Dunedin City Council

Okia Reserve Management Plan

2009–2019

DUNEDIN CITY COUNCIL

Kaunihera-a-rohe o Otepoti

Contents

Acknowledgements:

Photos by Leith Thomson and the Yellow-eyed Penguin Trust

Management Plan Process

The Yellow-eyed Penguin Trust and the Dunedin City Council jointly purchased Okia Reserve in 1991 and in August of that year signed a memorandum of encumbrance with the Minister of Conservation, which established the purposes for which the reserve was to be managed, the form of the management committee and required the preparation of a management plan to guide management of the reserve.

The purpose of this management plan is to provide for the management of Okia Reserve in accordance with the requirements of the Memorandum of Encumbrance. This plan will direct the work of the management committee from 2009-2019. As a guide for the next ten years, the plan seeks to give clear directions for management, while remaining flexible enough to allow for changing circumstances within the ten-year time frame.

The process for the preparation of the management plan is summarised as follows:

- A draft management plan is prepared in consultation with the management committee and key stakeholders (completed February 2009).
- The draft management plan is released for public submissions for at least two months (April – June 2009).
- Those wishing to be heard in support of their submissions appear before a hearing committee (September 2009).
- The draft plan is revised in light of submissions and hearing committee recommendations.
- The management committee considers the summary of submissions, hearing committee recommendations and revised draft and confirms any proposed changes.
- The Dunedin City Council formally approves the management plan (November 2009) and each management committee organisation signs final plan.

This plan is the second Management Plan for the Okia Reserve and replaces the previous plan approved in 1998.

Acknowledgements

This reserve management plan is a comprehensive review of the 1998 Okia Reserve Management Plan compiled by the Okia Reserve Committee dated 8 September 1998.

The Okia Reserve Management Plan is written in accordance with the requirements of the Memorandum of Encumbrance, 26 August 1991. It outlines the policies for Okia and acts as a guide for those responsible for the day-to-day management of the reserve.

The Management Plan is an important document that describes the physical, ecological, and cultural values of this reserve. It establishes a framework for implementation of the aims and objectives. The Plan clarifies the direction that management will take in the future, in order to protect and preserve this unique area.

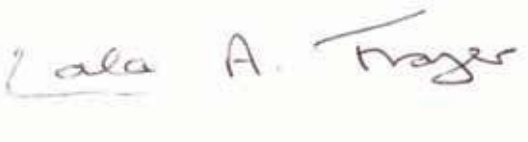
The energy and commitment of the Okia Management Committee signifies their recognition of the importance of the Plan. The Okia Management Committee wish to thank all those who made submissions or contributed in other ways to the preparation of the Plan.

Dunedin City Council 

Signed: 

Department of Conservation Signed:

Te Rūnanga o Ōtākou Signed:

Yellow-eyed Penguin Trust Signed: 

APPROVED 

DATE: 27 July 2010

1. Introduction

1.1 Background and purpose of the plan

The creation and ongoing development of the Okia Reserve is the result of a partnership between the Yellow-eyed Penguin Trust, the Dunedin City Council, Mana Whenua and the Department of Conservation.

The Yellow-eyed Penguin Trust and the Dunedin City Council jointly purchased the 231 hectare property in 1991 and in August of that year signed a memorandum of encumbrance with the Minister of Conservation, which established the purposes for which the Reserve was to be managed, the form of the Management Committee and required the preparation of a management plan to guide management of the reserve. The Management Committee has seven members; three from the Yellow-eyed Penguin Trust, two from Dunedin City Council and one each from Te Rūnanga o Ōtākou and the Department of Conservation, in recognition of the Department's role and expertise in protecting natural and historic resources and recognising the role of the Runanga as Kaitiaki of the area. In 2007 a representative from the New Zealand Sea Lion Trust was invited to attend all Okia Reserve Management Committee meetings and have speaking rights only.

Okia Reserve is located on the east of Otago Peninsula, 27 km north east of Dunedin. It covers an extensive area of dunes with a unique floral ecology, including some of the most significant dune and dune hollow vegetation in Otago. The Reserve has very high habitat values for a variety of native fauna; insects including diurnal moths such as Diasemia grammalis; birdlife including blue and yellow-eyed penguins; marine mammals such as fur seals and the endangered New Zealand sea lion. The area has significant geological features, the most well known being the Pyramids. As well as its natural values, Okia is important for its significance to the Mana Whenua, historic and prehistoric sites and the recreational and educational opportunities it provides.

In terms of the memorandum of encumbrance, Okia Reserve is to be managed primarily to conserve and protect the values of the land:

1. Wildlife and Nature Conservation
2. Ecological
3. Landscape
4. Historical
5. Archaeological and Cultural
6. Recreational
7. Educational

1.2. Management Aims Objectives and Policies

This Management Plan is required by the memorandum of encumbrance with the Minister of Conservation, which established the purposes for which the Reserve was to be managed, the form of the Management Committee, and required the preparation of a management plan to guide management of the reserve and is intended to be a plan for management. The Plan is a working document that has three functions:

- to establish forward looking management strategies;
- to guide day-to-day management decisions; and
- to provide appropriate policy support for controls on use.

The Plan itself is a policy document, which sets out objectives (desired outcomes) and policies to achieve these outcomes. Both objectives and policies are designed to be sufficiently specific to be of practical help in managing the Reserve, yet flexible enough to serve over a 10-year period of change and development. The Management Committee will periodically assess the progress made towards achieving the stated objectives using the implementation plan as a guide. The Plan will be fully reviewed after consultation with the public in 10 years time.

The Management Committee has followed processes and procedures outlined in the Reserves Act 1977 in preparing the Management Plan, although Okia Reserve is not a reserve in terms of that Act. The

Committee has sought submissions from interested parties and is very grateful to those people and organisations that have shown an interest in this reserve by contributing to this plan.

Management Aims

The aims of this Management Plan represent the long-term vision for the reserve. They provide a framework within which any future proposals for development/ enhancement, or any other form of action that may have an impact on the Reserve, can be considered.

Management Aims for Okia Reserve

1. To protect and enhance the Reserve as habitat for yellow-eyed penguin and other indigenous biota.
2. To revegetate (through planting and natural regeneration) the Reserve in indigenous plants and trees.
3. To protect and enhance the scenic qualities, ecological associations and other features of the natural environment.
4. To recognise that the Mana Whenua are the Kaitiaki of the Okia Reserve, to manage the Reserve in partnership with Te Rūnanga o Ōtākou, and to recognise and give effect to the principles of the Treaty of Waitangi.
5. To protect and conserve traditional, archaeological and other historic sites (or places).
6. To provide for public appreciation and understanding of the wildlife and other values of Okia Reserve and the need for habitat protection by way of interpretative services.
7. To provide for public recreation where adverse effects on other values can be avoided, remedied or mitigated.

Management Objectives

The objectives of a management plan specify the means necessary to achieve the aims. They are oriented towards action and provide the basis for developing specific policies on matters that reserve managers will need to address.

Management Policies

The policies become the means by which objectives are achieved. Over time, as certain specific objectives are attained or require change, relevant policies will also be amended. The policies in the Management Plan guide all future aspects of the Reserve and provide the framework for continuity of management.

1.3 Legal Description and Zoning

Okia Reserve (231ha) is located on the east of Otago Peninsula, approximately 27 km north east of Dunedin and 7km from Portobello.

Legal Description

The Reserve is held in one certificate of title being CT OT320/159 and is described as Part Lot 7, Deeds Plan 228, & being Part lot 25, Otakou Native Reserve.

The strip of land, described as Part Lot 25, that encompasses the coastal perimeter of the Reserve, is Maori freehold land under the Te Ture Whenua Maori Act 1993 and is commonly known as Taiaroa's Private Road. No formal right of way exists over the coastal perimeter. However, should future access likely be inhibited, then in co-operation with the owners, the process of obtaining a formal easement will be sought.

Dunedin City District Plan

The District Plan provides for the sustainable management of the District's land related resources under the Resource Management Act and guides activities that affect the use of these resources.

Okia Reserve is zoned Rural. Okia has been identified as an area of significant indigenous vegetation and habitat for indigenous fauna. It has additional protection under the District Plan, which identifies it as an 'Area of Significant Conservation Value' and has rules to protect these values.

Other Relevant Plans

Other policy and planning documents that may relate to and affect decisions made at Okia include the Department of Conservation's Conservation Management Strategy (Otago Conservancy), the New Zealand Coastal Policy Statement, Regional Coastal plans and Regional Plan: Water developed by the Otago Regional Council (under the Resource Management Act 1991) and the Kāi Tahu ki Otago Natural Resource Management Plans 1995–2005. The Okia Reserve Management Committee acknowledges the need to work co-operatively with the agencies that administer these policy and planning documents.

2. Values

2.1 Wildlife Values

Key Species

1. The Okia Reserve and the surrounding areas of private and public land are home to a significant breeding population of the endangered Yellow-eyed Penguin, as well as smaller numbers of the Little Blue Penguin. Both species are present in the area year round and are jointly managed by the Yellow-eyed Penguin Trust and the Department of Conservation.

2. Other significant avifauna in the area include South Island Rifleman, New Zealand Fernbird and native wetland and shorebird species such as the Kingfisher and Variable Oystercatcher.

3. The threatened New Zealand Sea Lion is present in the Okia Reserve, with a small but highly significant breeding population located at the southern end of Victory Beach.

4. Adjacent to the Reserve resides a small colony of New Zealand Fur Seals. Visits to the Reserve and the surrounding area have also been recorded from the Southern Elephant Seal and Leopard Seal.

5. The more common Herpetofauna have been recorded in the Reserve and surrounding area, but the declining Jewelled Gecko has also been sighted.

Lepidopter

1. Okia Flat has extensive dune hollows that contain significant native turf plant communities that support native butterflies, such as Red and Yellow Admiral butterflies, as well as an excellent range of native moth species.

2. Some moth species are widespread species but now local in the Dunedin Ecological District, for example Arctesthes catapyrrha, Diasemia grammalis, and Pterophorus innotatalis.

3. Some moth species have very restricted national distributions but have significant populations at Okia Flat, ie Delogenes limodoxa.

4. A good range of common moth species exists to complement the less common species, ie Orocrambus melitastes, Eudonia leptalea, and Scoparia exilis. They are mainly typical of low vegetation.

(Brian Patrick–December 1998; Lala Fraser 2009)

Okia Flat Fauna – Extracts from Part 6 Wildland Consultants' Ecological Assessment (see Appendix 3 for full report)

Indigenous mammals recorded within Okia Reserve (Table 5)

Species	Common name	Habitat/abundance	Threat status
Arctocephalus forsteri	NZ fur seal	Beach and rocks/occasional	Not Threatened
Mirounga leonina	Southern elephant seal	Beach and dunes/rare	Nationally Critical
Phocarctos hookeri	NZ sealion	Beach and dunes/occasional	Vulnerable[1]

Herpetofauna recorded within Okia Reserve (Table 7)

Species	Common name	Habitat/abundance	Threat status
Hoplodactylus maculatus	Common gecko	Big Pyramid/occasional	Not Threatened
Litoria aurea	Green and golden bell frog	Okia Flat/occasional	Exotic
Litoria ewingii	Whistling frog	Okia Flat/occasional	Exotic
Naultinus gemmeus	Jewelled gecko	Occasional	Gradual Decline
Oligosoma nigriplantare polychroma	Common skink	Okia Flat/abundant	Not Threatened

Bird species observed within Okia Reserve (Table 8)

Species	Common name	Habitat/abundance
Alauda arvensis	Skylark	Okia Flat/common
Carduelis chloris	Greenfinch	Okia Flat/occasional
Carduelis flammea	Redpoll	Okia Flat/occasional
Chrysococcyx lucidus lucidus	Shining cuckoo	Forest/rare
Circus approximans	Australasian harrier	Okia Flat/occasional
Emberiza citronella	Yellowhammer	Okia Flat/occasional
Fringilla coelebs	Chaffinch	Forest/common
Gerygone igata	Grey warbler	Forest/occasional
Haematopus unicolor	Variable oystercatcher	Beach/occasional

1 As classified by the International Union for Conservation Nature (IUCN)

Species	Common name	Habitat/abundance
Hirundo tahitica neoxena	Welcome swallow	Okia Flat/rare
Larus dominicanus dominicanus	Southern black-backed gull	Okia Flat/occasional
Porphyrio porphyrio melanotus	Pukeko	Okia Flat/rare
Sturnus vulgaris	Starling	Okia Flat/occasional
Tadorna variegata	Paradise shelduck	Okia Flat/occasional
Todiramphus sanctus	Kotare; sacred kingfisher	Edge of Papanui Inlet/occasional
Turdus merula	Blackbird	Forest/common
Turdus philomelos	Song thrush	Forest/occasional

Threatened bird species recorded within Okia Reserve (Table 9)

Species	Common name	Habitat/abundance	Threat status
Acanthissita chloris chloris	South Island rifleman	Taiaroa Bush/abundant (Johnson 1982)	Gradual Decline
Bowdleria punctata punctata	South Island fernbird	Dune scrub/rare (www.doc.govt.nz)	Sparse
Eudyptula minor minor	Southern little blue penguin	Northern beach/rare (Management Plan)	Gradual Decline
Megadyptes antipodes	Hoiho; yellow-eyed penguin	Limited to dunes/occasional (D. McFarlane 2008)	Nationally Vulnerable

2.2 Cultural and Historic Values

By Edward Ellison

Okia has a human history dating many hundreds of years, the oldest of which is the Waitaha, Kati Mamoe, and Kai Tahu iwi history that is interwoven with the land, sea, and natural resources of the locality. Kai Tahu came in the vanguard of Kati Mamoe, who in turn followed Waitaha by some centuries. Both Kati Mamoe and Kai Tahu migrated from the lower North Island. Relations between Kai Tahu and Kati Mamoe were at times strained, however over time through a series of battles, alliances and inter marriage between Waitaha, Kati Mamoe and Kai Tahu there emerged a unified group commonly known as Kai Tahu. The economy was of a hunter-gatherer nature, which followed a well established pattern set by the original inhabitants Waitaha.

An old settlement dating back to the earliest times was located at Okia, a place where generations lived, hunted and celebrated life. The hunter gatherer lifestyle was centred around numerous mahika kai resources that were available on the Peninsula and surrounding districts. This required regular travel to obtain the seasonal mahika kai foods. In addition expeditions ventured seasonally from Okia to the interior for pounamu (greenstone), south to Foveaux Strait for titi (muttonbird), and north to Canterbury for trade. The history of Okia and the region is in its place names, whakapapa and traditions. The name Okia is considered to be the name of an early ancestor of importance.

Another name with a strong connection to the area is Tarewai, a Kai Tahu warrior chief. Following an incident near the pyramids, Tarewai and several of his men were taken prisoner by Kati Mamoe. The warriors were killed, while the wounded Tarewai made his escape into surrounding bush leaving behind his prized mere. Tarewai tended his wounds, and when well enough entered the pa of his Kati Mamoe foe at night, where he retrieved his mere and dashed off into the night, with Mamoe warriors in pursuit. Tarewai returned to his people at Pukekura pa, whereupon he mounted an offensive against Kati Mamoe. He remained a threat to Kati Mamoe for many years later.

Still protruding from the Beach at Wickliffe Bay are the remains of the steamer Victory, which went aground on 3 July 1861. The beach where the steamer came to rest is now known as Victory Beach. The wreck of the Victory is the oldest steamer wreck of its kind on the New Zealand coastline.

2.3 Landscape Values

By MW Moore

The area has well known scenic landscape qualities including the low sweep of Victory Beach, estuarine margins of Papanui Inlet, undulating old sand surface of Okia Flat, the Pyramids, cliffs and headlands to the north, and the backdrop of grassy hills and a significant native forest area.

The Reserve is dominated by the Pyramids, an unusual geomorphological feature that attracts many visitors. The pyramids are two sea stacks formed from volcanic rock that have been changed to their present form from marine erosion during higher sea levels. The Pyramids gradually became isolated from the sea by the formation of sand dunes.

The reserve is part of a wider landscape context that comprises three main components.

i) Hill Country

- Largely bare of trees with focus on landform.
- Remnant bush areas.
- Macrocarpa shelter belts.

ii) Inlet

- Estuarine areas with focus on changes to mudflat and water.

iii) Dune Country and Beach

- Pasture land becoming rougher towards the beach
- Pinus radiata woodlots and significant individual trees.

The reserve is made up of five significant landscape zones described as follows.

i) Northern Cliffs and Pyramids

- Fossil sea cliffs and sea stacks.

ii) Hill Country/Pasture Land

- An extension to the adjacent pasture land.

iii) Dune Country

- Dune areas of bracken, sedge and tussock cover.
- A sub area of higher dunes and Pinus trees.

iv) Beach

- Broad expansive beach backed by dunes.

v) Inlet Edge

- Sandy beach backed by dunes orientates to tidal flat.

Okia – Landscape Context

Okia – Landscape Zones

2.4 Botanical Values

By PN Johnson– May 1993

Okia Reserve is of high regional and local conservation value. It has significant diversity of its dune landforms, wetland areas, native scrub, and rock face vegetation. The inventory of South Island dune and beach vegetation identifies Victory Beach as a highly rated site for the Otago Coast. The rating reflects the extent and diversity of dune flat and dune hollow vegetation, regarded as the best examples of such landforms along this section of the coast.

In the Otago Ecological Region the dune hollow vegetation is the best example. While dune crest plant communities are representative of the region, the native scrub and associated communities of the Pyramids are floristically rich for the region. The Pyramids are especially important for the diversity of plant species. Johnson (2004) (cited in Wildland's report) stated that Okia Flat/Wickliffe Bay had records for 33 plant species known only from one or two Otago Peninsula sites and the Pyramids had records for six plant species known only from one or two Otago Peninsula sites.

(Refer to Wildland's Ecological Assessment (Table 2) in Appendix 3 for greater detail.)

2.5 Recreational Values

The Okia Reserve is one of the Otago Peninsula's largest areas of open coastal land. It is a popular destination for sightseeing, observing wildlife and general relaxation. The scope of recreational use is wide and includes both passive recreation from picnics and wildlife viewing through to more active recreation e.g. walking, jogging, and mountain biking. The Reserve has an important role for maintaining wild isolated open landscape and is used by a variety of casual recreational users. Key management issues are to ensure the protection of wildlife, the solitude of the area and any significant vegetation from undue disturbance, including fire risk.

2.6 Other Values

Okia provides an excellent education opportunity for schools, educational institutions and the public. The Department of Conservation's educational resource guide on Okia provides a valuable source of ideas and information for school groups. (see Appendix 4 for details).

