



WORIMI CONSERVATION LANDS

PLAN OF MANAGEMENT

WORIMI CULTURE | PROTECT | RESPECT | CONNECT



Office of
Environment & Heritage
NSW National Parks & Wildlife Service



ACKNOWLEDGEMENTS

This Plan of Management was jointly adopted by the Minister for the Environment and the Minister for Lands and Water on 1 September 2015. The plan was prepared by the Board of Management for the Worimi Conservation Lands with staff of the Lower North Coast Region of the NSW National Parks and Wildlife Service (NPWS), part of the Office of Environment and Heritage.

Valuable information and comments were provided by the Worimi Conservation Lands Draft Plan of Management consultative group who gave generously of their time to contribute to the development of the draft plan of management.

For additional information or any inquiries about the Worimi Conservation Lands or this plan of management, contact the NPWS Hunter Coast Area Office at 12B Teramby Road, Nelson Bay, or by telephone on 4984 8200.

Published by:

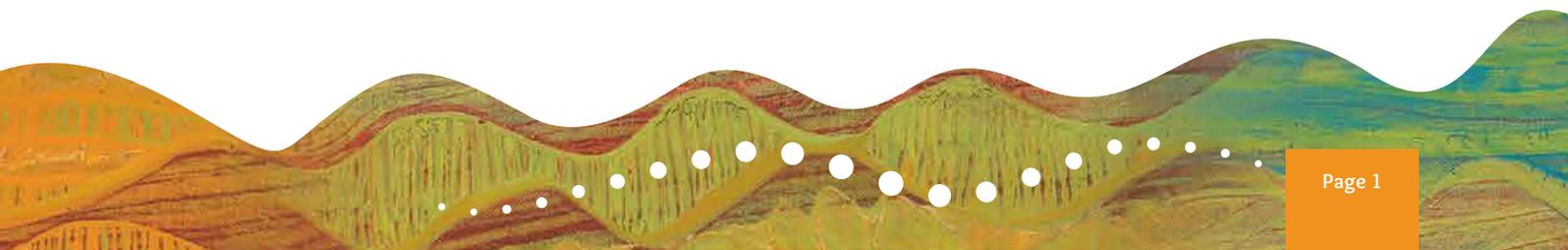
Office of Environment and Heritage
59–61 Goulburn Street
PO Box A290
Sydney South 1232

© Copyright State of NSW and the Office of Environment and Heritage:
Use permitted with appropriate acknowledgment.

ISBN 978 1 76039 1447

OEH 2015/0707

Printed on recycled paper.





“The Board has worked hard to prepare a plan of management that protects the land and our sites, whilst ensuring that people have the opportunity to visit and enjoy the park.

In preparing the plan an extensive amount of consultation with stakeholders and people with an interest in the Worimi Conservation Lands was undertaken. This gave the Board of Management an opportunity to understand why people value and care about the Worimi Conservation Lands. During this process the Board had the opportunity to explain and share what the cultural significance of this landscape means to the Worimi people.

Throughout the consultation process the Board utilised its cultural vision for the WCL - Worimi culture: protect, respect, connect - as a cultural filter in our discussions, our thinking and our decision making process.

The response to our consultation process has been, in many respects, overwhelming and humbling. Interested people and stakeholders gave their own time to attend meetings, discussions and write submissions to express what the Worimi Conservation Lands mean to them.

In finalising the Plan of Management, the Board has spent a considerable amount of time and care in considering people's thoughts and opinions and the value of the Worimi Conservation Lands, this has been a difficult task in balancing cultural, historic, natural and recreational values.

The Board believes that the Plan of Management provides a balanced approach to each of these values whilst committing to the cultural vision for the park: protect, respect, connect. This plan provides for everyone to continue to enjoy the Worimi Conservation Lands now and for future generations.

On behalf of the Board of Management, I would like to take this opportunity to thank everyone who contributed to the consultation process, who gave their time to provide the Board with valuable information that has contributed to the Plan of Management. The Plan will provide a framework for the Board to continue to manage the WCL with a consistent approach that will sustain this landscape for the future.”

Petrice Manton
Aboriginal owner and Chairperson
WCL Board of Management.

A MESSAGE ABOUT HOW THIS PLAN WAS DEVELOPED

The development of the draft plan was informed by a substantial consultation process, as well as the Board's vision for the future of the Worimi Conservation Lands.

CONSULTATION

The consultation process was conducted over a number of years. There were meetings and discussions with Aboriginal owners, park neighbours, the general public, visitors, user groups, and commercial operators.

A public workshop was held at Anna Bay in November 2010, and a consultative group with 12 stakeholder representatives was established soon after. The consultative group met with Board members and NPWS throughout 2011 and had detailed discussions on Worimi cultural values, natural values, camping, vehicle access and commercial tourism, as well as completing two field trips to the park.

The draft plan was exhibited for public comment from 26 October 2013 to 17 February 2014. During this time Board members and NPWS had additional meetings with stakeholders, particularly four wheel driving groups. The Board received 2330 submissions, including 1997 form letters. The main issues raised in the submissions were: maximising access for four-wheel driving and camping; ensuring the protection of Worimi cultural and natural values; strengthened law enforcement; and improving visitor education and awareness. The Board made changes in response to the submissions where consistent with both its vision statement 'Worimi culture: protect, respect, connect', and with the Board's legislative and cultural responsibilities.

THE BOARD'S VISION STATEMENT

The Board of Management developed a vision to help guide its management of the park and the development of the plan. The Board's vision is for a park where priority is given to PROTECTING, RESPECTING and CONNECTING COUNTRY.

The vision has been used as a basis for decision making to help ensure that the protection of Worimi cultural values remained the highest priority throughout the development of the draft plan. The following statements from the vision highlight the importance and priority of the Worimi cultural values of the park.

"We want to see the Worimi Conservation Lands respected and acknowledged as part of Worimi country."

"The Worimi Conservation Lands IS a Worimi cultural landscape that we want to protect for future generations."

"We want to be able to teach others about our land and our culture and in return developing respect for our land and our culture for the future, as our Elders have entrusted to us."

"Protecting, respecting and connecting to country is not something that can wait for the future, but must be acted on now..."

CONTENTS

1.	The Creation of the Worimi Conservation Lands: A Brief History	7
2.	Location, Gazettal and Regional Setting	8
2.1	WCL reserve categories and coordinated management	10
3.	Joint management of the Worimi Conservation Lands	12
3.1	Legal Framework for Aboriginal Ownership and Joint Management of Parks	12
3.2	Joint Management, the WCL Lease Agreement and this Plan	12
3.3	Other Legislation and Policy	15
3.4	Fern Bay Voluntary Planning Agreement	16
4.	Protect, Respect, Connect: A Vision for the WCL	17
5.	Worimi Cultural Values	18
6.	Historic Heritage Values	26
7.	Geology and Landform	30
8.	Flora and Fauna	34
9.	Pests	41
10.	Fire	44
11.	Climate Change	46
12.	Education and Visitor Information	47
13.	Visitors and Recreation	49
13.1	Camping	50
13.2	Vehicle Access	54
13.3	Recreational Fishing	61
13.4	Recreation Vehicle Area	62
13.5	Walking	64
13.6	Horse Riding	65
13.7	Dog Walking	66
13.8	Orienteering	68
13.9	Hang-gliding	68
13.10	Land Yachting	69
13.11	Other Activities	70
14.	Commercial Activities	71
15.	Commercial Filming	74
16.	Group Activities and Events	75
17.	Management Operations	76
18.	Other Uses	77
18.1	Tin City	77
18.2	Encroachments	78
18.3	Inholdings	78
18.4	Transmission Lines	80
18.5	Hunter Water Corporation Activities	80
18.6	Fishing Activities	82
18.7	Harness Race Horse Training	83
18.8	Mining and Exploration	83
19.	Implementation Table	84
20.	References	95

FIGURES

Figure 1:	Location of the Worimi Conservation Lands	9
Figure 2:	Reserves comprising the Worimi Conservation Lands	10
Figure 3:	WCL Board of Management Membership	13
Figure 4:	Joint management of the WCL and the role of the Board of Management (BoM) (Burdon Torzillo 2009)	14
Figure 5:	Diagram showing the range of Legislation and Policy that effects how the Board of Management (BoM) fulfils its role and the management of the WCL	16
Figure 6:	The dunes with exposed remnant soil layer from the last period of dune stability and Worimi Cultural Material (shell middens)	20
Figure 7:	Damage to Worimi Cultural Sites from vehicles and trail bikes	21
Figure 8:	Previously established 4WD routes in the swale through concentrations of Worimi Cultural Sites	22
Figure 9:	The Stockton Bight barrier system and the Worimi Conservation Lands	30
Figure 10:	Generalised landform profile of the Worimi Conservation Lands	31
Figure 11:	Beach Vehicle Permits sold 2007–2011	56
Figure 12:	Recreation Vehicle Permits sold 2007–2011	62
Figure 13:	North Stockton Special Area in the WCL	81

TABLES

Table 1:	Location, Gazettal and Regional Setting	8
Table 2:	Management principles for National Parks, State Conservation Areas and Regional Parks under the National Parks and Wildlife Act	11
Table 3:	Timeline and summary of formation of outer barrier and WCL landform	31
Table 4:	Vegetation communities at the WCL (Bell & Driscoll, 2010)	34
Table 5:	Significant plant species at the WCL (Bell & Driscoll, 2010)	36
Table 6:	Threatened species known or expected to occur in the WCL	36
Table 7:	Priority weed species in the WCL	42

MAPS

(See back pages of plan)

Map 1:	Birubi Point and Worimi Conservation Lands
Map 2:	Historic Heritage
Map 3:	Visitor and Management Access
Map 4:	Section 146 Agreement Lands

1. THE CREATION OF THE WORIMI CONSERVATION LANDS: A BRIEF HISTORY

The creation of the Worimi Conservation Lands (WCL) was the outcome of a long and successful negotiation by the Worimi Local Aboriginal Land Council (LALC) and traditional Aboriginal owners with the NSW Government.

The Worimi LALC first made a number of land claims under the NSW Aboriginal Land Rights Act 1986 over Crown land at Stockton Bight in the 1990s. At that time the NSW Government also expressed its desire to add lands at Stockton Bight to the national park reserve system.

Following this, the Worimi LALC wrote to the NSW Minister for the Environment with a co-management proposal that would enable the land to be included in the national park reserve system, protect the broader community's interests and provide for recognition of Worimi Country, land title and benefits to the local Aboriginal community. In 2001 an agreement was reached between the NSW Government, the Worimi LALC and the Worimi Traditional Owners and Elders Group to resolve some of the land claims by creating a park that is Worimi-owned and leased back to the NSW Government to be jointly managed with the Worimi traditional owners.

The legal framework for this arrangement is set out in the Aboriginal ownership and lease-back provisions of the *NSW National Parks and Wildlife Act 1974* (NPW Act) and section 36A of the Aboriginal Land Rights Act. Further detail on the legal framework is provided in Section 3.1.

Throughout 2005 and 2006 Worimi LALC representatives and an Aboriginal Negotiating Panel of Worimi Traditional Owners negotiated the Lease Agreement for the WCL with the Minister for the Environment. Once the Lease was agreed and entered into, the land was granted to the Worimi LALC under the Aboriginal Land Rights Act, and gazetted in 2007 under the NPW Act as Worimi National Park, Worimi State Conservation Area and Worimi Regional Park. The intertidal zone to mean low water mark was gazetted as part of Worimi Regional Park under Part 4 of the NPW Act, and therefore not returned to Aboriginal ownership. The Lease Agreement commits National Parks and Wildlife Service (NPWS) to managing the intertidal zone as part of the WCL.

A more detailed history of this period of negotiation is included in the preamble to the WCL Lease Agreement (see Section 3.2).

2. LOCATION, GAZETTAL AND REGIONAL SETTING

TABLE 1: LOCATION, GAZETTAL AND REGIONAL SETTING

FEATURES	DESCRIPTION
LOCATION	The WCL is located at Stockton Bight, between Fern Bay and Anna Bay, immediately north of the mouth of the Hunter River. This places the WCL between the major population centre and coal export port of Newcastle and the popular holiday destination of Port Stephens. See Figure 1.
AREA	The WCL covers 4029 hectares, comprising 1812 hectares of national park, 881 hectares of state conservation area and 1336 hectares of regional park. It includes 25.5 kilometres of coastline including the intertidal zone down to mean low water mark. This plan of management applies to these lands but does not prohibit any activity authorised under the <i>Fisheries Management Act 1994</i> .
RESERVATION DATE	1 February 2007.
PREVIOUS TENURE	<p>The majority of the WCL was previously part of:</p> <ul style="list-style-type: none"> ■ Crown land contained in water reserve 61307, ■ Crown Reserve 91676 for public recreation, ■ Crown Reserve 57573, and ■ Vacant Crown land. <p>A small portion (less than 2 hectares) of Crown Reserve 91451 for public recreation (Birubi Point Crown Reserve) and 169 hectares of land vested under the NPW Act were also included in the WCL. The majority of Water Reserve 61307 in the WCL is designated a special area under the <i>Hunter Water Act 1991</i>.</p>
REGIONAL CONTEXT	
BIOGEOGRAPHIC REGION	<p>The WCL is located at the south-eastern edge of the NSW North Coast Bioregion.</p> <p>The WCL forms an important coastal link in a network of protected areas that includes Tomaree National Park to the northeast, Tilligerry State Conservation Area to the north and Hunter Wetlands National Park to the west.</p>
SURROUNDING LAND USE	The north-eastern and south-western edges of the WCL are bordered by residential areas of Anna Bay and Fern Bay respectively. The Birubi Point Crown Reserve adjoins the WCL at Anna Bay, a popular holiday destination, and includes the Birubi Surf Life Saving Club. The remainder of the WCL is bordered by rural land holdings dominated by grazing and sand extraction operations. A Royal Australian Air Force (RAAF) base and domestic airport facilities are located at Williamtown, inland from the central portion of the WCL, limiting the potential for further residential development in this area due to aircraft noise.
OTHER AUTHORITIES	The WCL is located within the areas of the Worimi LALC, Hunter Local Land Services (formerly Lower Hunter-Central Rivers Catchment Management Authority) and Port Stephens Council.

FIGURE 1: LOCATION OF THE WORIMI CONSERVATION LANDS



2.1 WCL RESERVE CATEGORIES AND COORDINATED MANAGEMENT

The WCL comprises a national park, state conservation area and regional park (see Figure 2). The NPW Act sets out the management principles for each reserve category (see Table 2). The reserves comprising the WCL are contiguous, and their respective boundaries do not align with any discernable landscape features. Given the nature of the landscape of the WCL and the common cultural and natural values across each reserve category, an integrated approach to managing the WCL is needed.

FIGURE 2: RESERVES COMPRISING THE WORIMI CONSERVATION LANDS

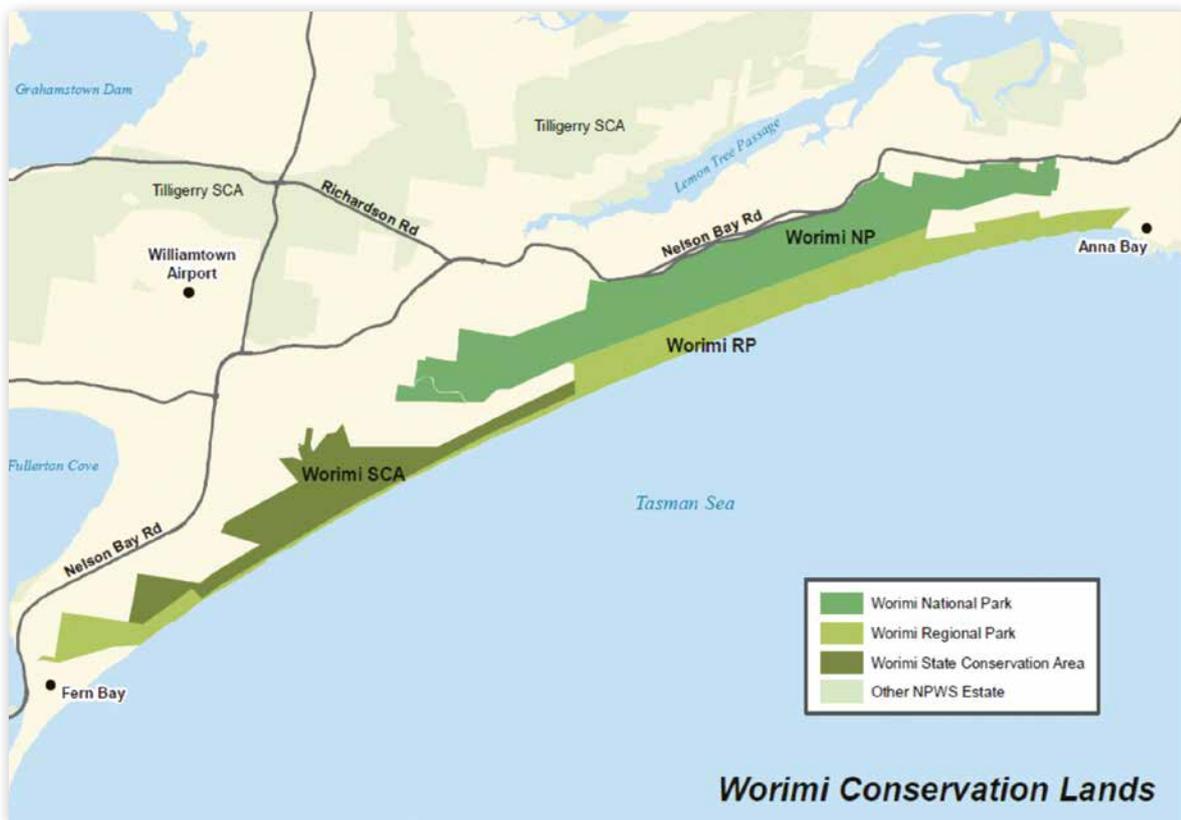


TABLE 2: MANAGEMENT PRINCIPLES FOR NATIONAL PARKS, STATE CONSERVATION AREAS AND REGIONAL PARKS UNDER THE NATIONAL PARKS AND WILDLIFE ACT

RESERVE CATEGORY	MANAGEMENT PRINCIPLES
NATIONAL PARKS	<ul style="list-style-type: none"> ■ conserve biodiversity, maintain ecosystem functions, protect geological and geomorphologic features and natural phenomena, and maintain natural landscapes ■ conserve places, objects, features and landscapes of cultural value ■ protect the ecological integrity of one or more ecosystems for present and future generations ■ promote public appreciation and understanding of the park's natural and cultural values ■ provide for sustainable visitor use and enjoyment that is compatible with conservation of natural and cultural values ■ provide for sustainable use (including adaptive re-use) of any buildings or structures or modified natural areas having regard to the conservation of natural and cultural values ■ provide for appropriate research and monitoring.
STATE CONSERVATION AREAS	<ul style="list-style-type: none"> ■ conserve biodiversity, maintain ecosystem functions, protect natural phenomena and maintain natural landscapes ■ conserve places, objects and features of cultural value ■ provide for the undertaking of uses permitted under other provisions of the NPW Act (including uses permitted under section 47) such as mineral exploration and mining), having regard to the conservation of the natural and cultural values of the state conservation area ■ provide for sustainable visitor or tourist use and enjoyment that is compatible with conservation of the area's natural and cultural values and with uses permitted in the area ■ provide for sustainable use (including adaptive re-use) of any buildings or structures or modified natural areas having regard to conservation of the area's natural and cultural values and with other uses permitted in the area ■ provide for appropriate research and monitoring.
REGIONAL PARKS	<ul style="list-style-type: none"> ■ provide opportunities for recreation and enjoyment in natural or modified landscapes ■ identify, interpret, manage and conserve the park so as to maintain and enhance significant landscape values ■ conserve natural and cultural values ■ promote public appreciation and understanding of the park's natural and cultural values ■ provide for sustainable visitor or tourist use and enjoyment that is compatible with conservation of natural and cultural values ■ provide for sustainable use (including adaptive re-use) of any buildings or structures or modified natural areas having regard to conservation of natural and cultural values.

This plan will also apply to any future additions to the WCL. The NPW Act requires a review of the classification of state conservation areas every five years in consultation with the Minister administering the *Mining Act 1992*. In the long term it is intended for Worimi State Conservation Area to become national park and so management will also be guided by the management principles of national parks where possible.

3. JOINT MANAGEMENT OF THE WORIMI CONSERVATION LANDS

▶ 3.1 LEGAL FRAMEWORK FOR ABORIGINAL OWNERSHIP AND JOINT MANAGEMENT OF PARKS

Aboriginal ownership and lease-back arrangements are established under Part 4A of the NPW Act. Part 4A of the Act provides for the land covered by a park or reserve to be Aboriginal-owned by granting ownership to the relevant Local Aboriginal Land Council (LALC) to hold on behalf of the Aboriginal owners.

Where an area of Crown land is subject to a land claim under the Aboriginal Land Rights Act, and has been identified by the NSW Government as being needed for nature conservation, section 36A of the Aboriginal Land Rights Act allows for the land claim to be resolved by negotiating a joint management agreement under Part 4A of the NPW Act.

A park or reserve that has been returned to Aboriginal owners is then leased back to the NSW Government to be jointly managed with the Aboriginal owners. The NPW Act sets the term of the lease at 30 years, which can be renewed for another 30 years, and certain other provisions that must be included in the Lease Agreement.

Aboriginal owners are people who have been listed on a register of Aboriginal owners. The Aboriginal Land Rights Act sets out the criteria for registration as an Aboriginal owner, which requires that a person must be a descendant of the original inhabitants of the area, have a cultural association with the area and have agreed to be registered. The Office of the Registrar, Aboriginal Land Rights Act, enters the names of people onto the register, or assists people to register by undertaking relevant research.

The care, control and management of an Aboriginal-owned park or reserve is vested in a Board of Management. The Board of Management is appointed under Part 4A of the NPW Act by the Minister responsible for administering the NPW Act and the Minister for Aboriginal Affairs, following a nomination process (see Section 3.2).

▶ 3.2 JOINT MANAGEMENT, THE WCL LEASE AGREEMENT AND THIS PLAN

The area now known as the WCL was returned to Worimi ownership on 1 February 2007, at which time the Lease Agreement for the WCL commenced. In accordance with the NPW Act, the Worimi LALC holds the title to the WCL on behalf of the registered Worimi owners.

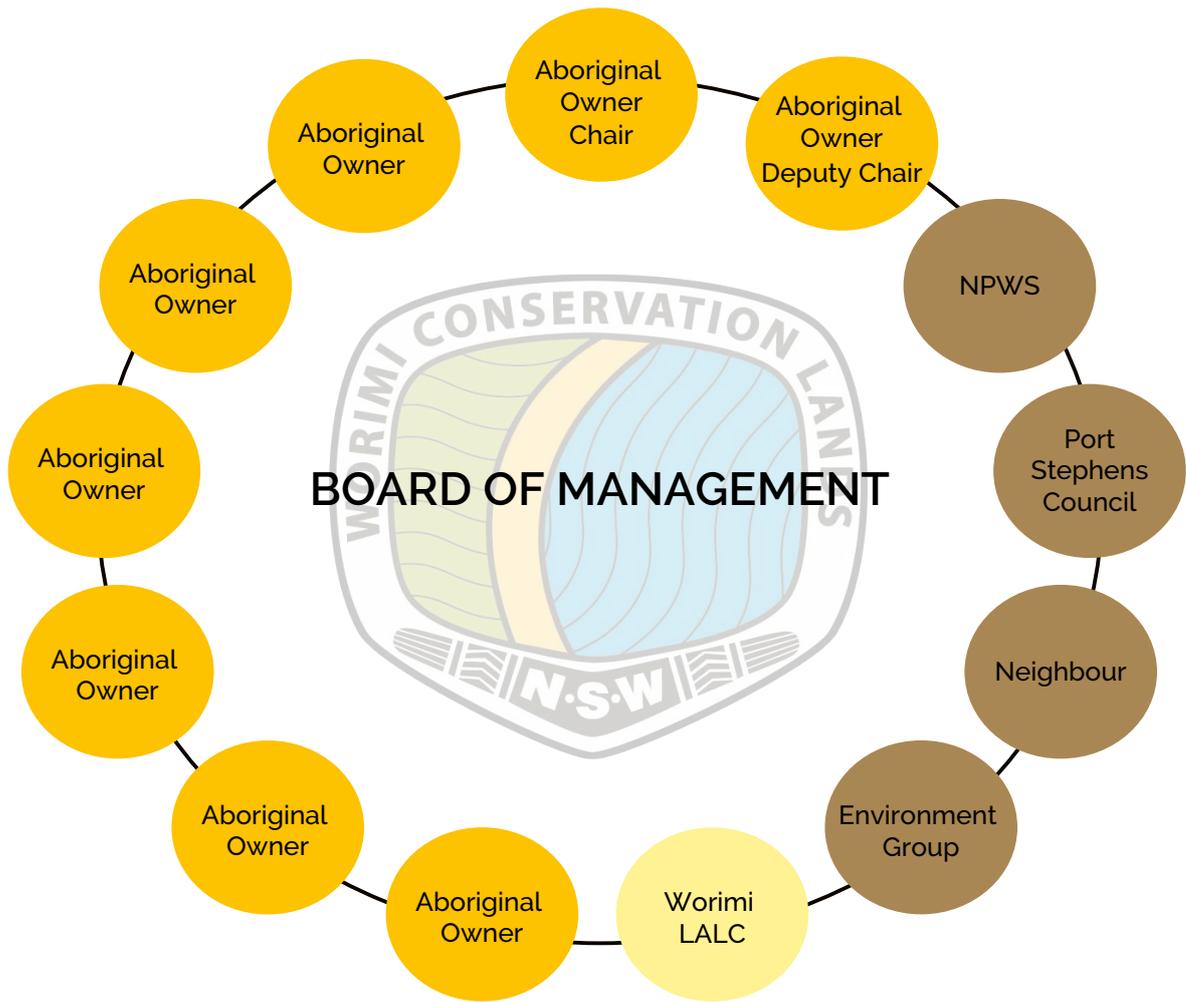
The Board of Management

The Board is responsible for the care, control and management of the WCL, and the preparation of this plan.

The Board for the WCL is made up of 13 members, including eight registered Worimi owners, forming the majority (see Figure 3). The remaining five positions are for:

- a representative of Worimi LALC
- a representative of Port Stephens Council
- a representative of NPWS, namely the Regional Manager
- a person nominated by a group concerned in the conservation of the region
- a person appointed on the nomination of a person who owns or leases land adjoining or in the vicinity of the WCL.

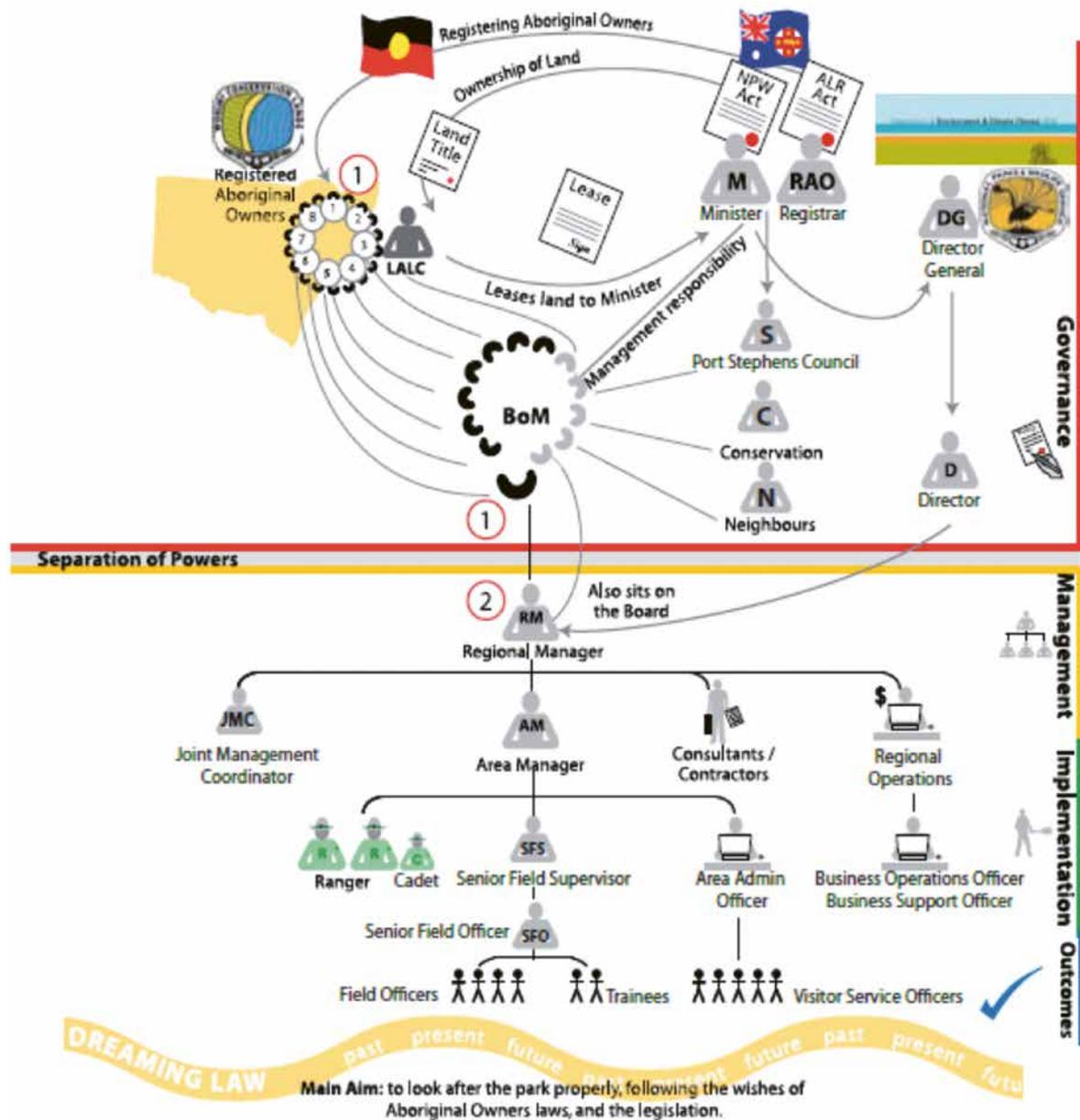
FIGURE 3: WCL BOARD OF MANAGEMENT MEMBERSHIP



In accordance with the NPW Act and WCL Lease Agreement, a majority of Aboriginal owners is required for the Board to achieve a quorum. The Board has established a governance structure, including protocols and procedures for how members fulfil their roles. The Board and deputy members have undertaken governance training to assist them in understanding the Board’s roles and responsibilities, how to work effectively within the Board and with others, where the Board sits in the ‘big picture’, and how to stay focussed on longer term goals and visions for the WCL while also addressing operational and management challenges.

Figure 4 shows where the Board fits within the joint management framework for the WCL, and highlights its role at a governance level. The Board meets its responsibilities through the development of strategic documents and policies, including the development of this plan, annual budgets and works plans, staffing strategies, operational plans such as fire plans, and policies.

FIGURE 4: JOINT MANAGEMENT OF THE WCL AND THE ROLE OF THE BOARD OF MANAGEMENT (BoM) (BURDON TORZILLO 2009)



This plan is the main document for setting the direction for the Board’s management of the WCL, and governs all activities by all people, including the Board and the NPWS. All future Board decisions must comply with the plan. The NPWS works with the Board of Management to implement its decisions and carry out the day-to-day management of the WCL.

The management of national parks, state conservation areas and regional parks in NSW is in the context of a legislative framework (see Section 3.3). The NPWS also has policies relating to nature conservation, cultural heritage conservation, recreation, commercial use, research and communication. While the Board is guided by these policies, it is not bound by them provided that all actions of the Board are consistent with relevant legislation and this plan.

