorded at subject site during targeted survey.	Yes
<u>South-eastern Glossy Black-Cockatoo</u> <i>Calyptorhynchus lathamii</i>	V	V	Eucalypt woodland and feeds almost exclusively on casuarina fruit.	Bionet (30)	Targeted not recorded. No crushed casuarina cones observed. Bird was not observed or heard calling	No
<u>Little Lorikeet</u> <i>Glossopsitta pusilla</i>		V	Eucalyptus forest and woodland, particularly along water courses.	Bionet (15)	Moderate. Highly likely to fly over site but would not be adversely affected by scope of works.	No

Species	Status EPBC BC		Habitat	Source of Records	Likelihood of Occurrence	Assessment Required?
Swift Parrot <i>Lathamus discolor</i>	E	CE	The Swift Parrot breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. In NSW mostly occurs on the coast and south-west slopes. Migrates to the Australian south-east mainland between March and October. On the mainland it occurs 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 Spotted Gum <i>Corymbia maculata</i> , Red Bloodwood <i>C. gummifera</i> , Swamp Mahogany <i>Eucalyptus robusta</i> , Mugga Ironbark <i>E. sideroxylon</i> and White Box <i>E. albens</i> .	Bionet (1)	Moderate. Highly likely to fly over site but would not be adversely affected by scope of works.	No
Superb Parrot <i>Polytelis swainsonii</i>	V	V	Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest.	PMST	Moderate. Highly likely to fly over site but would not be adversely affected by scope of works.	No
Turquoise Parrot <i>Neophema pulchella</i>		V	Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland.	Bionet (4)	Moderate. Highly likely to fly over site but would not be adversely affected by scope of works.	No
<u>Blue-winged Parrot</u> <u><i>Neophema chrysostoma</i></u>	V		Breeds on mainland Australia south of the Great Dividing Range in southern Victoria from Port Albert in Gippsland west to Nelson, and sometimes in the far south-east of South Australia, and the north-western, central and eastern parts of Tasmania. A partial migrant, variable numbers of birds migrate across Bass Strait in winter. Occurs in a range of habitats from coastal, sub-coastal and inland areas, through to semi-arid zones. Tends to favour grasslands and grassy woodlands and often found near wetlands both near the coast and in semi-arid zones.	PMST	Moderate. Highly likely to fly over site but would not be adversely affected by scope of works.	No
Powerful Owl <i>Ninox strenua</i>		V	Habitat for this species is widespread and primarily tall, moist productive eucalypt forests of the eastern tableland edge and the mosaic of wet and dry sclerophyll forests occurring on undulating gentle terrain nearer the coast. Nests in old hollow eucalypts in unlogged, unburnt gullies and lower slopes within 100 m of streams or minor drainage lines, with hollows greater than 45 cm wide and greater than 100 cm deep. Home range has been estimated as 300-1 500 ha according to habitat productivity.	Bionet (67)	Moderate. Highly likely to fly over site but would not be adversely affected by scope of works.	No

Species	Status EPBC BC		Habitat	Source of Records	Likelihood of Occurrence	Assessment Required?
Barking Owl <i>Ninox connivens</i>		V	Inhabits eucalypt woodland, open forest, swamp woodlands and, especially in inland areas, timber along watercourses. Denser vegetation is used occasionally for roosting. During the day they roost along creek lines, usually in tall understorey trees with dense foliage such as Acacia and Casuarina species, or the dense clumps of canopy leaves in large Eucalypts. It requires tree hollows for nesting. Home range has been estimated as 225-6,000 ha	Bionet (8)	Moderate. Highly likely to fly over site but would not be adversely affected by scope of works.	No
Sooty Owl <i>Tyto tenebricosa</i>		V	Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests.	Bionet (4)	Moderate. Highly likely to fly over site but would not be adversely affected by scope of works.	No
Masked Owl <i>Tyto novaehollandiae</i>		V	Lives in dry eucalypt forests and woodlands from sea level to 1100 m.	Bionet (3)	Moderate. Highly likely to fly over site but would not be adversely affected by scope of works.	No
<u>Rainbow Bee-eater</u> <u><i>Merops ornatus</i></u>	M		Variety of wooded and non-wooded habitats preferring sandy ground and bank cuttings for nesting. Summer breeding migrant from PNG & east Indonesia.	PMST	Moderate. Highly likely to fly over site but would not be adversely affected by scope of works.	No
Pilotbird <i>Pycnoptilus floccosus</i>	V		Found in wet forested areas and heathland in eastern Victoria and south-eastern New South Wales.	OEH (149)	Targeted not recorded. Bird was not observed or heard calling. Expected to be tolerant of existing unauthorised vehicle trail and associated disturbances.	No
Brown Treecreeper <i>Climacteris picumnus picumnus</i>	V	V	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; fallen timber is an important habitat component for foraging. Hollows in standing dead or live trees and tree stumps are essential for nesting.	OEH (73)	Targeted not recorded. Bird was not observed or heard calling. Expected to be tolerant of existing unauthorised vehicle trail and associated disturbances.	No
Speckled Warbler <i>Pyrholaemus sagittata</i>		V	Inhabits a wide range of eucalypt-dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Large, relatively undisturbed remnants are required for the species to persist in an area.	OEH (4)	Low. No suitable habitat.	No

Species	Status EPBC BC		Habitat	Source of Records	Likelihood of Occurrence	Assessment Required?
Painted Honeyeater <i>Grantiella picta</i>	V	V	The Painted Honeyeater inhabits eucalypt woodlands and scrub, usually heavily infested with mistletoe. In Western NSW known habitat is usually along floodplains and drainage lines. Nests are usually in the leafy extremities of native trees and this species diet is predominantly mistletoe (<i>Amyema</i> spp) berries, though nectar and insects may also be taken.	OEH (1)	Low. No suitable habitat.	No
Regent Honeyeater <i>Anthochaera phrygia</i>	E, M	E	This species mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. The Regent Honeyeater is a generalist forager, which mainly feeds on the nectar from a wide range of eucalypts and mistletoes. Key eucalypt species include Mugga Ironbark, Yellow Box, Blakely's Red Gum, White Box and Swamp Mahogany. One of the strongholds of the species is the nearby Capertee Valley, though there are also records from Kandos (1998 & 2001) and Clandulla State Forest (1993).	OEH (6)	Low. No suitable habitat.	No
Black-chinned Honeyeater (eastern subspecies) <i>Melithreptus gularis gularis</i>		V	Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (<i>Eucalyptus sideroxylon</i>), White Box (<i>E. albens</i>), Inland Grey Box (<i>E. microcarpa</i>), Yellow Box (<i>E. melliodora</i>), Blakely's Red Gum (<i>E. blakelyi</i>) and Forest Red Gum (<i>E. tereticornis</i>).	OEH (2)	Low. No suitable habitat.	
Grey-crowned Babbler (eastern subspecies) <i>Pomatostomus temporalis temporalis</i>		V	Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions.	OEH (2)	Low. No suitable habitat.	No
<u>Southern Whiteface</u> <u><i>Aphelocephala leucopsis</i></u>	V		Wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both. These areas are usually in habitats dominated by acacias or eucalypts on ranges, foothills and lowlands, and plains. Habitat critical to the survival of the Southern Whiteface includes areas of relatively undisturbed open woodlands and shrublands with an understorey of grasses or shrubs, or both; habitat with low tree densities and an herbaceous understorey litter cover which provides essential foraging habitat; living and dead trees with hollows and crevices which are essential for roosting and nesting.	PMST	Low. No suitable habitat.	No
Varied Sittella <i>Daphaenositta chrysoptera</i>		V	Eucalypt forests and woodlands, especially rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland.	OEH (75)	High. Recorded at subject site during targeted survey.	Yes