The cultural and historical heritage of the Reserve also attracts visitors to the site. While there is currently some opportunity for visitors to learn about the significance of the area for Māori, and about the historical use of the site, there is an opportunity to increase the public's ability to access such information by interpretive and educational panels/material.

3. Conservation Management

Okia Reserve was purchased primarily for the protection of the yellow-eyed penguin or hoiho. The Reserve is also home to a large number of bird species, as well as significant populations of marine mammals, small reptiles and rare species of insects.

Key management issues include:

- improving breeding habitat for the yellow-eyed penguin and protecting them from predation;
- maintaining the natural habitat of the jewelled gecko, blue penguin, NZ Sealions; and
- encouraging biodiversity generally.

Okia Reserve is the most significant site on the Otago Peninsula for the breeding of NZ Sealions. A number of females give birth and raise their pups on the Reserve, in a small pine forested area adjacent to Victory Beach. As recent research by the Department of Conservation has shown that the breeding populations in the Sub-Antartic Islands are decreasing, it is more important than ever to ensure that sealions continue to breed on the New Zealand mainland.

The control and trapping programme of pest animals has been ongoing at Okia. Monitoring suggests that pest and predator control is having a positive impact on the increasing variety and numbers and of native wildlife in the reserve. To be more effective, however, predator control needs to be sustained over the long term and extended beyond the reserve boundaries (with the co-operation of neighbouring landowners).

Skirting the northern cliffs is Taiaroa Bush, the largest remaining tract of native forest on the Peninsula. It is made up of broadleaf, fuchsia, kowhai, mahoe and flax and contains the last remnants of a distinctive type of coastal forest which once clothed the Otago coast from about Oamaru to Taieri Mouth. There are dense thickets of tree nettle and coprosma shrubs. Tree nettle or ongaonga is abundant at the base of the "Little Pyramid" and is host plant for native red and yellow admiral butterflies. Maiden hair fern, rare in the Dunedin area, can be seen at the base of the northern cliffs.

Introduced species dominate the dunes behind Victory Beach. Marram grass flourishes on the foredunes; and lupins and exotic grasses run wild over the old dune slack, although they are being replaced gradually by the natural regeneration of bracken fern and flax. The grasses were introduced for grazing, which continued up until the time of purchase in 1991 and continues on a limited basis for fire management purposes until 31 December 2009.

The original plant cover of the foredunes was probably pingao which survives naturally in only a few places on Otago Peninsula. Efforts are being made to re-establish pingao at several sites within the reserve. Damp dune hollows, resembling those found around inland lakes, are common on Okia Flat. Rich peaty material accumulates around the perimeter of the hollows and provides a fertile growing medium for wide variety of turf plants. Clumps of tall rushes emerge from the wetter parts.

Vegetation provides nesting material and shelter for some species of native wildlife present, but may also shelter predators. Any future planting should take into consideration the habitat requirements of all native wildlife species present in the Reserve, and should enhance the landscape character of Okia.

Control of some exotic species such as gorse, elderberry and lupin is required to ensure that these species do not encroach on areas of native vegetation.

Wildland Consultants' Ecological Assessment – Recommendation Summary

A summary of the recommendations made in Wildland Consultants' Ecological Assessment is outlined below (See Appendix 3 for full report). While these priorities have not been adopted as policies in their own right and will not necessarily form part of the implementation plan priorities, the recommendations are consistent with the broad objectives for each component of conservation management, from which key policies have been developed. These are outlined in sections 3.1 – 3.6 below.

Yellow-eyed penguin management (Very High Priority)

- Continue yellow-eyed penguin population monitoring.
- Continue pest animal control for yellow-eyed penguin.
- Continue planting of indigenous vegetation to restore penguin habitat.
- Continue to discourage access by members of the public to yellow-eyed penguin nesting areas.

Administration (High Priority)

- Prepare a preliminary budget and apply for funding to undertake restoration activities.

Boundary Issues (High Priority)

- Resolve boundary and grazing issues in the north of the Reserve.

Monitoring (High Priority)

- Continue current monitoring.
- Monitor weeds, threatened plant populations, vegetation condition, and gross vegetation change using photopoints, walk through surveys, and GIS.
- Monitor populations of threatened birds and lizards.

Weed control (High-Medium Priority)

- Maintain current levels of weed control (High).
- Increase control of woody weeds within the Reserve and follow the set goals and time scales for control/ eradication of each species (Medium).

Additional pest control (Medium Priority)

- Expand pest control to include pest animals such as possums, hedgehogs, rats, and rodents.
- Extend pest animal control to The Pyramids and Taiaroa Bush.

Grazing (Medium Priority)

- Discontinue grazing on Okia Flat.
- Maintain fire breaks by mowing.

Restoration planting/habitat restoration (Low priority)

- Continue planting of indigenous vegetation on the Margaret Hazel Slope.
- Plan for and progressively undertake indigenous vegetation and habitat restoration from beach/ foredune to rear dune forest communities, including establishment of low-stature ecotonal vegetation suitable for fernbird habitat.

3.1 Native Wildlife Habitat Protection and Conservation

3.1.1 Objectives

1. To ensure as a matter of priority the protection of the yellow-eyed penguin and the enhancement of nesting habitat for breeding success.
2. To protect and enhance the breeding and nesting habitats of other native wildlife species within the Reserve.

3.1.2 Policies

1. Where necessary and appropriate, management of the yellow-eyed penguins will be carried out to assist the survival and growth of a breeding population on this site and of the species as a whole. Management practices will be in accordance with the Hoiho Recovery Plan (see Appendix 4).
2. To manage the habitat requirements of other native species, in particular the New Zealand sealion. This will be done in consultation with Te Rūnanga o Ōtākou, the Department of Conservation and the NZ Sea Lion Trust.
3. The provisions of the Wildlife Act 1953 will apply. This prevents the injury, destruction or removal etc. of native wildlife from the reserves except by Department of Conservation staff and/or persons authorised by the Department for approved essential management purposes.
4. Monitoring of yellow-eyed penguins will continue at current levels: Annually during breeding season a nest search and two checks–one in early

December and a fledgling check in late January or the first week of February, or as recommended by the Department of Conservation or the Okia Reserve Management Committee.

5. Where resources allow, monitoring of threatened birds and lizards will be carried out, and a database to record observations of threatened species will be established and maintained.
6. Any structures or equipment (e.g. fences, wire, metal), which, in the opinion of the Management Committee are considered dangerous to wildlife, will be removed.

(Refer also to Research and Monitoring – Section 3.5)

3.2 Introduced Animals/Pest Control

3.2.1 Objectives

1. To ensure that plant and animal pests are controlled, managed and eradicated as appropriate to protect reserve values.
2. To control weed species as required to ensure protection and enhancement of reserve values.

3.2.2 Policies

1. An ongoing programme of pest animal control works will be approved by the Committee and implemented jointly by DCC, Yellow-eyed Penguin Trust staff and contractors. The Pyramids and Taiaroa Bush will be considered within the scope of the ongoing pest control programme.
2. A trapping programme for introduced mammals will be undertaken if necessary, particularly around known yellow-eyed penguin breeding sites in the reserve. Records stating predator type, numbers, sex, age and date of capture, will be kept.
3. As resources allow, pest control will be expanded to include pest animals such as possums, hedgehogs, rats and mice.
4. Pest control will be carried out in liaison with the appropriate authorities.
5. The Dog Control Bylaw 2002 (Section 5 of the Dunedin City Consolidated Bylaw 1991) applies in conjunction with this management plan.
6. Dogs and other domestic animals are prohibited on the Reserve.
7. Any wandering livestock or domestic animals will be removed, impounded or destroyed after due notice has been given following statutory procedures.
8. The Committee will work with adjacent landowners and the Otago Regional Council to coordinate pest animal control works, to achieve greater control, adequate buffer zones, and adequate protective fencing for the reserves.
9. The eradication and control of noxious plants and exotic plant species, particularly woody weeds, will be undertaken as required and as resources allow, and shall be undertaken in a manner that minimises impact on native flora or fauna in the Reserve.

(See also Fencing policies in section 3.6)

3.3 Vegetation Management

3.3.1 Objectives

1. To revegetate (through planting and natural regeneration) the reserve in indigenous plants and trees.
2. To manage vegetation in a manner that gives primacy to the needs of native wildlife, and:

   i) encourages the re-establishment of the native forest and shrubland vegetation on the dune crests throughout the reserve;

   ii) maintains, protects, and encourages the natural succession patterns of the dune and dune hollow vegetation;

   iii) prevents disturbance of vulnerable wildlife areas and cultural sites by planting;

iv) contributes to stabilisation of natural formations by planting (e.g. Margaret Hazel Slope; and

v) recognises the contribution of vegetation to the landscape character of Okia Reserve.

3. To monitor all vegetation in Okia Reserve, in particular, exotic plant species.

3.3.2 Policies

1. A vegetation management plan for the reserve will be prepared and adopted in consultation with DOC, DCC, YEPT and Te Rūnanga o Otäkou .
2. Future planting and vegetation maintenance will take into account the open space and habitat requirements of native fauna.
3. As resources allow, indigenous vegetation and habitat restoration will be undertaken from the beach/foredune to rear dune forest communities, including the establishment of low-stature ecotonal vegetation suitable for fernbird habitat.
4. Enhancement plantings, where undertaken, will be sourced from seeds and or propagated material that originates from species indigenous to Otago Peninsula, and will be facilitated in a manner that is consistent with natural growth patterns.
5. Vegetation surveys will be regularly programmed to ensure that vegetation trends are monitored.
6. Weeds, threatened plant populations, vegetation condition and gross vegetation change will be monitored annually, using photopoints and walk through surveys. GIS and aerial photography will be used for monitoring every 5-10 years.
7. All grazing in the reserve is to cease by 31 December 2009.

(Refer to Wildland Consultants' Ecological Assessment (Table 13), Appendix 3. See also pest and animal control – section 3.2, fire risk – section 3.4 and research and monitoring – section 3.5.)

3.4 Fire Risk Management

3.4.1 Objectives

1. To minimise the risk of fire events occurring.
2. To ensure that an effective fire response is in place in the event of a fire.

3.4.2 Policies

1. The Management Committee will, in consultation with the NZ Fire Service and Rural Fire Officer, prepare and adhere to a fire plan/strategy for the Okia Reserve.
2. Smoking will not be permitted within the reserve.
3. Lighting of fires and barbecues (including gas barbecues) within the reserve will be prohibited.
4. In times of unacceptably high fire risk, the Management Committee may close public access to the reserve.
5. Fire breaks will be mown as and when required.
6. The Management Committee will liaise with neighbours to ensure all available steps are taken to reduce the fire risk and respond to a fire if one should occur.
7. Staff of the Dunedin City Council and Department of Conservation will, whenever possible, provide assistance in all matters of fire prevention and control at or in the vicinity of Okia Reserve.
8. Signage will be provided to educate the public about the risk of fire.

3.5 Research and Monitoring

3.5.1 Objectives

1. To encourage research and monitoring programmes that will assist protection and management of the yellow-eyed penguin and native fauna and flora.

3.5.2 Policies

1. Research and monitoring will be at the discretion of the Management Committee and will only be

allowed where it is not detrimental to reserve values. The management committee will assess the proposal against the criteria used in section 5.5 (2) New Activities or Proposals.

2. The Management Committee (acting in consultation with the Department of Conservation, Dunedin City Council and the Yellow-eyed Penguin Trust) will require written briefs for all ecosystems related research or monitoring proposals, including statements on experimental design.
3. The Management Committee's Department of Conservation representative, in consultation with the Management Committee, will process and make recommendations on any research and monitoring programme applications. The Management Committee will be the final decision-maker on any such applications.
4. The Management Committee will require a copy of research and monitoring results and details may be made available to the public via the Dunedin City Council and Yellow-eyed Penguin Trust.

3.6 Fencing

3.6.1 Objectives

1. To ensure that the reserve is adequately fenced to protect reserve values.

3.6.2 Policies

1. Fencing will be maintained and installed on the Reserve as deemed necessary by the Okia Reserve Management Committee. The Committee will in each case determine the location and type of fence to be erected. Consideration will be given to the need for predator/pest proofing, access requirements, visual impact and avoidance of disturbance to archaeological and historical sites.
2. Maintenance of fences will be continued to prevent stock trespass and allow for plant communities to recover.
3. Where fencing is no longer required for management purposes, and is detrimental to achieving the aims of this management plan, this will be removed where possible.

4. Management of Cultural, Archeological and Historic Sites

4.1.1 Objectives

1. To protect and preserve the archaeological, cultural, and historical values of the Reserve.
2. To allow preservation, maintenance work, and research into archaeological or historic sites in consultation with Te Rūnanga o Ōtākou .
3. To ensure that proposed works or research will have no immediate or long term harmful effects on the native fauna and flora present, and will be of benefit to the historic values of sites at Okia.
4. To recognise and give effect to the principles of the Treaty of Waitangi.

4.1.2 Policies

1. Work in partnership with Te Rūnanga o Ōtākou to protect and preserve the archaeological values of the sites. The Historic Places Trust and other appropriate agencies will be consulted over those archaeological sites within the reserve that are identified in the District Plan.
2. Apply the accidental discovery protocol (attached as Appendix 8), in the event of an accidental discovery of cultural materials by Te Rūnanga o Ōtākou, the Dunedin City Council. DOC, and Yellow-eyed Penguin Trust contractors and any other individuals or groups permitted to undertake activities on the reserve by the Management Committee.
3. Allow for research projects into archaeological and historic sites that will benefit the knowledge and understanding of the cultural and historic values of the reserve.
4. Historic site preservation or maintenance work and historic research proposals, will be considered in accordance with the following criteria:
   i) Ground disturbance (eg excavations) will only be authorised with the agreement of Te Rūnanga o Ōtākou (in addition to Historic Places Act and District Plan requirements);
   ii) Site conservation and research work will be subject to requirements for native fauna and flora protection; and
   iii) The Management Committee will consult the relevant agencies and will monitor the coastal erosion that is exposing the village site.

5. Visitor Management

5.1 Public Use Overview

Okia Reserve is a popular destination for wildlife viewing and casual recreation. Key management issues are to ensure the protection of wildlife, cultural values, the solitude of the area and any significant vegetation from undue public disturbance.

The main access to Victory Beach is by way of the Riddell Road farm track from the end of Dick Road to the Pyramids and across the dunes to Victory Beach. Encouraging recreational use away from wildlife and culturally sensitive areas by means of tracks and signage is a priority. This will also ensure erosion of the dune area is contained. Increasing concerns are being raised regarding visitors disturbing breeding sealions at the southern end of Victory Beach and Papanui Inlet. In an attempt to discourage the public from entering the area where pups are born and nursed, there are two locked gates, one at the Papanui inlet and one at the Dick Road car park. Vehicle access around Papanui inlet is no longer available as the unformed legal road is now situated within Papanui inlet.

Visitor numbers have steadily increased from when the reserve was first opened to the public in 1992. Visitor numbers are seasonal with most visitor use in the months from December to March. Visitor numbers obtained from a track counter at the Dick Road entrance indicate average monthly summer visitors of between 470 (2007/08 data) and 570 visitors (2006/07 data). Late autumn, winter and early spring visitors per month generally average 150-200 (2008 data). A recent study has suggested that the visitor numbers counts may have been significantly under-reported, so actual numbers are likely to be higher.

Guided wildlife tours occur around the Peninsula and this is expected to increase as the Otago Peninsula becomes an increasingly popular wildlife viewing destination. Any guided tours on Okia Reserve will require an approved permit from the Okia Reserve Management Committee. (See Policy 5.5 New activities or proposals)

Due to the increasing numbers of visitors an adequate car parking area and toilet facilities at the end of Dick Road is a priority. A development plan will be prepared in line with the management objectives of this plan. Provision will be made for tracks, accessways, seating, toilets, car parking, site interpretation and signage.

Educating the public to avoid disturbance to any wildlife is necessary by way of providing and updating interpretation signs and information.

The annual Peninsula walk/run race occurs in January/ February and currently requires DOC and Sea Lion Trust volunteers to manage the impact of large numbers of people in the presence of sea lions. The Dunedin Orienteering Club have held regular events on the Reserve though the phasing out of grazed areas on the Reserve has now limited the tracks and areas suitable for orienteering.

There is one remaining crib on Okia Reserve subject to a “licence to occupy”. This licence is subject to certain conditions and is exclusive to the present owner or identified person/s and is not transferrable past the expiry date of 30 June 2012.

Okia provides an excellent education opportunity for schools, educational institutions and the public. The Department of Conservation educational resource guide on Okia (see appendix for details) provides a valuable source of ideas and information for school groups.

The cultural and historical heritage of the Reserve also attracts visitors to the site. While there is currently some opportunity for visitors to learn about the significance of the area for Maori, and about the historical use of the site, there is an opportunity to increase the public’s ability to access such information by interpretation and education. (See also 5.4.2(3))

Although some enhanced visitor facilities may be provided for, the Committee does not intend to develop the reserve in any significant way because the Reserve is one of the few large areas of open coastal land in the Otago Peninsula area. Protecting and preserving the wildlife and solitude of the area is of paramount importance.

5.2 Access

5.2.1 Objectives

1. To allow and provide for public access where consistent with the aim of protecting the reserve values, particularly wildlife values, habitat and cultural values.
2. To ensure that fencing, tracks and plantings allow for the effective management of public access.

5.2.2 Policies

1. Constraints or prohibitions on public access may be used when reserve values are at risk. Any reserve closures will be implemented through advice to visitor centres, signs and public advertisements.
2. Public access will be limited to pedestrians and non motorised cyclists only. Motor vehicle access, including cars, four-wheel drives and motorcycles will be prohibited unless authorised by the Okia Reserve Management Committee.
3. The Dick Road access to the reserve (NZMS 260, I/J 44) will be promoted as the means of gaining entrance to the reserve. This will be by the way of information provided to visitors centres, on brochures, and interpretative material.
4. The Management Committee may carry out a planting programme designed to constrain or prohibit access to vulnerable sites.
5. No dogs or horses will permitted in the reserve unless specifically authorised by the Okia Reserve Management Committee.
6. The carrying or discharging of firearms is prohibited in the reserve unless specifically authorised by the Okia Reserve Management Committee for management purposes.

5.3 Visitor Facilities

5.3.1 Objectives

1. To provide for visitor facilities at a level that encourages casual passive enjoyment of the coastal environment.
2. To ensure visitor facilities do not detract from the natural character of the reserve.