What does the Lease Agreement say about this Plan and use of the WCL?

The Lease Agreement requires the development of this plan, and the implementation of a coordinated approach to managing the three areas comprising the WCL (see Section 2.1) and the intertidal zone.

There are three main principles included in the Lease Agreement that guide the work of the Board. These are that the Board recognises and considers:

- the cultural values and the special significance of the WCL to the Aboriginal owners
- the nature conservation, recreation and community values of the WCL
- that to the Aboriginal owners, nature conservation values form an integral part of the cultural values of the WCL.

The Lease Agreement also acknowledges that the public has a right of general access to the WCL subject to the NPW Act and this plan. In accordance with the Lease Agreement, the principles applied by the Board to guide the management of public access to the WCL are:

- the protection of Aboriginal cultural values and the continuation of cultural practices
- the promotion and enhancement of appropriate use, understanding and enjoyment of the WCL
- ecological sustainability
- regional planning
- safety, security, or the protection of the WCL
- equity.

Worimi community development is also addressed in the Lease. The plan may provide for Worimi community development purposes that are consistent with the Lease and NPW regulations. Community development includes:

- recreation activities and facilities
- cultural activities and facilities
- general park activities and facilities
- activities that will improve the capacity Worimi people and Worimi LALC members to participate in the management of the WCL.

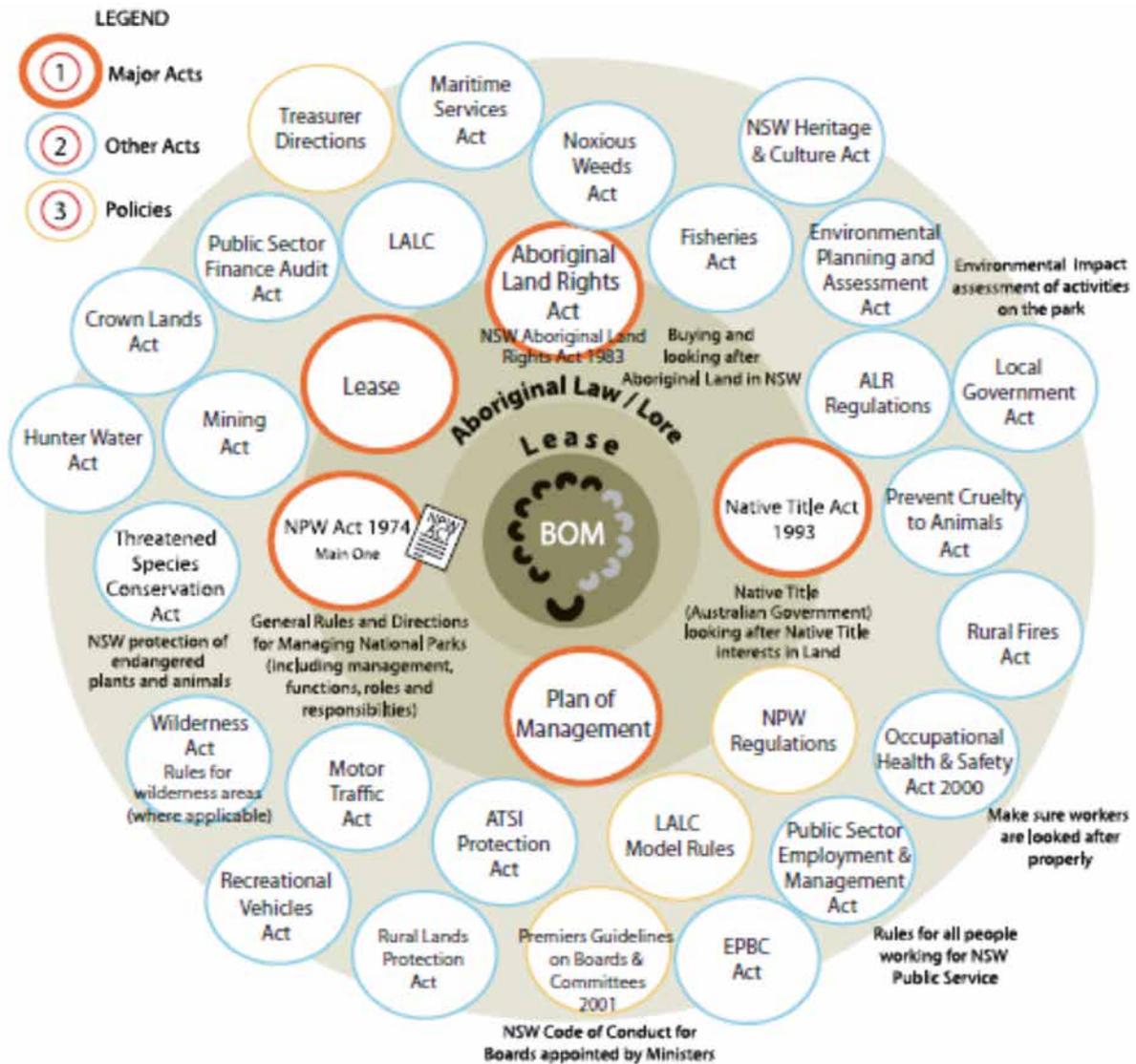
The Lease acknowledges Worimi hunting and gathering rights to foods for domestic purposes and other resources for ceremonial and cultural purposes. The Board is to set the rules for Worimi hunting and gathering on the WCL.

▶ 3.3 OTHER LEGISLATION AND POLICY

The other main laws for the management of the WCL are found in the NPW Act and Regulation, and the *Threatened Species Conservation Act 1995* (TSC Act). The NPW Act also outlines the things that must be considered when preparing a management plan.

Other legislation, international agreements and charters may also affect management of the WCL. In particular, the *Environmental Planning and Assessment Act 1979* may require the assessment and mitigation of the environmental impacts of any works proposed in this plan. Figure 5 illustrates the range of legislation that must be adhered to and considered when managing the WCL.

FIGURE 5: DIAGRAM SHOWING THE RANGE OF LEGISLATION AND POLICY THAT EFFECTS HOW THE BOARD OF MANAGEMENT (BoM) FULFILS ITS ROLE AND THE MANAGEMENT OF THE WCL (BURDON TORZILLO 2009)



▶ 3.4 FERN BAY VOLUNTARY PLANNING AGREEMENT

In 2010 the NPWS entered into a voluntary planning agreement with the proponent of a residential development which adjoins the WCL at Fern Bay, following endorsement by the Board.

The Fern Bay Voluntary Planning Agreement sets out natural heritage rehabilitation and visitor access improvement works that the proponent is obligated to complete. The obligations are documented in a vegetation management plan in the agreement, and include:

- weed control and waste removal works
- construction and formalisation of a four-wheel drive access and carpark with visitor information
- construction and formalisation of a walking track
- bollard and cabling of the park boundary and four-wheel drive track.

These will help address illegal access, rubbish dumping, weed control and habitat protection issues in this part of the WCL.

4. PROTECT, RESPECT, CONNECT: A VISION FOR THE WCL

We want to see the Worimi Conservation Lands (the Lands) respected and acknowledged as part of Worimi Country.

Caring for our Country and sharing the respect and knowledge of the Lands to share and care like our Elders. We want everybody to work on caring and sharing for our WORIMI Country.

The Lands include our sites, beliefs, cultural practices, ceremonies and places of significance. We want to be able to teach others about our land and culture and in return developing respect for our land and culture for the future, as our Elders have entrusted to us.

The Worimi Conservation Lands IS a Worimi cultural landscape that we want to protect for future generations. We will protect, respect and connect the Lands and our Country will connect and protect us.

Protecting Country

Protecting Country means looking after the traditional, cultural and environmental landscape. The plants and animals, our sites and places and beliefs and knowledge are all part of our culture and heritage that we will protect.

Respecting Country

Respecting Country includes our respect of 'Elders and Knowledge Holders', past, present and future generations. The Lands must be respected, and those who visit and enjoy the Lands must understand its values. This is important in respecting our Country.

Connecting Country

Connecting with Country is about spending time on the Lands and learning the values of the Lands. It's about understanding that we are Worimi People belonging to this Country. We have a spiritual connection to this Country, and will pass this on to our present and future generations.

Protecting, respecting and connecting to Country is not something that can wait for the future, but must be acted on now, to walk freely within our Country and develop and maintain our connections to our Country.

This vision has underpinned the development of this plan, and has been shared with the broader community throughout the consultation completed during its preparation. It has been consistently applied during development of management strategies and priorities contained in this plan. The actions of the Board, NPWS, and the provision of opportunities to visit and experience the WCL must be consistent with this vision.

Whilst protecting, respecting and connecting with Country are key Worimi values, the Board consider them to be relevant to all visitors to the WCL. In actively seeking a joint management partnership with NPWS, the Worimi community sought to ensure continued public access, while also achieving recognition and protection of the WCL's important cultural values. Key goals of this plan are to ensure that visitation is culturally and environmentally sustainable, and that visitors gain awareness, understanding and appreciation for the Worimi cultural values of the WCL as part their visit.

5. WORIMI CULTURAL VALUES

Worimi Country and the WCL

The Worimi People have always been and remain today the traditional custodians of a large area of land considered Worimi 'Country'. Aboriginal 'Country' is more than land, and includes all living things. It incorporates people, plants and animals; and embraces the seasons, stories and creation spirits. As such, Country is both a place of belonging and a way of believing, and is central to Worimi culture.

Worimi Country was generally bounded by the four rivers: the Hunter River to the south, Manning River to the north, and the Allyn and Patterson rivers to the west, and included the adjoining ocean and waterways. It included 18 clan groups or 'ngurras', with the WCL falling within the area of the Maiangal ngurra. All spoke the Gathang language.

Traditionally, the Worimi People used the beaches to travel between the northern and southern parts of the WCL. We know these areas today as Nelson Bay to the north and Stockton to the south. The entire WCL contains hundreds of sites that are significant to Worimi People. The area known by many as Stockton Bight has a special cultural significance to the Worimi People because it retains a large amount of cultural history. The land and waters have been used for many thousands of years for living, the gathering of foods and the continuation of cultural activities. Aboriginal cultural connections have always been strong in this area and continue today, as it is still well-utilised by today's Worimi People for fishing and recreation.

Much of Worimi Country has changed dramatically since 1788, and dispossession has had significant impacts on Worimi People and their culture. As a result, the granting of the freehold title over the WCL means it is of particular significance to the Worimi. Unlike the majority of their Country, it is an area where the protection of Worimi cultural values has priority in Australian law, where decisions affecting Worimi Country and culture are made by Worimi People through their majority representation on the Board of Management, and where Worimi traditional owners are employed to implement these decisions.

For all these reasons, the WCL is a unique cultural landscape that is highly significant to the Worimi community, and is an important part of their cultural and spiritual identity. As a result, the protection and management of Worimi Country, in its broadest sense, is the key priority of this plan.

Worimi cultural sites

The coastal location, unique landform and diversity of environments of the WCL provided a landscape rich in resources for the Worimi People. Direct accesses to marine resources from the ocean, estuarine resources from Tilligerry Creek, forest resources from the area between beach and estuary, and stone resources from neighbouring headlands for tool making, are examples of this richness. The history of the Worimi People's relationship with this area is abundantly evident in the extent and diversity of cultural material present throughout the WCL and adjoining areas such as Birubi Point.

This material evidence of the Worimi People's past use of the landscape are commonly referred to as Aboriginal sites, and are protected by law across New South Wales under the NPW Act. They are important to Aboriginal people for social, spiritual, historical, and commemorative reasons. Many Aboriginal people have deep spiritual and emotional ties to Aboriginal sites, and they can also play an important role in maintaining culture and connections to land.

There has been a considerable amount of archaeological investigation and reporting in and around the WCL, with large numbers of sites identified. The most extensive work in the WCL has been completed by Dean-Jones (1990, 1992) and Umwelt (2000), with investigations of smaller sections of the WCL by Comber (1990) and ERM (1995, 2001). Archaeological investigations at Birubi Point have been completed by Hall (1928), and most extensively by Dyal (2004).

The most visible cultural material present in the WCL is the extensive shell deposits that occur. These shell deposits, called middens, are dominated by pipi (*Plebidonax deltoides*) shell. Some also contain mud whelk (*Pyrazus ebininus*) and cockle (*Anadara trapezia*) shells; stone artefacts from tool making; and bird, fish and animal bone.

Typically, the middens occur as a mound capped with packed pipi shell, or may comprise scattered whole or fragmented shell. Artefacts of flaked stone at various concentrations are also present at many sites. The dynamic nature of the landscape affects the visibility of these cultural sites. Depending on local sand movement, the majority of the packed shell comprising the mound may be buried with only the top layer of shell exposed and level with the ground, or the mound may be fully exposed and stand above the ground surface. Often charcoal is present, and more rarely fire hearths and associated cooking stones occur.

There are also burial sites recorded in the WCL. Burial sites are highly significant and it is difficult to predict where they may occur in the landscape. It is possible that burials may occur in association with some of the midden sites. Aboriginal remains from previously disturbed burials in the Stockton Bight landscape have been repatriated from museums and scientific collections, and reburied in the WCL. The WCL is not a suitable location for new burials to occur, but additional repatriations of ancestral remains may occur in the future.

Understanding how the landscape of the WCL has changed over the last 6000 years helps to understand the occurrence and location of cultural sites in the WCL. Following the initial period of dune formation and mobility between 6000 and 4500 years ago, there have been periods in time when the dunes have been stable. During these periods of prolonged stability, the dunes were vegetated. After each period of stability, mobile dunes developed and buried the vegetated dunes. Further detail on the landform of the WCL is in Section 7. The vast majority of cultural material present in the WCL is associated with two landscape features of these periods of landscape change (see Figure 6):

- the remnant soil layers from past periods of dune stability, which can be seen most commonly as dark bands of soil on the lower slopes of the seaward face of the mobile dunes
- the open swale area that occurs between the smaller frontal dunes on the ocean side and the high, mobile dunes on the forest side.

FIGURE 6: THE DUNES WITH EXPOSED REMNANT SOIL LAYER FROM THE LAST PERIOD OF DUNE STABILITY AND WORIMI CULTURAL MATERIAL (SHELL MIDDENS)



Concentrations of exposed Aboriginal cultural material are greatest in these sections of the WCL, but occur widely throughout. The constant movement of the mobile dunes continually exposes and re-covers such sites, making their identification, protection and management extremely difficult.

Natural processes have an effect on these sites. All sites in the dunes are affected by wind patterns operating at short-term, seasonal and longer term timescales. Weather patterns may encourage dune movement or partial stabilisation by spinifex (*Spinifex sericeus*) and other colonising plants, depending on the strength of winds and rainfall (Umwelt 2010).

Sites in the swale area can also be periodically inundated with fresh water from raised groundwater following periods of high rainfall. In some conditions, such as storms and king tides, sea water can surge through the frontal dune into the swale and effect exposed low-lying sites.

Previous land uses — such as military operations, sand mining, and off-road driving — have destroyed or damaged many Aboriginal sites. Military activities occurred in the vicinity of Fern Bay (1930–40s) and Anna Bay (1970s) and are likely to have destroyed sites exposed at that time. In the 2000s, mineral sand mining occurred through much of the high dunes between Fern Bay and Lavis Lane, resulting in the total removal of cultural material in the mined area. During these operations, stone artefacts from the mined area were salvaged in accordance with the mine’s approval conditions.

The location and variable exposure of the large amount of Aboriginal cultural material in the WCL means there is a high risk of impacts on sites from vehicles. Visitors are informed through signs erected at vehicle access points, in brochures and on websites, and on all vehicle permits that driving on shell accumulations is prohibited in order to protect Aboriginal cultural sites. Temporary signs have been erected at some exposed sites to reinforce this message. Experience since the WCL’s establishment has shown that many visitors have little or no understanding of the occurrence and appearance of cultural sites in the WCL, which increases the risk of impacts from vehicle access. Significant damage to sites has occurred from visitors driving along and through the swale, and across the lower slopes of the mobile dunes where the exposed remnant soil layers and concentrations of cultural material are greatest (see Figure 7).

FIGURE 7: DAMAGE TO WORIMI CULTURAL SITES FROM VEHICLES AND TRAIL BIKES



In 2010 it became obvious that uncontrolled vehicle access was having an unacceptable impact on Aboriginal sites that could not be managed through existing measures (see Figures 7 and 8). A 3.2 kilometre section of swale and dunes north-east from Tin City that contains large, complex suites of culturally significant middens was identified to be suffering increasingly damaging vehicle-based impacts. Vehicle access was subsequently prohibited, the area was identified as a ‘midden conservation area’ and marked with bollards, signs were installed, and steps taken to encourage the build up of sand on the most exposed sites. This is the only area of mobile dunes in the WCL where human impacts on cultural material have been effectively reduced or managed, and provides a working example of the measures required to protect the WCL’s rich and significant evidence of Worimi use of the land.

FIGURE 8: PREVIOUSLY ESTABLISHED 4WD ROUTES IN THE SWALE THROUGH CONCENTRATIONS OF WORIMI CULTURAL SITES



In June 2012 the impacts from a storm event (see Section 7) caused the temporary closure of the WCL. The major flooding and erosion that occurred exposed large areas of remnant soil layers and Aboriginal sites behind the beachfront and throughout the swale. The new exposures were greatest north-east of Lavis Lane Access. With fewer newly exposed Aboriginal sites and areas of remnant soil layers, the area between Lavis Lane Access and Fern Bay was reopened to vehicles following archaeological assessment and fencing to protect important Aboriginal sites. North-east of Lavis Lane Access, the large numbers of Aboriginal sites throughout the swale and dunes has limited the ability to reopen the area behind the beachfront to vehicles without impacting or destroying Aboriginal sites.

Birubi Point Aboriginal Place

The Birubi Point Aboriginal Place was declared under the NPW Act in 2007, and covers the majority of the Birubi Point Crown Reserve, along with an adjoining area of Tomaree National Park. The values of the Aboriginal Place include burials, a ceremonial site, an area rich in natural resources, and extensive archaeological material important for teaching current and future generations about Aboriginal culture (Umwelt 2003).

The Birubi Point Crown Reserve is managed by Port Stephens Council. This area is one of the most culturally significant places in the Stockton Bight landscape, and is culturally connected to the WCL. From the Worimi perspective the Birubi Point area forms part of the Worimi cultural landscape at Stockton Bight, and the management of the Crown Reserve and the WCL must be complementary. Map 1 (at the back of this plan) shows the Birubi Point Crown Reserve and Aboriginal Place, and the Gan Gan Road Access to the WCL.

Many visitors experience the WCL in conjunction with a visit to Birubi Point. The Birubi Point Surf Life Saving Club and carpark overlook the WCL, and provide visitors a panoramic view of the dunes and beach. Birubi Point is recognised as a key visitor area and gateway to the WCL. A majority of commercial tourism passengers who visit the WCL do so via Birubi Point (see Section 14).

The protection of the Worimi cultural values of the Birubi Point Aboriginal Place and Birubi Point Crown Reserve is linked to the protection of the WCL's cultural values, and is a priority for the Worimi community. Management of the WCL needs to pay particular attention to the cultural connections with this site. The Board is continuing to work with Port Stephens Council to improve outcomes at Birubi Point, with the development of a formal agreement under consideration that will allow for improved coordination and cooperation in managing this culturally significant area. It is for these reasons the Board has a long-term interest in the addition of Birubi Point to the WCL.

Connecting with country, maintaining and sharing culture

Maintaining and sharing connections to Country is an important part of Worimi culture, and fundamental to the Board's vision for the WCL. The exceptional cultural values of this landscape and its unique management arrangements provide the opportunity to both:

- strengthen the Worimi People's connections to Country and culture, whilst
- sharing and explaining this culture to the broader community.

In this respect, the WCL is an important spiritual, cultural, social and economic asset for both the Worimi and the broader community.

Strengthening Worimi community connections to Country is a focus of the WCL Community Development Plan (Williams & Umwelt 2011) which has been developed by the Board to specifically drive these activities. Key elements of this document relevant to this plan include:

- a strong focus on promoting the Gathang language, using the naming of sites, locations and facilities to promote broader use and understanding of this key cultural asset
- a desire to encourage Worimi People 'back onto Country', providing formal and informal opportunities for Aboriginal people to access the WCL
- a commitment to facilitating economic opportunities for Worimi businesses on the WCL
- a commitment to ensure all visitors have the opportunity to learn from their interaction with Worimi Country.

The legislative framework for jointly managed parks in NSW specifically allows for the Board to approve the harvesting of natural resources for cultural purposes, in recognition of the cultural importance of this opportunity and maintaining culture.

Encouraging broader community connection with Worimi Country and culture is the driving force behind this plan's focus on providing quality, and culturally and environmentally sustainable visitor experiences (see Section 13). Ensuring the community continue to have opportunities for respectful and appropriate experiences on the WCL is key to building a shared understanding of the cultural significance of the Worimi lands.

Issues

Awareness of Worimi cultural values and identification of sites

The existing information and current approach to communicating important information about Worimi cultural values is not effective. There is a general lack of awareness and understanding of the Worimi cultural values of the WCL, and how visitor behaviour can impact on these values, sites and cultural material. Many visitors remain unaware of the occurrence and extent of Worimi sites throughout the landscape.

Cultural connections with Birubi Point

There is a need to improve the awareness, protection and management of Worimi cultural values in the Birubi Point Crown Reserve and the associated Aboriginal Place. The Board is uniquely positioned to support Port Stephens Council in delivering cooperative approaches to address these issues.

Ongoing impacts and loss of Worimi cultural sites and resources

The location and variable exposure of the large amount of Aboriginal cultural material in the WCL means there is a high risk of impacts from vehicles. This is compounded by the general lack of awareness amongst visitors of the location and appearance of Aboriginal sites, and the dynamic nature of the mobile dune landscape.

In the unstructured driving environment of mobile dunes, it is almost impossible to ensure sites are not damaged by vehicles. The previous situation of vehicle access throughout the entire mobile dune landscape resulted in unacceptable impacts to a high proportion of exposed sites. This led to the establishment of the midden conservation area in 2010, and the changes to vehicle access needed in response to the storm in 2012.

Since June 2012 there has been a significant reduction in impacts from vehicles, although damage resulting from unauthorised vehicle access continues to be an issue. Prior to this, many visitors unintentionally damaged Aboriginal sites while driving through the swale and along the lower slopes of the dunes, often following other vehicles or their tracks as a way of navigating across the sand and unaware of the impacts occurring.

Whilst fencing and/or signposting individual sites can limit impacts in a small number of stable locations, it is not a practical response across the broader mobile dune landscape. Given the numbers, extent and variable exposure of sites over time throughout the WCL, and the strong desire of the Worimi to maintain public use and access, ensuring Aboriginal site protection from vehicle damage is the most significant management challenge (see also Section 13.2).

Providing for cultural use and connection.

The Aboriginal owners have expressed interest in having one or more locations in the WCL dedicated for access and use for Worimi cultural activities, consistent with the Board's vision. The WCL is also an appropriate place for community cultural events, and a number of these, such as 'back to Country' days have been successfully held.

The relatively small area of the WCL, its long and linear nature, and the proximity to neighbours and urban areas limits the options to provide for hunting of native fauna. Opportunities to harvest plant and other materials for cultural use can be provided for.

As evidenced by the extensive middens, pipis are an important traditional Worimi food source, and maintaining a viable population of pipis within the WCL is a significant cultural issue for the Worimi. There has been ongoing concern amongst the Worimi community, recreational fishers and commercial tourism operators about declining pipi populations in the WCL. The Department of Primary Industries (Fisheries NSW) is responsible for the management of pipis under the Fisheries Management Act. Whilst their direct management falls outside the operation of this plan, it remains an issue of cultural significance that the Board will continue to focus on.

Desired outcomes/aims

- **Worimi cultural values, sites, cultural material and resources are maintained and protected.**
- **Visitors are aware of Worimi cultural values, and visitor use of the WCL is respectful and appropriate and does not cause damage to Worimi cultural sites or values.**
- **The WCL provides opportunities for the Worimi community to spend time on country and maintain Worimi culture.**
- **The WCL provides opportunities to learn about Worimi culture.**
- **The WCL provides opportunities to implement the WCL Community Development Plan.**

Management responses

1. Monitor the condition and exposure of Worimi cultural sites in the WCL, and implement site protection measures as necessary.
2. Implement measures to protect Worimi cultural sites and values from the impacts of visitor access to the WCL (see Sections 13, 14 and 15).
3. Develop a range of interpretive and education materials to:
 - improve access to information about the Worimi cultural values of the WCL
 - improve visitors' knowledge and awareness of Worimi cultural values and sites, and how to ensure their protection whilst visiting the WCL.

Ensure this information is provided across a range of media platforms as well as on WCL. All Worimi cultural content will be subject to approval by the Board.
4. Continue to provide opportunities for the sharing and strengthening of cultural knowledge with visitors through face-to-face contact with Aboriginal people — staff, community members, contractors and businesses — on Country.
5. Expand the use of Gathang language in WCL management, particularly in signage, interpretation, and educational materials. Move towards 'dual naming' of all key sites and locations to encourage a broader understanding of the cultural significance of the landscape.
6. Encourage use of the WCL by school, university and other organised groups to learn about Worimi culture.
7. Encourage and support research into the Worimi cultural values of the WCL.
8. Support Worimi community development in accordance with the NPW Act, WCL Lease Agreement, WCL Community Development Plan, and the vision statement in Section 4 of this plan.
9. Develop a number of Worimi cultural activity locations in the WCL. Preference will be given to locations that:
 - have already been used successfully for Worimi cultural activities
 - have the support of Aboriginal owners
 - avoid threatened ecological communities, significant plants or habitat
 - provide a high degree of privacy from other visitors.

The development and use of any culture use site will be subject to environmental assessment, and the development of policy and protocols for ongoing use and management. Development can include low-key structures that provide necessary support for cultural use of the site.
10. Work with the Port Stephens Council, the Worimi Aboriginal and Traditional Owners, the Worimi LALC and community, other government agencies, the Birubi Surf Life Saving Club and the local community to:
 - improve awareness and protection of the Worimi cultural values of Birubi Point Aboriginal Place and Crown Reserve
 - strengthen the role of Birubi Point as a visitor gateway and information point for the adjoining WCL.
11. Work with the Department of Primary Industries and researchers in efforts to ensure the long-term survival of pipi populations in the WCL.
12. Work with the Worimi owners and Department of Primary Industries to enable appropriate cultural access to a healthy and sustainable pipi population in the WCL.

6. HISTORIC HERITAGE VALUES

Heritage places and landscapes are made up of living stories as well as connections to the past which can include natural resources, objects, customs and traditions that individuals and communities have inherited from the past and wish to conserve for current and future generations. Cultural heritage comprises places and items that may have historic, scientific, aesthetic and social significance. The NPWS conserves the significant heritage features of NSW parks and reserves.

The Stockton Bight was noted by Captain James Cook in 1770 and mapped by Lieutenant John Shortland in 1797 (HLA 1995; ERM 2006a). Much of the low-lying area to the north of the WCL was drained for farming from the 1830s as dairying became established in the area (HLA 1995). Much of the WCL landscape was grazed, and this continued through the forested areas of the WCL until the mid-twentieth century.

The sandy soils of the WCL and surrounding landscape, and the swampy low-lying areas from Fullerton Cove through to Tilligerry Creek and surrounds were key factors that hindered development in the area. Throughout the 1800s and early 1900s, transport between Nelson Bay and Newcastle was reliant on shipping. A road from Stockton to Anna Bay was eventually gazetted, but a daily car transport service did not begin until the 1920s (Turner 1994).

Road access to Nelson Bay was improved during World War II to facilitate transport and access for army training and other defence activities. The road was sealed from Newcastle to Nelson Bay, and allowed for an expansion of economic opportunities in the Port Stephens area. Sand mining, and then retiree and holiday accommodation, and residential and tourism development gradually followed. Sand mining for heavy minerals commenced in 1968 at Anna Bay, Salamander, Bobs Farm, Tanilba, Oyster Cove, Williamtown and Medowie (Bartlett 1980). Sand extraction operations still occur and/or are planned at a number of locations adjoining the WCL.

A heritage significance assessment of the WCL was completed in 2006 (ERM 2006a). The main historic heritage values of the WCL relate to:

- history of use associated with the military and defence strategies during World War II
- Tin City and recreational fishing
- maritime history associated with shipwrecks in adjacent coastal waters as a result of the close proximity of the WCL to the entrance to Newcastle Harbour.

Military history

The military history of the WCL is associated with the establishment of formal defence strategies along Stockton Bight during World War II, and the use of the area for military training activities.

There are historic heritage items remaining in the WCL associated with the Fern Bay Armour Plate Proof Facility and the Northern Defence Line. These have national and state heritage significance due to their association with the events of World War II, as part of a sequence of facilities related to Defence Force activity. They also represent rare aspects of Australia's World War II history, and the Fern Bay Armour Plate Proof Facility is significant as an example of technical development within the context of World War II (ERM 2006a).

Fern Bay Armour Plate Proof Facility

The Fern Bay Armour Plate Proof Facility was established in 1941 (ADI 1995; HLA 1995) and situated near the south-west boundary of the WCL adjacent to the Stockton Rifle Range. The facility covered 168 hectares, with permanent facilities constructed within a 10-hectare compound (HLA 1995) that is in the WCL.

Testing at the facility included:

- proof of armour plate and armour piercing shot
- proof firings of rifle grenades
- proof firing of 35 millimetre solid shot
- calibration and acceptances of 25 pound guns.

The Stockton Beach Artillery Proof Range was located in the WCL north-east of the Fern Bay facility. High explosive mortar and artillery projectiles were tested there between 1942 and 1944, with operations supervised from the Fern Bay facility. Whilst there was a number of other facilities at other locations in Australia where small munitions were tested, no other records have been identified describing other armour proofing ranges (ERM 2006a). The proof range was used up until the late 1960s (ADI 1995).

Eight structures remain within the 10-hectare compound. The structures are clustered along the original concrete access road, which is in a variable condition ranging from intact to completely deteriorated. Most structures remain in fair to good condition, with most damage caused by fire and graffiti. The caretaker's cottage and associated outbuildings were demolished some time prior to the establishment of the WCL, with only the foundations and the remnants of some of the original brickwork remaining (ERM 2006a).

The Board has expressed some interest in the potential re-use of the compound area for educational and commercial activities related to the interpretation of the site and the WCL's natural and cultural values.

An area encompassing the site is subject to obligations regarding waste removal under the Fern Bay Voluntary Planning Agreement (see Section 3.4).

Northern Defence Line

Following attacks on Darwin, and the submarine attacks on Sydney and Newcastle harbours by the Japanese in World War II, steps were taken to address the vulnerability of the Australian mainland to attack. The Northern Defence Line was established along Stockton Bight in 1942 in response to concerns that the area was a suitable point of entry for enemy forces. The Northern Defence Line was north-east of the Fern Bay facility, and was manned principally by infantry including heavy and light anti-aircraft artillery, with coastal batteries at Fort Wallace at Stockton and Fort Scratchley in Newcastle. Tank traps were put in place at a number of locations along Stockton Bight to deter shore invasions.

A relatively intact line of tank traps occur in what is thought to be their original location along Tank Trail, with a number of traps previously moved from the line remaining in the vicinity. A single tank trap is situated on a management trail west of the Fern Bay facility. Part of an original line of tank traps is periodically exposed by shifting sands in mobile dunes on neighbouring private property. Other tank traps in the landscape were moved prior to the creation of the WCL. Tank traps were used to help establish a temporary overflow carpark below Birubi Point in the adjacent Crown Reserve prior to the creation of the WCL.

