



Review of Environmental Factors

Light To Light Walk Upgrade

September 2021

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ACRONYMS AND ABBREVIATIONS

ACHMP	Aboriginal Cultural Heritage Management Plan
AHIMS	Aboriginal heritage information management system
ASL	Above sea level
AWS	Automatic weather station
BC Act	<i>Biodiversity Conservation Act (NSW)</i>
BCD	Biodiversity and Conservation Division
BMP	Biodiversity Management Plan
BOM	Australian Bureau of Meteorology
BS Act	<i>Biosecurity Act (NSW)</i>
BVSC	Bega Valley Shire Council
CEMP	Construction environmental management plan
Cwth	Commonwealth
DAWE	Department of Agriculture Water and Environment (formally DoEE)
DECCW	Refer to OEH
DPI	(NSW) Department of Planning and Infrastructure
DPIE	(NSW) Department of Planning, Infrastructure and Environment
EEC	Endangered ecological community – as defined under relevant law applying to the proposal
EES	Environment, Energy & Science
EIA	Environmental impact assessment
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cwth)</i>
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
ESD	Ecologically Sustainable Development
FM Act	<i>Fisheries Management Act 1994 (NSW)</i>
ha	hectares
Heritage Act	<i>Heritage Act 1977 (NSW)</i>
ISEPP	<i>State Environmental Planning Policy (Infrastructure) 2007 (NSW)</i>
KFH	Key Fish Habitat
km	kilometres
LALC	Local Aboriginal Land Council
LEP	Local Environment Plan
m	Metres
NES	Matters of National environmental significance under the EPBC Act (c.f.)

NPW Act	<i>National Parks and Wildlife Act 1974 (NSW)</i>
NPWS	NSW National Parks and Wildlife Service
NSW	New South Wales
NV Act	<i>Native Vegetation Act 2003 (NSW)</i>
OEH	(NSW) Office of Environment and Heritage, formerly Department of Environment, Climate Change and Water
REF	Review of Environmental Factors
REP	Regional Environmental Plan
SEPP	State Environmental Planning Policy (NSW)
SIS	Species Impact Statement
sp/spp	Species/multiple species

1. INTRODUCTION

This Review of Environmental Factors (REF) has been prepared on behalf of the NSW National Parks and Wildlife Service (NPWS) to assess the environmental impacts of the proposed Light to Light Walk Upgrade in Ben Boyd National Park on the far south coast of NSW. For the purposes of the proposal, NPWS is the proponent while Environment, Energy and Science (EES) is the determining authority under Part 5, Division 5.1 of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act). Biodiversity Conservation Division (BCD) and NPWS are within the EES Group of the Department of Planning, Industry and Environment (DPIE).

In 2018, NPWS was awarded \$7.9 million from the NSW Government's Regional Growth – Environment and Tourism Fund to upgrade and realign the existing Light to Light Walk to create a signature nature-based walking experience. The funding program commenced in July 2018 and subject to planning and construction timeframes the project is expected to be complete in late 2022.

The fund was designed to support the creation of regional environmental infrastructure projects on publicly owned and private land where there is a clear public benefit, and regional tourism benefits. To be eligible, projects had to be able to demonstrate that the new or enhanced regional infrastructure will drive growth in the visitor economy, in particular growing regional visitation and increasing overnight visitor expenditure.

The proposal comprises of track re-alignment, re-instatement of tracks damaged by bushfire and upgrade works to precinct parking, accommodation and small vehicle access trails. Additional works include maintenance of existing tracks and vehicle trails and rehabilitation and revegetation. The location of the proposal is shown in Figure 1-1. The proposed works have been split into the following three activities, refer to Appendix H for all drawing plans:

- Activity 1 - Walking track
 - Realignment of the existing Light to Light Walk from Boyds Tower to Green Cape Light station (identified as New Tracks in Figure 1-2).
 - Reinstate bushfire impacted sections of track that are not identified for realignment (identified as Existing Tracks in Figure 1-2).
 - Maintenance of existing sections of track that were not bushfire impacted or are not identified for realignment (identified as Subsidiary Tracks in Figure 1-2).
 - Rehabilitation and revegetation of redundant sections of the track that would be closed (identified as redundant Tracks in Figure 1-2).
 - Installation of wayfinding, directional and interpretative signs.
- Activity 2 - Accommodation and facilities precinct, refer to Figure 1-5 and Figure 1-6
 - New hut accommodation and facilities at Mowarry Point
 - Formalisation of the existing campground at Mowarry Point.
 - New hut accommodation and facilities at Hegartys Bay.
- Activity 3 - Vehicle and site access, refer to Figure 1-7 to Figure 1-9:
 - Maintenance of Hegartys Bay vehicle access trail including establishing a small compound site capable of helicopter sling operations.

- Upgrade of Hegartys Bay Access Track to a boardwalk from the aforementioned compound area to the Hegartys Bay hut accommodation area to enable ATV, eBike, or trolley access to the Hegartys Bay precinct
- Upgrade of the Pulpit Rock car park including adjusting turning circle and parking. The existing amenity block will be retained.

The proposed activities would result in 3-day experience that combines walking and eco-accommodation in one of the most remote and dramatic settings in Australia. Mowarry Point Trail will be upgraded as part of regional fire management trail program for 4WD and small truck access, and as such it will not be assessed in this REF. Likewise, a permanent bridge will be installed over a small creek east of the public carpark as part of regional fire management trail program for 4WD and small truck access, and will not be assessed in this REF.

NPWS is also proposing:

- Precinct upgrades at Boyds Tower, Saltwater Creek campground and Bittangabee Bay campground.
- Carpark and service upgrades at Green Cape and Disaster Bay.

Although not currently being proposed, a project to reconfigure the building at Green Cape Lighthouse to provide a third nights accommodation for Light to Light walkers may commence.

These activities have not been considered as part of this REF for determination. Proposal specific surveys, environmental assessments and design plans and considerations would be required to complete a thorough assessment for REF determination of these other proposed upgrades. As these proposed upgrades are out of scope, these works will be assessed in a separate REF. However, these activities have been considered in the cumulative impacts of this REF (Section 6.9). Refer to Figure 1-10, which shows these other proposed activities within Boyd National Park.

Throughout December 2019 and January 2020, the Border Fire burnt much of the walking track infrastructure and surrounding landscape within Ben Boyd National Park. The walking track was closed for several months in 2020 while NPWS made the area safe.

The initial proposal included an extension of the Light to Light Walking Track from Green Cape to Disaster Bay to create a fourth day. This has been removed from the scope due to concerns that Aboriginal cultural heritage sites may be impacted. Other changes have been made to avoid sensitive areas, areas of landslide hazard and other sensitive or dangerous locations identified following the Border Fire.

For the purposes of this REF, the study area for Activity 1 (the walking track) was a 30m corridor along the proposed walking track alignment and was surveyed during detailed environmental investigations. This approach has been taken to allow the walking track to be micro sited before being constructed. Although the walking track would be no wider than 1.5m at any point once operational, the micro siting method will be used to minimise environmental and Aboriginal cultural heritage impacts by allowing NPWS to alter the track alignment within this corridor if required. The micro siting method is described in further detail in section 4.2.2.

The study area for these activities has been subject to detailed environmental investigation and delineates the maximum area within which the works will be located. This provides as much clarity and certainty as possible to NPWS during the proposals early design and assessment while retaining much needed construction flexibility, to avoid and minimise potential direct and indirect environmental and social impacts.

Any variation in design and construction would be in accordance with the maximum parameters assessed in this REF, to ensure that impacts to biodiversity (terrestrial ecology, flora, fauna) and Aboriginal heritage sites of medium and high significance are minimised. Several specialist studies have been undertaken as part of this assessment and are included as appendices. The location of the proposal is shown in Figure 1-1.



Light to Light Walk Upgrade REF -
Location of Proposal within Regional Context

- Points of Interest
- Activity 1 - Walking Track
- Activity 2 - Accommodation and Facilities
- Activity 3 - Vehicle and Site Access

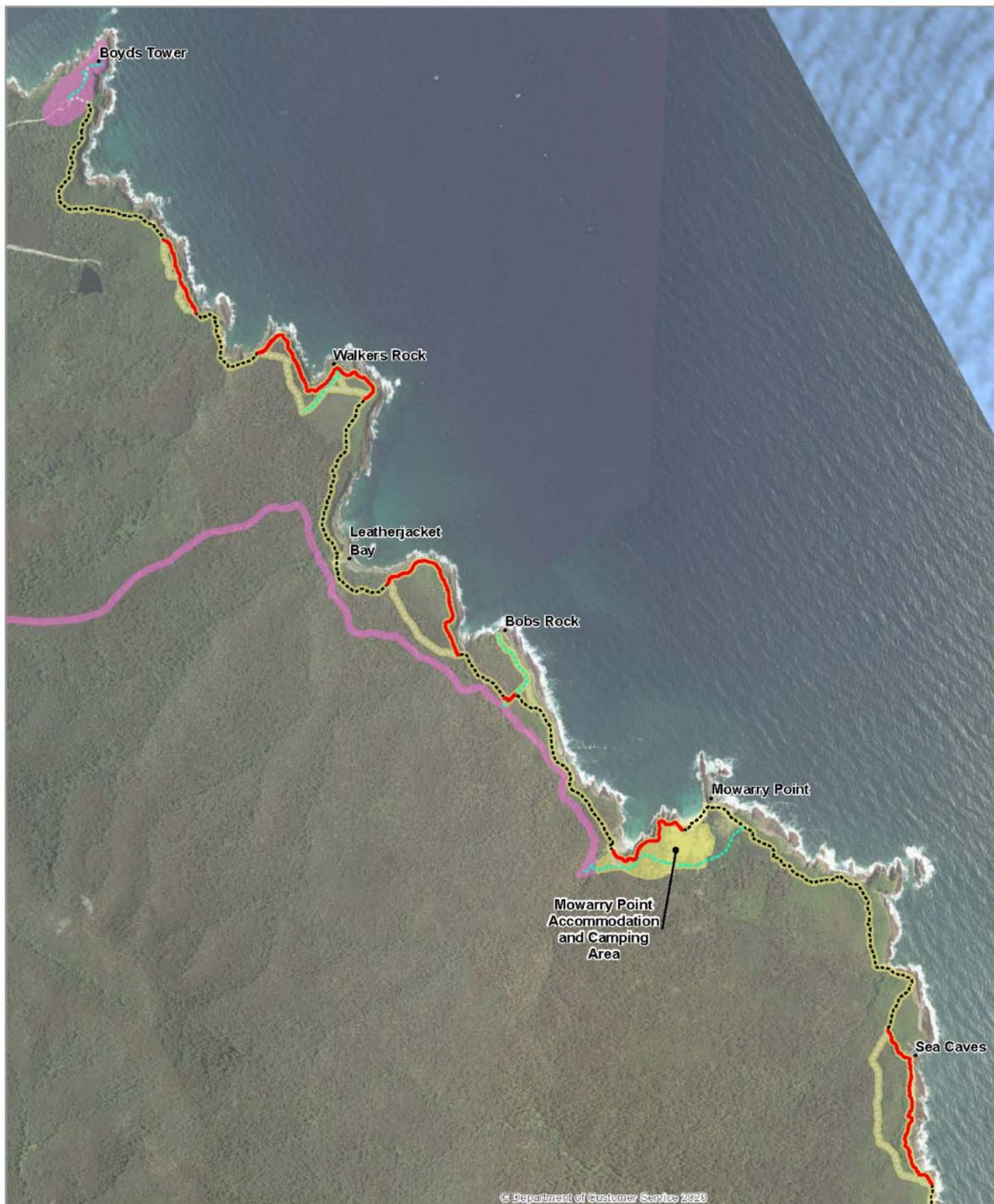
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Figure 1-1 Location of proposal within regional context.



Light to Light Walk Upgrade REF -
Activity 1 (Northern Sections)

- Points of Interest
- Activity 1 - Walking Track
- Existing Walking Tracks
- - - Existing Subsidiary Tracks
- - - Redundant Tracks
- Light to Light Walk Upgrade Study Area (30m corridor and precincts)
- Other REF Precincts

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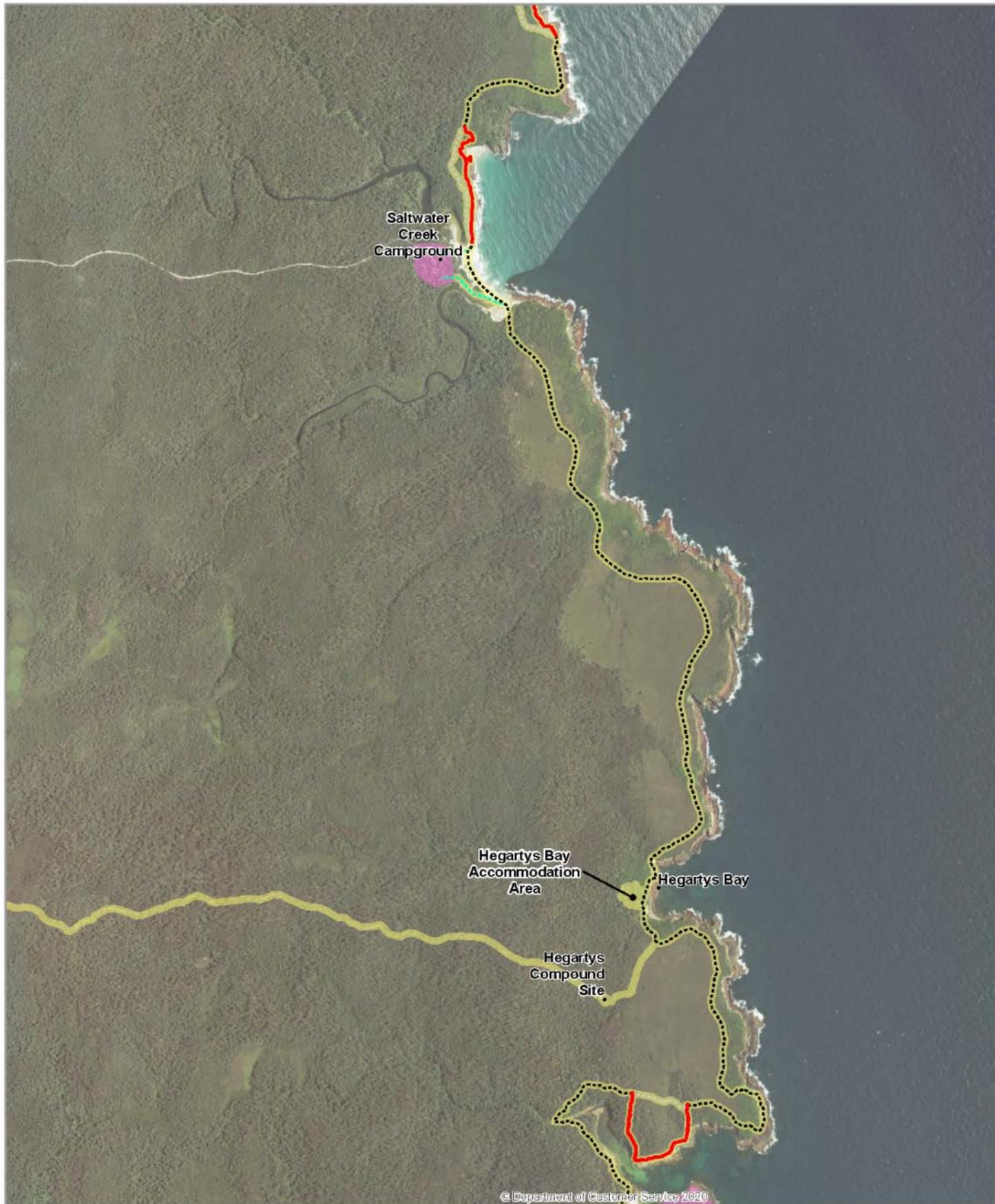


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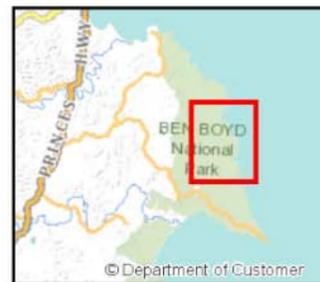
Figure 1-2 Activity 1 – Walking track works (Northern Sections).



Light to Light Walk Upgrade REF - Activity 1 (Middle Sections)

- Points of Interest
- Activity 1 - Walking Track
- Existing Walking Tracks
- Existing Subsidiary Tracks
- Redundant Tracks
- Light to Light Walk Upgrade Study Area (30m corridor and precincts)
- Other REF Precincts

0 100 200 400 600 800 1,000 Metres



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Figure 1-3 Activity 1 – Walking track works (Middle Sections).

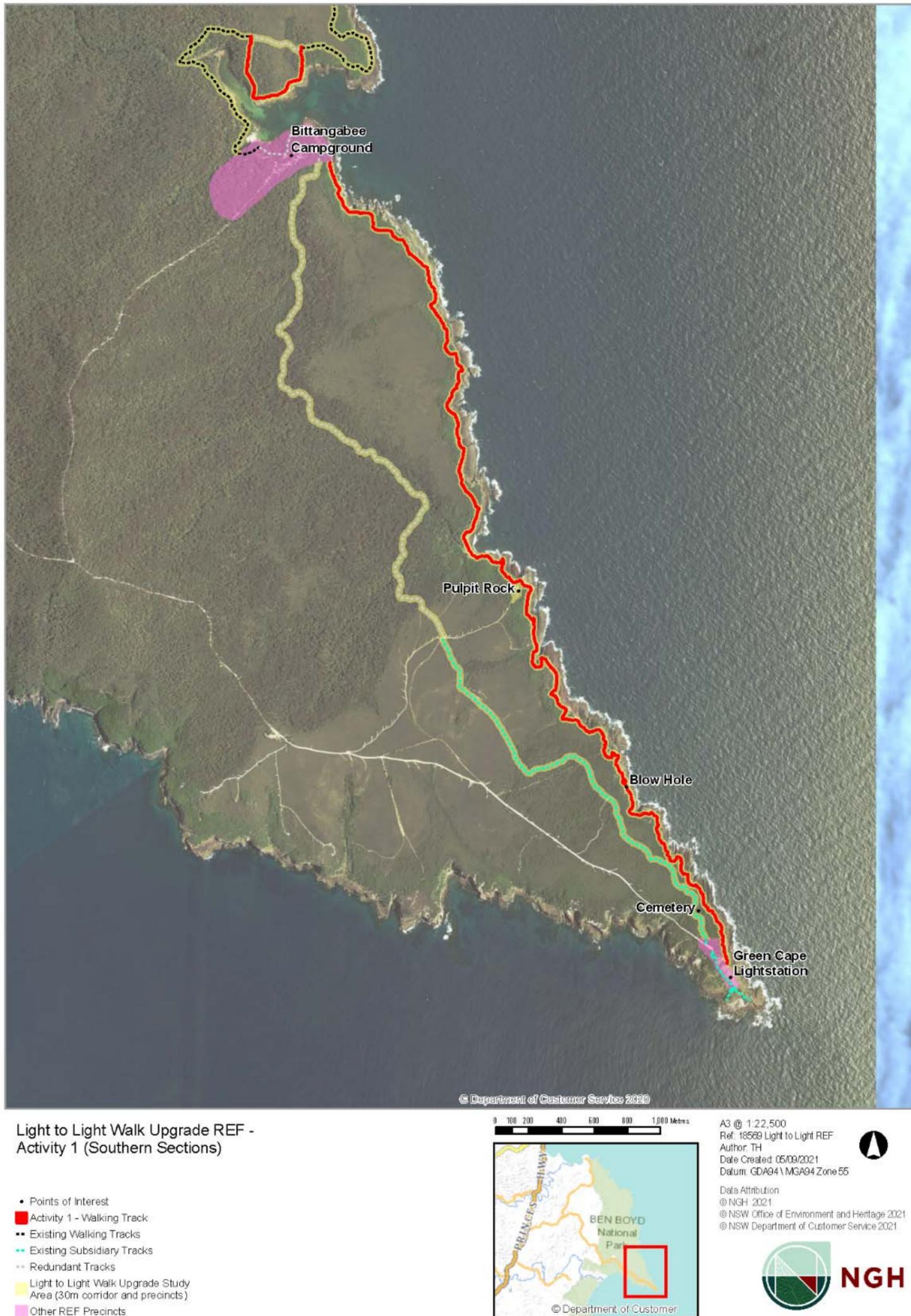
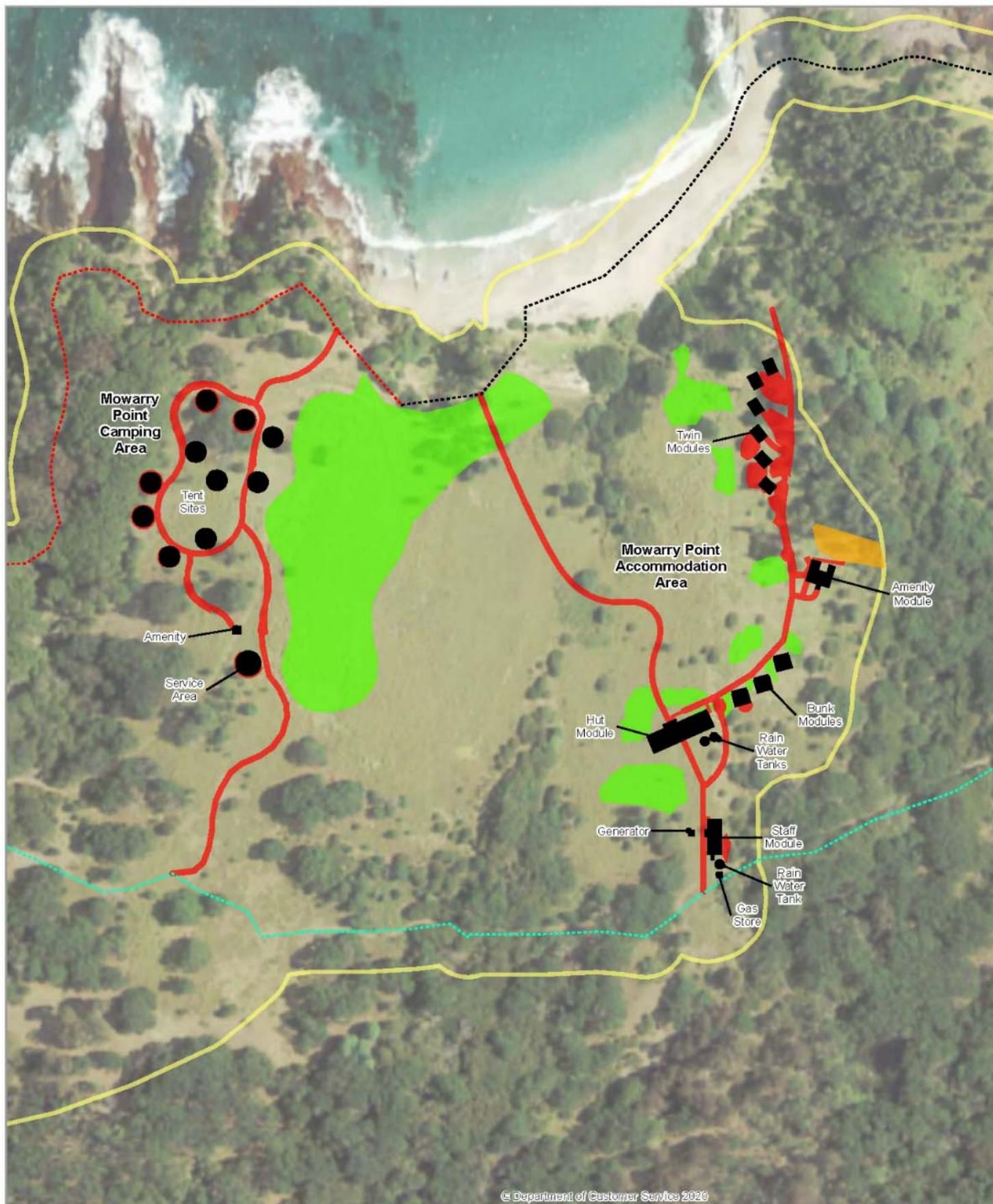


Figure 1-4 Activity 1 – Walking track works (Southern Sections).



Light to Light Walk Upgrade REF -
Mowarry Point Accommodation
Activity 2

- Proposed New Tracks
- Existing Walking Tracks
- Existing Subsidiary Tracks
- Redundant Tracks
- Mowarry Accommodation Structures (Activity 2 (Clearing Area))
- Activity 2 (Clearing Area)
- Activity 2 (Thinning Area)
- Activity 2 (Revegetation Area)
- Light to Light Walk Upgrade Study Area (30m corridor and precincts)



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Figure 1-5 Activity 2 Mowarry point accommodation works.



Light to Light Walk Upgrade REF -
Hegarty's Bay Accommodation
Activity 2

- Proposed New Tracks
- Existing Walking Tracks
- Existing Subsidiary Tracks
- Redundant Tracks
- Hegarty's Accommodation Structures (Activity 2 (Clearing Area))
- Activity 2 (Clearing Area)
- Activity 2 (Thinning Area)
- Light to Light Walk Upgrade Study Area (30m corridor and precincts)

0 10 20 40 Metres



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Figure 1-6 Activity 2 Hegarty's bay accommodation works.

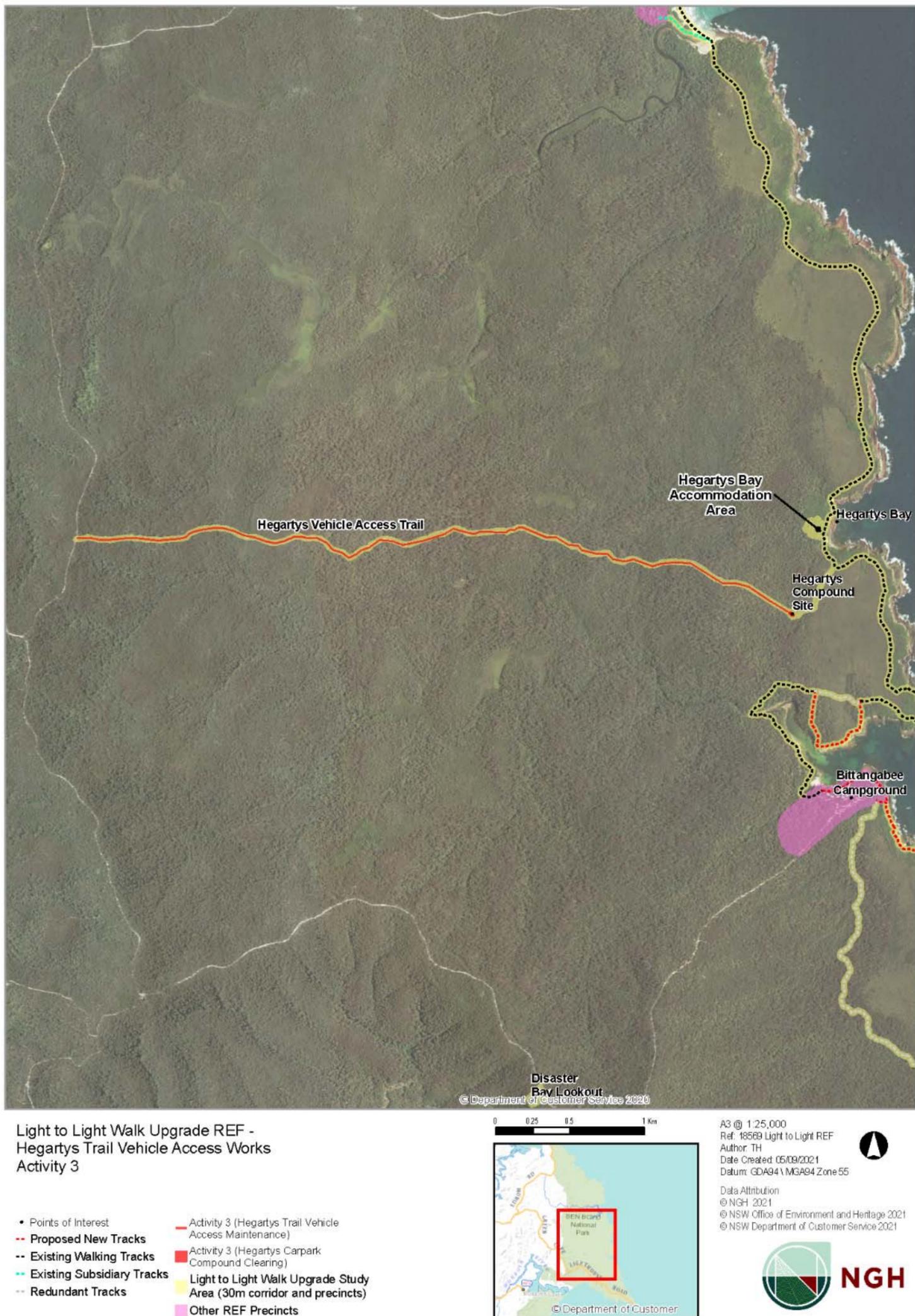


Figure 1-7 Activity 3 Hegarty's Bay vehicle access trail works.



Light to Light Walk Upgrade REF -
Hegarty's Bay Boardwalk Works
Activity 3

- Points of Interest
 - Proposed New Tracks
 - - Existing Walking Tracks
 - - Existing Subsidiary Tracks
 - - Redundant Tracks
- Strahler Stream Order**
- 1
 - 2
- Activity 3 (Hegarty's Bay Boardwalk Works)
 - Light to Light Walk Upgrade Study Area (30m corridor and precincts)

0 25 50 100 Metres



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Figure 1-8 Activity 3 Hegarty's bay boardwalk works.



Light to Light Walk Upgrade REF -
Pulpit Rock Precinct
Activity 3

- - - Proposed New Tracks
- - - Existing Walking Tracks
- - - Existing Subsidiary Tracks
- - - Redundant Tracks
- - - Existing Road
- Activity 3 (Pulpit Rock Carpark Clearing)
- Activity 3 (Revegetation Area)
- Light to Light Walk Upgrade Study Area (30m corridor and precincts)

0 10 20 40 Metres



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Figure 1-9 Activity 3 Pulpit rock car park precinct works.



Light to Light Walk Upgrade REF -
Other Ben Boyd NP Proposals

- Points of Interest
- Light to Light Walk Upgrade Study Area (30m corridor and precincts)
- Other REF Precincts



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Figure 1-10 Other proposed activities in Boyd National Park.

2. PERMISSIBILITY

2.1 LEGAL PERMISSIBILITY

Indicate whether the activity is permissible under the legislation, by marking the boxes if the activity is permissible. Include explanation where necessary.

- National Parks and Wildlife Act 1974* (NPW Act);
 - Plan of management (adopted or draft);
 - Conservation management plans; and
 - Ecologically Sustainable Development (ESD)
- Wilderness Act 1987*;
- Environmental Planning and Assessment Act 1979* (EP&A Act);
 - SEPPs;
 - REPs
 - LEPs
- Heritage Act 1977*;
- Biodiversity Conservation Act 2016* (BC Act);
- Rural Fires Act 1997* (RF Act);
- Fisheries Management Act 1994* (FM Act);
- Aboriginal Land Rights Act 1983 (ALRA)
- Commonwealth legislation (including the *Environment Protection and Biodiversity Conservation Act 1999* (EP&BC Act) and *Native Title Act 1993* (NT Act)).

2.1.1 *National Parks and Wildlife Act 1974*

The proposed development (activities) is consistent with the provisions of the NPW Act as described below. This section and information presented within this report show the development is permissible under the NPW Act.

Objects of the Act (s.2A)

The objects of the Act (Section 2A) are as follows:

- (a) the conservation of nature,
- (b) the conservation of objects, places or features (including biological diversity) of cultural value within the landscape,
- (c) fostering public appreciation, understanding and enjoyment of nature and cultural heritage and their conservation,
- (d) providing for the management of land reserved under this Act in accordance with the management principles applicable for each type of reservation. .

Impacts of the proposed activities have been considered and shown to comply with the objects of the Act. The principal aim of the realignment of the walking track and construction of hut accommodation is to encourage a greater diversity of people visit the national Park and undertake the Light to Light walk. Additional objects of the proposed activities are to allow for delivery of best practice conservation and management of the Park by realigning the walking track to reduce impact. Specifically;

- The proposal will not significantly impact on biodiversity and ecosystem or processes, with measures to conserve and protect potential impacts.
- The proposed works will improve the condition of the existing walks and vehicle access, therefore reducing erosion and ongoing impacts to the national park.
- The proposed activities will benefit the reserve by:
 - Clearly defining the track alignment to improve conservation outcomes and protect ecosystems and cultural values
 - Improving the quality of the walking track experience for park visitors by upgrading safety features, facilities and delivery of information in a range of formats to foster the appreciation and opportunity for enjoyment of nature, cultural heritage and the conservation.
- The proposal respects the cultural significance of the national park, both Aboriginal and historic heritage. Although the works are not within a declared Aboriginal Place, AHIMS search revealed over 100 previously recorded Aboriginal sites. The works will provide a level of protection and reduce ongoing harm and damage to these values by formalising tracks, and undertaking protection measures such as fencing, and interpretations of these values into the future.
- Potential impacts to flora and fauna have been considered in Section 5 of this REF and mitigation measures have been identified as required in Section 8.
- Potential impacts to Cultural values have been considered in Section 6.6 and Section 6.7 of this REF and mitigation measures have been identified as required in Section 8.

The proposal will encourage a greater diversity of visitors to undertake the Light to Light walk. The current walking track already allows for a fostering of appreciation, understanding and enjoyment of nature and cultural heritage and their conservation. The proposed activities would enhance this and would be consistent with the management principles applicable to the National Park and Historic sites and relevant Plan of Management (PoM) (see further discussion below and within this report showing compliance with the principles and PoM).

Ecological Sustainable Development

References to Ecological Sustainable Development (ESD) are included in NSW and Commonwealth legislation, and specifically the NPW Act. An objective of EES is to ensure that service developments are completed in an ecologically sustainable manner. The principles of ecologically sustainable development include:

- (a) The precautionary principle - minimise impacts and environmental damage
- (b) Inter-generational equity - ensuring the health, diversity and productivity of the environment are maintained or enhanced for future generations

- (c) Conservation of biological diversity and ecological integrity – biodiversity surveys and assessments have guided the development of the project to minimise environmental impacts
- (d) Improved valuation, pricing and incentive mechanisms – the proposal has taken into consideration valuation of assets and services to ensure the proposal is developed in a cost effective way.

The federal EPBC Act adopted the above definition of ESD and added a fifth principle:

- (e) Decision making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.

This REF has been guided by these principles when assessing the potential impact of the proposal. Where uncertainty exists, a precautionary approach has been taken to mitigate potential impacts. Environmental factors are valued in this assessment. The proposal is considered to be ecologically sustainable within the meaning of the above principles.

Reserve management principles (s.30E–30K)

The proposed activities are located within Ben Boyd National Park. Sections 30E of the NPW Act is therefore applicable to the activities and has been addressed below:

Management Principles	Relevancy, how the activities are consistent or where addressed in this report
30E National Parks	
(1) The purpose of reserving land as a national park is to identify, protect and conserve areas containing outstanding or representative ecosystems, natural or cultural features or landscapes or phenomena that provide opportunities for public appreciation and inspiration and sustainable visitor or tourist use and enjoyment so as to enable those areas to be managed in accordance with subsection (2).	The activities proposed are consistent with the purpose of management of the reserved land as described within this REF and in this table.
(2) A national park is to be managed in accordance with the following principles—	
(a) the conservation of biodiversity, the maintenance of ecosystem function, the protection of geological and geomorphological features and natural phenomena and the maintenance of natural landscapes,	The PoM outlines the reasons for conservation, maintenance, and protection of the park. This REF is in accordance with the POM and considers the existing environment and reviews the potential impacts and how these relate to the reasons for conservation, maintenance, and protection of the park and recommends mitigation measures to avoid or minimise impacts to the park.
(b) the conservation of places, objects, features and landscapes of cultural value,	The NPW Act specifically mandates protection for any physical/material evidence of Aboriginal occupation of NSW and places of cultural

Management Principles	Relevancy, how the activities are consistent or where addressed in this report
	<p>significance to the Aboriginal community and reserves (Aboriginal Areas and Aboriginal Land) or declares (Aboriginal Place) areas for the protection of Aboriginal cultural values and manage them accordingly is a function of the service/and the Act. The implementation of the Aboriginal heritage provisions of the NPW Act is the responsibility of Heritage NSW. It is an offence to knowingly disturb an Aboriginal places, sites and objects, irrespective of its nature or significance.</p> <p>The PoM outlines the reasons for places, objects, features and landscapes of cultural value of the park. This REF is in accordance with the POM and considers the existing environment and reviews the potential impacts and how this relates to the reasons for conservation, maintenance, and protection of the park and recommends mitigation measures to avoid or minimise impacts to the park.</p> <p>Impacts to Aboriginal heritage and sites have been considered in Section 6.6. Mitigation measures have been identified as required in Section 6.6 and Section 8. An Aboriginal Cultural Heritage Assessment Report (ACHAR) has been prepared and is summarised in this REF. The ACHAR is restricted to registered aboriginal parties.</p> <p>The ACHAR identified a rich suite of Aboriginal objects and sites within Ben Boyd National Park.</p> <p>Protection of historic heritage sites also forms part of the conservation function of the park. This is addressed below, under clause 30F.</p>
<p>(c) the protection of the ecological integrity of one or more ecosystems for present and future generations,</p>	<p>The PoM outlines the reasons for protection of the park, including the ecological integrity of ecosystems. This REF is in accordance with the POM and considers the existing environment. The REF reviews the potential impacts and how this relates to the reasons for biodiversity within the park and recommends mitigation measures to avoid or minimise impacts to the park.</p>
<p>(d) the promotion of public appreciation and understanding of the national park's natural and cultural values,</p>	<p>The PoM outlines the reasons and methods for promotion of public appreciation and understanding of the national park's natural and cultural values. The proposed activities are in accordance with the POM and are to upgrade and</p>

Management Principles	Relevancy, how the activities are consistent or where addressed in this report
	improve the promotion of public appreciation and understanding of the park. The REF recommends mitigation measures to avoid or minimise impacts to the park.
(e) provision for sustainable visitor or tourist use and enjoyment that is compatible with the conservation of the national park’s natural and cultural values,	The PoM provides for sustainable visitor or tourist use and enjoyment that is compatible with the conservation of the national park’s natural and cultural values. The proposed activities are in accordance with the POM and are to ensure ongoing use and enjoyment of the park. The REF recommends mitigation measures to avoid or minimise impacts to the park.
(f) provision for the sustainable use (including adaptive reuse) of any buildings or structures or modified natural areas having regard to the conservation of the national park’s natural and cultural values,	The PoM provides for sustainable use of buildings and structures that is compatible with the conservation of the national park’s natural and cultural values. The proposed activities are in accordance with the POM and are to ensure ongoing use and enjoyment of the park. The REF recommends mitigation measures to avoid or minimise impacts to the park.
(fa) provision for the carrying out of development in any part of a special area (within the meaning of the Hunter Water Act 1991) in the national park that is permitted under section 185A having regard to the conservation of the national park’s natural and cultural values,	Not applicable.
(g) provision for appropriate research and monitoring.	The PoM provides for appropriate research and monitoring of the park. The proposed activities are in accordance with the PoM and would not remove or reduce opportunities for research and monitoring. The REF recommends specific monitoring measures to avoid or minimise impacts to the park.