5.3.2 Policies

1. The Okia Reserve Management Committee will prepare a development plan in line with the management objectives of this plan. As part of this process, the procurement of an external report on visitor management and facility development will be investigated. Consideration will be given to the provision of tracks, accessways, seating, toilets, car parking, site interpretation and signage.
2. Visitors will be encouraged to keep to the marked tracks through the use of signs and brochures.
3. The use of signs will be kept to a minimum, but will be consistent with the need to provide visitor information and interpretation.
4. Consistent reserve signage will be used throughout the reserve.
5. Before any new track development occurs, the Okia Reserve Management Committee will arrange for a needs analysis in consultation with Te Rūnanga o Ōtākou. New track development will be consistent with the Dunedin City Council's Track Strategy.
6. Camping is not permitted on the reserve.
7. Campervan travellers will be encouraged to use serviced campervan parks such as at Portobello. (Suitable signs will be required)
8. A track counter will be maintained at Dick Road and ways of improving the accuracy of information provided will be investigated.

5.4 Interpretation, Education and Filming

5.4.1 Objectives

1. To educate the public by way of signs and appropriate interpretation.
2. To ensure the provision of informative and accurate interpretative publicity material that reflects the management aims for Okia Reserve.
3. To promote awareness about threats to wildlife and to minimise visitor disturbance of wildlife.

5.4.2 Policies

1. An education and interpretation plan will be included in any development plan.
2. On-site interpretation will be provided at major viewing points and significant historic sites to which visitors have open right of access.
3. Presentation of Kai Tahu, Kati Mamoe and Waitaha history and values will be determined in direct consultation and partnership with Te Rūnanga o Ōtākou.
4. Permits for filming will be considered by the Management Committee as outlined in section 4.5 New Activities or Proposals and in accordance with the following criteria:
    i) The purpose must have clear benefits for conservation and/or education and/or the management aims; and
    ii) All film shots must be archived to enable monitoring of habitat changes, erosion, etc.

5.5 New Activities or Proposals

This section focuses on the process of considering applications to undertake any new activities or proposals, including commercial activities on the reserve. (Refer also to Section 3.5 Research and Monitoring)

New activities or proposals may include any new recreational pursuits, events or activities not referred to in other parts of this plan. The term 'commercial activities' refers to any activity that requires payment greater than the cost of the provision of the service, with the intention of making a commercial gain for the permit holder.

The most common commercial activities are likely to be:

- Recreational tourism activities, e.g. guided nature/ wildlife/sightseeing or walking tours;
- One-off events, e.g. sporting events; and
- Filming/photography.

In considering any application, the Okia Committee will give consideration to the wider management aims of the reserves. This means that a number of considerations will need to be taken into account. Primarily this will be the protection of native wildlife species and their habitats, but also the aims relating to landscape values, recognition of the exercise of kaitiakitanga by Te Rūnanga o Ōtākou, and the protection and conservation of historical and cultural sites.

Fees for undertaking the activity will be set on a case by case basis and will take into account charges other agencies such as DOC and DCC set for commercial activities on reserve land. The processing of permits requires additional staff time and costs so application processing fees will be also be set and is dependant on the scale of the activity.

All commercial tour operators visiting a site to view marine mammals also require a Marine Mammal Viewing Permit. These permits are administered by DOC under the Marine Mammals Protection Regulations 1992 and can apply to shore-based operations as well as vessel-based operations.

5.5.1 Objectives

1. To ensure any new activities, proposals or commercial use undertaken on the reserve do not impact on reserve values, particularly the protection of native wildlife species, their habitats and the protection of cultural values.

5.5.2 Policies

1. Any new activities, proposals, or commercial use within the reserve will be considered on a case by case basis and will only be permitted with the prior written consent of the Okia Reserve Management Committee.
2. In considering any application the Committee will assess the proposal against the following criteria:
   a) Purpose of the proposal/new activity
      - Does the proposal add to public appreciation and understanding of the natural values, primarily native wildlife species, of Okia?

   b) Impacts on wildlife, landscape, cultural and historical values
      - Does the applicant show an understanding of the potential impacts of the proposal on native wildlife and their habitats?
        - How will the applicant ensure that any such impacts are mitigated or minimised?
      - Will the proposal/activity have an effect on the landscape values of the reserve? How will these impacts be mitigated or minimised?
      - Will the proposal/activity have an effect on wahi tapu, wahi taonga, traditional, archaeological and historic sites? How will these effects be minimised or mitigated?

   c) Existing Use
      - How will the proposed activity be integrated with existing use at the site?
3. In addition to the above, the Okia Committee will need to be satisfied that the applicant has the ability to undertake the proposal in a business-like and professional manner.
4. Conditions of consent from the Okia Committee may include a requirement that proposals will be undertaken stage by stage, with each stage involving the least overall change possible in practical terms so that impacts can be evaluated.
5. The conditions of any permit granted will be monitored by any Yellow-eyed Penguin Trust, DCC or DOC staff who are on site when activities are operating. The Okia Reserve Management Committee may revoke any permit if the conditions are not being met by the operator.
6. Fees for undertaking activities may be applied and will be in line with DCC and DOC fees and charges policy.
7. The processing of permits requires additional staff time and costs so application processing fees will be also be set at a level commensurate with the scale of the activity.
8. Any permit fees and charges will go towards offsetting the costs of providing and managing the Reserve.
9. The Okia Reserve Committee may review these criteria and conditions from time to time.

5.6 Occupation Agreements

5.6.1 Objectives

1. To remove all existing occupations of the Reserve except those required by the Okia Reserve Management Committee for the implementation of the aims, objectives and policies of the Management Plan.

5.6.2 Policies

1. Existing occupation agreements will be honoured until 30 June 2012. All existing occupation agreements are bound by the terms and conditions

of their licence to occupy and no extensions or changes will be permitted.

2. No new residential occupation agreements will be entered into.

5.7 Cultural use

5.7.1 Objectives

1. To provide for the use of cultural materials such as plant material, feathers and bone in a manner consistent with the aims of this management plan and with statutory instruments such as the Marine Mammals Protection Act 1978, the Wildlife Act 1953, the Conservation Act 1987 and the Ngāi Tahu Claim Settlements Act 1998.
2. To enable Te Rūnanga o Ōtākou to exercise kaitiakitanga over cultural materials consistent with Allocation of Cultural Materials Guideline (2007), prepared by Toitū Te Whenua – Te Rūnanga o Ngāi Tahu and the Department of Conservation.
3. To recognise and give effect to the principles of the Treaty of Waitangi.

5.7.2 Policies

1. The management committee will work with Te Rūnanga o Ōtākou to develop cultural resources on the Okia Reserve.
2. The management committee will develop an information base in conjunction with Te Rūnanga o Ōtākou to facilitate the sustainable management of cultural materials.
3. The management committee will work in partnership with Te Rūnanga o Ōtākou in making decisions on the issue of cultural materials.

5.8 Commemorative Plaques and Sponsorship

5.8.1 Objective

1. To minimise personal associations of areas, sites, or facilities within Okia.

5.8.2 Policies

1. Existing commemorative plaques and plantings will remain but no new plaques or plantings will be established.
2. Activities such as the establishment of personal memorials, the naming of specific areas and the interment of placenta or ashes are inconsistent with the cultural values of Okia Reserve and will not occur within the Reserve.
3. Sponsorship or substantial contributions to reserve development or enhancement may be recognised by way of public acknowledgment or other means and at the discretion of the Management Committee.

6. Administration

The Yellow-eyed Penguin Trust and the Dunedin City Council jointly purchased the 231 hectare property in 1991 and in August of that year signed a memorandum of encumbrance with the Minister of Conservation, which established the purposes for which the reserve was to be managed, the form of the management committee, and required the preparation of a management plan to guide management of the reserve. The management committee has seven members; three from the Yellow-eyed Penguin Trust, two from Dunedin City Council and one each from the Department of Conservation and Te Rūnanga o Ōtākou, in recognition of the department's role and expertise in protecting natural and historic resources and recognising the role of the Rūnanga as Kaitiaki of the area. In 2007 a representative from the New Zealand Sea Lion Trust was invited to attend all Okia Reserve Management Committee meetings and have speaking rights only.

The reserve adjoins a number of properties, including grazed pasture to the west, shrublands to the north and a private road (Taiaroa Road) following the coastal margin.

6.1 Plan Administration, Implementation and Review

6.1.1 Objectives

1. To achieve lawful, efficient and effective delivery of the management aims and objectives of this plan.
2. To ensure that the plan administration is consistent with the Memorandum of Encumbrance and the stated Aims for this reserve.

6.1.2 Policies

1. The Okia Reserve Management Committee will meet no less than 4 times per year. A table summarising all the policies in this plan will be attached to the agenda of each Management Committee meeting for reference.
2. Annually the Management Committee will assess progress in meeting the objectives of this plan, using the policy summary table as a guide, and will prepare a work plan and budget outlining major implementation tasks for the following year.
3. Within five years of this plan being adopted the Management Committee will internally assess the plan for relevance and usefulness. If the plan's objectives and policies require significant amendment the review of the plan will be brought forward.
4. A comprehensive review of this plan and its overall aim will be carried out at 10 yearly intervals. The 10 yearly intervals will commence on the day the management plan is adopted.
5. Public comment on the comprehensive review of this plan will be sought.

6.2 Finances and Budgets

6.2.1 Objective

1. To ensure that Okia Reserve is managed to maximise the benefit from available resources.

6.2.2 Policies

1. An annual budget for each financial year will be prepared and considered by the Okia Reserve Management Committee in October of each year.
2. A finance subcommittee will be established so that any resource requirements can be included in the budgets of the joint owners.
3. A formal agreement between the DCC and YEPT will be established to clarify financial input from joint owners.
4. The Okia Reserve Management Committee will research and actively pursue possible sources of funding for managing the Reserve (other than funds currently supplied by the joint owners).
5. Annually, the Management Committee will review proposed or forecasted expenditure for the following three years.

6. The Okia Reserve Management Committee will hold an annual planning and budgeting meeting.
7. A 10 year indicative budget should be prepared to reflect the implementation of tasks arising from this management plan.
8. Any permit fees and charges will go towards offsetting the costs of providing and managing the reserve.

6.3 Adjoining landholders

6.3.1 Objectives

1. To have good lines of communication with adjoining landholders and encourage them to engage with the Management Committee.
2. To promote awareness of the aims for Okia Reserve and to gain the support of adjoining landowners in achieving management objectives.

6.3.2 Policies

1. The Okia Reserve Management Committee will keep adjoining landholders informed of management decisions in respect to the Reserve and to co-operate with neighbours where appropriate on matters of mutual interest, for example pest control, fencing, access, fire fighting, biodiversity.
2. The Management Committee will develop a communication strategy to include and update neighbours of activities occurring on the Reserve.
3. The Management Committee will consider any opportunities for acquiring an interest any adjoining land as they arise.

(see also Fire Risk Management Policies – section 3.4)

6.4 Enforcement

6.4.1 Objectives

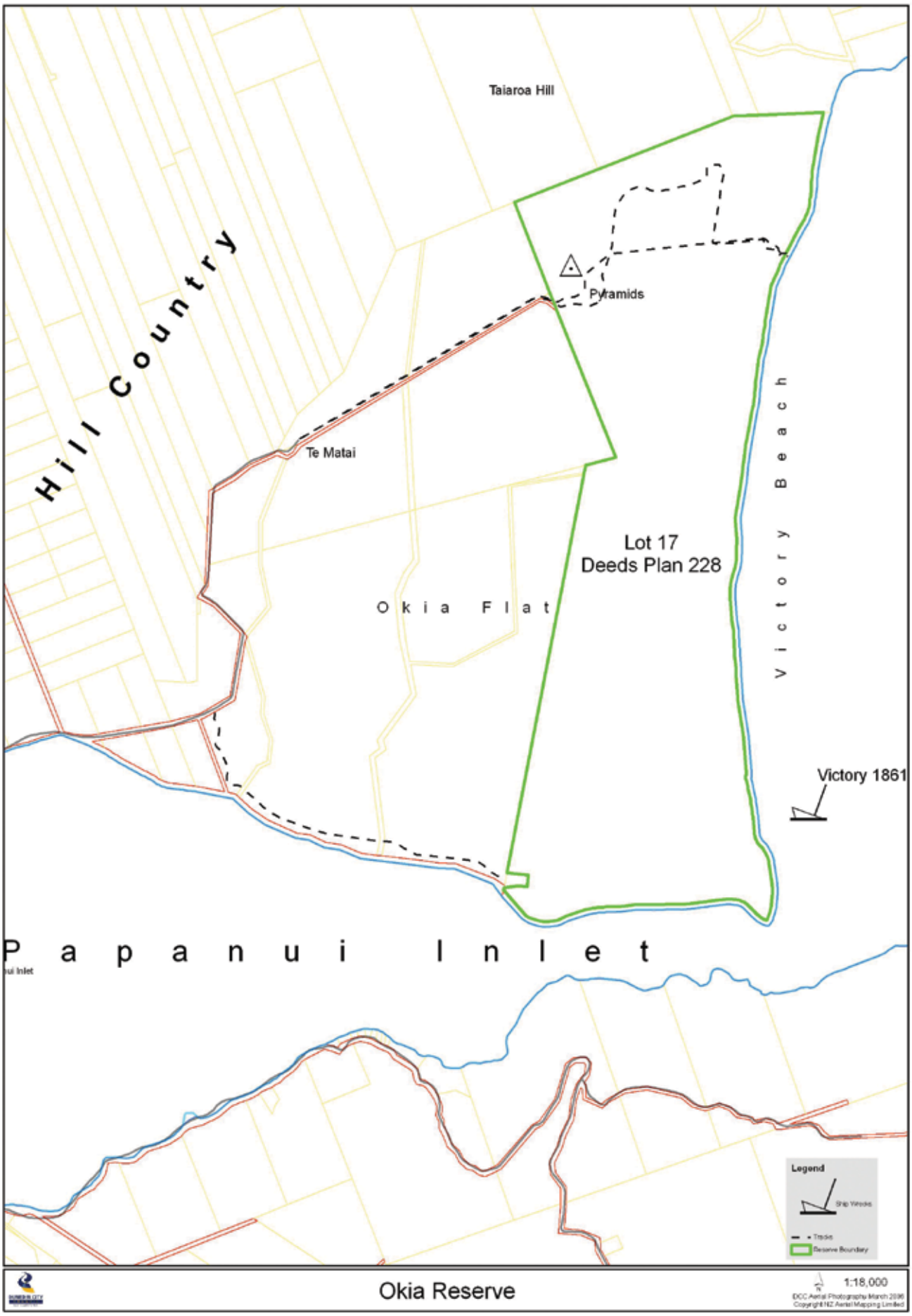
1. To enforce the provisions of this plan where necessary and appropriate, recognising that the enforcement provisions of the Reserves Act are not available at Okia Reserve.

6.4.2 Policies

1. The provisions of this management plan will be enforced through administrative and legal processes as required.
2. Media releases may be used as a tool for raising awareness about offences.
3. Symbols indicating prohibited activities may accompany reserve name signs.
4. The Okia Reserve Management Committee will encourage reserve neighbours and users to report suspected offences on reserves to the Council and/or the Police where appropriate.
5. Where damage is caused to any part of the Reserve or any facility within the Reserve, and the person causing the damage can be clearly identified, the management committee will seek to recover the costs of repairing the damage from that person.
6. Where an individual can be identified as a repeat offender, the Management Committee may consider prosecution through the courts.

Appendix 1 *Locality Map*

Appendix 1 *Cadastral Map*



Appendix 2

Memorandum of Encumbrance

ix) Deed of Encumbrance

MEMORANDUM OF ENCUMBRANCE FOR SECURING A SUM OF MONEY

THE DUNEDIN CITY COUNCIL a local authority within the meaning of the Local Government Act 1974 as to a five-sixteenth share and the YELLOW EYED PENGUIN TRUST a charitable trust incorporated under the Charitable Trusts Act 1957 as to an eleven-sixteenth share being registered as proprietors as tenants in common in the said shares of an estate in fee simple subject however to such encumbrances liens and interests as are notified by Memoranda underwritten or endorsed hereon in that parcel of land containing 231.1223 ha more or less being part Lot 7 Deeds Plan 228 and being all the land comprised in Certificate of Title 320/159 (Otago Registry) (Limited as to Parcels) Together with Right of Way over all roads coloured yellow on the said plan 228, Drainage Rights over part Lot 6 both granted by Conveyance 64488 and Right of Way over another part Lot 6 reserved by Conveyance 64487 and Subject to Outstanding Deed 158809 (hereinafter called "the said land").

AND desiring to render the said land available for the purpose of securing to and for the benefit of THE MINISTER OF CONSERVATION the rent charge hereinafter mentioned do hereby encumber the said land for the benefit of THE MINISTER OF CONSERVATION with the annual rent charge of TEN DOLLARS ($10.00) to be raised and paid at the times and in the manner following that is to say in one annual sum on the 1st day of November 1991 and on the 1st day of November in every year thereafter PROVIDED ALWAYS that if during the twelve months immediately preceding the 1st day of November in any year there shall have been no breach of any of the obligations of the Deed of Covenant a copy of which is set out in the Schedule hereunder written then the annual rent charge payable on such 1st day of November shall be reduced to ONE DOLLAR ($1.00) PROVIDED ALSO that if and whenever the obligations set out in the said Deed shall have been duly and wholly complied with or shall by effluxion of time or otherwise become no longer enforceable then this Memorandum of Encumbrance shall be wholly discharged by the Encumbrancer.

AND subject as aforesaid THE MINISTER OF CONSERVATION shall be entitled to all the powers and remedies given to mortgagees and rent chargees by the Land Transfer Act 1952 and the Property Law Act 1952.

THIS DEED made the 26th day of August 1991.

BETWEEN THE DUNEDIN CITY COUNCIL a local authority within the meaning of the Local Government Act 1974 and the YELLOW EYED PENGUIN TRUST a charitable trust incorporated under the Charitable Trusts Act 1957 (hereinafter called "the Owners") of the first part.

AND THE MINISTER OF CONSERVATION (hereinafter called "the Minister") of the other part.

WHEREAS

A. The Owners are or are about to become the registered proprietors as tenants in common of all that parcel of land containing 231.1223 ha more or less being part Lot 7 Deeds Plan 228 and being all the land comprised in Certificates of Title 320/159 (Otago Registry) (Limited as to Parcels) Together with Right of Way over all roads coloured yellow on the said plan 2284, Drainage Rights over part Lot 6 both granted by Conveyance 64488 and Right of Way over another part Lot 6 reserved by Conveyance 64487 and Subject to Outstanding Deed 158809 (hereinafter called "the said land").

B. The Owners have agreed with the Minister that the said land will be managed so as to conserve and protect the specific values of the said land which are listed in clause 1 of this Deed.

C. The Owners have agreed to enter into this Deed so as to bind themselves to the agreement reached with the Minister referred to above.