Boyces Trail is thought to have been upgraded by the American military whilst they were stationed at Nelson Bay during World War II. An observation post, known as 'Ypres' is reported to have been installed at the end of Boyces Trail during World War II to support the Fort Wallace battery that could shoot beyond the horizon (Sheppard 2012). The site has since been inundated by the inland migration of the mobile sand dunes.

The remains of rows of barbed wire and star picket fencing installed during World War II is periodically exposed at various locations along Stockton Beach, commonly at locations where there has been a blowout of the frontal dune or other beach erosion.

Other military training and the Morna Point Air Weapons Range

During and after World War II the WCL was used as a bombing range, and as a military training location. In addition to the proofing activities at the Fern Bay facility and use of the Stockton Beach Artillery Proof Range, there are also records of mortar firing from the area around the Lavis Lane entrance, and of heavy artillery firing from further away onto the beach (ADI 1995; Anon. 1988).

A RAAF air weapons range was located south of Morna Point, at Birubi. The area affected was approximately 500 hectares. The range was last active in 1965. Following the injury of a number of children from unexploded ordnance, the RAAF completed a hazard reduction operation. The occasional recovery of unexploded ordnance continued to occur up until the late 1980s (ADI 1995; Anon. 1988).

From time to time unexploded ordnance is uncovered and found in the WCL by staff and visitors. The removal of these objects is subject to protocols involving NSW Police and Department of Defence.

Stockton Bight was used for training purposes for some time after World War II. In March 1954 a training exercise using amphibious vehicles resulted in a number of vehicles sinking and the death of three men (HLA 1995; ERM 2006a).

Tin City and history of fishing

Tin City is the local name given to the group of eleven huts located behind the frontal dune along the central portion of the WCL (see Map 2). The existing huts are all single storey, corrugated iron clad structures with gable or skillion roofs.

The presence of huts at the Tin City location appears to date back to the late 1940s or 1950s, and is directly linked to the history of recreational fishing along the beach. A majority of huts were constructed during the 1970s and 1980s. Since then, some huts have been demolished or destroyed, some rebuilt or relocated within the current Tin City area, and modernised and in some cases expanded. The oldest surviving hut was built in December 1970, with the youngest built in 1992.

The huts continue to be used, with recreational fishing remaining popular amongst the current hut owners. The land on which the huts are located is part of the WCL and the ongoing use of the Tin City huts is addressed in Section 18.1. Tin City is one of the most popular visitor sites in the WCL, and actively marketed as a tourism attraction by licensed commercial operators, and as a commercial filming and photography location.

Tin City was assessed in 2006 as having local heritage significance (ERM 2006a). A heritage action statement has been prepared (Sheppard 2012) but has yet to be finalised.

A number of other huts were constructed and subsequently destroyed in the 1970s and 1980s several kilometres either side of Tin City. The rusting remains of some of these huts are often exposed, depending on local sand drift.

Maritime history and shipwrecks

Four shipwrecks have been recorded in or adjoining the WCL, with many others also occurring in waters off Stockton Beach to the south-west and Birubi Point to the east. The most recent and widely known is the wreck of the bulk carrier the *Sygn* which ran aground in May 1974 (see Map 2). Attempts to salvage the ship were unsuccessful, with the stern section remaining lodged in sands just off the beach south-west of Lavis Lane Access. The block and cabling used during the salvage attempts remain in the WCL, located just behind the frontal dune. The wreck is corroding away, with a visible reduction in detail and mass. It is one of the most recognisable landmarks in the WCL and a key destination for visitors and commercial tours.

The other shipwrecks, in order from west to east along the beach are the steamship *Mareeba*, wrecked in 1908; the steamship *Uralla*, wrecked in 1928; and the *Alice*, which was lost in 1927 whilst being towed to Port Stephens from Sydney.

Issues

Military history and historic heritage

Whilst a significance assessment for much of the military heritage in the WCL has been completed, further work is required to determine the most appropriate management of military heritage fabric, including movable items.

A large amount of broken asbestos sheeting was removed from the compound area at the Fern Bay facility in 2006, but the site remains contaminated with asbestos (ERM 2006b). The remnants of some of the original brickwork at the site are also unstable, and there has been periodic dumping of rubbish and stolen cars, graffiti and vandalism. These issues limit the potential for the site to be developed for re-use or promoted as a visitor node, and complicate the management of historic heritage values at the site.

There have been a number of investigations into the risk of unexploded ordnance in the area encompassing the WCL, with some conflict regarding the exact location and other details. The Stockton Bight Environmental Study (HLA 1995) concluded that although some live firing did occur, the greatest proportion of munitions that may remain on the beach, swale and dune areas between Fern Bay and Lavis Lane are inert proof rounds or solid shot. An examination of the risk of unexploded ordnance in and around the Fern Bay facility in 1983 also noted that small quantities of live ordnance might be buried in other cached sites elsewhere in the area (HLA 1995). There has been some unexploded ordnance removal work completed in the old RAAF site located in the north-east section of the WCL. Sand drift continues to bury and uncover munitions and ordnance. It is difficult to differentiate between inert and live munitions. All munitions and ordnance found in the WCL must be treated as live.

Some aspects of historic heritage may pose a safety risk to staff and visitors. These include:

- the remains of the *Uralla* shipwreck which are periodically exposed at low tides, depending on the build up of beach sand
- the rusting remains of metal pickets and barbed wire from fencing erected during World War II
- the remains of old huts exposed by sand drift and erosion, near and behind the frontal dune in some areas of the WCL
- the risk of unexploded ordnance.

In circumstances where sand drift exposes items dangerous to visitors, these items may need to be removed subject to appropriate assessment. The likelihood of this occurring is greatest in those areas of the WCL where visitation and access is greatest, such as the Recreation Vehicle Area (see Section 13.4). Appropriate protocols are followed to ensure the safe removal of any munitions or unexploded ordnance.

Information and interpretation

With the exception of the *Syigna* shipwreck, the historic heritage of the WCL is not well recognised by visitors. There is little interpretative material, and in some cases inaccurate information is commonly available from a range of external sources.

The presence, risk and appropriate behaviour regarding potentially hazardous historic heritage items needs to be communicated to visitors.

Desired outcomes

- **Significant items of the historic heritage of the WCL are conserved and interpreted, and risk to visitors minimised.**

Management responses

1. Complete appropriate heritage assessment of the military structures and items in the WCL.
2. Retain the tank traps in situ, and where possible reinstate previously moved traps into their original position.
3. Ensure historic heritage is addressed as part of the visitor communications strategy (see Section 12). Interpret the historic heritage of the WCL, with a focus on the military history associated with World War II and the *Syigna* shipwreck.
4. Undertake essential risk management associated with historic heritage in the WCL, and ensure risk messages are incorporated into park interpretation.
5. Consider historic heritage issues and the heritage action statement in the development of the Tin City huts occupation licence (see also Section 18.1).
6. Participate in and support research to document and improve our understanding of the military history of the WCL.

7. GEOLOGY AND LANDFORM

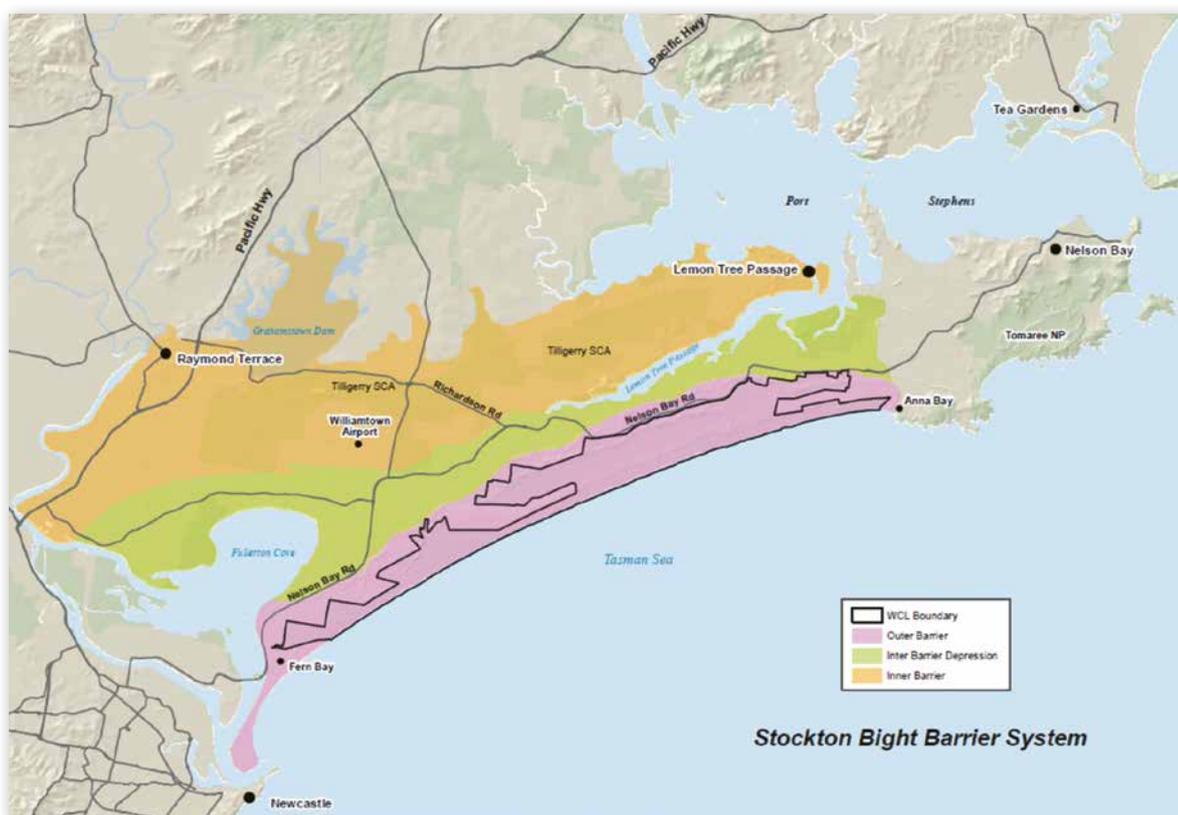
The geology of the WCL is dominated by Quaternary sands (Newcastle 1:100,000 Geology sheet). There are no naturally occurring rocky outcrops in the WCL. Stone from the Nerong volcanics group occurs as outcrops outside the WCL in the area surrounding Port Stephens, and forms Birubi Point (ERM 2006a).

Formation of the Worimi Conservation Lands

The WCL is part of the Newcastle or Stockton Bight barrier system (see Figure 9). This system has been subject to considerable research (Thom et al. 1992) and comprises three main landform units:

- the inner barrier, which is older and located inland from the WCL and is associated with the formation of Grahamstown and Moffats swamps
- the outer barrier, which is younger, and which forms the WCL landscape
- the low-lying, swampy area between the inner and outer barriers, known as the inter-barrier depression.

FIGURE 9: THE STOCKTON BIGHT BARRIER SYSTEM & THE WORIMI CONSERVATION LANDS



The outer barrier dominates the WCL landscape, and has been subject to a number of dune formation processes since sea levels stabilised to near current levels approximately 6000 years ago. These processes are summarised in Table 3. Since the first mobile dunes formed, the WCL landscape has had periods where the dunes stabilised and became covered in vegetation. Each period of landscape stability has been followed by a period where mobile dunes formed and migrated inland, covering the stable, forested landscape.

TABLE 3: TIMELINE AND SUMMARY OF FORMATION OF OUTER BARRIER AND WCL LANDFORM

YEARS BEFORE PRESENT	LANDFORM PROCESS
6000–4500	Windblown sand accumulated, mobile dunes formed and moved inland
4500–3000	Dunes stabilised and became vegetated; ridge 1 formed (outside the WCL)
3000–1200	Unstable period; major sand movement with mobile dunes moving inland
1200–500	Dunes stabilised and became vegetated; ridge 2 formed
500–PRESENT DAY	Unstable period; major sand movement with current mobile dunes moving inland; current mobile dunes are ridge 3

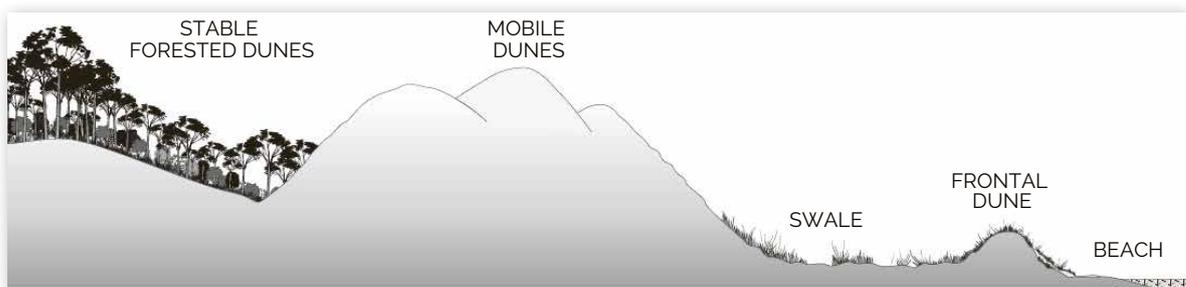
These processes formed the three roughly parallel ridges that dominate the outer barrier landscape as follows:

- ridge one — located just outside the WCL, roughly parallel to the northern edge of the WCL from north-east of Lavis Lane to west of Anna Bay (see Map 3)
- ridge two — located along the northern edge of the WCL from north-east of Lavis Lane to Sand Hill East Trail
- ridge three — is unstable and comprises the mobile transgressive dunes which visually dominate the WCL landscape.

The current landform

Figure 10 is a generalised profile of the WCL landform. It shows the beach, frontal dune, swale, and the mobile dunes encroaching onto the stable vegetated forested dunes.

FIGURE 10: GENERALISED LANDFORM PROFILE OF THE WORIMI CONSERVATION LANDS



Stabilised, vegetated or forested dunes (which include ridge two) occur throughout the northern and central portions of the WCL, reaching up to 40 metres above sea level. The soils of the stable forested dunes are a mixture of deep, well drained weakly to poorly developed podzol soils in the steeper areas, and poorly drained humus podzols in the flatter areas (HLA 1995).

The mobile sand dunes are the largest continuous mobile sand mass in NSW (HLA 1995). The dunes are visually spectacular and dominate the WCL landscape. The dune landscape is valued for its uniqueness and scenic beauty, and is an important aspect of its popularity as a visitor destination (see Section 13) and commercial filming location (see Section 15).

The dunes can reach 40 metres above sea level but vary in height over time, and are migrating inland, covering the stabilised, vegetated dunes. The remnant soils from previous periods of stability become exposed as the dunes move. This can typically be seen along the slopes of the dune face, with stumps from previously buried vegetation and Aboriginal cultural material regularly exposed (see Section 5). This is most common on the face of the dunes overlooking the swale north-east from around Lavis Lane Access, but also become visible throughout the dunes as they change shape in response to wind and weather conditions.

The average rate of inland migration of the mobile dunes is approximately 4 metres per year (HLA 1995), but varies throughout the WCL. The dune migration around the forest north-east of Lavis Lane appears to be more complex, with comparison of aerial photography between 1954 and 1998 showing areas of significant inland migration and other sections with comparatively little change (Umwelt 2008).

The dunes between Fern Bay and near Lavis Lane were mined between 1986 and 1992. Consequently these dunes are generally flatter and more uniform in shape. Sand mining of vegetated dunes also occurred in the area north-east of Fern Bay and at the Lavis Lane entrance (see Section 8).

The deflation basin, commonly referred to as the swale, is the flatter, low area that occurs between the mobile dunes and the frontal dune. The swale occurs along the length of the WCL, and is gradually widening over time as the mobile dunes migrate inland. The swale is generally wider north-east from the Lavis Lane Access – Tin City section of the WCL. Sections of more unstable mobile sand migrate through and along the swale in a number of locations north-east of Lavis Lane Access.

The swale is low-lying, in some places only 2 metres above sea level. Variable amounts of freshwater occur intermittently throughout the swale, depending on rainfall and groundwater levels, and support ephemeral and more permanent wetland areas.

The ongoing dune migration and exposure of old soil layers, and the ability to observe these coastal landscape and formation processes is an important part of the WCL's natural heritage value and significance.

The frontal dune is a natural landscape feature that occurs between the beach and swale. Beach vegetation is important to the development, maintenance and recovery of frontal dunes which are in turn important in protecting the swale area of the WCL. Localised disruption of vegetation may result in a blowout where strong onshore winds push sand inland, creating a lowered section of frontal dune that concentrates and funnels wind, increasing its velocity and capacity to move sand (DLWC 2001).

The sand characteristics, and size and structure of the beach and frontal dune, change from the south-western to the north-eastern end of the WCL. The sand at the south-western end of the beach is coarser, and tends to create softer conditions than that occurring in the north-east of the WCL. The south-western sections of the beach are also narrower, with a more variable frontal dune. Preliminary analysis of historical aerial photography from the area supports this as far back as the 1940s. Further along the beach from the Lavis Lane Access – Tin City section of the WCL, the frontal dune system is generally more intact. Aerial photography of the north-eastern sections of the beach show relatively intact frontal dune structure in place until around 2000, after which the frontal dune shows significant deterioration with multiple gaps forming and expanding in size.

Issues

The beach and mobile dune system is characterised by ongoing movement of sand. The dynamic nature of the landscape poses unique challenges in terms of addressing a range of park management issues. The extent of sand movement is such that it is possible an issue may arise for which new and adaptive management responses are needed.

Erosion

The effects of four-wheel drive and other vehicle use on migration rates of the mobile dunes are not well understood, but increased rates of erosion and sand mobility in areas where vehicular and pedestrian activity are concentrated has been observed. Examples of this include the changes in dune structure at the Lavis Lane entrance following its upgrade in 2010 and the expansion of gaps, or blowouts, along the frontal dunes.

There is increasing erosion of the frontal dune with scores of breaches along the length of the WCL. Whilst frontal dunes do change in response to natural conditions, including drought and storms, the extent of frontal dune erosion occurring in the WCL is linked to impacts on beach vegetation, high numbers of vehicles and inappropriate driving behaviour. The beach is the primary destination for the majority of visitors and concentrations of vehicles crossing the frontal dune at multiple locations along the length of the WCL is having significant impacts, including:

- loss of beach vegetation
- unnatural increase in erosion from wind and wave action
- increase in the number and size of frontal dune gaps and blowouts.

Driving on the frontal dune when the beach is impassable during storms, extreme weather events and big tides leads to a loss of stabilising vegetation and increases erosion.

In June 2012 the storm surge and wave action generated by an east coast low, combined with 2 metre plus high tides, extensively breached the frontal dune causing major flooding and erosion. This led to the temporary closure of the WCL. The severity of flooding and erosion that occurred in June 2012 is linked to the pre-existing degradation and erosion of the frontal dune.

These pressures and impacts combined with predicted rises in sea levels, and increases in shoreline and dune erosion identified as regionally significant impacts associated with climate change (DECCW 2010b) are a major concern (see Section 11).

Neighbouring sand extraction

There are sand extraction operations quarrying the dunes directly adjoining the WCL at Fern Bay and Anna Bay. Given the dynamic nature of the dunes and the constant movement of sand throughout the system, there is concern that the effect of these operations on sand movement and erosion is not adequately understood. The effect of these operations on the dune system requires investigation and action may need to be taken to minimise impacts.

Desired outcomes/aims

- Landscape and scenic values of the WCL are protected.
- The frontal dune is protected and rehabilitated.

Management responses

1. Implement measures to protect the frontal dune, swale and sand dunes from impacts in accordance with the visitors and recreation section of this plan (see Sections 8, 13 and 14).
2. Implement a program to monitor the condition of the frontal dune. Investigate options for rehabilitation and implement as necessary in response to the outcome of monitoring programs.
3. Encourage and support research into geomorphological processes in the WCL, the effects of visitation on these processes, and the effects of expected sea level rise associated with climate change (see Section 11) and the implications for managing the WCL.
4. In consultation with the relevant authorities and quarry owners and/or operators, investigate the effect of sand extraction operations on dunes directly adjoining the WCL, and act as necessary to address and minimise any impacts.

8. FLORA AND FAUNA

As part of Worimi Country, the land, water, plants and animals within a landscape are central to Aboriginal spirituality and contribute to Aboriginal identity. As such, the Worimi cultural values of the WCL are linked to the natural environment and biodiversity (see Section 5).

The flora and fauna of the WCL provide traditional foods and medicines and raw materials for a variety of traditional tools and implements. At least 50 plant species are known to be significant in terms of their cultural use associated with traditional tools and implements, food or medicine (Bell & Driscoll 2010). Maintenance of the vegetation is also important for protecting cultural sites from disturbance throughout the WCL. Whilst the cultural sites throughout the WCL and Birubi Point Aboriginal Place are demonstrative of the important role that the marine environment has as a source of food, some of these sites also contain bones from land-based animals that were hunted in the area.

The cultural importance of fauna also includes the totemic relationships Worimi People have with particular animals, and the role this had within traditional kinship systems. These aspects of Worimi culture are part of the interconnectedness of people and Country, and the cultural obligations to look after or care for Country.

A description of the other flora and fauna values of the WCL is outlined in the following sections.

Flora

The WCL provides an important habitat link within a broader wildlife corridor comprising the Hunter Wetlands National Park in the south-east, Tomaree National Park in the north-east, and Tilligerry State Conservation Area and a number of associated smaller reserves to the north. Collectively, these parks provide a landscape-scale habitat corridor linking the Watagans National Park to Port Stephens.

A detailed flora survey of the WCL was completed in 2010 by Bell and Driscoll. Eight vegetation communities have been identified and are listed in Table 4.

TABLE 4: VEGETATION COMMUNITIES AT THE WCL (BELL & DRISCOLL, 2010)

VEGETATION COMMUNITY	AREA (HECTARES)
FRONTAL DUNE SPINIFEX	227.5
DEPRESSION BANKSIA WOODLAND	4.2
BLACKBUTT-APPLE FOREST	1924.1
PAPERBARK-MAHOGANY SEDGE SWAMP FOREST	8.3
PAPERBARK-MAHOGANY DRY SWAMP FOREST	36.5
MAHOGANY-BALOSKION SWAMP FOREST	15.5
COASTAL TEA-TREE BANKSIA SCRUB	98.2
BEACH WETLANDS	21.5

Over 80% of the stable forested areas of the WCL are blackbutt-apple forest dominated by blackbutt (*Eucalyptus pilularis*) and smooth-barked apple (*Angophora costata*) trees, with old man banksia (*Banksia serrata*) often present. The inland migration of the mobile dunes are gradually inundating these areas of the WCL (see Section 7). Variation within the blackbutt–apple forest community occurs based on its fire history and closeness to the sea. Areas subject to higher fire frequency in the years leading up to the creation of the WCL have a less diverse understorey, and in some cases are dominated almost completely by bracken fern (*Pteridium esculentum*) (see also Section 10).

The blackbutt-apple forest surrounds some small pockets of paperbark-mahogany sedge swamp forest and paperbark-mahogany dry swamp forest. Broad-leaved paperbark (*Melaleuca quinquenervia*) is the dominant tree species in these communities, with swamp mahogany (*E. robusta*) also present. There are some larger areas of coastal tea-tree banksia scrub dominated by coastal tea-tree (*Leptospermum laevigatum*), old man banksia and coastal banksia (*B. integrifolia*) trees between Fern Bay and the Lavis Lane entrance.

The mahogany–baloskion swamp forest occurs at the south-western end of the WCL and is subject to rehabilitation efforts under the Fern Bay Voluntary Planning Agreement. It is dominated by dense stands of prickly-leaved paperbark (*M. nodosa*) and *L. polygalifolium* with plume rush (*Baloskion tetraphyllum*) and lomandra (*Lomandra longifolia*).

A small area of depression banksia woodland occurs near Fern Bay, with old man banksia common, and a range of understory shrub and herb species which are rare in the remainder of the WCL. This community is significant in that it is not represented in other conservation reserves. The depression banksia woodland and mahogany–baloskion swamp forest also contain the undescribed hybrid *E. robusta* x *E. parramattensis* subsp. *decadens*.

A 16-hectare section of the forested area of the WCL between Fern Bay and a neighbouring sand extraction site was subject to sand mining operations that ceased in 2001. Rehabilitation effort at the site included re-contouring to reflect the original topography, revegetation with local endemic species and weed control, and was completed prior to the creation of the WCL.

Frontal dune spinifex occurs along the frontal dune and throughout the swale, and sporadically throughout the mobile dunes. The sand-stabilising spinifex grass (*Spinifex sericeus*) dominates this community, with sand sedge (*Carex pumila*) also common in the swale. This community is critically important in helping to stabilise and protect the frontal dune from erosion. Spinifex grass is also colonising areas of the previously mined dunes in the south-west of the WCL.

Beach wetland communities occur throughout the swale area of the WCL, often adjacent to spinifex communities. The beach wetlands have been assessed as broadly consistent with endangered ecological community Sydney Freshwater Wetlands in the Sydney Basin Bioregion based on their location on coastal sand dunes and the dominance of sedge species present (Bell & Driscoll 2010).

At least 168 plant species are known to occur in the WCL. These include three threatened species listed under both the *Threatened Species Conservation Act 1995* (TSC Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and three species considered to be of conservation significance (see Table 5).

TABLE 5: SIGNIFICANT PLANT SPECIES AT THE WCL (BELL & DRISCOLL, 2010)

COMMON NAME	SCIENTIFIC NAME	TSC ACT	EPBC ACT
COAST GROUNDSEL	<i>Senecio spathulatus var. attenuatus</i>	Endangered	Endangered
ROUGH DOUBLETAIL ORCHID	<i>Diuris praecox</i>	Vulnerable	Vulnerable
SAND DOUBLETAIL ORCHID	<i>Diuris arenaria</i>	Endangered	Endangered
OTHER SIGNIFICANCE			
GOLDEN CANDLESTICKS	<i>Aotus lanigera</i>	near southern limit of its range	
LANCE BEARD HEATH	<i>Leucopogon lanceolatus var. gracilis</i>	near southern limit of its range	
	<i>Eucalyptus. robusta X E. parramattensis subsp. decadens</i>	undescribed hybrid species	

The threatened sand doubletail orchid and rough doubletail orchid occur along the cleared powerline easements through the north-east of the WCL, and along the boundary adjacent to Nelson Bay Road. Coast groundsel occurs in two sections of the frontal dune-swale between Lavis Lane Access and Tin City. This species was thought to be extinct in the Newcastle region prior to its identification in the WCL (Bell & Driscoll 2010).

Fauna

A total of 168 species have been recorded in the WCL, comprising 39 mammals, 12 reptiles, 9 amphibians and 108 birds (Ecotone Ecological Consultants 2008). Further survey work targeting migratory birds during summer, and frogs during spring is likely to identify further species. Threatened species, and migratory shorebird species known or expected to occur in the WCL are listed in Table 6.

TABLE 6: THREATENED SPECIES KNOWN OR EXPECTED TO OCCUR IN THE WCL

COMMON NAME	SPECIES	TSC ACT	STATUS IN WCL
MAMMALS			
BRUSH-TAILED PHASCOGALE	<i>Phascogale tapoatafa</i>	Vulnerable	Known
EAST COAST FREETAILED-BAT	<i>Mormopterus norfolkensis</i>	Vulnerable	Known
EASTERN BENTWING-BAT	<i>Miniopterus schreibersii oceanensis</i>	Vulnerable	Known
GREATER BROAD-NOSED BAT	<i>Scoteanax rueppellii</i>	Vulnerable	Known
GREY-HEADED FLYING-FOX	<i>Pteropus poliocephalus</i>	Vulnerable#	Known
KOALA	<i>Phascolarctos cinereus</i>	Vulnerable	Known
LITTLE BENTWING-BAT	<i>Miniopterus australis</i>	Vulnerable	Known
NEW HOLLAND MOUSE	<i>Pseudomys novaehollandiae</i>	#	Known
SPOTTED-TAILED QUOLL	<i>Dasyurus maculatus maculatus</i>	Vulnerable#	Expected
SQUIRREL GLIDER	<i>Petaurus norfolkensis</i>	Vulnerable	Known
YELLOW-BELLIED SHEATHTAIL-BAT	<i>Saccolaimus flaviventris</i>	Vulnerable	Expected

REPTILES			
GREEN TURTLE	<i>Chelonia mydas</i>	Vulnerable#	Known
BIRDS			
BAR-TAILED GODWIT	<i>Limosa lapponica</i>	^	Known
CURLEW SANDPIPER	<i>Calidris ferruginea</i>	Endangered^	Known
DOUBLE-BANDED PLOVER	<i>Charadrius bicinctus</i>	^	Known
GREATER SAND PLOVER	<i>Charadrius leschenaultii</i>	Vulnerable^	Known
GREAT KNOT	<i>Calidris tenuirostris</i>	Vulnerable^	Known
GREY-CROWNED BABBLER	<i>Pomatostomus temporalis temporalis</i>	Vulnerable	Known
GREY PLOVER	<i>Pluvialis squatarola</i>	^	Known
LESSER SAND PLOVER	<i>Charadrius mongolus</i>	Vulnerable^	Known
LITTLE TERN	<i>Sterna albifrons</i>	Endangered^	Known
MASKED OWL	<i>Tyto novaehollandiae</i>	Vulnerable	Known
ORIENTAL PLOVER	<i>Charadrius veredus</i>	^	Known
OSPREY	<i>Pandion haliaetus</i>	Vulnerable^	Expected
PACIFIC GOLDEN PLOVER	<i>Pluvialis fulva</i>	^	Known
PIED OYSTERCATCHER	<i>Haematopus longirostris</i>	Endangered	Known
POWERFUL OWL	<i>Ninox strenua</i>	Vulnerable	Known
RED KNOT	<i>Calidris canutus</i>	^	Known
RED-NECKED STINT	<i>Calidris ruficollis</i>	^	Known
RUDDY TURNSTONE	<i>Arenaria interpres</i>	^	Known
SANDERLING	<i>Calidris alba</i>	Vulnerable^	Known
SHARP-TAILED SANDPIPER	<i>Calidris acuminata</i>	^	Known
TEREK SANDPIPER	<i>Xenus cinereus</i>	Vulnerable^	Known
WHITE-FRONTED CHAT	<i>Epthianura albifrons</i>	Vulnerable	Known
YELLOW WAGTAIL	<i>Motacilla flava</i>	^	Expected
AMPHIBIANS			
WALLUM FROGLET	<i>Crinia tinnula</i>	Vulnerable	Expected

Threatened species also listed under the EPBC Act

^ Denotes migratory species listed under EPBC Act.

The south-west corner of the WCL lies adjacent to the Hunter River estuary. The Hunter estuary wetlands is a Ramsar-listed site, and an important feeding and roosting site for a large seasonal population of shorebirds and as a waylay site for transient migrants. Over 250 species of birds have been recorded within the Ramsar site, including 45 species listed under international migratory conservation agreements, and many threatened species listed under the TSC Act and the EPBC Act. Some of these species have been recorded at the WCL, and is demonstrative of the role the beach, swale and dune areas of the WCL have as habitat for these species. For example, Pacific golden plovers fly from the Hunter estuary to the WCL where they roost in the swales behind the frontal dunes during very high tides or when disturbed off their roost in the estuary (Lindesay & Newman 2014).

Shorebirds are regularly monitored in the WCL, and knowledge of avian fauna in and around the WCL has been bolstered by the ongoing efforts of the Hunter Bird Observers Club. Pied oystercatchers normally nest near the high tide mark, but have been observed to nest in the swale area of the WCL (Russell & George 2012). In 2011 a majority of the breeding pairs of pied oystercatchers were observed nesting in or in close proximity to the midden conservation area, where vehicle access had been excluded since November 2010. The changed vehicle access since the storm event in June 2012 has resulted in a larger area behind the beachfront where disturbance by vehicles should not occur. Since the 2009–10 breeding season, little terns have nested on the previously mined dunes along the south-western edge of the WCL and on neighbouring land. The location of the little tern nests at these sites is atypical of other known breeding sites that are generally located closer to the ocean on the beach and frontal dunes.