Clause 81 Operations under Plan of Management

The NPW Act clause 81 states where the Minister has adopted a Plan of Management (PoM) for a national park, historic site, nature reserve, karst conservation reserve, Aboriginal area or wildlife refuge, it shall, be carried out and given effect to by the Chief Executive. No operations shall be undertaken in relation to the lands to which the plan relates unless the operations are in accordance with that PoM. The proposed activities are consistent with the PoM (NPWS 2021) for the park:

Ben Boyd National Park and Bell Bird Creek Nature Reserve Plan of Management (2021)

The proposal is consistent with the aims and management principles of the Plan of Management (NPWS 2021) and accompanying Light to Light Walk Strategy.

A PoM amendment process was commenced in 2019 as the previous PoM, Ben Boyd National Park and Bell Bird Creek Nature Reserve Plan of Management (NPWS 2010) did not provide for all the activities proposed in this REF.

The improvements along the Light to Light Walk are outlined in the amendment and are more fully described in the Light to Light Walk Strategy (NPWS 2021)

Extensive public consultation, summarised in Section 3.5, was undertaken in July and August 2019 as part of the PoM amendment process. The amended PoM, (NPWS 2021) is available in full in Appendix D.

The Plan of Management, (NPWS, 2010) enabled construction of tented or hard-roofed accommodation at Mowarry Point, Bittangabee Bay and at Green Cape outside the lightstation complex. To date, none of this hard-roofed or tented accommodation has been constructed. NPWS no longer proposes to construct accommodation at Bittangabee Bay but does intend to construct hard-roofed and or tented accommodation at Mowarry Point and Hegartys Bay. In the future and subject to further assessment, similar accommodation could also be built at Green Cape or the Lightstation buildings renovated for this purpose.

Five amendments were provided for:

1. Amendment 1: Light to Light walk improvements
2. Amendment 2: Cultural camp
3. Amendment 3: Other management and visitor facility improvements
4. Amendment 4: Updates to park values
5. Amendment 5: New map

The following describes in detail the 2021 amendments that are relevant to the activities described in this REF (amendment 1 and 5).

AMENDMENT 1. LIGHT TO LIGHT WALK IMPROVEMENTS

This amendment is relevant to the following activities described in this REF:

- Activity 1 – Walking track
- Activity 2 - Accommodation and facilities

The previous Plan of Management (NPWS 2010) enabled construction of tented or hard-roofed accommodation at Mowarry Point, Bittangabee Bay and at Green Cape outside the lightstation complex.

This part of the 2021 amendment enables NPWS to construct new accommodation at Green Cape within the lightstation complex, new accommodation and supporting facilities at Hegartys Bay (or Bittangabee Bay and surrounds). Supporting facilities at Mowarry Point and Green Cape outside the lightstation complex were also included.

The amendment also enables NPWS to re-route major sections of the walk, construct new tracks to connect to nearby points of interest and provide certainty to the proposal so that a hut to hut style walk model can be developed and operated by NPWS.

Table 2-1 Amendment 1 regarding Light to Light Walk Improvements

Amendment	Description of Amendment
<p>1.1 General description</p>	<p>The 2010 Plan of Management (NPWS 2010) makes several general statements about the Light to Light Walk. Some require revision to ensure the description of the Walk and the management objectives provided in the plan accurately reflect the proposed standard and experience of the improved Light to Light Walk and outline the proposed works.</p>
<p>1.2 Accommodation and associated facilities</p>	<p><u>New Accommodation:</u> The previous Plan of Management (NPWS 2010) enabled construction of tented or hard roofed accommodation at Mowarry Point, Bittangabee Bay and Green Cape outside the lightstation complex. No new accommodation has been built in the park despite this being enabled in the 2010 PoM. The 2021 amendment proposes new accommodation at Mowarry Point and Hegartys Bay (but retains Bittangabee Bay and surrounds as a fall back option if Hegartys Bay is unviable) and allows new accommodation within the lightstation complex at Green Cape should that be required in the future.</p> <p><u>Pack campers on the Light to Light Walk:</u> Pack camping will continue to be allowed on the Light to Light Walk but will be limited to Mowarry Point and Bittangabee Bay as identified in Amendment 1.3. Away from the Light to Light Walk, dispersed pack camping will still be allowed in the southern section of Ben Boyd National Park. Saltwater Creek and Bittangabee Bay campgrounds will continue to operate as public campgrounds.</p>
<p>1.3 Camping</p>	<p><u>Pack camping on the Light to Light Walk:</u> The Light to Light Walk will continue to provide opportunities for people who wish to pack camp along the walk. At present pack camping generally occurs at Mowarry Point and Hegartys Bay (currently closed due to bushfire impacts). Pack camping also occurs at the car-based camping areas at Saltwater Creek and Bittangabee Bay. Dispersed pack camping will continue to be permitted in the southern section of the park, except on the Light to Light Walk where pack camping will be restricted to low-key walk-in public camping facilities at Mowarry Point and to purpose-built walk-in camp sites at Bittangabee Bay.</p>
<p>1.4 Walking track</p>	<p>A range of improvements to the Light to Light walking track are outlined in the Light to Light Walk Strategy. The proposed works include rerouting or upgrading sections of the existing track to; protect the environment, improve visitor experience and amenity, improve the track standard and reduce ongoing maintenance and better connect the Light to Light track with nearby points of interest. Rerouting will take place at multiple sites including the section along the vehicle track between Leather Jacket Bay and Mowarry Point carpark, the section south of Woodburn Creek, and an extensive section south of Bittangabee Bay. New connecting tracks include tracks to Boyds Tower and the Blowhole near Green Cape Lightstation. The 2010 Plan of Management (NPWS 2010) proposed investigating an extension of the Light to Light Walk from Green Cape to Wonboyn. This</p>

Amendment	Description of Amendment
	<p>investigation is now complete. The high cultural sensitivity of this area is now better understood, particularly regarding its large number of archaeological sites and its historic, spiritual and contemporary values to local Aboriginal people. Consequently, NPWS no longer proposes to construct a walking track along the coast between Green Cape and Wonboyn or Disaster Bay and this has been removed from the amended PoM (NPWS 2021).</p>
<p>1.5 Commercial opportunities</p>	<p>The previous Plan of Management (NPWS 2010) provided for commercial use of the Light to Light Walk and accommodation at Green Cape Lightstation, including leasing of buildings at the lightstation complex for visitor accommodation and facilities, this has been removed.</p> <p>While NPWS proposes to operate the hut to hut walk and its accommodation, the amendments continue to allow NPWS to enter into commercial partnerships that would support the operation of the Light to Light Walk. Any such partnerships may include providing visitor and management services such as cleaning, maintenance, tours, transfers, food supplies, cultural and environmental interpretation and education.</p>
<p>1.7 Heathlands</p>	<p>Protecting vegetation communities, including heathland, and protecting habitat for heath dwelling threatened plants and animals are two of the specific objectives identified in the previous Plan of Management (NPWS 2010). The plan aims to protect the highly significant coastal heathlands from the impacts of recreation use by preventing construction of new facilities in heathland and by closing and rehabilitating existing tracks within heathland.</p> <p>The 2021 amendment proposes that sections of the Light to Light walking track be rerouted. Key sections proposed for rerouting include longer sections south of Woodburn Creek and north of Green Cape Lightstation which currently traverse areas of heathland. These tracks will be rerouted into what is predominantly closed scrub/woodland vegetation dominated by giant honey-myrtle. While the proposed new alignments are mostly outside of heath, short sections of heath may be impacted.</p> <p>Much of the old alignments will be closed and rehabilitated, substantially reducing the overall impact of the walking track on heathland.</p>

AMENDMENT 5. NEW MAP

The current previous plan (NPWS 2010) includes two A4 black and white maps at the centre pages. One map shows the northern section of Ben Boyd National Park and Bell Bird Creek Nature Reserve. The other map shows the southern section of Ben Boyd National Park.

A new colour A3 map has been prepared that includes icons for the 2021 amendment to illustrate the proposed accommodation facilities at Mowarry Point and Hegartys Bay (or Bittangabee Bay) and the proposed camping site at Mowarry Point. The accompanying Light to Light Walk Strategy (NPWS 2021) outlines proposed realignments of the Light to Light walking track and the revised Plan of Management map illustrates the more significant reroutes proposed for the Light to Light walking track.

The revised Plan of Management map will include the management trail that extends from the car park at the end of Mowarry Point Trail to Mowarry Point.

AMENDMENT ADOPTION

After consideration of the submissions, and with some changes (see Section 3.5), the *Ben Boyd National Park and Bell Bird Creek Nature Reserve Plan of Management (2021)* was adopted in early 2021.

NPWS/EES management powers and responsibilities (s.8 and s.12)

Section 8 and section 12 of the NPW Act specify the powers and functions of the Chief Executive and the NPWS.

Under s.8 (7b) of the NPW Act the Chief Executive may arrange for the carrying out of such works as the Chief Executive considers necessary for, or in connection with the management and maintenance of these Parks and reserves. As the proposal would be within the jurisdiction of the *the Ben Boyd National Park and Bell Bird Creek Nature Reserve Plan of Management* as amended in 2021 and would meet the conservation outcomes including provision of sustainable facilities and promotion of historical and cultural heritage values, under this Act the Chief Executive is the appropriate authority to authorize the activity. The proposal is considered to be relevant to the management and maintenance practices used to protect identified natural and cultural values and to provide a durable, low-maintenance facilities for visitor use.

Under s.12 the NPWS is to carry out such works and activities as the Minister directs, either generally or in a particular case, in relation to points a) to f) the activity will provide for conservation and protection of wildlife, Aboriginal objects and places, facilities and opportunities for sustainable visitor or tourist use.

Conclusion: The proposed activity is consistent with the powers and responsibilities of NPWS under s. 8 and s.12 of the NPW Act.

2.1.2 Wilderness Act 1987

The Wilderness Act is designed to provide the permanent protection and proper management of wilderness areas and to promote education of the public in the appreciation, protection and management of wilderness.

The proposal site is not located within a nominated or declared Wilderness area.

2.1.3 Environmental Planning and Assessment Act 1979

The proposal would occur on land reserved under the *National Parks and Wildlife Act 1974*. NPWS as the proponent is a public authority for the purposes of the EP&A Act.

The proposal does not require approval under Part 4 of the Act and is classed as 'development permitted without consent' (refer to further discussion under State Environmental Planning Policies below). This type of development is subject to Part 5 of the EP&A Act.

Under Part 5, Section 5.5, of the EP&A Act, a determining authority (in this instance EES), has a duty to consider the environmental impact of a proposal. Under the EP&A Act, EES are required to examine and take into account to the fullest extent possible all matters affecting the environment by reasons of a proposed activity. This includes taking into consideration conservation agreements under the NPW Act and any plans of management adopted under that Act. Further, consideration is required for any agreement entered into under the BC Act. It also requires that EES adequately

assess the effect of the activity on any wilderness areas within the meaning of the *Wilderness Act*, and the impact of the proposal upon critical habitat, threatened species, populations, communities and their habitats.

NPWS utilise REFs to meet this responsibility, and this REF is structured to cover the issues required under the planning legislation. Representatives of EES and the NPWS planning team were consulted in the early stages of the planning phase, particularly regarding the requirement for an REF and relevant parts of the BC Act. Details of this consultation are provided in Section 3.3. Members of NPWS and EES also provided comments on early drafts of this REF.

State Environmental Planning Polices (SEPPs)

State Environmental Planning Policy (Infrastructure) 2007

This Infrastructure SEPP (ISEPP) applies across NSW and aims to facilitate the effective delivery of infrastructure across the state.

Division 12, Clause 65 relates to Parks and other Public Reserves and states that:

(1) Development for any purpose may be carried out without consent:

(a) on land reserved under the National Parks and Wildlife Act 1974, if the development is in the exercise of a function under that Act; or ...

Therefore, the proposed works do not require consent under Part 4 of the EP& A Act and can be assessed under Part 5 of the EP&A Act. As the works are proposed within a national park, EES would determine the REF.

Under [clause 65\(1\)](#) of the State environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP), consent is not required under Part 4 of the EP&A Act on land reserved under the NPW Act, if its authorised under that Act (NPW Act). This has been considered above and specifically how the development is consistent with the PoM for the park and clause 81 of the NPW Act.

Under clause 66 of the ISEPP, construction or maintenance of 'walking tracks, raised walking paths (including boardwalks), ramps, stairways or gates' is exempt development within parks and other reserves, and therefore consent is not required for the proposal for these works. As such, subject to cl.66 of ISEPP most of the proposal would be exempt development for the purpose of ISEPP. However, some works, such as the construction of the accommodation do not meet all provisions of cl.20 of ISEPP. Therefore, NPWS will process the proposal as an activity for the purpose of Division 5.1 of the EP&A Act.

SEPP (Koala Habitat Protection) 2020

Although the KHP SEPP applies to the Bega Valley Shire Council LGA, clause 5(2) states that the KHP SEPP does not apply to land dedicated or reserved under the [NPW](#) Act. No further consideration of this SEPP is required.

State Environmental Planning Policy (Coastal Management) 2018

This SEPP (Coastal Management SEPP) applies state wide across NSW and aims to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the *Coastal Management Act 2016*, including the management objectives for each coastal management area, by:

- (a) managing development in the coastal zone and protecting the environmental assets of the coast, and
- (b) establishing a framework for land use planning to guide decision-making in the coastal zone, and

- (c) mapping the 4 coastal management areas that comprise the NSW coastal zone for the purpose of the definitions in the [Coastal Management Act 2016](#).

The 4 coastal management areas include:

- Coastal wetland and littoral rainforest (and associated proximity areas)
- Coastal vulnerability area
- Coastal environment area
- Coastal use area

Under Clause 10 works including:

- Clearing of native vegetation;
- Harm of marine vegetation; and
- the carrying out of any earthworks, constructing a levee, draining of land or environmental protection works within the mapped Coastal wetland and littoral rainforest would require development consent.

Works within the proximity area of Coastal wetlands and littoral rainforest must not be granted consent if the works would have a significant impact on the:

- the biophysical, hydrological or ecological integrity of the adjacent coastal wetland or littoral rainforest, or
- the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland or littoral rainforest.

The proposed works do not occur within land mapped as coastal wetlands and littoral rainforest or their proximity zones.

2.1.4 Heritage Act 1977

The Heritage Act is the main statutory tool designed to conserve the cultural heritage of NSW and used to regulate development impacts on the state's heritage assets. The Heritage Act defines 'environmental heritage' as those places, buildings, works, relics, moveable objects and precincts of State or local heritage significance. A property is a heritage item if it is:

- Listed on the State Heritage Register (SHR), a register of heritage places of particular importance to the people of NSW; or
- Listed on the State Heritage Inventory (SHI), an electronic database of statutory listed heritage items. The SHI includes items on the SHR, s.170 Heritage Registers of some State Government agencies and heritage places listed on local council LEPs.
- An item listed on the National Parks Heritage and Conservation Register (contained in the Historic Heritage Information Management System – NPWS' s.170 Heritage Register)
- A place, building landscape feature or moveable heritage item older than 25 years.

Several items listed under the NSW *Heritage Act 1977* are recorded within Ben Boyd National Park including the southern sector where the proposal is located. Heritage listings are detailed in Section 5.18.2 and impacts are assessed in Section 6.7 of this REF.

2.1.5 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) commenced on the 25th of August 2017. The Act repeals the *Threatened Species Conservation Act 1995*, the *Native Vegetation Act 2003*, the *Nature Conservation Trust Act 2001* and the animal and plant provisions of the *National Parks and Wildlife Act 1974*. The Act is administered by DPIE with the purpose of maintaining 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. The Act aims to conserve biodiversity at bioregional and State scales.

Schedule 1 of the BC Act lists threatened species in NSW, Schedule 2 lists threatened ecological communities in NSW and Schedule 3 lists Key Threatening Processes (KTPs) in NSW.

As the activities are being considered under Part 5 of the EP&A Act, Part 7 Division 2 Section 7.8 of the *BC Act* has been considered. A Biodiversity Assessment Report (BAR) has been completed for the proposed activities and considers whether a significant impact for listed entities could result from the works. The BAR is summarised in Section 5 of this REF and appended in full (Appendix B). No significant impact to threatened species (populations), or ecological communities will occur as a result of this proposal as justified by this REF and the attached BAR. Therefore, no SIS under the BC Act will be required. See the attached BAR under Appendix B for more information.

2.1.6 Rural Fires Act 1977

The objects of the RF Act are to provide:

- (a) For the prevention, mitigation and suppression of bush and other fires in local government areas (or parts of areas) and other parts of the State constituted as rural fire districts; and
- (b) For the co-ordination of bush firefighting and bush fire prevention throughout the State; and
- (c) For the protection of persons from injury or death, and property from damage, arising from fires; and
- (d) For the protection of the environment by requiring certain activities referred to in paragraphs (a) – (c) to be carried out having regard to the principles of ecologically sustainable development described in section 2 (2) of the *Protection of the Environment Administration Act 1991*.

Under this Act, DPIE is a prescribed fire authority and is responsible for the control and suppression of all fires on lands that it manages. This management is subject to the Ben Boyd National Park Fire Management Strategy. Part 4 of this Act deals with the prevention and minimisation of the spread of bush fires throughout the State. The potential for the proposal to be a bushfire risk is considered in Section 6.4 of this REF.

The 2019/20 bushfire season has decimated many areas of native vegetation across the east coast of Australia and caused significant impacts to wildlife, including threatened species. An extent of 5.3 million ha of land representing 6.7% of NSW has been impacted by bushfires affecting over 60 threatened fauna species (DPIE, 2020). Scientists and government agencies have been working to understand how the fires have affected the environment and to determine where management intervention is needed.

2.1.7 Biosecurity Act 2015

The *Biosecurity Act 2015* (Biosecurity Act) is administered by NSW Department of Primary Industries (DPI). The Biosecurity Act repeals the *Noxious Weeds Act 1993*. It streamlines and modernises the way all biosecurity risks (feral animals, plant and animal diseases, and weeds) are managed in NSW. In relation to weeds, the Act:

- Embeds the principle of shared responsibility for weed risk across government, community and industry;
- Applies equally to all land and waterways in the state, regardless of whether ownership is public or private;
- Is premised on the concept of risk, so that weed management investment and response is commensurate with the risk posed; and
- Supports regional planning and management for weeds.

The Biosecurity Act includes a number of mechanisms (regulatory tools) that can be used to manage weed risks. The Act and Regulations provide specific legal requirements for high risk activities and state level priority weeds. The Biosecurity Act introduces a General Biosecurity Duty (GBD): that all plants are regulated with a GBD 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 reasonably practicable.

Whilst not a regulatory document, the South East Regional Strategic Weed Management Plan 2017 - 2022 (RSWMP) (South East Local Land Services, 2017), utilises the regulatory tools available in the Biosecurity Act to manage weed risks.

Appendix 1.1 of the RSWMP details the specific legal requirements for state level priority weeds and high-risk activities. For each state level priority weed, the management objective, and specific requirements for its management (as stated in the Biosecurity Act and regulations) is included. The specific requirements include Prohibited Matter, Biosecurity Zones, Control Orders and Mandatory Measures. Appendix 1.2 identifies regionally prioritised weeds and outcomes to demonstrate compliance with the General Biosecurity Duty.

The Biodiversity Assessment, appended in Appendix B and summarised in Section 6.4, notes the works areas are relatively free of weed ingress, although some weeds have been identified following the Border Fire of 2019/20.

2.1.8 Fisheries Management Act 1994

The FM Act sets out to conserve fish stocks and key fish habitats, threatened species, populations and ecological communities of fish and marine vegetation and biological diversity. Further, it aims to promote viable commercial fishing, aquaculture industries and recreational fishing opportunities.

Certain works carried out on 'water land', as defined under this Act, require approval under the FM Act. The proposed works at the Hegartys Bay access footpath would be undertaken partly on land that meets the definition of 'water land'.

This REF addresses potential impacts to native fauna, including fish, in Section 6.3 of this report. This includes reference to Guidelines for Watercourse Crossings on Waterfront Land. There is no proposed dredging, reclamation, harming of marine vegetation or use of explosives and other dangerous substances, as such a permit from Fisheries is not permitted.

Consultation for the proposed activities with relevant agencies is addressed in Section 3.1. As the upgrade to the Hegartys access footpath passes through 'water land' DPI Fisheries have been notified as per s199 of the FM Act.

2.1.9 Aboriginal Land Rights Act 1983

Native title rights (as discussed in Section 2.1.11 below) are different to and separate from the statutory right of Aboriginal Land Councils to make claims for land under the NSW Aboriginal Land Rights Act 1983.

The Local Aboriginal Land Councils (LALCs) must comply with the Aboriginal Land Rights Act 1983 (ALRA) and the Aboriginal Land Rights Regulation 2014 (ALRR) when they want to "deal with land" that is "vested" in them. This includes the requirements for the LALC to apply to/notify dealings with the New South Wales Aboriginal Land Council (NSWALC).

As the proposed activities do not require a dealing to be entered into with a LALC, there is no legislated requirement for application or notification with the NSWALC under the ALRA.

Consultation with the LALC's has occurred as part of the requirements for the Aboriginal Cultural Heritage Assessment (ACHA) process for the activity, refer to section 5.17 and 6.6, and Appendix A for outcomes.

2.1.10 (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act provides an assessment and approvals system for actions that impact on Matters of National Environmental Significance (MNES) and actions that have a significant impact on Commonwealth land. The approval of the Minister for the Environment is required if an action is likely to have a significant impact on or involve World Heritage properties, wetlands of international importance, Commonwealth listed threatened species and ecological communities, Commonwealth listed migratory species, nuclear action, Commonwealth marine areas, or Commonwealth land.

An EPBC Act Protected Matters Report was obtained on the 7th July 2021 for the area within a 10 kilometre buffer around the proposal site. The results of the search are summarised in Table 5-6, and have been incorporated into the threatened species evaluations. Potential impacts on Matters of National Environmental Significance are evaluated in Section 6.8 of this REF.

No significant impacts are predicted for Commonwealth listed matters. A referral is not considered warranted.

2.1.11 (Commonwealth) Native Titles Act 1993

Compliance with the Commonwealth Act would also require compliance with the [*Native Title \(New South Wales\) Act 1994*](#) (No 45), as such it is considered to not require separate consideration in this REF as the two acts are inextricably linked, and the following provides justification for the actions taken with this REF.

The *Native Title Act 1993* (Cwth) provides a legislative framework for the recognition and protection of common law native title rights. Native title is the recognition by Australian law that Indigenous people had a system of law and ownership of their lands before European settlement. Where that traditional connection to land and waters has been maintained and where government acts have not removed it, the law recognises the persistence of native title.

People who hold native title have a right to continue to practice their law and customs over traditional lands and waters while respecting other Australian laws. This could include visiting to protect important places, making decisions about the future use of the land or waters, and hunting, gathering and collecting bush medicines. Further, when a native title claimant application is registered by the National Native Title Tribunal, the people seeking native title recognition gain a right to consult or negotiate with anyone who wants to undertake a proposal on the area claimed.

Native title may exist in areas such as:

- Vacant Crown land.
- Some national parks, forests and public reserves.
- Some types of pastoral leases.
- Some land held for Aboriginal communities.
- Beaches, oceans, seas, reefs, lakes, rivers, creeks, swamps and other waters that are not privately owned.

A search of the National Native Title Tribunal Registers on 07 December 2020 found an active application within the Bega Valley Shire Council LGA. The land described in the application of the South Coast People follows the high-water mark along the coastline between the Towamba River and Ben Boyd National Park at Boyd Tower (incorporating the ocean surrounding the subject land).

The proposed activities would be located adjacent to land included in the South Coast Peoples Native Title Claim Application: NSD1331/2017, South Coast People, NC2017/003. NPWS has an agreement with NTSCORP, who represent the native title claimants, that they will be consulted on project work on the NSW south coast proposed by NPWS. As such, and in accordance with subsection 24JB(6) of the *Native Title Act 1993* (to the extent that this subsection applies) NTSCORP will be consulted during the REF process.

2.2 CONSISTENCY WITH DPIE STRATEGIES AND POLICIES

Indicate whether the activity is consistent with DPIE policy, including an explanation where necessary, by marking the boxes if the activity is consistent with policy:

NPWS area strategies or plans

NPWS policies

2.2.1 Landslides and rockfalls

The NPWS priority in managing landslides and rockfalls in parks is to protect life and property, consistent as far as possible with conserving the natural and cultural values of parks.

NPWS follows accepted risk management and safety practices; conforms with international and Australian standards; and follows corporate Risk Management Procedures and the Work, Health and Safety (WHS) System in its management of risk from landslides and rockfalls.

Implementation of the landslides and rockfalls policy is supported by National Parks and Wildlife Service (NPWS) [Landslides and Rockfalls Procedures](#) that provide more detailed guidance on how to record and respond to landslide and rockfall incidents and hazards in parks.

A detailed geological assessment and quantitative risk assessment has been undertaken and the activities proposed would be in accordance with the Landslides and Rockfalls Procedures.

2.2.2 Visitor accommodation

The NPW Act permits accommodation in parks for some purposes. Activity 2 includes the construction of accommodation and facilities including:

- New hut accommodation and facilities at Mowarry Point
- New hut accommodation and facilities at Hegartys Bay.

The visitor accommodation policy guides accommodation development within parks. Visitor accommodation is permissible in parks where it is consistent with the objects and management principles of the NPW Act and the relevant park's PoM. The proposed activities would be consistent with the PoM.

Site and precinct plans have been prepared for both new visitor accommodation sites that address the planning, design and construction of the accommodation and associated park facilities in each location.

2.2.3 Visitor safety

The visitor safety policy outlines the NPWS legal duty of care towards people in parks. It also provides guidance about how the DPIE can address safety issues and reduce risk to park visitors while maintaining park values.

Prior to finalisation of trail location and commencement of works visitor-safety risks would be assessed through the DPIE risk management system (internal information available to staff).
Ongoing

2.2.4 Walking tracks

The Walking Tracks Policy works in conjunction with the Park Visitor Facilities Manual, Park Facilities manual and Plan of Management to determine how walking tracks need to be constructed and maintained. The Policy states that tracks must be appropriately located and designed to minimise environmental impacts, and be appropriate to the setting as per the *Sustainability assessment criteria for visitor use and tourism* (OEH, 2011). The planning, development and management of walking tracks also considers the following:

- Public safety issues
- How the track fits within other walking opportunities, such as off-park tracks
- Opportunities to provide access for people with disabilities
- Resources needed to keep the track maintained.

The Light to Light Walk Upgrades would be constructed in accordance with these policies.

2.3 TYPES OF APPROVAL

2.3.1 EES proponents

<input checked="" type="checkbox"/>	EES approval* or authorisation, including expenditure
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* EES does not grant park approvals (e.g. leases, licences, consents etc.) to itself but has a range of general powers to undertake activities on-park, for example, ss. 8 and 12 NPW Act.

The works are 'development permitted without consent' under the EP&A Act. The determining authority (in this instance EES), has a duty to consider the environmental impact of a proposal under Part 5 of the EP&A Act. The assessment has been prepared in a manner consistent with NPWS' REF template format.

Other proponents

Instrument	Requirement	Timing
Heritage Act 1977 (s140)	Permit to disturb or excavate any land in NSW that is likely to contain archaeological relics.	Prior to start of the activity.
Heritage Act 1977 (s57)	exemptions for excavation apply for walking track work within the Green Cape Maritime Precinct curtilage	Prior to start of the activity.
National Parks and Wildlife Act 1974 (s90)	Aboriginal heritage impact permit from the Heritage NSW	Prior to start of the activity.

Are there any existing approvals, such as permits, leases, licences or easements, which apply to part or all of the proposed activity?

<input checked="" type="checkbox"/>	No
<input type="checkbox"/>	Yes

No further licences, leases or easements are required under the NPW Act

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3. CONSULTATION

3.1 CONSULTATION REQUIRED UNDER INFRASTRUCTURE SEPP

Local Council (clauses 13, 14, 15 and 15A)

local council infrastructure or Service (such as stormwater, sewer, roads)

heritage items listed under the local environmental plan (LEP)

flood liable land

- land within the coastal vulnerability area and the activity is inconsistent with a certified coastal management program for the land

Activity 1 would partly impact the curtilage of the Green Cape Lighthouse and residences group listed in the Bega Valley Shire Local Environmental Plan.

National park or other NPWS-managed land ([clauses 16\(2\)\(a\)](#) and [16\(2\)\(b\)](#))

- development on land zoned E1 or on or adjacent to land reserved or acquired under the NPW Act

As NPWS is the proponent, consultation is not required.

Marine park or aquatic reserve ([clause 16\(2\)\(c\)](#))

- on or adjacent to marine park or aquatic reserve

The proposal is not on or adjacent to marine park or aquatic reserve.

Sydney Harbour foreshore area ([clause 16\(d\)](#))

- in the foreshore area (of Sydney Harbour) within the meaning of the [Place Management NSW Act 1998](#)

The proposal is not within the foreshore area of Sydney Harbour.

Roads or maritime/TfNSW ([clause 16\(e\)](#) or [Schedule 3](#))

- a fixed or floating structure in navigable waters
- [traffic-generating development](#) on main roads

Construction activities may generate additional traffic on the Princes Highway.

Siding Spring Observatory ([clause 16\(g\)](#))

- increasing the amount of artificial light in the dark night sky within 200km of the Siding Spring Observatory.

The proposal would not increase the amount of artificial light in the dark night sky within 200km of the Siding Spring Observatory. No lighting proposed.

Mine subsidence area ([clause 16\(i\)](#))

- on land in a mine subsidence district within the meaning of the [Coal Mine Subsidence Compensation Act 2017](#)

The proposal does not involve development in a mine subsidence district.

RFS ([clause 16\(f\)](#))

- development for the purposes of a health Service facility, correctional centre or group home, or for residential purposes, in an area that is bush fire prone land

The proposal is not for the purposes of a health Service facility, correctional centre or group home, or for residential purposes, in an area that is bush fire prone land.

Defence Communications Facility (clause 16(h))

development on Defence communications facility buffer land within the meaning of clause 5.15 of the Standard Instrument under clause 16 of ISEPP

The proposal would not involve development on Defence communications facility buffer land within the meaning of clause 5.15 of the Standard Instrument under clause 16 of ISEPP.

3.2 CONSULTATION REQUIREMENTS UNDER NPW ACT

If the activity requires a lease or licence under s.151 or s.151H of the NPW Act, indicate if it requires:

- Public consultation under [s.151E](#)
 Reference to the NPW Advisory Council under [s.151G](#)

No Leases or Licences under the NPW Act are required as part of the proposed activity.

3.3 STATUTORY NOTIFICATIONS AND AGENCY CONSULTATION

A summary of consultation carried out with government agencies during the proposal development process is provided in Table 3-1 Summary of consultation with agencies during REF process

Table 3-1 Summary of consultation with agencies during REF process

Consultation	Consultation reference	Outcome	Comments and recommendations	Ongoing communication
Native Title Services Corp	24 JB (6) Native Title Act 1993	to follow	to follow.	Yes
BCD	BC Act	No objection to proposal	The REF should accurately describe the maximum footprint, provide all the necessary info on APZs', storm water and sewage management, any associated utilities etc. – everything that has the potential to affect vegetation, biodiversity, ACH or water. The REF must also describe all relevant construction info that might affect these environmental factors including site access and stockpiling.	Yes
EES	BC Act	No objection to proposal	General environmental constraints and specific biodiversity constraints, with a particular emphasis on previously	Yes

			<p>proposed Day 4 (Green Cape to Disaster Bay) were discussed to assist in informing the design of the development.</p> <p>This consultation provided the project the opportunity to avoid key biodiversity values identified in the site inspection and biodiversity surveys.</p>	
EES	BC Act BAM guideline	No objection to proposal	Consideration of 2019-2020 bush fire impact on the ecological condition of the site. In accordance with the <i>Guideline for applying the Biodiversity Assessment Method at severely burnt sites</i> (State of NSW & DPIE 2020), consultation with the consent authority is recommended in relation to this impact.	Yes
Registered Aboriginal Parties	NPW Act	Proposal has been refined	Extensive cultural heritage consultation with Eden LALC and other registered parties has been undertaken including four stages of consultation in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010. The Aboriginal community has also been included in site and investigation work throughout the development and refinement of the proposal.	Yes
DPI Fisheries	FM Act	To follow	To follow	No
Heritage NSW	Heritage Act	To follow	To follow	Yes

3.4 TARGETED CONSULTATION

Targeted consultation with the community has been undertaken via information on the NPWS website with the option of subscribing to a mailing list for ongoing updates to the proposal. Additionally, a project reference group has established to provide advice on the finalisation of the Light to Light Walk Strategy, with membership reflecting a broad range of stakeholders.

3.5 PLAN OF MANAGEMENT AMENDMENT

3.5.1 Consultation Submissions

Community consultation was conducted by NPWS in 2019 during which feedback was gathered from local organisations, businesses, residents and members of the community. The *Draft amendment to the Ben Boyd National Park and Bell Bird Creek Nature Reserve Plan of*

Management (Draft PoM amendment) and the *Draft Light to Light Walk Strategy* were both exhibited between 12 July 2019 and 26 August 2019.

Open house public information sessions were held at Pambula, Eden and Bega during the exhibition period. A total of **205 submissions** were received. These raised more than 1700 individual points.

All points raised in submissions were analysed and grouped into themes. Points and themes were then considered against set criteria to see if a change to the amendment was required.

The major themes raised in the submissions were:

1. New accommodation (see Section 3.5.2)
2. Green Cape accommodation (not discussed further within this REF)
3. Camping on the Light to Light Walk (see Section 3.5.2)
4. Walking tracks (see Section 3.5.2)
5. Commercialisation (see Section 3.5.2)
6. Public vehicle access (not discussed further within this REF)

Other general issues that do not fall into any of the above themes are discussed in Section 3.5.2.

3.5.2 Results of Submissions

A summary of the consultation, issues raised and response from NPWS is provided in the Public Exhibition Report in Appendix E.

While most submissions were from private individuals, submissions were also received from 12 community groups, 4 conservation groups, 3 schools and outdoor education facilities, 5 tourism businesses, 2 Aboriginal organisations and 3 government organisations. A summary of the submissions is provided below in Table 3-2 and Table 3-3.

Table 3-2 Number and type of submissions received

Type of submission	Number received
Unique¹ submissions from a person(s) or organisation	184
Identical or near identical submissions (form letters)	21 copies of 2 identical or near identical submissions

Most submissions were received via email or through the Office of Environment and Heritage '[Have your say](https://engage.environment.nsw.gov.au/consult)' page (https://engage.environment.nsw.gov.au/consult). Only a small number of submissions were received in hard copy form.

¹ Unique refers to the total material submitted by one author – person(s) or organisation

Table 3-3 Number of submissions that raised each theme

Theme	Themes listed in order of treatment in report	Number of unique submissions that raised this theme
1	New accommodation	86
2	Green Cape accommodation	59
3	Camping on the Light to Light Walk	107
4	Walking track improvements	71
5	Commercialisation	83
6	Public vehicle access	22

In addition, a submission was received that claimed to represent a diverse collection of more than 600 community members. The same submission claimed that over 2800 concerned citizens had signed a petition in support of their concerns. The submission raised all the key themes. The petition is at [change.org](https://www.change.org) and as of 12 November 2019 there was 4801 signatures.

3.5.3 Other general issues

A number of other issues were raised, however these issues did not result in any recommendations to change the draft amendment.

A summary of these issues is provided in the Submissions report, refer to Appendix E.

3.5.4 Response to the consultation process

In response to submissions, NPWS and its statutory advisory bodies, considered where changes could be made to revise the amendment, improving outcomes for visitors and for the parks natural and cultural heritage values. Not every theme led to changes.

The communities desire to continue to camp away from vehicles along the Light to Light Walk, particularly at Mowarry Point was recognised. This site will be formalised for walk-in only public camping facilities at to cater for independent pack campers, boat users, school groups and other general walk in campers. This is now included in the proposal as part of Activity 2.

A range of existing accommodation options were noted including off-park accommodation and commercial tour operator supported camping on park. However, NPWS is confident there will be additional demand from hut-to-hut walkers and anticipates that providing huts will complement existing accommodation options and this activity remains in the scope as part of Activity 2.

The previous PoM enabled commercial operation of the proposed accommodation and the exhibited Amendment did not propose to change this. Concerns with commercial managers operating on-park accommodation were recognised and references to commercial operators managing or leasing accommodation were removed. NPWS will manage all accommodation within the park. Commercial operators will be able to support walkers on the Light to Light, by providing guiding, transport, food, cleaning, or maintenance services etc.

There was a range of views about the track alignment and points of interest along the walk. Following extensive research and investigation, NPWS found the proposed alignment to be well balanced to provide a better visitor experience and protect the environment. This has been considered in detailing the final track alignment and is included as Activity 1 in this REF.

Respondents noted that Green Cape lightstation, being located at the southern end of the walk, is not an essential overnight stay for Light to Light walkers. Nevertheless, the iconic nature of the site means that accommodation within the lightstation complex is considered an important component of the hut-to-hut model. NPWS will prioritise accommodation in the lightstation buildings for Light to Light walkers. Initially this would be in the current arrangement. A subsequent proposal may be developed that establishes similar accommodation arrangements to Mowarry Point and Hegartys Bay. Green Cape will be made available for accommodation for casual short stays for some time each year in recognition of the concerns of existing users.

NPWS routinely manages the environmental impacts of popular visitor facilities in environmentally sensitive locations. In Ben Boyd National Park, NPWS will limit environmental impacts by setting back car parks from increasingly popular coastal destinations and provide short walk-in access for visitors. This approach is included in this proposal for Pulpit Rock as Activity 3.

The *Draft Amendment to the Ben Boyd National Park and Bell Bird Creek Nature Reserve Plan of Management (Draft PoM amendment)* was adopted by the Minister for the Environment on 11th of January 2021. The amended Plan of Management is available on the [Department of Planning, Industry and Environment website](#). The *Draft Light to Light Walk Strategy* was published on 30th of August 2021 and is available on the [Department of Planning, Industry and Environment website](#).

3.5.5 Ongoing community engagement

The draft REF will be publicly exhibited. NPWS would continue to inform the public throughout the proposal via regular updates of the website, email updates to interested and registered stakeholders.

Details of the proposed works would be posted in immediate vicinity of works as well as contact details of project manager for further information on the proposed works.

3.5.6 Light to Light Reference group

A Reference Group of external stakeholders has been developed following the PoM amendment consultation process to ensure the views and issues from a broad section of the community are considered. The group will include representatives from a broad range of local and regional stakeholder groups and organisations. Participation in the group is voluntary.

The group will be a key consultative body for the project and will support the project by providing input and advice to NPWS based on sound information about social, cultural, economic and environmental values.

3.6 CONSULTATION – ABORIGINAL COMMUNITIES

3.6.1 Native title consultation requirements

1. Is the land subject to an [Indigenous Land Use Agreement](#)?

No (go to Question 2)

Yes

If yes, check any relevant provisions of the ILUA including any notification procedures that must be followed and identify whether these have been followed

2. Has there been a determination of native title applicable to the land or is there a native title claim pending (check the [National Native Title Tribunal website](#))?