NOW THIS DEED WITNESSES that in pursuance of the said agreement the Owners covenant with the Minister as follows:-

1. THE said land will be managed primarily to conserve and protect the values of the said land which values include:-

(a) Wildlife and Nature Conservation
(b) Ecological
(c) Landscape
(d) Historical
(e) Archaeological and Cultural
(f) Recreational
(g) Educational

2. FORTHWITH upon the Owners becoming the registered proprietors of the said land the Owners will form a management committee to manage the said land in accordance with clause 1 hereof. The management committee shall comprise the following:-

(a) Three representatives from the Yellow Eyed Penguin Trust.
(b) Two representatives from the Dunedin City Council.
(c) One representative from Te Runanga Otakou Incorporated an incorporated Society under the Incorporated Societies Act 1908.
(d) One representative from the Department of Conservation.

The management committee shall have the power to obtain advice from experts in the relevant field as required.

3. THE management committee referred to in clause 2 hereof shall meet on a regular basis and shall make management decisions in respect of the said land in accordance with the objectives set out in clause 1 hereof.

4. THE management committee shall as soon as possible arrange for the preparation of a management plan for the said land which shall be advertised for public comment before such management plan is formally approved and accepted by the Owners, Te Runanga Otakou Incorporated and the Minister of Conservation. Prior to the approval and acceptance of the management plan the management committee shall meet on a regular basis to assist in the formulation of the management plan and to gauge the public comment which it receives in respect of the management plan. From and upon approval and acceptance of the said management plan by the Owners, Te Runanga Otakou Incorporated and the Minister of Conservation the said land will therafter be managed in accordance with the said management plan.

5. EACH of the Owners will not without first obtaining the prior written approval of the remaining Owner mortgage encumber sell exchange lease let or part with the possession of its share of the said land.

6. IF consent in accordance with clause 5 hereof is granted to the sale of any one of the Owners shares in the said land the Vendor shall obtain from the Purchaser thereof a Deed of Covenant between such Purchaser and the Minister containing the same covenants as are contained herein and also the

further covenant that should such Purchaser in turn sell or transfer the share purchased by the Purchaser in the said land then such Purchaser will forthwith obtain the execution by the sub-purchaser of a like Deed of Covenant with the Minister and so on with every succeeding sale or transfer of any share held by any of the Owners in the said land.

7. THE Owners will execute a Memorandum of Encumbrance over the said land to secure performance of its obligations under these presents.

8. ALL costs of and incidental to this Deed and the lodging of a Memorandum of Encumbrance shall be borne by the Owners.

IN WITNESS WHEREOF these presents have been executed the day and year first before written.

THE COMMON SEAL of THE DUNEDIN CITY COUNCIL was hereto affixed in the presence of:)

DUNEDIN CITY COUNCIL The Common Seal Of

.....
Mayor

.....
Group Manager,
Corporate Services

THE COMMON SEAL of the YELLOW EYED PENGUIN TRUST was hereto affixed in the presence of:)

.....

.....

Appendix 3

Wildland Consultants' Ecological Assessment of Okia Reserve 2008

ECOLOGICAL ASSESMENT OF
OKIA RESERVE,
OTAGO PENINSULA

DECEMBER 2008

Report No. 2092

Prepared for:

DUNEDIN CITY COUNCIL
PO BOX 5045
50 THE OCTAGON
DUNEDIN

Wildland CONSULTANTS

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CONTENTS

PROJECT TEAM

Steve Rate - project management, field survey, report preparation.
Roger Bawden - GIS mapping.
Kelvin Lloyd - report review.

Reviewed and approved for release by:

W.B. Shaw
Director/Principal Ecologist
Wildland Consultants Ltd

RECOMMENDATION SUMMARY

The following recommendations are made, with management priorities based on funding levels. High priority management activities should be instigated even when funding is low. Lower priority activities, although still ecologically desirable, can only be carried out with high levels of funding. However, they should not be pushed aside and forgotten, but incorporated into the management plan and undertaken when funding is available.

Yellow-eyed penguin management (Very High Priority)

- Continue yellow-eyed penguin population monitoring.
- Continue pest animal control for yellow-eyed penguin
- Continue planting of indigenous vegetation to restore penguin habitat
- Continue to discourage access by members of the public to yellow-eyed penguin nesting areas.

Administration (High Priority)

- Prepare a preliminary budget and apply for funding to undertake restoration activities.

Boundary Issues (High Priority)

- Resolve boundary and grazing issues in the north of the reserve.

Monitoring (High Priority)

- Continue current monitoring.
- Monitor weeds, threatened plant populations, vegetation condition, and gross vegetation change using photopoints, walk through surveys, and GIS.
- Monitor populations of threatened birds and lizards.

Weed control (High-Medium Priority)

- Maintain current levels of weed control (High).
- Increase control of woody weeds within the reserve and follow the set goals and time scales for control/eradication of each species (Medium).

Additional pest control (Medium Priority)

- Expand pest control to include pest animals such as possums, hedgehogs, rats, and rodents.
- Extend pest animal control to The Pyramids and Taiaroa Bush.

Grazing (Medium Priority)

- Discontinue grazing on Okia Flat.
- Maintain fire breaks by mowing.

Restoration planting/habitat restoration (Low priority)

- Continue planting of indigenous vegetation on the Margaret Hazel Slope.
- Plan for and progressively undertake indigenous vegetation and habitat restoration from beach/foredune to rear dune forest communities, including establishment of low-stature ecotonal vegetation suitable for fernbird habitat.

1. INTRODUCTION

The Okia Reserve Management Committee is currently reviewing the management plan for the Okia Reserve, a 231 ha tract of coastal cliff, forest, and sand dune habitats on the Otago Peninsula. The reserve is a key breeding habitat for nationally vulnerable yellow-eyed penguin (*Megadyptes antipodes*) and a haul-out site New Zealand sealion (*Phocarctos hookeri*). Dune hollows previously provided habitat for coastal turf communities under a grazing regime, but cessation of grazing in 1991 appears to have resulted in these communities being overtaken by rank grass and bracken. The Committee now requires a comprehensive assessment of Okia Reserve's ecological values, and how they should be managed. This report provides:

- An updated assessment of the habitat-types, biological associations, flora and fauna, and natural values within the reserve;
- Maps of the location and extent of the above within the reserve; and
- Suggested approaches for future management of the reserve.

2. METHODS

This report is based on a desktop review of current information and a field survey and assessment of vegetation and habitats within the reserve. The desktop review involved compilation and assessment of relevant literature on terrestrial vegetation, indigenous fauna, and fisheries within or adjacent to the site and liaison with the Yellow-eyed Penguin Trust.

A field survey was undertaken to inspect, describe, evaluate and map the indigenous vegetation in the reserve. In particular, important fauna habitats within the site were assessed and mapped and plant and animal pests present in and adjacent to the reserve were identified. Based on the results of the literature search and field survey, the significance of ecological values was assessed and recommendations were made for the management and monitoring of these values. GIS-based maps of the site, showing the above features, were also compiled.

3. GENERAL DESCRIPTION

The 231 ha Okia Reserve is located on the Otago Peninsula, *c*.27 km from Dunedin and *c*.7 km from Portobello. It lies within Dunedin Ecological District (Dunedin ED) in the Otago Coast Ecological Region. The topography of the Dunedin ED is characterised by volcanic hills, and the climate is moist (700-1200 mm p.a.) and coastal. The original forest vegetation at this site would probably have comprised matai-totara-rimu/mahoe-lacebark on dry coastal hills (McEwen 1987), matai-totara forest on dunes, and indigenous coastal forest and scrub on steep slopes and cliffs.

Today, the reserve comprises young dunes along the face of Victory Beach, a series of older dunes and dunes hollows reflecting previous shorelines across Okia Flat, and weathered basalt rock stacks (The Pyramids) and cliff faces that are part of Otago

Peninsula's volcanic history. Vegetation comprises a mixture of exotic and indigenous species, reflecting remnant vegetation and the relatively recent change from farming to reserve status.

Only *c*.5% of the original indigenous forest and scrub vegetation remains on Otago Peninsula, and the Okia Reserve is located within an 'Acutely Threatened' land environment with less than 10% of its indigenous cover left (Walker *et al*. 2007). There is little protected land in the vicinity of the Okia Reserve, the closest being two coastal QEII covenants of *c*.30 ha each (Figure 1). These are located 2.8 km to the southwest and 1.5 km to the northeast, and are also in Dunedin ED. Covenant 5/12/031 to the northeast appears (from assessment of an aerial photograph) to contain cliffs, dunes, wetlands, scrub, pasture, and hillslope forest remnants. Covenant 5/12/054 (DCC SNA sites 14, 15, and 16) to the southwest comprises hillslope kanuka forest with emergent Hall's totara, saltmarsh, plantation forest, broadleaved forest, exotic grassland, and indigenous and exotic scrub.

The site adjoins Papanui Inlet, which provides important habitat for shore birds and migrant waders (McEwen 1987). It is also an important nursery for flatfish and has a significant population of cockles (Otago Regional Council 2001). Victory Beach is used by yellow-eyed penguins, southern little blue penguins (*Eudyptula minor minor*), New Zealand fur seals (*Arctocephalus forsteri*), New Zealand sealions, and very occasionally by southern elephant seals (*Mirounga leonine*).

Figure 1: Location of Okia Reserve (boundary marked with black line) on Otago Peninsula. The locations of two nearby QEII covenants are marked with red dots.

4. VEGETATION AND HABITATS

Vegetation in Okia Reserve reflects environmental gradients of wind, moisture, and salinity, historical impacts such as grazing and fire, and current management which includes grazing, indigenous planting, and weed control. In general, foredunes are covered in marram (*Ammophila arenaria*) grassland, with lupin (*Lupinus arboreus*) scrub dominating from the first dune hollow to *c*.200 m inland from the beach. Trees such as ngaio (*Myoporum laetum*) and cabbage tree (*Cordyline australis*) are occasionally present on the rear of the second main dune ridge and its associated dune hollow. Further inland, lupin scrub grades into a mosaic of bracken (*Pteridium esculentum*) fernland on dune ridges, exotic grassland in dune hollows, and scattered sedgeland, rushland, and flaxland in wetter areas. The Pyramids (former coastal rock stacks prior to coastal aggradation) provide habitat for broadleaved forest, indigenous scrub dominated by *Helichrysum lanceolatum* and *Coprosma crassifolia*, and rock face and talus slope habitats. A small part of Taiaroa Bush is present in the northern part of Okia Reserve and contains narrow-leaved lacebark (*Hoheria angustifolia*) forest, broadleaved forest, and scrub on rocky faces. Broad vegetation types are mapped in Appendix 1.

4.1 Broadleaved forest

On the little pyramid, canopy species comprise kohuhu, mahoe (*Melicytus ramiflorus*), broadleaf, ngaio, and mapou. The understorey is dominated by ongaonga (*Urtica ferox*), elder, mapou, and *Coprosma crassifolia*. Grondcover species include hounds tongue fern (*Microsorum pustulatum*). New Zealand spinach, with *Asplenium appendiculatum* on a rocky talus substrate.

Broadleaved forest on the big pyramid is similar to that found on the little pyramid, with mahoe, kohuhu, mapou, ngaio, and broadleaf, but it also contains kowhai (*Sophora microphylla*) on the higher south-west facing slopes. Elder (*Sambucus nigra*) is common around the base of the pyramid and is scattered in habitats about half way up to the summit. Patches of forest located in pasture to the north of the big pyramid are dominated by broadleaf, mahoe, ngaio, pohuehue, and elder, with ongaonga, *Coprosma crassifolia*, *C. propinqua*, and poroporo also present.

Broadleaved forest on steep hillslopes in Taiaroa Bush comprises mahoe, kohuhu, ngaio, broadleaf and elder. Further east on rocky talus slopes, forest comprises broadleaf, elder, and (further east again) mahoe over a groundcover of *Earina autumnalis*, hounds tongue fern, moss, *Asplenium appendiculatum*, and lichen. There are scattered *Coprosma crassifolia*, *Corokia cotoneaster*, ongaonga, and *Helichrysum lanceolatum* in the understorey.

Figure 2: Broadleaved forest on the southern side of the little Pyramid.

Figure 3: Broadleaved forest on the lower slopes of the big Pyramid.

4.2 Narrow-leaved lacebark forest

At lower elevations in Taiaroa Bush, canopy species comprise abundant narrow-leaved lacebark, common pohuehue, and scattered broadleaf, mahoe, and ngaio. Scattered putaputaweta (*Carpodetus serratus*) and elder are present in the subcanopy. The understorey contains frequent ongaonga and *Coprosma areolata* and scattered fuchsia (*Fuchsia excorticata*), supplejack (*Ripogonum scandens*), *Coprosma crassifolia* and *C. propinqua*. Single specimens of poataniwha (*Melicope simplex*) and Hall's totara were observed. Indigenous groundcover species include *Polystichum neozelandicum* subsp. *zerophyllum*, prickly shield fern (*P. vestitum*), *Acaena juvenca*, hounds tongue fern, *Stellaria parviflora*, *Hydrocotyle heteromeria*, and button fern (*Pellaea rotundifolia*), but north of a fenceline, canopy gaps are common, and the groundcover in these areas comprises weedy pasture species such as creeping buttercup (*Ranunculus repens*), thistles (*Cirsium* spp.), cleavers (*Galium aparine*), chickweed (*Stellaria media*), *Nemesia floribunda*, and mouse-ear chickweed (*Cerastium fontanum*). This part of the forest is currently grazed by cattle and is in poor condition.

Figure 4: Grazing by cattle has resulted in poor condition forest in Taiaroa Bush.

Figure 5: Broadleaved forest with a groundcover of hounds tongue fern and *Earina autumnalis* in Taiaroa Bush.

4.3 Plantation forest

Plantation forest of *Pinus radiata* is present in the south-eastern part of the site. Elder is scattered throughout the open understorey, but is common on forest margins. The groundcover comprises litter with scattered plants of New Zealand spinach, hounds tongue fern, *Asplenium appendiculatum*, and shore spleenwort (*A. obtusatum*).

A small area of macrocarpa (*Cupressus macrocarpa*) forest is present on the south-western boundary of the site. Litter and bare ground dominate the groundcover, but scattered kanuka (*Kunzea ericoides*), bracken, seedlings of mapou and macrocarpa, New Zealand spinach, catsear, cocksfoot, shore spleenwort, and hounds tongue fern are present. Some macrocarpa have been felled and cut up for firewood.

4.4 Elder treeland

Elder trees and shrubs are emergent over lupin, bracken, and patches of marram and other exotic grasses on old dunes in the southern part of the site.

Figure 6: Elder treeland over bracken and exotic grasses at the southern end of Okia Flat.

4.5 *Helichrysum lanceolatum-Coprosma crassifolia* scrub and shrubland

Scrub and shrubland of abundant *Helichrysum lanceolatum* and *Coprosma crassifolia*, with frequent *Corokia cotoneaster* is present on The Pyramids and the rocky cliff near Taiaroa Bush. Mapou (*Myrsine australis*), broadleaf (*Griselinia littoralis*), lupin, flax (*Phormium tenax*), porcupine shrub (*Melicytus alpinus*), and bracken are scattered

throughout. One Hall's totara (*Podocarpus hallii*) was observed on the north-facing slopes of the little pyramid and *Carmichaelia petriei* is present on the big pyramid. Indigenous groundcover species include *Einada allanii*, New Zealand spinach (*Tetragonia implexicoma*), *Gaultheria antipoda*, silver tussock (*Poa cita*), and *Poa astonii* on steep rock faces. Weeds present include browntop (*Agrostis capillaris*), cocksfoot (*Dactylis glomerata*), sweet vernal (*Anthoxanthum odoratum*), *Nemesia floribunda*, catsear (*Hypochaeris radicata*), mouse-ear hawkweed (*Hieracium pilosella*), vetch (*Vicia sativa*), purple groundsel (*Senecio elegans*), and sheep's sorrel (*Rumex acetosella*), but indigenous species are dominant. Some areas of bare rock are included in this type.

Figure 7: Indigenous scrub on the top of the big Pyramid.

4.6 Lupin scrub

Lupin scrub is present mostly on older dunes within *c.*200 m of Victory Beach. It is generally bounded by marram grassland towards the sea and by bracken fernland or exotic grassland further inland. Lupin scrub also extends to the western boundary of Okia Reserve in its mid-reaches. Associate canopy species include bracken, scattered poroporo (*Solanum laciniatum*) and flax, pohuehue (*Muehlenbeckia australis*) - which is especially dense alongside Papanui Inlet - and frequent elder (*Sambucus nigra*) directly behind the youngest dune. The groundcover comprises sand, cocksfoot, chickweed, cleavers, ripgut brome (*Bromis diandrus*), marram, and scattered thistles (*Cirsium* spp.), *Senecio biserratus*, *S. mimimus*, beaked parsley (*Anthriscus caucalis*), and New Zealand spinach. In the northern part of the site, rear dunes and hollows have been planted with cabbage tree, ngaio, kohuhu (*Pittosporum tenuifolium*), flax, and other indigenous species. The abundance of planted and naturally regenerated

indigenous species decreases to the south. There is a patch of gorse located within lupin scrub in the central part of the site.

Figure 8: Lupin scrub on dunes. A strip of marram grassland is visible just before the beach.

4.7 Manuka scrub

A very small area on the south western boundary of the reserve adjacent to macrocarpa forest contains manuka (*Leptospermum scoparium*) over bracken, *Gaultheria macrostigma*, and bryophytes.

4.8 Bracken fernland

Bracken fernland is present on older dunes and forms a matrix with exotic grassland and sedgelands, flaxlands, and rushlands in dune hollows, and lupin scrub nearer Victory Beach. The stands of bracken are very dense and appear to be suppressing the establishment of other low stature species. However, scattered emergent lupin, kohuhu, and flax are present, along with much less common gorse, tauhinu (*Ozothamnus leptophylla*), manuka, wilding pines, and mingimingi (*Coprosma propinqua*).

Figure 9: Bracken fernland (dark brown colour) is the dominant vegetation cover over most of Okia Flat.

4.9 Rushlands, sedgelands, and turfs

On Okia Flat, species commonly occurring in rushlands include *Juncus edgariae*, *J. sarophorus*, *J. effusus*, and *J. pallidus*. *Carex secta*, *C. coriacea*, and/or flax are sometimes present. Exotic grasses such as creeping bent (*Agrostis stolonifera*), cocksfoot, Yorkshire fog (*Holcus lanatus*), sweet vernal, and browntop are present throughout. Common herbaceous exotics include Californian thistle (*Cirsium arvense*), creeping buttercup (*Ranunculus repens*), and curled dock (*Rumex crispus*). *Juncus articulatus* is present in some rushlands to the south and *Glyceria declinata* was present in a small area of open water near The Pyramids. Indigenous herbs include uncommon *Gonocarpus micranthus* and *Centella uniflora*, and scattered *Ranunculus glabrifolius*. The moss *Sphagnum novo-zelandicum* was rarely recorded and when present appeared to be in poor condition. Scattered, small, and pure stands of oioi (*Apodasmia similis*) are also present.