These threatened shorebirds breed in spring and summer (NPWS 2003; Owner & Rohweder 2003), coinciding with some of the busiest holiday periods in terms of visitors in the WCL. Temporary visitor exclusion areas and associated signage is installed to help protect nesting birds as necessary on a case-by-case basis, with limited success. Similar approaches at other breeding sites on the NSW coast typically involve a greater level of site monitoring, with the involvement of volunteers, and additional measures to mitigate the impacts of predation by foxes (*Vulpes vulpes*) which is crucial to achieving successful outcomes.

Issues

Fragmentation and loss of vegetation

The spinifex and beach wetland communities are fragile and easily damaged. Once this vegetation is disturbed, the sand and soil is more vulnerable to erosion. The importance and role of these communities in protecting the WCL landscape and cultural values is not well understood by many visitors. Driving through these communities on and behind the frontal dune is an ongoing issue, with new tracks regularly created. These issues are discussed further in Sections 13.1 and 13.2.

Beach vegetation can recover well naturally when the cause of disturbance and fragmentation is removed. The swale area at the Gan Gan Road entrance is a good example of this. The swale extends into the neighbouring lands at this location. The WCL boundary passes through the swale, and was fenced with bollard and cabling in 2010 to prevent visitor access to the neighbouring land. The vegetation in the swale on the neighbouring land has recovered well since disturbance from vehicles was removed. This is in contrast to the reduction in vegetation in the swale area along the Gan Gan Road Access within the WCL where vehicle access has continued. There has also been a significant improvement in the condition and extent of vegetation in the midden conservation area north-east of Tin City since vehicles were excluded to protect Worimi cultural sites.

The sandy soils of the forested areas of the WCL mean that new tracks are easily created. Regular unauthorised trail and quad bike access is hampering natural regeneration and in many instances creating new tracks. There are multiple branches at the end of Boyces Trail where it meets the dunes. As trafficable routes over the dune face degraded over time from use or changes to windblown sand, alternative approaches to the dune face were created by the unauthorised felling of trees and shrubs. This is increasing fragmentation of the forested area of the WCL, and creating favourable conditions for the spread of bitou bush (*Chrysanthemoides monilifera*) (see Section 9).

Protection of threatened species and endangered ecological communities

There is potential for maintenance operations along the powerline easements to impact on the sand and rough doubletail orchids.

Vehicles that drive through shallow beach wetlands in the swales are damaging vegetation. The location of the endangered coast groundsel in the WCL makes it particularly vulnerable to the impacts from vehicle access.

Foraging and nesting threatened migratory shorebirds are being disturbed and in some instances killed by vehicles. Disturbance from vehicles increases the risk of exposure and predation on eggs and chicks from native species such as seagulls (*Larus novaehollandiae*) and ravens (*Corvus coronoides*), and introduced species such as foxes. This has restricted the breeding success of pied oystercatchers and little terns in the WCL.

Pipis are an important source of food for pied oystercatchers and a variety of other shorebird species. Pipi populations along the NSW coast have declined in recent years and there is concern about the impact this may have on pied oystercatchers in the WCL.

Firewood collection

Some campers have used patches of remnant vegetation in the swale and dune areas in the central sections of the WCL for the collection of firewood. Many of the mature banksia trees present in these areas at the time the WCL was created have since been cut or pulled down.

Introduced species

Threats to the small mammal populations in the stable forested dunes include predation from foxes and cats (*Felis catus*). A number of beach wetlands, mainly at either end of the WCL, have dense infestations of the weed sharp rush (*Juncus acutus* subsp. *acutus*) to the detriment of native species. Further information on pest species in the WCL is provided in Section 9.

Desired outcomes

- The diversity of native vegetation and communities, animal species and communities, and habitat values are protected and enhanced.
- Structural diversity and habitat values are restored in degraded areas.
- Beach vegetation is protected to maximise its potential to minimise erosion and provide habitat for shorebirds.
- The habitat and populations of all threatened plant and animal species, and endangered ecological communities are protected and maintained, and negative impacts minimised.

Management responses

1. Implement measures to protect beach vegetation from impacts of camping, vehicles and day use in accordance with the visitors and recreation section of this plan (see Section 13).
2. Investigate options and implement measures to protect and rehabilitate beach vegetation on the frontal dune and within designated off-beach driving areas.
3. Liaise with Hunter Water Corporation and Ausgrid regarding maintenance of their easements to minimise impacts and support the protection of the sand and rough doubletail orchids (see Sections 18.4 and 18.5).
4. Monitor coast groundsel in the WCL, and implement measures as necessary to protect populations from disturbance, particularly from vehicle traffic.
5. Firewood collection, including driftwood, is not permitted in the WCL.
6. Monitor the occurrence and breeding success of threatened shorebirds, including little terns and pied oystercatchers, and implement measures to protect nesting birds as necessary. Such measures may include temporary closures or exclusion zones to protect nests and young birds during critical stages of the breeding cycle.
7. Work with and support volunteer involvement in the monitoring of shorebirds.
8. Ensure the visitor communications strategy (see Section 12) addresses:
 - the importance and protection of spinifex and beach wetland communities
 - use of the WCL and protection of threatened shorebirds
 - visitor awareness of key threats to these communities and species and how visitors can help ensure their protection.

9. PESTS

Pest species are plants and animals that have negative environmental, economic and social impacts and are most commonly introduced species. Pests can have impacts across the range of park values, including impacts on biodiversity, cultural heritage, and scenic values.

The Lower North Coast Pest Management Strategy 2012–17 (OEH 2012) identifies pest species across the region's parks and details priorities for control, including actions listed in the *Biodiversity Priorities for Widespread Weeds* (NSW DPI & OEH 2011), Threatened Species Priority Actions Statement and threat abatement plans prepared under the TSC Act. The overriding objective of the pest management strategy is to minimise adverse impacts of introduced species on biodiversity and other park and community values whilst complying with legislative responsibilities. The pest management strategy also identifies where other site-specific or pest-specific plans or strategies need to be developed to provide a more detailed approach.

Vertebrate pests

Introduced animals present in the WCL include foxes, cats and rabbits (*Oryctolagus cuniculus*). Wild dogs (*Canis lupus* subspp.) are present in the WCL from time to time. This reflects fluctuations in the wild dog population within the broader Port Stephens region in response to successive favourable seasons. Foxes and cats threaten small mammal populations in the forested areas of the WCL, and shorebird populations, including the threatened little tern and pied oystercatcher.

Foxes suppress native animal populations, particularly medium-sized ground-dwelling and semi-arboreal mammals, ground-nesting birds and freshwater turtles. Foxes have also been implicated in the spread of a number of weed species such as bitou bush and blackberry (*Rubus fruticosus* agg.) and are known to prey on domestic stock.

Predation by the European red fox was declared a key threatening process in 1998 under the TSC Act. The NSW Fox Threat Abatement Plan (Fox TAP) (OEH 2011b) was initiated in 2001 and revised in 2010 with the primary objective of establishing long-term control programs to protect priority threatened fauna species and populations. Foxes are being controlled at priority sites across NSW to protect biodiversity.

Vertebrate pest control in the WCL has focussed on fox control. This is part of a cooperative program stemming from participation in the Port Stephens Feral Animal Management Committee, and dates back to efforts to protect koala populations in the Port Stephens area. Sites in the WCL are also being considered for baiting as part of the Fox TAP program, given the threat posed to beach nesting shorebird species.

Wild dogs, including dingoes, are a declared pest under the *Local Land Services Act 2013* due to their impacts on livestock. The Board therefore has a statutory obligation to control wild dogs on the WCL. The fluctuating population, impacts on livestock, neighbouring residential areas and the need for a cooperative, cross-tenure approach are factors to be considered.

Weeds

Weed species recorded in the WCL and considered a priority for control are listed in table 7.

TABLE 7: PRIORITY WEED SPECIES IN THE WCL

COMMON NAME	SCIENTIFIC NAME
HIGH PRIORITY WEED SPECIES	
BITOU BUSH	<i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> *#
PAMPAS GRASS	<i>Cortaderia selloana</i> #
SHARP RUSH	<i>Juncus acutus</i> subsp. <i>acutus</i>
OTHER PRIORITY WEEDS	
AFRICAN LOVEGRASS	<i>Eragrostis curvula</i>
BAMBOO	<i>Phyllostachys aurea</i>
CORAL TREE	<i>Erythrina x sykesii</i>
GROUND ASPARAGUS	<i>Asparagus aethiopicus</i> *
LANTANA	<i>Lantana camara</i> *#
MORNING GLORY SPECIES	<i>Ipomoea</i> spp.
MOTHER-OF-MILLIONS	<i>Bryophyllum</i> spp. #
PENNYWORT	<i>Hydrocotyle bonariensis</i>
SLASH PINE	<i>Pinus elliotii</i>

* Declared Weed of National Significance (WoNS).

Declared “noxious” under the Noxious Weed Act 1993 in Port Stephens LGA.

Bitou bush is a native of South Africa. It is declared noxious throughout New South Wales, and listed as one of the Australian Government’s Weeds of National Significance. Invasion by bitou bush leads to a decline in the species diversity of affected plant communities and the fauna that depend on them and is listed as a key threatening process under the TSC Act. It readily invades a wide variety of disturbed and undisturbed coastal plant communities, out-competing native vegetation.

A threat abatement plan for bitou bush has been prepared (DEC 2006) which lists actions to abate, ameliorate or reduce the threat posed by bitou bush to threatened species, populations and ecological communities.

Bitou bush is prevalent along the beach and swale areas of the WCL, where it commonly occurs in clumps of mature bushes. Prevailing winds wrap around these clumps, eroding sand from around the base of the plant and hindering the establishment of native species such as spinifex grass. Bitou bush is also invading the forested areas of the WCL, and in some areas dominates the shrub layer.

Regular control of bitou bush has focussed on vehicle-based herbicide spraying, targeting areas around the Gan Gan and Lavis Lane accesses, and the forested areas around Bobs Farm off Nelson Bay Road. The WCL is also part of the aerial bitou bush spraying program, which has included treatment of bitou bush along the mobile dune–forest interface.

Sharp rush occurs in the moist depressions throughout the swale areas of the WCL. It is most common in the south-western and north-eastern sections, where it has colonised the beach wetland communities and is displacing native sedges and rushes such as knobby club-rush (*Ficinia nodosa*) and narrow-leaved cumbungi (*Typha domingensis*) (Bell & Driscoll 2010). Pennywort is also common throughout the swale areas of the WCL.

Pampas grass is present in the swale, and most commonly in the north-eastern end of the WCL. Some initial herbicide control of pampas grass has been achieved and follow-up control is continuing.

Other invasive weeds occur in the forested areas of the WCL, and most commonly around disturbed areas such as cleared easements, or in the vicinity of the WCL boundary.

The Fern Bay Voluntary Planning Agreement provides for the treatment and control of weeds in the forested south-western corner of the WCL for 20 years to improve the condition of the mahogany–baloskion swamp forest communities present.

Desired outcomes

- Pest plants and animals are controlled and where possible eliminated.
- Negative impacts of pest animals on WCL values are minimised.
- Negative impacts of introduced plant species on WCL values are minimised.

Management responses

1. Manage pest species in accordance with the Regional Pest Management Strategy.
2. Develop and implement a management plan for control of bitou bush and other invasive weeds throughout the WCL.
3. Investigate options to control sharp rush in beach wetland communities.
4. Seek the cooperation of neighbours in implementing weed and pest control programs. Where appropriate, undertake control in cooperation with the Hunter Local Land Services (incorporating the former Cumberland Livestock Health and Pest Authority and Lower Hunter-Central Rivers Catchment Management Authority), local Landcare groups, Port Stephens Council and Hunter Water Corporation.
5. Implement weed control measures of the Fern Bay Voluntary Planning Agreement.

10. FIRE

The primary fire management objectives of the NPWS are to protect life and property and community assets from the adverse impacts of fire, whilst managing fire regimes to maintain and protect biodiversity and cultural heritage.

Fire is a natural feature of many environments and is essential for the survival of some plant communities. However, inappropriate fire regimes can lead to loss of particular plant and animal species and communities, and high frequency fires have been listed as a key threatening process under the TSC Act.

The fire history of the WCL is only partially known. Large sections of the WCL are thought to have been burnt regularly throughout the twentieth century. Regular hazard reduction burning was undertaken in the north-east sections of the WCL between Bobs Farm and Anna Bay prior to the WCL's creation.

A fire management strategy which defines the fire management approach for the WCL has been prepared (OEH 2011c). The fire management strategy outlines the recent fire history of the area, key assets within and adjoining the WCL including sites of natural and cultural heritage value, fire management zones, and fire control advantages such as management trails and water supply points. It also contains fire regime guidelines for conservation of the WCL's vegetation communities.

The WCL borders semi-rural areas, except at Fern Bay where residential houses adjoin the park. Asset protection zones have been established at Fern Bay, Salt Ash, Bobs Farm and Anna Bay (OEH 2011c).

NPWS maintains cooperative arrangements with surrounding landowners and the Rural Fire Service and is actively involved with the Lower Hunter Bush Fire Management Committee. Cooperative arrangements include fire planning, fuel management and information sharing. Hazard reduction programs, ecological burning proposals and fire trail works are submitted annually to the Bush Fire Management Committee.

The Board of Management is concerned to improve awareness of the cultural values of the WCL to assist in their protection during hazard reduction and fire suppression activities.

Issues

There is a need for improved awareness of Aboriginal cultural values and their protection during hazard reduction and fire suppression activities.

Historic burning regimes are thought to be the reason behind lower species diversities, particularly in the understorey at a number of sites. The vegetation in the north-eastern section of the WCL has a comparatively low diversity of understorey species and fewer hollow-bearing trees than other similar areas. The south-western section of the WCL near Fern Bay exhibits very low species diversity and an understorey almost solely dominated by bracken fern.

There is potential for much of the forested area of the WCL to burn in hot, dry westerly conditions that would push a fire in a north-easterly direction towards Bobs Farm and Anna Bay.

The Fern Bay section of the WCL has been subject to arson a number of times since the park was created. Fires have also been caused in this area by stolen cars being dumped and burnt.

Desired outcomes

- Negative impacts of fire on life, property and the environment are minimised.
- The potential for spread of bushfires on, from, or into the WCL is minimised.
- Fire regimes are appropriate for conservation of native plant and animal communities.
- Fuel management and fire suppression activities do not impact on Worimi cultural values and sites.

Management responses

1. Implement the fire management strategy for the WCL.
2. Continue to be involved in the Lower Hunter Bush Fire Management Committee and maintain cooperative arrangements with local Rural Fire Service brigades and other fire authorities and surrounding landowners in regard to fuel management and fire suppression.
3. Work with local Rural Fire Service brigades to raise awareness of Worimi cultural values of the WCL to help ensure fuel management and fire suppression activities do not impact on Worimi cultural values and sites.
4. Suppress unplanned fires in the WCL in accordance with the Reserve Fire Management Strategy.
5. Manage the WCL to protect biodiversity in accordance with the identified fire regimes in the fire management strategy.
6. Monitor the ability of flora to recover between fires and review regimes, where relevant.
7. Rehabilitate areas disturbed by fire suppression operations as soon as practical after the fire.

11. CLIMATE CHANGE

Human induced or anthropogenic climate change has been listed as a key threatening process under the TSC Act. Projections of future changes in climate for NSW include higher temperatures, increasing sea levels and water temperatures, more intense but possibly reduced annual average rainfall, increased temperature extremes and higher evaporative demand. These changes are likely to lead to greater intensity and frequency of fires, more severe droughts, regional flooding, and ocean acidification.

Climate change may significantly affect biodiversity by changing the size of populations and distribution of species, modifying species composition, and altering the geographical extent of habitats and ecosystems. The potential impact of climate change is difficult to assess since it depends on the compounding effects of other pressures, particularly barriers to migration and pressure from feral animals. Species most at risk are those unable to migrate or adapt, particularly those with small population sizes or with slow growth rates.

Programs to reduce the pressures arising from other threats, such as habitat fragmentation, invasive species, bushfires and pollution, will help reduce the severity of the effects of climate change.

Predicted rises in sea levels, increased shoreline and frontal dune erosion (DECCW 2010b; HLA 1995) and increased wind erosion to dunes due to increased strength and frequency of southerly winds (HLA 1995) are significant issues for the WCL. There is also a likely increase in heavy rain events and cyclonic winds associated with east coast lows. There is concern that these impacts will be exacerbated by visitor-related impacts to the frontal dune and stabilising beach vegetation (see Sections 7 and 8), and reduce the potential for the frontal dune to naturally adapt and rehabilitate following storm events. Given the high levels of visitation that focus on the beachfront and dunes, the risks from the predicted effects of climate change have implications for visitor management.

Desired Outcomes

- The effects of climate change on natural systems and Worimi cultural sites are monitored and responded to.
- The effects of climate change on the WCL are considered in visitor management, access and operations.

Management Response

1. Continue fire, pest and weed management programs, and visitor access management to increase the WCL's ability to cope with future disturbances, including climate change.
2. Maintain awareness of predicted effects of climate change and consider implications for management.

12. EDUCATION AND VISITOR INFORMATION

Since 2007 there has been an ongoing need to inform people of the change to Worimi ownership and joint management, and the management framework implemented under the NPW Act. An important part of the Board's vision statement is to see the WCL respected and acknowledged as Worimi Country. Achieving the vision of protecting, respecting and connecting with Worimi Country and promoting and sharing this with visitors are key goals of this plan. This involves helping visitors understand the importance of Worimi cultural values, the significance of these values to the Aboriginal owners, and the Board's obligation to protect the cultural and natural values of the WCL.

The establishment of the WCL has provided the opportunity to better manage visitation while also maintaining a strong emphasis on protection of Worimi cultural and natural values.

Consistent with the Board's vision, access to information about Worimi cultural values and important natural values should be a part of the visitor experience in the WCL. In welcoming visitors, the Board is keen to foster improved awareness and understanding that the WCL is culturally significant and part of Worimi Country. It is important and culturally appropriate that the content and delivery of Worimi cultural information as part of visitor information and education is endorsed by the Aboriginal owner Board members (see Section 5).

There is a need to develop and make available accurate information about the WCL, to interpret the important park values and effectively communicate the rationale behind the management framework set out in this plan. There is also a strong community expectation that visitor education and communication be supported by effective law enforcement. These issues were consistently raised throughout the public consultation (DECCW 2010c) and exhibition of the draft plan. A strategic and planned approach to providing information to visitors and achieving education outcomes is needed, and is pivotal to achieving the vision for the WCL.

Issues

A greater emphasis on and improvements in communicating with visitors is required.

Many visitors do not understand the Worimi cultural significance of the WCL, and the reasons for protecting Worimi cultural sites in the park. Also, many visitors do not recognise the impact they can have on cultural sites or on worsening erosion and the frontal dune. Whilst the landscape is dynamic, beach vegetation such as spinifex is one of the only stabilising influences. A greater recognition amongst visitors of the importance of protecting beach spinifex, its fragility, and critical role in helping to build and stabilise the frontal dune is needed.

Awareness amongst visitors of the preparations that should be undertaken to minimise risk and ensure a safe visit to the WCL is generally low. It is common for visitors to require assistance in terms of navigating the WCL, recovering bogged vehicles or in response to mechanical failure. Many of these issues are avoidable, and often caused by a lack of preparation and little or no experience in driving on sand.

Important information for visitors is provided with vehicle permits. The information outlines the permit conditions and regulatory information about how and where vehicles may be driven in the WCL. There is an ongoing issue with vehicle permit holders not familiarising themselves with these conditions. The public exhibition of the draft of this plan generated a strong response to this issue. There is strong support for changing the process of obtaining a vehicle permit to ensure delivery of important information to visitors. In addition to the potential improvements in visitor education and awareness, this may contribute to improved compliance by visitors and assist in achieving better law enforcement and compliance outcomes.

Overcoming these issues to provide visitors the best opportunity to understand the Worimi cultural and other values of the park, and to ensure a safe and low impact visit are key goals of this plan.

Desired outcomes

- Visitors are aware of the cultural and natural values of the WCL, the reasons behind management decisions, and how to visit the park safely and with minimal impact.
- Information about the WCL values, landscape and key issues is available on-park and off-park in a variety of media.

Management Responses

1. Develop and implement a visitor communications strategy for the WCL that addresses:
 - on-park and off-park communication
 - delivery of information via the vehicle permit system
 - signage and other interpretative strategies
 - cultural and natural heritage, and recreation values
 - commercial operations.
2. Develop and implement an education plan to identify and deliver priority information to raise visitor awareness and understanding of Worimi cultural sites and values, threatened shorebirds, the frontal dune and other key WCL values and issues, and the rationale behind management decisions.

13. VISITORS AND RECREATION

The WCL is recognised internationally for its landscape, and is an important destination that contributes to the national and international reputation of the Port Stephens area for tourism and commercial filming (T Bylhouwer 2011, pers. comm.). In this respect, the WCL is also economically important to the Port Stephens region and the Board of Management.

The number of visitors to the area has grown dramatically since the 1990s, and has continued to increase since the creation of the WCL in 2007. Over 250,000 people are estimated to visit the WCL each year. Peak periods for visitation include the summer, autumn and spring school holidays. It is common for over 1000 vehicle movements to be recorded at each of the two entrances during the Christmas – New Year period. The growth in tourism at Port Stephens, population growth in Newcastle and Sydney, increased rates of four-wheel drive ownership, improvements in information technology and access to information about the area, and most recently the creation of the WCL and associated publicity have all contributed to these high levels of visitation.

The first full summer holiday season following gazettal of the WCL occurred in 2007–08. A recreation use study completed during this time gathered information on visitor motives and participation. Rest and relaxation, and spending time with family and friends were the most common motivations for visiting (TFI 2008). The popularity of the WCL as a family destination, and experiencing its unique landscape were also identified by participants at the plan of management public workshop (DECCW 2010c).

The sand dunes are the dominant feature of the WCL landscape, and provide a unique natural setting for outdoor recreation and tourism. The WCL is well known as a recreational fishing and four-wheel touring destination. Other popular activities include camping, swimming, surfing, family-based recreation, horse riding, walking, and trail and quad bike riding in the only Recreation Vehicle Area on public land in NSW (see Section 13.4). Accessing the beachfront is a key experience for the majority of visitors. The vast majority of visitors rely on four-wheel drive vehicles to access the WCL.

Central to the Board's vision for the WCL is protecting, respecting and connecting with Worimi culture (see Section 4). The popularity of the WCL is an opportunity to achieve the Board's vision with the broader community through sustainable visitation. The large amount of cultural sites present has potential to help raise awareness and appreciation of Worimi culture. However, these sites are susceptible to damage and permanent loss from unintentional impacts and inappropriate behaviour (see Section 5).

Issues

Greater numbers of visitors have spread out across the landscape as the popularity of the WCL has continued to increase. This is reflected in an increase in the collective footprint of impact from visitation.

The broad distribution of visitors is not only the result of the opportunity to explore the WCL landscape, but also the interaction between the large numbers of visitors. Visitors move to new areas in response to increasingly crowded conditions, especially during peak periods, or to avoid activities that are not compatible with the experience they are seeking. Inappropriate and at times anti-social behaviour of some visitors were consistently identified as issues during public consultation for this plan (DECCW 2010c). Examples include the extent of rubbish, broken bottles and discarded camping equipment left in the WCL, and incidences of what a majority of legitimate visitors consider to be dangerous driving.

The WCL does not have an endless capacity in terms of visitation. This is evident from the impacts to Worimi cultural sites (see Section 5), the frontal dune (see Section 7) and beach vegetation (see Section 8). Given the popularity of the WCL, the fact that the majority of activities visitors wish to undertake involve vehicles, and the dynamic, highly erodible sandy environment and extent of Worimi cultural sites, achieving safe and sustainable visitor access poses a significant management challenge. The monitoring of visitor access, and a range of cultural and natural value indicators as outlined throughout this plan will help evaluate the effectiveness of management decisions in addressing these issues.

In addition to the directions set out in the following sections regarding camping, vehicle use and other visitor access (see Sections 13.1 to 13.11), there is a general lack of awareness of the significant cultural and natural values of the WCL that needs to be addressed (see Section 12).

The dynamic nature of the landscape, and absence of infrastructure beyond the entrances to the WCL are also factors that need to be considered in terms of communication and visitor safety. Defining boundaries and installing effective signage is challenging in such a dynamic landscape. A desire to keep infrastructure to a minimum throughout the landscape was identified during the consultation for this plan (DECCW 2010c).

Desired outcomes

- Visitor access and recreation is safe and sustainable.

Management responses

1. Monitor visitor access, recreation and compliance, and undertake law enforcement as required to address inappropriate behaviour, unauthorised activity and other breaches of this plan, the NPW Act and Regulation. Visitor access is managed to achieve the Board's vision in accordance with Section 13 and other relevant sections of this plan.

▶ 13.1 CAMPING

The beach camping experience offered in the WCL is unique in terms of its landscape setting and is not available at any other location in New South Wales.

Camping was not permitted at Stockton Bight prior to the creation of the WCL (HLA 1995). Despite this, camping did occur (HLA 1995), and was primarily associated with recreational fishers' overnight use of the beachfront. The number of campers was low compared to the busy summer holiday seasons experienced since 2007.

Following the establishment of the WCL, NPWS in consultation with the Interim Management Committee (comprising the members of the Aboriginal Negotiating Panel who had negotiated the WCL Lease Agreement) took the decision to allow camping as an interim measure. The intention was to ensure that the history of recreational fishing at Stockton Bight could continue.

Some camping had been occurring amongst the intermittently wet paperbark forest along a section of the Lavis Lane entrance, and around other permanent vegetation within the dunes in the vicinity of Lavis Lane. Camping has since been excluded from these sites due to the unacceptable level of damage to vegetation that was occurring.

Following that decision, camping was permitted within 100 metres of the high tide mark along the length of the WCL. Disturbance of beach vegetation was not permitted. No facilities were provided with campers required to provide their own camping toilet, and to dispose of all rubbish off-park. Bins have been provided at the entrances during peak periods. Registration and camping fees were not introduced and there was no requirement to book sites or any restriction on group size or length of stay.

The decision to allow camping was followed by a rapid increase in its popularity. The highest levels of camping occurred during peak periods when the WCL is at its busiest in terms of day use and commercial recreation activity. This was characterised by large numbers of campsites and campers along the length of the WCL. Some campsites were big, with multiple structures or large tents and tarpaulins to accommodate large groups. Groups with up to 10 tents and 10 or more vehicles occurred regularly throughout peak periods. The Christmas – New Year period was consistently the busiest, averaging over 50 campsites per day with eight campers per site. The 2011–12 New Year period saw a peak of 220 campsites with an estimate of more than 2000 campers. A majority of campers stayed between one to three nights, and it was common for some to stay for up to a week. A small number of visitors camped for longer than a week. Camping was also increasing during the shoulder periods that include autumn and spring holidays.

The distribution of campsites expanded over time. The north-east end of the WCL initially had the highest number of campsites, with a concentration of campers within 5 kilometres of the Anna Bay entrance. The increase in campers to the levels experienced in the 2011–12 summer holidays had a more even distribution of campsites between Lavis Lane and the Anna Bay entrances. The number of campsites in the Recreation Vehicle Area also increased.

During these peak periods a proportion of campers near the Gan Gan Road entrance completed multiple trips in and out of the WCL (TFI 2008). This was associated with the campers using the WCL as free holiday accommodation whilst visiting Port Stephens, or in the case of nearby residents, undertaking trips home for food and other provisions.

The June 2012 storm event resulted in major flooding of large areas where visitors normally camped. The frontal dune has not recovered from the storm impact, with ongoing erosion issues (see 'Issues' section below). Seawater has breached the frontal dune under conditions of average tidal heights combined with moderate swells. Extreme storm events are no longer required to breach the frontal dune and there is now a greater risk of inundation in those areas where visitors normally camped. Given the persistence of these circumstances and the associated sustainability and safety issues, camping has not been reintroduced within the WCL.

The steady increase in high levels of camping prior to June 2012 was driven by a number of factors including proximity to the population of over five million people in Sydney and Newcastle, and a lack of fees. Beach camping opportunities like those at the WCL are not available at any other location in NSW. Outside the WCL camping in the Stockton and Port Stephens areas is limited to caravan park style options, with restrictions on group size common. The closest coastal camping opportunities in a natural setting adjoining beach locations are approximately one and a half hours drive north or south of the WCL at Myall Lakes National Park or Munmorah State Conservation Area respectively.

Issues

There is strong community interest in camping in the WCL, however, the previous situation with camping was not sustainable. Prior to the June 2012 storm, camping and the associated vehicle traffic was a major contributing factor to impacts to the frontal dune, loss of beach vegetation and the extent of rubbish left in the WCL. This was widely acknowledged throughout the public consultation for this plan (DECCW 2010c; OEH 2011a).

Frontal dune erosion and loss of beach vegetation

The beach/swale/dune environment is highly susceptible to disturbance and erosion. Each campsite is an area where activity is concentrated. The concentration of vehicle and pedestrian activity that occurs at each campsite has had significant impacts in terms of vegetation loss and frontal dune erosion. This is caused by repeated vehicle movements to and from campsites, and repeated foot traffic around campsites. The majority of this traffic involves multiple crossings of the frontal dune. These issues are magnified by larger camping groups with more people and more vehicles. These initial and cumulative impacts are often worsened by natural processes such as wind, wave and tidal action, such as that which occurred in the June 2012 storm event.

Whilst the numbers and extent of camping during peak periods prior to June 2012 has resulted in these impacts occurring along the length of the WCL, the impact was been greatest north-east of Lavis Lane Access where the frontal dune has historically been more intact. In some sections there is now large-scale destabilisation of the frontal dune and swale. This is also discussed in Section 7.

Sewage disposal

There is a lack of publicly available dump points suitable for camping toilets. NPWS is aware that a large proportion of campers empty camping toilets in the WCL prior to their departure. Toilet paper has been regularly observed, having been discarded or subsequently exposed behind the frontal dune and throughout the swale. This is detrimental to the environment and general aesthetics of the WCL and also a health and safety issue.

Campfires

There are multiple campfire scars along the length of the WCL. A proportion of campers do not properly extinguish their fires.

Building and industrial sources of timber are regularly used as firewood, resulting in nails and other contaminants being left behind. Many campers have chosen to burn their rubbish, and much of the large amount of broken glass present is from empty bottles thrown in campfires. There has also been a loss of vegetation and tree removal for firewood.

Rubbish and broken glass

As well as the rubbish associated with campfires noted above, a large amount of rubbish is left, and often buried. Broken or damaged camping equipment is also abandoned. The extent of broken glass also reflects the large amounts of alcohol consumed by some camping groups. Overnight camping by groups using the WCL as a party venue regularly occurs, and is linked to the extent of inappropriate behaviour identified as an issue throughout the public consultation completed during the preparation of this plan. Many people also linked these issues to a lack of accountability and the anonymity of camping groups.

This rubbish and broken glass is covered and uncovered over time by the ongoing movement of windblown sand, and poses a safety hazard. Rubbish and broken glass have also contaminated many Aboriginal cultural sites.

The presence/absence of rubbish and broken glass has been a factor for campers when selecting a suitable campsite. The extent of rubbish and litter in the WCL also has a significant impact on the scenic values and amenity, and is regularly raised as an issue by visitors.