- No (go to Question 3)
 Yes

If yes, you may need to consult with the native title claimant regarding the proposed activity

No determination of Native Title under the Commonwealth Register of Native Title has occurred within the subject site, however, there are three (3) outstanding State Land Claims.

3. Has native title been **extinguished**?

- No or unclear (go to Question 4)
 Yes

If yes, provide a clear explanation (and supporting evidence) to demonstrate extinguishment

4. If native title is not confirmed as extinguished, does the activity have a **high risk** of adversely affecting native title (e.g. major infrastructure works, new buildings or granting of leases).

- No
No further consideration required

- Yes

The proposed activities would be located adjacent to land included in the South Coast Peoples Native Title Claim Application: NSD1331/2017, South Coast People, NC2017/003. NPWS has an agreement with NTSCORP, who represent the native title claimants, that they will be consulted on project work on the NSW south coast proposed by NPWS. As such, and in accordance with subsection 24JB(6) of the *Native Title Act 1993* (to the extent that this subsection applies), NTSCORP will be consulted during the REF process..

If yes, proponents should discuss with NPWS the need to notify and consult NTS Corp or any native title claimants

3.6.2 Parks under other joint management arrangements

Is the park's management subject to another joint management arrangement such as a memorandum of understanding?

- No **Go to Section 3.6.3**
 Yes

If yes, proponents should discuss the proposed activity with the relevant advisory committee or consultative group

3.6.3 Other parks

For all parks, proponents should discuss with NPWS the need to consult with relevant Aboriginal communities. Such consultation is usually recommended as it may assist with the assessment of impacts on Aboriginal cultural heritage

In accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW 2010), the aboriginal community were consulted as part of the Aboriginal cultural heritage assessment for the proposed activity. Consultation included: notification to interested parties, provision of proposed activity information, site meetings and surveys, and seeking feedback and advice on cultural heritage related matters.

4. THE PROPOSAL

4.1 DESCRIPTION OF THE PROPOSED ACTIVITY

The proposal presented in this REF has been developed iteratively, in tandem with the environmental assessments and consultation with relevant government agencies, the community and other stakeholders. This process aims to avoid or minimise potential impacts wherever practicable and results in a proposal that responds appropriately to the site constraints for the Light to Light Walk Upgrade.

The proposal is comprised of three separate activities. Locations of the proposed activities are provided in Figure 1-1. An overview of the disturbance footprint of each of these proposed activities is included in Table 4-2.

4.1.1 Activity 1: Walking track

Track scope

Establish new three-day, Class 4 walking track from Boyds Tower to Green Cape Lightstation incorporating new track sections and the some sections of the existing Light to Light Walk comprising of:

- Realignment of some sections of the existing Light to Light Walk, including:
 - Day 1 – South of Boyds Tower, Walkers Rock, Leatherjacket Bay and Mowarry Point
 - Day 2 – Sea Caves and Saltwater Creek
 - Day 3 – Bittangabee Bay to Green Cape
- The track will mostly be a natural surface track between 1000mm and 1500mm wide.
- Stairs will be timber or stone sleepers. Basic drainage such as cross drains and water bars, will be installed as required.
- Small duck board/floating grate/boardwalk segments will be required for difficult rock platforms or sensitive environmental or cultural sections.
- Small viewing platforms on natural surface (for example bedrock) or using boardwalk, will be provided at key locations.
- Reinstate bushfire impacted sections of track that are not identified for realignment. (Border Fire of 2019/20 – see Section 2.1.6). The track surface, stairs and drains would be reinstated, and gravel, mulch and woodchip would be applied where needed to stabilise the tread.
- Maintenance of existing sections of track that were not bushfire impacted or are not identified for realignment. This would include repair of stairs and drains, vegetation trimming and rectification of ongoing erosion issues.
- Revegetation of redundant sections of the track would be in accordance with Section 8 and Appendix B of the Biodiversity Management Plan (Rehabilitation program). This would generally involve removing track infrastructure and placing weed free straw, mulch and woody debris to stabilise disturbed areas.
- Sections of redundant track that are close to other tracks or precincts may require logs and planting to discourage ongoing visitor access.
- Installation of wayfinding, directional and interpretative signs.

Design Principles

The design and construction of the walking track would be undertaken in accordance with Australian Standard for walking track construction (AS 2156), where possible. The survey area and evaluation of the impact assessment in this REF has considered a 30m wide corridor to enable micro-siting of the activities during detailed setout and construction.

The following sections of the NPWS Park Facilities Manual would also be used to guide the design

- 5.1 Tracks & related structures planning - Class 4 Hiking Track
- 5.3.3 Natural surface track
- 5.5.4 Stone tread steps
- 5.5.5 Sleeper steps
- 5.4.3 Cross drains
- 5.4.4 Water bars
- 5.8 Viewing platforms
- 5.9.2 Duck board
- 5.9.3 Floating grate
- 5.9.5 Elevated boardwalk
- 5.9.6 Footbridge

An initial scoping report was prepared by Track and Trail Management Services in 2019 (Track and Trail Management Services Pty Ltd, 2019) for proposed new track sections. This report provided detailed information on vegetation, slope, soil types and construction methods. The alignment proposed in this report has since been modified in places to take into account; environmental constraints, bushfire impacts and landslide risks.

Precedent images and designs of the proposed works for Activity 1 are shown in Appendix H for the following:

- Track and boardwalk construction
- Revegetation and rehabilitation
- Boardwalk – pier construction, ebike and ride on mower.

4.1.2 Activity 2: Accommodation and facilities

The proposal includes work at two accommodation precincts. Indicative facilities at both precincts are shown in Appendix G.

Mowarry Point

New hut accommodation and facilities at Mowarry Point are shown in Figure 1-5 and would comprise of:

- 6 x twin share huts
- 3 x eight share huts
- 1 x communal hut, with basic kitchen and dining area, treated water and solar power
- 1 x amenity hut comprising four stalls, remote composting toilets and non potable water
- 1 x staff hut, with amenity and cooking facilities, solar power, workshop and battery store
- A new boardwalk would be constructed from the existing 4WD management trail to the amenity hut for servicing using ATV, eBike or electric trailer.
- Other footpaths would be natural surface or floating boardwalk

- 2 x large rainwater tanks would be installed on gravel beds
- Small gas tank and generator stores would be built at rear of precinct on concrete pad footings and would include screening

The accommodation would be of timber structure on ground screw piers, built to meet BAL-29 with small APZs. An alternative design may be required where geotechnical conditions restrict the use of ground screws. The precinct design utilises existing disturbed areas as much as possible. Where vegetation clearing would be required, this would be restricted to the minimum area required to establish the site and small APZs. Revegetation is proposed to screen accommodation from beach and other park users. A bushfire refuge located at the beach and rock shelf would be sign posted.

Filtration trenches would be installed in the northeast corner to dispose of all wastewater (excluding toilet waste) which would be captured in compost units. Filtration trenches would be left to revegetate excluding large trees. Electrical conduits, water pipes and wastewater pipes would be hung off the boardwalk where possible to reduce trenching.

The proposal also includes the formalisation of the existing campground at Mowarry Point which would comprise:

- 10 x tent sites. These would be marked with bollard. Some may require material to be brought in or a tent platform to create a flat pad
- Formalise footpaths, natural surface or as floating boardwalk
- A double stall standard NPWS skillion toilet with pump-out tank
- A small service area for truck turnaround during pump-out

The precinct would utilise existing disturbed areas as much as possible, some clearing would still be required. The existing service track would be retained and used to access the toilet for pump-out. No water would be provided.

Hegartys Bay

The new hut accommodation at Hegartys Bay is shown in Figure 1-6 and would comprise of:

- 6 x twin huts
- 3 x eight share huts
- 1 x communal hut, with basic kitchen and dining area, treated water and solar power
- 1 x amenity hut comprising four stalls, remote composting toilets and non potable water
- 1 x staff hut, with amenity and cooking facilities and solar power and constructed to meet BAL-FZ and sized as a Bushfire Refuge
- 1 x storage module with a small workshop and battery store
- A new boardwalk would be constructed from the Light to Light Walk to the amenity hut for servicing using ATV, eBike or electric trailer
- Other footpaths would be natural surface or floating boardwalk
- 2 x large rainwater tanks would be installed on gravel beds
- Small gas tank and generator stores would be built at rear of precinct on concrete pad footings and would include screening

The accommodation would be of timber structure on ground screw piers, built to meet BAL-29 with small APZs. The precinct design utilises existing disturbed areas as much as possible. Where vegetation clearing would be required, this would be restricted to the minimum area required to establish the site and APZs to ensure the accommodation precinct is screened from other park users. Some bushfire regrowth establishing species that have a short life would be managed to encourage the end state of the ecological community.

The staff module would be used as a bushfire refuge and would be sized to accommodate all people at the precinct in the event of a catastrophic bushfire.

Filtration trenches would be installed in the Northern corner of the precinct to dispose of all wastewater excluding toilet waste which would be captured in compost units. Filtration trenches would be left to revegetate excluding large trees. The electricity and gas conduits would be hung from boardwalks or follow the wastewater trenches to minimise ground disturbance.

Design Principles

The following guiding design principles have been considered in developing the accommodation precincts for the Light to Light Upgrade:

- Designs consider pre-fabrication and fly-in for efficient construction on site.
- Designs minimise footprints with a focus on respecting environmental, cultural and heritage sensitivities
- Designs enhance key visitor nodes and experience to best practice sustainable development, including lifecycle considerations.
- Designs maximise operating efficiency with innovative approaches to heating and energy efficiency to minimise cost and carbon footprints.
- Solar and battery energy will be installed and used to minimise the use of fossil fuels.
- Precinct layout will conceal the overnight sites as much as possible. Infrastructure should be clearly visible once the overnight precinct is revealed.
- Where possible, infrastructure is placed on disturbed areas or areas where environmental impacts are minimised.
- Infrastructure is a submissive form within the landscape, integrate with the environment and enhance the aesthetic experience of visitors.
- Style, form and materials of structures are integrated with a consistent design theme that reflect and are sympathetic to the local environment along the Light to Light Walk and responds to each precinct site conditions.
- Dispersal of infrastructure within overnight precincts is confined to as small an area as practical, consistent with site constraints with appropriate separation of elements.
- Layout of infrastructure within the nodes provides some separation from different user groups (twin share huts vs bunk huts) and from service infrastructure including staff huts and sheds.
- Huts are oriented for views and sunlight where possible.
- Staff huts are located to provide privacy for NPWS staff and include separate areas for sleeping and tool/equipment storage.
- Toilets are located for access by all users and be inconspicuous within the site particularly from approaches.
- Toilets siting also considers the requirements for sunlight, air movement, and helicopter long line access.
- Support services such as gas bottles, water tanks, and grease traps/absorption trenches are hidden.
- Structures are designed to be removable, relocatable, and reusable (where possible), and renewable/recycled resources would be utilised where possible.

Operation Principles

- Primary access during operation will be:
 - Mowarry Point – limited vehicle access using the existing service track and then walking, ATV, trolley or ebike throughout the precinct

- Hegarty Bay – limited vehicle access using the existing service track and then walking, ATV, trolley or ebike along the proposed boardwalk (see Activity 3) to and throughout the precinct
- Existing service tracks will remain management vehicles only and maintained for 4WD and small truck access. Vehicle movements will be minimised.
- Larger items will be transferred to and from accommodation precincts by helicopter.
- The accommodation precincts will be shut down for 2-3 weeks annually for maintenance.

4.1.3 Activity 3: Vehicle and site access

Vehicle and access upgrades include three parts:

Hegartys Bay Vehicle Access Trail

The access work proposed at the Hegartys Bay vehicle access trail will comprise of:

- Basic maintenance of the existing Hegartys Bay vehicle access trail to allow continuing 4WD and small truck access.
- Upgrading the turning circle at end of trail with a small bushfire impacted 'tree island' cleared to allow helicopter slinging, vehicle/ATV/ebike parking and material storage, refer to Figure 4-1.
- Vegetation waste would be mulched and used on site.
- Installation of a small shed at the turning circle.

Once these works are completed the track, turning circle and sheds would remain for management vehicles and would be maintained for 4WD and small truck access for operational activities and emergency evacuation.

Hegartys Bay Access Track

The upgrade of Hegartys Bay access track from the end of the vehicle track to the Hegartys accommodation precinct would comprise of:

- Upgrade of the existing footpath to a boardwalk:
 - Mesh boardwalk would be installed using the existing alignment.
 - Footings would be positioned to minimise disturbance of heathland community.
 - Boardwalk width would be about 2 to 2.4m to suit ATV, trolley or ebike wheelbase.
- Installation of bridge over the small drainage south of Hegartys Bay precinct the same width as the boardwalk and of similar design.
- The boardwalk would continue into the Hegartys Bay accommodation precinct.

The boardwalk would be used for construction access to Hegartys Bay and remain in operation to provide small vehicle access to the site. The boardwalk would also be used to evacuate injured or ill people from the accommodation precinct to the Hegartys Bay vehicle access trail.

Precedent images and designs of the proposed boardwalk are provided Appendix H.

Pulpit Rock Car Park

The upgrade of the Pulpit Rock car park would provide a safer and formalised precinct for all park users. The proposal would include (refer to Figure 4-2):

- Moving the existing vehicle loop to the south of the existing toilet which would be retained
- Establishment of road and carparks by grading and gravelling using road machinery
- Approximately 0.15ha of tree clearing
- Approximately 0.08ha of revegetation and site stabilisation as shown in Figure 1-9

Design Principles

- NPWS Park Facilities Manual
 - 5.9.5 Elevated boardwalk (with structural engineering design for ATV load)
 - 5.9.6 Footbridge (with structural engineering design for ATV load)
- NPWS Roads Manual
 - Activity Specification – Light Maintenance Grade
 - Activity Specification – Road Formation Mowing, Tree and Vegetation Control



Figure 4-1 Helicopter slinging operations area



Figure 4-2 Pulpit Rock concept design

4.2 CONSTRUCTION METHODOLOGY

4.2.1 Pre-construction

The following work will be undertaken prior to construction activities commencing:

- Planning and approvals, including cultural heritage and historic heritage site surveys.
- Qualitative and quantitative geological risk assessment, including landslip and rockfall.
- Detailed design and specification for track users, including specialist studies such as civil, structural and geotechnical assessments (where required).
- Construction Assessment Procedure – New Works Application.

- Preparation of Environmental Work Management Plans, Safe Work Management Plans etc.
- Pre-clearing surveys along designated sections within each activity.
- Site inductions.
- Site establishment and construct compound set up, including all construction signs and safety information (as outlined in this section).
- Installation of temporary traffic management signage.
- Installation of temporary signs for visitors using the walking tracks.
- Installation of site erosion and sediment controls.
- Survey, flagging and pegging of proposed work site and limit of works.

4.2.2 Construction

The proposed construction methods will vary depending on the nature of the activity (walking track, accommodation, or access). Construction methods and materials have been selected to minimise the impact on biodiversity, heritage and the natural landscape, whilst ensuring safety requirements are met and the work can be undertaken efficiently to minimise visitor impacts.

Construction work will be undertaken in accordance with the NPWS Landslides and Rockfalls Procedures, the NPWS Park Facilities Manual, Environmental Work Management Plans, Safe Work Management Plans and relevant Australian Standards and sections of the Australian Building Code.

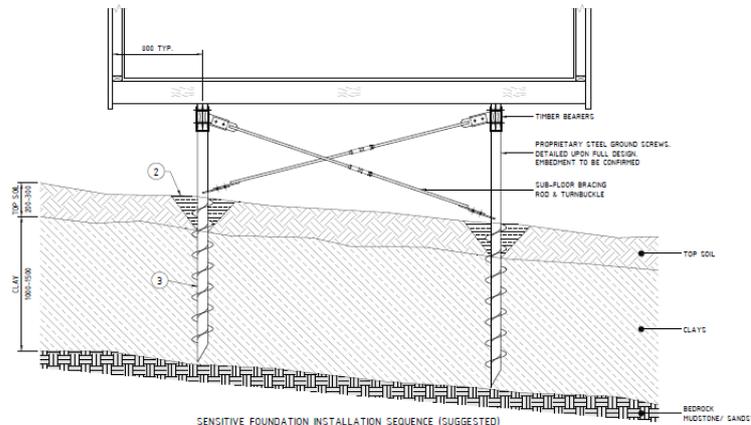
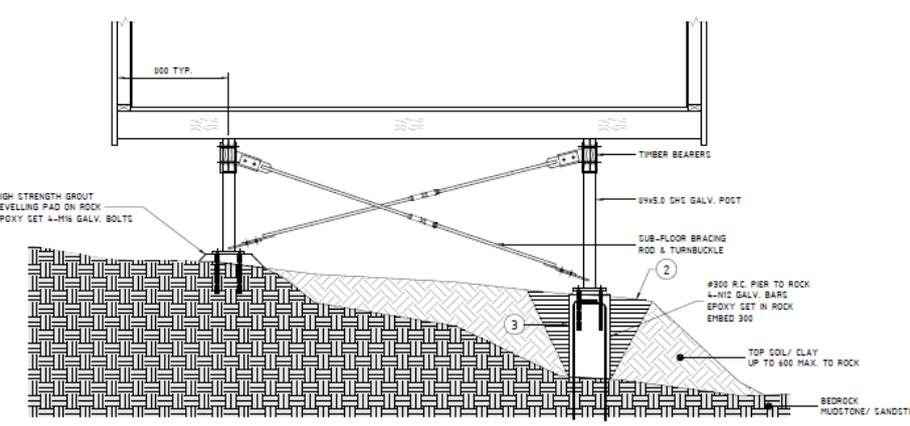
The proposed works for each activity are outlined in Table 4-1.

Table 4-1 Construction activities

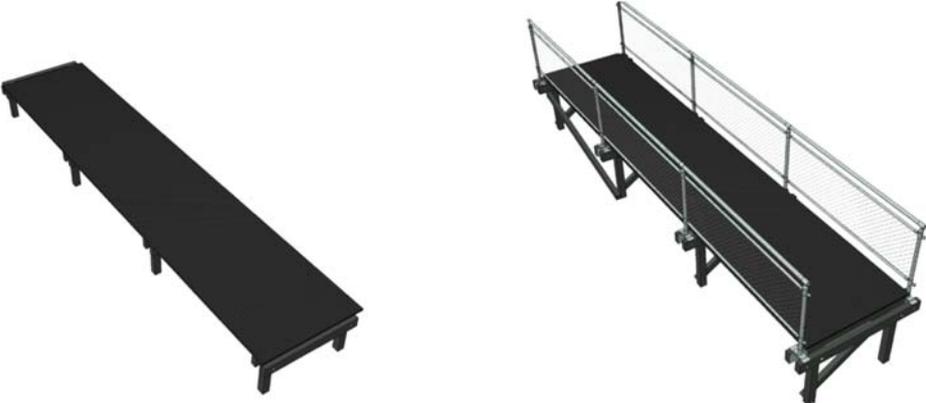
Location	Proposed construction activities
Activity 1: Walking track	
Boyd Tower to Green Cape	<p>Construction of the new walking track alignment would require:</p> <ul style="list-style-type: none"> • Microsite the walking track location within the REF corridor (30m) with NPWS, the track contractor, project ecologists and project archaeologist where required. • Existing tracks identified for upgrading would be inspected and methods developed to fix stairs, solve existing drainage issues and reduce track widths. • Vegetation clearing would be restricted to the immediate track corridor by trimming vegetation along the confirmed track alignment. • Erosion and sediment controls and site security would be incrementally established related to the current work zone. • Trimmed vegetation and topsoil sods would be kept for ground stabilisation and revegetation. • Trail sections will be completed progressively to ensure that no uncompleted sections are exposed to wet weather conditions.

Location	Proposed construction activities
	<ul style="list-style-type: none"> • The track will be fully benched using either small machinery or hand tools. Some sections may require timber edge restraints to retain the side of the tread. • Tracks would be built with a 5% outslope to encourage water to sheet across and off the track in a gentle manner instead of funnelling down the track centre line. • Where the grade exceeds 10%, climbing turns will be installed to reduce the grade. Where this is not possible or not desirable, stairs or grade dips may be installed. • Sections where the route follows rock platforms and changes in level, small drop-offs, uneven and/or rough surfaces occur may require a jackhammer to create foot holds, steps and even tread. If this is not possible small sections of boardwalk would be constructed. • Some sections may require complex technical stone structures, such as dry stone stairways using imported rock. • Some sections of new track would require timber or steel steps. • Stepping stones or boardwalk would be installed at a number of gully and stream crossings or to traverse sensitive locations with minimal direct impacts. • Some sections of track would require imported gravel to stabilise the tread. For the remainder of the alignment the natural mineral soils are suitable for the track surface. • Old sections of track that would become redundant after the new walk is constructed would be closed and revegetated. • Bushfire impacted sections of the walk that will remain will be reinstated to Class 4 standard including reinstatement of the track tread, stairs and drainage structures. • Other sections of the track that will remain will undergo basic maintenance activities such as fixing stairs and drainage to reduce erosion and importing gravel to ensure good track surface. • Signs and interpretive features would be installed using small footings either with compacted backfill or concrete. • Disturbed areas would be progressively stabilised using a combination of weed free straw, mulch, jute mesh, woody debris and topsoil sods.
<p>Activity 2: Accommodation and camping facilities</p>	

Location	Proposed construction activities
<p>Mowarry Beach and Hegartys Bay</p>	<p>The NPWS Construction Assessment procedures would be used to help guide the processes and documentation (including certification process) associated with new visitor infrastructure construction. Construction activities would include:</p> <ul style="list-style-type: none"> • Vegetation trimming and clearing to allow for construction of buildings, tent sites at Mowarry and establishment of APZs. Some short-lived post bushfire establishing species that pose a risk to visitors through falling limbs will also be removed. • Erosion and sediment controls would be established and sites secured. • Removal of topsoil, excavation for footings and establishment of concrete pads to allow installation of the accommodation structures. • Depending on ground conditions, piers would be directly (Type 1) augured on site or be steel reinforcement installed and then concreted, as shown below (Type 2 & 3). • The toilet at the Mowarry Campground will be constructed on a concrete slab as per the standard drawings from the NPWS Park Facilities Manual. • Buildings would be constructed off site and helicoptered into place directly onto the piers. • Once installed, the final fit out and commissioning would be undertaken in-situ. • Footpaths would be established using either natural surface, gravel or mesh boardwalk and signs and interpretive elements installed. • Site services would be installed, either be hanging off boardwalks or by trenching. • The precincts would be progressively stabilised, landscaped and revegetated using a combination of weed free straw, mulch, jute mesh, woody debris and local native species.

Location	Proposed construction activities
J	 <p>SENSITIVE FOUNDATION INSTALLATION SEQUENCE (SUGGESTED)</p> <ol style="list-style-type: none"> 1. SET-OUT FOUNDATION POINTS 2. HAND EXCAVATE TO 200mm DEEP. STOP IF ANY HERITAGE ITEMS ARE OBSERVED. 3. IF NO ITEMS ARE NOTED, INSTALL GROUND SCREW. <p>FOUNDATION TYPE F1 (GROUND SCREW) SCALE 1:20</p>  <p>SENSITIVE FOUNDATION INSTALLATION SEQUENCE (SUGGESTED)</p> <ol style="list-style-type: none"> 1. SET-OUT FOUNDATION POINTS 2. HAND EXCAVATE TO 200mm DEEP. STOP IF ANY HERITAGE ITEMS ARE OBSERVED. 3. IF NO ITEMS ARE NOTED, INSTALL R.C. PIER <p>FOUNDATION TYPE F2 (CONCRETE FOUNDATION ON ROCK) SCALE 1:20</p>

Location	Proposed construction activities
	
<p>Activity 3 Vehicle and site access</p>	
<p>Hegartys Bay Vehicle Access Trail</p>	<ul style="list-style-type: none"> • Hegartys vehicle track would undergo basic maintenance, which would include: <ul style="list-style-type: none"> ○ Slashing or mowing of grassed areas within the road corridor. ○ Trimming of growth on trees and shrubs. ○ Trimming long grass or vegetation obscuring sight distance for road users, obstructing road guide signs, obstructing effective cross drainage, not providing a neat appearance to the road users or that may be a source for bush fires. ○ Trim low or overhanging branches to provide clearance for vehicle movements. ○ Light grading and repair of drain and rollovers. • The turning circle at the end of the vehicle track would be cleared of vegetation, compacted and graded to form an ancillary facility. • A small shed would be installed on a concrete pad footing. • Disturbed areas would be stabilised using a combination of weed free straw, mulch, jute mesh, woody debris and local native species.
<p>Hegartys Bay Access Track</p>	<ul style="list-style-type: none"> • Vegetation would be trimmed along the existing footpath • Footing locations would be augured by hand or small machine. • Footings and boardwalk substructure would be installed.

Location	Proposed construction activities
	<ul style="list-style-type: none"> • Mesh running surface would be installed to a width of 2-2.4m suit ATV or other small vehicle wheelbase • The boardwalk would be incrementally installed and continue to the Hegartys Bay accommodation precinct. • As it is installed, the boardwalk would form the work base for each incremental section to minimise ground disturbance • Footings for the proposed boardwalk bridge south of Hegartys Bay would be excavated from the bank or pinned directly to existing bedrock. • The supports and substructure would be installed and then the mesh running surface and handrails. • Disturbed areas would be progressively stabilised using a combination of weed free straw, mulch, jute mesh, woody debris and local native species. 
<p>Pulpit Rock car park precinct</p>	<ul style="list-style-type: none"> • Pulpit Rock Road would be closed to the public, site fencing installed and erosion and sediment controls installed. • Vegetation would be trimmed to establish the new turning circle. • The new road surface would be compacted and graded with imported road base incorporating drains and crowning to aid surface water runoff. • Car parking bays would be delineated and wheel stops and signs installed • Remaining areas, and the existing turning circle, would be stabilised using a combination of weed free straw, mulch, jute mesh, woody debris and local native species.

4.2.3 Operation

The Light to Light Walk

Ongoing maintenance of the Light to Light Walk would be required. The proposal has been developed to minimise maintenance requirements and would involve vegetation pruning, weed control and repairs. Stairs, drains, signs and other track features would require periodic maintenance. This would generally be done by hand with some support from helicopters or small vehicles if required.

Accommodation Precincts

Primary access to the Mowarry Point accommodation during operation would be walking, ATV, ride on mower or e-bike from the public carpark. The Mowarry Point vehicle access trail would continue to provide management vehicle only access to the precinct and be maintained for 4WD and small trucks. Vehicle movements would be minimised where possible. A separate proposal is being prepared to install a bridge on this road which would aid operational access, provide for access in the event of a bushfire and reduce impacts to the creek.

Hegartys Bay vehicle access trail would continue to provide management vehicle access only and be maintained for 4WD and small trucks only. Primary access to transport small items up to 100 kg from the Hegartys Bay vehicle access tail carpark to Hegartys accommodation would be by ATV/mower/e-bike along the proposed mesh boardwalk. The turning circle would be maintained and be used for emergency evacuation by helicopter or ambulance.

Larger items would be transported to both Hegartys Bay and Mowarry Point accommodation by helicopter to minimise impacts.

The accommodation precincts would be shut down each year for a period of 2-3 weeks for maintenance. This would involve painting, timber oiling and thorough cleaning of the building. Vegetation maintenance and other precinct work would also be undertaken at this time.

The accommodation precincts will be staffed at all times by a NPWS hut officer. These people will undertake general maintenance and operational activities on a day-to-day basis.

Once the accommodation precincts are established, the vegetation will be maintained as an Asset Protection Zone to provide bushfire resilience as follows:

- Tree canopies will be separated by 2 m (small clumps of trees may be accepted as one large tree canopy) and where possible remove lower limbs carrying fine fuel within 2 m of the ground
- No tree canopy will be within 2 m of the buildings
- Shrubs will not occupy more than 10% of the APZ and will not be retained in small isolated pockets that provide a pathway from the hazard to the building
- Ground fuels will be equivalent to mown grass or <1 cm of leaf litter
- Establishing Strategic Fire Advantage Zones by undertaking prescribed burns to the NW-SW of the APZ at 5- 10 year intervals

Rehabilitation

Rehabilitation and revegetation would be undertaken across all three activities; the track, the accommodation precincts and the access improvements. During the operational phase of the proposal, redundant walking tracks sections and disturbed areas associated with the construction will continue to be inspected and managed to encourage revegetation.

Some areas may benefit from targeted effort to ensure revegetation is advancing or to prevent park visitors from using redundant areas.

The overall intent of rehabilitation will be to revegetate or employ assisted regeneration techniques to the site, consistent with the surrounding PCT type and in line with the recommendations made in Appendix B of this REF.

Weed control

A Weed and Pathogen Management procedure would be developed for the proposal and incorporated into the Biodiversity Management Plan, as outlined in section 7.2 of the BAR. The procedure would cover:

- Management of priority weeds under the Biosecurity Act 2015 during and after construction
- Weed hygiene protocol in relation to plant, machinery, and fill
- Monitoring treatment and reporting of pathogens such as Myrtle Rust and Phytophthora
- Avoiding foreign soil matter for landscaping/mulching.
- Install disinfecting facilities – wash-down bays, footbaths and/or scrubbing stations at primary entrance/exit points for both vehicles/machinery and foot traffic
- Installing signage (e.g. ‘Stay on marked tracks’) in priority locations (heath habitat), to reduce off-track disturbance and elevate or divert walking tracks to minimise contact with soil, particularly in locations that have the potential to become muddy.

Ongoing monitoring

PEST MANAGEMENT

The BAR recommended that monitoring be undertaken to inform, evaluate and manage the decision-making process on pest management actions. This was due to the assessment of an increased risk of predation activity arising from the proposal. See Section 7.2 of the BAR for further details on the assessed impacts to threatened species.

THREATENED SPECIES MONITORING

The BAR recommends that the results of the targeted small mammal surveys completed as part of this assessment should be used to plan monitoring and management activities maintain and where possible enhance this biodiversity value. The results obtained from the BAR’s assessment of impact are a valuable and useful base line study which should be used to guide future decision making regarding these conservation issues. Full details of monitoring recommendations are given in Section 8.3 of the BAR.

4.2.4 Size of the proposed activity footprint

The proposal would have a direct impact of 2.9ha and an indirect impact of 2.83ha. The approximate proposed activity footprint is summarised in Table 4-2. Impacts to each plant community type are provided in the BAR (Appendix B).

For Activity 1, a 30m buffer, 15m either side of the track centre line, was assumed and assessed as part of this REF. This approach has been taken to allow the walking track to be micro-sited within the corridor before being constructed. Direct impacts for walking track construction would be restricted to the tread width of 1m. Indirect impact areas have been assumed at 5m wide in treed corridors and 3m wide in heathland. Once complete, the operational impact would be the footprint of the track, 1m wide.

For Activity 2 the construction and operational impact includes the APZ around the footprint of the accommodation structures.

Activity 3 includes road and access upgrades. Work associated with the Hegartys Bay vehicle access track would be restricted to the existing road formation. Some maintenance trimming of vegetation would be undertaken and a small section of bushfire impacted vegetation at the end of the trail would be cleared. No road realignments are proposed. Although wider, the Hegartys Bay Access Track boardwalk would be restricted to the existing footpath footprint and the direct impact of this activity would be a maximum width of 2.4m for the length of the boardwalk and associated with the footings only. Impacts associated with the Pulpit Rock carpark work would be restricted to the minimum necessary to establish the proposal.

Table 4-2 Approximate study area and impact areas for proposed works.

Proposed works	Construction Impact	Operational Impact	Revegetation	Study Area
Activity 1: Walking track Boyds Tower to Green Cape				
Realignment of the existing Light to Light Walk from Boyds Tower to Green Cape Light station (including installation of wayfinding, directional and interpretative signs)	Direct impact: 1.31ha Indirect impact: 2.9ha	1.31ha (included within the construction impact)	No revegetation	43.35ha
Reinstate bushfire impacted sections of track that are not identified for realignment	Reinstate track features including steps, edging, signs and drains. Some minor earth works to the track within the existing disturbed area may also be required to reinstate the tread and prevent further soil erosion. Operational long term impact part of the maintenance requirements and objectives.			
Maintenance of existing sections of track that were not bushfire impacted or are not identified for realignment.	Maintain existing track features including steps, edging, signs and drains. Some minor earth works or additional drains within the existing disturbed area may be required to fix existing soil erosion issues. Operational long term impact part of the maintenance requirements and objectives.			

Rehabilitation and revegetation of redundant sections of the track that would be closed	No construction impacts.		Positive long-term impact 0.88ha of revegetated areas	
Activity 2: Accommodation and facilities				
New hut accommodation and facilities at Mowarry Point	0.22ha	Standard maintenance, not an operational impact	0.74ha	12.27ha
Formalisation of the existing campground at Mowarry Point	0.15ha			
New hut accommodation and facilities at Hegartys Bay	0.85ha		N/A	
Activity 3: Vehicle and site access				
Maintenance Hegartys Trail vehicle access and establish of ancillary site	0.07ha	Standard maintenance, not an operational impact	N/A	32.30ha
Mesh boardwalk to be installed from end of Hegartys vehicle access track to accommodation precinct	0.08ha (assume clearing impact for footing installation only)		N/A	
Upgrade of the Pulpit Rock car park precinct	0.15ha		0.08ha	

4.2.5

Ancillary activities e.g. roads, infrastructure, bush fire hazard reduction

Activity 1 (walking track), and 3 (vehicle and site access)

Ancillary activities would include the maintenance of temporary road closure barriers and signage on roads and walking tracks that provide access to the site during construction.

The track will include directional signs and interpretative elements, at regular intervals to guide walkers.

Activity 2 (accommodation)

Ancillary activities would include the maintenance of signage on tracks that provide access to the site during construction works and temporary barriers around construction areas.

The APZ will be maintained during the operation of the accommodation areas.

The accommodation precincts will include directional signs and interpretative elements for users of the accommodation areas.

4.2.6 **Proposed construction methods, materials and equipment**

Proposed construction methods have been described in section 4.2. Proposed construction equipment and materials include:

Activity 1: Walking track

Proposed equipment for this activity includes:

- Small machinery: mini excavator, motorised wheelbarrow etc
- Jackhammer
- Hand tools
- ATV and ebike (on access trails only)
- Helicopter

Proposed materials for this activity includes:

- Gravel
- Stepping stones and stone steps
- Timber steps and track edging
- Retaining wall/causeway rock
- Galvanized steel pipe pegs
- Chiselled tread
- FRP mesh and FRP beams for boardwalk
- Weed free straw, mulch and woody debris for stabilisation work

Activity 2: accommodation and facilities

Proposed equipment for this activity includes:

- Small machinery: mini excavator, motorised wheelbarrow etc.
- Light vehicles (road access only)
- Hand tools
- Cement mixer
- ATV and ebike

- Helicopter

Proposed materials for this activity includes:

- Ground screw piers
- Concrete with steel reinforcement
- Timber, FC sheeting and other building materials
- Modular buildings and associated infrastructure
- Services including; gas, water, electrical and solar panels
- FRP mesh FRP beams for boardwalk
- Gravel
- Weed free straw, mulch, jute mesh, woody debris and local plants for stabilisation and revegetation work

Activity 3: Vehicle and site access

Proposed equipment for this activity includes:

- Road graders and compactors
- Small machinery: mini excavator, motorised wheelbarrow etc.
- ATV, small 4WD and ebike
- Hand tools

Proposed materials for this activity includes:

- Gravel
- Timber
- Mesh
- Steel shed with concrete pad footing
- FRP mesh FRP beams for boardwalk
- Galvanised steel handrails for boardwalk bridge
- Wheel stops, fencing and signs at Pulpit Rock
- Weed free straw, mulch and woody debris for stabilisation work

Examples of similar construction methods used for the three activities is provided in Appendix H.

4.2.7 Receiving, storage and on-site management of construction materials

General

The primary storage area and compound site for all activities would be the Green Cape Quarry under an agreement with NSW State Forests. It would be used as the base for helicopter sling operations and refuelling, refer to Figure 4-3. This quarry area is cleared and large enough (approx. 10,600 m²) to incrementally store all building and track construction material.

All material that needs to be transported by helicopter will be lifted directly from the quarry to sites. This will include prefabricated buildings and building materials and track materials such as timber, stone, FRP mesh and gravel. Roads may need to close under traffic control conditions if flight paths cross over. NPWS may also choose to close sections of the Park for these operations.

Existing roads would be used to transport large items to the primary ancillary site. Existing roads will also be used to transport work crews and smaller lighter materials by light vehicle or small truck.

Some material and equipment would be brought to work locations via vehicle, to as close to the required location as possible, and then carried by hand, small machinery or small vehicles.

Stockpiled materials would be stored on existing hardstand and disturbed grounds within works areas. The sites will include erosion and sediment controls.



Figure 4-3 Main compound and helicopter lift area

Alternative ancillary facilities, either compounds, stockpile sites or sling load locations, would satisfy the following requirements:

- Existing disturbed areas with no vegetation clearing required
- At least 40 metres away from the nearest waterway
- Of low ecological and heritage conservation significance
- At least 100 metres away from residential dwellings and other land uses that may be sensitive to noise
- Of relatively level ground
- Outside the 1 in 10 year ARI floodplain
- Have appropriate erosion, sediment, pollution and waste controls installed and be secure.

Activity 1 (track work)

The primary storage area and compound site at Green Cape Quarry would be used to store and sling load via helicopter track materials such as stone, FRP mesh, timber, stone and gravel. Waste material from track works would be transported from work locations back to this site by helicopter. The general location of this compound is shown in Figure 4-4 and is labelled “Main Compound”.

Smaller lighter material and equipment required for track construction would be brought into the Park via road vehicle to as close to the required location as possible using existing roads and then carried by hand, small machinery or small vehicles to work locations. If this material needs to be stored, secured areas within existing carparks and disturbed areas within the Park that comply with the alternative ancillary provisions (as detailed in the previous section) would be used.

Activity 2 (accommodation)

The primary storage area and compound site at Green Cape Quarry would be used to store and sling load via helicopter building modules and building materials such as sand, concrete, steel, FRP mesh, timber, stone and gravel. Waste material from accommodation work would be transported from work locations back to this site by helicopter.

Small compounds and stockpile sites will also be required for both accommodation precincts. These will be secured and include erosion and sediment controls. For Mowarry Point, a section of the public carpark on Mowarry Point Trail would be utilised with a second ancillary facility established on the existing 4WD service track at the rear of the accommodation precinct, refer to Figure 4-4 with the location labelled "Mowery Compound". At Hegartys Bay, the new turning circle proposed at the end of the vehicle access trail (Activity 3) would be used as a small compound and stockpile site (shown as "Hegartys Compound" in Figure 4-4). Additional walk-in and small vehicle only ancillary sites would be established at the Hegartys Bay accommodation precinct and would be accessed using the proposed new boardwalk (Activity 3).

Existing roads would be used to transport large items to the primary ancillary site. Existing roads will also be used to transport work crews and smaller lighter materials to Mowarry Point and Hegartys Bay work locations by light vehicle or small truck.