Sedgeland species commonly occurring on Okia Flat include *Carex secta*, *C. virgata*, *C. coriacea*, and *C. dipsacea*. Large areas dominated by wiwi (*Ficinia nodosa*) are also present.

Turfs on dune hollow margins appear to be much reduced compared to the descriptions provided by Johnson (1993a). Some species typical of these communities were noted (*Centella uniflora*, *Gonocarpus micranthus*, *Nertera setulosa*) as well as *Lobelia anceps*, which is not listed by Johnson (1993a, 2004).

However there was very little vegetation that could be described as turf - most of this appeared to have been displaced by exotic grassland.

Figure 10: Extensive rushlands and sedgelands (outlined in red) east of The Pyramids.

Figure 11: Small example of rushland.

Figure 12: Small example of *Carex secta* sedgeland with flax and toetoe.

4.10 Flaxland

Dense, tall flax (*Phormium tenax*) occupies several seasonally wet hollows, mostly south of The Pyramids. Exotic grasses and herbs typify the intertussock vegetation. *Sphagnum novo-zelandicum* is present in one flaxland along with *Gaultheria macrostigma*, wiwi, *Helichrysum filicaule*, and *Gonocarpus micranthus*.

Figure 13: Flaxland surrounded by bracken fernland on Okia Flat.

4.11 Grassland

Grassland dominated by the exotic species sweet vernal, browntop, cocksfoot, and Yorkshire fog is present throughout Okia Flat, especially in older dune hollows, on hillslopes in the northwest of the site, and along tracks. Other common species include mouse-ear hawkweed, catsear, patotara (*Leucopogon fraseri*), *Helichrysum filicaule*, *Acaena novae-zelandiae*, and scattered silver tussock, wiwi, lupin, and bracken. In the northwest of the site (The Margaret Hazel Slope), extensive indigenous plantings have been undertaken in hillslope pasture. Plantings are discussed in more detail in Section 7.2.

Figure 14: Exotic grassland and indigenous plantings on the Margaret Hazel Slope.

Figure 15:Exotic grassland in dune hollow.

4.12 Marram grassland

Marram grassland is present on foredunes, at the estuary mouth, and at a few locations on Okia Flat. Foredunes are steep-faced, especially in the southwest of the site. Few other species are present on foredunes apart from purple groundsel. Further away from the sea lupin becomes more common. A small patch of pikao (*Desmoschoenus spiralis*) has been planted where the main track reaches the beach. A few sand tussock (*Austrofestuca littoralis*) and one Cook's scurvy grass (*Lepidium oleraceum*) have also been planted there.

Figure 16: Marram and lupin dominate dunes on the edge of Papanui Inlet. Abundant pohuehue is visible in the foreground.

4.13 Vegetation change 1982-2008

Since the surveys of Johnson (1982, 1993a) and the formation of the reserve, there appear to have been several changes in the distribution of habitats and plant species. There is some uncertainty about the type and extent of these changes due to the nature of the data presented in previous reports and different methods used. These changes appear to include:

- A decrease in the extent and quality of wetlands and turf communities:
  - Cover of exotic grasses has increased after removal of grazing pressure and lower rainfall in recent years.
  - Turf communities appear to have been largely lost through competition with exotic grasses, although a few characteristic species persist.
- An increase in abundance of some indigenous and exotic plant species, including:
  - Elder, particularly in the south of Okia Flat.
  - Natural regeneration of indigenous shrubs (e.g. kohuhu) and flax across Okia Flat.
  - The cover of bracken across Okia Flat.
  - Jointed wire rush on the western edge of Okia Flat.
  - Mouse-ear hawkweed on Okia Flat (especially in grazed areas).
- A decrease in the quality of narrow-leaved lacebark forest within Taiaroa Bush, due to heavy browsing by cattle.

- A change in the distribution and possibly an increase in abundance of gorse on Okia Flat.

5. FLORA

5.1 Species recorded

During the current survey, a total of 158 vascular plant species were recorded at the site, of which 103 (65%) were indigenous and 55 (35%) exotic (Appendix 2). Seven species of plants recorded at the site during current and previous surveys are classified as nationally threatened or uncommon (de Lange *et al.* 2004; Table 1), although only three of these is naturally occurring. In addition, *Neopaxia linearifolia* is listed as 'Data Deficient'. The pikao sites described in Johnson (1993b) were not relocated in the current survey, although access to these areas was difficult because of the sheer faces on the dunes. Likewise, habitats below high tide level within Papanui Inlet could not be visited due to the state of the tide. In addition, the short duration of the survey and its timing - when few plants were in flower - did not allow for the confirmation of all threatened and uncommon species records. Species not recorded during this survey, but previously recorded at the site (Appendix 2), may still be present.

Table 1: Threatened plant species recorded in Okia Reserve.

Species	Common Name	Threat Classification	Notes
Austofestuca littoralis	Sand tusssock	Gradual Decline	Planted; beach by main track
Carex cirrhosa		Gradual Decline	Damp turf near The Pyramids (Johnson 2004)
Desmoschoenus spiralis	Pikao	Gradual Decline	Planted; beach by main track and between The Pyramids
Drymoanthus flavus		Serious Decline	NE face of big pyramid (Johnson 2004)
Epilobium chionanthum		Gradual Decline	Ponds at centre of damp hollows, Okia Flat (Johnson 1993a)
Lepidium oleraceum	Cook's scurvy grass	Nationally Endangered	Planted; beach by main track
Olearia fragrantissima	Fragrant tree daisy	Sparse	Planted, Margaret Hazel Slope

Figure 17: Pikao (left), sand tussock (right), and Cook's scurvy grass (inset, rear of same dune) have been planted on the edge of Okia Reserve.

Johnson (2004) stated that Okia Flat/Wickliffe Bay had records for 33 plant species known only from one or two Otago Peninsula sites and The Pyramids had records for six plant species known only from one or two Otago Peninsula sites (Table 2).

Table 2: Indigenous plant species recorded at Okia Reserve that have been recorded at three or less sites on Otago Peninsula (Johnson 2004).

Species	Location	Number of Sites
Adiantum cunninghamii	Cliffs near Taiaroa Bush	3
Baumea rubiginosa	Dune hollows, central Okia Flat	2
Baumea tenax	Moist dune hollows, central and southern Okia Flat	1
Blechnum minus	Swamp kiokio	3
Callitriche petriei	Turf surrounding ponds beside The Pyramids	1
Carex cirrhosa	Damp turf at pond margin, near The Pyramids	1
Carex dipsacea	Okia Flat	3
Carex lessoniana	Okia Flat	2
Carmichaelia petriei	Big Pyramid	3
Celmisia gracilenta	Okia flat	3
Chionochloa rubra subsp. *cuprea*	Okia Flat	2
Dryomanthus flavus	NE face of the big Pyramid	2
Epilobium billardiereanum subsp. *billardiereanum*	Swamp, Okia Flat	2

Species	Location	Number of Sites
Euchiton involucratus	Okia Flat	2
Euchiton traversii	Okia Flat	1
Galium perpusillum	Turf around ponds by The Pyramids	2
Galium propinquum	In *Carex* swamp, Okia Flat	3
Gaultheria macrostigma	Okia Flat	1
Gentiana grisebachii	Beside boggy dune hollow, Okia Flat	3
Gonocarpus aggregatus	Moist dune hollows, Okia Flat	2
Gonocarpus montanus	Dry rocky ground near The Pyramids	2
Gratiola sexdentata	Shallow water, dune hollow, The Pyramids	2
Herpolirion novae zelandiae	Damp dune hollow, Okia Flat	1
Hydrocotyle hydrophila	Ponds at The Pyramids	3
Hydrocotyle novae zeelandiae	Okia Flat	3
Hypericum japonicum	Dune hollow by The Pyramids	2
Isolepis habra	Damp ground, near The Pyramids	1
Isolepis inundata	Wet dune hollow, Okia Flat	1
Juncus antarcticus	Dune hollow, The Pyramids	2
Juncus pusillus	Near The Pyramids	2
Juncus sarophorus	Okia Flat	1
Lachnogrostis tenuis	Rocky face big Pyramid	2
Lagenifera pumila	The Pyramids	3
Lemnor minor	Near The Pyramids	2
Lepidium oleraceum	Dune, Victory Beach	3
Lepidosperma australe	Okia Flat	2
Melicytus alpinus	The Pyramids	2
Microlaena stipoides	Rocky face, little Pyramid	3
Myriophyllum propinquum	Pond at The Pyramids	2
Myriophyllum triphyllum	Pond at The Pyramids	2
Neopaxia linearifolia	Moist turf, pond margin, The Pyramids	1
Nertera setulosa	Mist hollows, Okia Flat	3
Olearia fragrantissima	Planted in pasture	3
Pelargonium inodorum	East side of Okia Flat; eroded unstable sand amongst pasture and low bracken	1
Potamogeton cheesemanii	Near The Pyramids	3
Pratia perpusilla	Turf around ponds, Wickcliffe Bay	2
Ranunculus glabrifolius	Okia Flat	3
Schoenus maschalinus	Moist turf, Okia Flat	2
Scleranthus biflorus	Rock crevices, The Pyramids	2
Senecio quadridentatus	Rock outcrop, The Pyramids	2
Triglochin striata	Moist dune hollows, Okia Flat	3
Uncinia leptostachya	Top of big Pyramid	1
Vittadinia australis	Little Pyramid	1
Wolffia australiana	Near The Pyramids	1

Okia Reserve has five plant species that are listed in Appendix 16A 'Threatened Plants present on land within Dunedin City' and six plant species listed in Appendix 16B 'Important native tree species present on land within Dunedin City' of the Dunedin City District Plan (Table 3). Two further species listed in Appendix 16, small-leaved milk tree (*Streblus heterophyllus*) and matai (*Prumnopitys taxifolia*), were recorded by Johnson (1982) in Taiaroa Bush and may be present in the reserve, although they were not recorded in the current survey.

Table 3: Plant species recorded in Okia Reserve and listed in Appendix 16A 'Threatened Plants present on land within Dunedin City' and Appendix 16B 'Important native tree species present on land within Dunedin City' of the Dunedin City District Plan.

Species	Common Name	Appendix	Notes
Chionochloa rubra	Red tussock	16A	Recorded previously by Johnson (1982) on Okia Flat
Coprosma virescens		16A	Recorded previously by Johnson (1982) on The Pyramids. Dunedin has nationally significant populations
Hoheria angustifolia	Narrow-leaved lacebark	16B	Taiaroa Bush
Melicope simplex	Poataniwha	16B	Taiaroa Bush
Myoporum laetum	Ngaio	16B	Indigenous forest, dunes, planted
Olearia fragrantissima	Fragrant tree daisy	16A	Dunedin has nationally significant populations. Planted only
Plagianthus regius	Lowland ribbonwood	16B	Two specimens, lower eastern slopes of big Pyramid
Podocarpus hallii	Hall's totara	16B	Little Pyramid, Taiaroa Bush
Scandia geniculata	Scandia	16A	Little Pyramid; Dunedin has nationally significant populations
Sophora microphylla	Kowhai	16B	Big Pyramid and planted
Urtica ferox	Ongaonga; tree nettle	16A	Throughout indigenous forest; Dunedin has nationally significant populations

5.2 Pest plants

Several pest plants were identified in Okia Reserve (Table 4). All except blackberry (*Rubus fruticosus*) and lupin (*Lupinus arboreus*) have been the focus of previous control efforts. From the description provided by Johnson (1993), the number of plants and distribution of gorse on Okia Flat appears to have changed substantially since 1993. For example, the large patch of gorse recorded in the middle of the reserve in 2008 is not mentioned in 1993, and a 10 m wide patch recorded in 1993 near the main track to the beach was not observed in 2008. In general, it appears that gorse has been controlled well in the northern half of the reserve, but less well in the southern half of the reserve. Elder appears to have increased in abundance compared to previous surveys, especially in the south of the site. Wilding pines (*Pinus* spp.) were commonly encountered along the western boundary southern part of The Pyramids. Source populations of gorse and wilding pines are present in plantation forest to the west of the site and continuing reinvasion is likely without cooperation from neighbouring landowners. Establishment of an indigenous forest buffer in this area could also reduce invasion of woody weeds from this source. The general location of gorse, Scotch broom, and blackberry plants is mapped in Appendix 1.

Table 4: Pest plants recorded at Okia Reserve, October 2008.

Species	Common Name	Notes
Ammophila arenaria	Marram	Extensive on beach/foredunes
Cortaderia selloana	Pampas grass	A few plants in the south of site; sprayed with herbicide
Cupressus macrocarpa	Macrocarpa	A few trees and wildings in the southwest of Okia Flat
Cytisus scoparius	Scotch broom	A few widely scattered plants
Lupinus arboreus	Lupin	Very abundant on Okia Flat
Pinus pinaster	Maritime pine	A few plants in the southwest of Okia Flat
Pinus radiata	Radiata pine	Plantation in SE of site; wildings mostly east of plantation forest on western boundary; one tree on the big Pyramid
Rubus fruticosus	Blackberry	Small number of plants on edge of estuary in SW of site
Sambucus nigra	Elder	Widespread; dune hollows, forest, and Okia Flat
Ulex europaeus	Gorse	Patchy distribution; some sprayed; source populations in plantation forest to the west

6. FAUNA

6.1 Indigenous mammals

Three species of indigenous mammal have been recorded in Okia Reserve (Table 5).

Table 5: Indigenous mammals recorded within Okia Reserve. (Okia Reserve Management Plan 1998, http://www.doc.govt.nz/).

Species	Common name	Habitat/abundance	Threat status
Arctocephalus forsteri	NZ fur seal	Beach and rocks/occasional	Not Threatened
Mirounga leonina	Southern elephant seal	Beach and dunes/rare	Nationally Critical
Phocarctos hookeri	NZ sealion	Beach and dunes/occasional	Range Restricted

6.2 Pest animals

Rabbits (*Oryctolagus cuniculus*) are abundant at the site. Possums (*Trichosurus vulpecula*), cats (*Felis catus*), and mustelids (*Mustela* spp.) are being controlled as part of the yellow-eyed penguin habitat enhancement programme. Cattle (*Bos taurus*) graze forest in Taiaroa Bush and paddocks in the centre of Okia Flat. There have been studies of mice (*Mus musculus*) densities undertaken by University staff and students. Other pest animals such as rats (*Rattus* spp.) and European hedgehogs (*Erinaceus europaeus*) are also likely to be present.

Table 6: Pest animals recorded within Okia Reserve. (Okia Reserve Management Plan 1998, http://www.doc.govt.nz/, and #October 2008 survey).

Species	Common name	Habitat/abundance	Threat status
*Bos taurus**	Cattle	Taiaroa Bush, Okia Flat/occasional (sign only)#	Not Threatened
*Mus musculus**	House mouse	Throughout/occasional	Not Threatened
*Mustela erminea**	Stoat	Widespread/occasional	Not Threatened
*Mustela furo**	Ferret	Widespread/occasional	Not Threatened
*Oryctolagus cuniculus**	European rabbit	Widespread/abundant#	Not Threatened
*Trichosurus vulpecula**	Brushtail possum	Widespread/occasional	Not Threatened

6.3 Herpetofauna

Two exotic species of frog and three indigenous lizard species have been recorded in Okia Reserve (Table 7).

Table 7: Herpetofauna recorded within Okia Reserve (Okia Reserve Management Plan 1998, DOC Herpetofauna database, http://www.doc.govt.nz/, and #October 2008 survey).

Species	Common name	Habitat/abundance	Threat status
Hoplodactylus maculatus	Common gecko	Big Pyramid/occasional	Not Threatened
*Litoria aurea**	Green and golden bell frog	Okia Flat/occasional	Exotic
*Litoria ewingii**	Whistling frog	Okia Flat/occasional	Exotic
Naultinus gemmeus	Jewelled gecko	Occasional[1]	Gradual Decline
Oligosoma nigriplantare polychroma	Common skink	Okia Flat/abundant#	Not Threatened

[1] Habitat omitted to protect from poaching risk.

6.4 Avifauna

6.4.1 General

Seventeen species of birds (nine indigenous and eight exotic) were recorded in Okia Reserve in October 2008 (Table 8). Another nine bird species have been previously recorded in and near the reserve (Okia Reserve Management Committee 1998).

Table 8: Bird species observed within Okia Reserve, October 2008.

Species	Common name	Habitat/abundance
*Alauda arvensis**	Skylark	Okia Flat/common
*Carduelis chloris**	Greenfinch	Okia Flat/occasional
*Carduelis flammea**	Redpoll	Okia Flat/occasional
Chrysococcyx lucidus lucidus	Shining cuckoo	Forest/rare
Circus approximans	Australasian harrier	Okia Flat/occasional
*Emberiza citronella**	Yellowhammer	Okia Flat/occasional
*Fringilla coelebs**	Chaffinch	Forest/common
Gerygone igata	Grey warbler	Forest/occasional
Haematopus unicolor	Variable oystercatcher	Beach/occasional
Hirundo tahitica neoxena	Welcome swallow	Okia Flat/rare
Larus dominicanus dominicanus	Southern black-backed gull	Okia Flat/occasional
Porphyrio porphyrio melanotus	Pukeko	Okia Flat/rare
*Sturnus vulgaris**	Starling	Okia Flat/occasional
Tadorna variegata	Paradise shelduck	Okia Flat/occasional
Todiramphus sanctus	Kotare; sacred kingfisher	Edge of Papanui Inlet/occasional
*Turdus merula**	Blackbird	Forest/common
*Turdus philomelos**	Song thrush	Forest/occasional

6.4.2 Threatened avifauna

Four threatened bird species have been recorded in Okia Reserve (Table 9).

Yellow-eyed penguin (Acutely Threatened-Nationally Vulnerable)
In the 2006/07 breeding season the reserve was home to 14 breeding pairs of yellow-eyed penguins, with 16 chicks fledging. Seventeen breeding pairs of yellow-eyed penguins nested at Okia in the 2007/08 season (http://www.yellow-eyedpenguin.org.nz). The main nesting area is located in the north-eastern part of the reserve (Figure 18). Within this area, there are northern and southern nesting concentrations, with scattered nests between. There is also one nest in the southern part of the site.