Species	Status EPBC BC	Habitat	Source of Records	Likelihood of Occurrence	Assessment Required?
Dusky Woodswallow <i>Artamus cyanopterus cyanopterus</i>	V	Usually found in woodlands and dry open sclerophyll forests characterised by an open understorey and a ground cover of grasses, and/or sedges or open ground, with coarse woody debris. Also often observed in farm land, usually at the edges of forest or woodland or in roadside remnants or wind breaks with dead timber.	OEH (81)	Moderate. Highly likely to fly over site but would not be adversely affected by scope of works.	No
Hooded Robin (south-eastern form) <i>Melanodryas cucullata cucullata</i>	V	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.	OEH (12)	Targeted not recorded. Bird was not observed or heard calling. Expected to be tolerant of existing unauthorised vehicle trail and associated disturbances.	No
Scarlet Robin <i>Petroica boodang</i>	V	Drier eucalypt forests and temperate woodlands, often on ridges and slopes, within an open understorey of shrubs and grasses and sometimes in open areas. Abundant logs and coarse woody debris are important structural components of its habitat. In autumn and winter it migrates to more open habitats such as grassy open woodland or paddocks with scattered trees.	OEH (889)	High. Recorded at subject site during targeted survey.	Yes
Flame Robin <i>Petroica phoenicea</i>	V	Breeds in upland tall moist eucalypt forests and woodlands descending to dry forests, open woodlands and in pastures and native grasslands in winter.	OEH (830)	High. Recorded at subject site during targeted survey.	Yes
<u>Yellow Wagtail</u> <i>Motacilla flava</i>	M	Rare visitor to SE Australia. Inhabits saltmarsh	PMST	Low. No suitable habitat.	No
<u>Black-faced Monarch</u> <i>Monarcha melanopsis</i>	M	Rainforest and wet eucalypt forest.	PMST	Low. No suitable habitat.	No
<u>Satin Flycatcher</u> <i>Myiagra cyanoleuca</i>	M	Heavily vegetated gullies in forest, tall woodlands; variety of habitats during migration to NE Qld and PNG during Feb-April.	PMST	Low. No suitable habitat.	No
<u>Rufous Fantail</u> <i>Rhipidura rufifrons</i>	M	Understorey of densely vegetated habitat such as open forest and rainforest. Wider range of habitats during migration to PNG during March/April	PMST	Low. No suitable habitat.	No
Diamond Firetail <i>Stagonopleura guttata</i>	V	Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum <i>Eucalyptus pauciflora</i> 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.	OEH (4)	Low. No suitable habitat.	No

Species	Status EPBC BC		Habitat	Source of Records	Likelihood of Occurrence	Assessment Required?
MAMMALS						
Spotted-tailed Quoll (SE Mainland Population) <i>Dasyurus maculatus</i>	E	V	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 crevices, boulder fields and rocky-cliff faces as den sites. Nearest record is from the ridge immediately north of the study area, though this is only accurate to 10km.	OEH (10)	Moderate. Suitable habitat present, but extent of works proposed will not adversely affect this species particularly as it is an upgrading of an existing unauthorised vehicle track. Species would be easily negotiating and traversing the current site condition. No significant resources for this species was identified within the ultimate alignment selected.	No
<u>Parma Wallaby</u> <i>Macropus parma</i>	V	V	Preferred habitat is moist eucalypt forest with thick, shrubby understorey, often with nearby grassy areas, rainforest margins and occasionally drier eucalypt forest.	PMST	Moderate. Suitable habitat present, but extent of works proposed will not adversely affect this species particularly as it is an upgrading of an existing unauthorised vehicle track. Species would be easily negotiating and traversing the current site condition. No significant resources for this species was identified within the ultimate alignment selected.	No
Brush-tailed Rock-wallaby <i>Petrogale penicillata</i>	V	E	Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges.	Bionet (1)	Moderate. Suitable habitat present, but extent of works proposed will not adversely affect this species particularly as it is an upgrading of an existing unauthorised vehicle track. Species would be easily negotiating and traversing the current site condition. No significant resources for	No

Species	Status EPBC BC		Habitat	Source of Records	Likelihood of Occurrence	Assessment Required?
					this species was identified within the ultimate alignment selected.	
<u>Southern Brown Bandicoot (eastern)</u> <u>Isodon obesulus obesulus</u>	E	E	Generally, only found in heath or open forest with a heathy understorey on sandy or friable soils.	PMST	Moderate. Suitable habitat present, but extent of works proposed will not adversely affect this species particularly as it is an upgrading of an existing unauthorised vehicle track. Species would be easily negotiating and traversing the current site condition. No significant resources for this species was identified within the ultimate alignment selected.	No
Koala <i>Phascolarctos cinereus</i>	V	V	Open eucalypt forest and woodland, containing a variety of "preferred" food tree species.	Bionet (32)	Moderate. Suitable habitat present, but extent of works proposed will not adversely affect this species particularly as it is an upgrading of an existing unauthorised vehicle track. Species would be easily negotiating and traversing the current site condition. No significant resources for this species was identified within the ultimate alignment selected.	No
Eastern Pygmy-possum <i>Cercartetus nanus</i>		V	Heathland, woodland and rainforest that support a large number of proteaceous and myrtaceous plants.	Bionet (82)	Low. No suitable habitat.	No
Yellow-bellied Glider <i>Petaurus australis</i>		V	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils.	Bionet (8)	Moderate. Suitable habitat present, but extent of works proposed will not adversely affect this species particularly as it is an upgrading of an existing unauthorised vehicle track.	No

Species	Status EPBC BC		Habitat	Source of Records	Likelihood of Occurrence	Assessment Required?
					Species would be easily negotiating and traversing the current site condition. No significant resources for this species was identified within the ultimate alignment selected.	
Squirrel Glider <i>Petaurus norfolcensis</i>		V	Inhabits woodlands and dry sclerophyll forests, usually in diverse stands of shrubs and trees. Shelters and breeds in tree hollows, and is primarily an insectivorous animal but, has also been known to ingest plant exudates.	Bionet (13)	Moderate. Suitable habitat present, but extent of works proposed will not adversely affect this species particularly as it is an upgrading of an existing unauthorised vehicle track. Species would be easily negotiating and traversing the current site condition. No significant resources for this species was identified within the ultimate alignment selected.	No
Southern Greater Glider <i>Petauroides volans</i>	E	E	Moist eucalypt forests with relatively old trees and abundant hollows.	Bionet (1152)	Moderate. Suitable habitat present, but extent of works proposed will not adversely affect this species particularly as it is an upgrading of an existing unauthorised vehicle track. Species would be easily negotiating and traversing the current site condition. No significant resources for this species was identified within the ultimate alignment selected.	No
<u>Grey-headed Flying-fox</u> <u><i>Pteropus poliocephalus</i></u>	V	V	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	PMST	Low. No roosting camps in the vicinity of the study area.	No

Species	Status EPBC BC		Habitat	Source of Records	Likelihood of Occurrence	Assessment Required?
			commonly found in gullies, close to water, in vegetation with a dense canopy. No local records.			
Large-eared Pied bat <i>Chalinolobus dwyeri</i>	V	V	Found mainly in well-timbered areas containing gullies with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. Roosts in caves, crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (<i>Hirundo ariel</i>), frequenting low to mid-elevation dry open forest and woodland close to these features.	Bionet (154)	Low. No suitable habitat. Likely to be present in surrounding rocky areas and escarpments but no significant resources observed within the ultimate alignment selected	No
Eastern Falsistrelle <i>Falsistrellus tasmaniensis</i>		V	Prefers moist habitats, with trees taller than 20m where it forages on beetles, moths, weevils and other flying insects above or just below the tree canopy. It generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings.	Bionet (209)	Low. No hollow bearing trees to be removed. No significant reduction of any insect attracting plants.	No
Southern Myotis <i>Myotis macropus</i>		V	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.	Bionet (2)	Low. No suitable habitat. Likely to be present in surrounding rocky areas and escarpments but no significant resources observed within the ultimate alignment selected	No
Greater Broad-nosed Bat <i>Scoteanax rueppellii</i>		V	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. Usually roosts in tree hollows but also in buildings.	Bionet (26)	Low. No hollow bearing trees to be removed. No significant reduction of any insect attracting plants.	No
Yellow-bellied Sheath-tail-bat <i>Saccolaimus flaviventris</i>		V	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.	Bionet (31)	Low. No hollow bearing trees to be removed. No significant reduction of any insect attracting plants.	No
Eastern Coastal Free-tailed Bat <i>Micronomus norfolkensis</i>		V	Hollow-roosting bat that forages in dry eucalypt forests and woodlands.	Bionet (1)	Low. No hollow bearing trees to be removed. No significant reduction of any insect attracting plants.	No
Large Bentwing-bat <i>Miniopterus schreibersii oceanensis</i>		V	Forages in forested areas, catching moths and other flying insects above the treetops. Caves are the primary roosting habitat, but the species also uses derelict mines, storm-water tunnels, buildings and other man-made structures	Bionet (275)	Low. No suitable habitat. Likely to be present in surrounding rocky areas and escarpments but no significant resources observed within the ultimate alignment selected	No