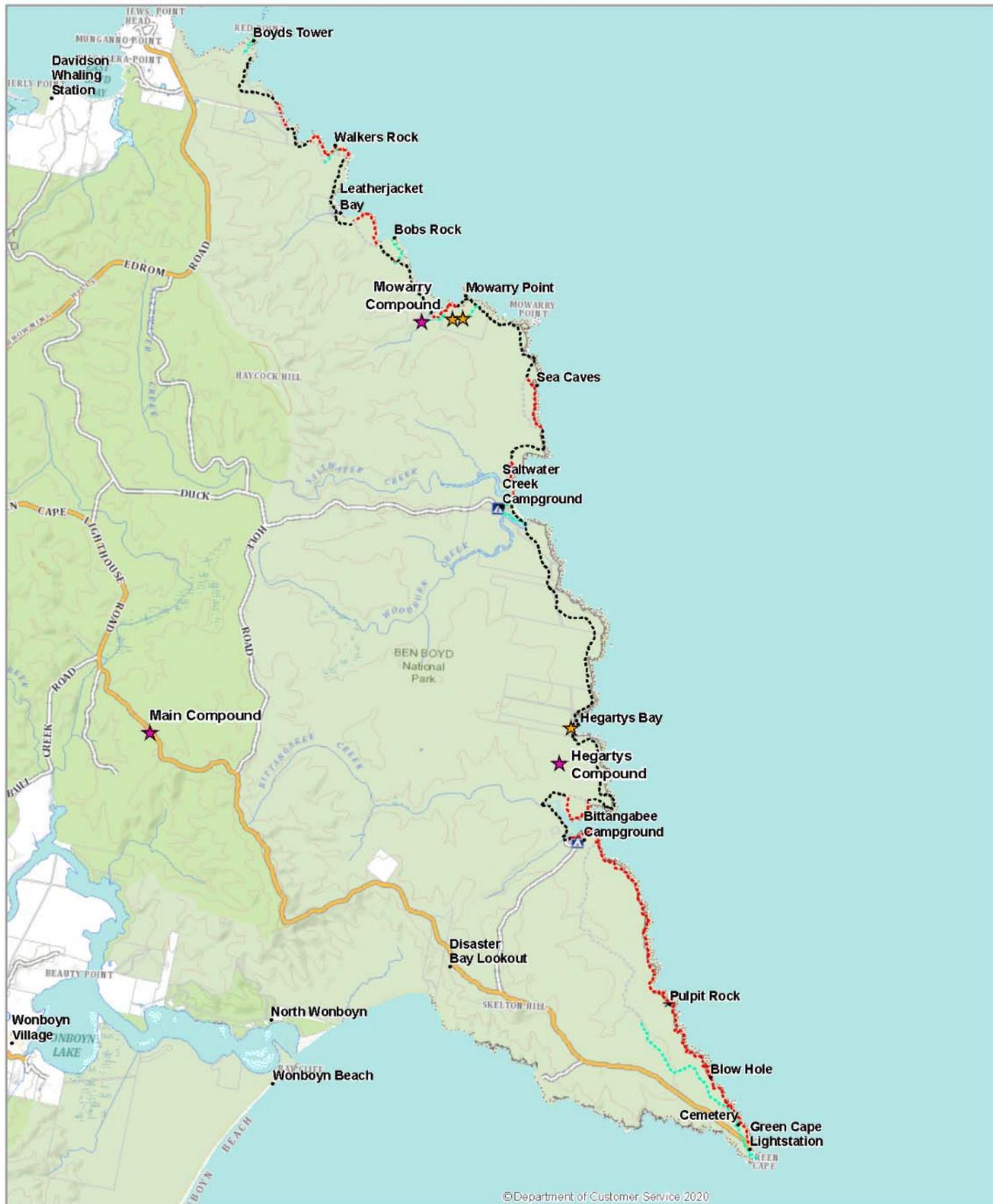
Vehicle movements to accommodation precincts would be a maximum of around 3 or 4 light vehicles and 1 or 2 small trucks per day. Some roads may be temporarily closed under traffic control if helicopter flight paths cross over.

Activity 3 Vehicle and site access

Materials associated with the maintenance work proposed for the Hegartys Bay Access Trail would be delivered directly to work locations and no compound or stockpiling is expected.

A small compound will be established at the end of the Hegartys access trail by clearing the vegetation island in the middle of the existing turning circle. This is shown in detail in Figure 4-2 and its location is shown in Figure 4-4 with the label "Hegartys Compound". This will then be used a compound and ancillary site for work across all three activities. Vegetation waste will also be stored at this location and will be used for stabilisation work.

For the Pulpit Rock carpark works, a small secure compound including erosion and sediment controls will be established within existing cleared areas, as shown in Figure 1-9. For the most part, material would be delivered directly to work locations with little need to stockpile.



Light to Light Walk Upgrade REF -
Compound Locations

- ★ Compound Locations
- ★ Stockpile Locations
- Points of Interest
- - Proposed New Track
- - Existing Walking Tracks
- - Existing Subsidiary Tracks
- - Redundant Tracks



A3 @ 1:65,000
Ref: 18569 Light to Light REF
Author: TH
Date Created: 05/09/2021
Datum: GDA94 \ MGA94 Zone55

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Figure 4-4 Overview of compound and stockpile sites

4.2.8 Earthworks, site clearing and extent of vegetation removal

Activity 1 – 3

The proposed earthwork for the three activities would consist of:

- Vegetation clearing and establishment of new walking track sections
- Bank stabilisation for construction of new boardwalk mesh bridge at Hegartys Bay
- Excavation for:
 - Footings for boardwalks
 - At locations where erosion control measures are required,
 - Levelling of walking tracks to establish the tread where natural surfaces are proposed
 - Track sections where there is a steep cross-fall where benching may be required and where steps, retaining walls or stabilised batters are required
 - Landscaping
 - Building foundations
 - Service trenches
 - Grading of the existing vehicle management trail to Hegartys Bay
 - Earthwork to level sites, install drainage and grade imported road base for the turning circle at Hegartys Bay Vehicle Access Trail and new carpark at Pulpit Rock
 - Cultural and historic heritage salvage activities
 - Post holes for signs, interpretive elements and track furniture

Excavation will be limited, where possible. For example, screw piles are preferred for all building elements which do not require excavation. Floating boardwalks will be used in places where small vehicles are not required which do not require earthwork. Other boardwalks will be kept to less than 1m to allow for smallest foundation type to be used. Replacement of existing signs will be undertaken with the aim to utilise the existing holes to install the new signs, to minimise/remove the need for excavation works.

Vegetation clearing would be minimised by carrying out a thorough micro-site during the set out phase of the track with the contractor. This micro-siting activity would set out the track to ensure large or habitat trees and sensitive cultural sites are not impacted. The accommodation precincts have been designed to minimise vegetation clearing and the need for large APZs.

4.2.9 Environmental safeguards and mitigation measures

Specific environmental safeguards and mitigation measures have been developed in Section 6 and are summarised in Section 7 and form part of this proposal.

4.2.10 Sustainability measures (materials and resource efficiency)

Wherever possible, topsoil, woody debris and rock would be recovered for re-use. Where new track construction produces material, such as cut vegetation and spoil, this could be used to rehabilitate sections of decommissioned track. Suitability of material and locations will be determined via a detailed rehabilitation plan (guidance provided in Appendix B).

In areas where stonework is recommended, stone would be sourced from local quarries first. Local stone would be utilised for steppingstones at gully/stream crossings as well as rocky sections requiring low retaining walls.

Local timber will be sourced from a certified sustainable source, as per NPWS requirements and used for stairs, boardwalk, seating, and signage to meet the NPWS Park Facilities Manual (NSW Office of Environment & Heritage, 2016) requirements.

It is expected that only two sections of track will require imported gravel to stabilise the tread, the remainder of the alignment will utilise the natural mineral soils as the track surface.

Once the new track is constructed, old sections of track that become redundant would be closed and rehabilitated.

Where native vegetation is removed, it will be mulched on site and used to rehabilitate redundant track sections and disturbed areas following construction. Non-native introduced plant species will be treated prior to construction and will not be included in mulch.

The accommodation precincts have been designed to be self-sufficient, with roof harvested rainwater, solar power and composting toilets. Highly efficient pellet heaters will be used to heat communal areas. Where possible building materials, furniture, fittings and other loose items will be sourced from sustainable suppliers and have been designed to minimise resource usage.

4.2.11 Construction timetable; staging and hours of operation

The works are expected commence late 2021 and to take approximately 24 months to complete.

The proposal would be undertaken during standard works hours. These hours include:

- Monday to Friday: 7am to 6pm
- Saturday: 8am to 1pm
- Sunday and Public Holidays: No work.

Should works be required outside of the standard working hours, consultation would be undertaken with NPWS regarding the alternate construction hours.

4.3 OBJECTIVES OF THE PROPOSAL

The Light to Light Walk Upgrade aims to promote the rich culture and heritage of the area, encourage sustainable practices, improve access to natural features of the park, and thereby invite and introduce a new audience to experience the unique Ben Boyd National Park environment. The architecture of the Light to Light Walk will champion these aspects, keeping with park values for sustainability, visual amenity and environmental and conservation values. Specifically, the objectives of the proposal are to:

- Create a new sustainable walking experience of internationally competitive calibre
- Create nature-based experiences which encourage visitors to value their national parks
- Create nature-based experiences which support the sustainable growth of the regional economy
- Provides a culturally sensitive environmentally sustainable nature-based experience which delivers enhanced visitor management and environmental outcomes
- Contributes to the financial sustainability of NPWS

- Supports sustainable increase in overall visitation to Ben Boyd National Park in non-peak periods
- Contributes to a sustainable increase in overall visitor volumes in the region throughout the year
- Contributes to an increase in non-peak visitor volumes in the region
- Creates employment opportunities for host communities
- Builds strong partnerships with industry, government and host communities
- Provides new opportunities for the Aboriginal community to appropriately share their culture, participate in and benefit from the regional tourism industry.

New huts at Mowarry Point and Hegartys Bay will accommodate walkers on the first two nights of the walk and will include twin and four share huts, a communal kitchen, dining area, toilets, staff accommodation and storage. Green Cape Lightstation may be used to accommodate walkers to add a third night to the experience. Initially, walkers would stay at the Lightstation in the current arrangement. In the future, the lightkeeper's cottages and other buildings may be adaptively re-used where viable to better accommodate walkers (part of subsequent assessment). Carrying capacity across each accommodation precinct is proposed to be 36 walkers per night.

The proposed itinerary is as follows:

- Day 1
 - Walk from historic Boyds Tower in the north, along the coastline, trekking through Melaleuca woodlands past Red Sands Bay and Leatherjacket Bay and stay overnight at Mowarry Point in new hut accommodation.
- Day 2
 - Walk from Mowarry Point, travel across rocky coastlines, over rock foundations, and past secluded beaches and stay overnight at Hegartys Bay in new hut accommodation.
- Day 3
 - Walk from Hegartys Bay to Green Cape lighthouse, experiencing Bittangabee Bay, Pulpit Rock, a blow hole and historic ruins. Overnight at the historic Green Cape Lightstation utilising the existing accommodation or exit Ben Boyd National Park.

The scope of works described in Section 4 would be completed to achieve the itinerary.

A secondary two-night camping itinerary will also be created utilising the proposed Mowarry Point campground and Bittangabee Bay.

The upgraded walk will also be available for general park visitors to enjoy as day activities or to facilitate connectivity to other precincts in the Park such as Salt Water and Bittangabee. Further possible itineraries are given in the Light to Light Walk Strategy.

The upgrade of the Pulpit Rock car park precinct is required to improve pedestrian safety and improve parking and vehicle turning. The vehicle track loop in its current shape and length is inadequate for parking and turning and the toilet is in the centre of the loop and access is dangerous for pedestrians. Also, the end of the vehicle track is not clearly shown and vehicles have impacted the walking track as they are parked closer to the Pulpit Rock stairs. The new loop and parking will be located south of the toilet to minimise the risk to pedestrians and prevent ongoing damage to the Park.

4.4 REASONS FOR THE ACTIVITY AND CONSIDERATION OF ALTERNATIVES

4.4.1 *Reasons for the activity*

Ben Boyd National Park is a popular tourist destination and receives around 150,000 visitors annually. The Key reasons for activities are as follows:

- Provide an extension and/or an upgrade of the existing Light to Light walk for users of Ben Boyd National Park.
- Provide additional accommodation facilities for users of Ben Boyd National Park.
- Provide additional access to new accommodation areas for users of Ben Boyd National Park.
- Provide safe access to Pulpit Rock from the existing vehicle access and toilet area.

4.4.2 *Consideration of alternatives*

Activity 1 – Walking track

DO NOTHING

The do-nothing approach would involve no construction of new walking track sections. This would not meet the objectives of the proposal to deliver an 'outstanding immersive visitor experience' within the Ben Boyd National Park. Areas of track poorly located would continue to damage the environment through erosion and disturbance to sensitive areas.

ALTERNATIVE 1

Alternative 1 involves a four day walk. The proposed itinerary would be:

- Day 1
 - Walk from historic Boyds Tower in the north, along the eastern coastline, trekking through Melaleuca woodlands past Red Sands Bay and Leatherjacket Bay and stay overnight at Mowarry Point in new hut accommodation.
- Day 2
 - Walk from Mowarry Point, travel across rocky coastlines, over rock foundations, and past secluded beaches and stay overnight at Hegartys Bay in new hut accommodation.
- Day 3
 - Walk from Hegartys Bay to Green Cape lighthouse, experiencing Bittangabee Bay, Pulpit Rock, a blow hole and historic ruins. Overnight at the historic Green Cape Lightstation in existing accommodation or exit Ben Boyd National Park.
- Day 4
 - Walk from Green Cape Lightstation to Disaster Bay along the new cliff-top walk, ending at the Disaster Bay Lookout.

ALTERNATIVE 2 (PREFERRED)

Alternative 2 involves a three day walk for users of Ben Boyd National Park. The proposed itinerary is:

- Day 1
 - Walk from historic Boyds Tower in the north, along the eastern coastline, trekking through Melaleuca woodlands past Red Sands Bay and Leatherjacket Bay and stay overnight at Mowarry Point in hut new accommodation.
- Day 2
 - Walk from Mowarry Point, travel across rocky coastlines, over rock foundations, and past secluded beaches and stay overnight Hegartys Bay in hut new accommodation.
- Day 3
 - Walk from Hegartys Bay to Green Cape lighthouse, experiencing Bittangabee Bay, Pulpit Rock, a blow hole and historic ruins. Overnight at the historic Green Cape Lightstation in existing accommodation or exit Ben Boyd National Park.
- Day 4
 - Cultural and historic heritage tours, morning birdsong or heathland experiences.

Activity 2 – Accommodation and facilities

DO NOTHING

The do-nothing approach would involve no construction of accommodation facilities. This would not meet the objectives of the proposal to deliver an ‘outstanding immersive visitor experience’ within the Ben Boyd National Park. Informal camping without toilet facilities would continue.

ALTERNATIVE 1

Alternative 1 involves new accommodation at Mowarry Point and Hegartys Bay for users of Ben Boyd National Park. The proposed accommodation includes;

- Accommodation at Mowarry Point will include hut accommodation, communal kitchen and toilet facilities
- Accommodation at Hegartys Bay will include hut accommodation, communal kitchen and toilet facilities
- Closure of informal campgrounds at Mowarry Point and Hegartys Bay.

ALTERNATIVE 2 (PREFERRED)

Alternative 2 involves new accommodation at Mowarry Point, formalisation of the existing campground at Mowarry Point and new accommodation at Hegartys Bay for users of Ben Boyd National Park. The proposed accommodation includes;

- Accommodation at Mowarry Point will include hut and camping accommodation, communal kitchen and toilet facilities.
- Accommodation at Hegartys Bay will include hut accommodation, communal kitchen and toilet facilities (camping available at Bittangabee Bay).
- Formalisation of the campground at Mowarry Point which will include tent pads, footpaths and a toilet
- Provision of additional walk-in camp sites at Bittangabee Bay (alternative assessment).

Activity 3 – Vehicle and site access

DO NOTHING

The do-nothing approach would involve no construction of additional vehicle and site access to accommodation facilities or rectification of existing safety issues at Pulpit Rock. This would not meet the objectives of the proposal to deliver an ‘outstanding immersive visitor experience’ within the Ben Boyd National Park.

ALTERNATIVE 1

Alternative 1 involves upgrade and realignment of tracks to allow for 4WD and small truck access and carparking upgrades including:

- Upgrade and realignment of Mowarry Point Trail vehicle access.
- Upgrade and realignment Hegartys Trail vehicle access including a compound site and boardwalk to accommodation precinct.
- Additional carparking facilities at Disaster Bay.
- Upgrade of the Pulpit Rock car park precinct including adjusting turning circle and parking.

ALTERNATIVE 2 (PREFERRED)

Alternative 2 reduces the access and safety work to the minimum required to undertake broader proposal and involves maintenance of existing vehicle tracks, new boardwalk at Hegartys Bay for small vehicle access and improved car parking at Pulpit Rock:

- Hegartys Bay
 - Hegartys Bay vehicle trail to undergo basic maintenance for construction to allow safe access for 4WD and small trucks.
 - Turning circle to be formalised with ‘tree island’ cleared to allow helicopter slinging, vehicle/ATV/ebike parking and material storage.
 - Small shed to be installed at turning circle.
 - Track to remain for management vehicles only and maintained for 4WD and small truck access with minimal movements.
- Upgrade of Hegartys Bay access track for ATV access
 - Mesh boardwalk to be installed from end of Hegartys vehicle access trail to accommodation precinct on existing alignment.
 - Mesh bridge to be installed over drainage south of Hegartys Bay accommodation precinct.
- Upgrade of the Pulpit Rock car park precinct including adjusting turning circle and parking.

NPWS has secured some funding for other access and safety upgrades within Ben Boyd NP. These proposals will be subject to subsequent planning and assessment processes.

4.4.3 Justification of the proposal

The Light to Light Walk Upgrade proposal was identified as part of the NPWS Visitor Infrastructure Program, a long-term strategy to deliver unique visitor experiences in regional NSW national parks.

The delivery of the Light to Light Walk Upgrade proposal meets the objectives of the NPWS Visitor Infrastructure Program to deliver nature-based tourism projects that;

- Are iconic, imaginative, inspiring and innovative.
- Transform the way visitor interact with the location.
- Provide a cohesive and strategic vision for the project location.
- Provide commercial and other partnership opportunities.
- Have the capacity to deliver regional economic benefits.

The strategy for the Light to Light Walk Upgrade proposal is consistent with the NPWS Visitor Infrastructure Program outcomes to;

- Meet demand for nature-based tourism and walking tracks, including visitation growth and greater regional dispersal of recreational activities.
- Increase participation in visitor activities and promotion of park stewardship with flow-on benefits to future revenue generation.
- Support national and state policies to increase international and domestic tourism in New South Wales.
- Align with the vision to inspire everyone to love their national parks.

5. DESCRIPTION AND FEATURES OF THE EXISTING ENVIRONMENT

5.1 DESCRIPTION OF THE EXISTING ENVIRONMENT

The proposal site is located in the Ben Boyd National Park along the New South Wales Far South Coast. The Ben Boyd National Park spans 10,485ha and is comprised of three main sectors; the largest sector located south of Eden, a central sector north of Eden and a smaller sector north of the Pambula River.

The Statement of Significance within the *Ben Boyd National Park and Bell Bird Creek Nature Reserve Plan of Management* states key values associated with the Park:

- Geological, geomorphological and landscape values.
- Biological values.
- Cultural Values.
- Tourism, recreation and educational values.

A number of features within the Park are highlighted as having national significance. These include;

- Several sites of Devonian era fossil relics, believed to originate from the intermediate period as marine animals evolved into terrestrial animals. These are of high scientific value regarding both fish species development and landscape development.
- The geologically spectacular Pinnacles erosional landform.
- The Pambula Estuarine Wetland, which is currently listed on the Directory of Important Wetlands as determined by the Commonwealth Department of Environment and Heritage, as an ecologically important site.
- Several endangered and vulnerable flora and fauna species residing in the Park.

The Ben Boyd National Park is among a system of parks that line the coast of NSW from Moruya to the Victorian Border to protect sites of cultural and natural importance. The national park is also bordered on the west by East Boyd, Broadwater and Nullica State Forests.

The existing Light to Light Walking Track is approximately 31km long and traces along the coast from Boyds Tower southward to Green Cape Lighthouse. This is located within the southern sector of the national park south of Eden.

The proposed Light to Light Walk Upgrade and associated works are located within the southern sector and described in detail in Section 4.1.

5.2 METEOROLOGICAL DATA

Climatic conditions (BOM, 2020) for Ben Boyd National Park (recorded at Green Cape AWS) indicate that the warmest month in terms of mean maximum temperatures is February; 23.8°C. The coldest month in terms of mean minimum temperatures is July; 9.2°C.

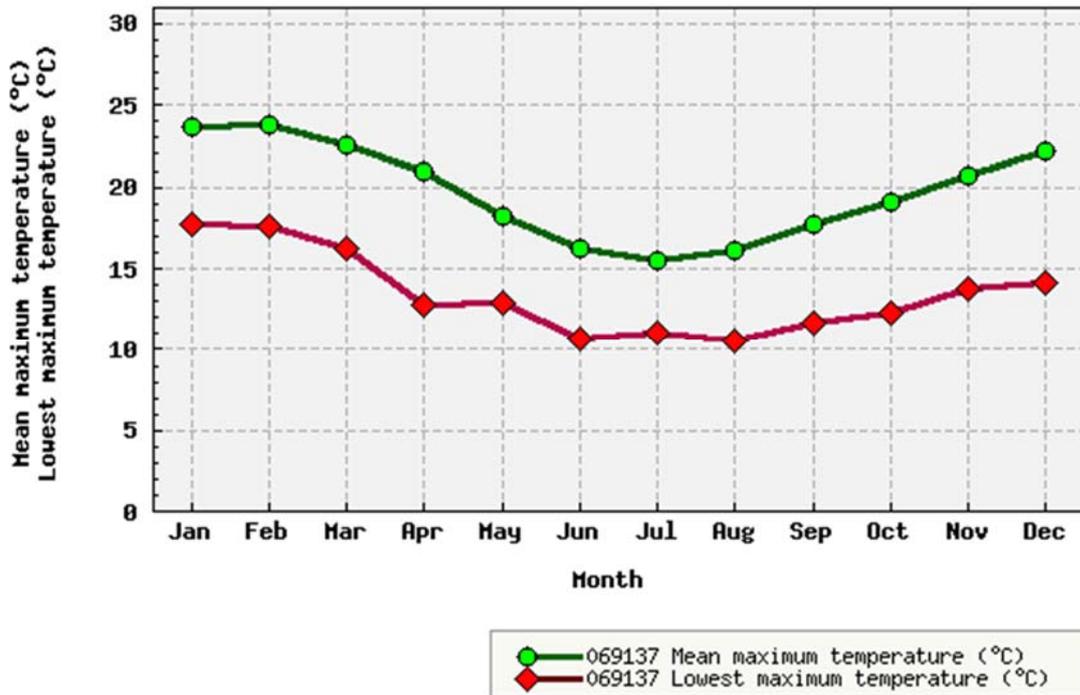


Figure 5-1 Mean historical temperature data from 2000 – 2019 (BOM 2020).

Mean annual rainfall is recorded at 611.7mm with January recording the highest Rainfall at 64.5mm and August recording the lowest monthly mean in rainfall at 34.4mm (BOM 2020).

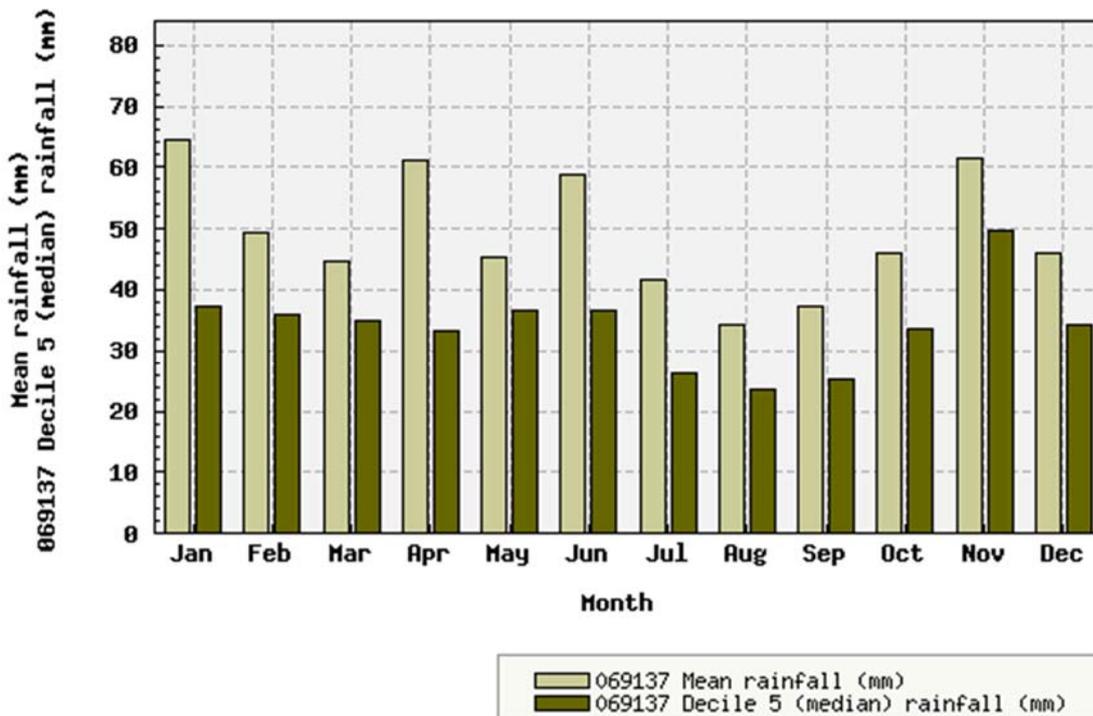


Figure 5-2 Mean historical rainfall data from 1994 – 2019 (BOM 2020).

5.3 TOPOGRAPHY

The Light to Light Walk Upgrade is located along the coastline of the Ben Boyd National Park. The varying landform and topography are largely due to the western boundary ridgeline, the influence

of coastal erosion and the termination of creeks upon reaching the ocean. The northern sector of the Park is lower than the southern measuring 100m ASL (Above Sea Level) and 160m ASL respectively. At 252m ASL the Mowarry Trig, also known as Haycock Hill, is the highest point in the Park. The coastline consists of multiple long sandy beaches north of Terrace Beach. South of Terrace Beach, cliffs are the dominant feature with occasional small bays.

Along the proposal site in particular, there is topographical exposure to both cliff faces and vegetated slopes, with the slopes ranging from relatively flat surfaces to those of a steeper angle. The walking trail itself ranges from 0m - 120m ASL, however the trail is largely along the coastal bedrock and 10 - 30 meters above sea level.

5.4 SURROUNDING LAND USES

The Light to Light Walking Track is in Ben Boyd National Park. The national park is primarily used as a recreational destination and has ecological, scientific, aesthetic, cultural and economic significance. The State Forests that border the national park to the west were previously used extensively for logging. Within the Park, Haycock Point, Mowarry Point and to an extent, Hegarty's Bay, were formerly cleared for agricultural purposes. Although impacted by bushfire, these sites are currently in recovery and native flora are progressively repopulating. At the southern extent of the Park, Green Cape Lightstation is a State Heritage listed complex. Boyds Tower also has local heritage significance.

Ben Boyd National Park is frequented by both locals and tourists for recreational purposes such as fishing, camping, walking and surfing. Associated with these activities has been the construction of roads and tracks which have extended on the pre-reservation network. Current usage of the Park also encompasses the Aboriginal Culture Camp at Haycock Point and tourist visitation to Boyds Tower, the Bittangabee building ruins and Green Cape Lightstation. The coastal towns of Eden and Pambula are both within close proximity of the National Park.

5.5 GEOLOGY/GEOMORPHOLOGY

The geological significance of the Ben Boyd National Park varies across a range of well displayed features present along the coastline. Largely composed of Upper Devonian rocks, the park contains some of the oldest rocks on the NSW coast. The folded, and often colourful, rock structures belong to the Devonian Merimbula Group and consist predominantly of sandstone, siltstone and shale. The northern sector of the Park has the largest concentration of Tertiary deposits across the Park with quartzites, gravels, clays and sand commonly found deposited in the upper strata. The southern sector has small sections of these deposits.

Specific geological features of interest within the Ben Boyd National Park include:

- Unique erosional features along the coastline. The "Pinnacles" is one such feature, formed of white sand and red clay on a steep gully side.
- Granite xenoliths present in basalt dyke rock forms.
- Rock sites with extensive quartz veins.
- Multiple sites containing remnants of Devonian fossils, largely consisting of an unknown extinct air breathing lobe-finned bony fish. These fossils have been noted as being up to 1.5 meters in length.

The Bega-Mallacoota 1:250,000 Geological Map indicates that the geology underlying the proposed works area consists of Late Devonian and Tertiary geological sequences. The works area is within

the Merimbula Group (Dm) with a small area within the Tertiary Sediments (Ts) unit (Table 5-1 and Figure 5-3).

The Devonian Sedimentary Merimbula Group rocks are the bedrock geology of the area.

Quaternary maps indicate that the rock types along the coastal area in question are Holocene era geology. Within the Estuarine plain system, Qhef Holocene tidal-delta flat geology dominates. Within the coastal barrier system, Qhbd Holocene dune and Qhbb Holocene sandy beach geological rock types. The subaqueous riverbed along the Light to Light Walk is dominated by Qhec Holocene estuarine channel geological types.

Table 5-1 Geology of proposed works area

Geological group	Description	Location within works area
Ben Boyd Formation (Dmb)	Massive mudrock and coarse sandstone	<ul style="list-style-type: none"> • Walking track • Eastern portion of Mowarry Trail and Hegartys Trail
Worange Point Formation (Dmw)	Massive sandstone with mudrock	<ul style="list-style-type: none"> • Central portion of Mowarry Trail • Western portion of Hegarty's Trail
Bellbird Creek Formation (Dmc)	Thin-bedded sandstone, siltstone and mudstone	<ul style="list-style-type: none"> • Western portion of Mowarry Trail
Tertiary Sediments (Ts)	fluvial sands, grits, lacustrine clays	<ul style="list-style-type: none"> • Central portion of Hegartys Trail



Figure 5-3 Geology of works are (Bega-Mallacoota 1:250 000).

The area hosts one geologically significant area located at Red Point, just south of Boyd's Tower. This outcrop displays folding and reverse faulting of bedrock and records an excellent example of the area's geologic history.

The massive and interbedded sandstone and mudrock rock types recorded and observed in the area exhibit low erosional potential where faults or discontinuities are absent – large boulders were observed at the bottom of steep cliffs and are likely attributed to coastal erosion.

Areas with Tertiary Sediment cover are considered to have a high erosional potential due to being unconsolidated.

5.6 SOIL TYPES AND PROPERTIES

Ben Boyd National Park is composed of relatively erodible soils consisting of a large quantity of shallow sandy soil, often containing a large amount of humus. Soils originating from Tertiary deposits commonly contain gravel and sand limiting the fertility of the soils. Vehicle tracks and recreation areas are the largest causes of surface erosion.

According to NSW Governmental records (NSW OEH, 2018), the National Park is largely composed of kurosols, with areas of natric kurosols, podosols and rudosols and tenosols (Figure 5-4).

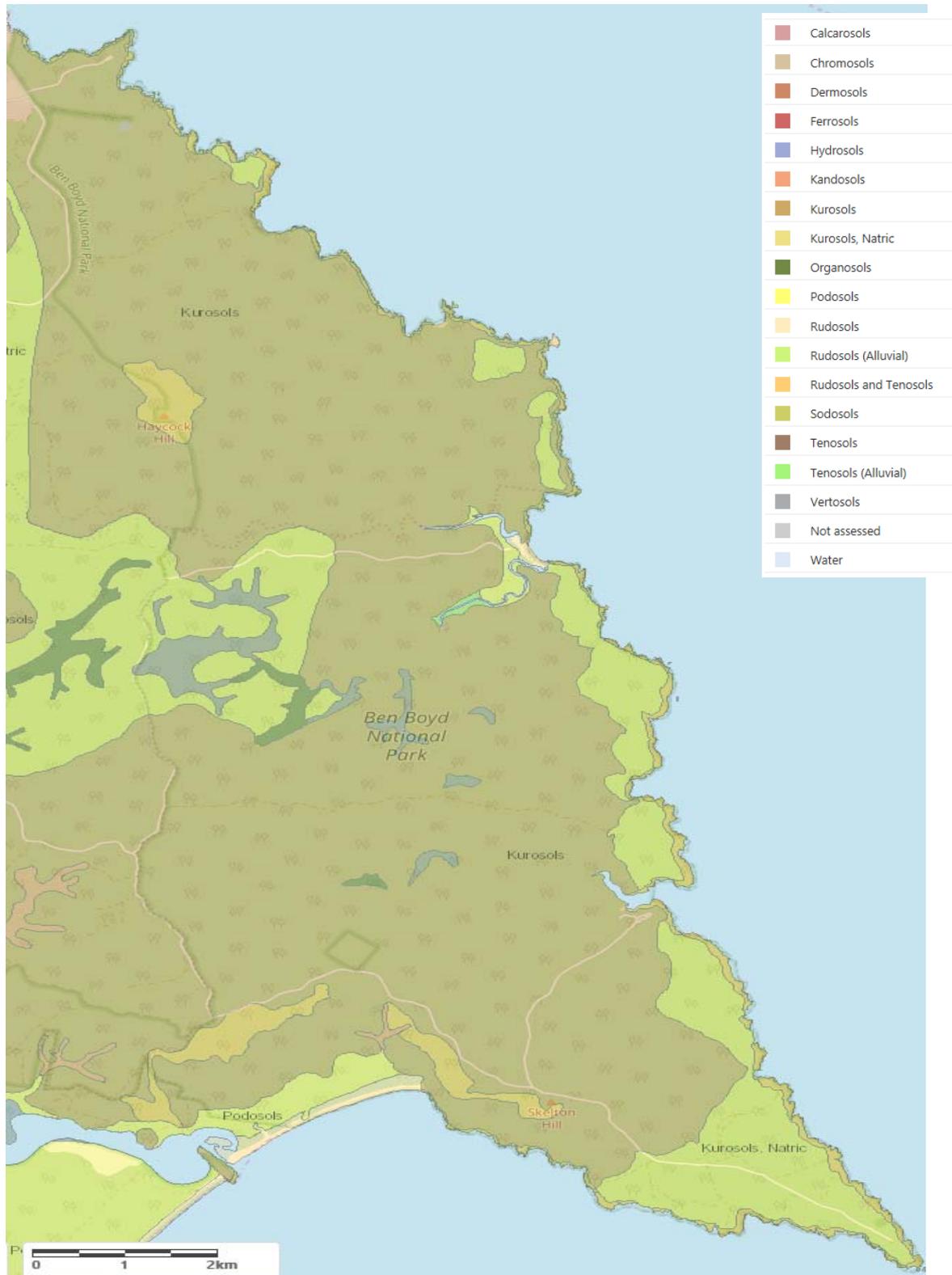


Figure 5-4 Australian soil classification soil type map of the Ben Boyd National Park (NSW OEH, 2018).

Statewide land and soil mapping describes soil types and properties of the proposal site (NSW OEH, 2018) (Table 5-2).

Table 5-2 Soil landscapes within the proposal site and their limitations.

Soil Landscape	Description	Location
Merrica 8823me	<ul style="list-style-type: none"> • Stony, infertile and erodible soils • Mass movement and rockfall hazard • Localised steep slopes and rocky outcrops • Undulating hills on sandstone, siltstone and conglomerate • Topsoils are non-cohesive and highly permeable • Sheet erosion risk, gully erosion risk • Imperfect drainage 	<ul style="list-style-type: none"> • Boyd's tower • Leather Jacket Bay • South of Leather Jacket Bay • West of Mowarry Point • Mowarry Point (side track) • Sea Caves • Bittangabee Bay (North) • City Rock to Disaster Bay • Mowarry Point Accommodation • Mowarry Trail • Hegartys Trail
Merrica Variant A 8823mea	<ul style="list-style-type: none"> • Erosional, deeper or less rocky soils on undulating low hills 	<ul style="list-style-type: none"> • Hegartys Accommodation and Helipad • Hegartys Trail
Merrica Variant C 8823mec	<ul style="list-style-type: none"> • Colluvial, very rocky sites on steep slopes 	<ul style="list-style-type: none"> • Disaster Bay to Disaster Bay Lookout • Disaster Bay Toilet
Merrica Variant E 8823mee	<ul style="list-style-type: none"> • Coastal headlands with <i>Melaleuca armillaris</i> 	<ul style="list-style-type: none"> • South of Red Sand's Bay • Bittangabee Bay to Pulpit Rock • Green Cape to City Rock • Pulpit Rock Toilet
Merrica Variant F 8823mef	<ul style="list-style-type: none"> • On sites with resistant rock strata; undulating to rolling low hills to hills. • Limitations include stony, infertile, erodible soils on steep slopes. 	<ul style="list-style-type: none"> • Bittangabee Bay (North)
Kangarutha Point 8823kp	<ul style="list-style-type: none"> • Coastal cliffs and rock platforms • Limitations include shallow soil on very steep slopes, rockfall hazards, low fertility, minimal use for grazing or cultivation • Coupled with the contribution of water, sheet erosion poses a risk • Wave erosion 	<ul style="list-style-type: none"> • South of Red Sand's Bay • Leather Jacket Bay • Mowarry Point (side track) • Sea Caves • South of Saltwater Creek • Bttangabee Bay to Pulpit Rock

Soil Landscape	Description	Location
	<ul style="list-style-type: none"> Stony non-cohesive shallow soils with poor moisture availability 	<ul style="list-style-type: none"> Pulpit Rock to Green Cape Green Cape to City Rock
Nadgee Moor 8823nm	<ul style="list-style-type: none"> Tertiary sediments The windswept plains are infertile and imperfectly-drained Very high limitations for grazing and cultivation Gully erosion risk, wind erosion risk Poor water availability, non-cohesive and acidic soils Prone to seasonal waterlogging 	<ul style="list-style-type: none"> Sea Caves South of Saltwater Creek Bittangabee Bay (North) Green Cape to City Rock

5.7 WATERWAYS (INCLUDING WILD AND SCENIC RIVERS)

The Park is within the area of the Southern Rivers Catchment Management Authority. Numerous watercourses drain from the coastal ridge within the park (see Figure 5-5). Most are intermittent. The catchment systems of Ben Boyd National Park are generally well-kept as almost all the contributing watercourses are located within the National Park or surrounding state forests. As such, the catchment systems are not exposed to a high level of pollution. The largest source of pollutant material originates from the adjacent forestry operations, roads and tracks throughout the Park which lead to sediment runoff.

Four major watercourses are located within the vicinity of the proposal site:

- Mowarry Creek.
- Saltwater Creek.
- Woodburn Creek.
- Bittangabee Creek.

At both Saltwater and Woodburn Creeks, small estuarine lagoons have developed, and several wetlands have formed along Woodburn and Bittangabee Creeks in areas of poor drainage. The ecosystems of these sites are highly valued.

During site surveys conducted in December 2018 and January 2019, and noted during additional surveys in 2020, 39 smaller unnamed watercourses were identified. Three of these watercourses contained running water and 11 contained pooling. Waterways with running water are considered to provide higher value habitat (riparian and aquatic) and are more sensitive to impacts (including nutrient input / pollution that may disperse into larger areas of habitat).