Dogs at campsites

Dogs are regularly left unattended or off-lead at campsites, sometimes to act as a deterrent to lower any risk of theft from campsites. Uncontrolled and potentially aggressive dogs pose a significant risk to visitors and staff. Many dogs also escape from campsites during storms. See also Section 13.7

Safety

There are large numbers of vehicles present during peak periods when the majority of campers visit. Short lines of sight in the undulating landscape behind the frontal dune and the ability to camp along the length of the WCL increases risks to campers from vehicles. The risk posed from irresponsible drivers, especially at night, led to some campers erecting temporary barricades to demarcate an area around their site in an effort to prevent vehicles from entering. A number of 'near misses' have been reported to staff since the creation of the WCL.

Implementation issues

Management of the large and increasing numbers of campers during peak periods prior to June 2012 involved a significant investment of staff and financial resources, and was not effective in terms of protection of WCL values.

Given the community desire for camping opportunities, and the dynamic and highly erodible nature of the landscape, the provision of sustainable camping opportunities poses a significant challenge. In similar sandy environments in other parts of Australia and overseas where there is a high demand for camping, land managers have faced similar sustainability issues. There are few, if any, working examples of where camping has proven to be sustainable in dynamic, sandy environments such as at the WCL. In the majority of these cases, the response has been to establish more defined camping areas and harden sites as a way of limiting impact.

Factors such as community desire for continued beach driving access, protection of Worimi cultural sites, frontal dune and beach vegetation protection, aircraft noise associated with the RAAF base and Williamstown airport (GHD 2011), and the ability, management effort and resources required to provide and maintain camping opportunities need to be considered.

The provision of beach camping opportunities that are safe and environmentally sustainable will involve establishing a designated camping area or areas, and limiting the footprint of impact from camping. Protecting the frontal dune and beach vegetation are priorities. Vehicle access should be defined. The extent of sand movement throughout the swale area north-east from Tin City hampered efforts to maintain a trafficable route along the edge of the midden conservation area behind the frontal dune. Based on these considerations, and the areas in the WCL available for vehicle access (see Section 13.2), the provision of camping areas will be considered south-west from Tin City. Further investigation is needed to determine the exact location and carrying capacity of camping areas.

Desired outcomes

- Provision of safe and sustainable camping opportunities at WCL.
- Impacts on the frontal dune and vegetation are minimised.

Management responses

1. Camping will be permitted only at designated sites in designated camping areas. The designated camping area or areas will be located south-west from Tin City, behind the beach and frontal dune.
2. A camping strategy will be prepared to guide the establishment of a camping area or areas. The strategy will provide for:
 - up to a combined total of 30 designated campsites
 - adequate spacing between sites in each camping area so as to provide for separation between campers
 - the number of campers up to maximum of eight per site
 - the size of sites and number of vehicles and equipment that can be accommodated at each site
 - provision of options for group camping for more than eight people
 - designated vehicle and pedestrian access to sites
 - protection of beach vegetation and limiting erosion
 - interpretation of cultural and natural values
 - maximum length of stay
 - maintaining and managing the area and sites
 - implementing a registration and booking system, including camping fees.
3. Fires will be permitted only in designated fireplaces. Only clean timber sourced from outside the WCL may be used. Firewood collection within the WCL, including driftwood, is prohibited.
4. No domestic animals, including dogs, will be permitted at individual campsites or camping areas (see also Section 13.7). Facilities or sites for camping with horses will not be provided.
5. All campers must bring their own camping toilet, and all camping sewage must be disposed of in an authorised facility.
6. Construct toilet facilities at the Lavis Lane entry at or in the immediate vicinity of the carpark, and if feasible consider incorporating a camping toilet dump point.
7. Participate in cooperative efforts with other agencies to develop appropriate camping toilet dump points in the vicinity of WCL entrances.
8. Due to the dynamic dune system and extent of sand drift, camping areas or sites may be temporary closed where use of or access to the sites will cause unacceptable impacts.

▶ 13.2 VEHICLE ACCESS

The driving experiences available at the WCL are unique in terms of the landscape setting and opportunities that are available compared to other coastal locations in New South Wales.

The WCL is a popular destination for four-wheel drive touring. Trail bike riding and recreation vehicle use (see Section 13.4) are also popular. Popular destinations and activities that influence where visitors drive in the WCL are the *Syigna* shipwreck, Tin City, the dunes, fishing, camping (prior to June 2012) and four-wheel drive touring. The beach is the most commonly driven route and the busiest area in the WCL, with the *Syigna* shipwreck and Tin City some of the most visited destinations. The dunes are also a popular destination for visitors, offering elevated views across the WCL, and challenging opportunities for more advanced four-wheel drivers. The majority of commercial operations are also reliant on vehicles.

Prior to the storm in June 2012, driving was permitted on the beach, swale and dune area throughout the length of the WCL. Behind the beachfront, the pattern of driving was parallel to and behind the frontal dune, or the inland edge of the swale along the toe of the mobile dunes. Day visitors and campers drove between the swale and the beach by crossing over or through gaps in the frontal dune. This pattern of use represented a broad distribution across the beach, swale and dune areas of the WCL, and was characterised

by periods of intense use by large numbers of vehicles. During peak periods the extent of vehicle use across the entire beach and dune landscape was such that it was difficult, even through aerial observations, to find an area without evidence of vehicle tracks. The popularity of camping was a key factor behind increased levels and concentrations of traffic around the frontal dune and throughout the WCL.

In November 2010, vehicles were excluded from a 3.2 kilometre long section of swale and dunes north-east of Tin City to protect the large concentrations of middens and cultural material present (see Section 5). A track was established along the bollard line marking the boundary of the vehicle exclusion area, with the intention of keeping available an option to drive behind the beach in this area. Within months, ongoing sand drift rendered multiple sections of this track untrafficable.

As noted previously, the June 2012 storm had a major impact on the WCL landscape causing its temporary closure. Since then vehicle access has been permitted along the beachfront, and behind the beachfront between Lavis Lane Access and Fern Bay. The reintroduction of vehicle access behind the beachfront between Lavis Lane and Gan Gan Road entries has not been possible due to the risk of impact and destruction of Aboriginal sites (see Section 5).

Driving occurs throughout the night, and is associated with beach fishing, day visitors leaving the WCL, and (prior to June 2012) camping.

Driving on vegetation and shell accumulations is prohibited, and driving on the frontal dune has been actively discouraged. There is no public vehicle access permitted in the forested areas of the WCL. A speed limit of 40 kilometres per hour applies, and drivers are required to slow to 20 kilometres per hour within 100 metres of pedestrians.

The areas in the WCL where vehicle access is permitted in accordance with this plan are considered road-related areas under the *Road Transport (General) Act 2005*, and as such normal road rules apply. Unregistered vehicles are not permitted in the WCL.

Entrances

There are two existing and one planned designated vehicle accesses in the WCL: Gan Gan Road Access, Lavis Lane Access, and Fern Bay Access. See Map 3.

Entry to the WCL at Anna Bay is from Gan Gan Road, along a section of Crown road. The Board has funded the upgrade of the Crown road from Gan Gan Road to the entrance of the WCL to an unsealed, all-weather two-wheel drive standard. From this entry, vehicles travel along Gan Gan Road Access parallel to the beach along the swale, crossing the frontal dune onto the beach approximately one kilometre from Birubi Point. The Board has also installed bollard and cabling in this area to help demarcate the WCL boundary from neighbouring private land and the Birubi Point Crown Reserve, and to help direct traffic onto the beach.

Entry from Williamstown is off an unsealed section of public road off Lavis Lane. The Board has realigned and upgraded the Lavis Lane Access route. This addressed the issue of visitors encroaching onto neighbouring private property when using the old trail to access the WCL. The upgrade also included an expansion to the carparking area and improvements to cater for vehicles with trailers used to float recreation vehicles to the WCL. With the exception of a steep section of road on the approach to the carpark, the access is unsealed. The steep section was sealed to address drainage issues and significant erosion that was damaging the track. Consideration may be given to hardening the carpark and the remaining unsealed sections of track linking it to Lavis Lane, and upgrading drainage if erosion or other issues create an unsustainable maintenance burden. Planning has commenced for the construction of toilet facilities at the Lavis Lane carpark.

A third vehicle entrance is planned at Fern Bay via Seaside Boulevard. This will be a secondary four-wheel drive access, with a carpark located near the entrance. Its construction is scheduled under the Fern Bay Voluntary Planning Agreement (see Section 3.4), with planning and assessment work in progress.

Vehicle Permit System

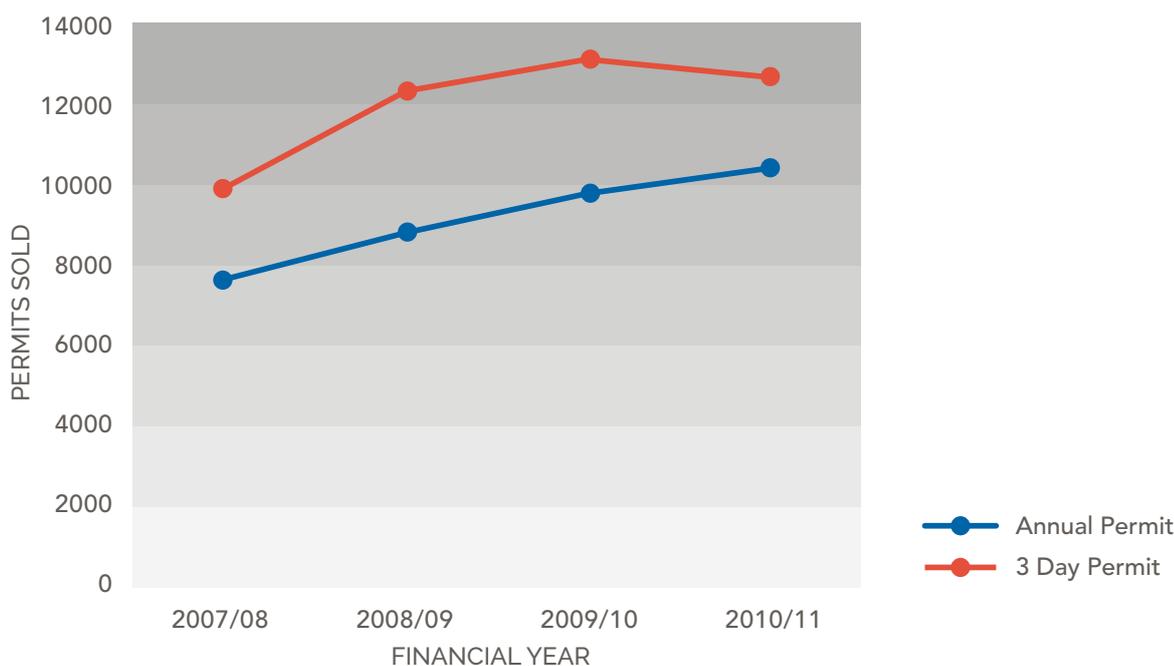
Prior to the creation of the WCL, a Beach Vehicle Permit issued by Port Stephens Council was required by all vehicles to drive on Stockton Beach. A vehicle permit system has been continued by the Board. The vehicle permit system is an important point of contact with visitors for providing information to assist with education about the WCL's values and compliance with regulations. It is also an important source of income to the Board, and all revenue generated by the permit system is reinvested in the management the WCL.

All vehicles entering the WCL must be registered and display a valid WCL Beach Vehicle Permit. A separate WCL Recreational Vehicle Permit is required for conditionally registered vehicles to use the Recreation Vehicle Area within the WCL (see Section 13.4). Beach Vehicle Permits are available from a range of businesses near the Gan Gan Road and Lavis Lane entrances, and the Hunter Coast Area Office of the NPWS. There are currently no limits on how many permits are issued.

Vehicle numbers

Vehicle permit sales are a source of consistent long-term data regarding numbers of vehicles that may enter the WCL. Vehicle counters have been installed at the Gan Gan Road and Lavis Lane entries. The data provided by the counters has had multiple interruptions due to technical issues and damage from repeated acts of vandalism. NPWS staff stationed periodically at the entrances have also collected data on numbers of vehicles entering the WCL during peak periods.

FIGURE 11: BEACH VEHICLE PERMITS SOLD 2007–2011



Annual Beach Vehicle Permit sales have grown 26 per cent from 7629 in 2007–08 to over 10,347 in 2010–11 (see Figure 11). Three-day Beach Vehicle Permit sales grew from 9837 to 12,585 in the same period representing a 22 per cent increase. The summer and autumn school holidays, and public holidays are the busiest in terms of vehicles in the WCL. For example, the vehicle counter at the Gan Gan Road entrance recorded an average of almost 600 vehicles entering the WCL each day. Research in the summer holidays in 2007–08 confirmed the Gan Gan Road entrance to be the busiest, although Lavis Lane entrance still recorded significant numbers of vehicles entering the WCL (TFI 2008). The Lavis Lane Access upgrade was completed in 2010, significantly improving the accessibility of the WCL.

Issues

For the vast majority of people, access is reliant on vehicles. Protecting the cultural and natural values of the WCL whilst providing sustainable vehicle access poses a significant management challenge.

The sandy and dynamic nature of the landscape means that it is highly susceptible to disturbance and erosion from vehicles (Page & Thorpe 2010; DLWC 2001; Defeo et al. 2009; Schlacher & Thompson 2007, 2008). The situation of uncontrolled vehicle access in the coastal zone, and in particular behind the frontal dune that was inherited at the time the WCL was created is anomalous in NSW. Driving on and behind the frontal dune is widely regarded as unsustainable because of the impact it has on sensitive beach vegetation, and backbeach and frontal dune areas that are susceptible to erosion (DLWC 2001; DECCW 2010e). There are many sections of coastline north of the WCL managed by NPWS or local government that provide beach driving opportunities and all require drivers to keep to the beachfront for these reasons.

The current situation with vehicle access is unsustainable. The large numbers of vehicles and the behaviour of a proportion of visitors pose a serious risk to the cultural and natural values of the WCL, and the safety and experience of other visitors.

Aboriginal cultural heritage

The location and variable exposure of Aboriginal cultural material means there is a high risk of impacts from vehicles. As the landscape changes there is potential for more cultural material to become exposed, and thus at risk from impact and damage from vehicles. The ongoing vehicle activity along the back of the swale and toe of the mobile dunes has increased erosion in this zone, resulting in increased exposure of and impacts on Aboriginal sites from vehicles. The exclusion of vehicles from the midden conservation area north-east of Tin City greatly reduced impacts on Aboriginal cultural sites in that location, with a similar reduction in impacts observed throughout the larger area north-east of Lavis Lane Access since June 2012.

Whilst driving on shell accumulations is prohibited, many visitors have little or no understanding of the occurrence and appearance of cultural sites in the WCL, which increases the risk of impacts from vehicle access.

There are burial sites recorded in the WCL. Burial sites are highly significant and it is difficult to predict their location in the landscape. See also Section 5.

Frontal dune erosion and loss of beach vegetation

There are links between the impacts on beach vegetation and the rates and severity of frontal dune erosion occurring in the WCL. As new routes across the frontal dune remove vegetation, they become a focal point for erosion. As traffic on new routes across the frontal dune continues, larger and more permanent gaps in the frontal dune are created, and erosion worsens.

The beach is the primary destination for a majority of visitors, and concentrations of vehicles crossing the frontal dune at multiple locations along the length of the WCL are having a major impact. Prior to June 2012 it was acknowledged that there was significant fragmentation and loss of the frontal dune, particularly north-east of Lavis Lane Access, and that the extent of frontal dune erosion throughout the WCL was linked to increasing vehicle access during the last decade. This situation was worsened by the impact of the storm in June 2012. There is a link between the degraded condition of the frontal dune prior to June 2012 and the severity of impact by the storm.

Beach vegetation is fragile. There is ongoing damage from four-wheel drive vehicles, all-terrain vehicles, and motorbikes driving on and through beach vegetation. The terrain behind the beach is variable, and vegetation cover is greatest in the swale. When visitors drive behind the beach and navigate through this area, many divert across vegetation when faced with impassable or difficult terrain. New tracks are easily created and the impacts of one vehicle driving across a previously intact section of vegetation can remain visible for days. Many visitors follow other vehicle tracks as a way of navigating, and repeat traffic across a section of vegetation throughout a day can create a new driving route. This is a major contributing factor to increased fragmentation of beach vegetation. Beach vegetation has recovered dramatically in those areas of the WCL and adjoining lands where the impact from vehicles has been removed.

Sections of the WCL throughout the swale become inundated during and immediately after periods of high rainfall. These sections often become untrafficable, and many visitors will divert and drive onto beach vegetation and/or the frontal dune in order to continue their trip. This occurs along the access through the swale from the Gan Gan Road Access to the beach, and has resulted in a significant loss of beach vegetation along this route.

Driving on the frontal dune when the beach is impassable leads to a loss of stabilising vegetation and increases erosion. This issue has mainly arisen during king tides, storms and extreme weather events. However, since the impact and erosion of the beach from the storm in June 2012, average tidal heights and moderate swell conditions render the beach impassable to traffic more often. This has led to even greater pressure on the frontal dune from vehicles, hampering its recovery and in many instances causing further erosion.

Threatened species, flora and fauna

Foraging and nesting threatened shorebird species, such as the endangered little tern and pied oystercatcher, and other foraging migratory shorebirds are being disturbed and killed by vehicles. Disturbance of nesting little terns and pied oystercatchers is causing high chick mortality from predation or exposure (see Section 8). These birds have also been driven over and killed. The threatened plant, coast groundsel, occurs throughout the swale in the vicinity of Lavis Lane Access where there is a high risk of disturbance by vehicle traffic.

The knowledge of the effects that vehicle traffic can have on benthic macro-fauna (soil organisms) and other beach biota, especially in the intertidal zone is improving. Research has found greatly reduced diversity and abundance of benthic macro-fauna on beaches where driving is permitted (for example Moss & McPhee 2006; Schlacher & Thompson 2007).

There are ongoing issues with the creation and use of tracks throughout the forested areas of the WCL by unauthorised and unregistered vehicles. This is also discussed further in Section 8.

Capacity of Worimi Conservation Lands to accommodate vehicles

The effects of continual vehicle disturbance to sand surface across the entire landscape on natural dune migration processes is unknown, although there is anecdotal evidence that suggests disturbed areas are less stable and prone to increased rates of change.

The environmental and social carrying capacity of the WCL to accommodate visitors and vehicles is not well understood. The impacts to Worimi cultural sites, beach vegetation and the frontal dune indicate that the current situation is unsustainable. The numbers of visitors and vehicles in the WCL on the busiest days of the year has a demonstrable impact on the WCL landscape, cultural and natural values and visitor experience and safety.

Vehicle permit system and compliance

The level of compliance with the permit system has increased since the WCL was created, with the majority of visitors obtaining a Beach Vehicle Permit prior to visiting the WCL. For example, during the 2010–11 Christmas – New Year period, only 4 per cent of vehicles entering the WCL had not obtained a Beach Vehicle Permit and were turned away. Despite the high proportion of compliance with the requirement to obtain a Beach Vehicle Permit there remains a degree of non-compliance with conditions of use associated with the Beach Vehicle Permit. The delivery of important information such as protecting Worimi cultural sites, beach vegetation, the frontal dune and threatened shorebirds, as well as a range of other regulatory information needs to be more effective in educating and raising visitor awareness.

Visitor and staff safety

Many visitors are inexperienced in off-road driving. For many visitors it is their first time driving on sand. Lack of planning, preparation and awareness of potential driving hazards, inappropriate driving technique and inexperience often result in drivers bogging, overheating or damaging their vehicles, or placing themselves and their passengers in dangerous situations. The number of drivers requiring assistance or recovery is considerable during busy weekends and peak periods.

Speeding vehicles regularly pose a risk to walkers, campers and beach users. Vehicles and trail bikes regularly enter the Birubi Point Crown Reserve, posing a risk to walkers and to operations of the Birubi Point Surf Life Saving Club.

Some visitors are placing themselves and others at risk through the illegal and high risk driving activities such as towing people on various equipment behind vehicles, drink driving, and high-speed driving and riding. The Westpac rescue helicopter has attended numerous medical emergencies associated with vehicle accidents in the WCL.

Night driving in the WCL is an inherently dangerous activity given the dynamic nature of the terrain and limited visibility. Driving at night behind the beachfront has led to accidents from misjudging terrain and near misses from four-wheel drives straying into campsites.

There are serious concerns for staff safety. Staff have been at risk from dangerous drivers and have been threatened with assault on numerous occasions by aggressive visitors when dealing with compliance issues and illegal activity.

Boundary and illegal access

The park has a complex boundary. Large sections of the mobile dunes south-west and north-east of the Lavis Lane entry, and north of the Gan Gan Road entry are privately owned, and not part of the WCL (see Map 3, insets 1 and 2). These boundaries are not well understood or are ignored, with some visitors inadvertently or intentionally trespassing onto neighbouring dunes.

Standard approaches to boundary marking and fencing do not work in the dynamic environment of the beach and dunes. Bollard and cabling has been successful in defining the WCL boundary and adjacent neighbouring land in less active dune systems. However, in the mobile dunes, fencing is impractical and expensive. The absence of fencing in these areas makes it difficult for visitors to know where the park boundary is.

There is ongoing unauthorised vehicle access by registered and unregistered vehicles throughout the WCL. Much of this unauthorised access involves people entering the WCL from or through neighbouring properties. Vehicles and trail bikes also enter and exit the WCL illegally through the Birubi Point Crown Reserve, impacting on the Worimi cultural values of this significant area, creating safety issues for pedestrians and interfering with the operation of the Birubi Surf Life Saving Club. Some visitors also float unregistered trail bikes and other vehicles into the WCL.

Commercial operations

Commercial tourism operations that occur at the north-east end of the WCL involve large volumes of tour bus movements across part of the Birubi Point Aboriginal Place in Birubi Point Crown Reserve. The Board is concerned to ensure that the significant cultural values of the Aboriginal Place are not threatened by commercial tourism operations. This is discussed further in Section 14.

The *Sygn* shipwreck and Tin City are key tourism destinations visited by commercial operators and many visitors. There are impacts on the frontal dune at these locations from the frequency and volume of traffic.

Desired outcomes

- The provision of unique sustainable vehicle based visitor opportunities in a coastal dune setting.
- Vehicle-based access and recreation opportunities encourage appreciation and awareness of the WCL's values and their conservation.
- Vehicle use does not impact on the Worimi cultural values of the WCL, and negative impacts on other cultural and natural values are minimised.

Management responses

1. Public vehicle access will be permitted at the three designated vehicle accesses as shown on Map 3. All vehicles must have a Beach Vehicle Permit. Driving is permitted on the beachfront between the Sygna and the Gan Gan Road Access frontal dune crossing. Driving behind the beachfront is permitted:
 - along defined routes to and from WCL designated vehicle accesses
 - in the Recreation Vehicle Area (see Section 13.4)
 - along defined routes (including across the frontal dune) to and from Tin City and designated camping areas.Driving outside these areas, or on Aboriginal cultural sites, beach vegetation, the frontal dune (except on designated frontal dune crossings) and on management trails is not permitted. Unregistered vehicles may not be operated or transported into the WCL.
2. Vehicle access across the frontal dune will be defined and, where necessary, formalised to protect the frontal dune.
3. Monitor Aboriginal cultural sites and their exposure in those areas of the WCL where vehicles are permitted, and implement measures to protect sites from impacts of vehicles.
4. Work with Port Stephens Council in an effort to ensure vehicle access between the WCL and the Birubi Point Crown Reserve is managed to ensure the protection of Worimi cultural values and safety.
5. Continue to implement the beach vehicle permit system, and review the fee structure periodically in accordance with the Lease Agreement. Ensure the visitor communications strategy and associated education plan address the vehicle permit system.
6. Vehicle access to the WCL or identified sections of the WCL may be temporarily closed due to weather conditions that would lead to safety concerns or increased impacts from vehicle use. Examples include storm events that render sections of the beachfront impassable.
7. Monitor numbers of vehicles in the WCL, and investigate the carrying capacity of the beachfront and Recreation Vehicle Area for vehicle-based access. If necessary, implement techniques to manage the number of vehicles to be within capacity during peak periods.
8. Work cooperatively with NSW Police and adjoining land owners and managers to address illegal vehicle access and inappropriate driving.

▶ 13.3 RECREATIONAL FISHING

The WCL has a strong association with fishing and harvesting of marine resources.

The Worimi People have a long history of fishing and shellfish collecting. This is reflected in the extraordinary number of Worimi cultural sites occurring throughout the WCL. The midden sites are dominated by pipi shells, with some also containing estuarine and rockshelf shellfish species. The strong cultural links with fishing are also evident at Birubi Point and throughout the declared Aboriginal Place (see Section 5). Archaeological investigations at Birubi have identified 23 fish species, the use of fish hooks made from turban shells, and evidence of diverse and effective fishing methods (Dyall 1982, 2004). Fishing continues to be an important part of Worimi culture today.

The WCL is recognised as an excellent beach fishing destination and has a strong history of recreational fishing (see Section 6). Prior to the more recent broader popularity of the WCL, recreational fishing was one of the main reasons people visited Stockton Bight. Fishing continues to be one of the most popular recreational activities in the WCL, including outside of peak holiday periods. The Board of Management recognise the significance of the park to recreational fishers and is keen to facilitate access for responsible recreational fishing. This is supported by the significant amount of beach driving access provided for in this plan (see Section 13.2).

All recreational fishing activities in NSW waters are regulated under the Fisheries Management Act. Recreational fishing must be in accordance with recreational licence conditions specified by the Department of Primary Industries and the Fisheries Management Act. Gazettal of the WCL to the mean low water mark does not change this authority.

Issues

Rubbish and discarded fishing gear pose a threat to fauna, and in particular shorebirds. There have been a number of instances of shorebirds, including the threatened pied oystercatcher, being injured from discarded fishing lines and hooks becoming wrapped around their legs.

Many of the cultural and natural value protection issues associated with vehicle access and camping are relevant to recreational fishing. As noted in Section 13.1, the interim decision to permit camping in the WCL was based on a desire to provide a range of access, including recreational fishing. Vehicle traffic across the frontal dune and to and from campsites has had a demonstrable impact on beach vegetation and the frontal dune, and is detailed in Sections 13.1 and 13.2. It is important that vehicles are kept off the frontal dune at all times.

Since the impact on the park from the storm event in June 2012, and the subsequent slow recovery of the frontal dune and ongoing issues, camping has not been permitted. The Board has tried to minimise the effect on recreational fishers who fish through the night. However, these efforts have been consistently undermined by visitors exploiting any opportunity to camp in breach of the current restrictions. Camping opportunities are provided for in this plan, and outlined in the management responses in Section 13.1.

Desired outcomes

- **The WCL provides opportunities for recreational fishing, and any impacts from recreational fishing on cultural and natural values are minimised.**
- **Recreational fishing in the intertidal area of the WCL is licensed under the Fisheries Management Act.**

Management responses

1. Recreational fishing opportunities will be included in the visitor communications strategy, and responsible recreational fishing will be addressed in the visitor education plan.
2. Work cooperatively with the Department of Primary Industries to ensure that recreational fishing activities licensed under the Fisheries Management Act have minimal impact on reserve values.

▶ 13.4 RECREATION VEHICLE AREA

In 1986 a Recreation Vehicle Area (RVA) was established at Stockton Bight under the *Recreation Vehicles Act 1983*. The RVA provides an area where, in addition to road-registered four-wheel drives and motorbikes, vehicles with 'conditional registration' for Stockton Bight may be ridden. The WCL RVA is currently the only RVA on publicly managed land in NSW.

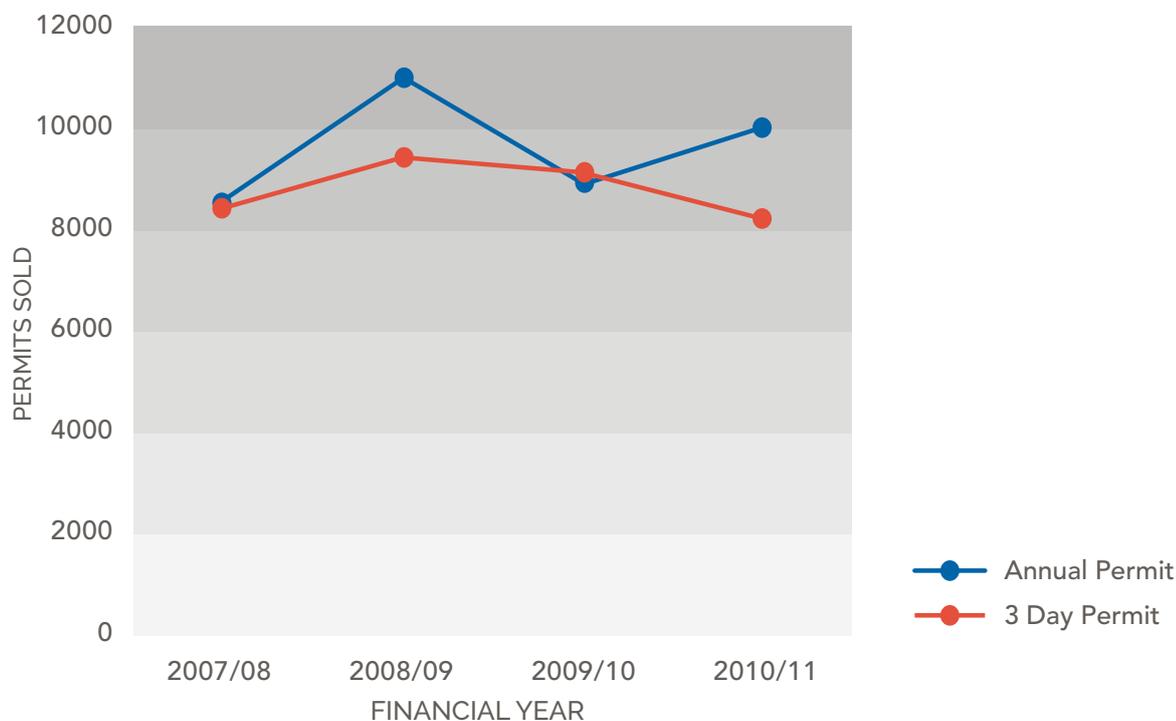
Conditional registrations for Stockton Bight are issued by the NSW Roads and Maritime Services. Conditional registration is available only to vehicles that meet specific criteria. The majority of conditionally registered vehicles used in the WCL are quad bikes, also known as all-terrain vehicles and, to a lesser extent, trail bikes. Dune buggies and other similar styles of off-road vehicles cannot be conditionally registered and are not permitted. Conditionally registered vehicles can only be ridden during daylight hours.

Following the establishment of the WCL in February 2007, and prior to the appointment of the Board, NPWS in consultation with the Interim Management Committee successfully applied to have the RVA boundary changed under the Recreation Vehicles Act. The original RVA was established in 1986 and covered approximately 15 kilometres of beachfront between Fern Bay and Tin City, with a 100 metre wide corridor that provided access from the entry at Lavis Lane. The changes to the RVA resulted in a larger area with access to an additional 140 hectares and more diverse terrain. The RVA is now 430 hectares and covers the majority of the beach, swale and dune area between Fern Bay and Lavis Lane Access (see Map 3). Much of this area had been heavily disturbed by sand mining for heavy minerals prior to the creation of the WCL. The management and regulation of the RVA is subject to the Recreation Vehicles Act and NPW Act and Regulation.

All conditionally registered vehicles operating within the RVA require a WCL Recreational Vehicle Permit. Recreational Vehicle Permits are only available for vehicles with conditional registration for Stockton Bight.

Annual and three-day Recreational Vehicle Permits sales have averaged 480 and 440 per year respectively between 2007–08 and 2010–11 (see Figure 12).

FIGURE 12: RECREATION VEHICLE PERMITS SOLD 2007–2011



Issues

The issues described in the vehicle access section of this plan (see Section 13.2) regarding Aboriginal cultural heritage, frontal dune erosion and loss of beach vegetation, and threatened flora and fauna species are also relevant to the RVA.