Species	Status EPBC BC		Habitat	Source of Records	Likelihood of Occurrence	Assessment Required?
Eastern Cave Bat <i>Vespadelus troughtoni</i>		V	Cave-roosting species that is usually found in dry open forest and woodland, near cliffs or rocky overhangs; has been recorded roosting in disused mine workings, occasionally in colonies of up to 500 individuals. Occasionally found along cliff-lines in wet eucalypt forest and rainforest.	Bionet (1)	Low. No suitable habitat. Likely to be present in surrounding rocky areas and escarpments but no significant resources observed within the ultimate alignment selected	No
New Holland Mouse <i>Pseudomys novaehollandiae</i>	V		Open heathland, open woodland with a heathland understorey and vegetated sand dunes.	Bionet (1)	Moderate. Suitable habitat present, but extent of works proposed will not adversely affect this species particularly as it is an upgrading of an existing unauthorised vehicle track. Species would be easily negotiating and traversing the current site condition. No significant resources for this species was identified within the ultimate alignment selected.	No
FISH						
<u>Macquarie Perch</u> <i>Macquaria australasica</i>	E	E	streams and lake habitats especially the upper reaches of rivers and their tributaries. It prefers clear water and deep rocky holes with lots of cover. As well as aquatic vegetation, additional cover may comprise of large boulders, debris and overhanging banks.	PMST	Low. No suitable habitat.	No
<u>Australian Grayling</u> <i>Prototroctes maraena</i>	V	V	Spends part of its lifecycle in freshwater and at least part of the larval and/or juvenile stages in coastal seas. inhabit cool, clear, freshwater streams with gravel substrate and areas alternating between pools and riffle zones. Also in clear, gravel-bottomed and in muddy-bottomed, heavily silted habitats. The species has been found over 100 km upstream from the sea.	PMST	Low. No suitable habitat.	No
INVERTEBRATES						
Giant Dragonfly <i>Petalura gigantea</i>		E	Permanent swamps and bogs with some free water and open vegetation.	Bionet (237)	High. Precautionary approach taken	Yes

Species	Status EPBC BC		Habitat	Source of Records	Likelihood of Occurrence	Assessment Required?
<u>Purple Copper Butterfly</u> <u><i>Paralucia spinifera</i></u>	V	V	Occurs above 850 m elevation, at sites with a south-west to north-west aspect, usually where direct sunlight reaches the habitat, and with extremes of cold such as regular winter snowfalls or heavy frosts. Vegetation structure is commonly open woodland or open forest with a sparse understorey that is dominated by the shrub, Blackthorn <i>Bursaria spinosa</i> subsp. <i>lasiophylla</i> .	PMST	Low. No suitable habitat.	No

Appendix 2. Photographic record of area investigated




	<p>Plate 1. Existing vehicle turnaround area adjacent to Birds Rock Lookout at the northern end of Stage 1 of the MWD track.</p>
	<p>Plate 2. PCT 3696 Western Blue Mountains Rocky Scribbly Gum Woodland (foreground) and PCT 3865 Western Blue Mountains Pagoda Scrub (background) in the north of the study area.</p>
	<p>Plate 3. PCT 3687 Newnes Plateau Peppermint-Ash Tall Forest near Carne Creek.</p>



Plate 4. Carne Creek near the proposed alignment crossing.



Plate 5. PCT 3862 Newnes Plateau Rockplate Heath south of Carne Creek.



Plate 6. PCT 3696 Western Blue Mountains Rocky Scribbly Gum Woodland in the vicinity of the proposed campground.

	<p>Plate 7. The northern unmapped occurrence of Newnes Plateau Shrub Swamp (PCT 3945) along an ephemeral drainage line. Vegetation and soil profiles at this location and the two southernmost occurrences of the community have been adversely modified by motorcycle use.</p>
	<p>Plate 8. Fruiting <i>Persoonia hindii</i> near the track alignment.</p>
	<p>Plate 9. Chlorotic <i>Persoonia hindii</i> near the proposed track alignment. The chlorosis may be due to <i>Phytophthora</i> infection.</p>



Plate 10. The northernmost of the three 'arms' of Barrier Swamp that the proposed track alignment traverses. This is the most intact of patch of the EEC that the track would traverse.

Appendix 3. Ecological Assessments

1. Commonwealth – EPBC Act

By the completion of the field investigation, the following MNES had been recorded or were considered likely to occur within or near the proposal area:

- Temperate Highlands Peat Swamps on Sandstone – endangered ecological community
- Deane's Boronia – vulnerable species
- Blue Mountains Water Skink – endangered species
- Gang-gang Cockatoo – endangered species.

The Significant Impact Guidelines prepared under the EPBC Act are used to determine whether the action (i.e. the proposed work) has, will have, or is likely to have a significant impact on these MNES and, as such, whether the conducting of the proposal would be a controlled action requiring referral of the matter to the Federal Minister for the Environment.

1.1 Temperate Highlands Peat Swamps on Sandstone

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

- *reduce the extent of an ecological community*

At three locations the proposed track route traverses the western arms of Barrier Swamp, a large Temperate Highlands Peat Swamp, that covers some 26.6 ha. A smaller swamp covering some 0.7 ha is also traversed at one location where that swamp extends up an ephemeral drainage line. At each of the locations where the track would traverse the swamps, vegetation cover has been reduced by past usage of an informal motorcycle track.

It is estimated that approximately 300 m² of the community would be affected by the proposed works during construction. Given the already disturbed nature of the community at each of the locations where the tracks traverses it, and its wider occurrence locally, it is considered that the extent of the community would not be significantly reduced. To avoid further compaction of soil and vegetation disturbance, stepping stones would be used to formalise these sections of the track. This method would avoid further reduction in the extent of the community.

- *fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines*

The subject occurrences of the community are already traversed by the extant motorcycle track, which has resulted in clearing of vegetation and disruption to soil profiles. Furthermore, the track traverses upper sections of the swamps or crosses at pinch points. Whilst there would be some further fragmentation of the community, the impact of this is considered to be minimal.

- *adversely affect habitat critical to the survival of an ecological community*

Habitat critical to the survival of the community has not been defined. Regardless of this, it is considered that habitat of the community would not be adversely affected in the medium to long term.

- *modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns*

Compaction of soil during placement of stepping stones and raised boardwalks could result in a minor damming effect. Given that the track traverses upper sections of the swamps or crosses at pinch points, the impact of this is likely to be negligible, particularly considering the extant damage done by motorcycle use.

- *cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting*

The minor damming effect that may occur as a result of the positioning of stepping stones through the swamps would favour plant species adapted to wetter conditions immediately upslope of the alignment. Provision of gaps at irregular distances along the track alignment to permit the dispersal of water would prevent this.

- *cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:*
 - *assisting invasive species, that are harmful to the listed ecological community, to become established*

Soil disturbance associated with construction of the track could favour the establishment of invasive plant species such as annual and perennial species of the Asteraceae (daisy) family such as Catsear (*Hypochaeris radicata*) which was observed at one of the locations where the proposed track alignment crossed the swamp. Were this to occur, such plants would be confined to these disturbed edges and unlikely to spread into the extant, intact area of swamp. Weeds could readily be controlled during routine maintenance and monitoring operations along the track.

- *or causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community*

The proposed works would not cause the regular mobilisation of fertilisers, herbicides or other chemicals or pollutants that would be harmful to the Temperate Highland Peat Swamps on Sandstone.

- *or interfere with the recovery of an ecological community.*

Given the minimal level of disturbance represented by the proposed action, it is unlikely that it would significantly interfere with the recovery of this community.

Conclusion

The proposal is considered unlikely to have a significant impact on the Temperate Highlands Peat Swamps on Sandstone EEC. Referral of the proposal to the Federal Minister for the Environment as a controlled action is not required.

1.2 Deane's Boronia

An action is likely to have a significant impact on vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population⁵*

No individuals of the species were detected during the current survey. However, the species has been recorded in a number of locations nearby including approximately 115 m upslope of where the proposed track alignment traverses the northern arm of the larger swamp.

⁵ An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity, and/or
- populations that are near the limit of the species' range.

For the purposes of this assessment, the population of Deane's Boronia in the locality is considered an 'important population.'

As part of the REF process, safeguards have been recommended; these being:

- a pre-works survey for Deane's Boronia be undertaken where the alignment traverses affected potential habitat (Newnes Plateau Shrub Swamp [PCT 3945] and adjacent Upper Blue Mountains Fringing Swamp Woodland [PCT 3691]⁶ during the appropriate survey season (September to November)
- should any plants be detected, the track would be re-routed to avoid their removal
- should any plants be detected, their location would be marked on the works plans
- contract staff would be briefed by NPWS staff of the conservation significance of Deane's Boronia and the need to avoid removal and disturbance, should it occur.
- confirmed Deane's Boronia habitat areas adjacent to the track would be marked with exclusion tape or similar where necessary.

Provided these safeguards are adopted, there would be no removal of any individuals of the species during the proposed work.

- *reduce the area of occupancy of an important population*

Provided the measures above are implemented, there would be no changes to the population's area of occupancy.

- *fragment an existing important population into two or more populations*

Provided the measures above are implemented, there would be no fragmentation of the population.

- *adversely affect habitat critical to the survival of a species*

Provided the measures above are implemented, there would be no adverse effect on habitat.

- *disrupt the breeding cycle of an important population*

Provided the measures above are implemented, there would be no disruption to the species' breeding cycle.

- *modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

Provided the measures above are implemented, no habitat of the species is likely to be modified, destroyed, removed or isolated.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

Rooting by Feral Pigs (*Sus scrofa*) is considered a potential threat to the species and its habitat (DCCEEW 2023b). It is unlikely that the proposed work would exacerbate this threat beyond its current level given that the track is extant. Currently, invasive weeds are not listed as a threat to the species. Provided equipment/machinery is cleaned prior to its use in the proposed work area, it is unlikely invasive species would become established in the species' habitat.