Groundwater systems are considered relatively stable, however the central sector of the Park (north of this proposal location) comprised largely of sand dominated deposits, is at risk of polluted runoff originating from the Eden garbage tip which is located on the western edge of the Park along the Princes Highway approximately 5 km north of Eden.

There are no declared wild or scenic rivers located within Ben Boyd National Park or within the vicinity of the proposal site.



Light to Light Walk Upgrade REF -
Waterways of the Ben Boyd NP Locality

- Points of Interest
 - Proposed New Track
 - - Existing Walking Tracks
 - - Existing Subsidiary Tracks
 - - Redundant Tracks
- | Strahler Stream Order |
|-----------------------|
| 1 |
| 2 |
| 3 |
| 4 - 5 |
| 6 - 7 |
- Estuaries and Waterbodies



A3 @ 1:65,000
Ref: 18569 Light to Light REF
Author: TH
Date Created: 06/09/2021
Datum: GDA94 \ MGA94 Zone 55

Data Attribution
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Figure 5-5: Watercourses

5.8 CATCHMENT VALUES

The watercourses within the vicinity of the proposal site are part of the larger Southern Rivers Catchment spanning 29,000km² bounded by the Great Dividing Range and the coastline. According to the DPI Fisheries - Freshwater Community status of the major rivers in the catchment, these range from very poor to fair. It is only as the major rivers approach the bays that the status improves to good. Refer to Figure 5-6.

5.9 COASTAL RISK AREAS

Considering the close proximity of the proposal site to the ocean, multiple areas are at risk of inundation from the sea level rise associated with climate change. This is particularly evident for the beach and the low-lying bay areas, including Hegartys Bay, Leather Jacket Bay and the beach at the Saltwater Creek campground. The *Bega Valley LEP 2013* does not include mapping of areas at risk of sea level rise due to climate change. Mapping under the *State Environment and Planning Policy (Coastal Management) 2018* Shows the coastline of the Ben Boyd National Park to be listed as Coastal Use Area and Coastal Environment Area.

It is unlikely that there will be any potential of acid sulfate soil occurring along the Light to Light Walk as it occurs outside areas with a high probability of occurrence (Appendix F). A small risk area is located at the entrance of Saltwater Creek within the area proposed for additional camp sites (not part of this assessment). According to NSW OEH (2018) this estuarine site is deemed to have a high probability of acid sulfate soils.

5.10 WETLANDS

The *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Report was generated on the 15th January 2020. This report indicated that no wetlands of International Importance are located within 10km of the National Park.

Wetlands within the National Park are located around Woodburn and Bittangabee Creeks. These wetlands form in areas of poor drainage, and the ecosystems of these sites have high value. These wetlands are mapped as Coastal Wetland under the *State Environment and Planning Policy (Coastal Management) 2018*.

These wetlands along Woodburn and Bittangabee Creeks are not of significant proximity to the works associated with this proposal to pose a risk to those wetland ecosystems.

The proposed works would not occur within land mapped as coastal wetlands or their proximity zones under the *State Environment and Planning Policy (Coastal Management) 2018*.

5.11 SEPP (COASTAL MANAGEMENT) - LITTORAL RAINFOREST:

The proposed works are not within land mapped as littoral rainforest or their proximity zones under the *State Environment and Planning Policy (Coastal Management) 2018*.

5.12 SEPP (COASTAL MANAGEMENT) – COASTAL WETLAND:

The proposed works are not within land mapped as Coastal Wetland or their proximity zones under the *State Environment and Planning Policy (Coastal Management) 2018*.

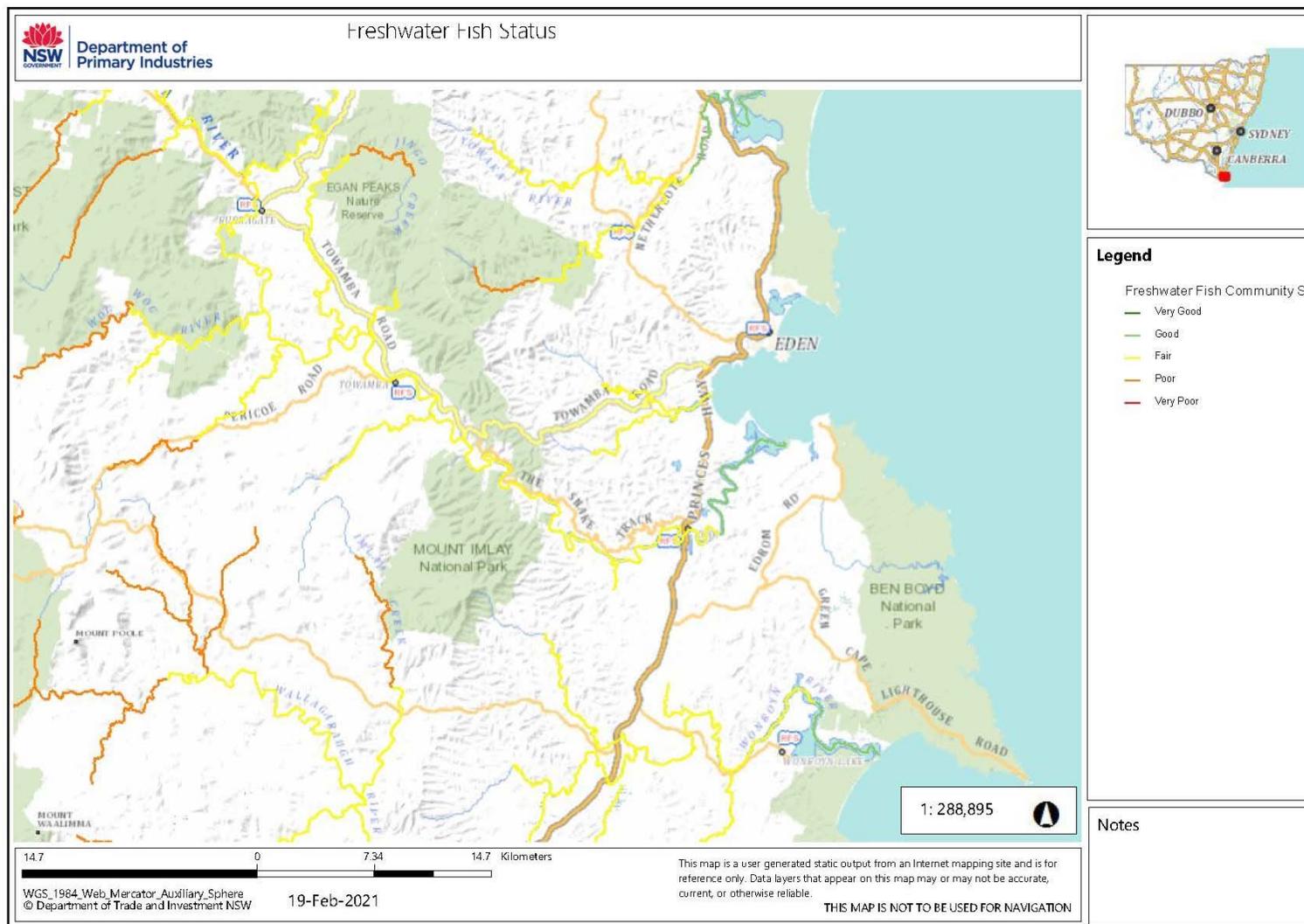


Figure 5-6 Freshwater Fish Community status

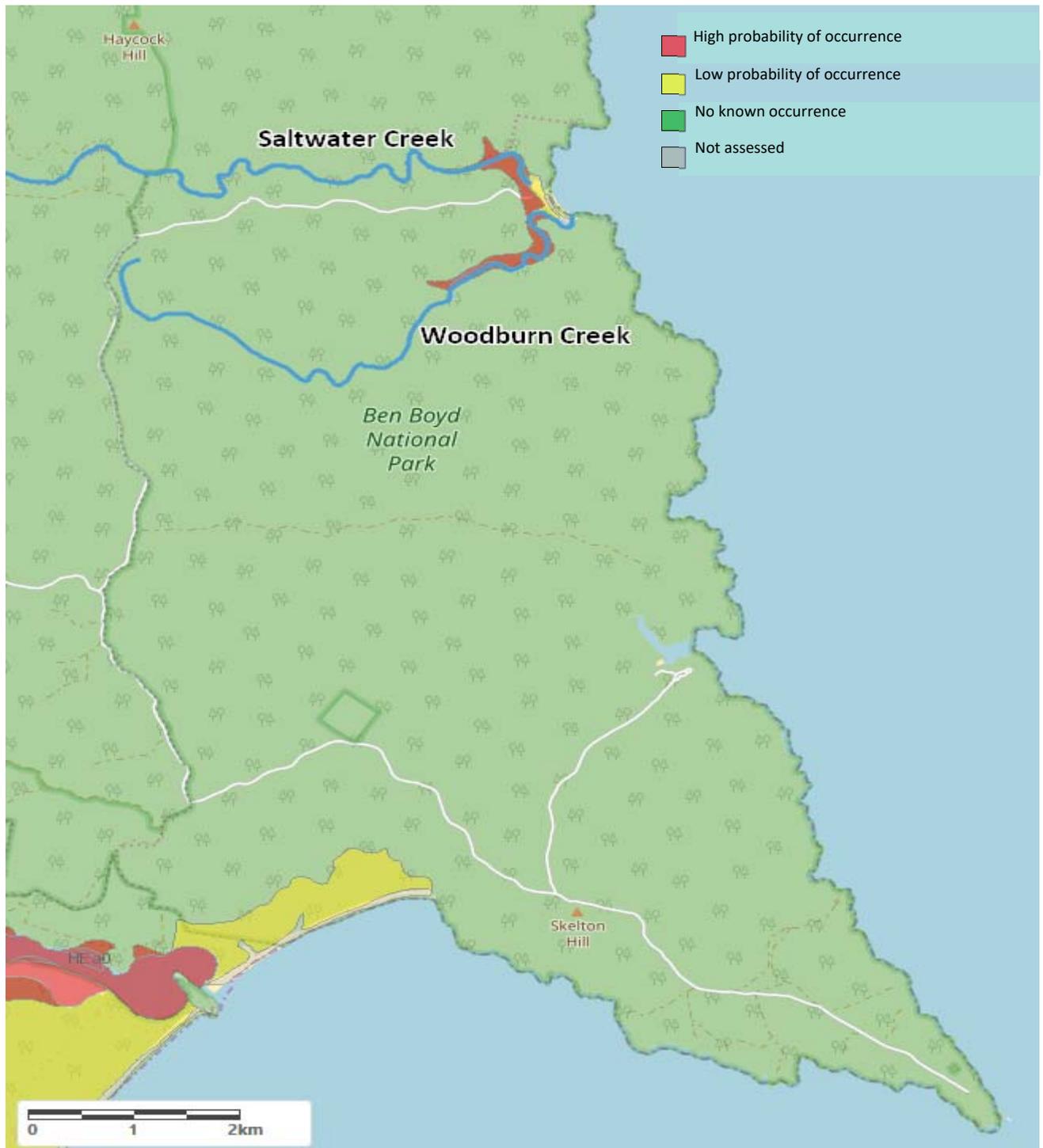


Figure 5-7 Probability of Acid Sulfate Soil occurrence within the vicinity of the proposal site (NSW OEH, 2018)

5.13 ECOLOGICAL COMMUNITIES (THREATENED ECOLOGICAL AND REGIONALLY SIGNIFICANT COMMUNITIES)

5.13.1 Database searches

The NSW Wildlife Atlas BioNet database search conducted on the 19th of July 2021 indicated 11 threatened communities listed under the BC Act for the coordinates North: -36.99, West: 149.74, East: 150.26, South: -37.38. The EPBC Act Protected Matters Search Tool conducted on the 19th of July 2021 indicated 3 threatened ecological communities for the study area using a 10km buffer.

5.13.2 Site inspection

Field surveys were undertaken in December 2018 (17th, 18th, 20th, and 21st); January 2019 (23rd, 24th and 26th), August 2019 (28th and 29th), and November 2020 (24th and 25th). All surveys were undertaken by a senior ecologist and an assistant. This included senior botanists and zoologists.

The main aims of the field surveys were to gather enough floristic data to determine with confidence the plant community occurring within the study area, and to assess the condition and habitat quality of the native vegetation. Secondly, the survey aimed to identify areas of potential habitat for threatened fauna and flora species. Targeted field surveys were also undertaken for particular species.

The following areas were assessed in the field surveys:

- The entire length of the proposed Light to Light track, including the area within 15 metres either side of the flagged proposed track (Activity 1);
- The footprint of the proposed accommodation and pack camping sites Mowarry Point (Activity 2);
- The footprint of the proposed accommodation site Hegartys Bay (Activity 2);
- The vehicle access track to Hegartys Bay (vehicle-based survey) (Activity 3);
- The Pulpit Rock Carpark area (Activity 3)

It is noted that a wider area was searched (including the Mowarry Point Access Trail) as per the project's original scope. Sightings made within areas outside the current development footprint were retained as they are useful in providing species occurrence information in the wider area however, data collected outside the development footprint was not attributed to the quantification of the development impact.

The proposed works areas had previously been marked with flagging tape by NPWS in most areas. The NGH team followed the flagged track for most of the route. Where the flagging tape was missing, the centreline of the 30 m study area corridor was followed, using GIS layers loaded onto an iPad. In some places, the survey involved navigation through thick vegetation, rugged terrain and on steep coastal cliffs.

No Threatened Ecological Communities were identified on the proposal site.

Two areas within the proposal site are mapped as having high biodiversity value on the OEH (2018) Biodiversity Values Map:

1. West of Leather Jacket Bay incorporating sections of the proposed walking track and proposed Mowarry Point Trail upgrade.
2. West of Bittangabee Bay incorporating a small section of the proposed walking trail.

5.14 FLORA AND FAUNA

5.14.1 Flora

Regional context

The proposal site is located in the Ben Boyd National Park along the New South Wales Far South Coast. The national park spans 10,485ha and is comprised of three main sectors; the largest sector located south of Eden, a central sector north of Eden and a smaller sector north of the Pambula River.

There are a number of nationally significant features within the national park and several endangered and vulnerable flora and fauna species are known exist in the Park.

Approach

DESKTOP ASSESSMENT

The following database searches were undertaken on 12th December 2018, and repeated on 27th February 2020 and 19th of July 2021 to obtain lists of threatened and migratory flora and fauna that have the potential to occur at the site:

- NSW BioNet Wildlife Atlas database for species of flora and fauna and populations listed as threatened under the *Biodiversity Conservation Act 2016* recorded for the coordinates North: -36.99, West: 149.74, East: 150.26, South: -37.38. The search identified 11 Endangered Ecological Communities (EEC), 10 threatened flora species and 52 threatened fauna species, comprising of, 2 amphibians, 31 bird species and 18 mammal species.
- Commonwealth Environment Protection Biodiversity (EPBC) Protected Matters Search found species and populations listed as threatened under the *Environment Protection Biodiversity Conservation Act 1989* within a 10km radius of the proposal site. The search identified 3 Endangered Ecological Communities, 50 migratory species and 69 threatened species that have the potential to occur at the site.

The results of the database searches are provided in full in Appendix F. During the field surveys undertaken during December 2018 and January 2019, the following information was collected:

- Plant species identification (top canopy, middle stratum, ground cover species) to enable the determination of plant community types.
- An assessment of the condition/habitat quality of the native vegetation (ground cover density, human disturbance and evidence of recent fire).
- Records of significant habitat features, including:
 - Hollow-bearing trees.
 - Dead, fallen timber with hollows.
 - Waterways, soaks and pools.
 - Scats, tracks and runways for wildlife.
 - Feed trees of the Glossy Black Cockatoo (*Calyptorhynchus lathami*).
 - Feed trees and gliding trees for the Yellow-bellied Glider (*Petaurus australis*).
 - Potoroo/bandicoot diggings.

- Spotted-tail Quoll scats/latrines (*Dasyurus maculatus*).
- Owl roosts and nests (pellet/whitewash search).
- Presence of invasive weeds and feral animals (foxes, rabbits).

Based on existing vegetation mapping and the initial site inspection, vegetation within the proposal site was assigned to Plant Community Types (PCTs) in accordance with the Vegetation Information System (VIS) Classification Database, which is a central authoritative repository for native vegetation data managed by NSW EES. PCTs were determined based on the presence of diagnostic species identified in the site survey.

The following threatened plant species were searched for where suitable habitat was encountered.

Table 5-3 Targeted threatened species survey summary; survey effort and timing

Target Species	Survey type	PCT	Survey effort	Timing
<i>Viola cleistogamoides</i>	Targeted search	1141	During PCT identification; 9 days.	Dec, Jan
<i>Cryptostylis hunteriana</i>	Targeted search	1141	During PCT identification; 9 days.	Dec, Jan
<i>Galium austral</i>	Targeted search	Not associated with any PCTs	During PCT identification; 9 days.	Dec, Jan
<i>Pultenaea pedunculata</i>	Targeted search	721	During PCT identification; 9 days.	Dec, Jan

Existing environment

PLANT COMMUNITY TYPES RECORDED WITHIN THE PROPOSAL SITE

PCTs identified within the proposal site are:

PCT 721 - Bracelet Honey-myrtle – Coast Tea-tree tall shrubland on headlands, South East Corner Bioregion.

PCT 772 - Coast Banksia – Coast Wattle dune scrub of the Sydney Basin Bioregion and South East Corner Bioregion.

PCT 777 - Coast Grey Box – Mountain Grey Gum – Stringybark moist shrubby forest in coastal gullies, southern South East Corner Bioregion.

PCT 891 - Ironbark - Woollybutt - White Stringybark open forest on coastal hills, South East Corner Bioregion

PCT 1084 - Red Bloodwood – Silvertop Ash – White Stringybark heathy open forest on costal foothills, southern South East Corner Bioregion.

PCT 1141 - Scrub She-oak – Swamp Banksia coastal lowland heath, southern South East Corner Bioregion.

PCT 1157 - Silvertop Ash – Rough-barked Apple shrubby open forest on the hinterland hills, far southern South East Corner Bioregion.

No PCTs were identified as meeting the criteria of Threatened Ecological Communities under the EPBC Act or BC Act.

In most areas, the mapped PCTs were found to be in very good condition (undisturbed and weed free), including excellent examples of intact, species rich South Coast Heath with varied fire histories (PCT1141 'Scrub She-oak – Swamp Banksia coastal lowland heath, southern South East Corner'); this PCT has restricted distribution in NSW along a narrow coastal strip south from Bournda to the Victorian border.



Figure 5-8 PCT 1141 – example of condition type 1; South Coast heath burnt in 2016



Figure 5-9 PCT 1141 example of condition type 2; north of Bittangabee Bay, South Coast heath burnt in 1990 - 1996

The lack of disturbance to the native vegetation was notable along the walking route, with some exceptions:

- Evidence of human disturbance (removal of undergrowth and some canopy trees) around the campsites at Hegartys Bay, Mowarry Point, Saltwater Creek, Bittangabee Bay; and at the Disaster Bay, City Rock, Green Cape, Boyd Tower and Pulpit Rock car parks.
- Evidence of historical logging along the Hegartys Bay and Mowarry Point access trails.
- Severe post-fire weed infestation in the northernmost survey area (south of Boyds Tower)
- Scat records of the European Rabbit (*Oryctolagus cuniculus*) listed as a Key Threatening Process (BC NSW and EPBC Australia) were common on the walking track corridor.

- One scat record of the European Fox (*Vulpes vulpes*) (also listed as Key Threatening Processes (BC NSW and EPBC Australia) was recorded.
- Many areas burnt in the 2019-2020 fires had also been burnt in 2014 and 1999. For these areas, there may be areas that were re-burnt before they had time to recover from the previous fires and this is likely to lead to population declines and reduced recovery. High Fire Frequency is listed as a Key Threatening Process

Threatened species

No threatened flora species were observed during two flora survey programs, taking in all areas to be impacted by the works. There are three species including Leafless Tongue Orchid (*Cryptostylis hunteriana*), Hidden Violet (*Viola cleistogamoides*) and Matted Bush Pea (*Pultenaea pedunculata*) which have historical records of occurrence within the region, and/or potential habitat within the study area). Considering the availability of potential habitat and the cryptic nature of these threatened flora species, five-part tests were undertaken as part of the BAR.

5.14.2 Fauna

Approach

DESKTOP ASSESSMENT

The NSW Wildlife Atlas BioNet database search conducted on 19th of July 2021 indicated 11 threatened communities listed under the BC Act for the coordinates North: -36.99, West: 149.74, East: 150.26, South: -37.38. The Search identified 52 threatened fauna species, comprising of, 2 amphibians, 31 bird species and 18 mammal species. The EPBC Act Protected Matters Search Tool identified 50 migratory species and 69 threatened species that have the potential to occur at the site.

The results of the database searches are provided in full in Appendix F.

Site survey

Informed by the vegetation surveys, a targeted survey program was undertaken, summarised below.

Table 5-4 Targeted threatened species survey summary; survey effort and timing

Target Species	Survey type	PCT	Survey effort	Timing
Long-footed Potoroo		Camera Signs	59 cameras/14 nights	11-28 March & 1-16 April 2019
Long-nosed Potoroo	1141, 777, 772, 721	Camera Signs	59 cameras/14 nights	11-28 March & 1-16 April 2019
Smoky Mouse	1084	Camera	59 cameras/14 nights	11-28 March & 1-16 April 2019
Eastern Chestnut Mouse	772, 721	Camera	59 cameras/14 nights	11-28 March & 1-16 April 2019
White footed Dunnart	1157, 1141, 772, 721	Camera	59 cameras/14 nights	11-28 March & 1-16 April 2019

Target Species	Survey type	PCT	Survey effort	Timing
Southern Brown Bandicoot	772, 721	Camera Signs	59 cameras/14 nights	11-28 March & 1-16 April 2019
Spotted-tail Quoll	772, 777, 891, 1157, 1084, 1141	Camera Signs	59 cameras/14 nights	11-28 March & 1-16 April 2019
Green and Golden Bell Frog	772,	Nocturnal – spotlighting call playback	4 nights - 3.3 person hours 1.3 person hours	11-13 & 26 March 2019
Eastern Bristlebird	721, 772, 1141	Diurnal bird survey	12 x 20 minute surveys – 4 person hours	11-14 March & 1-2 April 2019
Eastern Ground Parrot	721, 1141	Diurnal bird survey	12 x 20 minute surveys – 4 person hours	11-14 March & 1-2 April 2019
<i>Viola cleistogamoides</i>	Targeted search	1141	During PCT identification; 9 days.	Dec, Jan
<i>Cryptostylis hunteriana</i>	Targeted search	1141	During PCT identification; 9 days.	Dec, Jan
<i>Galium austral</i>	Targeted search	Not associated with any PCTs	During PCT identification; 9 days.	Dec, Jan
<i>Pultenaea pedunculata</i>	Targeted search	721	During PCT identification; 9 days.	Dec, Jan
Long-footed Potoroo		Camera Signs	59 cameras/14 nights	11-28 March & 1-16 April 2019
Long-nosed Potoroo	1141, 777, 772, 721	Camera Signs	59 cameras/14 nights	11-28 March & 1-16 April 2019
Smoky Mouse	1084	Camera	59 cameras/14 nights	11-28 March & 1-16 April 2019
Eastern Chestnut Mouse	772, 721	Camera	59 cameras/14 nights	11-28 March & 1-16 April 2019
White footed Dunnart	1157, 1141, 772, 721	Camera	59 cameras/14 nights	11-28 March & 1-16 April 2019
Southern Brown Bandicoot	772, 721	Camera Signs	59 cameras/14 nights	11-28 March & 1-16 April 2019
Spotted-tail Quoll	772, 777, 891, 1157, 1084, 1141	Camera Signs	59 cameras/14 nights	11-28 March & 1-16 April 2019

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Eastern Ground Parrot	721, 1141	Diurnal bird survey	12 x 20 minute surveys – 4 person hours	11-14 March & 1-2 April 2019

Assessment of the proposed works area

DATABASE SEARCH RESULTS

Table 5-5 Targeted threatened species survey results summary

Species	Number of individuals	Location	Notes
Dusky Woodswallow (<i>Artamus cyanopterus</i>)	1	heath west of the Pulpit Rock carpark	
Glossy Black Cockatoo (<i>Calyptrorhynchus lathamii</i>)	3	Mowarry Access trail	Adult pair and juvenile <i>Allocasuarina littoralis</i> , is common in this location
Powerful Owl (<i>Ninox Strenua</i>)	1	Green Cape Lighthouse Road shortly after entering the woodland from the open heath near the Pulpit Rock turnoff	Juvenile
White-bellied Sea Eagle (<i>Haliaeetus leucogaster</i>)	2	Flying overhead	Pair observed on all field survey days
Wedge-tailed eagle (<i>Aquila audax</i>)	1	Near the Sea Caves	
Spotted-tail Quoll (<i>Dasyurus maculatus</i>)	1 scat	on the rocks near the Sea Caves	
Southern Brown Bandicoot (<i>Isodon obesulus obesulus</i>)	8 sightings	LC41; between Pulpit Rock & Green Cape	8 images recorded, with 1 individual in each image
Long-nosed Potoroo (<i>Potorous tridactylus</i>)	24 sightings at 9 locations	LC03; 300m south of Bittangabee Bay LC40, LC41; between Pulpit Rock & Green Cape	24 images recorded, with 1 individual in each image

		LC53, LC55, LC56, LC57, LC58 & LC59; on the northern side of Bittangabee Bay	
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Threatened species assessments

A total of 31 threatened species were identified as likely to occur on site and with a potential to be impacted. Each species was addressed in a Test of Significance (BC Act listed species) or Assessment of Significance (EPBC Act listed species) and are discussed in detail in Section 9.3 of the BA. Each assessment concluded that a significant impact is not considered likely considering measures accounted for in the planning of the proposal, the recommended mitigation measures and the relatively small extent of clearing considering the vegetation present within the study area. No threatened species are considered to be at risk of significant impacts. Potential impacts to migratory species were also assessed. Significant impacts are deemed unlikely for any EPBC listed migratory species.

Taking into consideration the impacts of the 2019/2020 bushfire, suitable breeding and foraging habitat in adjoining habitat remains in some areas, and the limited loss of foraging, nesting, roosting and denning resources caused by the proposal is unlikely to place any of the threatened fauna or flora species at risk of extinction. More mobile species (e.g. birds and bats) are unlikely to rely on burnt areas of the site until vegetation exhibits substantial recovery. However, recovery within 10 months was evident, therefore by the time construction begins, habitat for flora and fauna species at the subject site and in adjacent areas of the national park are likely to be extensive.

Areas of outstanding biodiversity value

The proposal area is not located within Area of Outstanding Biodiversity Value declared under Part 3 of the Biodiversity Conservation Act, and thus not listed in Part 3 of the Biodiversity Conservation Regulation 2017.

5.15 SEPP (KOALA HABITAT PROTECTION) 2020

The proposal site is located within the Bega Valley Local Government Area (LGA). Although the Bega Valley LGA is listed in Schedule 1 of the SEPP, it does not apply as the proposal site is on land reserved under the *National Parks and Wildlife Act 1974*.

5.16 WILDERNESS (NOMINATED OR DECLARED)

The proposal site is not located within a nominated or declared Wilderness area under the Wilderness Act

5.17 ABORIGINAL CULTURAL HERITAGE

Lantern heritage Pty Ltd prepared the ACHAR which has been summarised by NPWS. NGH takes no responsibility for the content of this section or the assessment within it as NPWS has provided this information.

5.17.1 Regional context

Several Aboriginal archaeological sites are recorded on or close to the existing walking track, new alignments and precincts and there is potential for unrecorded sites to be present. A study of the intangible cultural heritage study of Ben Boyd National Park (Donaldson 2018) found the general landscape and specific locations within south Ben Boyd National Park are of cultural significance to many local Aboriginal people.

5.17.2 Summary of ACHA

NPWS engaged consultant archaeologists Lantern Heritage to conduct an updated Aboriginal Cultural Heritage Assessment (ACHA) in accordance with OEH guidelines and codes following the 2019/2020 Border Fire. This followed earlier work undertaken by OnSite CHM. The ACHA is summarised below and provided in full Appendix A (restricted access). The purpose of the report is to:

- Conduct the ACHA in consultation with the Aboriginal community.
- Prepare the assessment in accordance with relevant OEH codes and guidelines and to produce an ACHA to accompany an AHIP application should one be required.

Consultation with Registered Aboriginal parties was undertaken in accordance with the *OEH Aboriginal Cultural Heritage Consultation Requirements for Proponents* (Department of Environment, Climate Change and Water, 2010). Three registered Aboriginal parties responded to the invitation to register an interest in being consulted about the project and a project meeting was held subsequently with two of the RAPs to discuss management and mitigation options. The groups/individuals who registered interest were:

- Bega Local Aboriginal Land Council (LALC);
- Eden LALC; and
- Steven Holmes (representing Thaua Country Aboriginal Corporation).

Extensive site searches were conducted via AHIMS on 21 January 2021 and on 15 February 2021. One hundred and eighty-one (181) sites or objects were listed as being present within the south Ben Boyd National Park search area. Of the 181 sites listed within the search area, there were 93 previously recorded Aboriginal sites listed on AHIMS as being within 100m of the Light to Light walk upgrade areas

Previous investigations between Boyd Tower and Green Cape Lighthouse within Ben Boyd National Park have identified a suite of Aboriginal sites along the coastal fringe, including Shell middens, Artefact Scatters and at least one burial.

5.17.3 Pre bushfire field surveys and excavation

Initial archaeological fieldwork was undertaken over 10 days in August 2018. Fieldwork involved surveying existing and new sections of track, the latter including substantial realignments of the track between Boyds Tower and Green Cape and a new section of track between Green Cape and Wonboyn beach.

The fourth day of the proposal, Green Cape to Wonboyn was removed following this initial fieldwork. The change was in recognition of the need to conserve the rich suite and complex of previously unrecorded Aboriginal sites of high scientific and cultural integrity along the southwestern coast of the national park.

In August 2019 OnSite CHM conducted test excavations at Leatherjacket Bay along the access road to Mowarry Point and at the proposed accommodation area at Hegartys Bay. Test excavations revealed significant cultural deposits which remains otherwise largely obscured and confirmed the importance of these embayments as cultural foci points in this landscape.

5.17.4 Post bushfire field surveys and excavation

NPWS engaged Lantern Heritage to complete an assessment of bushfire impacts to known sites associated with the Light to Light walking track following the 2019/20 Border Fire. Lantern was also engaged to conduct an archaeological survey for Aboriginal heritage along sections of new track alignment and conduct test excavation at Mowarry Point campground in the location of proposed infrastructure upgrades.

In 2020, Lantern Heritage surveyed the Light to Light upgrade areas and recorded a total of 107 sites that comprised of 79 previously recorded sites. Due to the high visibility encountered during survey, the extent of previously recorded sites was clearly seen to be much larger than originally observed. Rather than record additional small sites, Lantern used a large-scale landform-based approach to combine previously recorded sites into larger sites where appropriate.

Sites were recorded within each section of proposed upgrades with the exception of the Pulpit Rock access track and carpark area, where no sites were recorded. Impacts to Aboriginal sites caused by the Border Fire varied greatly within the surveyed areas.

The field survey identified areas of Potential Archaeological Deposit (PAD) across the proposed Mowarry Point accommodation area. In December 2020, Lantern Heritage undertook an archaeological test excavation program within the identified impact areas in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b). The test excavation identified the presence of subsurface archaeological deposit within four locations. The artefact assemblage across the four sites comprised flakes, flake fragments, other debitage, as well as cores, retouched tools and manuports.

A number of Aboriginal sites would be impacted by the proposal and an Aboriginal Heritage Impact Permit (AHIP) under section 90A of the NPW Act would be required.

5.18 NATIONAL, STATE & LOCAL NATURAL OR CULTURAL HERITAGE VALUES

5.18.1 Regional context

The post contact history of the Park dates back to 1797 when George Bass arrived to shore close to the mouth of the Pambula River in the northern sector of the Park. This was then followed by Matthew Flinders who lost eight of his men in 1802 when he moored at Disaster Bay and sent men ashore in search of water. Occupation by European settlers didn't occur until the 1840's when the Imlay family settled in the area to found agricultural grazing and commercial whaling stations.

During 1844 Benjamin Boyd, established a whaling site at Bittangabee and began competition with the Imlay whaling crews which came to an end in 1848 when the Imlay family underwent a family tragedy. At this point, Boyd owned a commercial empire with establishments in the Riverina and Monaro. Boyd came to Australia in 1842 as a London stockbroker, however he returned to London after the collapse of his empire in 1849 leaving behind Boyds Tower and the whaling station at East Boyd.

The sandstone Boyds Tower was originally built in the prospect of becoming a lighthouse, however, after a dispute with the government Boyd utilised it as a lookout from which to spot whales. After the departure of Boyd, George Davidson also began to utilise the tower in this way. In 1988 a conservation management plan was implemented to protect the heritage of Boyds Tower.

Green Cape Lighthouse, located at the southernmost point of Ben Boyd National Park, began operation in 1883. The light station complex consists of the 29m lighthouse, the residences of the head and the assistant keeper and multiple shed buildings. In 1997 the light system within the lighthouse was replaced by an automated system, as of this point the light tower came under the management of NPWS. In the vicinity of the lighthouse is a gravesite with the remains of some of the victims of a shipwreck off the coast. One of the largest shipwrecks was that of Ly-ee-moon in 1886 with the loss of approximately 76 lives.

Further historic sites within the Park include a concrete storehouse at Bittangabee Bay which delivered supplies to the lighthouse during its construction. A wooden tramway, which was used to transport the ship delivered supplies to the lighthouse until 1920. The current state of the building is poor, however remnants remain from the wharf and collapsed tramway bridges.

Although there are many remnants of other historical sites within the Park, ranging from instances of whaling, to residential and agricultural indications, there is very little known about their history. Historical sites in the southern sector of the park where the proposal is located include:

- Multiple sites of building or hut remains including locations in the vicinity of Green Cape, Saltwater Creek and Hegartys Bay.
- Remnants of quarries and a previous kiln at the Bittangabee house.
- Building foundations, a stone well and a scattering of building blocks indicating prior agricultural use, remaining at Mowarry Point.
- A well-preserved corrugated iron shelter located at Disaster Bay.
- Fences at Leather Jacket Bay and at Skelton Hill Trig, both post and rail.
- Telegraph line routes associated with the Green Cape Lighthouse.
- Evidence of previously used roads between Morwarry Point and Bittangabee, dating back to the 1840s.

5.18.2 Heritage items

A search of the Australian Heritage Database was undertaken on 29 February 2021. No items of world, national or Commonwealth significance are present within or adjacent to the project area.

A search of the Maritime heritage database was undertaken on 29th February 2021. One item was found, Item 2346 – Bittangabee Bay.

A search of the NSW Heritage Office State Heritage Inventory undertaken on 23 August 2021 identified one item of State heritage significance listed on the State Heritage Register and three items of local heritage significance listed on the Bega Valley Shire Local Environmental Plan within Ben Boyd National Park:

- Green Cape Maritime Precinct, State Heritage Register, listing no. 01897
- Boyds Tower, Local Environmental Plan
- Bittangabee Ruins, Local Environmental Plan

- Greencape Lighthouse and residences group, Local Environmental Plan

The Green Cape Maritime Precinct includes the southern-most peninsula of Green Cape encompassing the lighthouse, lightstation cottages, Ly-ee-Moon shipwreck, shipwreck cemetery and associated built structures. Also included is the southern shoreline of Bittangabee Bay to capture the storehouse and the remnant jetty footings. Activity 1 would partly impact the curtilage of the Green Cape Maritime Precinct and an exemption under s.57 the NSW Heritage Act is required (Figure 5-10).

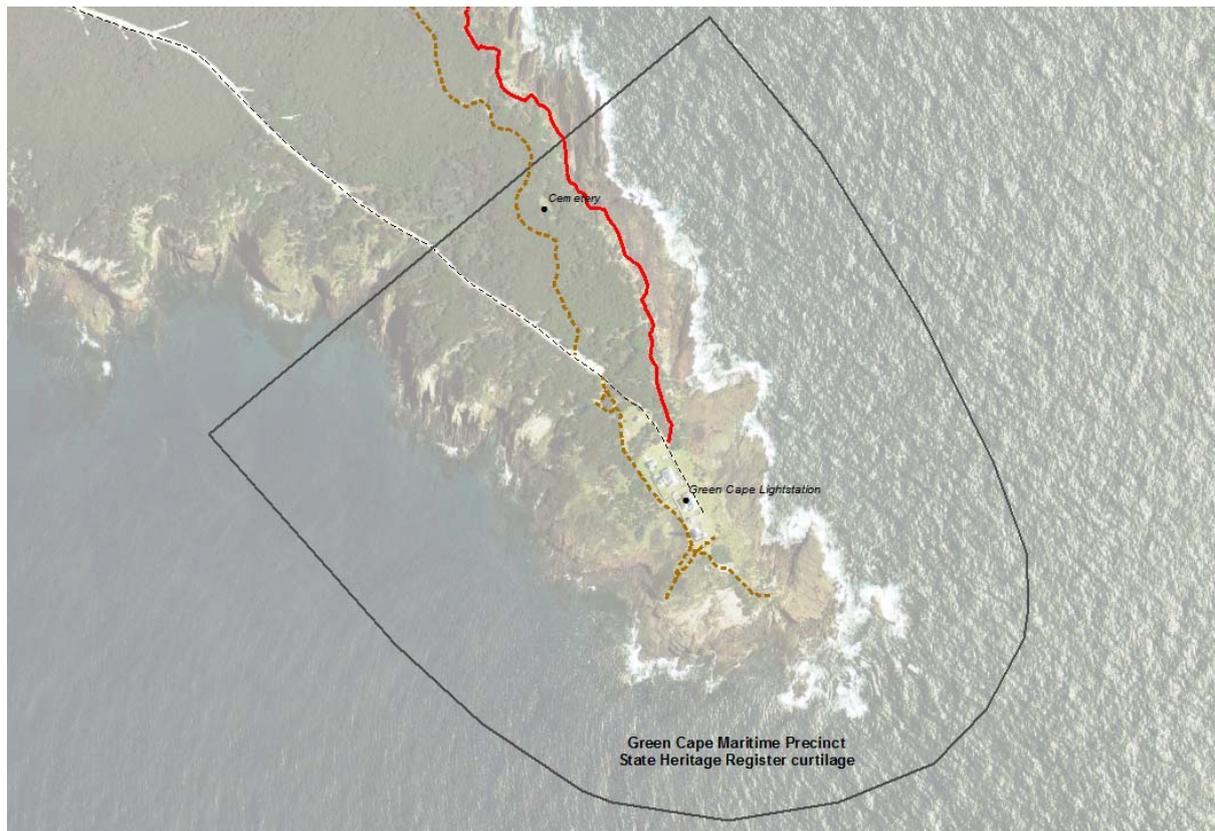


Figure 5-10 Extension of Activity 1 into Green Cape Maritime Precinct curtilage

The search also identified three items listed on the NPWS Section 170 Register (the Historic Heritage Information Management System) within the vicinity of the proposal:

- Hegartys Bay Hut – potentially meets requirements of Section 170 of the Heritage Act.
- Mowarry Whaling Site – listed under Section 170 of the Heritage Act.
- Mowarry Homestead Site – listed under Section 170 of the Heritage Act.