Compatibility with park values and management principles

Appropriately ridden all-terrain vehicles are considered sustainable in the WCL, however, a large proportion of conditionally registered vehicle users are seeking a riding experience that is not consistent with the NPW Act or the Board's vision for the WCL. More advanced and high-speed activities such as racing, jumping and informal motorsport or motocross type activities that are not appropriate in the WCL characterise much of the riding that takes place.

Non-compliance and riding outside the RVA

Many conditionally registered vehicle users, particularly the more advanced riders, seek access to steeper and more challenging and diverse terrain than is provided within the RVA. A large proportion of riders illegally access areas outside the RVA in the WCL and on neighbouring private property in the vicinity of Lavis Lane. Similar issues with illegal all-terrain vehicles and trail bike riding, and ongoing non-compliance occur near Newcastle in the Belmont Wetlands State Park which covers much of the dunes along Nine Mile Beach between Blacksmiths and Redhead beaches (Andrew Neil Pty Ltd 2010).

Management of conditionally registered vehicles is difficult and consumes a disproportionate amount of staff time and resources. Many riders are uncooperative and fail to stop when approached for operating outside of the RVA or in breach of their Recreational Vehicle Permit conditions.

Alternative riding opportunities

The WCL has the only remaining RVA on publicly managed land in NSW. Previously declared recreation vehicle areas on Crown land in NSW have been rescinded. Off-park recreational vehicle opportunities are available at purpose-built riding facilities managed by the private sector and motorcycle clubs and associations.

Visitor and staff safety

There are safety concerns from speeding and high risk riding. Conditionally registered vehicle users have also expressed safety concerns about the large number of four-wheel drive vehicles in the RVA, and four-wheel tracks in the sand that can be difficult to ride across and impact on their riding experience.

The majority of situations where staff have been threatened when dealing with compliance issues and illegal activity have been associated with conditionally registered vehicles.

Desired outcomes

- **Use of conditionally registered vehicles in the RVA is compatible with the WCL setting, and encourages appreciation and awareness of the WCL's values and their conservation.**

Management responses

1. Appropriately conditionally registered vehicles may access the Recreation Vehicle Area as shown on Map 3. An operations plan will be developed for the management of the Recreation Vehicle Area. The Board will work with the Roads and Maritime Services, NSW Police and user groups to address:
 - visitor safety
 - protection of Worimi cultural sites
 - protection of beach vegetation.

Monitor compliance with the Recreational Vehicle Permit and Recreation Vehicle Area, and if necessary review the future operation of the Recreation Vehicle Area.

▶ 13.5 WALKING

The beach is a popular walking destination, with strong links to recreational use of Birubi Point Crown Reserve. A majority of walkers enter the WCL via the Crown Reserve.

The section of the WCL between the frontal dune crossing on Gan Gan Road Access and the Birubi Point Crown Reserve has the largest number of pedestrians and short-distance walkers. The popularity of this section of the WCL is associated with its closeness to Anna Bay, the Birubi Point Crown Reserve, and, during the warmer months and peak holiday periods, the Surf Life Saving Club. Visitors in this section of the WCL typically spend time on the beach, swimming and surfing. During peak holiday periods the beach in this section of the WCL is dominated by four-wheel drives that use the beach area for parking.

Small numbers of visitors park at the Lavis Lane entrance and walk along the vehicle access track to the dunes. The beach and swale area of the WCL provides a unique long-distance coastal walking opportunity. This is only occasionally completed by small numbers of walkers. The large numbers of vehicles on the beach, especially during peak and shoulder periods, and a lack of promotion are likely factors contributing to the low numbers of walkers completing this long-distance route.

The beach has also been used for charity events that have involved participants walking or running the length of the beach through the WCL from Stockton to Birubi Point (see Section 16).

A walking track from the carpark at the planned Fern Bay entrance to the base of the dunes will be constructed in accordance with the Fern Bay Voluntary Planning Agreement (see Map 3). There are no other designated walking tracks proposed, but walkers can use the management trail network in the forested areas of the WCL.

Tomaree National Park borders the Birubi Point Crown Reserve and has extensive walking opportunities on its network of management trails and walking tracks. There is community interest in developing a walking opportunity from the southern end of Tomaree National Park to the Tomaree Head summit track at the mouth of Port Stephens. In conjunction with the WCL and Birubi Point Crown Reserve this would provide a unique coastal long-distance walking opportunity.

Issues

There are safety concerns with the large numbers of vehicles on the beach between the Gan Gan Road Access track frontal dune crossing and the Birubi Point Crown Reserve, given the large numbers of pedestrians and day users in this area. Vehicles are not permitted on the beach within the Crown Reserve. Excluding vehicles from the section of beach adjoining the Crown Reserve will provide a larger vehicle-free area for people using the beach, and reduce the potential for drivers to enter the Crown Reserve from the WCL. There are also concerns with visitors swimming between the Gan Gan Road Access dune crossing and the Crown Reserve instead of using the flagged area patrolled by the Birubi Point Surf Life Saving Club.

As residential development expands on neighbouring land at Fern Bay, there is the potential for similar pedestrian safety issues to arise on the dunes and beach in the south-western end of the WCL.

Existing walking opportunities in the WCL are not interpreted or promoted. The provision of enhanced walking opportunities is consistent with the Board's vision, and may be considered, subject to further planning and assessment work.

Desired outcomes

- Safe and sustainable walking opportunities are promoted and interpreted.

Management responses

1. Vehicles will not be allowed on the beach between the Birubi Point Crown Reserve and the frontal dune crossing for vehicles entering via the Gan Gan Road Access.
2. Develop a walking track strategy to address awareness and promotion of existing opportunities, linkages to other coastal walking opportunities (such as in Tomaree National Park), new walking routes/ linkages in the WCL, and improving pedestrian safety at the three park entrances and the Recreation Vehicle Area.
3. Walking opportunities will be included in the visitor communications strategy, and walking opportunities will be interpreted and promoted.

▶ 13.6 HORSE RIDING

The WCL provides one of the few beach-based horse riding opportunities in the greater Newcastle – Port Stephens area. Horse riding is currently permitted along the beach, swale and dunes.

Some riders float their horses to the WCL via the Gan Gan Road Access and park near the boundary. A small number of riders also float their horses to the carpark at the Lavis Lane Access. A small number of local riders enter the WCL on horseback through the Gan Gan Road Access. There is also a history of recreational riders and commercially led riding groups accessing the WCL directly from adjoining properties and riding through the forest and dunes to the beach.

Organised groups visit the WCL to ride, and consents have been issued for groups to ride on the beach. There is one licensed commercial operator providing horse riding experiences on the beach, swale and dune area of the WCL and neighbouring dunes.

It is recognised that some riders enjoy riding in bushland. Extensive horse riding opportunities in a bushland setting are available in Medowie State Conservation Area, and in Wallaroo, Karuah and Columbey national parks.

Issues

Horse riding has the potential to disturb and damage Worimi cultural sites, sensitive beach vegetation and the frontal dune. The sandy soils of the forested dune area of the WCL are highly erodible, and do not cope well with horse riding. Maintaining a safe, navigable route from the forest onto the dunes poses a significant challenge, and is costly. Historically, new routes onto the dunes have been created once previous routes became unrideable. This is not sustainable. Issues associated with track creation and fragmentation of vegetation are discussed further in Section 8.

Some riders access the WCL directly from adjoining properties. Exclusive access from private property is not permissible. There is a history of shared vehicle and horse riding access on the beach in the WCL. However, unsafe environments for horse riding may be created during peak periods when there are large numbers of vehicles entering and leaving the WCL. Visitor pressures around the entry from Gan Gan Road are likely to increase as land adjoining the WCL and Birubi Point Crown Reserve is developed for holiday accommodation. The Lavis Lane entrance is used by all-terrain vehicles and trail bikes (see Section 13.4) and there is concern this may pose a greater risk to horse riders sharing this access. To date, most riders have generally chosen to avoid the busiest times in terms of vehicle traffic when entering the WCL.

The north-eastern end of the WCL is a focal point for day visitors, with many visiting in conjunction with the Birubi Point Crown Reserve and Surf Life Saving Club. The presence of horse manure, especially in areas of concentrated day use along the beachfront, has been raised as an issue by visitors.

The large numbers of visitors and predominance of vehicles accessing the WCL limit the capacity to provide additional horse riding opportunities beyond what is currently permissible. There is a need to provide accurate information about the available horse riding opportunities in the WCL, and how riders can ensure they minimise or avoid impacts on cultural and natural values. Developing a permit system for horse riders similar to that currently implemented for vehicle access may assist in achieving these outcomes.

Horse riding as part of an organised group activity is addressed under Section 16. Horse riding that is part of a commercial operation is addressed under Section 14.

Desired outcomes

- Provision of safe and sustainable horse riding opportunities that cater for existing, legitimate use.
- Horse riders are aware of the cultural and natural values of the WCL.

Management responses

1. Horse riding is permitted on the beachfront, and in those areas behind the beachfront where driving is also permitted. Riders must avoid beach vegetation, cultural material and sites. Horse riding is not permitted on management trails or in the forested areas of the WCL.
2. Horse riding activities involving 10 or more horses, including those that are part of an organised non-commercial event, require written consent (see Section 16).
3. Horse riders may access the WCL via designated vehicle accesses only. Alternative access for horse riding may be developed to address safety concerns associated with the sharing of vehicle access, if required.
4. Work with horse riders to develop and implement a code of conduct and if required a permit system for horse riding in the WCL.
5. Ensure the visitor communications strategy addresses horse riding, with consideration given to limits on capacity, safe entry to the WCL, the code of conduct and sustainability issues.

▶ 13.7 DOG WALKING

Domestic dogs are not permitted in national parks or state conservation areas under the NPW Act and Regulation, however, they may be allowed in a regional park. Since the creation of the WCL in 2007, dogs have been permitted on-lead on the beachfront, and were also allowed at campsites until June 2012. It is common for visitors to bring their dogs with them when visiting the park.

The north-eastern end of the beach, in conjunction with the Birubi Point Crown Reserve is used by local residents for dog walking. Dogs are currently permitted on-lead in the Birubi Point Crown Reserve, and prior to the creation of the park, sections of the beach south from Birubi had been available for leash-free dog walking.

Residents at Fern Bay and other neighbouring locations have used the forested areas of the park for dog walking and exercising.

Issues

The majority of visitors who choose to bring dogs to the park have their pets off-leash at least some of the time during their visit, and commonly whilst on the beachfront. Uncontrolled and potentially aggressive dogs pose a significant risk to visitors and staff. Issues with dogs at campsites are addressed in Section 13.1.

Uncontrolled dogs pose a threat to fauna, especially shorebirds, including the threatened little tern and pied oystercatcher which nest in the park. The presence of domestic animals such as dogs, including whilst on a lead, has also been shown to have negative impacts on fauna (Banks & Bryant 2007).

Uncontrolled dogs can also be problematic given vehicle traffic on the beachfront, especially during peak holiday periods, and the presence of horse riders.

The boundary with Birubi Point Crown Reserve is not well understood on the ground. There is a need for a cooperative approach to visitor communication with Port Stephens Council regarding dog walking in the north-eastern section of the park and the Crown Reserve. Port Stephens Council are currently reviewing access for dog walking in Birubi Point Crown Reserve, and have advised it is likely that dog walking will continue to be permitted in the Crown Reserve adjoining the north-eastern boundary of the park. This may include a timed off-leash dog exercise area.

Desired outcomes

- Dogs have minimal impacts on the park's cultural, natural and other recreational values.
- Park visitors and neighbours practise responsible pet ownership.
- Dog walking in the park complies with the Companion Animals Act 1998 and is linked to existing dog walking opportunities in Birubi Point Crown Reserve.

Management responses

1. Dogs must be kept on a leash at all times and must be kept under control at all times. Dog owners must clean up and remove their dogs' faeces from the park.
2. Dogs will only be allowed on Gan Gan Road Access and a 3-kilometre section of beachfront south from the boundary with Birubi Point Crown Reserve at the north-eastern end of the WCL as shown on Map 3.
3. Liaise with Port Stephens Council to achieve a coordinated approach to visitor communication and signage informing of dog walking in the WCL and Birubi Point Crown Reserve.
4. Ensure dog walking opportunities and the prohibition on dogs in other areas of the WCL are addressed in the visitor communications strategy.

▶ 13.8 ORIENTEERING

Newcastle and the broader Hunter region have an active orienteering movement. Orienteering events are generally held in unfamiliar territory and off established tracks or routes, and have historically been held in the forested areas of the WCL adjoining Boyces Trail. All orienteering will require written consent, and permissibility will be assessed against the likelihood of unacceptable impacts on the WCL's cultural and natural values, other users and infrastructure. Orienteering must be organised to an acceptable standard, as guided by NPWS policy.

Issues

Organised events involve the placement of markers or other fixtures and access off established tracks and routes, and have the potential to impact natural and cultural values if not properly managed.

Desired outcomes

- **The WCL continues to provide opportunities for orienteering with minimal impacts to WCL values.**

Management responses

1. All orienteering events will be assessed on an individual basis and require written consent. Placement of markers, or other fixtures, must not disturb the soil, substrate, vegetation, wildlife or interfere with WCL or other infrastructure.

▶ 13.9 HANG GLIDING

The use of hang-gliders is subject to a civil aviation order, which specifies the conditions to be complied with by hang-glider pilots. There are specific topographical and wind requirements that enable hang-gliding and paragliding activities to take place, and activities are limited to specific locations.

Historically, the dunes (including preferred locations outside the WCL) have been used to teach hang-gliding. The dunes in the Recreation Vehicle Area are currently used infrequently as a location to teach hang-gliding in an organised and commercial context.

Preferred coastal hang-gliding launch sites occur outside the WCL, in Newcastle at Strzelecki Lookout and in Glenrock State Conservation Area (DECCW 2010a).

Issues

The WCL is under the flight path of the Williamstown Domestic Airport and RAAF base, and airspace restrictions apply. The area falls within a military control zone with controlled airspace to ground surface over the majority the WCL. The Recreation Vehicle Area is subject to high levels of vehicle use during peak holiday periods and weekends. These factors are likely to continue to limit hang-gliding in the WCL beyond the current levels of use.

Desired outcomes

- **Hang gliding does not impact on cultural and natural values and is carried out with appropriate approvals.**

Management responses

1. Hang-gliding will require the consent of the park authority. The vehicle access provisions of this plan must be adhered to (see Section 13.2). Commercial hang-gliding activity, including teaching, will require a license (see Section 14).

▶ 13.10 LAND YACHTING

Land yachting and the related activities of kite landboarding and buggying are land-based variations of sailboarding and kitesurfing. Land yachting and kite buggying typically involve the use of three-wheeled vehicles propelled by wind using a fixed sail or a kite. Kite landboarding involves the use of a kite to propel the rider of a landboard or mountainboard, which is similar in design to a skateboard, but larger with pneumatic wheels and foot-straps. The dunes and the eastern end of the beachfront are preferred locations used by riders in the WCL. This group of activities typically occurs infrequently, and in comparatively low numbers.

Issues

There is potential for land yachting, kite landboarding and buggying to directly impact on Worimi cultural values by travelling on and through Aboriginal sites and cultural material. Similar concerns exist regarding the disturbance of beach vegetation, particularly in the swale areas. There are safety concerns regarding the compatibility of land yachting and related activities with other activities and visitor use, especially during peak periods. These issues combine to limit the capacity of the WCL to provide for land yachting and related activities.

Desired outcomes

- **Land yachting, kite landboarding and buggying does not impact on cultural and natural values and is carried out with appropriate approvals.**

Management responses

1. Land yachting, kite landboarding and buggying will require the consent of the park authority and may be permitted on the beachfront between the Sygna and the Gan Gan Road Access frontal dune crossing, and in the Recreation Vehicle Area. Conditions regarding the timing and specific location of the activity may apply.

▶ 13.11 OTHER ACTIVITIES

The permissibility of other unforeseen or new activities not described in this plan will depend on the intent and priorities of this plan, the NPW Act and Regulation, and be guided by NPWS policy. For example, traditional geocaching that involves the burial of items will not be permitted in the WCL due to concerns about Worimi cultural site protection, erosion and vegetation protection. The appropriateness of other recreational activities may require consideration of issues such as interaction with other visitors, as well as the protection of cultural and natural values. In those cases where an activity not specifically addressed in this plan is deemed permissible, it will require consent from the park authority.

Issues

As noted previously in this plan, the WCL does not have an endless capacity to provide for the range of recreational and other activities that people may seek to participate in. The WCL is already subject to high volumes of visitors and the provision of sustainable opportunities for camping and vehicle access will require considerable resources. The protection of cultural and natural values, and visitor safety are key management considerations, and other unforeseen or new activities must be appropriate to the WCL.

Desired outcomes

- **Other, unforeseen or new recreational activities that arise are assessed for their permissibility and appropriateness.**

Management responses

1. Recreational activities not specifically addressed in this plan may be approved by consent, subject to assessment of the activity against this plan and the priority to ensure the protection of Worimi cultural values, the NPW Act and Regulation, and NPWS policies where applicable.

14. COMMERCIAL ACTIVITIES

Commercial activities at the WCL have many potential benefits. They can increase visitor opportunities to participate in cultural and nature-based activities, and for many visitors commercial operators provide the only practical means to access and experience the WCL. Commercial activities also provide an opportunity to promote the important cultural and natural values of the area, and can make a positive contribution to achieving sustainable visitor access.

The WCL is a significant tourism destination and a major drawcard to the region (Rand & Simpson 2010). The majority of commercial passengers to the WCL combine their visit with other commercial tourism ventures and attractions in the Port Stephens area.

Commercial tourism prior to the creation of the Worimi Conservation Lands

Commercial tourism was established at Stockton Bight prior to the creation of the WCL. Port Stephens Council licensed operators on an annual basis, and the licences covered a number of parcels of Crown land along Stockton Bight. Cadastral boundaries were not marked and commercial operations routinely occurred beyond the licensed area. A majority of the commercial tourism activity was concentrated on the adjacent privately owned high dunes closest to the Gan Gan Road entrance, Tin City and the Sygna shipwreck. Passengers boarded and disembarked commercial tours from the Birubi Point Crown Reserve.

A moratorium on new commercial licences was implemented by Port Stephens Council whilst the land claims and the Lease negotiations to establish the WCL were being resolved. In addition, advice was commissioned by NPWS regarding the management of commercial tourism, which highlighted the benefits of having a single licensing system apply across the different tenures (MLCS Corporate 2005, 2006). Following the establishment of the WCL, the NPWS on behalf of the Board of Management negotiated an agreement with the LALC under section 146 of the NPW Act to provide for a single commercial licensing system for the WCL and the adjacent lands owned privately by the LALC. Map 4 shows the land covered by the agreement. The agreement came into effect on 1 January 2011. Under the agreement the NPWS is responsible for licensing and regulating commercial operations on the land covered by the agreement.

Existing commercial tourism

The established pattern of commercial use has continued since the creation of the WCL, and the Board of Management endorsed the continuation of the moratorium on issuing new commercial licences pending the development of this plan.

Over 110,000 people visit the WCL each year with commercial tour operators. Approximately 90 per cent of all commercial passengers visit the dunes on the land subject to the section 146 agreement, with sandboarding the main activity. A variety of four-wheel drive and tag-along tours also take place throughout the beach and dune areas of the WCL. The higher dunes, the *Sygna* and Tin City are key destinations. Horse riding tours also operate at the north-east end of the WCL and quad biking tours operate in the Recreation Vehicle Area. A number of operators provide four-wheel drive training, and one operator is licensed to provide vehicle recovery and towing services.

The majority of commercial tourism activity continues to be linked to the Birubi Point Crown Reserve. With the exception of the quad bike tours, the lower carpark within the Crown Reserve and below the headland is used as the primary boarding point for almost all commercial passengers. This location also has the convenience of publicly available facilities at the Birubi Surf Life Saving Club, including public toilets.

Worimi community development

The Board of Management has prepared a community development plan (Williams & Umwelt 2011) which identifies employment and economic opportunities as a key theme. Commercial activities are a potential source of employment and economic opportunities for the Worimi community.

Issues

Awareness, interpretation and protection of Worimi cultural values

Existing commercial operations provide limited information about Worimi cultural values as part of their tours but operators have expressed a willingness to incorporate information about the values into their operations. The Board is preparing Worimi cultural awareness information that will provide the basis for cultural awareness training for licensed commercial operators.

The protection of the important Aboriginal cultural values of the Birubi Point Crown Reserve and Birubi Point Aboriginal Place is a long-standing priority for the Worimi community (see Section 5). The concentration of commercial activity at the north-eastern end of the WCL is contributing to congestion in the Birubi Point Crown Reserve, and increasing pressure on public facilities at Birubi Surf Life Saving Club. The reliance on the lower carpark in the Crown Reserve as the boarding point for commercial passengers concentrates vehicle activity in this area (see Map 1). The Board of Management and Port Stephens Council have expressed interest in seeing an alternative location developed as a hub from which commercial operations can continue to operate.

The high volume and concentration of commercial traffic on the access points from the WCL to the Birubi Point Crown Reserve and the section 146 lands near the Gan Gan Road entrance have contributed to erosion, which is also contributing to the area being subject to longer periods of water inundation following rainfall events.

New commercial opportunities

There is ongoing interest from the private sector in developing new or expanding existing commercial operations on WCL, including interest in operations based out of Newcastle as well as Port Stephens. Some of the proposed activities have not been compatible with the protection of the cultural and natural values of the WCL.

There are concerns about the capacity of the WCL to sustain an increase in commercial operations, given the existing high levels of non-commercial visitation. There is a strong preference for any new or additional commercial operations to:

- provide different experiences and opportunities to those already available
- provide enhanced opportunities for passive recreation
- improve visitor understanding and awareness of the cultural and natural values
- contribute to employment, training and economic outcomes for Worimi People and Worimi LALC members.

Desired outcomes

- Viable commercial tourism and recreation opportunities that acknowledge Worimi country, Worimi cultural values of the WCL, and provide sustainable culture and nature based experiences.
- Commercial tourism and recreation provides opportunities for sustainable access, and contribute to the protection of WCL values.
- No unlicensed commercial activity is conducted on WCL.

Management responses

1. Commercial operations will be permitted to continue, and may require controlled access to areas not available to other vehicle-based visitors, subject to licence conditions. This may include routes to ensure access to lands under section 146 agreements.
2. Prepare a commercial tourism strategy for the WCL. If capacity for new commercial operations is identified, priority will be given to:
 - Worimi culturally based operations
 - provision of enhanced opportunities for passive recreation
 - operations with a focus on improved visitor understanding and awareness of the WCL's cultural and natural values
 - operations that provide direct employment, training and economic outcomes for Worimi People and Worimi LALC members.
3. Maintain a licensing system for all permissible commercial activities. All operators must act in accordance with their licence and conditions. This system will form part of a commercial tourism strategy for the WCL, and will be regulated to ensure compliance.
4. All commercial operators and their staff will be required to complete cultural awareness training approved by the Board. All Worimi cultural content in any commercial tourism on the WCL must be approved by the Board of Management.
5. Work with the Port Stephens Council, the Worimi LALC, and other government agencies to establish an alternative commercial operations hub near the Anna Bay entrance to the WCL to replace the current reliance on the Birubi Point Crown Reserve.
6. Access to Birubi Point Crown Reserve and the section 146 lands from the WCL may only be used by commercial tourism operators in accordance with their licence conditions.
7. An all-weather, four-wheel drive track will be formed to allow licensed commercial access from Gan Gan Road Access track into the neighbouring section 146 lands, subject to agreement by the Worimi LALC.

15. COMMERCIAL FILMING

The WCL is one of the most sought after and active film locations in NSW (A Hubber 2011, pers. comm.). In 2009–10 and 2010–11 there were 18 and 36 (respectively) commercial films or photographic shoots approved for the WCL. The majority of these activities also involved use of neighbouring private land, known as ‘the tongue’, which requires approval from the Worimi LALC.

Under the NPW Regulation, consent is required to carry out commercial filming and photography in parks. Some filming activities may also require approval under the NPW Act. Commercial filming on the WCL requires the consent from NPWS on behalf of the Board of Management.

Screen Hunter Central Coast was established to advocate for and facilitate commercial filming and photography in the Hunter – Central Coast region. It currently provides a single point of contact for commercial filming applications on the WCL and neighbouring Worimi LALC lands. Screen Hunter Central Coast liaises with NPWS regarding the assessment of applications, any conditions that may be required, and the issuing of consents for commercial filming and photography on WCL. Depending on the nature and scale of the filming activity approved, NPWS may be required to supervise the activity.

Issues

The location of the WCL boundary and neighbouring land tenures are generally not well understood. Film crews who have successfully applied to film off-park on neighbouring lands often seek approval to also film in the WCL once on location. Such requests, often with as little as a few hours notice, can be difficult to assess and process.

There are regular requests to film activities that are inappropriate and otherwise not permitted in the WCL. Such requests commonly involve inappropriate driving, which is an ongoing visitor management and safety issue in the WCL.

Desired outcomes

- **Providing continued opportunities for appropriate commercial filming and photography whilst protecting the cultural and natural values of the WCL.**

Management responses

1. Work with Screen Hunter Central Coast, the Hunter Water Corporation and the Worimi LALC to implement a coordinated approach to the assessment, approval and supervision of commercial filming and photography.
2. Commercial filming and photography that involves activities that have an unacceptable impact on WCL values, that are not permissible under the NPW Act, or that promote dangerous driving or other illegal or unauthorised activities will not be approved.

16. GROUP ACTIVITIES AND EVENTS

A variety of non-commercial group activities are conducted in the WCL, including four-wheel drive club touring and training days, fishing club excursions, horse riding, all-terrain vehicle riding in the Recreation Vehicle Area, hang-gliding and land yachting.

The WCL has also been the venue for a diverse range of events. These include orienteering events in the forested areas of the WCL, fishing competitions such as the annual Tin City Classic, beach walking charity fund raising events, the annual Stockton Beach clean-up day, and the 'Celebration on the Sand' ceremony to mark the creation of the WCL.

Group activities and events can provide opportunities for people who would not normally visit to have a positive experience in the WCL.

The capacity for the WCL to safely accommodate a group activity or event will depend on the nature, location and timing of the activity, and the number of participants.

Issues

The large volume of visitors during peak periods may reduce the capacity of the WCL to accommodate some group activities and events during these times. Groups may also create or worsen congestion at the entrances.

There is a history of party groups visiting the WCL overnight. Party groups often disturb other visitors and leave rubbish and broken glass behind.

Desired outcomes

- The WCL continues to provide opportunities for Worimi cultural and other community based events that promote Worimi cultural values and contribute to the well-being of the broader community.
- Social, cultural and environmental impacts from group activities and events are minimised.

Management responses

1. Activities involving 12 or more vehicles, 10 or more horses, or 40 or more people will require consent from the park authority and may be limited in time or place.
2. Events — including community-based, not-for-profit and charity events — may be held throughout the WCL subject to environmental and other appropriate assessment. Any such event will require consent from the park authority.

17. MANAGEMENT OPERATIONS

In order to achieve protection of the values of the WCL, to provide opportunities for visitors and to facilitate management operations it is important to build and maintain appropriate infrastructure.

A network of management trails (and associated gates) in the WCL is maintained and is regularly used for fire management and other operational activities (see Map 3). Vehicle use of management trails is only available for essential park management, emergency response, other authorised activities, or approved Worimi cultural activities.

Staff are regularly stationed at the entrances to provide advice, record visitor data and ensure compliance with vehicle permits. A shelter structure has been installed at the Gan Gan Road entrance to facilitate staff undertaking these duties. A similar shelter structure is planned for the Lavis Lane entrance.

Issues

Staff conduct vehicle-based patrols in the WCL. Access to the swale and dune areas for management operations requires care to ensure the protection of Aboriginal cultural sites and beach vegetation.

Existing NPWS management facilities have reached their capacity to accommodate the staff and equipment required to manage the WCL. Despite ongoing investigation by NPWS, a viable off-park solution to this issue has not been found, and consideration has been given to constructing a management facility on the WCL. This would have practical advantages in terms of work efficiency, and also enhance the management presence on the WCL.

The management trail network south-west of Boyces Trail is currently inadequate for management purposes. A new section of management trail is needed to provide a link between Boyces and Tank trails in order to provide safe and practical access through steep terrain with sandy soils.

Unauthorised access, typically by trail bikes and other vehicles, to the management trail network has and continues to occur.

Desired outcomes

- **Management operations have minimal impact and facilitate the conservation of the WCL's values.**
- **Management facilities adequately serve management needs and have minimal impact on the natural and cultural values of the WCL.**

Management responses

1. Gate and/or signpost management trails to restrict unauthorised access as necessary.
2. Maintain the management trail network as shown on Map 3.
3. Subject to environmental assessment, construct a new section of management trail to link Boyces and Tank trails.
4. Construct a shelter for staff at the Lavis Lane entrance.
5. Subject to agreement by the Board, investigate and identify appropriate locations in the WCL for the possible construction of a works depot/park management facility. Appropriate locations will have minimal impact and be located close to the park boundary. The construction of any future facilities will be subject to environmental assessment.

18. OTHER USES

▶ 18.1 TIN CITY

There has been no formal permission granted to the hut owners by any government department or public authority for the lawful occupation of the land. Tin City is acknowledged in the WCL Lease Agreement. A licence is required under the NPW Act in order to allow the occupation and use of the land on which the huts are located.

Public awareness of Tin City beyond the recreational fishers has evolved through its promotion and exposure by the local tourism industry. However, there are mixed views amongst the Worimi Aboriginal and Traditional Owners regarding future long-term occupation of the huts. The history of dispossession, and the level of control exercised over the lives of many Aboriginal people and communities by successive governments, is something experienced by many Worimi People still alive today as well as by family members who have passed away. For many of these people it is inconceivable that government authorities would have allowed any Aboriginal people to establish something akin to Tin City, and that any such attempt by Aboriginal people would have met with immediate eviction.

Issues

The owner-occupiers of the huts are responsible for the huts. The dynamic nature of the beach and swale area of the WCL means that Tin City is affected by sand drift. Depending on weather conditions, the occupants need to protect the huts from erosion or inundation from windblown sand.

The historic heritage value of the huts is addressed in Section 6.

Desired outcomes

- The occupation and use of Tin City is licensed in accordance with the Lease Agreement.

Management responses

1. Establish a licence to use and occupy the hut sites at Tin City. The licence may need to address issues outside of the broader framework for visitor management set out in this plan. The licence must prohibit the construction of any new huts, the expansion or relocation of any hut, and permanent residency, and address:
 - use of the huts for casual recreation in accordance with this plan by the respective hut owner/occupiers
 - health and safety standards
 - maintenance of structures
 - protection of cultural and natural values.

▶ 18.2 ENCROACHMENTS

An encroachment is an unauthorised extension of a property boundary onto land owned by a neighbour. Encroachments typically occur in the form of structures or improvements such as sheds, fences, lawns and gardens which have extended from adjacent lands onto lands reserved under the NPW Act.

There are a number of small encroachments into the WCL. These are typically associated with neighbouring residential properties and involve the storage of miscellaneous items just within the WCL. There are a number of sand extraction operations adjoining the WCL. These areas are often dynamic with windblown sand regularly creating changes in landform. In these conditions the boundary is difficult to permanently demarcate, and often requires survey to accurately determine. In these circumstances there is a higher potential for encroachments to occur.

All encroachments should be identified and addressed. In a majority of cases encroachments should be removed and rehabilitated as necessary.

Issues

Use of the WCL by neighbouring residents to store miscellaneous items is not permitted, and when located in Asset Protection Zones has the potential to hinder firefighting and other management operations. In some instances a survey may be required to accurately define the boundary.