Figure 18: Primary yellow-eyed penguin habitat (yellow shaded area) within Okia Reserve.

Southern little blue penguin (Chronically Threatened - Gradual Decline)
These penguins breed at the north end of Wickcliffe Bay (Department of Conservation 2003). They have also nested in slash created when lupin was cleared at mid-beach for pikao planting in 2004/05. Two nest boxes were put in and were also used at this time. They are very opportunistic birds (D. MacFarlane, pers. comm., December 2008).

South Island rifleman (Chronically Threatened - Gradual Decline)
Recorded by Johnson (1982) in Taiaroa Bush. If still present, current cattle grazing will not be improving quality of habitat.

South Island fernbird (At Risk – Sparse)
This species has been sighted in dune scrub (Department of Conservation 2003). There were at least nine territories identified in 2007 (Ornithological Society of New Zealand 2007).

Table 9: Threatened bird species recorded within Okia Reserve.

Species	Common name	Habitat/abundance	Threat status
Acanthissita chloris chloris	South Island rifleman	Taiaroa Bush/abundant (Johnson 1982)	Gradual Decline
Bowdleria punctata punctata	South Island fernbird	Dune scrub/rare (www.doc.govt.nz)	Sparse
Eudyptula minor minor	Southern little blue penguin	Northern beach/rare (Management Plan)	Gradual Decline
Megadyptes antipodes	Hoiho; yellow-eyed penguin	Dunes/occasional (D. McFarlane pers.comm 2008)	Nationally Vulnerable

7. ECOLOGICAL SIGNIFICANCE

A summary of ecological values and their ranking according to Dunedin City District Plan criteria is outlined in Table 10. Values listed in some other publications are presented in Table 11.

Table 10: Ranking of Okia Reserve based on Dunedin City District Plan ecological evaluation criteria.

Criteria	Ranking			Comments/Justification
	H	M	L	
Wetland		●		Extensive flaxlands, sedgelands and rushlands.
Rarity and distinctiveness	●			Important site for threatened and locally uncommon species of plants, lizards, mammals, and birds. Only *c.*5% of original indigenous forest and scrub remains on Otago Peninsula.
Representativeness		●		Indigenous dry coastal forest and scrub on hillslopes is typical of historic vegetation in Dunedin ED.
Viability		●		Threatened species management; weed and pest animal control; but grazing in parts of Taiaroa Bush and Okia Flat, and ongoing weed invasion.
Ecological context	●			Important site for seabirds, marine mammals, fernbirds and penguins; contiguous with coastal forest and scrub, and Papanui Inlet.
Naturalness		●		Mostly dominated by indigenous species; some weeds.
Diversity and pattern	●			Relatively high indigenous species richness, Several indigenous vegetation types, one bioclimatic zone, and several landforms; ecological sequence from beach to forest.
Size and shape	●			Large size, relatively regular shape.
Overall Assessment - Site is significant in terms of District Plan Criteria				✓ Yes | | No

Reasons for significance:
Okia Reserve is dominated by indigenous vegetation that provides habitat for threatened plant, bird, mammal, and lizard species, and is located in a landscape from which most indigenous vegetation has been cleared. The site is large and encompasses a vegetation/habitat sequence from beach to indigenous forest. Current management is likely to increase its already considerable ecological values over time.

Table 11: Ecological values for the Okia Reserve listed in other publications. Site names and numbers are derived from the relevant publication.

Publication	Site Name	Description	Values
Regional plan: Water for Otago (Otago Regional Council 2001)	Okia Flat Wetland Management Area	Dune hollows (permanently or periodically wet), wetland turf, bogs and ponds within the Okia Reserve, Okia Flat, Otago Peninsula. The best example of dune hollow vegetation in the Otago Coast Ecological Region	Very diverse native wetland vegetation within the dune hollows (described by Johnson 1993a). Some paddocks are of special interest in having sphagnum moss, the only sphagnum known on Otago Peninsula, and a species (*Sphagnum novozelandicum)* which is generally uncommon in New Zealand. The bog sedges *Baumea rubiginosa* and *B. tenax* grow with the sphagnum
Dunedin City District Plan - Schedule 25.4 (Dunedin City Council 2006)	Areas of Significant Conservation Value, Site C076	DCC/ Yellow-Eyed Penguin Trust Reserve Incorporating: The Pyramids Lake	Habitat of yellow-eyed penguin Lake – regionally significant tarn, rush and sedge swamp (listed in WERI database)
Johnson (1982)	Site 16 Taiaroa Bush	Forest of narrow-leaved lacebark, mahoe, fuchsia, broadleaf etc	The largest remaining area of bush on Otago Peninsula Highest total rating of all listed peninsula sites SI rifleman
	Site 18 The Pyramids	Forest of broadleaf, kohuhu, mahoe etc Scrub of *Helichrysum lanceolatum* etc	Floristically rich flora of turf plants in wet hollow nearby
	Site 19 Victory Beach	Lupin, marram, elder etc	Penguins
Johnson (1992)	241 Victory Beach	Marram, lupin, bracken, pasture, *Ficinia nodosa*, *Juncus* rushlands, *Carex dipsacea*, wetland turf communities	Only example of turf wetland vegetation on Otago dunes. Rating of 4/5 for diversity of communities and landforms Rating of 4/5 for native sand/dune species Total rating of 13/20 (highest ranked Otago site)

8. ECOLOGICAL MANAGEMENT

8.1 Yellow-eyed penguin

Current situation:
Penguin monitoring at Okia is carried out over the breeding season, with a nest search and two checks, one in early December and a fledging check in late January or first week of February (D. MacFarlane, pers. comm., December 2008). Members of the

public occassionally enter nesting areas on the penguin tracks. In order to help prevent this, access to these tracks is not made obvious.

Action Plan:
Continue monitoring at current levels. Continue indigenous planting and weed control to improve nesting habitat. Refer to expertise of Yellow-eyed Penguin Trust.

8.2 Other threatened fauna

Current situation:
Jewelled gecko (scrub and forest on the big Pyramid), southern little blue penguin (rocks at northern end of Victory beach), South Island rifleman (coastal forest in Taiaroa Bush), South Island fernbird (dune scrub), and southern elephant seal and New Zealand sealion (Victory beach and dunes) have been recorded in and near Okia Reserve. The bird and lizard species are likely to be benefitting from pest control and other habitat enhancement undertaken to benefit the yellow-eyed penguin population. However, there is currently no regular monitoring of these species and, in the long term, current management may result in a loss of habitat for fernbird (through succession of scrub to forest) and for rifleman through deterioration of forest habitat as a result of grazing by cattle. Fur seals, elephant seals, and sealions are monitored by Department of Conservation and/or researchers from Otago University. There has been previous monitoring of blue penguins within the reserve, but it is not known if this is regularly carried out.

Action Plan:
Maintaining a database to record observations of each of these species would assist with monitoring and understanding their habitat use. Goals and a management plan should be developed for each species, and this should include regular monitoring of their populations.

Fernbird territories should be mapped. The local branch of the Ornithological Society has undertaken surveys of fernbirds and should be able to assist with this. As loss of fernbird habitat is likely through succession of scrub to forest, areas of important fernbird habitat (ideally including the nine known breeding territories) on Okia Flat should be maintained as such, or alternative fernbird habitat created through indigenous vegetation restoration in appropriate sites (e.g. wetland margins). Control of mammalian predators would also benefit the fernbird population.

To benefit jewelled gecko, pest control should be extended to the big Pyramid. Natural vegetation succession and restoration of indigenous shrubland and forest vegetation will increase the amount of habitat available for jewelled gecko, and help to connect areas of existing habitat.

8.3 Pest animal control

Current situation:
To protect yellow-eyed penguin, pest animal control is carried out year-round with trap-lines targeting potential predators, most notably mustelids (stoats and ferrets) and cats (http://www.yellow-eyedpenguin.org.nz/). Current and past work by the Yellow-eyed Penguin Trust appears to be allowing the population to slowly increase

in size. Pest control is likely to be improving habitat for species other than yellow-eyed penguin, such as common skinks and South Island fernbirds.

Action Plan:
Current pest control should be continued. However, pest control should be extended to include The Pyramids and Taiaroa Bush to help protect lizard and bird habitat. Control of possums, rabbits, hedgehogs, and rodents would have additional benefits for indigenous vegetation and threatened plant and animal species, and would add value to current pest control initiatives.

8.4 Indigenous vegetation restoration

Current situation:
Indigenous revegetation of the area began in 1992/93 with indigenous shrubs and trees planted to enhance penguin breeding habitat and other areas of ecological value. Dunes and hollows at the north end of Victory Beach were planted in 1993/94 to improve penguin nesting habitat (http://www.yellow-eyedpenguin.org.nz/). This 2008 survey recorded good survival of flax, cabbage tree, ngaio, kohuhu, kanuka, and *Coprosma propinqua* amongst lupin and bracken.

Planting began at the top of the Margaret Hazel Slope in 2000, and species surviving in 2008 include ngaio, flax, toetoe, broadleaf, fuchsia, mahoe, Hall's totara, *Olearia avicenniifolia*, *O. fragrantissima*, lemonwood, kohuhu, kowhai, *Coprosma crassifolia*, *C. rugosa*, and many cabbage trees. The Yellow-eyed Penguin Trust finished planting on the Margaret Hazel slope in the winter of 2008 (maintenance is to continue) and proposes to move resources into conservation work associated with Taiaroa Bush (D. McFarlane, Yellow-eyed Penguin Trust, pers. comm., 2008).

Pikao has been planted as part of the Dunedin City Council Coastal Dune Conservation Programme at mid-beach, where the walking track from the little Pyramid leads onto Victory Beach (http://www.yellow-eyedpenguin.org.nz/). Sand tussock and Cook's scurvy grass have also been planted there. Pikao has also been planted alongside the track between The Pyramids in an old "sand blow", but this site is not going to be maintained (D. McFarlane, Yellow-eyed Penguin Trust, pers. comm., 2008).

Currently GPS coordinates of all plantings are recorded using standard WWF Habitat Protection forms and monitored at the end of spring following planting and then the autumn after planting. Herbicide spray releasing has been used at Okia for all plantings since 2004, and has been key to their success (D. McFarlane, Yellow-eyed Penguin Trust, pers. comm., 2008).

Action Plan:
Continue planting of indigenous tree species on the Margaret Hazel Slope, with the goal of establishing indigenous forest habitat. Continue planting to improve yellow-eyed penguin habitat. Integrate plantings with weed control (e.g. control elder in plantings undertaken to improve yellow-eyed penguin habitat). Ongoing beach and foredune restoration involving extensive control of marram and plantings of indigenous dune species should be undertaken. It is now known that the natural distribution of spinifex (*Spinifex sericeus*) originally included Dunedin (Edgar &

Connor 2000), and dune restoration with this species, as well as pikao, sand tussock, and *Euphorbia glauca*, should be undertaken in the future. A method for Dunedin dune restoration was recently provided to the Dunedin City Council (Wildland Consultants 2008) and this approach would be suitable for dune restoration at Victory Beach. Restoration of indigenous beach and foredune vegetation should be viewed as a component of ongoing dune restoration that eventually re-establishes a vegetation sequence from indigenous foredune to dune forest.

Prior to historic vegetation clearance, Okia Flat would have been largely covered by indigneous dune forest, a type which has become nationally rare. Matai (*Prumnopitys taxifolia*) and totara (*Podocarpus totara*) would have been the typical dominants of indigenous dune forest in the eastern South Island. Restoring Okia Flat to indigenous dune forest should be a long term management objective. This is not likely to conflict with use of site by yellow-eyed or blue penguins, because these species would historically have bred in coastal scrub and forest. Fernbirds do not persist in tall closed forest and their typical habitats incorporate dense low-stature vegetation such as rushland, red tussock grassland, or shrubland. In natural ecosystems these vegetation types often occur adjacent to or within taller vegetation where environmental constraints such as wet soil or exposure to wind prevent the development of taller vegetation. At Okia Flat, restoration of dune forest should include restoration or enhancement of low-stature ecotonal vegetation in wet or exposed sites, or other area where tall forest establishment would be restricted. For example, planting red tussock, flax, jointed wire rush, tauhinu, manuka, and mingimingi around wetland areas would result in vegetation that would provide habitat for fernbirds. Similar gradients in vegetation stature could be established behind foredunes on Victory Beach and where the reserve is adjacent to Papanui Inlet.

It is recommended that a restoration plan is developed for the site. The plan should contain restoration goals and priorities, areas to be planted, site preparation, suitable species, sources of plants, numbers of plants required, planting densities, maintenance and monitoring required, funding sources, and a staged implementation plan. This plan would also outline the requirements for the (future) planting of pikao and other foredune species.

8.5 Weed control

Current situation:
Weed control is ongoing, with a particular effort made in previous years to control gorse and broom by spraying with herbicide. Current gorse/broom control is based on systematic, paddock-by-paddock sweeps. Felling of elder has been undertaken by the Yellow-eyed Penguin Trust on the slopes of the big Pryamid and up the side of the Margaret Hazel slope in the last five years. Cut stumps were swabbed with Vigilant (http://www.yellow-eyedpenguin.org.nz/, D. MacFarlane, pers. comm., December 2008). Pampas has been sprayed in the southern part of the site. Some macrocarpa and wilding pines have been felled. Volunteers periodically sweep the western part of the reserve for wilding pines, usually taking out 100-150 trees every year. In the coming months, the large patch of gorse is to be sprayed and two pines near The Pyramids are to be cut down. Neighbouring landowners have been allowed to fell outlying macrocarpa in the southwest of the site (not the dense stand by the fence) for firewood (D. McFarlane, Yellow-eyed Penguin Trust, pers. comm., October 2008).

Elder appears to be increasing in abundance within the reserve and gorse is widespread along the central western boundary of the site (see vegetation map, Appendix 1).

Action Plan:
Current weed control activities are commendable and need to be continued. Elder and gorse are the main woody weeds and, along with other less problematic woody weeds, should be targeted for systematic control and eventual eradication. Care should be taken where weed species are used by yellow-eyed penguins or close to nesting sites and a progressive weed control and planting regime will be required. A control plan for specific weeds in Okia Reserve is outlined in Table 12 below. Ideally, weed control should extend beyond reserve boundaries, especially for gorse within the pine plantation to the west and elder throughout Taiaroa Bush. Liaison with adjoining property owners will be necessary. Light-demanding weed species do not thrive under forest canopies, and there may be opportunities to establish dense indigenous forest vegetation on reserve margins where invasion of such weeds is likely to be an ongoing issue. No management of the pine plantation in the SE part of the reserve is envisaged in the short term because it provides sealion habitat and would be expensive to remove. However, consideration should be paid to using the pines as a nurse crop for indigenous forest restoration (e.g. see Porteus 1993). Thinning or poisoning of radiata pine will be required to provide adequate light levels for indigenous species.

Table 12: Weed-specific control plan for Okia Reserve.

Species	Goal	Time span	Method
Blackberry (*Rubus fruticosus*)	Eradication	2 years	Spray isolated plants plants with herbicide, or cut canes and uproot crowns, disposing of material off-site or off the ground on-site so that cut canes and crowns do not regrow.
Elder (*Sambucus nigra*)	Eradication	10 years	Progressive control (cut and paint stumps with herbicide) from south end of site to north; monitor effectiveness of previous years' control efforts.
Gorse (*Ulex europaeus*)	Control: no patches, <10 plants sprayed/year	5 years	Spray or cut below ground level all plants within the reserve; monitor and control reinvasion.
Lupin (*Lupinus arboreus*)	Control: eradicate from Okia Flat: <5 plants/ha on beach/foredunes	20+ years	Overtop with dune forest on older dunes; control on foredunes when undertaking future beach/foredune restoration.
Macrocarpa (*Cupressus macrocarpa*)	Eradication	10 years	Continue felling of trees and wildings in reserve.
Maritime pine (*Pinus pinaster*)	Eradication	2 years	Fell all trees within the reserve; monitor and control all wildings.

Species	Goal	Time span	Method
Marram (*Ammophila arenaria*)	Control: <5 plants/ha on beach/foredunes	20+ years	Spray with herbicide as part of indigenous beach/foredune vegetation restoration.
Pampas grass (*Cortaderia selloana*)	Eradication	2 years	Monitor sprayed plants; re-spray if necessary.
Radiata pine (*Pinus radiata*)	Control: no trees, <5 wildings removed/year	5 years	Fell all trees within the reserve; monitor and control wildings.
Scotch broom (*Cytisus scoparius*)	Eradication	2 years	Spray isolated plants with herbicide.

8.6 Grazing

Current situation:
Grazing over much of the reserve ceased in 1991, and is planned to cease grazing on the remaining parts of Okia Flat in 2009 (http://www.yellow-eyedpenguin.org.nz/). Grazing by cattle on Okia Flat has resulted in pugging, soil compaction, browsing of indigenous vegetation, nutrient enrichment, and weed dispersal, although it appeared to favour indigenous turf vegetation which has now been lost. Fencelines in the north of Okia Reserve do not conform to cadastral boundaries. Sheep graze pasture within the reserve boundaries northeast of the bluffs near Taiaroa Bush (Figure 19). Cattle also graze the part of Taiaroa Bush that is located within Okia Reserve (Figure 19), with serious detrimental impacts on forest health, including weed dispersal, nutrient enrichment, trampling, browsing, inhibition of regenerative processes, and canopy collapse. Long-term grazing has detrimental impacts on indigenous biodiversity (Smale *et al*. 2008) and, in Taiaroa Bush, will eventually destroy indigenous forest which is accessible to cattle. The Yellow-eyed Penguin Trust is currently working with Akapatiki A Block Properties Incorporated (landowner to the north) on the restoration of Taiaroa Bush in the presence of farm animals.