- *introduce disease that may cause the species to decline, or*

State (OEH 2023b) and Commonwealth (DCCEW 2023) profiles of the species do not mention any diseases that are a threat to Deane's Boronia .

⁶ Although the TBDC (DPE 203) indicates that the species is associated with other more widespread PCTs along the proposed track alignment, it is considered survey effort should be concentrated in these PCTs which better fit its habitat description.

- *interfere with the recovery of the species*

With the adoption of the proposed safeguards, it is unlikely that the proposed work would interfere with the recovery of Deane's Boronia.

Conclusion

The proposal is considered unlikely to have a significant impact on the Deane's Boronia. As such, it is considered that the proposed action is not a controlled action requiring referral to the Federal Minister for the Environment for further consideration or approval.

1.3 Blue Mountains Water Skink – Endangered

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of the population*

The Blue Mountains Water Skink is predicted to be associated with the Newnes Plateau Shrub Swamp ('Shrub swamp'). At each of the locations where the track would traverse the swamps, vegetation cover has been reduced by past usage of an unauthorised motorcycle track. The proposed installation of steppingstones in these sections would not cause further degradation of this habitat type.

To avoid further habitat disturbance, the recommendations stated in section 5.3 and 7 would be implemented to formalise these sections of the track. These methods would avoid further reduction in the extent of the habitat.

Whilst these portions of the study area may be impacted during the course of the works, these would not lead to a long-term decrease in the size of the Blue Mountains Water Skink population.

- *reduce the area of occupancy of the species*

The Blue Mountains Water Skink is restricted to an isolated and naturally fragmented habitat of sedge and shrub swamps that have boggy soils and appear to be permanently wet (OEH 2023a). The recorded Newnes Plateau Shrub Swamp TEC within the study area is represented by the shrub swamp that occurs in association with three ephemeral drainage lines that cross the proposed walking track (Figure 8).

There would be no further disturbance to this TEC, therefore no reduction of area of occupancy available to this species. Whilst this is the case, during construction periods occurring within proximity of the TEC minor disturbance will occur. However, this would be a temporary impact that would result in the areas that are current being utilised as unauthorised motorcycle tracks to naturally regenerate. This overall resulting in a positive improvement to the quality of this habitat.

Therefore, it is considered that the proposal would not reduce the area of occupancy of the Blue Mountains Water Skink.

- *fragment an existing population into two or more populations*

The distribution of the Blue Mountains Water Skink is highly fragmented (NPWS 2002). At present there is limited information on how skinks use areas outside the swamp itself or the extent of movement of individuals between populations; however, maintenance of contiguous habitat, and protection of streams between populations should be considered important, as should the prevention of activities that alter the existing hydrological regimes of swamps (NPWS 2002).

Only 300 m² of habitat would be disturbed during construction, with the recommendations present this would be allowed to naturally regenerate post work. Due to this the Blue Mountains Water Skink would not experience any long-term fragmentation of an existing population.

- *adversely affect habitat critical to the survival of a species*

There is currently no critical habitat declared for the Blue Mountains Water Skink (DCCEEW 2023c). Regardless of this, any habitat occupied by this animal is expected to be critical to its survival. Considering the scope of works proposed, its duration and the recommendations present, the proposed activity would not adversely affect habitat critical to the survival of the Blue Mountains Water Skink.

- *disrupt the breeding cycle of a population*

Little is known about the biology and ecology of the Blue Mountains Water Skink; as a result, limited information is available on key resources required for different activities, including breeding (NPWS 2002). Soil moisture and leaf litter depth appear to be important determinants of skink abundance, with skinks preferring areas with wetter soils and deeper leaf litter (LeBreton 1996 cited in NPWS 2002).

Given the details previously provided within this species' assessment, it is not considered that the proposal would significantly disrupt the breeding cycle of a population of Blue Mountains Water Skink in the medium to long term.

- *modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

Given the details previously provided within this species' assessment, it is not considered that the proposal would significantly modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that the Blue Mountains Water Skink is likely to decline.

- *result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat*

Weed invasion is an identified threat to the Blue Mountains Water Skink. The disturbance during construction and proposed activities of the area post works may aid colonisation of it by opportunistic weeds such as Blackberry (*Rubus ulmifolius*). Disturbance of the habitat may also permit introduced predators access to portions of the swamp community not previously accessible to these species. Provided the recommended mitigative measures proposed are adopted, the activity would not result in invasive species harmful to the Blue Mountains Water Skink becoming established in its habitat beyond what may already be extant.

- *introduce disease that may cause the species to decline, or*

The proposal is unlikely to introduce diseases that may cause the Blue Mountains Water Skink to decline.

- *interfere with the recovery of the species.*

A national Recovery Plan for this species has been prepared (NPWS 2001). Section 9.3 of the plan provides six specific recovery objectives, one of which is relevant to the proposal:

- To minimise the risk of the Blue Mountains Water Skink declining in the long term by the implementation of a range of activities to ameliorate the impact of factors considered to be detrimentally affecting the species or its habitat.

The recovery action of this identified objective is to: *Identify the factors detrimentally affecting the Blue Mountains Water Skink or its habitat, monitor the level of these factors at each site, and implement a range of activities to ameliorate or prevent the impact of these factors.*

While none of the 'Identification, monitoring and amelioration of threats at each site' measures are relevant to the carrying out of the proposal, in accordance with Section 12.3.2 'Environmental planning, impact assessment and development consent' of the plan:

- Consent and determining authorities under the EP&A Act and/or the *Native Vegetation Conservation Act 1997* will ensure that development assessments, for development proposals affecting known or potential sites for the Blue Mountains Water Skink, are undertaken with

reference to this recovery plan (including the environmental impact assessment guidelines [NSW NPWS 2002]) and any future advice from the NPWS regarding the distribution, threats and ecology of the species.

- BMCC and any other consent or determining authorities will ensure that development consent, issued for proposals on land adjoining known populations of the Blue Mountains Water Skink or which may impact on the species or its habitat, includes provisions to minimise or prevent these impacts.

With reference to the OEH's SOS strategy for this species (OEH 2023b), 15 actions (supplementary to NSW legislation), policy and programs have been identified that can be used by stakeholders where applicable to guide management at a site, regional or state scale. None are specifically relevant to the proposed work; however, a general objective to implement appropriate sediment controls will be adopted. Additionally, under the SOS program, it is acknowledged the study area is located within the Blue Mountains Priority Management Site for the Blue Mountains Water Skink. Fifteen conservation management actions have been identified to ensure the population of this threatened species is sustained; of these, the objective to minimise levels of disturbance caused due to recreational users in the area, is relevant to the proposal. These requiring methodologies such as aligning the proposed track as closely as possible to the already disturbed footprint caused by unauthorised vehicle access, rehabilitating areas of past disturbance that are adjacent to the proposed construction footprint and monitoring disturbance impacts.

Conclusion

The proposal is considered unlikely to have a significant impact on the Endangered Blue Mountains Water Skink. Referral of the proposal to the Federal Minister for the Environment as a controlled action is not required.

1.4 Gang-gang Cockatoo – Endangered

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of a population*

A 'population of a species' is defined under the EPBC Act as an occurrence of the species in a particular area. In relation to critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to:

- a geographically distinct regional population, or collection of local populations, or
- a population, or collection of local populations, that occurs within a particular bioregion.

The removal of vegetation from the proposed walking track alignment would not cause a long-term decrease in the size of this species population. Resources for this species would be retained adjacent and beyond the areas investigated, these available for the foraging and roosting needs of the Gang-gang Cockatoo. No hollow-bearing trees will be removed.

- *reduce the area of occupancy of the species*

With reference to the conservation advice provided for this species, the area of occupancy is estimated to be 30,000 km². The works proposed would not reduce the area of occupancy of this species. Post-work the Gang-gang Cockatoo would still be able to access the vegetation adjacent to the walking track and those resources present, in proximity and beyond this.

- *fragment an existing population into two or more populations*

The works proposed would not fragment an existing population into two or more populations. The Gang-gang Cockatoo is known to traverse open spaces, bushland environments and urban/rural infrastructure.

- *adversely affect habitat critical to the survival of a species*

The proposal will not affect habitat critical to the survival of this species. As per the conservation advice “Habitat critical to the survival of the Gang-gang Cockatoo includes all foraging habitat during both the breeding and non-breeding season. For the purpose of this document, this does not include exotic feeding grounds such as ornamental trees, shrubs, and hedges within urban and suburban areas. Gang-gang Cockatoos rely on stands of suitable hollow-bearing trees (NSW OEH 2017; Davey & Mulvaney 2020), which are a key component of their breeding habitat. Habitat critical to the survival (of the species) includes hollow-bearing trees with known or potential Gang-gang Cockatoo hollow chambers that are generally around 20 cm in floor diameter, around 50.5 cm deep (range 22–90 cm) and occur between around 7.5 m (range 5–9.4 m) above the ground (Davey & Mulvaney).”