These items have been identified, surveyed and exist as footings, ruins and archaeological material. All three items may be impacted by the proposal and an excavation permit under s.140 the NSW Heritage Act is required.

5.19 VEGETATION OF CULTURAL LANDSCAPE VALUE

There is no known vegetation of cultural landscape value or plant of resource significance to the local Aboriginal people within or adjacent to the proposal area.

5.20 RECREATION VALUES

Ben Boyd National Park is used for recreation activities including bushwalking, whale watching, bird watching, camping, swimming, surfing, fishing and boating. The existing Light to Light Walk is of particular interest to visitors as this bushwalk encounters the many natural and historical sites of the Park. Throughout the Park there are numerous other bushwalks ranging in length and grade allowing for a vast range of tourist activity.

Several locations in or adjacent to the southern sector of the Park have widely known recreation value. Pulpit Rock is an important site for land-based game fishing as it is relatively close to the continental shelf. Green Cape is well known for whale watching, scuba diving and snorkelling as it has deep water immediately offshore and has sheltered sites in most wind conditions. Heathland is popular for bird watching and during the spring bloom.

Saltwater Creek and Bittangabee Bay campgrounds are very popular as they provide opportunities for basic camping in a natural setting, a different experience to caravan parks in nearby towns. Although less popular, Remote camping is also currently possible at Mowarry Point and Hegartys Bay.

The proposal site is in the vicinity of a number of popular areas used for recreational activities including:

- Boyds Tower
- Leather Jacket Bay
- Mowarry Point
- Saltwater Creek
- Hegartys Bay
- Bittangabee Bay
- Pulpit Rock
- Green Cape

5.21 SCENIC & VISUALLY SIGNIFICANT AREAS

The scenic quality of the Ben Boyd National Park is outstanding with multiple accessible lookout locations along the coastline. The Park is popular with tourists who visit to admire the cultural heritage, historic architecture and natural beauty and interesting geological formations. The Park contains open and closed forested areas progressing to coastal heathland, sand dunes, creeks, beaches and cliff faces thereby offering a vast range of aesthetically appealing scenic landscapes. The range of native Australian flora and fauna in this landscape is perceived with admiration.

The Light to Light Walk provides one of few opportunities for extended walking along a natural coastline.

5.22 EDUCATION OR SCIENTIFIC VALUES

Highly significant scientific research has been conducted in the Park across a range of disciplines. This includes pioneering research in botany, ecology, geology and geomorphology. The scientific

importance of the fossil sites within Ben Boyd National Park is high, as intermediate fossils such as the Devonian era fish are uncommon.

Of particular significance are the fish fossils found in several places along the coastline. The fossils are of a previously unknown species of air breathing lobe-finned bony fish, up to 1.5 m long and a plate covered fish now entirely extinct. They appear to be the remains of schools of fish which were trapped in mud following drying out of a delta/floodplain system during the Devonian period (360 million years ago). The fossils are of international scientific significance. They are a relic of the era when marine animals were just beginning to leave the ocean to evolve into land-dwellers. These are vulnerable to damage and their locations have not been publicised.

Public education and interpretation facilities have been integrated throughout the national park to assist visitors in understanding, appreciating and protecting the Park's values. The Aboriginal Culture Camp at Haycock Point is often visited by school groups to encourage education on the history of the park, the local Aboriginal heritage and traditions and the natural environment. The Bournda Education Centre and camping sites are also utilised frequently by school groups. The existing Light to Light Walk is undertaken by several school groups each year.

The Park is used for educational visits by schools and tertiary institutions, community organisations and individuals. It provides opportunities for study of coastal processes, ecology, threatened animal species, Aboriginal and historic sites and the environmental impact of recreational use.

5.23 INTERESTS OF STAKEHOLDERS

5.23.1 Internal Stakeholders

The DPIE Environment, Energy and Science are a key internal stakeholder group, as the proposed works would occur within the Ben Boyd National Park. EES and specialists branches within NPWS have been consulted on the key environmental aspects to ensure the Park's values are protected and that the proposal is carried out in accordance with these values.

5.23.2 External Stakeholders

Several external stakeholders have an interest in Ben Boyd National Park. A reference group has been formed consisting of local groups and other government departments. The purpose of the reference group is to ensure the views and issues from a broad section of the community are considered. The group will include representatives from a broad range of local and regional stakeholder groups and organisations. Participation in the group is voluntary. The group will be a key consultative body for the project and will support the project by providing input and advice to NPWS based on sound information about social, cultural, economic and environmental values.

Many members of the public that utilise the national park, the Light to Light Walk and accommodation facilities for recreational purposes as well as commercial operators, have an interest in the proposal. These people have been engaged through the PoM amendment process and through regular project updates.

The proposed works are in the interest of these stakeholders as it would improve the safety and quality of the Light to Light Walking Track by providing additional accommodation options and introducing an improved experience. The proposed works would also provide economic benefits to local stakeholders as a result of increased visitors to the region to the region to undertake the walk.

Consultation has been undertaken with these stakeholders and is summarised in Section 4.

5.24 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE (EPBC ACT)

The EPBC Act identifies seven Matters of National Environmental Significance. These include [World Heritage properties](#), [National Heritage places](#), [Ramsar wetlands of international significance](#), [nationally listed threatened species and ecological communities](#), [listed migratory species](#), [Commonwealth marine areas](#) and [nuclear actions](#). A search of the EPBC databases for items of national environmental significance was conducted to identify significant features within a 10km radius of the proposed works. A summary of the results is included in Table 5-6.

Table 5-6 EPBC matters of national environmental significance

Matters of national significance	Results	Comment
World Heritage Properties	None	Not Applicable
National Heritage Places	None	Not Applicable
Wetlands of International Importance	None	Not Applicable
Great Barrier Reef Marine Park	None	Not Applicable
Commonwealth Marine Areas	1	Not applicable. Proposed works area not within marine environment.
Threatened Ecological Communities	4	Not applicable. There are no TEC's within the study area.
Threatened Species	73	Threatened species have been assessed for potential impact in Section 6.3 and Appendix B. Impacts are not considered likely to be significant for any EPBC listed species.
Migratory Species	52	Migratory species have been assessed for potential impact in Section 6.3 and Appendix B. Impacts are not considered likely to be significant for any EPBC listed species.

6. IMPACT ASSESSMENT

6.1 ASSESSMENT SUMMARY

The environmental issues relevant to the proposal were reviewed in light of potential impacts, site values and planning requirements. Key issues were identified based on potential impact from the proposed activities, considering the nature of potential impact, the likelihood of impact and the sensitivity of the local environment. The impact assessment approach is consistent with AS/NZ ISO 14004:2004 (Environmental Management Systems) and AS/NZ ISO 13000:2009.

A summary of key impacts for each activity is provided below and categorised by low, moderate and high impact.

Environmental impacts and analysis for the site is outlined in Table 6-2.

Table 6-1 Environmental Impact

Constraint	Definition
Low	Minimal impacts are anticipated. Most suitable for development. Standard management protocols would be sufficient to manage any impacts. Least cost for assessment and management of constraints.
Moderate	Impacts should be minimised, where possible. These areas may require specific management protocols and may add some cost and time to the assessment and approval process.
High	Avoid if possible. These areas will be difficult, expensive or may not be possible to obtain approval to develop. They may require costly additional surveys to understand and manage impacts. They may impact the ability to obtain a timely approval and may affect the assessment pathway.

Table 6-2 Impact assessment summary.

Activity location	Physical and chemical impacts	Biological impacts	Community impacts	Natural resource impacts	Aboriginal cultural heritage impacts	Cultural heritage potential impacts	MNES impacts
Activity 1: Walking track.							
New walking track: Boyd Tower to Green Cape (installation of wayfinding, directional and interpretative signs)	Moderate	Low	Moderate	Low	Moderate	Moderate	NA
Reinstatement of bushfire impacted track sections	NA	NA	NA	NA	NA	NA	NA
Maintenance of existing sections of track that were not bushfire impacted or are not identified for realignment	NA	NA	NA	NA	NA	NA	NA

Activity location	Physical and chemical impacts	Biological impacts	Community impacts	Natural resource impacts	Aboriginal cultural heritage impacts	Cultural heritage potential impacts	MNES impacts
Rehabilitation and revegetation of redundant track sections	Low	Low	Low	Low	Low	Low	NA
Activity 2: Accommodation and facilities							
New hut accommodation and facilities at Mowarry Point	Moderate	Low	Moderate	Low	Moderate	Moderate	NA
Formalisation of the existing campground at Mowarry Point.	Moderate	Low	Moderate	Low	Moderate	Moderate	NA
New hut accommodation and facilities at Hegartys Bay.	Moderate	Low	Moderate	Low	Moderate	Moderate	NA
Activity 3: Vehicle and site access							
Maintenance of Hegartys Bay vehicle access Trail (including compound and	Moderate	Low	Moderate	Low	Moderate	Moderate	NA

Activity location	Physical and chemical impacts	Biological impacts	Community impacts	Natural resource impacts	Aboriginal cultural heritage impacts	Cultural heritage potential impacts	MNES impacts
helicopter operations site)							
Upgrade of Hegartys Bay access track for ATV, eBike, trolley (from boardwalk compound area to Hegartys Bay accommodation precinct)		Low	Moderate	Low	Moderate	Moderate	NA
Upgrade of the Pulpit Rock car park precinct (including adjusting turning circle and parking).		Low	Moderate	Low	Moderate	Moderate	NA

6.2 PHYSICAL AND CHEMICAL IMPACTS

Physical and chemical impacts during construction and operation				
	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
1. Is the proposal likely to impact on soil quality or land stability?	<input checked="" type="checkbox"/>	<p>All activities</p> <p>Medium – negative (short term)</p> <p>Medium – positive (long term)</p>	<p>All activities</p> <p>Excavation and vegetation removal during the construction phase would cause soil disturbance and expose soils to erosive forces. Impacts to soil quality and land stability would be medium to short term. Management would focus on measures that address the erodibility of the soils, slopes and sensitivity of the potential receiving environments.</p> <p>Potential contamination as a result of fuel spills or concrete that will be mixed and used onsite during construction could occur, however is considered low, with the implementation of appropriate mitigation measures and minimal work required.</p> <p>Compaction of soils from the transport and storage of equipment and materials would be minor as storage would occur in disturbed areas and structural components would be assembled offsite where possible and delivered to site by helicopter.</p> <p>A detailed geological assessment has been undertaken and the proposal altered in places to avoid areas of geological instability.</p> <p>The mitigation measures presented in this REF are considered sufficient to manage these risks.</p>	<p>All activities</p> <ul style="list-style-type: none"> • A Soil and Water Management Plan (SWMP) must be prepared by the work contractor(s) and approved by NPWS. The SWMP will be adapted as works progress and a number of plans prepared to manage the discrete sections and types of works. • An erosion and sediment control plan would be prepared in conjunction with the final design and implemented. This would include: <ul style="list-style-type: none"> ○ Sediment control measures are to be in place prior to any vegetation clearing and site leveling and shall be maintained until runoff catchments are stabilised. Sediment controls are to be inspected regularly by the relevant contractor and by NPWS staff. ○ Sediment control measures are also to be in place for the storage of any spoil as required.

Physical and chemical impacts during construction and operation				
	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
				<ul style="list-style-type: none"> ○ Construction works involving ground disturbance are not to be carried out for the proposed activity during or within two days of heavy rainfall. ● Soil disturbance will be minimised by clearly demarcating the works footprint and marking all other areas as no go zones prior to works. ● Clearing and excavation works will not be conducted during high rainfall periods. The weather will be monitored during the proposed works period and works will cease, and open areas stabilised, if heavy rainfall was forecast. ● Erosion and sediment control measures are to be implemented and maintained to: <ul style="list-style-type: none"> ○ Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets ○ Reduce water velocity and capture sediment on site

Physical and chemical impacts during construction and operation				
	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
				<ul style="list-style-type: none"> ○ Minimise the amount of material transported from site to surrounding pavement surfaces ○ Divert clean water around the site (in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book)). ● Vehicle use and material laydown will be restricted to existing or proposed disturbed areas. ● All areas disturbed by works will be progressively stabilised and rehabilitated to ensure stable surfaces are obtained as soon as practical (progressively where possible). ● Spill kits will be stored in both chemical storage locations and designated refuelling areas. ● No concrete wash out will occur onsite unless in a purpose-built washout facility.
		Activity 1	Activity 1 <u>Construction</u>	Activity 1

Physical and chemical impacts during construction and operation				
	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
		Medium – negative (short-term) High – positive (long-term)	<p>Track realignment impact areas would be restricted to the track corridor and tread width.</p> <p>Compaction of soils from the use of a mini excavator to form the proposed walking track would be minor and would aid in establishing a hard tread surface reducing erosion in operation.</p> <p>Some minor regrading of compacted soil may be required to assist with revegetation. It is unlikely that there would be any adverse impact to soil quality and land stability.</p> <p>Impacts on geological conditions during construction would include cutting, grinding, drilling and removal of Devonian rock in some areas for track realignment.</p> <p>The mitigation measures presented in this REF are considered sufficient to manage these risks.</p> <p><u>Operation</u></p> <p>The proposed new walking track would have a positive long-term impact on soil quality and land stability, with an operational impact width of 1-1.5m. The proposed works would formalise walking tracks, fix existing tracks in poor condition or bushfire damaged and move away from eroding areas where possible, thereby reducing ongoing disturbance and landform instability</p>	<ul style="list-style-type: none"> • The track setout and footing locations will take into account the topography and erosive nature of soils on the site. • Impacts to geological formations will be designed to have minimal impact and appear natural in design.

Physical and chemical impacts during construction and operation				
	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
		<p>Activity 2 Medium negative (short term) Low – Negative (long term)</p>	<p>Activity 2 <u>Construction</u> The accommodation designs have been developed to require as little ground disturbance as possible with footings to utilise ground screws instead of concrete slab or other excavated foundations. Impact of compaction of soil during construction is considered low. For the most part, modular building, materials and other components would be transported to the sites by helicopter. The mitigation measures presented in this REF are considered sufficient to manage these risks. <u>Operation</u> The proposed accommodation and facilities would have a positive long-term effect on the environment by reducing the impact to soil stability through the removal of informal camping areas that currently do not have any facilities.</p>	<p>Activity 2</p> <ul style="list-style-type: none"> Clearing and ground disturbance within the accommodation precincts must be restricted to the minimum necessary to carry out the work. Vehicle movements must not exceed 4 light vehicles and 2 trucks per day during the construction period.
		<p>Activity 3 Medium negative (short term) High – positive (long term)</p>	<p>Activity 3 <u>Construction</u> Road works associated with the maintenance of Hegartys Bay vehicle access trial trail, as well as constructing a compound, would expose soils. Other works associated with Activity 3 would also</p>	<p>Activity 3</p> <ul style="list-style-type: none"> All works to conform to OEH (2010) Erosion and Sediment Control on Unsealed Roads standards.

Physical and chemical impacts during construction and operation				
	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>lead to soil exposure with potential for erosion during construction.</p> <p>The mitigation measures presented in this REF are considered sufficient to manage these risks.</p> <p><u>Operation</u></p> <p>The proposed maintenance would have a positive long-term impact on soil quality and land stability for the vehicle access track and the boardwalk to Hegartys Bay. The proposed works at Pulpit Rock would improve carparking and turnaround areas, reducing the amount of soil disturbance and potential for erosion.</p>	
2. Is the activity likely to affect a water body, watercourse, wetland or natural drainage system?	<input checked="" type="checkbox"/>	<p>All activities</p> <p>Low – negative (short term)</p> <p>High – positive (long term)</p>	<p>All activities</p> <p>Potential contamination risks from hydrocarbons and other products entering waterways, during construction exist. This impact potential is low with the appropriate mitigation measures.</p> <p>Ground disturbance would occur as a result of proposed works. This would result in increased potential for erosion and sediment laden runoff if not managed properly.</p> <p>The mitigation measures presented in this REF are considered sufficient to manage these risks.</p>	<p>All activities</p> <ul style="list-style-type: none"> • All chemicals (fuels, concrete) will be stored in impervious bunded areas located at least 40m from waterways and in accordance with manufacturer's instructions. • Refuelling will be in accordance with manufacturer's instructions and will only be in designated refuelling areas which are bunded and at least 40m from waterways. • Contractors are to have, and be competent in the use of, petrochemical spill kits for use of any spillage during

Physical and chemical impacts during construction and operation				
	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
				<p>the construction. The NPWS is to be notified of any spills and the action taken to contain them.</p> <ul style="list-style-type: none"> • All machinery is to be free from any fuel and other pollutant residues, with connections and hoses inspected regularly. • Track mats or similar will be utilised for machinery access over sensitive areas. • Avoid use of natural surface trails in proximity to waterways to minimise sediment run-off. • Temporary watercourse crossings will be designed to minimise impacts on hydrology, aquatic habitat and fauna by: <ul style="list-style-type: none"> ○ Maintaining low-flow conditions ○ Being designed with consideration of the potential for flooding during construction ○ Be removed and the area rehabilitated following completion of construction. ○ These crossings will take into consideration the requirements of

Physical and chemical impacts during construction and operation				
	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
				the FM Act and Policy and guidelines for fish habitat conservation and management (NSW Department of Primary Industries, 2013).
		<p>Activity 1 Medium – negative (short term) High – positive (long term)</p>	<p>Activity 1 <u>Construction</u> The works (including movement of earth and imported material and vegetation clearing) would be undertaken in the vicinity of a number of drainage lines throughout the walking track realignment footprint. The mitigation measures presented in this REF are considered sufficient to manage these risks. <u>Operation</u> The upgraded Light to Light Walk will better manage surface water runoff and have less erosion and fewer maintenance requirements than the current track.</p>	<p>Activity 1</p> <ul style="list-style-type: none"> Structural components will be assembled offsite where possible and delivered to work sites by helicopter. Avoid use of natural surface trails in proximity to waterways to minimise sediment run-off.
		<p>Activity 2 Low – negative (short term) High – positive (long term)</p>	<p>Activity 2 Works associated with construction of accommodation and facilities may temporarily impact on drainage lines within and adjacent to the precincts during construction. For the most part, modular building, materials and other components</p>	<p>Activity 2</p> <ul style="list-style-type: none"> Building modules will be assembled offsite where possible and delivered to precincts by helicopter. Drainage lines within and adjacent to the accommodation precincts must be

Physical and chemical impacts during construction and operation				
	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			would be transported to the sites by helicopter and vehicle movements to the precincts minimised. The mitigation measures presented in this REF are considered sufficient to manage these risks.	demarcated and assigned as “no go zones” during construction.
		Activity 3 Low – negative (short term) High – positive (long term)	Activity 3 <u>Construction</u> The installation of a mesh boardwalk from the end of the Hegartys vehicle track to the accommodation precinct would cross an ephemeral drainage line to the south of the accommodation. This would require construction of a mesh bridge to cross the drainage line with some footings being located within the waterway. Other potential construction impacts on waterways in proximity of work associated with Activity 3 include sediment runoff and any chemical or fuel spills and flow into larger waterways or coastal waters. The mitigation measures presented in this REF are considered sufficient to manage these risks.	Activity 3 <ul style="list-style-type: none"> Work must not be undertaken on the mesh bridge during high flow conditions. Footings locations for mesh bridge must be cleared of all excess material prior to completion. Structural components associated with the mesh boardwalk must be assembled offsite where possible and incrementally installed to minimise disturbance.
3. Is the activity likely to change flood or tidal regimes, or be affected by flooding?	<input type="checkbox"/>	N/A	This proposal does not include construction in flood or tidal areas and will not alter flood or tidal regimes or be impacted by flooding.	N/A

Physical and chemical impacts during construction and operation				
	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
4. Is the activity likely to affect coastal processes and coastal hazards, including those projected by climate change (e.g. sea level rise)?	☒	Activity 1 Low-negative (long term)	Activity 1 The new walking track alignment will in places, be constructed close to the cliff edge. In some locations, the proposed walking track is in steep locations where there is a risk of rock fall. Coastal erosion may affect the longevity of the path into the future, particularly in areas of sandstone and mudstone. A detailed geological assessment has been undertaken to avoid active geological and coastal locations. The mitigation measures presented in this REF are considered sufficient to manage these risks.	Activity 1 NA
		Activity 2 Low-negative (long term)	Activity 2 The activity is unlikely to be affected by coastal processes and coastal hazards, including those projected by climate change.	Activity 2 NA
		Activity 3 Low-negative (long term)	Activity 3 The activity is unlikely to be affected by coastal processes and coastal hazards, including those projected by climate change.	Activity 3 NA
5. Does the activity involve the use, storage, or transport of hazardous substances or the use or generation of chemicals,	☒	All Activities Low-negative (short term) Low-negative	All activities Fuels would be required for the operation of equipment and machinery for all activities and there is a low possibility of a spill during refuelling	All activities <ul style="list-style-type: none"> All chemicals (fuels, concrete) will be stored in impervious bunded areas located at least 40m from waterways

Physical and chemical impacts during construction and operation				
	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
which may build up residues in the environment?		(long term)	<p>activities or a leak that could cause a pollution event.</p> <p>Fuels and other chemicals will be stored at the accommodation precincts in purpose built storage modules during operation. However, there is potential for spills to occur in the operation phase.</p> <p>The mitigation measures presented in this REF are considered sufficient to manage these risks.</p>	<p>and in accordance with manufacturer's instructions.</p> <ul style="list-style-type: none"> • An emergency spill kit is to be kept on site at all times. All staff are to be made aware of the location of the spill kit and trained in its use. • All plant, machinery, tools and fuel storage must be in good working order and regularly checked for leaks. • No concrete wash out will occur onsite unless in purpose built washout facility. • Dedicated fuel and other chemical stores must be included in the accommodation design.
6. Does the activity involve the generation or disposal of gaseous, liquid or solid wastes or emissions?	<input checked="" type="checkbox"/>	<p>All Activities</p> <p>Low-negative (short-term)</p> <p>Low-negative (long-term)</p>	<p>All activities</p> <p>The proposed works would generate waste including mulch from vegetation removal and material offcuts.</p> <p>Only a small amount of exhaust emitting machinery will be used on site. Minimal liquid and solid wastes would be generated by onsite facilities as a result of construction.</p> <p>The mitigation measures presented in this REF are considered sufficient to manage these risks.</p>	<p>All activities</p> <ul style="list-style-type: none"> • Resource management hierarchy principles are to be followed: <ul style="list-style-type: none"> ○ Avoid unnecessary resource consumption as a priority ○ Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery) ○ Disposal is undertaken as a last resort

Physical and chemical impacts during construction and operation				
	Applicable?*	Impact level (negligible, low, medium or high; negative or positive; or N/A)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			The accommodation has been designed with minimal services and utilising sustainable principles. Solid waste generation by visitors would be minimised through education and “pack it in pack it out messaging”. Toilet waste would be composted and transferred off park. Other liquid waste would be treated on site. Minimal solar generated electricity would be restricted to the communal hut building with no power or lighting at other locations to remove the need for a supply generator.	<ul style="list-style-type: none"> ○ (in accordance with the Waste Avoidance & Resource Recovery Act 2001). ● Materials including mulch and vegetation waste will be reused on site where possible. ● Wastes not reused onsite will be taken to an appropriate licenced facility able to accept the waste. ● Construction staff will remove litter brought to the site. ● Machinery will be well maintained and not left idling.
7. Will the activity involve the emission of dust, odours, noise, vibration or radiation in the proximity of residential or urban areas or other sensitive locations?	<input checked="" type="checkbox"/>	All Activities Low-negative (short-term)	<p>All activities</p> <p>The proposal would require the movement of machinery, excavations and increased traffic during the construction period. This would be temporary for the duration of the works.</p> <p>There are no permanent residential receivers within the vicinity of the proposed works.</p> <p>The mitigation measures presented in this REF are considered sufficient to manage these risks.</p>	<p>All activities</p> <ul style="list-style-type: none"> ● Ensure machinery used is well maintained and in good working order. ● Construction noise to be minimised during peak visitation periods. ● Dust suppression techniques to be implemented if required.

6.3 BIOLOGICAL IMPACTS

Biological impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
1. Is any vegetation to be cleared or modified? (includes vegetation of conservation significance or cultural landscape value)	<input checked="" type="checkbox"/>	<p>Activity 1</p> <p>Low-negative (long term)</p>	<p>Activity 1</p> <p><u>Construction</u></p> <p>A total of 1.31ha of native vegetation would be cleared to establish the new track sections including, track features, signs and interpretive elements. Indirect impacts of these activities would be 5m in forested sections and 3m in heathland. Plant communities impacted include PCT 721, 772, 777, 891, 1084, 1141, and 1157. This includes areas that support threatened species habitat. No communities that meet the definition of a Threatened Ecological Community would be impacted.</p> <p>The linear nature proposed and potential to mitigate impacts, including by rehabilitating redundant sections of trail area considered to somewhat offset the impact.</p> <p>The proposal consists of a 30m wide track corridor to allow for micro-siting adjustments to be implemented where habitat trees or other valuable habitat features are identified during the pre-clearing process. The maximum width of this</p>	<p>All Activities</p> <ul style="list-style-type: none"> • A Biodiversity Management Plan (BMP) is to be created and include: <ul style="list-style-type: none"> ○ Pre-clearing protocol (including avoidance and micro siting requirements around habitat features). ○ Exclusion zones or other means to clearly demarcate proposal boundaries and protect the adjacent vegetation. ○ Re-establishment of native vegetation – species, area and method. ○ Clearing of native vegetation and removal of bush rock. ○ Unexpected threatened species finds. ○ Protection of native vegetation to be retained. ○ Aquatic habitats and riparian zones.

Biological impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			corridor will be utilised around habitat trees to ensure the greatest distance between the track and tree is implemented.	<ul style="list-style-type: none"> ○ Weed and pathogen management ○ Pest management actions and procedures ○ Rehabilitation of disturbed areas and discontinued tracks ○ Best practice removal and disposal of vegetation ○ Staged removal of habitat features such as fallen logs (if required) with attendance by an ecologist ○ Exclusion of vehicles through sensitive areas ● Pre-clearing surveys by an ecologist to identify any threatened flora and fauna species, and specific habitat features that may be impacted by construction works. Habitat features of threatened species to be targeted during pre-clearing surveys so that they can be avoided during construction include: <ul style="list-style-type: none"> ○ Hollow-bearing trees ○ Glossy Black Cockatoo feed trees ○ Quoll denning habitat and latrine sites ○ Active nests (woodland birds)
		Activity 2 Low-negative (long-term)	<p>Activity 2 <u>Construction</u></p> <p>A total of 1.22ha of native vegetation would be cleared, consisting of PCTs 721 and 891. This includes areas that support threatened species habitat. No communities that meet the definition of a Threatened Ecological Community would be impacted.</p> <p>The designs minimise disturbance and clearing wherever possible, including by using areas already disturbed, minimal building footprints and minimal APZs. At Hegartys Bay, some short-lived post bushfire establishing species, primarily Black Wattle and <i>Melaleuca armillaris</i>, that can be hazardous due to falling limbs may be thinned to hasten the end state ecological conditions.</p>	
		Activity 3 Low-negative	<p>Activity 3 <u>Construction</u></p>	

Biological impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
		(long-term)	<p>A total of 0.30ha of native vegetation would be cleared, consisting of PCTs 1157, 721, 777 and 1141. This includes areas that support threatened species habitat. No communities that meet the definition of a Threatened Ecological Community would be impacted.</p> <p>The clearing required for this activity would be carried out to formalise the turning circle at the end of Hegartys Bay Vehicle Access Trail, the construction of the boardwalk from the vehicle trail to Hegartys Bay accommodation precinct and the upgrade to the Pulpit Rock carpark.</p>	<ul style="list-style-type: none"> ○ Yellow-bellied Glider feed trees ○ Rocky outcrops ● Clearing protocols that identify vegetation to be retained, prevent inadvertent damage and reduce soil disturbance; all groundwork associated with construction and operation of the walking track elements of the proposed activity will be carried out by hand, handheld tools and plant e.g. chainsaws and brush cutters, and a mini excavator if required and with prior approval by the NPWS. Larger machinery may be used for works associated with Activity 2 and Activity 3. ● The detailed design and construction planning will be carried out to minimise the extent of clearing within the development footprint, avoid the loss of known threatened species, hollow-bearing trees, and essential habitat features. ● Used existing tracks where possible to limit the extent of clearing. ● Utilise areas already impacted by previous clearing or disturbance for access purposes, stockpiles or the

Biological impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
				<p>establishment of compound sites. No stockpiling or storage within dripline of any mature trees.</p> <ul style="list-style-type: none"> • If clearing of vegetation is required outside the subject site these areas will need to be assessed as an addendum to this REF. • Trees to be retained, including trees adjacent but outside of the subject site, require an adequate tree protection zone (TPZ) for the duration of works. Details for calculating TPZs are provided within Australian Standard 4970-2009 – Protection of trees on development sites. • If the TPZ cannot be avoided during works, the Structural Root Zones (SRZ) of trees will be retained. Details for calculating the SRZs are provided within Australian Standard 4970-2009 – Protection of trees on development sites. • Staff training and site briefing to communicate environmental features

Biological impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
				<p>to be protected and measures to be implemented</p> <ul style="list-style-type: none"> • Site induction and toolbox talks are to identify the location and nature of ecologically sensitive areas and Limit of Works. • Landscape plantings will be comprised of local indigenous species.
2. Is the activity likely to have a significant effect on threatened flora species, populations, or their habitats, or area of outstanding biodiversity value (refer to threatened species assessment of significance (5-part test))?	<input checked="" type="checkbox"/>	<p>All activities</p> <p>Low-negative (long-term)</p>	<p>All activities</p> <p>No threatened flora species were recorded within the study area or identified during the field surveys. However, there are historical records and/or potential habitat within the study area for three threatened flora species.</p> <p>Considering the availability of potential habitat and the cryptic nature of these threatened flora species, Tests of Significance (BC Act) and Assessments of Significance (EPBC Act) were.</p> <p>These species are:</p> <ul style="list-style-type: none"> • Leafless Tongue Orchid (<i>Cryptostylis hunteriana</i>) – BC Act and EPBC Act • Hidden Violet (<i>Viola cleistogamoides</i>) – BC Act 	No additional measures

Biological impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<ul style="list-style-type: none"> Matted Bush Pea (<i>Pultenaea pedunculata</i>) – BC Act <p>The results of the assessments found that in the unlikely event one of the assessed species were detected within the study area, the low impacts associated with the proposal would not have an adverse effect on viable local populations or species life cycles.</p>	
3. Does the activity have the potential to endanger, displace or disturb fauna (including fauna of conservation significance) or create a barrier to their movement?	<input checked="" type="checkbox"/>	<p>All activities</p> <p>Low-negative (long-term)</p>	<p>All activities</p> <p>The proposal would include the disturbance of habitat favoured by some threatened fauna species. In addition to loss of habitat, potential indirect impacts include; over clearing, predation by feral animals, displacement of resident fauna through vegetation clearing and habitat removal, loss of shade/shelter, reduction in viability of adjacent habitat due to edge effects, erosion, introduction and spread of noxious weeds and pathogens, disturbance to marine mammals (i.e. Seals), displacement of resident fauna through increased human activity, and disturbance to marine mammals (i.e. Seals) due to an increase in human activity.</p>	<p>All activities</p> <ul style="list-style-type: none"> Avoid the removal or disturbance of shelter/denning habitat such as woody debris, fallen logs, burrows in the ground, dense shrubs, rock crevices and bush rocks during the construction of the walking track. Any fallen timber and dead wood encountered within the development footprint will be left in situ wherever possible or would be relocated to adjacent areas (within the buffer area) of similar habitat to aid in habitat enhancement. If rock removal is unavoidable it is to be removed with suitable machinery so as not to

Biological impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>Refugia, such as rocky outcrops or mosaics of unburnt habitat play an important role in survival and how post-fire recovery proceeds. For animals, high intensity fire can increase predation by invasive and native species, and fox and cat densities have been shown to increase in the weeks to months following fires.</p> <p>Preclearance surveys and mitigation measures which address minimisation of impacts from construction designs to address edge effects have been included to further reduce risks.</p>	<p>damage the underlying rock or result in excessive soil disturbance.</p> <ul style="list-style-type: none"> • If any Glossy Black Cockatoo feed trees are encountered during pre-clearing surveys, these would be retained. • If active nests of threatened bird species are encountered, works within 200m of the nest would be postponed until nestlings fledge. • If an active threatened owl nest is detected, no works using noisy machinery would be undertaken within 200 m of the nest tree. • As part of continuing maintenance, clear management measures will be set in place to avoid and minimise impacts on breeding habitat and foraging habitat for threatened species. • Information on the threatened species within the locality are to be included in the induction process for applicable personnel.

Biological impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
				<ul style="list-style-type: none"> An unexpected threatened fauna or flora procedure must be developed and if species are discovered, works will stop immediately, and the environment manager notified. An ecologist will then be engaged to determine management actions to avoid or mitigate any potential impact. Staff training and public signs must communicate the importance of remaining on tracks, and leaving no trace while in the national park. Ensure all staff and visitors to the park are aware of laws re. approaching marine mammals (in this case seals). In accordance with the Biodiversity Conservation Regulation 2017 (Clause 2.3).
4. Is the activity likely to have a significant effect on threatened fauna species, or their habitats, or areas of outstanding biodiversity value (refer	<input checked="" type="checkbox"/>	All activities Low-negative (long-term)	All activities The receiving environment contains habitat for several threatened fauna. However, the threatened species assessments outlined in Section 5.14.2 conducted for these identified species found that it	No additional measures.

Biological impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
to threatened species assessment of significance (5 part test))?			<p>is unlikely that impacts from the proposed activities will be significant.</p> <p>This conclusion was reached through the consideration of the impacts of the 2019/2020 bushfire, suitable breeding and foraging habitat in adjoining habitat remains in some areas, and the limited loss of foraging, nesting, roosting and denning resources caused by the proposal. More mobile species (e.g. birds and bats) are unlikely to rely on burnt areas of the site until vegetation exhibits substantial recovery. However, recovery within 10 months was evident, therefore by the time construction begins, habitat for flora and fauna species at the subject site and in adjacent areas of the national park are likely to be extensive.</p>	
5. Is the activity likely to impact on an ecological community of conservation significance?	<input checked="" type="checkbox"/>	All activities N/A	All activities No EECs were observed during the field.	No additional measures.
6. Is the activity likely to have a significant effect on an endangered	<input checked="" type="checkbox"/>	All activities N/A	All activities	No additional measures.

Biological impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
ecological community or its habitat (refer to threatened species assessment of significance (5 part test))?			No EECs were observed during the field work and no 5-part tests have been undertaken. The proposal would not significantly impact any EEC.	
7. Is the activity likely to cause a threat to the biological diversity or ecological integrity of an ecological community?	<input checked="" type="checkbox"/>	All activities Negligible	All activities The diversity and integrity of the local area are not anticipated to be impacted. Mitigation measures aimed at limiting the works footprint and managing risks ensure this risk is manageable.	No additional measures.
8. Is the activity likely to introduce noxious weeds, vermin, feral species or genetically modified organisms into an area?	<input checked="" type="checkbox"/>	All activities Low-negative (long-term)	All activities The establishment of additional tracks and precinct work could encourage pests, weeds and pathogens into areas where they are currently excluded. Mitigation measures include weed, pathogen and pest plans to monitor and manage these impacts.	All Activities <ul style="list-style-type: none"> Project-specific pest management actions will be detailed in the BMP, and will be appropriately funded and based on the principles of adaptive management. The plan should include provisions for monitoring (e.g. camera traps to detect feral predator densities), evaluation and the use control strategies through baiting or other means, where appropriate.

Biological impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
				<ul style="list-style-type: none"> • A Weed and Pathogen Management procedure would be developed for the proposal. This would include: <ul style="list-style-type: none"> ○ Management protocol for declared priority weeds under the Biosecurity Act 2015 during and after construction ○ Weed hygiene protocol in relation to plant, machinery, and fill ○ Any occurrences of pathogens such as Myrtle Rust and Phytophthora would be monitored, treated, and reported. ○ Avoid all use of foreign soil matter for landscaping/mulching. Always use matter from in situ. ○ Install disinfecting facilities – wash-down bays, footbaths and/or scrubbing stations at primary entrance/exit points for both vehicles/machinery and foot traffic ○ In priority locations (heath habitat), install signage (e.g. ‘Stay on marked tracks’) to reduce off-track disturbance and elevate or divert walking tracks to

Biological impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
				<p>minimise contact with soil, particularly in locations that have the potential to become muddy.</p> <ul style="list-style-type: none"> o The procedure would be incorporated into the Biodiversity Management Plan.
9. Is the activity likely to affect any declared area of outstanding biodiversity value?	<input type="checkbox"/>	All activities N/A	All activities No impacts on declared lands of outstanding biodiversity value would result from the proposal.	No additional measures.
10. Is the activity likely to affect any joint management agreement under the BC Act?	<input type="checkbox"/>	All activities N/A	All activities No areas of joint management would be impacted as a result of the works proposed in this REF.	No additional measures.

6.4 COMMUNITY IMPACTS

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
1. Is the activity likely to affect community services or infrastructure?	<input checked="" type="checkbox"/>	<p>All activities</p> <p>Low – negative (short-term) High – positive (long term).</p>	<p>All activities</p> <p><u>Construction</u></p> <p>During construction, there would be an increase in construction associated traffic on both the public and national park road networks for movement of construction staff, material deliveries etc.</p> <p>The use of compound sites to store equipment and materials, and helicopters, will reduce the amount of deliveries required to the park each day as equipment and materials can be stored within the park.</p> <p>Construction employee parking would be established within the compound sites, and staff cars would not utilise parking outside of the national park. Carpooling would be encouraged.</p> <p>As a result, the popular features and precincts of the park are likely to suffer some level of disruption and reduced access.</p> <p>Any disruptions as a result of construction would be short term and minimal and with work preferred during non-peak times.</p> <p>Short term road closures may be required during the construction period. Roads may also be closed</p>	<p>All Activities</p> <ul style="list-style-type: none"> • Notice of planned work schedules, including impacts to parking areas and road closures must be advertise to the public in advance of work commencing.

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>under traffic control for short periods to allow helicopters to pass overhead.</p> <p>No broader community services or infrastructure would be affected.</p> <p>The mitigation measures presented in this REF are considered sufficient to manage these risks.</p> <p><u>Operation</u></p> <p>The proposed works would improve accessibility, safety and facilities in the southern sector of Ben Boyd National Park resulting in a positive outcome for community and visitors to the place.</p> <p>The upgraded walking track would provide a higher level of service that meets Australian and NPWS walking track standards. The accommodation precincts would enable a wider group of people to experience the natural and cultural heritage values of the national park.</p>	
		<p>Activity 1 Low – negative (short-term) High – positive (long term).</p>	<p>Activity 1 <u>Construction</u> Minor impacts will occur to visitors within Ben Boyd National Park during construction as a result of construction. This would be in the form of small track diversions or discrete track closures. The</p>	<p>Activity 1</p> <ul style="list-style-type: none"> • The existing track network must remain open until the new track sections are fit for use. • Rehabilitation of existing tracks to be closed must not occur until walking

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>existing Light to Light Walk, or other tracks within Ben Boyd National Park will not be closed during construction. Roads may be closed under traffic control for short periods to allow helicopters to pass overhead.</p> <p>The mitigation measures presented in this REF are considered sufficient to manage these risks.</p> <p><u>Operation</u></p> <p>The upgraded walking track would provide a higher level of service and would provide improved access for park users. Sections of track impacted bushfire would also be reinstated and provide improved access.</p> <p>Some sections would be rehabilitated and no longer be accessible to users of the national park. These would be offset by the new and reinstated sections.</p>	<p>track realignment are completed and open to ensue uninterrupted access to walking track users.</p>
		<p>Activity 2 Low – negative (short term) High – positive (long term).</p>	<p>Activity 2 <u>Construction</u> Building would be constructed as modules, assembled off-site, and delivered by helicopter to reduce the amount of onsite construction required.</p>	<p>Activity 2</p> <ul style="list-style-type: none"> A formalised accommodation booking system must be implemented. A review of its effectiveness will be undertaken within 6 months of commencement.