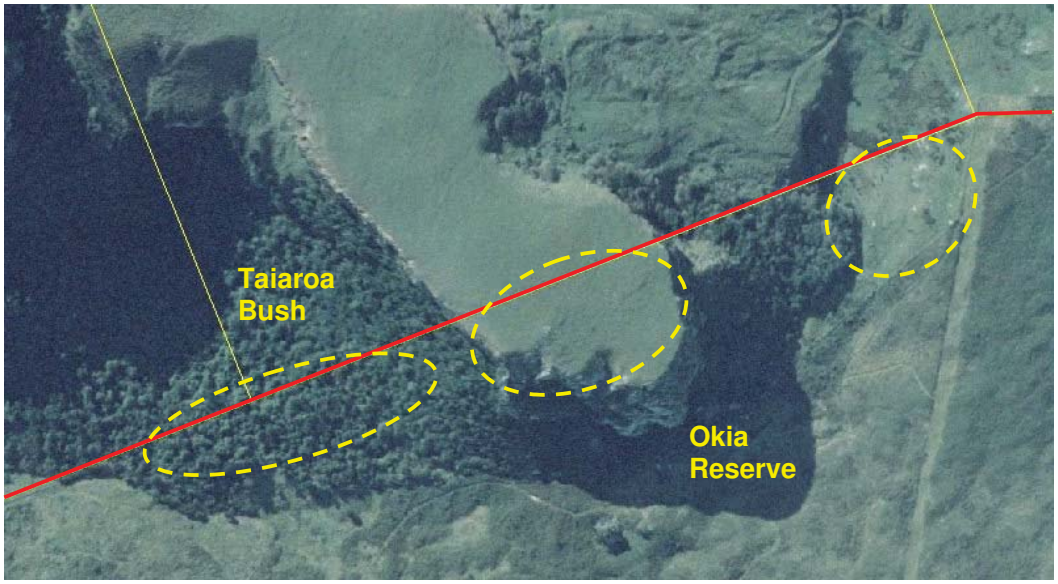

Figure 19: Approximate areas grazed by neighbouring landowners (yellow dashed ellipses) at the northern end of Okia Reserve (northern boundary marked in red).

Action Plan:
Continue with plan to remove stock from Okia Flat. In order to maintain a fire break, it will be necessary to mow a strip of vegetation periodically. With regard to cadastral boundaries on the northern boundary of Okia Reserve, there are at least four options: (1) Continue negotiations with Akapatiki A Block Properties Incorporated regarding restoration of Taiaroa Bush in the presence of stock animals, (2) Negotiate a land swap with Akapatiki A Block Properties Incorporated to exchange grazed land on top of headland and on the flats northeast of the headland for an equal or larger sized area of Taiaroa Bush, (3) Survey and fence existing cadastral boundaries. This should minimise damage to the forest, or (4) Negotiate to the cessation of grazing within Taiaroa Bush and/or Okia Reserve with current landowners. There may be other options available to resolve ecological issues in this part of the reserve. However, exclusion of stock will be necessary to fully realise the ecological potential of Taiaroa Bush in the long-term.

8.7 Vegetation monitoring

Current situation:
Vegetation monitoring has involved reports by Johnson (1993) and this report. Monitoring of plantings is currently undertaken in Okia Reserve.

Action Plan:
Vegetation monitoring should continue, but also be extended so that the success of restoration activities can be assessed. Suggested vegetation monitoring is presented in Table 13. The methods used are simple and require little additional resources than those currently available. The main difference to current management is that the monitoring should be carried out systematically and regularly.

Table 13: Techniques suggested for vegetation monitoring in Okia Reserve. Some of these techniques are already in use.

Monitoring	Method	Frequency	Use
New plantings	• Record number and identity of species planted at time of planting. • Walk through inspection of plantings with records made of number and species identity of failures. • Note weed encroachment.	• Initially weekly for six weeks, and then monthly for one year	• Replace losses. • Release from weeds. • The most successful species should dominate plantings in following years.
Weeds	• Walk through survey could be combined with weed control (Section 8.9). • Location of all woody weeds marked on GPS.	• Annual	• GPS waypoints allow success of control to be checked following year.
Vegetation condition	• Walk through survey. • Note presence of pest animals, stock, human impacts, other influences.	• Annual	• Inform management decisions.
Vegetation change over time	• Photographs taken from permanently marked and GPS referenced photopoints. • Mapping broad vegetation types on aerial photographs.	• Every 5-10 years	• Assess success and rate of restoration activities/ natural regeneration. • Inform management decisions.

8.8 Threatened plant species

Current situation:
Due to the timing of the current survey and the consequent lack of identifying features on many species, the presence and distribution of some threatened plant species could not be confirmed within Okia Reserve. *Carex cirrhosa* and *Epilobium chionanthum* may be present in seasonally wet areas, but have probably declined in Okia Reserve due to encroachment by rank exotic grasses and low rainfall in recent years. Planting regimes, natural regeneration to forest, and removal of grazing pressure as outlined in the management plan, are unlikely to be compatible with preservation of wetland and turf habitats in their current form. *Drymoanthus flavus* (big pyramid) is probably still present in Okia Reserve. Sand tussock, Cook's scurvy grass, pikao, and fragrant tree daisy have been planted in the reserve.

Action Plan:
The location of *Drymoanthus flavus* plants/populations should remain confidential and access to this area discouraged, as one of the major threats to this species is over-collection (http://nzpcn.org.nz). A specific survey of the *Drymoanthus flavus* population should be undertaken, with monitoring of known plants to assess the population status over time.

While the planting of threatened species provides an excellent educational feature, planting of dune species such as sand tussock, Cook's scurvy grass, *Euphorbia glauca*, and pikao would best be undertaken as part of a full indigenous foredune vegetation restoration exercise (e.g. Wildland Consultants 2008), rather than as

isolated patches. It may also be prudent to plant threatened species such as fragrant tree daisy after shelter of faster growing species has established. Plants should also be matched to habitats, for example species such as fragrant tree daisy should not be planted where they are likely to be overwhelmed by taller forest. Plantings should be monitored to gauge success and to ascertain problems that may arise for future planting work (see previous section). Additional threatened species such as *Pseudopanax ferox* should be considered for future plantings.

8.9 Funding and community involvement

Maintaining and enhancing indigenous biodiversity within Okia Reserve will require substantial resources and funding. Applications for funding should be made to relevant agencies such as the Community Conservation Fund, which is available to community groups undertaking conservation activities on public land.

Okia Reserve already benefits from involvement of community groups and organisations, and this should be encouraged. Preparation of a management plan will help to establish a common vision and objectives for the reserve.

8.10 Management priorities

Limited resources are available to undertake ecological restoration in Okia Reserve and it is therefore important to focus on key objectives. The following management priorities are based on maintaining current ecological values and what should be undertaken if funding is low.

The highest priority should be continuation of yellow-eyed penguin management because this is the purpose for which the reserve was formed. Other high priorities are preparation of a preliminary budget and applications for funding to undertake restoration activities, resolving boundary issues and grazing in the north of the reserve, and maintaining current levels of weed control. Medium priority management includes increasing weed control, extending pest control, stopping grazing on the remainder of Okia Flat, and monitoring of vegetation and other threatened species. The lowest priority activities are planting on the Margaret Hazel Slope and undertaking reserve-wide restoration of an indigenous vegetation sequence from foredunes to hillslope forest. It is important to note that lower priority management activities should not be pushed aside and forgotten, but incorporated into the management plan as funding permits.

8.11 1998 Management Plan

The Management Plan lacks detail in some areas and contains statements which are not necessarily consistent. For example control of exotic plants is mentioned on P.5, but no species are identified and no time scale is given for their removal. Similarly, there is a requirement to undertake periodic vegetation monitoring, but the frequency and intensity of monitoring is not defined.

The current plan anticipates that natural regeneration will be sufficient to restore indigenous forest vegetation to the substantial areas of the reserve that currently lack forest. However these processes will not be sufficient to return areas of dune

vegetation currently occupied by marram grassland to indigenous dune vegetation, nor will grassy hillslopes rapidly regenerate to indigenous forest without substantial intervention. Extensive active restoration is still required for the establishment of indigenous vegetation in Okia Reserve, and it is recommended that the required actions are defined in the management plan.

9. CONCLUSIONS

Okia Reserve has high ecological values because it is a large protected site (particularly so in the context of protected areas on Otago Peninsula), contains nationally threatened and locally uncommon species of plants, birds, mammals, and lizards, contains a range of indigenous plant communities and landforms, and is being actively managed for biodiversity conservation.

Current management is allowing yellow-eyed penguin to slowly increase in numbers, establishing indigenous vegetation, and encouraging natural regeneration of indigenous vegetation to proceed. However, woody weeds appear to be increasing in abundance and there are unresolved boundary issues resulting in stock damage to Taiaroa Bush. In addition, the current management plan lacks specific details regarding monitoring, weed eradication, and how indigenous vegetation is to be restored, maintained, and protected.

We suggest that progressive restoration of indigenous dune vegetation to Okia Flat and Victory Beach is adopted as a long-term objective of the management plan. The three major elements of dune restoration should be indigenous sand-binding vegetation on foredunes, indigenous forest incorporating matai and totara on rear dunes, and indigenous flax, sedgeland, rushland, red tussock grassland, and/or shrubland on wetland and lagoon margins.

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APPENDIX 1

MAP OF VEGETATION TYPES

APPENDIX 2

LIST OF VASCULAR PLANT SPECIES RECORDED IN OKIA RESERVE AND CONTIGUOUS WILD AREAS

* Exotic species.
[#] Planted only.
[†] Non-local native species.
● Present, r = rare, o = occasional, f = frequent, a = abundant, v = very abundant

Species	Common name	Site 18 Pyramids (Johnson 1982)	Site 16 Taiaroa Bush (Johnson 1982)	Site 19 Victory Beach (Johnson 1982)	Victory Beach (Johnson 1992)	Okia Flat (Johnson 1993a)	Okia Reserve (2008)		
							Pyramids	Taiaroa Bush	Victory Beach/ Okia Flat
Acaena juvenca	Bidibid		o					o	
Acaena novae-zelandiae	Bidibid	f	f	f	f		f		f
*Achillea millifolium**	Yarrow							r	
*Agrostis capillaris**	Browntop			v	o	●	v		v
*Agrostis stolonifera**	Creeping bent			o	v	●			o
*Ammophila arenaria**	Marram			a	a				a
*Anthoxanthumn odoratum**	Sweet vernal			a	a	●	a	o	a
*Anthriscus caucalis**	Beaked parsley	f		f	f			o	o
Apium prostratum	NZ celery			o	o				
Apodasmia similis	Jointed wire rush; oioi					●			o
*Arctium pubens**	burdock		o						
Aristotelia serrata	wineberry		o						
Asplenium appendiculatum	Ground spleenwort	f					r	f	r
Asplenium bulbiferum	Hen and chicken fern		o						
Asplenium flaccidum	Hanging spleenwort		o						
Asplenium hookerianum	Hooker's spleenwort		o				r	r	
Asplenium lyallii	Lyall's spleenwort						r		
Asplenium obtusatum	Shore spleenwort	f	f						r
Astelia fragrans			f				r	r	
Austrofestuca littoralis	Sand tussock								#
Australina pusilla			o						
Azolla filiculoides						●			
Azolla rubra				f	f				
Baumea rubiginosa						●			
Baumea tenax						●			
*Bellis perrenis**	Daisy		o	o	o				r
Blechnum chambersii			o					r	
Blechnum discolor	Crown fern		o						
Blechnum fluviatile			r						
Blechnum minus	Swamp kiokio								r
Blechnum penna-marina			r						r
Brachyglottis sciadophila			f						
*Bromis diandrus**	Ripgut brome						o		o
*Bromus mollis**				r	r				
Callitriche petriei						●			

Species	Common name	Site 18 Pyramids (Johnson 1982)	Site 16 Taiaroa Bush (Johnson 1982)	Site 19 Victory Beach (Johnson 1982)	Victory Beach (Johnson 1992)	Okia Flat (Johnson 1993a)	Okia Reserve (2008)		
							Pyramids	Taiaroa Bush	Victory Beach/ Okia Flat
*Callitriche stagnalis**	Starwort		o	a	a				
Calystegia tugoriorum			o						
Cardamine debilis			o						
*Carduus tenuiflorus**			r	o	o				
Carex buchananii				r	r	●			
Carex cirrhosa						●			
Carex coriacea				o	o	●			o
Carex dipsacea				a	a	●			o
Carex flagellifera						●			
Carex lessoniana						●			
Carex secta		o		o	o	●			o
Carex virgata						●			o
Carmichaelia petriei	NZ broom	o					o		
Carpodetus serratus	Putaputaweta		o					o	
Celmisia gracilenta		r		r	r	●			
Centella uniflora				o	o	●			r
*Cerastium fontanum**	Mouse-ear chickweed		f	f	f		o	o	f
Chionochloa conspicua				o	o				
Chionochloa rubra	Red tussock			r	r	●			
*Cirsium arvense**	Californian thistle		f	f	f		o	o	o
*Cirsium vulgare**	Scotch thistle		o	o	o	●		o	o
Clematis foetida			r					r	
Clematis paniculata			o				r		
Colobanthus muelleri		r							
*Conium maculatum**	Hemlock		o	o	o		o		
Coprosma areolata			v					f	
Coprosma crassifolia		a	a				a	o	r
Coprosma propinqua			o					o	r
Coprosma propinqua × robusta[†]								r	
Coprosma rhamnoides			r						
Coprosma rigida		o							
Coprosma rotundifolia			o						
Coprosma rubra		f	a					r	
Coprosma rugosa									#
Cordyline australis	Cabbage tree	o							o
Corokia cotoneaster							f	r	
Cortaderia richardii	Toetoe								o
*Cortaderia selloana**	Pampas grass								r
Corybas micranthus					r				
Cotula australis	Soldier's button			o	o		r		
Cotula dioica				o	o				
Crassula moschata	Shore stonecrop		o						
Crassula sieberiana		r					r		
*Crepis capillaris**						●	o		r
*Cupressus macrocarpa**	Macrocarpa			o	o				o
Cyathea dealbata	Silver fern; ponga		o						

Species	Common name	Site 18 Pyramids (Johnson 1982)	Site 16 Taiaroa Bush (Johnson 1982)	Site 19 Victory Beach (Johnson 1982)	Victory Beach (Johnson 1992)	Okia Flat (Johnson 1993a)	Okia Reserve (2008)		
							Pyramids	Taiaroa Bush	Victory Beach/ Okia Flat
*Cynosaurus cristatus**				r	r				
*Cytisus scoparius**	Broom	r				●	r	r	r
*Dactylis glomerata**	Cocksfoot			a	a	●	o	o	a
Desmoschoenus spiralis	Pikao, pingao								#
Dichelachne crinita	Plume grass	r							
Dichondra repens	Mercury Bay weed	r							
*Digitalis purpurea**	Foxglove							o	r
Disphyma australe	NZ iceplant								
Earina autumnalis		o	o				o	f	
Earina mucronata			o					o	
Einada allanii							f		
Eleocharis acuta				o	o	●			
Elymus tenuis	Prostrate bluegrass	r							
Epilobium brunnescens		r	r	r	r				
Epilobium chionanthum						●			
Euchiton audax				o	o				
Euchiton involucratus				r		●			r
Euchiton ruahinicus						●			
Euchiton traversii						●			
*Euphorbia peplus**	Milkweed						r	r	
Ficinia nodosa	Wiwi; knobby club rush			a	a	●	r		a
Fuchsia excorticata	Fuchsia		v					o	#
*Fumaria muralis**	Scrambling fumitory								r
*Fumaria officinalis**	Fumaria			r	r				
*Galium aparine**	Cleavers		f	f	f		o	a	a
Galium perpusillum	Dwarf bedstraw					●			
Gaultheria antipoda		r					r		
Gaultheria macrostigma				o	o	●			o
Gentiana grisbachii						●			
Geranium microphyllum			r			●			r
*Geranium molle**	Dove's foot	r							r
*Glyceria declinata**	Floating sweetgrass			f		●			r
Gnaphalium luteo-album		o					o		
Gonocarpus micranthus					r	●			r
Gratiola sexdentata						●			
Griselinia littoralis	Broadleaf	a	a				a	f	o
Haloragis erecta							r		
Hebe salicifolia	Koromiko						r	r	
Heirochloe redolens	Karetu; holy grass				a				
Helichrysum filicaule		f				●	f		f
Helichrysum lanceolatum							f		
*Hieracium pilosella**	Mouse-ear hawkweed					●	o		f
Histiopteris incisa	Water fern; tarata								r

Species	Common name	Site 18 Pyramids (Johnson 1982)	Site 16 Taiaroa Bush (Johnson 1982)	Site 19 Victory Beach (Johnson 1982)	Victory Beach (Johnson 1992)	Okia Flat (Johnson 1993a)	Okia Reserve (2008)		
							Pyramids	Taiaroa Bush	Victory Beach/ Okia Flat
Hoheria angustifolia	Narrow-leaved lacebark		v					a	
*Holcus lanatus**	Yorkshire fog			a		●	o	o	o
*Hordeum murinum**				o	o				
Hydrocotyle heteromeria		o	o	f	f			o	
Hydrocotyle hydrophila				o	o	●			
Hydrocotyle moschata		o					r		
Hydrocotyle novae-zeelandiae				o		●	r		
Hydrocotyle novae-zeelandiae var. *montana*					o	●			
Hypericum japonicum						●			
*Hypochaeris radicata**				f	f	●	o		f
Hypolepis ambigua			o						
*Ilex aquifolium**						●			
Isolepis habra						●			
Isolepis inundata						●			
Juncus antarcticus						●			
*Juncus articulatus**	Jointed rush		o	f	f	●			o
*Juncus bufonius**				o	o	●			
Juncus edgariae	Edgars rush			v	v	●	r		a
*Juncus effusus**	Soft rush			f	f	●			f
Juncus pallidus				f	f	●			f
Juncus pusillus						●			
Juncus sarophorus				a	a	●			a
Korthalsella lindsayi		r							
Kunzea ericoides	Kanuka						r		r
Lachnogrostis sp.						●			
Lagenifera petiolata						●			
Lagenifera pumila		o							
Lastreopsis hispida			o						
Lastreopsis glabella			f						
Lemnor minor	Common duckweed			f	f	●			
*Leontodon taraxicoides**				f	f				f
Lepidium oleraceum	Cook's scurvy grass								#
Lepidosperma australe	Square sedge			o	o	●			o
Leptopteris hymenophylloides	Heruheru		o						
Leptospermum scoparium	Manuka			r	r				r
Leucopogon fraseri		o		o	o	●	o		o
Libertia ixioides								r	
Lilaeopsis novae-zelandiae				o					
Linum monogynum				o	o				
Lobelia anceps									r
Lobelia perpusilla				o	o	●			
*Lolium perenne**	Perennial ryegrass			o	o				r
*Lupinus arboreus**	Lupin	v	r	v	v	●	a		v