- *disrupt the breeding cycle of a population*

Hollow-bearing trees available for the breeding needs of this species would be retained adjacent to, and beyond the limits of, the alignment of the walking track surveyed. As such, the proposal will not disrupt the breeding cycle of the species. Conservation advice says there is one Gang-gang Cockatoo population although there could be four.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The proposal is not considered to modify, destroy, remove or isolate a significant amount of Gang-gang Cockatoo habitat such that the long-term survival of this species would be jeopardised. Given the extent of similar resources beyond the boundaries of the walking track alignment surveyed, it is not considered that the proposed work would have an impact on the Gang-gang Cockatoo such that the species is likely to decline.

- *result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species’ habitat*

The Fox (*Vulpes vulpes*) was recorded as being present along the alignment walked. Beyond what is actually, or potentially extant, the proposed work will not result in the establishment of any invasive species that are harmful to the presence of the Gang-gang Cockatoo or its habitat.

- *introduce disease that may cause the species to decline, or*

Dieback caused by the root-rot fungus (*Phytophthora cinnamomi*) is listed as a KTP on the EPBC Act. The proposed activity has the potential to introduce this pathogen that lives in soils and plant roots and is the key organism associated with the dieback of native plant species in Australia. Work must therefore avoid the potential spread of this organism as far as possible. Contractors will need to adhere to the following hygiene protocols:

- Before entering and leaving the work site, workers are to remove excess soil and mud and then spray boots, tools, gloves and small equipment with recommended disinfectant supplied by the contractor (70% Methylated spirits / 30% Water) until runoff is clear.
- Avoid unnecessary soil disturbance.
- *interfere with the recovery of the species.*

There is no adopted or made Recovery Plan for this species under the EPBC Act.

Conclusion

The construction of a multi-day walking track is not considered to have a significant impact on the Gang-gang Cockatoo or its habitat. As such, it is not considered necessary that the matter be referred to the Federal Minister for the Environment for further consideration or approval.

2. State – BC Act (Section 7.3)

By the completion of the field investigation the following biota listed under this Act were recorded:

- Newnes Plateau Shrub Swamp – endangered ecological community
- *Persoonia hindii* – endangered species
- Flame Robin – vulnerable species

- Scarlet Robin – vulnerable species
- Varied Sittella – vulnerable species
- Gang-gang Cockatoo – vulnerable species.

As they have been previously recorded within the locality, and as suitable habitat is present, it is considered necessary to adopt the precautionary approach to the potential presence of the:

- Small Pale Grass-lily – endangered species
- Deane's Boronia – vulnerable species
- Blue Mountains Water Skink – endangered species
- Giant Dragonfly – endangered species.

The potential impact associated with the proposal on the EEC and these threatened species, is considered with reference to the assessment criteria provided under s.7.3 of the BC Act. These criteria are designed to determine whether a proposed action is likely to significantly affect threatened communities, species or their habitats, and consequently whether a SIS (or BDAR should the proponent choose that option) is required.

In accordance with the guidelines provided on the Assessment of Significance (State of NSW through NSW DPI 2006), due to the similarity of their habitat requirements, an assessment has been conducted on the three woodland bird species (Flame Robin, Scarlet Robin and Varied Sittella) as opposed to the preparation of individual assessments.

2.1 Newnes Plateau Shrub Swamp

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Not applicable to a TEC.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

- (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*

At three locations the proposed track route traverses the western arms of Barrier Swamp, a large Newnes Plateau Shrub Swamp, that covers some 26.6 ha. A smaller swamp covering some 0.7 ha is also traversed at one location where that swamp extends up an ephemeral drainage line. At each of the locations where the track would traverse the swamps, vegetation cover has been reduced by past usage of an informal motorcycle track.

To avoid further compaction of soil and vegetation disturbance, stepping stones and raised boardwalks would be used to formalise these sections of the track. These methods would avoid further reduction in the extent of the community.

It is estimated that approximately 300 m² of Newnes Plateau Shrub Swamp would be affected by the work. Given the already disturbed nature of the community at each of the locations where the tracks traverses it, and its wider occurrence locally, it is considered that the local occurrence of the community would not be placed at risk of extinction.

- (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction*

The minor damming effect that may occur as a result of the positioning of stepping stones through the swamps would favour plant species adapted to wetter conditions immediately upslope of the alignment. This would not substantially and adversely modify the nature of the community such that its local occurrence it is likely to be placed at risk of extinction.

(c) *in relation to the habitat of a threatened species, population or ecological community:*

- (i) *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity,*

As mentioned in (a) above approximately 300 m² of the community would be affected.

- (ii) *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity,*

The subject occurrences of the community are already traversed by the extant motorcycle track, which has resulted in clearing of vegetation and disruption to soil profiles. Furthermore, the track traverses upper sections of the swamps or crosses at pinch points. Whilst there would be some further fragmentation of the community, the impact of this is considered to be minimal.

- (iii) *the importance of the habitat to be removed, modified, fragmented or isolated to the long term survival of the species or ecological community in the locality,*

At most 300 m² of the community would be affected during construction. Given the already disturbed nature of the occurrences of the community and its wider extent, it is considered the area affected is not important to the long-term survival of the Newnes Plateau Shrub Swamp in the locality.

(d) *whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),*

No declared AOBV would be directly or indirectly affected by the proposal. The subject site is not listed as a declared AOBV under Part 3 of the NSW Biodiversity Conservation Regulation 2017.

(e) *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process*

Currently 35 KTP for mainland NSW are listed under Schedule 4 of the BC Act. Of these, the following would be relevant to the proposed work:

- Clearing of native vegetation.
- Removal of dead wood and dead trees
- Infection of native plants by *Phytophthora cinnamomi*

These KTPs would be managed through the following measures:

- Clearing of vegetation would not be more than that required to safely and effectively complete the scope of work.
- dead wood and dead trees on the track would be relocated to adjoining/nearby habitat
- Hygiene protocols to prevent the spread of plant pathogens adopted and implemented.

Expected impact on Newnes Plateau Shrub Swamp

The proposal is considered unlikely to significantly affect Newnes Plateau Shrub Swamp, or its habitat. As such, the preparation of a SIS [or BDAR were NPWS to elect that option] on Newnes Plateau Shrub Swamp is not required.

2.2 *Persoonia hindii*

(a) *in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,*

Persoonia hindii has been recorded at numerous locations along the southern half of the proposed walking track alignment. As the species grows clonally through rhizomatous growth, each of these locations may comprise only one to a few individuals. These plants, and those elsewhere in the locality, are considered to comprise the local population.

In order to upgrade the existing informal motorcycle trail to a walking track of 1.5 m width, the proposed work has the potential to directly remove some stems of the species that are currently growing adjacent to the extant track which is generally less than one metre wide. At these locations the track would be diverted to avoid removal of these stems.

Additionally, as part of the REF process, safeguards have been recommended and would be adopted; these being:

- known locations of *Persoonia hindii* would be marked on the works plans
- contract staff would be briefed by NPWS staff of the conservation significance of *Persoonia hindii* and the need to avoid removal and disturbance
- *Persoonia hindii* areas adjacent to the track would be marked with exclusion tape or similar where necessary.
- Hygiene protocols to prevent the spread of *Phytophthora* adopted and implemented.
- Upon completion of track construction, boot washing devices be provided at the start of the walk with accompanying signage highlighting the conservation significance of the species and the importance of this practice in maintaining and protecting the population.

Provided the safeguards for track construction and subsequent visitor use are adopted, the local population is unlikely to be placed at risk of extinction.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

- (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
- (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction*

Not applicable to a threatened species.

(c) in relation to the habitat of a threatened species or ecological community:

- (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity,*

Provided the measures above are implemented, no habitat of the species is likely to be removed or modified.

- (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity,*

Provided the measures above are implemented, there would be no fragmentation of the population.

- (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long term survival of the species, population or ecological community in the locality,*

No habitat of the species is likely to be modified, destroyed, removed or isolated.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

No declared AOBV would be directly or indirectly affected by the proposal. The subject site is not listed as a declared AOBV under Part 3 of the NSW Biodiversity Conservation Regulation 2017.

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process

Currently 35 KTP for mainland NSW are listed under Schedule 4 of the BC Act. Of these, the following would be relevant to the proposed work:

- Clearing of native vegetation.
- Removal of dead wood and dead trees
- Infection of native plants by *Phytophthora cinnamomi*

These KTPs would be managed through the following measures:

- Clearing of vegetation would not be more than that required to safely and effectively complete the scope of work.
- dead wood and dead trees on the track would be relocated to adjoining/nearby habitat
- Hygiene protocols to prevent the spread of plant pathogens adopted and implemented.