Desired outcomes

- All encroachments are managed in accordance with relevant policies and no new encroachments occur.

Management responses

1. Document and resolve all encroachments.
2. Monitor the WCL boundary and address any new encroachments as necessary.

▶ 18.3 INHOLDINGS

Inholdings are parcels of land completely or partially surrounded by lands reserved under the NPW Act. Access through a park is often required to gain entry to and/or from inholdings for a variety of purposes.

Quarries

There are two active quarries adjoining the north-east section of the WCL. These quarries operate under permissive occupancies for sand extraction that pre-date the WCL. Their existing interests include access through the WCL from Nelson Bay Road.

Existing management trails are used to access the quarries. Trucks enter on the H-block Trail and then follow Quarry Trail to access the western quarry (see Map 4). Access to the eastern quarry is from Egg Trail, along the transmission line easement and onto Metro Trail.

Neighbouring land owned by Worimi LALC

The Worimi LALC privately owns three parcels of land which are accessed through the WCL. These are:

- land adjoining the north-eastern end of the WCL near the Gan Gan Road Access
- an inholding west of the quarries that adjoin the north-eastern section of the WCL
- land adjoining the Lavis Lane Access.

The Worimi LALC has a licensed access from the Gan Gan Road entrance to its privately owned block adjoining the north-east section of the WCL (see Map 4). This licence pre-dates the creation of the WCL.

The other Worimi LALC land west of the quarries is an inholding with no legal access. Whilst this land is currently subject to the section 146 agreement with NPWS (see Section 14 and Map 4), this agreement does not place any access restrictions on the Worimi LALC. The land is mobile sand dune and accessible by four-wheel drive only. Access through the WCL via the Gan Gan Road entrance may be the only practical means of access.

The Worimi LALC also access land adjoining the WCL from the Lavis Lane entrance. Such access is typically associated with a Worimi LALC owned and operated commercial tourism venture, and other cultural education activities.

Issues

The quarries have been points of illegal entry into the WCL for unauthorised and unregistered vehicles. Whilst management of accesses through the WCL to the quarries has been improved with gates installed on the management trails, use of these accesses by unregistered and unauthorised vehicles continues to occur.

The management trails used to access the eastern quarry differ from the access identified in the permissive occupancy. Any change, variation, renewal or transfer of any access provision that is part of an existing interest at the time the WCL was created may trigger the requirement to obtain a licence to continue to access the inholding.

Protection of Worimi cultural sites, beach vegetation and the frontal dune are issues that need to be addressed in relation to any vehicle access to the Worimi LALC inholding.

Desired outcomes

- **All accesses to inholdings are licensed, and impacts on cultural and natural values are minimised.**

Management responses

1. Liaise with the holders of the permissive occupancies and Department of Lands as necessary to improve management of the quarry accesses through the WCL and to licence the current access route to the eastern quarry.
2. Establish licenses with the Worimi LALC to cover access across the WCL to Worimi LALC owned land, including the Worimi LALC's inholding and land neighbouring the WCL at the Lavis Lane entrance.

▶ 18.4 TRANSMISSION LINES

In accordance with the *Electricity Supply Act 1995* a network operator can operate and use the existing powerlines whether or not there is a formal easement in place.

Ausgrid has powerlines traversing forested sections of the WCL at Fern Bay and between Salt Ash and Anna Bay. These transmission lines are covered by formal easements that pre-date the WCL. The easements have been cleared, and have a significant visual and environmental impact. At Fern Bay the transmission lines are located adjacent to the western boundary of the WCL. The remaining transmission lines fragment the forested sections of the WCL along Easement Trail at Salt Ash from Nelson Bay Road, across Boyces Trail to the WCL boundary, and from Nelson Bay Road to the eastern boundary of the WCL at Anna Bay.

Ausgrid must comply with the NPW Act and Regulation when carrying out any maintenance or replacement work and will require consent for certain works.

The easements are occasionally used for access for management purposes by NPWS.

Issues

The threatened sand and rough doubletailed orchids occur along the easements and maintenance needs to be planned and implemented to minimise risk to these species (see Section 8).

There has been some progress in controlling unauthorised access with fencing and gates having been installed, but unauthorised and unregistered vehicle and trail bike use of the easement is an ongoing issue.

Desired outcomes

- **Transmission lines are managed to minimise impacts on WCL values.**

Management responses

1. Liaise with Ausgrid to address unauthorised access, and to minimise impacts on cultural and natural values of the WCL from access and maintenance of their easements.

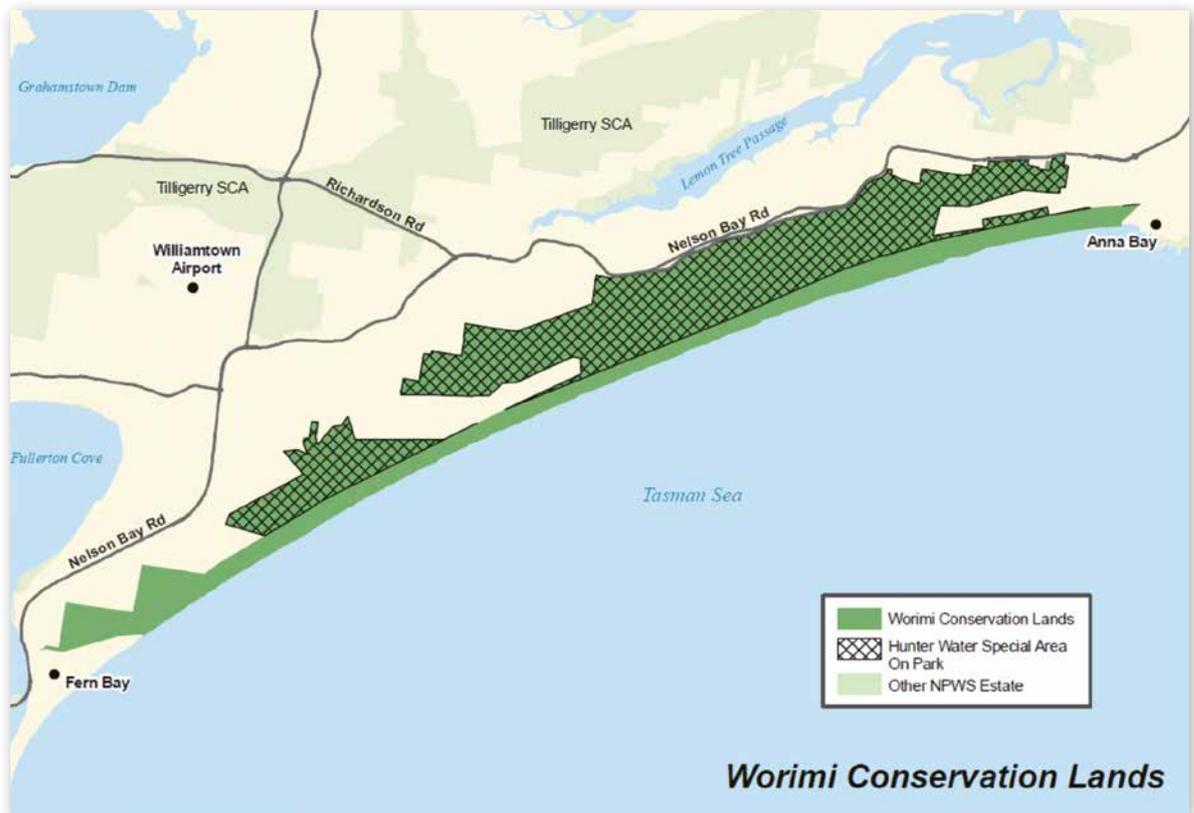
▶ 18.5 HUNTER WATER CORPORATION ACTIVITIES

The WCL includes a majority of the former Crown Water Reserve 61307 and a Special Area declared under the Hunter Water Act. The North Stockton Special Area covers a majority of the WCL from near the *Sydney* shipwreck to Anna Bay (see Figure 13). Hunter Water Corporation also has an easement in the central portion of the WCL within the Special Area that pre-dates the WCL.

The NPW Act provides for the rights of Hunter Water Corporation to exercise its functions under the Hunter Water Act. These functions include the extraction, treatment, reticulation or replenishment of groundwater as authorised or permitted in accordance with the requirements of the Environmental Planning and Assessment Act.

The Special Area protects the North Stockton aquifer which is considered an emergency drought water supply. Hunter Water Corporation infrastructure in the Special Area includes a number of test bores, and a network of piezometers to monitor groundwater in the aquifer. Monitoring is currently conducted on a monthly basis by Hunter Water Corporation staff or its contractors and requires accessing areas not directly accessible via the management trail network.

FIGURE 13: NORTH STOCKTON SPECIAL AREA IN THE WCL



Desired outcomes

- Activities associated with the Special Area authorised under the Hunter Water Act are managed to minimise impacts on WCL values.

Management responses

1. The protection of groundwater quality will be considered in the planning and implementation of WCL management activities, and any activities within the WCL that require the approval of NPWS or the Park Authority, in consultation with Hunter Water Corporation.
2. A lease, licence, easement or right of way shall not be granted under the NPW Act for land within the WCL that is also part of the Special Area without the concurrence of the Hunter Water Corporation.
3. Liaise with Hunter Water Corporation to minimise impacts from its activities associated with investigative, monitoring and any extractive activities in the Special Area.

▶ 18.6 FISHING ACTIVITIES

Historically, recreational fishing was one of the main reasons people visited the area (see Section 6) and continues to be one of the most popular recreational activities in the WCL (see Section 13).

All fishing activities in NSW waters are regulated under the Fisheries Management Act. Both commercial and recreational fishing must be in accordance with licence conditions specified by the Department of Primary Industries and the Fisheries Management Act. Gazettal of the WCL to the mean low water mark does not change this authority and fishing operations continue to be managed by the Department of Primary Industries. This includes land-based activities (e.g. hauling of nets), whether or not the fisher is situated below or above the mean high water mark.

Commercial fishers must be licensed or obtain a permit under the NPW Regulation for use of WCL facilities, including access trails. Commercial fishers access the WCL year round to gather pipis and beachworms, and seasonally to beach haul. Commercial fishing activity in the WCL is reliant on four-wheel drive access.

Commercial fishers are required to use the designated vehicle accesses (see Section 13.2) to access the WCL. A Beach Vehicle Permit is required for all vehicles used by commercial fishers to access the WCL.

Issues

Many of the cultural and natural value protection issues associated with vehicle access are applicable to commercial fishing, with protection of the frontal dune and beach vegetation a priority in this regard. The unpredictability of storm and extreme weather events that may require temporary park closures to vehicles may affect commercial fisher access.

The beach is the most visited, and usually the busiest part of the WCL in terms of people and vehicles. There is some concern about visitors driving on the beach during commercial fishing activities, and consideration to ensure the safety of visitors and commercial fishers is needed.

The implementation of a licensing or similar system for commercial fishers to access the WCL would assist in providing an agreed framework for managing these issues, and minimising impacts from continued commercial fisher access.

Desired outcomes

- Fishing in the intertidal area of the WCL is done in accordance with the provisions of the Fisheries Management Act.
- Fishing in the WCL is managed to minimise impacts on park values and the safety of visitors.

Management responses

1. Work cooperatively with the Department of Primary Industries to ensure that activities licensed under the Fisheries Management Act have minimal impact on park values.
2. Require commercial fishers to have a licence to access the WCL.

▶ 18.7 HARNESS RACE HORSE TRAINING

The north-eastern end of the park is used for professionally training harness race horses. This commercial activity pre-dates the creation of the WCL. The flatness of the beach in this area, and its width at low tides makes it a favoured training location. The horses are floated to the WCL via the Gan Gan Road entrance, and park near the boundary with the Crown Reserve adjacent to the lower carpark at Birubi Point (see Map 1).

Issues

There are safety concerns regarding the compatibility of harness race horse training and visitor use, especially during peak periods. The speed that harness race horses can reach when being trained, and the use of the beachfront by family groups and fishers has in some cases led to conflict. The presence of horse manure, especially in areas of concentrated day use along the beachfront has been raised as an issue by visitors. Given the volume of visitor and commercial operator traffic in and around the Gan Gan Road entry, congestion and the concerns regarding horses and vehicles noted in Section 13.6 are applicable. There have been discussions between NPWS and Harness Racing NSW regarding these issues and the requirement for appropriate approvals.

There is limited capacity to provide for any expansion of harness race horse training beyond levels of use occurring at the time the WCL was created.

Desired outcomes

- **Harness race horse training does not impact on cultural, natural and recreation values, and is carried out with appropriate approvals.**

Management responses

1. Work with the Harness Racing NSW to address issues of speed, safety, parking and congestion at the Gan Gan Road entry, horse manure, and user conflict and congestion issues.
2. Require harness race horse training activities to be licensed. Licensed harness race horse training will be permitted on specified sections of the beachfront south-west from the Gan Gan Road Access frontal dune crossing to the Sygna shipwreck.

▶ 18.8 MINING AND EXPLORATION

Exploration for minerals and petroleum, as well as mining and petroleum production, are permissible uses within state conservation areas. The boundary of Worimi State Conservation Area reflects a sand mining lease that was active throughout the period of negotiation to establish the WCL. No sand mining has occurred since the WCL was created, and the mining lease has since been rescinded. Worimi State Conservation Area is currently covered by petroleum exploration licence 458.

The Department of Trade and Investment, Regional Infrastructure and Services is the lead authority for mining and petroleum activities, including mineral exploration and mine site rehabilitation. Exploration and production proposals in state conservation areas must comply with all statutory requirements, including any necessary environmental impact assessments and approvals.

Desired outcomes

- Mining and mineral exploration activities have minimal impact on natural and cultural values.

Management responses

1. Applications for mining or mineral exploration in Worimi State Conservation Area will be subject to environmental impact assessment and all necessary approvals.

19. IMPLEMENTATION TABLE

The Board acknowledge the role of the Aboriginal owners, public, user groups and relevant stakeholders in the development of this plan, and the willingness of user groups to engage in the management of the WCL. The Board are committed to working with the Aboriginal owners in the ongoing management of the WCL and the implementation of this plan. The Board also envisage ongoing engagement with stakeholders and key user groups in the implementation of this plan.

PLAN SECTION AND MANAGEMENT RESPONSES	PRIORITY
5. WORIMI CULTURAL VALUES	
1. Monitor the condition and exposure of Worimi cultural sites in the WCL, and implement site protection measures as necessary.	Ongoing/ High
2. Implement measures to protect Worimi cultural sites and values from the impacts of visitor access to the WCL (see Sections 13, 14 and 15)	Ongoing/ High
3. Develop a range of interpretive and education materials to: <ul style="list-style-type: none"> ■ improve access to information about the Worimi cultural values of the WCL ■ improve visitors' knowledge and awareness of Worimi cultural values and sites, and how to ensure their protection whilst visiting the WCL. <p>Ensure this information is provided across a range of media platforms as well as on WCL. All Worimi cultural content will be subject to approval by the Board.</p>	High
4. Continue to provide opportunities for the sharing and strengthening of cultural knowledge with visitors through face-to-face contact with Aboriginal people – staff, community members, contractors and businesses – on Country.	High
5. Expand the use of Gathang language in WCL management, particularly in signage, interpretation, and educational materials. Move towards 'dual naming' of all key sites and locations to encourage a broader understanding of the cultural significance of the landscape.	High
6. Encourage use of the WCL by school, university and other organised groups to learn about Worimi culture.	High
7. Encourage and support research into the Worimi cultural values of the WCL.	Medium
8. Support Worimi community development in accordance with the NPW Act, WCL Lease Agreement, WCL Community Development Plan, and the vision statement in Section 4 of this plan.	High
9. Develop a number of Worimi cultural activity locations in the WCL. Preference will be given to locations that: <ul style="list-style-type: none"> ■ have already been used successfully for Worimi cultural activities ■ have the support of Aboriginal owners ■ avoid threatened ecological communities, significant plants or habitat ■ provide a high degree of privacy from other visitors. <p>The development and use of any culture use site will be subject to environmental assessment, and the development of policy and protocols for ongoing use and management. Development can include low-key structures that provide necessary support for cultural use of the site.</p>	Medium

<p>10. Work with the Port Stephens Council, the Worimi Aboriginal and Traditional Owners, the Worimi LALC and community, other government agencies, the Birubi Surf Life Saving Club and the local community, to:</p> <ul style="list-style-type: none"> ■ improve awareness and protection of the Worimi cultural values of Birubi Point Aboriginal Place and Crown Reserve ■ strengthen the of Birubi Point role as a visitor gateway and information point for the adjoining WCL. 	High
11. Work with the Department of Primary Industries and researchers in efforts to ensure the long-term survival of pipi populations in the WCL.	Medium
12. Work with the Worimi owners and Department of Primary Industries to enable appropriate cultural access to a healthy and sustainable pipi population in the WCL.	High
6. HISTORIC HERITAGE VALUES	
1. Complete appropriate heritage assessment of the military structures and items in the WCL.	High
2. Retain the tank traps in situ, and where possible reinstate previously moved traps into their original position.	Ongoing/Medium
3. Ensure historic heritage is addressed as part of the visitor communications strategy (see Section 12). Interpret the historic heritage of the WCL, with a focus on the military history associated with World War II and the <i>Syigna</i> shipwreck.	High
4. Undertake essential risk management associated with historic heritage in the WCL, and ensure risk messages are incorporated into park interpretation.	High
5. Consider historic heritage issues and the heritage action statement in the development of the Tin City huts occupation licence (see also Section 18.1).	High
6. Participate in and support research to document and improve our understanding of the military history of the WCL.	Medium
7. GEOLOGY AND LANDFORM	
1. Implement measures to protect the frontal dune, swale and sand dunes from impacts in accordance with the visitors and recreation section of this plan (see Sections 8, 13 and 14).	Ongoing/ High
2. Implement a program to monitor the condition of the frontal dune. Investigate options for rehabilitation and implement as necessary in response to the outcome of monitoring programs.	Ongoing/ High
3. Encourage and support research into geomorphological processes in the WCL, the effects of visitation on these processes, and the effects of expected sea level rise associated with climate change (see Section 11) and the implications for managing the WCL.	High
4. In consultation with the relevant authorities and quarry owners and/or operators, investigate the effect of sand extraction operations on dunes directly adjoining the WCL, and act as necessary to address and minimise any impacts.	High

8. FLORA AND FAUNA

1. Implement measures to protect beach vegetation from impacts of camping, vehicles and day use in accordance with the visitors and recreation section of this plan (see Section 13).	Ongoing/ High
2. Investigate options and implement measures to protect and rehabilitate beach vegetation on the frontal dune and within designated off-beach driving areas.	Ongoing/ High
3. Liaise with Hunter Water Corporation and Ausgrid regarding maintenance of their easements to minimise impacts and support the protection of the sand and rough doubletail orchids (see Sections 17.4 and 17.5).	Ongoing/ High
4. Monitor coast groundsel in the WCL, and implement measures as necessary to protect populations from disturbance, particularly from vehicle traffic.	Ongoing/ High
5. Firewood collection, including driftwood, is not permitted in the WCL.	Ongoing
6. Monitor the occurrence and breeding success of threatened shorebirds, including little terns and pied oystercatchers, and implement measures to protect nesting birds as necessary. Such measures may include temporary closures or exclusion zones to protect nests and young birds during critical stages of the breeding cycle.	Ongoing/ High
7. Work with and support volunteer involvement in the monitoring of shorebirds.	Medium
8. Ensure the visitor communications strategy (see Section 12) addresses: <ul style="list-style-type: none"> ■ the importance and protection of spinifex and beach wetland communities; ■ use of the WCL and protection of threatened shorebirds; ■ visitor awareness of key threats to these communities and species and how visitors can help ensure their protection. 	High

9. PESTS

1. Manage pest species in accordance with the Regional Pest Management Strategy.	Ongoing
2. Develop and implement a management plan for control of bitou bush and other invasive weeds throughout the WCL.	High
3. Investigate options to control sharp rush in beach wetland communities.	Medium
4. Seek the cooperation of neighbours in implementing weed and pest control programs. Where appropriate undertake control in cooperation with the Hunter Local Land Services (incorporating the former Cumberland Livestock Health and Pest Authority and Lower Hunter-Central Rivers Catchment Management Authority), local Landcare groups, Port Stephens Council and Hunter Water Corporation.	High
5. Implement weed control measures of the Fern Bay Voluntary Planning Agreement.	Medium

10. FIRE	
1. Implement the fire management strategy for the WCL.	Ongoing/ High
2. Continue to be involved in the Lower Hunter Bush Fire Management Committee and maintain cooperative arrangements with local Rural Fire Service brigades and other fire authorities and surrounding landowners in regard to fuel management and fire suppression.	Ongoing/ High
3. Work with local Rural Fire Service brigades to raise awareness of Worimi cultural values of the WCL to help ensure fuel management and fire suppression activities do not impact on Worimi cultural values and sites.	High
4. Suppress unplanned fires in the WCL in accordance with the Reserve Fire Management Strategy.	Ongoing
5. Manage the WCL to protect biodiversity in accordance with the identified fire regimes in the fire management strategy.	Ongoing/ High
6. Monitor the ability of flora to recover between fires and review regimes, where relevant.	Ongoing
7. Rehabilitate areas disturbed by fire suppression operations as soon as practical after the fire.	High
11. CLIMATE CHANGE	
1. Continue fire, pest and weed management programs, and visitor access management to increase the WCL's ability to cope with future disturbances, including climate change.	Medium
2. Maintain awareness of predicted effects of climate change and consider implications for management.	Ongoing
12. EDUCATION AND VISITOR INFORMATION	
1. Develop and implement a visitor communications strategy for the WCL that addresses: <ul style="list-style-type: none"> ■ on and off-park communication ■ delivery of information via the vehicle permit system ■ signage and other interpretative strategies ■ cultural and natural heritage, and recreation values ■ commercial operations. 	High
2. Develop and implement an education plan to identify and deliver priority information to raise visitor awareness and understanding of Worimi cultural sites and values, threatened shorebirds, the frontal dune and other key WCL values and issues, and the rationale behind management decisions.	Ongoing

13. VISITORS AND RECREATION

<p>1. Monitor visitor access and recreation and undertake law enforcement as required to address inappropriate behaviour, unauthorised activity and other breaches of this plan, the NPW Act and Regulation. Visitor access is managed in accordance with section 12 and other relevant sections of this plan.</p>	Ongoing
<h3>13.1 CAMPING</h3>	
<p>1. Camping will be permitted only at designated sites in designated camping areas. The designated camping area or areas will be located southwest from Tin City, behind the beach and frontal dune.</p>	Ongoing
<p>2. A camping strategy will be prepared to guide the establishment of a camping area or areas. The strategy will provide for:</p> <ul style="list-style-type: none"> ■ up to a combined total of 30 designated campsites ■ adequate spacing between sites in each camping area so as to provide for separation between campers ■ the number of campers up to maximum of eight per site ■ the size of sites and number of vehicles and equipment that can be accommodated at each site ■ provision of options for group camping for more than eight people ■ designated vehicle and pedestrian access to sites ■ protection of beach vegetation and limiting erosion ■ interpretation of cultural and natural values ■ maximum length of stay ■ maintaining and managing the area and sites ■ implementing a registration and booking system, including camping fees. 	High
<p>3. Fires will be permitted only in designated fireplaces. Only clean timber sourced from outside the WCL may be used. Firewood collection within the WCL, including driftwood, is prohibited.</p>	Ongoing
<p>4. No domestic animals, including dogs, will be permitted at individual campsites or camping areas (see also Section 13.7). Facilities or sites for camping with horses will not be provided.</p>	Ongoing
<p>5. All campers must bring their own camping toilet, and all camping sewage must be disposed of in an authorised facility.</p>	Ongoing
<p>6. Construct toilet facilities at the Lavis Lane entry at or in the immediate vicinity of the carpark, and if feasible consider incorporating a camping toilet dump point.</p>	Medium
<p>7. Participate in cooperative efforts with other agencies to develop appropriate camping toilet dump points in the vicinity of WCL entrances.</p>	Medium
<p>8. Due to the dynamic dune system and extent of sand drift, camping areas or sites may be temporary closed where use of or access to the sites will cause unacceptable impacts.</p>	Ongoing

13.2 VEHICLE ACCESS

<p>1. Public vehicle access will be permitted at the three designated vehicle accesses as shown on Map 3. All vehicles must have a Beach Vehicle Permit. Driving is permitted on the beachfront between the Sygna and the Gan Gan Road Access frontal dune crossing. Driving behind the beachfront is permitted:</p> <ul style="list-style-type: none"> ■ along defined routes to and from WCL designated vehicle accesses ■ in the Recreation Vehicle Area (see Section 13.4) ■ along defined routes (including across the frontal dune) to and from Tin City and designated camping areas. <p>Driving outside these areas, or on Aboriginal cultural sites, beach vegetation, the frontal dune (except on designated frontal dune crossings) and on management trails is not permitted. Unregistered vehicles may not be operated or transported into the WCL.</p>	Ongoing
<p>2. Vehicle access across the frontal dune will be defined, and where necessary formalised to protect the frontal dune.</p>	High
<p>3. Monitor Aboriginal cultural sites and their exposure in those areas of the WCL where vehicles are permitted, and implement measures to protect sites from impacts of vehicles.</p>	Ongoing/ High
<p>4. Work with Port Stephens Council in an effort to ensure vehicle access between the WCL and the Birubi Point Crown Reserve is managed to ensure the protection of Worimi cultural values and safety.</p>	High
<p>5. Continue to implement the beach vehicle permit system, and review the fee structure periodically in accordance with the Lease Agreement. Ensure the visitor communications strategy and associated education plan address the vehicle permit system.</p>	Ongoing
<p>6. Vehicle access to the WCL or identified sections of the WCL may be temporarily closed due to weather conditions that would lead to safety concerns or increased impacts from vehicle use. Examples include storm events that render sections of the beachfront impassable.</p>	Ongoing
<p>7. Monitor numbers of vehicles in the WCL, and investigate the carrying capacity of the beach front and Recreation Vehicle Area for vehicle-based access. If necessary, implement techniques to manage the number of vehicles to be within capacity during peak periods.</p>	Ongoing/ Medium
<p>8. Work cooperatively with NSW Police and adjoining land owners and managers to address illegal vehicle access and inappropriate driving.</p>	Ongoing
<h2>13.3 RECREATIONAL FISHING</h2>	
<p>1. Recreational fishing opportunities will be included in the visitor communications strategy, and responsible recreational fishing will be addressed in the visitor education plan.</p>	High
<p>2. Work cooperatively with the Department of Primary Industries to ensure that recreational fishing activities licensed under the Fisheries Management Act have minimal impact on reserve values.</p>	Ongoing

13.4 RECREATION VEHICLE AREA

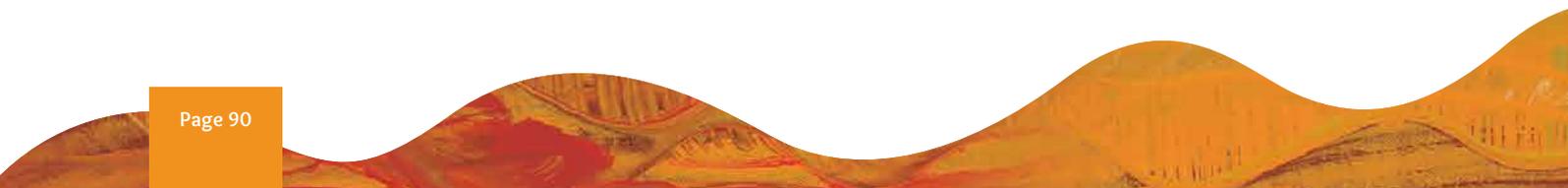
<p>1. Appropriately conditionally registered vehicles may access the Recreation Vehicle Area as shown on Map 3. An operations plan will be developed for the management of the Recreation Vehicle Area. The Board will work with the Roads and Maritime Services, NSW Police and user groups to address:</p> <ul style="list-style-type: none"> ■ visitor safety ■ protection of Worimi cultural sites ■ protection of beach vegetation. <p>Monitor compliance with the Recreational Vehicle Permit and Recreation Vehicle Area, and if necessary review the future operation of the Recreation Vehicle Area.</p>	Ongoing/ High
--	---------------

13.5 WALKING

<p>1. Vehicles will not be allowed on the beach between the Birubi Point Crown Reserve and the frontal dune crossing for vehicles entering via the Gan Gan Road Access.</p>	Ongoing
<p>2. Develop a walking track strategy to address awareness and promotion of existing opportunities, linkages to other coastal walking opportunities (such as in Tomaree National Park), new walking routes/linkages in the WCL, and improving pedestrian safety at the three park entrances and the Recreation Vehicle Area.</p>	Medium
<p>3. Walking opportunities will be included in the visitor communications strategy, and walking opportunities will be interpreted and promoted.</p>	High

13.6 HORSE RIDING

<p>1. Horse riding is permitted on the beachfront, and in those areas behind the beachfront where driving is also permitted. Riders must avoid beach vegetation, cultural material and sites. Horse riding is not permitted on management trails or in the forested areas of the WCL.</p>	Ongoing
<p>2. Horse riding activities involving 10 or more horses, including those that are part of an organised non-commercial event, require written consent (see Section 16).</p>	Ongoing
<p>3. Horse riders may access the WCL via designated vehicle accesses only. Alternative access for horse riding may be developed to address safety concerns associated with the sharing of vehicle access, if required.</p>	Ongoing/Medium
<p>4. Work with horse riders to develop and implement a code of conduct and if required a permit system for horse riding in the WCL.</p>	High
<p>5. Ensure the visitor communications strategy addresses horse riding, with consideration given to limits on capacity, safe entry to the WCL, the code of conduct and sustainability issues.</p>	High



13.7 DOG WALKING	
1. Dogs must be kept on a leash at all times and must be kept under control at all times. Dog owners must clean up and remove their dogs' faeces from the park.	Ongoing
2. Dogs will be allowed only on Gan Gan Road Access and a 3-kilometre section of beachfront south from the boundary with Birubi Point Crown Reserve at the north-eastern end of the WCL as shown on Map 3.	Ongoing
3. Liaise with Port Stephens Council to achieve a coordinated approach to visitor communication and signage informing of dog walking in the WCL and Birubi Point Crown Reserve.	Ongoing
4. Ensure dog walking opportunities and the prohibition on dogs in other areas of the WCL are addressed in the visitor communications strategy.	Ongoing
13.8 ORIENTEERING	
1. All orienteering events will be assessed on an individual basis and require written consent. Placement of markers, or other fixtures, must not disturb the soil, substrate, vegetation, wildlife or interfere with WCL or other infrastructure.	Ongoing
13.9 HANG GLIDING	
1. Hang-gliding will require the consent of the park authority. The vehicle access provisions of this plan must be adhered to (see Section 13.2). Commercial hang-gliding activity, including teaching, will require a license (see Section 14).	Ongoing
13.10 LAND YACHTING	
1. Land yachting, kite landboarding and buggying will require the consent of the park authority and may be permitted on the beachfront between the Sygna and the Gan Gan Road Access frontal dune crossing, and in the Recreation Vehicle Area. Conditions regarding the timing and specific location of the activity may apply.	Ongoing
13.11 OTHER ACTIVITIES	
1. Recreational activities not specifically addressed in this plan may be approved by consent, subject to assessment of the activity against this plan and the priority to ensure the protection of Worimi cultural values, the NPW Act and Regulation, and NPWS policies where applicable.	Ongoing