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>Roads may be closed under traffic control for short periods to allow helicopters to pass overhead.</p> <p>As such, the impact to users of the southern sector of Ben Boyd National Park due to construction of the precincts is considered short term and minor.</p> <p>During construction, access to the existing camp sites at Mowarry Point and Hegartys Bay will be restricted. Hegartys Bay has not reopened following the 2019/20 bushfires. Day usage of these precincts will not be restricted during construction.</p> <p>The mitigation measures presented in this REF are considered sufficient to manage these risks.</p> <p><u>Operation</u></p> <p>Disruptions will occur to users of the existing free walk in campgrounds at Hegartys Bay and Mowarry Point. Mowarry Point will be formalised with designated sites and a toilet. Camping will no longer be provided at Hegartys Bay. Additional camp sites will be created at Bittangabee Bay (separate proposal) for pack campers. Bittangabee Bay is 3km from Hegartys Bay and will have designated walk-in camp sites and toilet. No changes are proposed at Saltwater Creek.</p>	<ul style="list-style-type: none"> Public camping will be maintained at Mowarry Point, independent of hut accommodation.

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>Pack-campers will have the choice to stay at the purpose-built walk-in campgrounds at Mowarry Point and Bittangabee Bay; and/or the existing park campgrounds at Saltwater Creek and Bittangabee Bay.</p> <p>School and other groups will also be able to undertake the Light to Light Walk as a tented experience in this way.</p> <p>Hut accommodation bookings would be limited to one night at each of the location.</p> <p>On completion of the proposed upgrades to accommodation areas and infrastructure, users would have access to formalised camping areas and purpose built accommodation.</p> <p>The mitigation measures presented in this REF are considered sufficient to manage these risks.</p>	
		<p>Activity 3 Low – negative (short term) High – positive (long term)</p>	<p>Activity 3 <u>Construction</u> Site access disruptions would be temporary and limited to the construction phase for access work associated with Activity 3. Pulpit Rock may need to be closed, or temporary access arrangements installed, for a short time to allow for the new carpark to be established.</p>	<p>Activity 3</p> <ul style="list-style-type: none"> The CEMP will include traffic controls including signage and speed limits will be implemented for works undertaken on public access tracks

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>The mitigation measures presented in this REF are considered sufficient to manage these risks.</p> <p><u>Operation</u></p> <p>In the long term, national park users would benefit from improved carparking facilities at Pulpit Rock. Access improvements at Hegartys Bay would allow for more efficient operation of the accommodation precinct.</p>	
2. Does the activity affect sites of importance to local or broader community for their recreational or other values or access to these sites?	<input checked="" type="checkbox"/>	<p>Activity 1</p> <p>Low – negative (short term). High – positive (long term).</p>	<p>Activity 1</p> <p><u>Construction</u></p> <p>During construction, sections of the existing track and portions of the carparks may be temporarily closed or have restricted level of service. Where possible track diversions would be preferred to allow for the current Light to Light Walk to remain open. Impacts would be limited due to the planned staging of works across the park, with other walks open and available for visitor use.</p> <p>Other popular recreational activities would not be impacted. However, the use of helicopter for material transport will generate temporary noise impacts and require road closure for short periods of time. Traffic controls will need to be put in place. this may result in temporary impacts to park users and road users.</p>	<p>Activity 1</p> <ul style="list-style-type: none"> Track closures and impacts on car parks will be minimised and staged to retain public access as much as possible during construction Appropriate controls for flight paths crossing public tracks and trails will be implemented to ensure no people are below the flight path for aircraft operations. Aircraft operations would be undertaken Monday to Friday avoiding weekends and public holidays unless approved by the Area Manager. Where required, construction signage and temporary fencing will be installed

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p><u>Operation</u></p> <p>The outcome would be positive in the long term with the walking track upgraded to provide a higher level of service and improved access for park users. Sections of track impacted bushfire would also be reinstated and provide improved access.</p>	at either end of work zones to notify visitors and prevent access.
		<p>Activity 2</p> <p>Low – negative (short term). High – positive (long term).</p>	<p>Activity 2</p> <p><u>Construction</u></p> <p>The existing campground at Hegartys Bay has not reopened following the 2019/20 bushfires and this would continue during the construction. Mowary Point campground would also be closed during construction. Other day use and recreational activities, at the precincts or elsewhere in Ben Boyd National Park, would not be restricted.</p> <p>A purpose-built walk-in campground is currently under construction at Bittangabee Bay (addressed under a separate REF) designed specifically for Light to Light Walk pack-campers. Bittangabee Bay is approximately 4.5km's from Hegartys and will have toilet facilities.</p>	<p>Activity 2</p> <p>No additional measures.</p>

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p><u>Operation</u></p> <p>Provision of new hut accommodation at Mowarry Point and Hegartys Bay would provide for a broader range of visitors, particularly those who are unable to camp.</p> <p>The formalisation of the Mowarry Point camp ground as well as other proposals within ben Boyd National Park, including precincts upgrades at Boyds Tower and Green Cape will provide improved recreational opportunities for park users.</p> <p>The removal of pack camping at Hegartys Bay will have some negative long-term impact for visitors who value this location. Hegartys Bay will remain open for day users and general walkers. Although, this will partly be offset by new pack camping sites at Bittangabee Bay 3km to the south.</p>	
		<p>Activity 3</p> <p>Low – negative (short term). High – positive (long term).</p>	<p>Activity 3</p> <p>The proposed works would have a temporary and minor impact on access to these sites that would be limited to the construction period. Vehicle access to Pulpit Rock may need to be restricted for a short time to allow for the new carpark to be established. Fishers and other users would be able to walk-in from a temporary carpark.</p>	<p>Activity 3</p> <p>No additional measures.</p>

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			The impacts on the community would be temporary and the outcome would be positive with improved and safer access to recreational areas.	
3. Is the activity likely to affect economic factors, including employment, industry and property value?	<input checked="" type="checkbox"/>	All activities Medium – positive (short term and long term).	All activities There will be short-term local employment of contractors and hire of local plant and equipment during construction of the proposal. The proposal would create a new experience on park, the first hut-to-hut walk in NSW and will create local jobs and overall regional economic benefit. The value of any land outside the national park is not expected to be affected by this proposal.	N/A
4. Is the activity likely to have an impact on the safety of the community?	<input checked="" type="checkbox"/>	All activities Medium – negative (short term). Low – negative (long term). Medium – positive (long-term)	All activities <u>Construction</u> During construction, there would be an increase in construction associated traffic on the public road network for movement of construction staff, material deliveries etc. The use of compound sites to store equipment and materials will reduce the amount of deliveries required to the park each day as equipment and materials can be stored within the park. Construction employee parking would be established within the compound sites, and staff	<ul style="list-style-type: none"> • Vehicles will be restricted to low speeds (20km/h) as a general speed and (5km/h) when within vicinity of the public. • Construction sites must be managed to prevent public access during and outside work times. • Proposed works must be certified to comply with the Building Code of Australia (BCA) or relevant Australian Standards as per the OEH Construction Assessment Procedure.

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>cars would not utilise parking outside of the national park.</p> <p>The use of helicopter to transport certain construction materials to remote areas of the proposal site will result in fewer disruptions to park users.</p> <p>All work would be constructed to meet relevant Australian Standards, building codes and bushfire regulations with independent certification granted where required.</p> <p>All work sites will be fenced off from park users.</p>	

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
		<p>Activity 1 Low – negative (long term). Medium – positive (long term)</p>	<p>Activity 1 <u>Operation</u> Overall, the upgraded and reinstated track will provide a safer experience for walkers with better constructed stairs, grades and drains that will prevent erosion and keep the tread in good condition. A quantitative geological assessment has been undertaken for areas of the walking track where geological hazards were identified. In some places the track has been moved to avoid hazards. In place, the track will be located in the vicinity of fall risk locations. Provided users stay on the track, there would be no risk of falling. The mitigation measures presented in this REF are considered sufficient to manage these risks.</p>	<ul style="list-style-type: none"> • The walking track must be constructed to meet AS 2156 Walking tracks classification and signage and the NPWS Park Facilities Manual. • Geological and landslide risks must be managed in accordance with the NPWS Landslides and Rockfalls Procedures.
		<p>Activity 2 Medium – positive (long term)</p>	<p>Activity 2 <u>Operation</u> The accommodation precincts will be installed as per all relevant Australian Standards and building codes to create a safe site. This will include internal fire separations, balustrades etc. Mowarry Point campground will provide an improved and safer experience for users with dedicated camp sites and a toilet.</p>	<p>No additional measures.</p>

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>Bushfire refuge locations have been identified at Mowarry Point. At Hegartys Bay, the staff hut has been designed and sized as a bushfire refuge. Other bushfire provisions including Asset Protection Zones, appropriate building materials and under floor clearances have also been incorporated into the design.</p> <p>The mitigation measures presented in this REF are considered sufficient to manage these risks.</p>	
		<p>Activity 3 Low – negative (short term). Medium – positive (long term)</p>	<p>Activity 3 <u>Operation</u> The compound at the end of the Hegartys bay vehicle access trail will remain in operation and provide an evacuation point for injured or ill walkers. The proposed boardwalk will also assist in transporting people in the event of an emergency. The Pulpit Rock carpark upgrade will create a safer precinct with the toilet located away from moving vehicles and dedicated car parking spaces. The mitigation measures presented in this REF are considered sufficient to manage these risks.</p>	No additional measures.
5. Is the activity likely to cause a bushfire risk?	<input checked="" type="checkbox"/>	<p>All activities Low – negative</p>	<p>All activities <u>Construction</u></p>	<p>All activities</p> <ul style="list-style-type: none"> No mechanical works involving the use of welding equipment, machinery with

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
		(short and long term).	<p>The southern sector of Ben Boyd National Park is located within bushfire prone land. There would be potential for increased bushfire risk during construction in the summer months due to increased traffic and operation of machinery. Use of welding equipment, machinery with hot exhausts or any activities likely to emit sparks may be a fire hazard.</p> <p>National Parks are a non-smoking location.</p> <p><u>Operation</u></p> <p>An increase in visitors to the southern sector of the Park due to improved facilities and access has the potential to increase bushfire risk. However, most visitors who use the upgraded track will be undertaking a managed experience hut hosts present at the two accommodation points.</p> <p>NPWS also routinely closes national parks during high and extreme fire danger rating periods, this practice would continue.</p> <p>The mitigation measures presented in this REF are considered sufficient to manage these risks.</p>	<p>hot exhausts or any activities likely to emit sparks may be a fire hazard, will be undertaken during total fire bans.</p> <ul style="list-style-type: none"> • The Construction Environmental Management Plan (CEMP) must identify construction works that represent an ignition risk and include mitigation measures to reduce the risk. The CEMP will also include mitigation measures for extreme fire danger weather events. • A bushfire specific evacuation plan and emergency management procedures will be developed, which adheres to the Reserve Fire Management Plan in place to evacuate staff and contractors in the event of wildfire. This plan must be developed for Hegartys Bay, Mowarry Beach and for the Light to Light Walk.
		Activity 1 Low – negative	Activity 1 In some areas, the walk will be located further from access tracks. This may increase the risk to visitors	No additional measures.

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
		(long term).	from bushfire due to an increased distance from evacuation areas and potential difficulty in closing the park. The walk is also expected to increase the overall visitation to the park. The mitigation measures presented in this REF are considered sufficient to manage these risks.	
		Activity 2 Medium – positive (long term)	Activity 2 Building, evacuation and Asset Protection Zone protocols have been assessed for Hegartys Bay and Mowarry Point in the ‘Bushfire risk reduction advice Hegartys Bay and Mowarry, Ben Boyd National Park’ (Ecological Australia, 2019). Recommendations include a refuge building at Hegartys Bay and rock refuge sites at Mowarry Point. Accommodation precincts would always be staffed by NPWS hut hosts and a daily safety briefing would take place. This would include bushfire safety. Camp fires will not be permitted at the Mowarry Point Campground. The addition of a compound capable of helicopter operations within the vicinity of Hegartys Bay would improve emergency access to the area for evacuation or firefighting.	<ul style="list-style-type: none"> • Infrastructure (including the huts, communal kitchen and host hut) at Mowarry Point and Hegartys Bay must be constructed to meet development standards of land as categorised by Ecological Australia (Ecological Australia, 2019): <ul style="list-style-type: none"> ○ The hut hosts accommodation at Hegartys Bay must be constructed to meet the development standards of BAL FZ and a community refuge. ○ All other buildings must be BAL 29. ○ Appropriate Asset Protection Zones must be maintained. • Campfires will not be permitted at the accommodation precincts.

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			The mitigation measures presented in this REF are considered sufficient to manage these risks.	
		Activity 3 High – positive (long term)	Activity 3 Works associated with Hegartys Bay access would improve emergency access, as such reducing bushfire risk. The mitigation measures presented in this REF are considered sufficient to manage these risks.	No additional measures

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
6. Will the activity affect the visual or scenic landscape?	☒	Activity 1 Medium negative (short term) Medium – positive (long term)	Activity 1 <u>Construction</u> The proposal has been designed with limited use of permanent signage, handrails and stairs by utilising the natural topography to reduce impacts on the scenic experience. Safety aspects will remain important ensuring the trail is clearly identified and safe for users. Vegetation clearing, soil disturbance and machinery may impact on the visual landscape however as this would be restricted to the immediate track width this impact is considered minor. <u>Operation</u> This activity would improve the visual and scenic landscape for visitors by providing more diverse and increased experiences. The mitigation measures presented in this REF are considered sufficient to manage these risks.	Activity 1 <ul style="list-style-type: none"> The use of signs, handrails and steps and other track infrastructure will be minimised where possible. Where these structures are required, as much as possible, they must utilise natural materials that blend into the environment
		Activity 2 Medium negative (long term)	Activity 2 <u>Construction</u> The construction of accommodation infrastructure within Mowarry Point and Hegartys Bay would have	Activity 2 <ul style="list-style-type: none"> The design and style of accommodation and facilities will be in

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
		Medium – positive (long term)	<p>a permanent impact on visual and scenic landscape, as these areas currently have no infrastructure.</p> <p>Although to a lesser extent, the formalisation of the Mowarry Point campground and inclusion of a toilet would also have a permanent visual impact.</p> <p><u>Operation</u></p> <p>The proposed accommodation would enable a wider range of visitors to enjoy the natural and cultural values of the park. The designs and style of the huts has been raised by the community during consultation phases. The final designs have been carefully placed to be screened from other park users with smaller buildings front facing and the impact gradient extending away from public spaces.</p> <p>Vegetation regeneration within the accommodation precincts will reduce the impacts on visibility over time.</p> <p>The mitigation measures presented in this REF are considered sufficient to manage these risks.</p>	<p>keeping with the surrounding landscape.</p> <ul style="list-style-type: none"> The design and scale of accommodation and facilities will be in accordance with NPWS design guidelines. Revegetation screening with endemic species must be incorporated into the landscape designs for both precincts to reduce the visual impact of the hut accommodation to other users while matching the surrounding environment.
		Activity 3	Activity 3 <u>Construction</u>	<ul style="list-style-type: none"> Construction equipment, machinery and materials will be stored at nominated compound sites.

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
		<p>Negligible–negative (long term)</p> <p>Medium – positive (long term)</p>	<p>Construction activities at Hegartys Bay are for the most part away from visitor locations and visual amenity would not be impacted. Vegetation clearing, soil disturbance and machinery may impact on the local visual landscape for the duration of construction at Pulpit Rock.</p> <p><u>Operation</u> The widening and formalisation of access to Hegartys Bay would have a permanent impact on the local visual and scenic landscape, particularly the section of Heathland. The Pulpit Rock upgrade would lead to an improved visual setting with dedicated vehicle loop, car parking and better access to the toilet.</p> <p>The mitigation measures presented in this REF are considered sufficient to manage these risks.</p>	<ul style="list-style-type: none"> The Hegartys Bay access boardwalk must be kept to a minimal height and follow the natural topography.
7. Is the activity likely to cause noise, pollution, visual impacts, loss of privacy, glare or overshadowing to members of the community, particularly adjoining landowners?	<input checked="" type="checkbox"/>	<p>All activities</p> <p>Negligible – negative (long term).</p>	<p>All activities</p> <p><u>Construction</u> The impacts of construction related noise, vibration, dust generation and traffic impacts are considered manageable with the implementation of the mitigation measures in this REF.</p>	<ul style="list-style-type: none"> Walking tracks, accommodation and service infrastructure must be designed and constructed to minimise operation and maintenance requirements. Works to be carried out during standard work hours (i.e. 7am to 6pm Monday to Friday; 8am to 1pm

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p><u>Operation</u></p> <p>There is no overshadowing to properties outside the southern sector of Ben Boyd National Park and no loss of privacy to adjoining landowners.</p>	<p>Saturdays). Any work that is performed outside normal work hours or on Sundays or public holidays must be approved prior and is to minimise noise impacts.</p> <ul style="list-style-type: none"> Aircraft operations must not be undertaken in early morning or late afternoon or in a way that will impact campers and other park users.
		<p>Activity 1</p> <p>Medium negative (short term).</p>	<p>Activity 1</p> <p>– The use of helicopters to transport infrastructure to the site would cause short term noise, pollution and visual impacts. The construction of new track sections that are close to existing sections may impact visitors as they encounter work locations. In operation the track will require ongoing maintenance with low noise and pollution impacts. The mitigation measures presented in this REF are considered sufficient to manage these risks.</p>	No additional measures
		<p>Activity 2</p> <p>Low – negative (short term).</p>	<p>Activity 2</p> <p>Localised and minor impacts relating to noise, vibration, dust generation, and traffic generation during the construction phase of this activity would occur.</p>	No additional measures

Community impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>The accommodation precincts will require ongoing servicing and maintenance with potential to impact park users.</p> <p>The mitigation measures presented in this REF are considered sufficient to manage these risks.</p>	
		<p>Activity 3 Low – negative (short term).</p>	<p>Activity 3 The use of helicopters to transport infrastructure to the site would cause short term noise, pollution and visual impacts. In operation service roads and tracks would require ongoing maintenance and would impact park users.</p> <p>No ongoing noise or other impacts are proposed from work associated wit Activity 3.</p> <p>The mitigation measures presented in this REF are considered sufficient to manage these risks.</p>	No additional measures

6.5 NATURAL RESOURCE IMPACTS

Natural resource impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
1. Is the activity likely to result in the degradation of the reserve or any other area reserved for conservation purposes?	<input checked="" type="checkbox"/>	<p>All activities</p> <p>Low – negative (short term)</p> <p>High – positive (long term)</p>	<p>All activities</p> <p>The locality will undergo a transformation due to construction of the upgraded walk, accommodation and improved site access. The design has been iterative and has avoided sensitive areas that may be prone to degradation where possible.</p> <p>A previously proposed fourth day was excluded from the proposal due to the unacceptable impact it may have resulted in.</p> <p>Multi-day walkers generally align with NPWS values - interest in and concern/respect for the natural and cultural heritage that national parks protect. These visitors are looking for opportunities to spend time in nature, interested in places that provide stories and are looking for a deeper connection with nature and culture that contrasts with normal life.</p>	No additional measures
		<p>Activity 1</p> <p>Low – negative (short term).</p>	<p>Activity 1</p> <p><u>Construction</u></p>	No additional measures

Natural resource impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>Realignment of tracks and closure/rehabilitation of existing tracks will be undertaken. This will impact the reserve by creating new tracks in some undeveloped areas. In places these realignments will move the track from sensitive landforms or consolidate networks of informal tracks. Redundant tracks will be closed and rehabilitated.</p> <p><u>Operation</u></p> <p>New track sections have been scoped to meet the relevant Australian Standard and NPWS Park Facilities Manual with minimal grade changes, track infrastructure and signage. Imported material will be minimised with a natural surface preferred. This type of track aligns with visitor expectations for a multi-day walk. Short day walks, attached to formal car parks and precincts, are available within Ben Boyd National Park and are more popular with general park users.</p>	
		<p>Activity 2 Low – negative (short term).</p>	<p>Activity 2</p> <p><u>Construction</u></p> <p>Whilst complete avoidance of impacts to these aspects is not possible, the proposal has been designed with the to avoid and minimise impacts to</p>	<p>Activity 2</p> <ul style="list-style-type: none"> • Construction of accommodation huts and associated infrastructure at Hegartys Bay and Mowarry Point will

Natural resource impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>the reserve. Both sites have experienced historical agricultural disturbance and have been partially cleared of vegetation. Buildings have been sited to utilise these previously disturbed areas and impacts would be restricted to the immediate locality.</p> <p>Work sites will be established to be the minimal size necessary to construct the precincts.</p> <p>Buildings would be modular and transported to the sites by helicopter to minimise on site disturbances. The buildings would be removable and would be founded on ground screw piles. Internal footpaths would be boardwalks to reduce impacts.</p> <p>Compost toilets have been specified with the compost material removed from the park. This will minimise the need for on site treatment and disposal of wastewater.</p> <p>Mitigation measures have been included to mitigate any impacts that cannot be avoided or minimised, to ensure that impacts are reduced to the minimum necessary to undertake the works.</p> <p><u>Operation</u></p> <p>The new accommodation will offer an improved experience to park users closely aligned with</p>	<p>be undertaken with minimal disturbance necessary.</p>

Natural resource impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>NPWS values. Some loss of natural space will occur within the locality of the precincts.</p> <p>While there will be some ongoing impacts from the proposal, the current situation of uncontrolled toileting, litter and campfires at both Mowarry Point and Hegartys Bay will no longer occur.</p> <p>Furthermore, the formalisation of the precincts will allow access to these locations by a wider group of people increasing the appreciation of the Park and other reserves.</p> <p>The proposed Mowarry Point and Hegarty Bay accommodation also includes the construction of a staff hut. This will be staffed full time and will allow for ongoing maintenance of the facilities to ensure degradation of these areas does not occur. The hit host will also provide welcome briefings to all visitors and provide an opportunity to remind visitors on the sensitive nature of the setting.</p>	
		<p>Activity 3 Low – negative (short term).</p>	<p>Activity 3 While there will be some short term minor impacts during construction, access upgrades at Hegartys Bay will allow for the efficient operation of the accommodation precinct. The access boardwalk will remove a surface track through heathland and</p>	<p>Activity 3 No additional measures.</p>

Natural resource impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			allow for recovery of that plant community along its length. The Pulpit Rock car park upgrade will require minor impacts during construction. Long term, this work will provide a more formal carpark and remove the current practice of vehicles impacting the reserve by parking informally.	
2. Is the activity likely to affect the use of, or the community's ability to use, natural resources?	<input checked="" type="checkbox"/>	All activities Low Positive	All activities The proposal would not affect the community's ability to use natural resources. Access to all fishing locations would be unchanged. The Light to Light Walk will enable a wider range of visitors to enjoy the natural surroundings whilst minimising impacts on the natural and cultural values of the national park.	No additional measures.
3. Is the activity likely to involve the use, wastage, destruction or depletion of natural resources including water, fuels, timber or extractive materials?	<input checked="" type="checkbox"/>	All activities Negligible–negative (short term) Low-positive (long term)	All activities Although the proposal would involve the use of natural resources including rock, gravel and timber, these resources would not be used to a degree that would lead to destruction or depletion. Re-use of onsite natural resources such as top soil sods and woody debris would be undertaken where appropriate.	All activities No additional measures.

Natural resource impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>Buildings have been designed to standard dimensions to reduce wastage. Sustainable and recycled materials have been specified that are long lasting and simple to maintain in a remote setting.</p> <p>With the implementation of appropriate construction measures the project would not impact water quality and no water within the park is used as a water supply or forms a water supply catchment.</p>	
4. Does the activity provide for the sustainable and efficient use of water and energy?	<input checked="" type="checkbox"/>	<p>Activity 2</p> <p>Negligible positive (long term)</p>	<p>Activity 2</p> <p>– The buildings associated with Activity 2 have been designed as off grid remote hiking huts. Limited solar power will be provided and restricted only to lighting of the communal hut, charging points and the staff hut. No power would be provided to the accommodation huts. Roof harvested rainwater tanks would be installed and will provide water for drinking and cooking. No showers will be provided. Highly efficient pellet heaters will be used in the communal hut.</p>	<p>Activity 2</p> <ul style="list-style-type: none"> • The design and fit out of the accommodation locations must specify energy and water efficient fixtures as required.

6.6 ABORIGINAL CULTURAL HERITAGE IMPACTS

The information in this Aboriginal Cultural Heritage Impacts section has been provided by Lantern heritage Pty Ltd and summarised by NPWS, and has been included verbatim. NGH takes no responsibility for the content of this section or the assessment within it as NPWS has provided this information.

Aboriginal cultural heritage impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
1. Will the activity disturb the ground surface or any culturally modified trees?	<input checked="" type="checkbox"/>	<p>All activities</p> <p>Medium-negative (short term)</p> <p>Low-negative (long term)</p>	<p>All activities</p> <p>The activity will result in ground disturbance and vegetation removal. No culturally modified trees have been identified and no large trees would be impacted by the proposal.</p> <p>Ground disturbance has been minimised by specifying a Class 4 natural surface track with minimal signage and track infrastructure, utilising existing tracks were appropriate and utilising non-disturbing building techniques.</p>	No additional measures
2. Does the activity affect known Aboriginal objects or Aboriginal places?	<input checked="" type="checkbox"/>	<p>Medium-negative (short term)</p> <p>Low-negative (long term)</p>	<p>All activities</p> <p>Extensive site searches were conducted via AHIMS on 21 January 2021 and on 15 February 2021. One hundred and eighty-one (181) sites or objects were listed as being present within the south Ben Boyd National Park search area. Of the 181 sites listed within the search area, there were 93 previously recorded Aboriginal sites listed on AHIMS as being within 100m of the Light to Light walk upgrade areas</p>	<p>All Activities</p> <ul style="list-style-type: none"> A 20-year AHIP must be obtained through Heritage NSW to allow impacts from the proposed works and long-term maintenance of the proposed Light to Light upgrades including walking tracks between Boyd's Tower and Green Cape Lightstation, Mowarry Point, Hegartys

Aboriginal cultural heritage impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			Previous investigations between Ben Boyd Tower and Green Cape Lighthouse within Ben Boyd National Park have identified a suite of sites along the coastal fringe, including middens, artefact scatters and at least one burial.	Bay and associated vehicle and access tracks.
3. Is the activity located within, or will it affect, areas containing the following landscape features? <ul style="list-style-type: none"> • within 200m of waters*; • within a sand dune system*; • on a ridge top, ridge line or headland; • within 200m below or above a cliff face; or • within 20m of or in a cave, rock shelter or a cave mouth. 	<input checked="" type="checkbox"/>	Medium-negative (short term) Low-negative (long term)	All activities Most of the proposal is within landscape features where Aboriginal objects are commonly found – 200 metres of water and on ridge tops/ridge lines/headlands. Test excavations and field surveys have revealed significant cultural sites and deposits within these landforms confirming their importance as cultural points in this landscape.	No additional measures
4. If Aboriginal objects or landscape features	<input checked="" type="checkbox"/>	Medium-negative	All activities	All activities

Aboriginal cultural heritage impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
are present, can impacts be avoided?		(short term) Low-negative (long term)	<p>Significant track and buildings design refinements have been undertaken to avoid Aboriginal objects and minimise impacts to sensitive areas.</p> <p>To minimise on ground impacts, the walk has been developed to Class 4 standard. These tracks require bushwalking experience, are generally narrow, follow the natural topography, may be rough and steep with minimal signage and track infrastructure. Likewise, the accommodation precincts have been designed in line with these principles with small footprints and basic services to reduce on ground impacts.</p> <p>Significant sites discovered between Green Cape and Disaster Bay led to the removal of this section of walking track from the scope of this proposal.</p> <p>Activity 1</p> <p>The proposal consists of a 30m wide track corridor to allow for micro-siting adjustments to be implemented where cultural sites are present. The maximum width of this corridor will be utilised when siting the 1m track alignment to ensure the greatest distance between the track and the site to avoid and minimise harm.</p> <p>Floating boardwalks, where the mesh deck is fixed to treated pine sleepers laid directly on the ground, will</p>	<ul style="list-style-type: none"> As state above in question 2 of this table, a 20 year AHIP must be obtained through Heritage NSW to allow impacts from the proposed works and long-term maintenance of the proposed Light to Light upgrades including walking tracks between Boyd's Tower and Green Cape Lightstation, Mowarry Point, Hegartys Bay and associated vehicle and access tracks. <p>Activity 1</p> <ul style="list-style-type: none"> Walking track works within the Light to Light upgrade project must be limited to within the 30m wide micro-siting corridor.

Aboriginal cultural heritage impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>also be used to pass through sensitive locations with minimal ground disturbance (see Appendix H).</p> <p>Activity 2</p> <p>Site plans for both precincts have been developed to utilise existing disturbed areas as much as possible.</p> <p>Buildings have been designed to be modular with ground screws utilised as the preferred footing type. These are screwed directly into the ground with disturbance restricted to the diameter of the screw avoiding the need for extensive excavation associated with concrete foundations.</p> <p>Internal footpaths will be boardwalks with simple post footings or floating timber sleepers. In operation all staff and visitors will be required to stay on boardwalks to not impacts adjacent areas. This approach has been adopted to avoid the need for gravel footpaths.</p> <p>For the most part, service pipes and conduits will be hung from boardwalks to avoid trenching.</p> <p>The formalisation of the Mowarry Point campground will create dedicated tent sites and includes a toilet which will avoid the current practice of dispersed camping.</p>	

Aboriginal cultural heritage impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>Activity 3</p> <p>Work associated with Activity 3 is restricted to existing disturbed areas or is located away from cultural sites. The proposed access boardwalk to Hegartys Bay will be constructed on the alignment of an existing track.</p> <p>Despite these actions, some sites cannot be avoided and an AHIP will be sought for the proposal to cover all three activities.</p>	
5. If the above steps indicate that there remains a risk of harm or disturbance, has a desktop assessment and visual inspection been undertaken (refer to the Due Diligence Code)?	<input checked="" type="checkbox"/>	<p>Medium-negative (short term)</p> <p>Low-negative (long term)</p>	<p>In 2020, Lantern Heritage surveyed the Light to Light upgrade areas and recorded a total of 108 sites that comprised of 79 previously recorded sites. Due to the high visibility encountered during survey as a result of the Border Fire, the extent of previously recorded sites was clearly seen to be much larger than originally observed. Rather than record additional small sites, Lantern used a large scale landform based approach to combine previously recorded sites into larger sites where appropriate.</p> <p>Sites were recorded within each section of proposed upgrades with the exception of the Pulpit Rock access track and carpark area, where no sites were recorded.</p>	<p>All activities</p> <ul style="list-style-type: none"> • A program of surface collection and salvage excavation must be completed prior to impacts. Salvage is recommended for sites listed in the ACHAR and in accordance with the methodology of the ACHAR appendices. • All cultural material recovered from the proposed salvage excavation must be held in temporary care at the relevant NPWS office or project archaeologist's

Aboriginal cultural heritage impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>Impacts to Aboriginal sites caused by the Border Fire varied greatly within the surveyed areas.</p> <p>The field survey identified areas of Potential Archaeological Deposit (PAD) across the proposed accommodation areas at Hegartys Bay and Mowarry Point.</p> <p>Test excavations at Hegartys Bay in July 2019 found significant archaeological deposits. In December 2020 Lantern Heritage undertook an archaeological test excavation program at Mowarry Point and found subsurface archaeological deposits at four locations.</p> <p>Fifty-four percent (54%) of sites will be directly impacted by the proposed works, although this harm will be partial only. Thirty-five percent (35%) of sites will not be harmed and the long term management and protection of these sites will be covered in a Aboriginal Cultural Heritage Management Plan (ACHMP). Remaining Aboriginal objects/sites are located within the proposed Light to Light impact areas and can be avoided by the proposed works.</p> <p>While the proposed Light to Light upgrade works will result in direct harm to four Aboriginal sites, the majority of harm is limited to areas that have already been disturbed by long term visitor use. Proposed</p>	<p>office for analysis until an appropriate time when it can be returned to site.</p> <ul style="list-style-type: none"> • Ground disturbing activities associated with the Light to Light walk upgrades at the sites listed in the ACHAR are monitored by Eden LALC or other Aboriginal community representatives as chosen by NPWS. • Management and mitigation measures outlined in the ACHAR must be implemented over the life of the AHIP. • The Aboriginal Cultural Heritage Management Plan (ACHMP) included as an appendix to the ACHAR must be followed to reduce and manage potential long-term visitor impacts to recorded sites located outside the Light to Light project upgrade area. • All contractors involved in all activities associated with the project must receive cultural heritage inductions prior to undertaking work in the study areas.

Aboriginal cultural heritage impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>impacts from the walking track upgrade will serve to protect the archaeological and natural resources in the Light to Light study area from further impact by limiting visitor access to areas that are less disturbed. The sites to be impacted by Light to Light upgrade works represent a very small proportion of the entire Ben Boyd National Park.</p> <p>An ACHA has been completed and is attached to this REF in Appendix A (restricted).</p>	<ul style="list-style-type: none"> • A copy of the final ACHAR must be forwarded to all Registered Aboriginal Parties for their review and comment. • In the event that Ancestral (human) skeletal remains, or suspected human skeletal remains, are encountered during any of the proposed works or salvage actions, all work must stop and the procedures outlined in the ACHAR appendices must be implemented. • No work is to be conducted beyond the proposed AHIP areas. All areas beyond the proposed AHIP boundary must be treated as no-go zones and must not be used for stockpiling of materials or vehicle access, unless existing vehicle access tracks are used or through a separate archaeological investigation/AHIP. • NPWS must consider the recommendations of Donaldson's 2018 intangible cultural heritage study of Ben Boyd National Park. These

Aboriginal cultural heritage impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
				<p>recommendations include but are not limited to:</p> <ul style="list-style-type: none"> ○ providing opportunities for RAPs and local Aboriginal people to showcase their culture and heritage values in the interpretative signage proposed for the Light to Light project; ○ undertaking an Aboriginal naming project across Ben Boyd NP; and ○ continuing to support Aboriginal use of the camping grounds within Ben Boyd NP;
6. Is the activity likely to affect wild resources or access to these resources, which are used or valued by the Aboriginal community?	<input type="checkbox"/>	N/A	<p>The proposed activity is not expected to affect wild resources used or valued by the local Aboriginal community.</p> <p>The proposed activity may have an impact on access to resources by the local Aboriginal community in the short term however positive long term impacts for community access are proposed.</p>	

Aboriginal cultural heritage impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			As part of the Light to Light walking track upgrade some sections of track will be closed which will discourage public access to parts of the coast that are considered to have high cultural value to the local Aboriginal community. Access to the coastal resources of Ben Boyd NP for the local Aboriginal community will be enhanced through development of a community campground within Bittangabee campground (separate proposal). This will support ongoing connections for local Aboriginal community with the natural resources and cultural values of Ben Boyd NP	

6.7 CULTURAL HERITAGE IMPACTS

The information in this Cultural Heritage Impacts section has been provided by Lantern heritage Pty Ltd and summarised by NPWS, and has been included verbatim. NGH takes no responsibility for the content of this section or the assessment within it as NPWS has provided this information.

Other cultural heritage impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
1. What is the impact on places, buildings, landscapes or moveable heritage items?	<input checked="" type="checkbox"/>	Medium-negative (short term) Low-negative (long term)	<p>All activities</p> <p>No items of world, national or Commonwealth significance are present within or adjacent to the project area. An item listed on the Maritime heritage database would not be impacted by the proposal.</p> <p>Heritage items listed on the Bega Valley Shire Local Environmental Plan within Ben Boyd National Park would not be impacted by the proposal.</p> <p>The proposal extends onto the curtilage of the state heritage listed Green Cape Maritime Precinct.</p> <p>The proposals would also occur within the vicinity of the three heritage items listed on the NPWS Section 170 Register</p> <p>Activity 1</p> <p>A small portion of the upgraded section of track between Bittangabee Bay and Green Cape would pass through the curtilage of the Green Cape Maritime Precinct. Work at this location would involve the establishment of a natural surface track from the rock platform to the Green Cape precinct. This would be 1-1.5m wide and have</p>	<p>All activities</p> <ul style="list-style-type: none"> • All contractors involved in all activities associated with the project must receive historic heritage inductions prior to undertaking work in the study areas. • If encountered, archaeological remains will be assessed by an archaeologist to determine whether the suspected find constitutes a relic under the <i>NSW Heritage Act 1977</i> and whether NSW Heritage Council should be notified. • Conduct archival recording at all heritage items of local or state significance where impacts are anticipated within the curtilage of an item. • Subsurface disturbance must be avoided across all identified areas of potential archaeological deposits predicted to contain relics. • A Conservation Management Plan be prepared for the identified heritage items to reduce and manage potential long-term visitor impacts to the locally and

Other cultural heritage impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>minimal track infrastructure and signage.</p> <p>Significant fabric, meaning physical material of the place/item including elements, fixtures, landscape features, contents, relics and objects which contributes to heritage significance would not be impacted. This work does not qualify as a standard exemption and an approval under section 57(1) of the Heritage Act 1977 would be required.</p> <p>Activity 2</p> <p>Heritage items listed on the NPWS Section 170 register are located at both accommodation precincts. At Mowarry Point evidence of former agricultural activity and possibly earlier whaling activities has been identified. At Hegartys Bay several building foundations, chimneys, footpaths and garden beds have been observed.</p> <p>Site plans for both precincts have been developed to avoid obvious evidence of historic heritage items.</p> <p>Buildings have been designed to be modular with ground screws utilised as the preferred footing type to avoid the need for extensive excavation associated with concrete foundations.</p>	<p>state significant items present along the Light to Light Walk.</p> <ul style="list-style-type: none"> An unexpected finds procedure be developed prior to commencement of works and integrated into the above Conservation Management Plan A heritage interpretation plan must be developed for the Light to Light Walk that also incorporates any additional information or research undertaken in relation to the above mitigation measures. <p>Activity 1</p> <ul style="list-style-type: none"> NPWS must apply to Heritage NSW for an exemption under section 57(1) of the <i>Heritage Act 1977</i> for walking track work proposed within the Green Cape Maritime Precinct curtilage, <p>Activity 2</p> <ul style="list-style-type: none"> NPWS must apply to Heritage NSW for an excavation permit under section 140 of the <i>Heritage Act 1977</i> to undertake

Other cultural heritage impacts during construction and operation				
	Applicable?*	Likely impact (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<p>Internal footpaths will be boardwalks with simple post footings or floating timber sleepers. In operation all staff and visitors will be required to stay on boardwalks to not impacts adjacent areas. This approach has been adopted to avoid the need for gravel footpaths.</p> <p>For the most part, service pipes and conduits will be hung from boardwalks to avoid trenching.</p> <p>The formalisation of the Mowarry Point campground will create dedicated tent sites and includes a toilet which will avoid the current practice of dispersed camping.</p> <p>Activity 3 No historic heritage items have been identified in the vicinity of work locations associated with this activity.</p>	works at Mowarry Point and Hegartys Bay where ground disturbance activities are anticipated and will need to be mitigated through monitoring and/or salvage excavations.
2. Is any vegetation of cultural landscape value likely to be affected (e.g. gardens and settings, introduced exotic species, or evidence of broader remnant land uses)?	<input type="checkbox"/>	N/A	No vegetation of cultural landscape value will be affected by the proposal.	