Expected impact on *Persoonia hindii*

The proposal is considered unlikely to significantly affect, *Persoonia hindii*, or its habitat. As such, the preparation of a SIS [or BDAR were NPWS to elect that option] on *Persoonia hindii* is not required.

2.3 Small Pale Grass-lily

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

No individuals of the species were detected during the current survey. However, the species has been recorded in a number of locations in the vicinity of the proposed track alignment, the closest of which is on the western edge of North Ridge Road approximately 650 m north of its intersection with Camp Road. Furthermore, two of the most widespread PCTs along the alignment, PCTs 3687 Newnes Plateau Peppermint-Ash Tall Forest and PCT 3688 Newnes Plateau Silvertop Ash Woodland, are associated with the species in the TBDC (DPE 2023). These PCTs, along with PCT 3945 Newnes Plateau Shrub Swamp (which is also associated with the species but more restricted in distribution), mean that there are substantial areas of potential habitat for the species along the proposed track alignment and in the wider area.

As part of the REF process, safeguards have been recommended; these being:

- pre-works survey for Small Pale Grass-lily be undertaken where the alignment traverses affected potential habitat (PCTs 3687, 3688 and 3945) during the appropriate survey season (October to February)
- known locations of the Small Pale Grass-lily (including the North Ridge Road record) would be marked on the works plans
- contract staff would be briefed by NPWS staff of the species conservation significance and need to avoid removal and disturbance
- known and confirmed Small Pale Grass-lily habitat adjacent to the track would be marked with exclusion tape or similar where necessary.

Provided these safeguards are adopted, there would be no removal of any individuals of the species during the proposed work. Given the extent of those PCTs that are associated with the species beyond the proposed work area, there is unlikely to be any significant removal of habitat. The local population is unlikely to be placed at risk of extinction.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

- (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
- (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction*

Not applicable to a threatened species.

(c) in relation to the habitat of a threatened species or ecological community:

- (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity,*

Provided the measures above are implemented, no habitat of the species is likely to be removed or modified.

- (ii) *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity,*

Provided the measures above are implemented, there would be no fragmentation of the population.

- (iii) *the importance of the habitat to be removed, modified, fragmented or isolated to the long term survival of the species or ecological community in the locality,*

It is considered that in relation to the wider distribution of the species' habitat beyond that affected by the proposed work, the area affected is not important.

- (d) *whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),*

No declared AOBV would be directly or indirectly affected by the proposal. The subject site is not listed as a declared AOBV under Part 3 of the NSW Biodiversity Conservation Regulation 2017.

- (e) *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process*

Currently 35 KTP for mainland NSW are listed under Schedule 4 of the BC Act. Of these, the following would be relevant to the proposed work:

- Clearing of native vegetation.
- Removal of dead wood and dead trees
- Infection of native plants by *Phytophthora cinnamomi*

These KTPs would be managed through the following measures:

- Clearing of vegetation would not be more than that required to safely and effectively complete the scope of work.
- dead wood and dead trees on the track would be relocated to adjoining/nearby habitat
- Hygiene protocols to prevent the spread of plant pathogens adopted and implemented.

Expected impact on the Small Pale Grass-lily

The proposal is considered unlikely to significantly affect, the Small Pale Grass-lily, or its habitat. As such, the preparation of a SIS [or BDAR should NPWS elect that option] on the Small Pale Grass-lily is not required.

2.4 Deane's Boronia

- (a) *in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,*

No individuals of the species were detected during the current survey. However, the species has been recorded in a number of locations nearby, including approximately 115 m upslope of where the proposed track alignment traverses the northern arm of Barrier Swamp.

As part of the REF process, safeguards have been recommended; these being:

- a pre-works survey for Deane's Boronia be undertaken where the alignment traverses affected potential habitat (Newnes Plateau Shrub Swamp [PCT 3945] and adjacent Upper Blue Mountains Fringing Swamp Woodland [PCT 3691] during the appropriate survey season (September to November)
- should any plants be detected, the track would be re-routed to avoid their removal
- should any plants be detected, their location would be marked on the works plans
- contract staff would be briefed by NPWS staff of the conservation significance of Deane's Boronia and the need to avoid removal and disturbance, should it occur.
- confirmed Deane's Boronia habitat areas adjacent to the track would be marked with exclusion tape or similar where necessary.

Provided these safeguards are adopted, there would be no removal of any individuals of the species during the proposed work.

Given the extent of Newnes Plateau Shrub Swamp and Upper Blue Mountains Fringing Swamp Woodland beyond the proposed work area, there is unlikely to be any significant removal of habitat given that track formalisation through the swamps would be undertaken using stepping stones. The local population is unlikely to be placed at risk of extinction.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

- (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
- (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction*

Not applicable to a threatened species.

(c) in relation to the habitat of a threatened species or ecological community:

- (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity,*

Provided the measures above are implemented, no habitat of the species is likely to be removed or modified.

- (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity,*

Provided the measures above are implemented, there would be no fragmentation of the population.

- (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long term survival of the species or ecological community in the locality,*

It is considered that in relation to the wider distribution of the species' habitat beyond that affected by the proposed work, the area affected is not important.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

No declared AOBV would be directly or indirectly affected by the proposal. The subject site is not listed as a declared AOBV under Part 3 of the NSW Biodiversity Conservation Regulation 2017.

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process

Currently 35 KTP for mainland NSW are listed under Schedule 4 of the BC Act. Of these, the following would be relevant to the proposed work:

- Clearing of native vegetation.
- Removal of dead wood and dead trees
- Infection of native plants by *Phytophthora cinnamomi*

These KTPs would be managed through the following measures:

- Clearing of vegetation would not be more than that required to safely and effectively complete the scope of work.
- dead wood and dead trees on the track would be relocated to adjoining/nearby habitat
- Hygiene protocols to prevent the spread of plant pathogens adopted and implemented.

Expected impact on Deane's Boronia

The proposal is considered unlikely to significantly affect, the Deane's Boronia, or its habitat. As such, the preparation of a SIS [or BDAR should NPWS elect that option] on the Deane's Boronia is not required.

2.5 Woodland Bird Species

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Several woodland bird species were recorded during the investigation. Where observed these species were seen foraging within the canopy that occurs adjacent to the proposed walking track alignment.

The environments present within, and surrounding, the proposed track alignment, would constitute habitat in which these species can forage, shelter and potentially breed. While some native vegetation will be disturbed/removed, similar resources for these species will be retained within both the study area and surrounding locality, these providing resources for the life cycle requirements of the threatened woodland species recorded. Whilst the proposal will clear native vegetation, the loss of this would not significantly affect the presence of the species recorded (or expected). As such, the establishment of the walking track would not have an adverse impact on these species, such that a local population of those threatened birds recorded would be placed at risk of extinction.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

- (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
- (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction*

Not applicable to fauna.

(c) in relation to the habitat of a threatened species or ecological community:

- (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity,*

The proposal would result in the removal of some native vegetation, primarily understorey and ground cover plants; however, suitable habitat will be retained in the surrounding area ensuring no long-term loss of breeding, sheltering and foraging opportunities.

- (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity,*

The loss of some native vegetation is not expected to result in the disturbance to these species' dispersal or movement patterns. Suitable habitat for these species would be retained within the nearby (and surrounding) localities. As such, the proposal would not cause any further fragmentation of, or isolation to, any areas of habitat used by those threatened birds recorded in proximity to the proposed walking track alignment.

- (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long term survival of the species or ecological community in the locality,*

The proposal is not considered to remove, modify, fragment or isolate a significant amount of vegetation such that the long-term survival of those threatened birds recorded would be jeopardised. Suitable habitat will be retained within, and beyond, the subject site. Given that no major components of these species' habitat are to be further isolated or fragmented, it is considered that the proposal would not

have an impact on those threatened birds recorded such that the long term survival of these species in the locality would be adversely affected.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

No declared areas of outstanding biodiversity value would be directly or indirectly affected by the proposal. The subject site is not listed as a declared area of outstanding biodiversity value under Part 3 of the BC Regulation 2017.

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process

Currently 35 KTP for mainland NSW are listed under Schedule 4 of the BC Act. Of these, the 'clearing of native vegetation' and 'removal of dead wood and dead trees' would be applicable to the proposal. While it is acknowledged that the proposed work will result in the removal of some native vegetation, it is not considered that this clearance would significantly contribute to a KTP such that the life cycle requirements of the Flame Robin, Scarlet Robin and Varied Sittella would be compromised. The retention of dead, woody debris is encouraged.

Expected impact on Woodland Birds

The undertaking of the proposal would not disturb, remove, modify or fragment any habitats critical to the life cycle requirements of the Flame Robin, Scarlet Robin or Varied Sittella. It is not considered that the proposal would have a significant impact on these threatened species or their habitat. As such, the preparation of a SIS that further considers the impacts of the proposal on the Flame Robin, Scarlet Robin and Varied Sittella is not required.