14. COMMERCIAL ACTIVITIES	
1. Commercial operations will be permitted to continue, and may require controlled access to areas not available to other vehicle-based visitors, subject to licence conditions. This may include routes to ensure access to lands under section 146 agreements.	Ongoing
2. Prepare a commercial tourism strategy for the WCL. If capacity for new commercial operations is identified, priority will be given to: <ul style="list-style-type: none"> ■ Worimi culturally based operations ■ provision of enhanced opportunities for passive recreation ■ operations with a focus on improved visitor understanding and awareness of the WCL's cultural and natural values ■ operations that provide direct employment, training and economic outcomes for Worimi People and Worimi LALC members. 	Medium
3. Maintain a licensing system for all permissible commercial activities. All operators must act in accordance with their licence and conditions. This system will form part of a commercial tourism strategy for the WCL, and will be regulated to ensure compliance.	Ongoing
4. All commercial operators and their staff will be required to complete cultural awareness training approved by the Board. All Worimi cultural content in any commercial tourism on the WCL must be approved by the Board of Management.	High
5. Work with the Port Stephens Council, the Worimi LALC, and other government agencies to establish an alternative commercial operations hub near the Anna Bay entrance to the WCL to replace the current reliance on the Birubi Point Crown Reserve.	High
6. Access to Birubi Point Crown Reserve and the section 146 lands from the WCL may only be used by commercial tourism operators in accordance with their licence conditions.	Ongoing
7. An all-weather, four-wheel drive track will be formed to allow licensed commercial access from Gan Gan Road Access track into the neighbouring section 146 lands, subject to agreement by the Worimi LALC.	Medium
15. COMMERCIAL FILMING	
1. Work with Screen Hunter Central Coast, the Hunter Water Corporation and the Worimi LALC to implement a coordinated approach to the assessment, approval and supervision of commercial filming and photography.	Ongoing/High
2. Commercial filming and photography that involves activities that have an unacceptable impact on WCL values, that are not permissible under the NPW Act, or that promote dangerous driving or other illegal or unauthorised activities will not be approved.	Ongoing
16. GROUP ACTIVITIES AND EVENTS	
1. Activities involving 12 or more vehicles, 10 or more horses, or 40 or more people will require consent from the park authority and may be limited in time or place.	Ongoing
2. Events – including community-based, not-for-profit and charity events – may be held throughout the WCL subject to environmental and other appropriate assessment. Any such event will require consent from the park authority.	Ongoing

17. MANAGEMENT OPERATIONS	
1. Gate and/or signpost management trails to restrict unauthorised access as necessary.	High
2. Maintain the management trail network as shown on Map 3.	Ongoing
3. Subject to environmental assessment, construct a new section of management trail to link Boyces and Tank trails.	High
4. Construct a shelter for staff at the Lavis Lane entrance.	High
5. Subject to agreement by the Board, investigate and identify appropriate locations in the WCL for the construction of a works depot/park management facility. Appropriate locations will have minimal impact and be located close to the park boundary. The construction of any future facilities will be subject to environmental assessment.	Medium
18. OTHER USES	
18.1 TIN CITY	
1. Establish a licence to use and occupy the hut sites at Tin City. The licence may need to address issues outside of the broader framework for visitor management set out in this plan. The licence must prohibit the construction of any new huts, the expansion or relocation of any hut, and permanent residency, and address: <ul style="list-style-type: none"> ■ use of the huts for casual recreation in accordance with this plan by the respective hut owner-occupiers ■ health and safety standards ■ maintenance of structures ■ protection of cultural and natural values. 	High
18.2 ENCROACHMENTS	
1. Document and resolve all encroachments.	Medium
2. Monitor the WCL boundary and address any new encroachments as necessary.	Ongoing
18.3 INHOLDINGS	
1. Liaise with the holders of the permissive occupancies and Department of Lands as necessary to improve management of the quarry accesses through the WCL and to licence the current access route to the eastern quarry.	High
2. Establish licenses with the Worimi LALC to cover access across the WCL to Worimi LALC owned land, including the Worimi LALC's inholding and land neighbouring the WCL at the Lavis Lane entrance.	Medium
18.4 TRANSMISSION LINES	
1. Liaise with Ausgrid to address unauthorised access, and to minimise impacts on cultural and natural values of the WCL from access and maintenance of their easements.	Ongoing/ High

18.5 HUNTER WATER CORPORATION ACTIVITIES	
1. The protection of groundwater quality will be considered in the planning and implementation of WCL management activities, and any activities within the WCL that require the approval of NPWS or the Park Authority, in consultation with Hunter Water Corporation.	High
2. A lease, licence, easement or right of way shall not be granted under the NPW Act for land within the WCL that is also part of the Special Area without the concurrence of the Hunter Water Corporation.	Ongoing
3. Liaise with Hunter Water Corporation to minimise impacts from its activities associated with investigative, monitoring and any extractive activities in the Special Area.	Ongoing/Medium
18.6 FISHING ACTIVITIES	
1. Work cooperatively with the Department of Primary Industries to ensure that activities licensed under the Fisheries Management Act have minimal impact on park values.	Ongoing/Medium
2. Require commercial fishers to have a licence to access the WCL.	Ongoing/Medium
18.7 HARNESS RACE HORSE TRAINING	
1. Work with the Harness Racing NSW to address issues of safety, parking and congestion at the Gan Gan Road entry, horse manure, and user conflict and congestion issues.	High
2. Require harness race horse training activities to be licensed. Licensed harness race horse training will be permitted on specified sections of the beach front southwest from the Gan Gan Road Access frontal dune crossing to the <i>Sygn</i> a shipwreck.	Ongoing/High
18.8 MINING AND EXPLORATION	
1. Applications for mining or mineral exploration in Worimi State Conservation Area will be subject to environmental impact assessment and all necessary approvals.	Ongoing

20. REFERENCES

- ADI (1995) *Site History Review, Hazard Identification and Assessment within Proposed Mineral Sand Extraction Area in Crown Reserve at Fern Bay*. Prepared by ADI Services Environmental for Umwelt Pty. Ltd.
- Andrew Neil Pty. Ltd. (2010) *Belmont Wetlands State Park: Final Plan of Management*. NSW Land and Property Management Authority.
- Anon. (1988) Unexploded ordnance site assessment – Stockton Rifle Range, Fern Bay Armour Plate Proof Range, Stockton beach Artillery Proof Range and Morna Point Air Weapons Range NSW. Unpublished.
- Banks, P. B & Bryant, J. V. (2007) ‘Four-legged friend or foe? Dog walking displaces native birds from natural areas’. *Biology Letters*. 3:611-613.
- Bartlett, M, A. (1980) *The Port Stephens Story*. Port Stephens Historical Society.
- Bell, S. & Driscoll, C. (2010) *Vegetation of the Worimi Conservation Lands Port Stephens, New South Wales: Worimi NP, Worimi SCA & Worimi RP*. Report to Dept. of Environment, Climate Change & Water Hunter Region Parks & Wildlife Group.
- Burdon Torzillo (2009) Empower. NPWS good governance for Worimi Conservation Lands Board of Management.
- Bylhouwer, T. (2011) Personal communication. Port Stephens Tourism Marketing Manager.
- Comber, J. (1990) Archaeological Survey of Proposed Sand extraction Site at Anna Bay, NSW.
- Dean-Jones, P (1990) *Newcastle Bight Aboriginal Sites Study*. Report to NSW National Parks and Wildlife Service and National Estate Grants Committee.
- Dean-Jones, P (1992) *Archaeological survey at Fern Bay*. Report to Port Stephens Council.
- DEC (2006) *NSW Threat Abatement Plan – Invasion of Native Plant Communities by Chrysanthemoides monilifera (Bitou Bush and Boneseed)*. Department of Environment and Conservation, NSW.
- DECCW (2010a) *Glenrock State Conservation Area Plan of Management*. Department of Environment, Climate Change and Water (NSW).
- DECCW (2010b) *NSW Climate Impact Profile. The impacts of climate change on the biophysical environment of New South Wales*. Department of Environment, Climate Change and Water NSW.
- DECCW (2010c) Summary of community workshop proceedings. Worimi Conservation Lands Plan of Management Community workshop held on 7th November 2010. Unpublished.
- DECCW (2010e) *Vehicle Access – General Policy*. Department of Environment, Climate Change and Water NSW.
- Defeo, O, McLachlan, A, Schoeman, DS, Schlacher, TA, Dugan, J, Jones, A, Lastra, M, Scapini, F (2009) ‘Threats to sandy beach ecosystems: A review’. *Estuarine, Coastal and Shelf Science*. 81: 1-12.
- NSW DPI & OEH (2011) *Biodiversity Priorities for Widespread Weeds*. Report prepared for the 13 Catchment Management Authorities (CMAs) by NSW Department of Primary Industries and Office of Environment & Heritage, Orange.

- DLWC (2001) *Coastal Dune Management: A Manual of Coastal Dune Management and Rehabilitation Techniques*. Coastal Unit, Department of Land and Water Conservation, Newcastle.
- Dyall, LK (1982) Aboriginal fishing stations on the Newcastle coastline, New South Wales. In Bowdler, S. (Ed) *Coastal Archaeology in Eastern Australia*. Australian National University Press, Canberra.
- Dyall, LK (2004) The Aboriginal Middens at Birubi: an account of surface collections (1964-1977) on the Aboriginal site at Birubi, near Port Stephens, New South Wales, and its subsequent excavation in 1978 and 1979. Unpublished report.
- Ecotone Ecological Consultants (2008) *Vertebrate Fauna Survey Worimi Conservation Lands*. EEC Project No. 0583CW. Prepared for NSW Department of Environment and Climate Change.
- ERM (1995) *Proposed Mining Site at Fern Bay, New South Wales: Archaeology Report*. Report to Umwelt (Australia) Pty Ltd.
- ERM (2001) *Interim final report on excavations, Fern Bay Archaeological Project 2000*. Report to NSW NPWS.
- ERM (2006a) *Stockton Bight Remaining Lands. Cultural Heritage Significance Assessment*. Prepared for the NSW National Parks and Wildlife Service.
- ERM (2006b) *Waste Material Survey at the Former Fern Bay Armour Proofing Range*. Prepared for Department of Environment and Conservation – Hunter Region.
- GHD (2011) *RAAF Base Williamtown & Salt Ash Air Weapons Range 2025 ANEF Summary Report*. Department of Defence, Australian Government.
- Hall, LD (1928) Some Aboriginal Flakes from Morna Point, N. S. Wales. *Records of the Australian Museum*.
- HLA Envirosciences Pty Ltd. (1995) *Stockton Bight Environmental Study*. Newcastle Bight Co-ordination and Liaison Committee on behalf of Port Stephens Shire Council and Newcastle City Council.
- Hubber, A (2011) Personal communication. Manager Screen Hunter Central Coast.
- Lindesay, A & Newman, M (2014) Submission from Hunter Bird Observers Club Inc. on the Worimi Conservation Lands Draft Plan of Management.
- MLCS Corporate (2005) *Business scoping study for the Stockton Bight area*. Prepared for the Department of Environment and Conservation and the Worimi Local Aboriginal Land Council.
- MLCS Corporate (2006) *Strategic economic development plan for the Stockton Bight area*. Prepared for the Department of Environment and Conservation and the Worimi Local Aboriginal Land Council.
- Moss, D & McPhee, DP (2006) 'The impacts of recreational Four-Wheel Driving on the Abundance of the Ghost Crab (*Ocypode cordimanus*) on subtropical Sandy Beaches in SE Queensland'. *Coastal Management*. 34:133-140
- NPWS (2003) *Little Tern (Sterna albifrons) Recovery Plan*. NSW NPWS, Hurstville.
- OEH (2011a) *Planning for the future. Worimi Conservation Lands*. Issue 3 Camping. Office of Environment and Heritage. OEH 2011/0645.

- OEH (2011b) *NSW Threat Abatement Plan: Predation by the red fox (Vulpes vulpes)*, Office of Environment and Heritage, Sydney, www.environment.nsw.gov.au/threatenedspecies/ThreatAbatementPlans.htm.
- OEH (2011c) *Worimi Conservation Lands Reserve Fire Management Strategy*. Office of Environment and Heritage, Sydney NSW.
- OEH (2012). *Regional Pest Management Strategy 2012–17, Lower North Coast: A new approach for reducing impacts on native species and park neighbours*. Office of Environment and Heritage, Sydney, NSW. www.environment.nsw.gov.au/pestsweeds/RegionPestManagement.htm.
- Owner, D & Rohweder, D (2003) Distribution and habitat of Pied Oystercatchers (*Haematopus longirostris*) inhabiting ocean beaches in northern New South Wales. *Emu*. 103: 163-169.
- Page, L & Thorp, V (2010) *Tasmanian Coastal Works Manual: A best practice management guide for changing coastlines*. Department of Primary Industries, Parks, Water and Environment – Tasmania.
- Rand and Associates & Simpson and Associates (2010) *Port Stephens Tourism Plan 2010: Diagnostic Report*. Industry and Investment NSW, Port Stephens Council and Port Stephens Tourism Limited.
- Russell, N & George, R (2012) 'Australian Pied Oystercatchers leapfrog to reproductive success in the Worimi Conservation Lands'. *The Whistler*. 6:35-38.
- Schlacher, TA & Thompson LMC (2007) 'Exposure of Fauna to off-Road Vehicle (ORV) Traffic on Sandy Beaches'. *Coastal Management*. 35: 567-583.
- Schlacher, T. A. & L. M. C. Thompson, 2008. Physical impacts caused by off-road vehicles (ORVs) to sandy beaches: spatial quantification of car tracks on an Australian barrier island. *Journal of Coastal Research* 224: 234–242.
- Sheppard, J (2012) *Tin City Huts Worimi Conservation Lands. Heritage Action Statement*. Draft Report. Prepared for the NSW Office of Environment and Heritage, National Parks and Wildlife Service.
- Sutherland, D (2011) *Garoowa Coastal Sea Country Report: Port Stephens Great Lakes Marine Park*. Prepared for the Worimi Knowledge-holders Aboriginal Corporation.
- Thom, BG, Shepherd, M, Ly, CK, Roy, PS, Bowman, GM, Hesp, PA (1992) *Coastal Geomorphology and Quaternary Geology of the Port Stephens-Myall Lakes Area*. Department of Biogeography and Geomorphology, Australian National University. Monograph 6. Canberra.
- TFI (2008) *Worimi Conservation Lands Recreational Use Study December 2007 – January 2008. Final Report*. Unpublished report prepared for the Department of Environment and Climate Change. The Tom Farrell Institute, University of Newcastle.
- Turner, JW (1994) The History of Stockton Bight. In HLA (1995) *Stockton Bight Environmental Study: Part B Resource Inventory*. Prepared for Newcastle Bight Co-ordination and Liaison Committee on behalf of Port Stephens Shire Council and Newcastle City Council.
- Umwelt (2000) *Aboriginal assessment of proposed mineral sand mine at Stockton Bight*. Report to Mineral Deposits (Operations) Pty Ltd.

Umwelt (2003) *Birubi Point Aboriginal Place Nomination Assessment*. Prepared for the National Parks and Wildlife Service.

Umwelt (2008) *Options for 4WD Access onto Stockton Beach Recreational Vehicle Area*. Prepared for the Department of Environment and Climate Change.

Umwelt (2010) *Managing Vehicle Access around Midden Sites at Stockton Bight*. Prepared for the Department of Environment, Climate Change and Water.

Williams, M & Umwelt (2011) *Worimi Conservation Lands Community Development Plan 2011-2015*. Prepared for the Worimi Conservation Lands Board of Management. Michael Williams & Associates Pty Ltd in association with Umwelt Environmental Consultants.



Private property – subject to section 146 agreement under NPW Act 1974

Gan Gan Rd Access Entry Station

Lower Car Park P

Birubi Surf Club P

Frontal Dune Crossing

Map 1 - Birubi Point & Worimi Conservation Lands

Legend

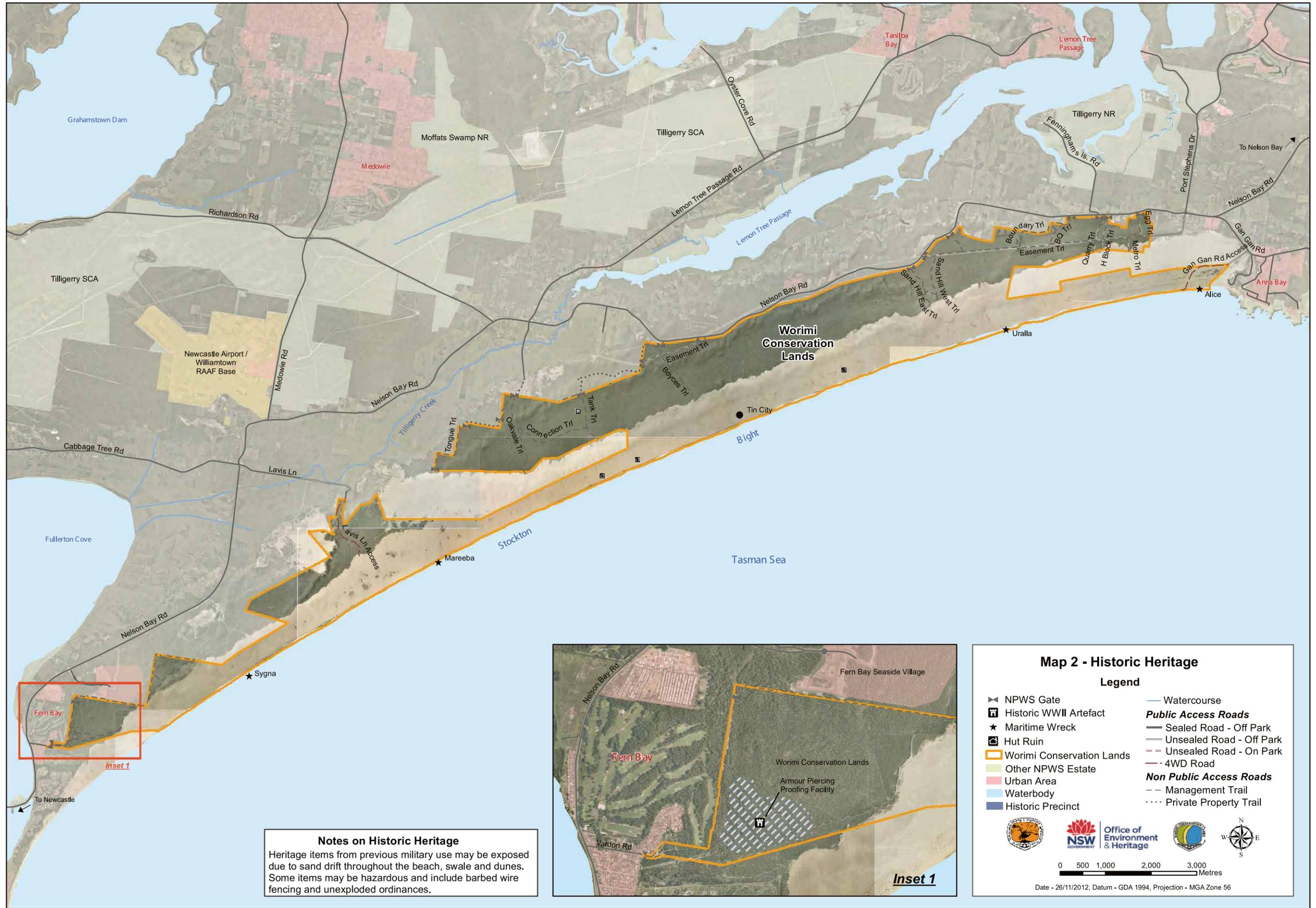
- | | |
|--------------------------------|--------------------------------|
| Building | Public Access Roads |
| Parking - Off Park | — Sealed Road - Off Park |
| Private Property - section 146 | — Unsealed Road - Off Park |
| Crown Reserve | - - 4WD Road |
| Worimi Conservation Lands | Non Public Access Roads |
| Aboriginal Place | - - Management Trail |



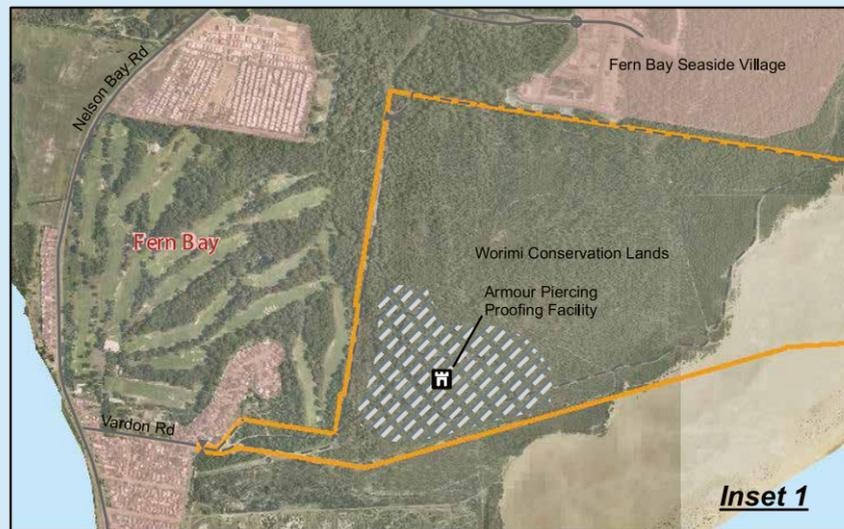
Date - 26/11/2012, Datum - GDA 1994, Projection - MGA Zone 56



Map Extent



Notes on Historic Heritage
 Heritage items from previous military use may be exposed due to sand drift throughout the beach, swale and dunes. Some items may be hazardous and include barbed wire fencing and unexploded ordnances.

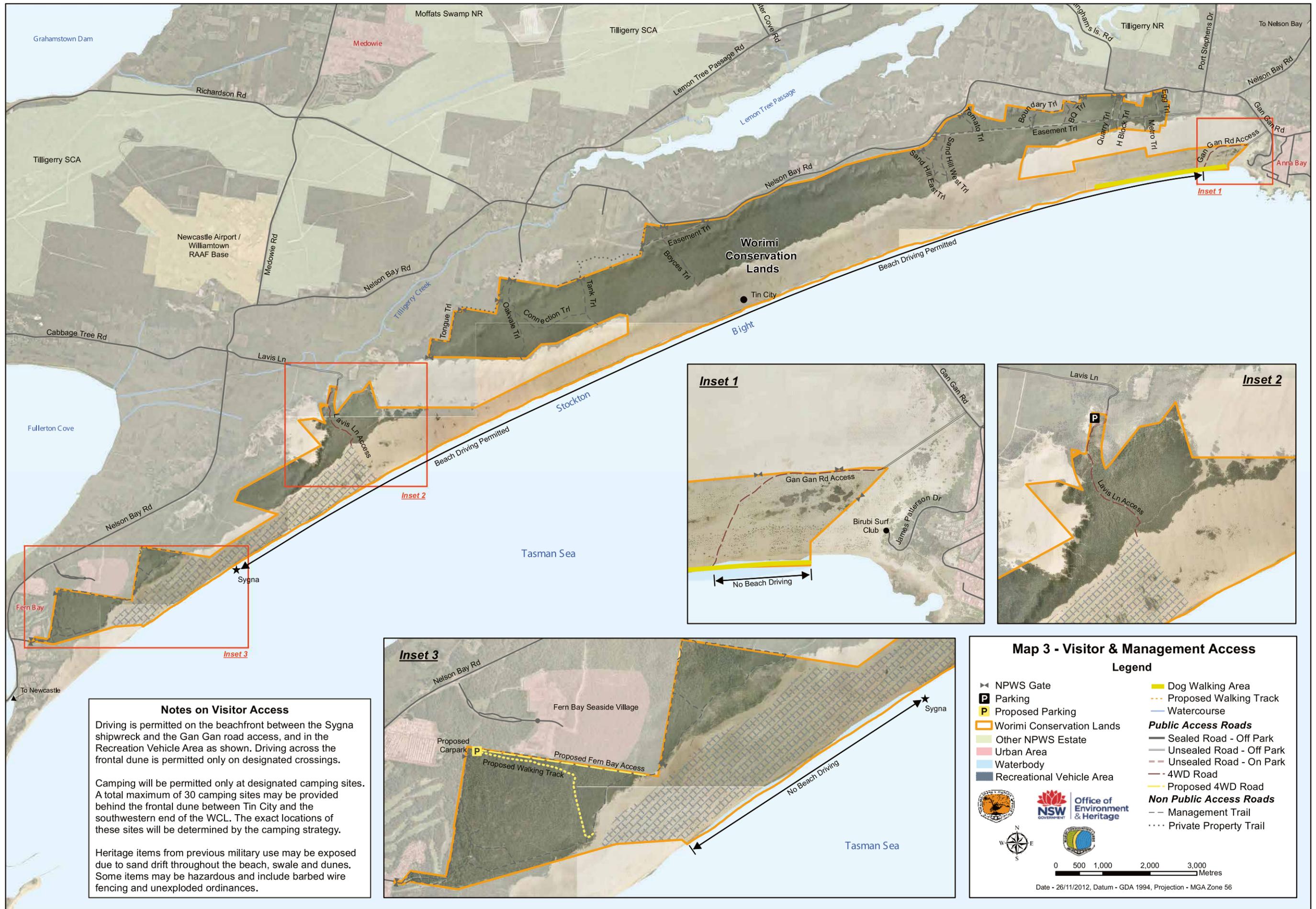


Map 2 - Historic Heritage

Legend

<ul style="list-style-type: none"> NPWS Gate Historic WWII Artefact Maritime Wreck Hut Ruin Worimi Conservation Lands Other NPWS Estate Urban Area Waterbody Historic Precinct 	<ul style="list-style-type: none"> Watercourse Public Access Roads Sealed Road - Off Park Unsealed Road - Off Park Unsealed Road - On Park 4WD Road Non Public Access Roads Management Trail Private Property Trail
---	--

0 500 1,000 2,000 3,000 Metres
 Date - 26/11/2012, Datum - GDA 1994, Projection - MGA Zone 56



Notes on Visitor Access

Driving is permitted on the beachfront between the Sygna shipwreck and the Gan Gan road access, and in the Recreation Vehicle Area as shown. Driving across the frontal dune is permitted only on designated crossings.

Camping will be permitted only at designated camping sites. A total maximum of 30 camping sites may be provided behind the frontal dune between Tin City and the southwestern end of the WCL. The exact locations of these sites will be determined by the camping strategy.

Heritage items from previous military use may be exposed due to sand drift throughout the beach, swale and dunes. Some items may be hazardous and include barbed wire fencing and unexploded ordnances.

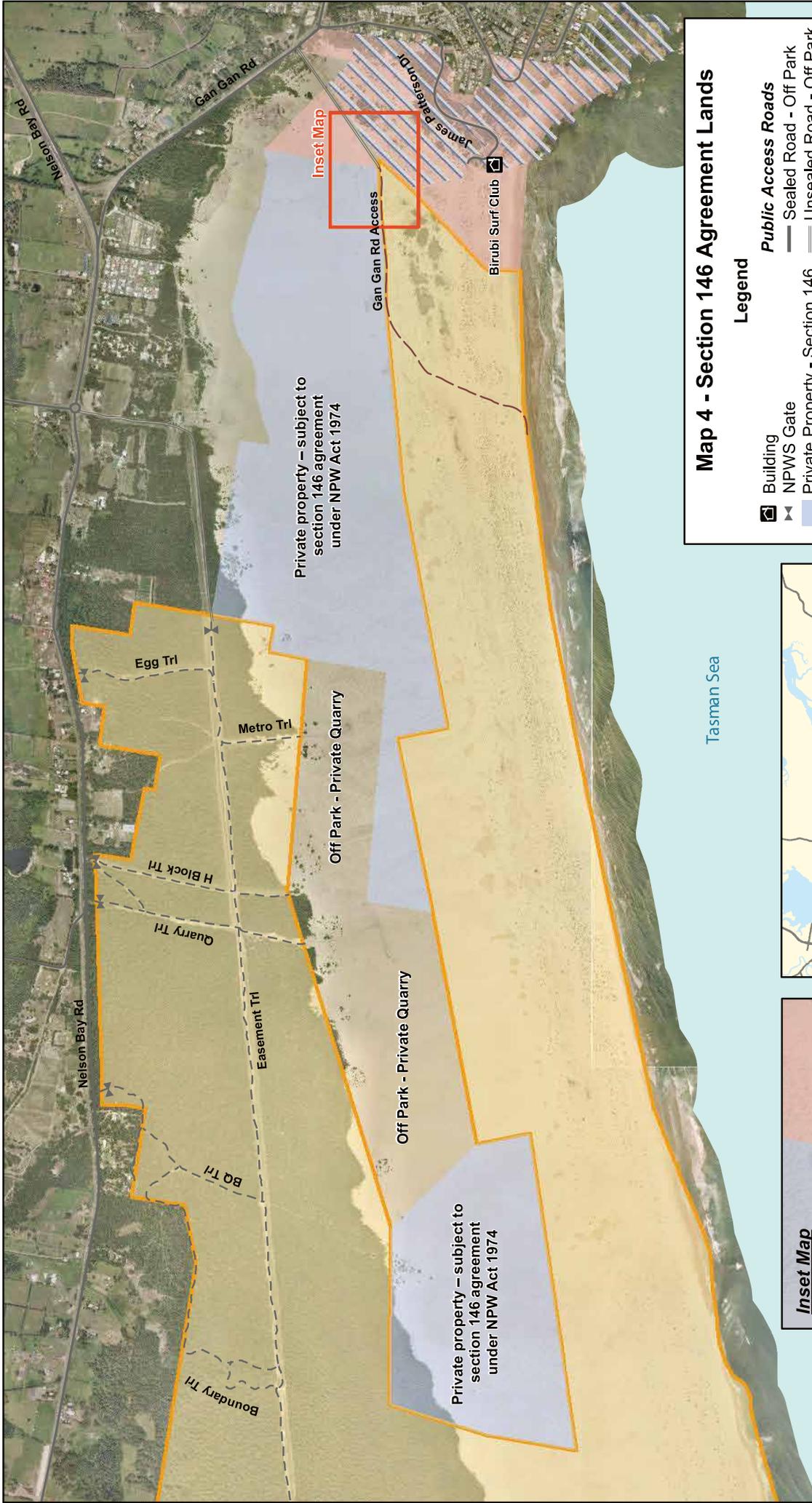
Map 3 - Visitor & Management Access

Legend

- NPWS Gate
- Parking
- Proposed Parking
- Worimi Conservation Lands
- Other NPWS Estate
- Urban Area
- Waterbody
- Recreational Vehicle Area
- Dog Walking Area
- Proposed Walking Track
- Watercourse
- Public Access Roads**
- Sealed Road - Off Park
- Unsealed Road - Off Park
- Unsealed Road - On Park
- 4WD Road
- Proposed 4WD Road
- Non Public Access Roads**
- Management Trail
- Private Property Trail



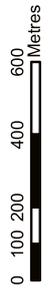
Date - 26/11/2012, Datum - GDA 1994, Projection - MGA Zone 56



Map 4 - Section 146 Agreement Lands

Legend

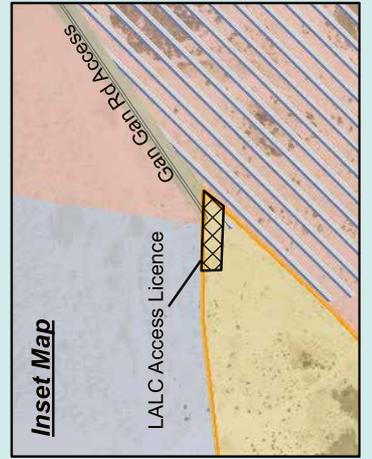
- Building
- NPWS Gate
- Private Property - Section 146
- Crown Reserve
- Worimi Conservation Lands
- Aboriginal Place
- Public Access Roads
Sealed Road - Off Park
- Unsealed Road - Off Park
- 4WD Road
- Non Public Access Roads
Management Trail



Date - 26/11/2012, Datum - GDA 1994, Projection - MGA Zone 56



Map Extent



Inset Map