6.8 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE UNDER THE EPBC ACT

	Applicable?*	Impact level (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
1. Is the proposal likely to impact on matters of national environmental significance under the EPBC Act, as follows:	<input type="checkbox"/>	N/A	No matters of national environmental significance under the EPBC Act would be impacted by the activities that form this proposal.	
• Listed threatened species or ecological communities	<input type="checkbox"/>	N/A	No species or TECs listed under the EPBC Act would be significantly impacted as a result of the activities that form this proposal. Refer to BAR which is attached to this REF as Appendix B.	No additional measures.
• Migratory species protected under international agreements	<input type="checkbox"/>	N/A	No migratory species would be significantly impacted as a result of the activities that form this proposal. Refer to the BAR which is attached to this REF as Appendix B.	No additional measures.
• Ramsar wetlands	<input type="checkbox"/>	N/A	No Ramsar wetlands would be impacted as a result of the activities that form this proposal.	No additional measures.
• Commonwealth marine environment	<input type="checkbox"/>	N/A	No commonwealth marine environment would be impacted as a result of the activities that form this proposal.	No additional measures.

	Applicable?*	Impact level (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
<ul style="list-style-type: none"> World heritage properties or national heritage places 	<input type="checkbox"/>	N/A	No world or national heritage items, places or properties would be impacted as a result of the activities that form this proposal.	No additional measures.
<ul style="list-style-type: none"> the national heritage values of national heritage places 	<input type="checkbox"/>	N/A	No national heritage values of national heritage places would be impacted as a result of the activities that form this proposal.	No additional measures.

6.9 CUMULATIVE IMPACTS

	Applicable?*	Impact level (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
1. Are there any cumulative environmental impacts with other existing or likely future activities.	<input checked="" type="checkbox"/>	Negligible	<p>Projects outside the REF scope within Ben Boyd National Park include;</p> <ul style="list-style-type: none"> Precinct upgrades at Boyds Tower, Saltwater Creek campground, and Bittangabee Bay campground. Carpark and service upgrades at Green Cape and Disaster Bay. 	No additional measures.

	Applicable?*	Impact level (negligible, low, medium or high negative or positive; or N/A)	Reasons (describe the type, nature and extent of the impact, the nature of the receiving environment and any proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures
			<ul style="list-style-type: none"> The upgrade of Mowarry Point Trail, including a new bridge, to provide improved bushfire access. <p>Although not currently being proposed, a project to reconfigure the building at Green Cape Lighthouse to provide a third nights accommodation for Light to Light walkers may commence.</p> <p>At this stage, no substantive cumulative impacts are anticipated. These projects would be assessed under separate assessments to identify environmental impacts.</p>	

7. SUMMARY OF IMPACTS

Category of Impact	Significance of Impacts		
	Extent and Duration	Nature	Impact on Sensitive Features
Physical and Chemical	Moderate short term.	<p>The Light to Light Walk upgrade would change the two/three day walk with camping at public campgrounds to a multi-day 'hut to hut' style walk with shorter walking lengths each day and provision of overnight accommodation. The new alignment is broken into new sections for the purpose of separating work areas.</p> <p>The walking tracks will be 1-1.5m wide with mostly surface tracks and some stairs with excavation and vegetation removal required during the construction phase.</p> <p>Compaction of soils from the transport and storage of equipment and materials would be minor as storage would occur in disturbed areas.</p> <p>A permanent culvert would be installed over a small creek east of the public carpark at Mowarry Beach.</p> <p>Fuels would be required for the operation of equipment and machinery, with the likelihood of a spill/pollution event occurring being very low.</p> <p>Construction noise may cause temporary disturbance to users of the National Park.</p>	<p>Erodibility of the soils, slopes and sensitivity of the potential receiving environments.</p> <p>Should a spill/pollution event occur it has potential of entering drainage lines and waterways.</p>
Biological	Moderate short term.	<p>Direct impacts include Loss of native vegetation and fauna habitat. Potential indirect impacts include over clearing, predation by feral animals, displacement of resident fauna through vegetation clearing and habitat removal, loss of shade/shelter, reduction in viability of adjacent habitat due to edge effects, erosion, introduction and spread of noxious weeds and pathogens , disturbance to marine mammals (i.e. Seals), displacement of resident fauna through increased human activity, and disturbance to marine mammals (i.e. Seals) due to an increase in human activity.</p>	<p>No EECs will be impacted. While threatened species are known from the area, impacts have been assessed as non significant and are considered manageable.</p> <p>The successful rehabilitation of redundant sections of the existing track will somewhat offset the additional 5.73ha of clearing required.</p>

Category of Impact	Significance of Impacts		
	Extent and Duration	Nature	Impact on Sensitive Features
Community	Low to moderate short term.	<p>Construction disturbance would be temporary and a number of measures would be implemented to reduce the impact of construction activities on users of the Ben Boyd National Park.</p> <p>During operation, visitors would benefit from the new Light to Light Walk with improved accommodation and facilities (cooking, toilets etc) as well as improved visual views along the walk and improved site access.</p>	Construction noise impacts on users of the Ben Boyd National Park may affect their experience.
Natural Resources	Low short term.	<p>Realignment of tracks, closure/rehabilitation of existing tracks, maintenance and upgrades to site access and provision of accommodation huts and facilities will impact upon the Ben Boyd National Park.</p> <p>The walk will enable visitors to enjoy the natural surroundings whilst minimising impacts on the natural and cultural values of the National Park.</p>	The process of avoid, minimise and offset would be implemented to minimise any negative impacts upon the National Park.
Aboriginal Culture	Moderate	<p>The activities will result in ground disturbance and vegetation removal.</p> <p>An ACHA has been completed to assess the impacts of the proposal on Aboriginal Objects .</p> <p>The realignment of tracks would have the biggest impact, with 69.6% of the recorded sites being present on the proposed Light to Light Walk.</p> <p>Both proposed accommodation sites at Hegartys Bay and Mowarry Point had Aboriginal objects present.</p> <p>An extensive artefact scatter on the access track into Mowarry Point was relocated. No Aboriginal objects were identified along the Hegartys access track or at Disaster Bay lookout carpark.</p>	The proposal will impact upon Aboriginal heritage. Recommendations from the ACHA would need to be adhered to.
Cultural Heritage	Low	<p>Three sites were recorded on the Australian Heritage Database within the Ben Boyd National Park;</p> <ul style="list-style-type: none"> • Ben Boyd National Park (natural). • Bittangabee Ruins (historic). • Boyds Tower Fish Fossils (natural). 	The proposal will have a negligible impact on Ben Boyd National Park.

Category of Impact	Significance of Impacts		
	Extent and Duration	Nature	Impact on Sensitive Features
		<p>One item was listed under the NSW Heritage Act within the Ben Boyd National Park;</p> <ul style="list-style-type: none"> Green Cape Maritime Precinct. 	
Cumulative Impacts	Low	<p>Projects outside the REF scope within Ben Boyd National Park include;</p> <ul style="list-style-type: none"> Reconfiguration of Assistant Lightkeepers Cottage and Headkeepers Cottage at Green Cape Lightstation to provide accommodation as well as reconfiguration of existing bathrooms to provide communal toilet and shower facilities. The Telegraph Station would be adapted to provide NPWS accommodation. Precinct upgrades at Boyds Tower, Saltwater, Bittangabee and Green Cape. The Draft Amendment to the Ben Boyd National Park and Bell Bird Creek Nature Reserve Plan of Management 2019 	

8. SUMMARY OF MITIGATION MEASURES

Category of Impact	Safeguards/Mitigation Measures
Physical and Chemical	<ul style="list-style-type: none"> A Soil and Water Management Plan (SWMP) must be prepared by the work contractor(s) and approved by NPWS. The SWMP will be adapted as works progress and a number of plans prepared to manage the discrete sections and types of works. An erosion and sediment control plan would be prepared in conjunction with the final design and implemented. This would include: <ul style="list-style-type: none"> Sediment control measures are to be in place prior to any vegetation clearing and site leveling and shall be maintained until runoff catchments are stabilised. Sediment controls are to be inspected regularly by the relevant contractor and by NPWS staff. Sediment control measures are also to be in place for the storage of any spoil as required. Construction works involving ground disturbance are not to be carried out for the proposed activity during or within two days of heavy rainfall. Soil disturbance will be minimised by clearly demarcating the works footprint and marking all other areas as no go zones prior to works.

- Clearing and excavation works will not be conducted during high rainfall periods. The weather will be monitored during the proposed works period and works will cease, and open areas stabilised, if heavy rainfall was forecast.
- Erosion and sediment control measures are to be implemented and maintained to:
 - Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets
 - Reduce water velocity and capture sediment on site
 - Minimise the amount of material transported from site to surrounding pavement surfaces
 - Divert clean water around the site (in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book)).
- Vehicle use and material laydown will be restricted to existing or proposed disturbed areas.
- All areas disturbed by works will be progressively stabilised and rehabilitated to ensure stable surfaces are obtained as soon as practical (progressively where possible).
- Spill kits will be stored in both chemical storage locations and designated refuelling areas.
- No concrete wash out will occur onsite unless in a purpose-built washout facility.
- The track setout and footing locations will take into account the topography and erosive nature of soils on the site.
- Impacts to geological formations will be designed to have minimal impact and appear natural in design.
- Clearing and ground disturbance within the accommodation precincts must be restricted to the minimum necessary to carry out the work.
- Vehicle movements must not exceed 4 light vehicles and 2 trucks per day during the construction period.
- All works to conform to OEH (2010) Erosion and Sediment Control on Unsealed Roads standards.
- All chemicals (fuels, concrete) will be stored in impervious bunded areas located at least 40m from waterways and in accordance with manufacturer's instructions.
- Refuelling will be in accordance with manufacturer's instructions and will only be in designated refuelling areas which are bunded and at least 40m from waterways.
- Contractors are to have, and be competent in the use of, petrochemical spill kits for use of any spillage during the construction. The NPWS is to be notified of any spills and the action taken to contain them.
- All machinery is to be free from any fuel and other pollutant residues, with connections and hoses inspected regularly.
- Track mats or similar will be utilised for machinery access over sensitive areas.
- Avoid use of natural surface trails in proximity to waterways to minimise sediment run-off.
- Temporary watercourse crossings will be designed to minimise impacts on hydrology, aquatic habitat and fauna by:
 - Maintaining low-flow conditions
 - Being designed with consideration of the potential for flooding during construction
 - Be removed and the area rehabilitated following completion of construction.
- These crossings will take into consideration the requirements of the FM Act and Policy and guidelines for fish habitat conservation and management (NSW Department of Primary Industries, 2013).
- Structural components will be assembled offsite where possible and delivered to work sites by helicopter.

	<ul style="list-style-type: none"> • Avoid use of natural surface trails in proximity to waterways to minimise sediment run-off. • Building modules will be assembled offsite where possible and delivered to precincts by helicopter. • Drainage lines within and adjacent to the accommodation precincts must be demarcated and assigned as “no go zones” during construction. • Work must not be undertaken on the mesh bridge during high flow conditions. • Footings locations for mesh bridge must be cleared of all excess material prior to completion. • Structural components associated with the mesh boardwalk must be assembled offsite where possible and incrementally installed to All chemicals (fuels, concrete) will be stored in impervious bunded areas located at least 40m from waterways and in accordance with manufacturer’s instructions. • An emergency spill kit is to be kept on site at all times. All staff are to be made aware of the location of the spill kit and trained in its use. • All plant, machinery, tools and fuel storage must be in good working order and regularly checked for leaks. • Dedicated fuel and other chemical stores must be included in the accommodation design. Minimise disturbance. • Resource management hierarchy principles are to be followed: <ul style="list-style-type: none"> ○ Avoid unnecessary resource consumption as a priority ○ Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery) ○ Disposal is undertaken as a last resort ○ (in accordance with the Waste Avoidance & Resource Recovery Act 2001). • Materials including mulch and vegetation waste will be reused on site where possible. • Wastes not reused onsite will be taken to an appropriate licenced facility able to accept the waste. • Construction staff will remove litter brought to the site. • Machinery will be well maintained and not left idling. • Ensure machinery used is well maintained and in good working order. • Construction noise to be minimised during peak visitation periods. • Dust suppression techniques to be implemented if required.
Biological	<ul style="list-style-type: none"> • A Biodiversity Management Plan (BMP) is to be created and include: <ul style="list-style-type: none"> ○ Pre-clearing protocol (including avoidance and micro siting requirements around habitat features). ○ Exclusion zones or other means to clearly demarcate proposal boundaries and protect the adjacent vegetation. ○ Re-establishment of native vegetation – species, area and method. ○ Clearing of native vegetation and removal of bush rock. ○ Unexpected threatened species finds. ○ Protection of native vegetation to be retained. ○ Aquatic habitats and riparian zones. ○ Weed and pathogen management ○ Pest management actions and procedures

- Rehabilitation of disturbed areas and discontinued tracks
- Best practice removal and disposal of vegetation
- Staged removal of habitat features such as fallen logs (if required) with attendance by an ecologist
- Exclusion of vehicles through sensitive areas
- Pre-clearing surveys by an ecologist to identify any threatened flora and fauna species, and specific habitat features that may be impacted by construction works. Habitat features of threatened species to be targeted during pre-clearing surveys so that they can be avoided during construction include:
 - Hollow-bearing trees
 - Glossy Black Cockatoo feed trees
 - Quoll denning habitat and latrine sites
 - Active nests (woodland birds)
 - Yellow-bellied Glider feed trees
 - Rocky outcrops
- Clearing protocols that identify vegetation to be retained, prevent inadvertent damage and reduce soil disturbance; all groundwork associated with construction and operation of the walking track elements of the proposed activity will be carried out by hand, handheld tools and plant e.g. chainsaws and brush cutters, and a mini excavator if required and with prior approval by the NPWS. Larger machinery may be used for works associated with Activity 2 and Activity 3.
- The detailed design and construction planning will be carried out to minimise the extent of clearing within the development footprint, avoid the loss of known threatened species, hollow-bearing trees, and essential habitat features.
- Used existing tracks where possible to limit the extent of clearing.
- Utilise areas already impacted by previous clearing or disturbance for access purposes, stockpiles or the establishment of compound sites. No stockpiling or storage within dripline of any mature trees.
- If clearing of vegetation is required outside the subject site these areas will need to be assessed as an addendum to this REF.
- Trees to be retained, including trees adjacent but outside of the subject site, require an adequate tree protection zone (TPZ) for the duration of works. Details for calculating TPZs are provided within Australian Standard 4970-2009 – Protection of trees on development sites.
- If the TPZ cannot be avoided during works, the Structural Root Zones (SRZ) of trees will be retained. Details for calculating the SRZs are provided within Australian Standard 4970-2009 – Protection of trees on development sites.
- Staff training and site briefing to communicate environmental features to be protected and measures to be implemented
- Site induction and toolbox talks are to identify the location and nature of ecologically sensitive areas and Limit of Works.
- Landscape plantings will be comprised of local indigenous species.
- Avoid the removal or disturbance of shelter/denning habitat such as woody debris, fallen logs, burrows in the ground, dense shrubs, rock crevices and bush rocks during the construction of the walking track. Any fallen timber and dead wood encountered within the development footprint will be left in situ wherever possible or would be relocated to adjacent areas (within the buffer area) of similar habitat to aid in habitat enhancement. If rock removal is unavoidable it is to be removed with suitable machinery so as not to damage the underlying rock or result in excessive soil disturbance.

	<ul style="list-style-type: none"> • If any Glossy Black Cockatoo feed trees are encountered during pre-clearing surveys, these would be retained. • If active nests of threatened bird species are encountered, works within 200m of the nest would be postponed until nestlings fledge. • If an active threatened owl nest is detected, no works using noisy machinery would be undertaken within 200 m of the nest tree. • As part of continuing maintenance, clear management measures will be set in place to avoid and minimise impacts on breeding habitat and foraging habitat for threatened species. • Information on the threatened species within the locality are to be included in the induction process for applicable personnel. • An unexpected threatened fauna or flora procedure must be developed and if species are discovered, works will stop immediately, and the environment manager notified. An ecologist will then be engaged to determine management actions to avoid or mitigate any potential impact. • Staff training and public signs must communicate the importance of remaining on tracks, and leaving no trace while in the national park. • Ensure all staff and visitors to the park are aware of laws re. approaching marine mammals (in this case seals). In accordance with the Biodiversity Conservation Regulation 2017 (Clause 2.3). • Project-specific pest management actions will be detailed in the BMP, and will be appropriately funded and based on the principles of adaptive management. The plan should include provisions for monitoring (e.g. camera traps to detect feral predator densities), evaluation and the use control strategies through baiting or other means, where appropriate. • A Weed and Pathogen Management procedure would be developed for the proposal. This would include: <ul style="list-style-type: none"> ○ Management protocol for declared priority weeds under the Biosecurity Act 2015 during and after construction ○ Weed hygiene protocol in relation to plant, machinery, and fill ○ Any occurrences of pathogens such as Myrtle Rust and Phytophthora would be monitored, treated, and reported. ○ Avoid all use of foreign soil matter for landscaping/mulching. Always use matter from in situ. ○ Install disinfecting facilities – wash-down bays, footbaths and/or scrubbing stations at primary entrance/exit points for both vehicles/machinery and foot traffic ○ In priority locations (heath habitat), install signage (e.g. ‘Stay on marked tracks’) to reduce off-track disturbance and elevate or divert walking tracks to minimise contact with soil, particularly in locations that have the potential to become muddy. ○ The procedure would be incorporated into the Biodiversity Management Plan.
Community	<ul style="list-style-type: none"> • Notice of planned work schedules, including impacts to parking areas and road closures must be advertise to the public in advance of work commencing. • The existing track network must remain open until the new track sections are fit for use. • Rehabilitation of existing tracks to be closed must not occur until walking track realignment are completed and open to ensue uninterrupted access to walking track users. • A formalised accommodation booking system must be implemented. A review of its effectiveness will be undertaken within 6 months of commencement. • Public camping will be maintained at Mowarry Point, independent of hut accommodation.

- The CEMP will include traffic controls including signage and speed limits will be implemented for works undertaken on public access tracks
- Track closures and impacts on car parks will be minimised and staged to retain public access as much as possible during construction
- Appropriate controls for flight paths crossing public tracks and trails will be implemented to ensure no people are below the flight path for aircraft operations.
- Aircraft operations would be undertaken Monday to Friday avoiding weekends and public holidays unless approved by the Area Manager.
- Where required, construction signage and temporary fencing will be installed at either end of work zones to notify visitors and prevent access.
- Vehicles will be restricted to low speeds (20km/h) as a general speed and (5km/h) when within vicinity of the public.
- Construction sites must be managed to prevent public access during and outside work times.
- Proposed works must be certified to comply with the Building Code of Australia (BCA) or relevant Australian Standards as per the OEH Construction Assessment Procedure.
- The walking track must be constructed to meet AS 2156 Walking tracks classification and signage and the NPWS Park Facilities Manual.
- Geological and landslide risks must be managed in accordance with the NPWS Landslides and Rockfalls Procedures.
- No mechanical works involving the use of welding equipment, machinery with hot exhausts or any activities likely to emit sparks may be a fire hazard, will be undertaken during total fire bans.
- The Construction Environmental Management Plan (CEMP) must identify construction works that represent an ignition risk and include mitigation measures to reduce the risk. The CEMP will also include mitigation measures for extreme fire danger weather events.
- A bushfire specific evacuation plan and emergency management procedures will be developed, which adheres to the Reserve Fire Management Plan in place to evacuate staff and contractors in the event of wildfire. This plan must be developed for Hegartys Bay, Mowarry Beach and for the Light to Light Walk.
- Infrastructure (including the huts, communal kitchen and host hut) at Mowarry Point and Hegartys Bay must be constructed to meet development standards of land as categorised by Ecological Australia (Ecological Australia, 2019):
 - The hut hosts accommodation at Hegartys Bay must be constructed to meet the development standards of BAL FZ and a community refuge.
 - All other buildings must be BAL 29.
 - Appropriate Asset Protection Zones must be maintained.
- Campfires will not be permitted at the accommodation precincts.
- The use of signs, handrails and steps and other track infrastructure will be minimised where possible.
- Where these structures are required, as much as possible, they must utilise natural materials that blend into the environment.

	<ul style="list-style-type: none"> • The design and style of accommodation and facilities will be in keeping with the surrounding landscape. • The design and scale of accommodation and facilities will be in accordance with NPWS design guidelines. • Revegetation screening with endemic species must be incorporated into the landscape designs for both precincts to reduce the visual impact of the hut accommodation to other users while matching the surrounding environment. • Construction equipment, machinery and materials will be stored at nominated compound sites. • The Hegartys Bay access boardwalk must be kept to a minimal height and follow the natural topography. • Walking tracks, accommodation and service infrastructure must be designed and constructed to minimise operation and maintenance requirements. • Works to be carried out during standard work hours (i.e. 7am to 6pm Monday to Friday; 8am to 1pm Saturdays). Any work that is performed outside normal work hours or on Sundays or public holidays must be approved prior and is to minimise noise impacts. • Aircraft operations must not be undertaken in early morning or late afternoon or in a way that will impact campers and other park users.
Natural Resources	<ul style="list-style-type: none"> • Construction of accommodation huts and associated infrastructure at Hegartys Bay and Mowarry Point will be undertaken with minimal disturbance necessary. • The design and fit out of the accommodation locations must specify energy and water efficient fixtures as required.
Aboriginal Culture	<ul style="list-style-type: none"> • A 20-year AHIP must be obtained through Heritage NSW to allow impacts from the proposed works and long-term maintenance of the proposed Light to Light upgrades including walking tracks between Boyd’s Tower and Green Cape Lightstation, Mowarry Point, Hegartys Bay and associated vehicle and access tracks. • As state above in question 2 of this table, a 20 year AHIP must be obtained through Heritage NSW to allow impacts from the proposed works and long-term maintenance of the proposed Light to Light upgrades including walking tracks between Boyd’s Tower and Green Cape Lightstation, Mowarry Point, Hegartys Bay and associated vehicle and access tracks. • Walking track works within the Light to Light upgrade project must be limited to within the 30m wide micro-siting corridor. • A program of surface collection and salvage excavation must be completed prior to impacts. Salvage is recommended for sites listed in the ACHAR and in accordance with the methodology of the ACHAR appendices. • All cultural material recovered from the proposed salvage excavation must be held in temporary care at the relevant NPWS office or project archaeologist’s office for analysis until an appropriate time when it can be returned to site. • Ground disturbing activities associated with the Light to Light walk upgrades at the sites listed in the ACHAR are monitored by Eden LALC or other Aboriginal community representatives as chosen by NPWS. • Management and mitigation measures outlined in the ACHAR must be implemented over the life of the AHIP. • The Aboriginal Cultural Heritage Management Plan (ACHMP) included as an appendix to the ACHAR must be followed to reduce and manage potential long-term visitor impacts to recorded sites located outside the Light to Light project upgrade area. • All contractors involved in all activities associated with the project must receive cultural heritage inductions prior to undertaking work in the study areas. • A copy of the final ACHAR must be forwarded to all Registered Aboriginal Parties for their review and comment.

	<ul style="list-style-type: none"> • In the event that Ancestral (human) skeletal remains, or suspected human skeletal remains, are encountered during any of the proposed works or salvage actions, all work must stop and the procedures outlined in the ACHAR appendices must be implemented. • No work is to be conducted beyond the proposed AHIP areas. All areas beyond the proposed AHIP boundary must be treated as no-go zones and must not be used for stockpiling of materials or vehicle access, unless existing vehicle access tracks are used or through a separate archaeological investigation/AHIP. • NPWS must consider the recommendations of Donaldson’s 2018 intangible cultural heritage study of Ben Boyd National Park. These recommendations include but are not limited to: <ul style="list-style-type: none"> ○ providing opportunities for RAPs and local Aboriginal people to showcase their culture and heritage values in the interpretative signage proposed for the Light to Light project; ○ undertaking an Aboriginal naming project across Ben Boyd NP; and ○ continuing to support Aboriginal use of the camping grounds within Ben Boyd NP.
Cultural Heritage	<ul style="list-style-type: none"> • All contractors involved in all activities associated with the project must receive historic heritage inductions prior to undertaking work in the study areas. • If encountered, archaeological remains will be assessed by an archaeologist to determine whether the suspected find constitutes a relic under the NSW <i>Heritage Act 1977</i> and whether NSW Heritage Council should be notified. • Conduct archival recording at all heritage items of local or state significance where impacts are anticipated within the curtilage of an item. • Subsurface disturbance must be avoided across all identified areas of potential archaeological deposits predicted to contain relics. • A Conservation Management Plan be prepared for the identified heritage items to reduce and manage potential long-term visitor impacts to the locally and state significant items present along the Light to Light Walk. • An unexpected finds procedure be developed prior to commencement of works and integrated into the above Conservation Management Plan • A heritage interpretation plan must be developed for the Light to Light Walk that also incorporates any additional information or research undertaken in relation to the above mitigation measures. • NPWS must apply to Heritage NSW for an exemption under section 57(1) of the <i>Heritage Act 1977</i> for walking track work proposed within the Green Cape Maritime Precinct curtilage, • NPWS must apply to Heritage NSW for an excavation permit under section 140 of the <i>Heritage Act 1977</i> to undertake works at Mowarry Point and Hegartys Bay where ground disturbance activities are anticipated and will need to be mitigated through monitoring and/or salvage excavations.
MNES	No additional measures.
Cumulative Impacts	No additional measures.

9. CONCLUSION

This Review of Environmental Factors has assessed the potential impacts of activities associated with the Light to Light Upgrade project works proposed in the Ben Boyd National Park south of Eden NSW. The proposal involves:

- Activity 1 - Walking track
 - Realignment of the existing Light to Light Walk from Boyds Tower to Green Cape Light station.
 - Reinstate bushfire impacted sections of track that are not identified for realignment.
 - Maintenance of existing sections of track that were not bushfire impacted or are not identified for realignment.
 - Rehabilitation and revegetation of redundant sections of the track that would be closed.
 - Installation of wayfinding, directional and interpretative signs.
- Activity 2 - Accommodation and facilities precinct.
 - New hut accommodation and facilities at Mowarry Point
 - Formalisation of the existing campground at Mowarry Point.
 - New hut accommodation facilities at Hegartys Bay.
- Activity 3 - Vehicle and site access.
 - Maintenance Hegartys Access Trail including establishing a small compound and compound site capable of helicopter sling operations.
 - Upgrade of Hegartys Bay access trail to a boardwalk from the aforementioned compound area to the Hegartys Bay hut accommodation area to enable ATV, eBike, or trolley access to the Hegartys Bay precinct
 - Upgrade of the Pulpit Rock car park including adjusting turning circle and parking. The existing amenity block will be retained.

Risks to soil, water, native vegetation, flora, fauna, community safety and Aboriginal heritage have been identified as requiring mitigation. Significant impacts are not anticipated. With the implementation of mitigation measures set out in this REF, these impacts are considered acceptable.

Important note: The field work and assessment of these works was completed prior to the 2019/20 bushfire season, which has decimated many areas of native vegetation across the east coast of Australia and caused significant impacts to wildlife, including threatened species. An extent of 5.3 million ha of land representing 6.7% of NSW has been impacted by bushfires affecting over 60 threatened fauna species (DPIE, 2020). Scientists and government agencies have been working to understand how the fires have affected the environment and to determine where management intervention is needed. In accordance with the *Guideline for applying the Biodiversity Assessment Method at severely burnt sites* (State of NSW & DPIE 2020), consultation with the consent authority has been undertaken and incorporated in relation to this impact.

10. REFERENCES

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Appendix A **ABORIGINAL CULTURAL HERITAGE ASSESSMENT**

Restricted

Appendix B **BIODIVERSITY ASSESSMENT REPORT**

Appendix C TRACK SCOPING REPORT

Appendix D **PLAN OF MANAGEMENT AMENDMENT**

Available online

<https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Parks-plans-of-management-other-documents/ben-boyd-national-park-amendment-plan-management-210074.pdf>

Appendix E SUBMISSIONS REPORT

Available online

<https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Parks-plans-of-management-other-documents/ben-boyd-national-park-light-to-light-walk-public-exhibition-report-200128.pdf>

Appendix F **DATABASE SEARCHES**



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 19/07/21 12:50:37

[Summary](#)

[Details](#)

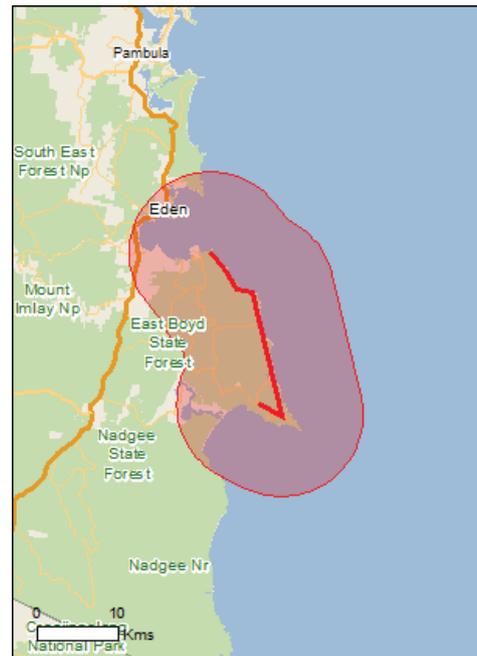
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

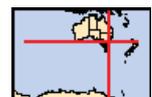
[Acknowledgements](#)



This map may contain data which are
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[Coordinates](#)

Buffer: 10.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	73
Listed Migratory Species:	52

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	80
Whales and Other Cetaceans:	14
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	6
Regional Forest Agreements:	1
Invasive Species:	39
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	1

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside the Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area. Generally the Commonwealth Marine Area stretches from three nautical miles to two hundred nautical miles from the coast.

Name

EEZ and Territorial Sea

Marine Regions

[\[Resource Information \]](#)

If you are planning to undertake action in an area in or close to the Commonwealth Marine Area, and a marine bioregional plan has been prepared for the Commonwealth Marine Area in that area, the marine bioregional plan may inform your decision as to whether to refer your proposed action under the EPBC Act.

Name

[South-east](#)

Listed Threatened Ecological Communities

[\[Resource Information \]](#)

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

Name	Status	Type of Presence
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area
Lowland Grassy Woodland in the South East Corner Bioregion	Critically Endangered	Community likely to occur within area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area

Listed Threatened Species

[\[Resource Information \]](#)

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or

Name	Status	Type of Presence
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within

Name	Status	Type of Presence area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Breeding likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area
Fish		
Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat may occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area
Frogs		
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat known to occur within area
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat may occur within area
Mammals		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Name	Status	Type of Presence
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat likely to occur within area
Potorous tridactylus tridactylus Long-nosed Potoroo (SE Mainland) [66645]	Vulnerable	Species or species habitat known to occur within area
Pseudomys fumeus Smoky Mouse, Konoom [88]	Endangered	Species or species habitat may occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Plants		
Acacia constablei Narrabarba Wattle [10798]	Vulnerable	Species or species habitat known to occur within area
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat likely to occur within area
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area
Correa baeuerlenii Chef's Cap [17007]	Vulnerable	Species or species habitat may occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat known to occur within area
Genoplesium rhyoliticum Pambula Midge-orchid [55116]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Leionema ralstonii [64926]	Vulnerable	Species or species habitat may occur within area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat may occur within area
Pomaderris parrisiae Parris' Pomaderris [22119]	Vulnerable	Species or species habitat likely to occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat may occur within area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Vulnerable	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat may occur within area

Reptiles

Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area

Sharks

Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species

[[Resource Information](#)]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea Sooty Shearwater [82651]		Species or species

Name	Threatened	Type of Presence
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	habitat likely to occur within area Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Balaena glacialis australis Southern Right Whale [75529]	Endangered*	Species or species habitat known to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species

Name	Threatened	Type of Presence
Balaenoptera musculus Blue Whale [36]	Endangered	habitat may occur within area Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur

Name	Threatened	Type of Presence within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name

Commonwealth Land -

Listed Marine Species [\[Resource Information \]](#)

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
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Birds

Name	Threatened	Type of Presence
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Catharacta skua Great Skua [59472]		Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species

Name	Threatened	Type of Presence
Lathamus discolor Swift Parrot [744]	Critically Endangered	habitat known to occur within area Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Foraging, feeding or related behaviour likely to occur within area
Puffinus griseus Sooty Shearwater [1024]		Species or species habitat likely to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Sterna albifrons Little Tern [813]		Species or species habitat may occur within

Name	Threatened	Type of Presence area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche sp. nov. Pacific Albatross [66511]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thinornis rubricollis Hooded Plover [59510]		Species or species habitat known to occur within area
Thinornis rubricollis rubricollis Hooded Plover (eastern) [66726]	Vulnerable*	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifefsnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within

Name	Threatened	Type of Presence area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaesus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Vanacampus poecilolaemus Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area

Mammals

Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
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Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area
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Reptiles

Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area

Whales and other Cetaceans

[Resource Information]

Name	Status	Type of Presence
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Mammals

Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area

Name	Status	Type of Presence
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Bell Bird Creek	NSW
Ben Boyd	NSW
Eagles Claw	NSW
Eden Region	NSW
Forestry Management Areas in Eden (FMZ2)	NSW
Nadgee	NSW

Regional Forest Agreements	[Resource Information]
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Note that all areas with completed RFAs have been included.

Name	State
Eden RFA	New South Wales

Invasive Species	[Resource Information]
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Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
Birds		
<i>Alauda arvensis</i> Skylark [656]		Species or species habitat likely to occur within area
<i>Anas platyrhynchos</i> Mallard [974]		Species or species habitat likely to occur within area
<i>Carduelis carduelis</i> European Goldfinch [403]		Species or species habitat likely to occur within area
<i>Carduelis chloris</i> European Greenfinch [404]		Species or species habitat likely to occur within area
<i>Columba livia</i> Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
<i>Passer domesticus</i> House Sparrow [405]		Species or species habitat likely to occur

Name	Status	Type of Presence
Streptopelia chinensis Spotted Turtle-Dove [780]		within area Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species

Name	Status	Type of Presence
Asparagus scandens Asparagus Fern, Climbing Asparagus Fern [23255]		habitat likely to occur within area Species or species habitat likely to occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera subsp. rotundata Bitou Bush [16332]		Species or species habitat likely to occur within area
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur within area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Nassella neesiana Chilean Needle grass [67699]		Species or species habitat may occur within area
Nassella trichotoma Serrated Tussock, Yass River Tussock, Yass Tussock, Nassella Tussock (NZ) [18884]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Ulex europaeus Gorse, Furze [7693]		Species or species habitat likely to occur within area

Nationally Important Wetlands

[[Resource Information](#)]

Name	State
Twofold Bay	NSW

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Upwelling East of Eden	South-east

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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

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

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-37.10475 149.95124,-37.11926 149.96601,-37.13678 149.97975,-37.14007 149.99761,-37.24891 150.02981,-37.23907 150.00369

Acknowledgements

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

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

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

Please feel free to provide feedback via the [Contact Us](#) page.

BioNet Atlas search results

Light to Light Walk upgrade

Fauna Species	Count	Flora Species	Count
<i>Arctocephalus forsteri</i>	1	<i>Acacia constablei</i>	1
<i>Arctocephalus pusillus doriferus</i>	3	<i>Cryptostylis hunteriana</i>	1
<i>Ardenna carneipes</i>	1	<i>Distichlis distichophylla</i>	5
<i>Artamus cyanopterus cyanopterus</i>	23	<i>Pomaderris bodalla</i>	1
<i>Balaenoptera musculus</i>	5	<i>Pultenaea pedunculata</i>	2
<i>Calamanthus fuliginosus</i>	15	<i>Viola cleistogamoides</i>	33
<i>Callocephalon fimbriatum</i>	24	<i>Wilsonia backhousei</i>	1
<i>Calyptorhynchus lathamii</i>	44	Total	44
<i>Cercartetus nanus</i>	83		
<i>Chelonia mydas</i>	1		
<i>Climacteris picumnus victoriae</i>	3		
<i>Daphoenositta chrysoptera</i>	3		
<i>Dasyurus maculatus</i>	5		
<i>Diomedea exulans</i>	1		
<i>Dugong dugon</i>	1		
<i>Esacus magnirostris</i>	1		
<i>Eubalaena australis</i>	1		
<i>Falsistrellus tasmaniensis</i>	6		
<i>Glossopsitta pusilla</i>	9		
<i>Haematopus fuliginosus</i>	14		
<i>Haematopus longirostris</i>	47		
<i>Haliaeetus leucogaster</i>	57		
<i>Heleioporus australiacus</i>	1		
<i>Hieraetus morphnoides</i>	6		
<i>Hirundapus caudacutus</i>	9		
<i>Isoodon obesulus obesulus</i>	234		
<i>Lathamus discolor</i>	3		
<i>Litoria aurea</i>	3		
<i>Lophoictinia isura</i>	4		
<i>Macronectes halli</i>	1		
<i>Megaptera novaeangliae</i>	403		
<i>Micronomus norfolkensis</i>	5		
<i>Miniopterus orianae oceanensis</i>	59		
<i>Myotis macropus</i>	8		
<i>Ninox connivens</i>	1		
<i>Ninox strenua</i>	51		
<i>Numenius madagascariensis</i>	2		
<i>Pachycephala olivacea</i>	1		
<i>Pandion cristatus</i>	6		
<i>Petauroides volans</i>	2		
<i>Petaurus australis</i>	67		
<i>Petroica boodang</i>	8		
<i>Petroica phoenicea</i>	1		
<i>Pezoporus wallicus wallicus</i>	42		
<i>Phascolarctos cinereus</i>	8		
<i>Potorous tridactylus</i>	923		
<i>Pterodroma solandri</i>	1		
<i>Pteropus poliocephalus</i>	3		
<i>Saccolaimus flaviventris</i>	1		
<i>Scoteanax rueppellii</i>	4		
<i>Sminthopsis leucopus</i>	3		
<i>Thalassarche cauta</i>	3		
<i>Thalassarche impavida</i>	1		
<i>Thalassarche melanophris</i>	7		
<i>Thinornis cucullatus cucullatus</i>	27		
<i>Tyto novaehollandiae</i>	11		
<i>Tyto tenebricosa</i>	44		
Total	2301		

Appendix G **PROPOSED DESIGN DRAWINGS**

Appendix H **EXAMPLES OF PROPOSED TRACK CONSTRUCTION METHODS**



