2.6 Blue Mountains Water Skink

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life-cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

The Blue Mountains Water Skink is predicted to be associated with the Nunes Plateau Shrub Swamp TEC ('sedge swamp'). The works will require the disturbance of 300 m² of this habitat type.

The area that is proposed to be disturbed is currently being used as an unauthorised vehicle track. The proposed works would include the installation of stepping stones through the sedge swamp, this allowing the proximate vegetation to naturally regenerate post works.

Whilst this portion of the study area may be disturbed during the course of the works, this would not lead to a long-term decrease in the size of the Blue Mountains Water Skink population. As such, it is not considered that the proposal would have an adverse effect on the lifecycle of the Blue Mountains Water Skink such that a viable local population would be placed at risk of extinction.

With reference to the OEH's SOS strategy for this species (OEH 2023b), 15 actions (supplementary to NSW legislation), policy and programs have been identified that can be used by stakeholders where applicable to guide management at a site, regional or state scale. None are specifically relevant to the proposed work; however, a general objective to implement appropriate sediment controls will be adopted. Additionally, under the SOS program, it is acknowledged the study area is located within the Blue Mountains Priority Management Site for the Blue Mountains Water Skink. Fifteen conservation management actions have been identified to ensure the population of this threatened species is sustained; of these, the objective to minimise levels of disturbance caused due to recreational users in the area, is relevant to the proposal. These requiring methodologies such as aligning the proposed track as closely as possible to the already disturbed footprint caused by unauthorised vehicle access, rehabilitating areas of past disturbance that are adjacent to the proposed construction footprint and monitoring disturbance impacts.

Considering (based on a visual qualitative assessment) the impacts (weed dispersal, edge effect dieback, dispersal urban refuse and so forth), or lack thereof, noted to be associated with both the unauthorised motor cycle track and NPWS fire trail, use of the walking track is unlikely to contribute to, or benefit, these matters. It is predicted, given the 'remote' nature of the walking track and the character of the members of the public that are expected to traverse this, that matters such as the dumping of urban refuse, habitat destruction/disturbance, weed proliferation and so forth, that could affect the habitat of this species are unlikely to arise.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

- (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*
- (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

Not applicable to fauna.

(c) in relation to the habitat of a threatened species or ecological community:

- (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity,*
- (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity,*
- (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,*

The Blue Mountains Water Skink is restricted to an isolated and naturally fragmented habitat of sedge and shrub swamps that have boggy soils and appear to be permanently wet (OEH 2023a). The recorded Nunes Plateau Shrub Swamp TEC is traversed by the proposed alignment in three separate sections (Figure 8).

During construction of the walking track 300 m² of this TEC will be removed. However, this impact would only be temporary, as upon completion, the sections of the track that traverse this TEC will be constructed from sandstone steppingstones. These recommendations have been made to remove any restricting to the movements of this species and to permit the surrounding vegetation to naturally regenerate.

The proposal is not considered to significantly remove, modify, fragment or isolate habitat important to the long-term survival of the Blue Mountains Water Skink in the locality.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

No declared AOBV would be directly or indirectly affected by the proposal. The subject site is not listed as a declared AOBV under Part 3 of the BC Regulation 2017.

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

KTP listed for mainland NSW that may be exacerbated by the proposed work are:

- Clearing of native vegetation (BC Act)
- Infection of native plants by *Phytophthora cinnamomi* (BC Act)
- Introduction and establishment of Exotic Rust Fungi of the order *Pucciniales pathogenic* on plants of the family *Myrtaceae* (Myrtle Rust) (BC Act).
- Invasion of native plant communities by exotic perennial grasses (BC Act).

The proposed activity has the potential to introduce *Phytophthora* and Myrtle Rust. Work would therefore avoid the potential spread of these organisms as far as possible, with contractors adhering to the following hygiene protocols:

- Before entering and leaving the work site, workers are to remove excess soil and mud and then spray boots, tools, gloves and small equipment with recommended disinfectant supplied by the contractor (70% Methylated spirits / 30% Water) until runoff is clear
- Avoid unnecessary soil disturbance.

The proposal would not significantly contribute to these KTP such that the lifecycle requirements of the Blue Mountains Water Skink would be compromised.

Expected impact on the Blue Mountains Water Skink

With the adoption of the mitigation measures proposed, 'impacts' associated with the walking track would not disturb, remove, modify or fragment any habitats critical to the lifecycle requirements of the Blue Mountains Water Skink. It is considered that the proposal would not significantly affect this threatened species, or its habitat. As such, the preparation of a SIS that further considers the impact of the proposal on the Blue Mountains Water Skink is not triggered.

2.7 Giant Dragonfly

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life-cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

The Giant Dragonfly is predicted to be associated with the Nunes Plateau Shrub Swamp TEC ('sedge swamp'). The works will not require the disturbance of 300 m² of this habitat type.

The area that is proposed to be disturbed is currently being used as an unauthorised vehicle track. The proposed works would include the installation of stepping stones through the sedge swamp, this allowing the proximate vegetation to naturally regenerate post works.

Whilst this portion of the study area may contract during the course of the works, this would not lead to a long-term decrease in the size of the Giant Dragonfly population. As such, it is not considered that the proposal would have an adverse effect on the lifecycle of the Giant Dragonfly such that a viable local population would be placed at risk of extinction.

The study area is located within the Priority Management Area for the Giant Dragonfly. With reference to the OEH's SOS strategy for this species (OEH 2023c), 15 actions (supplementary to NSW legislation), policy and programs have been identified that can be used by stakeholders where applicable to guide management at a site, regional or state scale. None are specifically relevant to the proposed work; however, a general objective to implement appropriate sediment controls will be adopted. Additionally, under the SOS program, it is acknowledged the study area is located within the Blue Mountains Priority Management Site for the Giant Dragonfly. Fifteen conservation management actions have been identified to ensure the population of this threatened species is sustained; of these, the objective to minimise levels of disturbance caused due to recreational users in the area, is relevant to the proposal. These requiring methodologies such as aligning the proposed track as closely as possible to the already disturbed footprint caused by unauthorised vehicle access, rehabilitating areas of past disturbance that are adjacent to the proposed construction footprint and monitoring disturbance impacts.

Considering (based on a visual qualitative assessment) the impacts (weed dispersal, edge effect dieback, dispersal urban refuse and so forth), or lack thereof, noted to be associated with both the unauthorised motor cycle track and NPWS fire trail, use of the walking track is unlikely to contribute to, or benefit, these matters. It is predicted, given the 'remote' nature of the walking track and the character of the members of the public that are expected to traverse this, that matters such as the dumping of urban refuse, habitat destruction/disturbance, weed proliferation and so forth, that could affect the habitat of this species are unlikely to arise.

(b) *in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*

- (i) *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*
- (ii) *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

Not applicable to fauna.

(c) *in relation to the habitat of a threatened species or ecological community:*

- (i) *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity,*
- (ii) *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity,*
- (iii) *the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,*

The Giant Dragonfly is predicated to be associated with the recorded Nunes Plateau Shrub Swamp TEC that is present within the study area (Figure 8)

During construction of the walking track 300 m² of this TEC will be removed. However, this impact would only be temporary, as upon completion the sections of the track that traverse this TEC will be constructed from sandstone steppingstones. These recommendations have been made to minimise site disturbance and allow the surrounding vegetation to naturally regenerate.

The proposal is not considered to significantly remove, modify, fragment or isolate habitat important to the long-term survival of the Giant Dragonfly in the locality.

(d) *whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),*

No declared AOBV would be directly or indirectly affected by the proposal. The subject site is not listed as a declared AOBV under Part 3 of the BC Regulation 2017.

(e) *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

KTP listed for mainland NSW that may be exacerbated by the proposed work are:

- Clearing of native vegetation (BC Act)
- Infection of native plants by *Phytophthora cinnamomi* (BC Act)
- Introduction and establishment of Exotic Rust Fungi of the order *Pucciniales* pathogenic on plants of the family *Myrtaceae* (Myrtle Rust) (BC Act)
- Invasion of native plant communities by exotic perennial grasses (BC Act).

The proposed activity has the potential to introduce *Phytophthora* and Myrtle Rust. Work would therefore avoid the potential spread of these organisms as far as possible, with contractors adhering to the following hygiene protocols:

- Before entering and leaving the work site, workers are to remove excess soil and mud and then spray boots, tools, gloves and small equipment with recommended disinfectant supplied by the contractor (70% Methylated spirits / 30% Water) until runoff is clear
- Avoid unnecessary soil disturbance.

The proposal would not significantly contribute to these KTP such that the lifecycle requirements of the Giant Dragonfly would be compromised.

Expected impact on the Giant Dragonfly

With the adoption of the mitigation measures proposed, the carrying out of the walking track works would not disturb, remove, modify or fragment any habitats critical to the lifecycle requirements of the Giant Dragonfly. It is considered that the proposal would not significantly affect this threatened species, or its habitat. As such, the preparation of a SIS that further considers the impact of the proposal on the Giant Dragonfly is not triggered.

2.8 Gang-gang Cockatoo

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

The disturbance of 2.27 ha of native vegetation from the subject site, this composed of about 1 m either side of the existing disturbed unauthorised vehicle track, is not considered to limit the extent of foraging, breeding or sheltering opportunities available to the Gang-gang Cockatoo in either the subject site or study region. The proposal would not clear any areas of breeding habitat (i.e., hollow-bearing trees), nor would it erect any barriers that would have a negative impact on the viability of this species. Within the subject site and adjacent bushland, resources would remain available for the lifecycle needs of this species, thereby ensuring the local viability of its population. The proposal is therefore not considered to have an adverse effect on the Gang-gang Cockatoo or its local population, such that it would be placed at risk of extinction.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

- (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
- (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction*

Not applicable to fauna.

(c) in relation to the habitat of a threatened species, population or ecological community:

- (i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and*
- (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity,*
- (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality*

The proposal will require the removal of approximately 2.27 ha of native vegetation, this including a number of potential feed trees. No hollow-bearing trees require removal.

The Gang-gang Cockatoo is highly mobile and can traverse open spaces. The removal of 2.27 ha of native vegetation, including some feed trees (fruit producing eucalypts), is not expected to result in a disturbance to this species' dispersal patterns. Wooded corridors available for the dispersal and interbreeding needs of this species will be retained, these providing connectivity with the surrounding bushland areas and conservation reserves. As such the proposal will not fragment or isolate any currently interconnecting or proximate areas of habitat available for use by the Gang-gang Cockatoo.

The proposal is not considered to remove, modify, fragment or isolate a significant amount of vegetation such that the long-term survival of the Gang-gang Cockatoo will be jeopardised. The habitat within the study area extends well beyond the boundaries of the scope of work proposed. At a regional level, the resources present immediately adjacent and included in the proposed walking track surveyed would not be considered to constitute a significant area of habitat in relation to either the local or regional requirements of the Gang-gang Cockatoo. As such, given the extent of work proposed, combined with

the extent of the surrounding vegetated areas, the long-term survival of the Gang-gang Cockatoo within, and in close proximity to, the study area is ensured.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)

No declared AOBV would be directly or indirectly affected by the proposal. The subject site is not listed as a declared AOBV under Part 3 of the NSW Biodiversity Conservation Regulation 2017.

(e) whether the proposed development or activity is part of a key threatening process or is likely to result in the impact of a key threatening process

Currently 35 KTP's for mainland NSW are listed under Schedule 4 of the BC Act. Of these, the 'clearing of native vegetation' and 'Infection of native plants by *Phytophthora cinnamomi*' will be applicable to the proposal.

The removal of about 2.27 ha of native vegetation, this including some fruit bearing eucalypt saplings, is not considered a significant loss in comparison to the remaining vegetation and resources within the study area and surrounding region.

The proposed activity has the potential to introduce *Phytophthora cinnamomi*, a pathogen that lives in soils and plant roots and is the key organism associated with the dieback of native plant species in Australia. Work must therefore avoid the potential spread of this organism as far as possible. Contractors will need to adhere to the following hygiene protocols:

- Before entering and leaving the work site, workers are to remove excess soil and mud and then spray boots, tools, gloves and small equipment with recommended disinfectant supplied by the contractor (70% Methylated spirits / 30% Water) until runoff is clear.
- Avoid unnecessary soil disturbance.

Provided the recommended mitigation measures are adopted, the proposal is not considered to significantly contribute to, or increase the impact of, these KTP such that the lifecycle requirements of the Gang-gang Cockatoo would be compromised.

Expected impact on the Gang-gang Cockatoo

The proposal is not considered to have a significant impact on the local status of the Gang-gang Cockatoo. The work will not remove any significant portions of this species' roosting or breeding sites and no major foraging areas will be significantly affected. The establishment of a walking track will not present a barrier to the dispersal or movement patterns of the Gang-gang Cockatoo. Therefore, it is not considered that the proposal will have a significant impact on this species or its habitat; as such, the preparation of a SIS [or BDAR] that further considers the impacts of the proposal on the Gang-gang Cockatoo is not required.

Appendix 4. Fauna species recorded

Key

A – species listed under the EPBC Act

B – species listed under the BC Act

E – species is listed as Endangered

V – species is listed as Vulnerable

* – indicates introduced species

A	B	Common Name	Family and Scientific Name	Detection method
		MAMMALS		
			Dasyuridae	
		Yellow-footed Antechinus	<i>Antechinus flavipes</i>	Hair sample present in predator scat collected
			Vombatidae	
		Common Wombat	<i>Vombatus ursinus</i>	Diggings and scats indicative of this species observed
			Pseudocheiridae	
		Common Ringtail Possum	<i>Pseudocheirus peregrinus</i>	Hair sample present in predator scat collected
			Macropodidae	
		Eastern Grey Kangaroo	<i>Macropus giganteus</i>	Observed
		Common Wallaroo	<i>Macropus robustus</i>	Observed
		Red-necked Wallaby	<i>Macropus rufogriseus</i>	Observed
		Swamp Wallaby	<i>Wallabia bicolor</i>	Observed
			Muridae	
		Bush Rat	<i>Rattus fuscipes</i>	Hair sample present in predator scat collected
			Canidae	
		* Fox	<i>Vulpes vulpes</i>	Hair sample present in predator scat collected
		BIRDS		
			Phasianidae	
		Brown Quail	<i>Coturnix ypsilophora</i>	Observed
			Columbidae	
		Crested Pigeon	<i>Ocyphaps lophotes</i>	Observed
			Accipitridae	
		Wedge-tailed Eagle	<i>Aquila audax</i>	Observed
			Falconidae	
		Peregrine Falcon	<i>Falco peregrinus</i>	Roost indicative of this species observed
			Cacatuidae	
		Yellow-tailed Black Cockatoo	<i>Calyptorhynchus funereus</i>	Observed
E	V	Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	Observed
		Galah	<i>Eolophus roseicapillus</i>	Observed
			Psittacidae	
		Crimson Rosella	<i>Platycercus elegans</i>	Observed
			Menuridae	
		Superb Lyrebird	<i>Menura novaehollandiae</i>	Heard
			Climacteridae	

A	B	Common Name	Family and Scientific Name	Detection method
		White-throated Treecreeper	<i>Cormobates leucophaea</i>	Observed
			Acanthizidae	
		Rockwarbler	<i>Origma solitaria</i>	Observed
		White-browed Scrubwren	<i>Sericornis frontalis</i>	Observed
		Brown Thornbill	<i>Acanthiza pusilla</i>	Observed
		Striated Thornbill	<i>Acanthiza lineata</i>	Observed
			Meliphagidae	
		White-eared Honeyeater	<i>Lichenostomus leucotis</i>	Observed
		New Holland Honeyeater	<i>Phylidonyris novaehollandiae</i>	Observed
			Psophodidae	
		Spotted Quail-thrush	<i>Cinclosoma punctatum</i>	Observed
		Eastern Whipbird	<i>Psophodes olivaceus</i>	Heard
			Neosittidae	
	V	Varied Sittella	<i>Daphoenositta chrysoptera</i>	Observed
			Pachycephalidae	
		Crested Shrike-tit	<i>Falcunculus frontatus</i>	Observed
		Grey Shrike-thrush	<i>Colluricincla harmonica</i>	Observed
			Artamidae	
		Grey Butcherbird	<i>Cracticus torquatus</i>	Observed
		Pied Butcherbird	<i>Cracticus nigrogularis</i>	Observed
		Australian Magpie	<i>Cracticus tibicen</i>	Observed
		Pied Currawong	<i>Strepera graculina</i>	Observed
		Grey Currawong	<i>Strepera versicolor</i>	Observed
		Grey Butcherbird	<i>Cracticus torquatus</i>	Observed
			Rhipiduridae	
		Grey Fantail	<i>Rhipidura albiscapa</i>	Observed
		Willie Wagtail	<i>Rhipidura leucophrys</i>	Observed
			Corvidae	
		Australian Raven	<i>Corvus coronoides</i>	Observed
			Corcoracidae	
		White-winged Chough	<i>Corcorax melanorhamphos</i>	Observed
			Petroicidae	
	V	Flame Robin	<i>Petroica phoenicea</i>	Observed
	V	Scarlet Robin	<i>Petroica boodang</i>	Observed
		Eastern Yellow Robin	<i>Eopsaltria australis</i>	Observed
			Timaliidae	
		Silvereye	<i>Zosterops lateralis</i>	Observed
		AMPHIBIANS		
			Myobatrachidae	
		Common Eastern Froglet	<i>Crinia signifera</i>	Heard