Species	Common name	Site 18 Pyramids (Johnson 1982)	Site 16 Taiaroa Bush (Johnson 1982)	Site 19 Victory Beach (Johnson 1982)	Victory Beach (Johnson 1992)	Okia Flat (Johnson 1993a)	Okia Reserve (2008)		
							Pyramids	Taiaroa Bush	Victory Beach/ Okia Flat
*Marrubium vulgare**	Horehound		o	o	o		r		
*Matricaria dioscoidea**	Rayless chamomile			r	r				
Melicope simplex	Poataniwha		o					r	
Melicytus alpinus	Porcupine shrub	r					r		
Melicytus ramiflorus	Mahoe	a	a				f	a	r
*Melissa officinalis**	Lemon balm	f	f	f					
Metrosideros diffusa			f						
Metrosideros umbellata	Southern rata				o				
Microsorum pustulatum	Hounds tongue fern	f	f				f	f	r
*Mimulus guttatus**	Monkey musk			o					
Montia sp.				r		●			
Muehlenbeckia australis	Pohuehue	v	v	v	v		a	a	a
Myoporum laetum	Ngaio	a	a				f	f	o
*Myosotis caespitosa**	Water forget-me-not			r	r				
*Myosotis silvatica**		r						r	
Myriophyllum propinquum						●			
Myriophyllum triphyllum						●			
Myrsine australis	Mapou	f	f	o	o		f		r
*Nasturtium microphyllum**	Watercress			f	f				
*Nemesia floribunda**					f		f	o	f
Nertera setulosa				f		●			r
Olearia arborea			o				r		
Olearia avicenniifolia		f					o		#
Olearia fragrantissima[#]									#
Ozothamnus leptophyllus	Tauhinu								r
Parietaria debilis			r						
Parsonsia heterophylla		o	o				o	o	
Pellaea rotundifolia			f					o	
Pennantia corymbosa			r						
Phormium tenax	Flax; harakeke	f		o	o	●	f		f
*Pinus radiata**	Radiata pine			o	o	●	r		o
Pittosporum eugenioides	Lemonwood		o				r		#
Pittosporm tenuifolium	Kohuhu	f	f				f	f	
Plagianthus divaricatus	Saltmarsh ribbonwood			r					
Plagianthus regius	Lowland ribbonwood		f				r		
*Plantago coronopus**	Buck's horn plantain			o	o				
*Plantago lanceolata**	Narrow-leaved plantain			o	o				
Plantago raoulii			r						
*Poa annua**	Annual poa			o	o		r	o	
Poa astonii		f					f		
Poa cita	Silver tussock	a		a		●	f		
Poa imbecilla			o	o	o				
Poa laevis			a		a				
Poa pratensis						●			
Poa sp.					o				
Podocarpus hallii	Hall's totara		r	r	r		r	r	r

Species	Common name	Site 18 Pyramids (Johnson 1982)	Site 16 Taiaroa Bush (Johnson 1982)	Site 19 Victory Beach (Johnson 1982)	Victory Beach (Johnson 1992)	Okia Flat (Johnson 1993a)	Okia Reserve (2008)		
							Pyramids	Taiaroa Bush	Victory Beach/ Okia Flat
*Polycarpon tetraphyllum**	Allseed			o			r		o
*Polygonum arenastrum**	Small-leaved wireweed	r		o			o		
Polystichum neozelandicum subsp. *zerophyllum*		f	f					o	
Polystichum vestitum	Prickly shield fern						r	r	r
Potentilla anserinoides						●			
Potomageton cheesemanii				o	o	●			
Prasophyllum colensoi	Leek orchid					●			
Prumnopitys taxifolia	Matai		r						
*Prunella vulgaris**	Selfheal		o	o	o				
Pseudopanax crassifolius	Lancewood	o	o				o		r
Pseudowintera colorata	horopito		o						
Pteridium esculentum	Bracken	o	o	a		●	o		v
Puccinellia sp.	Salt grass			o					
Pyrrosia eleagnifolia	Leather leaf fern	f	f				o		
Ranunculus glabrifolius	Waoriki			o	r	●			o
Ranunculus reflexus			o					r	
*Ranunculus repens**	Creeping buttercup		f	a	a	●	r	o	a
*Ranunculus sceleratus**	Celery-leaved buttercup			o	o				
Ripogonum scandens	Supplejack		f					r	
Rubus cissoides	Lawyer		o					r	
Rubus fruticosus agg.*	Blackberry								r
Rubus squarrosus	Leafless lawyer	o	r	o	o				
*Rumex acetosella**	Sheeps sorrel	o		o	o		o		f
*Rumex crispus**	Curled dock			o	o	●			o
*Rumex obtusifolius**	Broad dock			r	r				r
*Sagina procumbens**	Procumbent pearlwort			r	r				
Salicornia australis	Glasswort			o	o				
*Sambucus nigra**	Elder	f	f	o	o		f	f	f
Samolus repens				o	o				
Scandia geniculata		r	r				r		
Schizeilema trofoliolata			f						
Schoenus concinnus				o	o				
Schoenus maschalinus	Dwarf bogrush			r	r	●			
Scleranthus biflorus		r							
Selliera radicans				o	o	●			
Senecio biserratus			o	o	o		r		o
*Senecio elegans**	Purple groundsel			a	a		r		f
*Senecio jacobaea**	Ragwort	o	o					o	
Senecio minimus			f	f	f			o	r
*Sisymbrium officinale**	Hedge mustard			r	r				
Solanum laciniatum	Poroporo		r	o	o		r		o
*Solanum nigrum**	Black nightshade			r	r				
*Solanum tuberosum**	Potato			r					
*Sonchus oleraceus**	Sow thistle	o		o	o		o		o

Species	Common name	Site 18 Pyramids (Johnson 1982)	Site 16 Taiaroa Bush (Johnson 1982)	Site 19 Victory Beach (Johnson 1982)	Victory Beach (Johnson 1992)	Okia Flat (Johnson 1993a)	Okia Reserve (2008)		
							Pyramids	Taiaroa Bush	Victory Beach/ Okia Flat
Sophora microphylla	Kowhai		o				o		#
*Spergularia rubra**	Sand spurrey			o					
*Stelleria media**	Chickweed		f	f	f			f	f
Stelleria parviflora			o	o	o		r	r	
Streblus heterophylla	Small-leaved milk tree		f						
*Taraxicum officinale**	Dandelion			o	o				o
Tetragonia implexicoma	NZ spinach	f		f			f	f	f
Tetragonia tetragonioides	NZ spinach				f				
*Trifolium dubium**		o		o	o			r	o
*Trifolium repens**			f	f	f		o		f
Triglochin striata						●			
*Ulex europaeus**				r	r	●	r		o
Uncinia uncinata	Hooked sedge						r		
Urtica ferox	Ongaonga	v	v				v	a	
*Urtica urens**				o	o				r
*Veronica serpyllifolia**	Turf speedwell			r	r				
*Vicia sativa**	Vetch						f		
Viola cunninghamii						●			r
*Vulpia bromoides**		r							
Wahlenbergia gracilis		o							
Wolffia australiana	Watermeal			f	f	●			

Appendix 4

Research Undertaken

Hamilton, Billy *"Using colour to increase stoat (Mustela erminea) trap catch"*, Department of Conservation Science Internal Series 187, September 2004, Department of Conservation PO Box 10-420 Wellington, New Zealand

Auge, Amelie *Sea Lion Satellite Tracking study 2008-2010* Research from March 2008 monitoring the presence, location, and behaviours of NZ sea lions in Papanui Inlet and south of Victory Beach Zoology Department, University of Otago and Department of Conservation Marine Mammal Research Office

Jackson, Josephine. *Gregariousness in a nascent population of NZ sea lions at Otago* Masters in Science Otago University Marine Science Department

Shaun McConkey Monthly Survey Identifying Sea Lions NZ Sea lion Trust

Appendix 5

Information Sources

Käi Tahu ki Otago Natural Resource Management Plans 1995 and 2005

Hoiho Recovery Plan 2002 – 2025 www.doc.govt.nz

DCC Coastal Dune Conservation Works Programme DTEC Consulting Ltd July 2002

DCC Coastal Dune Conservation Investigations City Consultants Ltd June 1998

DOC Resource Kit "Super sites for Conservation Education – Okia" www.doc.govt.nz

A Biodiversity Strategy for Dunedin City Council August 2007– sets out the vision and goals for sustainable management of Dunedin's biodiversity

Appendix 6

Reserve Bylaws

5 CONTROL OF DOGS

5.1 Definitions

5.2 Shelter for Dogs

5.3 Control of Dogs

5.4 Dog Exercise Area

5.5 Public Places in which Dogs are Prohibited

5.6 Fouling in Public Places

5.7 Infectious or Infested Dogs

5.8 Bitches in Season

5.9 Nuisances

5.10 Licence to Keep More than One Dog

5.11 Impounding of Dogs

5.12 Dog Control Fees

5.13 Amendment of Schedules

SCHEDULE

(a) Designated Dog Exercise Areas

(b) Tracks and Reserves Where Dogs Are Allowed

(c) Areas Where a Hunting Permit is Required

(d) Areas Where Dogs Are Prohibited

Control of Dogs

CONTROL OF DOGS

DUNEDIN CITY COUNCIL DOG CONTROL BYLAW 2004

Former Bylaws Repealed

Section 5 of the Dunedin City Council Dog Control Bylaw 1997 on Control of Dogs is hereby repealed and all bylaws of the Dunedin City Council already in force shall be read subject to this bylaw. In the event of conflict between the provisions of any former bylaw and the provisions of this bylaw, the provisions of this bylaw shall prevail.

5.1 Definitions

Act – means the Dog Control Act 1996

Animal Control Officer – has the same meaning as 'Dog Control Officer' as appointed under section 11 of the Act.

Owner – means every person who:

(a) Owns a dog; or

(b) Has possession of the dog, whether the dog is at large or in confinement, otherwise than for the sole purpose of restoring a lost dog to its owner; or

(c) Is the parent or guardian of and shares a household with a person under the age of 16 years who is the owner of the dog pursuant to paragraph (a) or (b) of this definition:

But does not include any person who has seized or taken custody of the dog under the Dog Control Act 1996 or the Animal Protection Act 1960 or any regulation made under either of those Acts.

Paws Track – the track defined by white painted paw prints and signage through the no dog area from the corner of Bedford Street and Victoria Road along the northern side of the Forbury Road extension, in front of the Surf Club to the access point for the Middle Track and onto the beach to the piles.

Public Place – means a place that, at any material time, is open to or is being used by the public, whether free or on payment of a charge, and whether any owner or occupier of the place is lawfully entitled to exclude or eject any person from that place and includes any aircraft, hovercraft, ship or ferry or other vessel, train, or vehicle carrying or available to carry passengers for reward.

Working Dog – means:

- any guide dog, hearing ear dog, or companion dog
- any dog:

- kept by the Police or any constable, the Customs Department, the Ministry of Agriculture, the Ministry of Fisheries or the Ministry of Defence, or any officer or employee of any such Department of State solely or principally for the purposes of carrying out the functions, powers, and duties of the Police or the Department of State or that constable, officer, or employee; or,

- a collie dog (heading, huntaway or handy) that is kept solely or principally for the purposes of herding or driving stock

- kept by the Department of Conservation or any officer or employee of that department solely or principally for the purposes of carrying out the functions, duties, and powers of that department

- declared by resolution of the territorial authority to be a working dog for the purposes of the Act, or any dog of a class so declared by the authority, being a dog owned by any class of persons specified in the resolution and kept solely or principally for the purposes specified in the resolution.

5.2 Shelter for Dogs - (1) The owner of any dog shall provide for it a weatherproof kennel or place of confinement of adequate size with access to clean water, constructed on well-drained ground and, in the case of a kennel without other means of confinement, provided with a fixed chain or running wire which allows the dog free movement about the kennel. All kennels or places of confinement shall be kept in a reasonable, clean and sanitary condition. A place of confinement may include a dwelling.

(2) Animal Control Officers will have discretion to determine what is reasonable.

(3) No owner of any dog shall keep it on any premises in any kennel or place of confinement, other than a dwelling, any part of which is nearer than two metres to any boundary of those premises.

5.3 Control of Dogs on a Leash - (1) The owner and any person for the time being having charge of any dog shall ensure that the dog does not enter or remain in any public place unless it is kept on a leash, chain or lead which is in turn secured or held so that the dog cannot break loose.

Except

(a) That a dog may be exercised without being restrained during the hours commencing half an hour before sunrise and half an hour after sunset in any public place where dogs are allowed other than a road, street or prohibited area. The dog must be under continuous control whilst being exercised. For the purpose of this clause it shall be deemed to be sufficient control if the dog is under the continuous surveillance or control of some responsible person, that is, able to be recalled instantly whenever another person, dog, or any other animal, is encountered. The dog must not give rise to any reasonable complaint as to its behaviour while being exercised.

(b) In dog exercise areas dogs can be exercised at any time but must still be under the control or surveillance of some responsible person.

(2) The provisions of 5.3(1) shall not apply to a working dog carrying out the work in respect of which the dog has been registered.

(3) Notwithstanding any other provision of this Bylaw, the entry of dogs on to any public place specified in Section 5.5 is prohibited.

5.4 Dog Exercise Areas - (1) Dogs within Exercise Areas may be exercised at large at all times while under continuous surveillance and effective control, or on a leash according to the appropriate signage for that area within the exercise area, except dogs are not permitted to enter children's playgrounds and marked sports grounds where these are adjacent to Exercise Areas.

(2) The designated Dog Exercise Areas are contained in Section (A) of the attached Schedule.

(3) See also Section (B) and (C) of the Schedule for details on tracks and reserves where dogs under control are allowed.

(4) Owners must pick up and wrap all dog faeces deposited by their dogs on Exercise Areas and place into the litter bins provided.

5.5 Public Places in which Dogs are Prohibited - (1) Dogs are prohibited in those places listed in Section (D) of the attached Schedule at all times unless otherwise specified.

(2) The Council may from time to time make areas temporarily prohibited to dogs because of any potential conflict with people, domestic animals, or at the advice of the Department of Conservation, wildlife. Temporary prohibitions will be notified by signage placed at the points of entry to the areas and where practicable, public notice in the newspaper.

5.6 Fouling in Public Places - No person being the owner or a person having charge of any dog shall permit the dog to defecate in a public place or on land or premises other than that occupied by the owner.

(1) Provided that, no offence shall be deemed to have been committed against this bylaw where the owner or the person having charge of the dog removes the faeces immediately after the dog has deposited them.

(2) Any person having charge of any dog shall at all times while exercising the dog whether within a designated exercise area or any public place carry a suitable receptacle to remove and dispose of dog faeces immediately after the dog has deposited them.

(3) Plastic bags, paper bags or acceptable pooper scoopers are examples of suitable receptacles.

(4) Where a public litter bin or similar receptacle is used to dispose of the droppings, they must be suitably wrapped or contained to prevent fouling the receptacle.

5.7 Infectious or Infested Dogs - No person being the owner or having control or charge of any infectious or infested dog shall take the same into any public place or permit or suffer such dog to enter or remain in a public place except when being taken to a veterinary clinic.

5.8 Bitches in Season - No person being the owner or having control or charge of any bitch in season shall take the same into any public place or permit or suffer such dog to enter or remain in a public place except when being taken to a veterinary clinic. Such bitches shall be kept confined but adequately exercised.

5.9 Nuisances - (1) The owner of any dog and the owner or the occupier of any premises on which any dog or dogs are kept shall:

(a) Take adequate precautions to prevent the dog or dogs or the keeping thereof from becoming a nuisance or annoyance.

(2) If, in the opinion of the Council, any dog or dogs or the keeping thereof on any premises has become or is likely to become a nuisance, the Council may, by notice in writing, require the owner or occupier of the premises within a time specified in such notice, to do all or any of the following:

a) Reduce the number of dogs kept on the premises

b) Order the permanent removal of a single dog on a property.

c) Construct, alter, reconstruct or otherwise improve the kennels, places of confinement or other buildings used to house or contain such dog or dogs (Animal Control Officers will have the discretion to determine what is acceptable or reasonable).

d) Require such dog or dogs to be tied up or otherwise confined during specific periods.

e) Take such other action as the Council deems necessary to minimise or remove the likelihood of nuisance.

(3) The owner of every dog shall ensure it does not create a nuisance or annoyance:

a) By obstructing the lawful passage of persons in public places;

b) By rushing and frightening persons in a public place or lawfully on private property;

c) Shall not permit it to be kept in circumstances that may be offensive or likely to be injurious to health;

d) Shall not permit or allow it at any time to destroy, tear or otherwise interfere with any refuse container whether the container is on private property or in a public place.

5.10 **Permit to Keep More Than One Dog -** (1) No more than one dog of registrable age (whether or not such a dog is registered) may be kept on any premises unless:

a) The owner or occupier is the holder of a permit to keep two or more dogs; or,

b) The premises are zoned rural in the relevant, operating Dunedin City District Plan.

c) Notwithstanding the exception in (b), if a justifiable complaint is received about any dog on the premises the Council may, in its discretion, require the owner to apply for and obtain a permit for all dogs on the premises.

(2) No permit shall be granted to the owner or occupier of any premises if such premises by reason of inadequate fencing, size, location or detrimental effect on any other premises would be inappropriate for the housing of two or more dogs.

(3) If the property in which the dog owner resides is leased/rented, the written consent of the property owner is required to keep two or more dogs on that property before any consideration for a Kennel Permit will be given. A copy of such consent must be forwarded to Council.

(4) A permit issued under this Clause is subject to the conditions set by the Council. Any breach of such conditions or other terms or restrictions shall be a breach of this Bylaw. Any permit may be revoked by the Council for breach of conditions or, in the event of change of circumstances relating to the premises, the owner or occupier thereof or the animals kept or remaining on such premises.

(5) Applications for permits to keep more than one dog shall be made on the form supplied by the Council and shall provide such information in respect of the application as the Council may reasonably require.

(6) There shall be paid to the Council for every such permit an inspection fee which the Council may from time to time by resolution publicly notified prescribe, and on each 1st day of July following the date of issue, an annual fee may be charged for the following twelve months.

(7) The fee for such permits shall be payable in addition to the registration fees payable under the Dog Control Act 1996.

5.11 **Impounding of Dogs -** When any contravention of Section 52 (1)(2) of the Act occurs, the dog may be impounded in a dog pound in accordance with Section 52(3) of the Act. Animal Control Officers may elect in some circumstances to require the owner of a continually offending dog to have the dog neutered or spayed.

5.12 **Dog Control Fees -** The Council will regularly review its dog control fees. Fees will be set by resolution, publicly notified and advertised.

5.13 **Amendment of Schedules -** That any items contained in the attached schedules to this Bylaw be altered at any time by resolution of Council and publicly notified.

SCHEDULE

NOTE: All are Dunedin City Council reserves or tracks unless otherwise stated.

(A) DESIGNATED DOG EXERCISE AREAS

Rotary Park – Highcliff Road

Forrester Park – Norwood Street

Cemetery Road – East Taieri

Shand Park – Brighton Road, Green Island

Wakari Reserve

Kew Park – Corner of Easther Cres and Forbury Road

(NOTE: Dogs are not permitted in children's playgrounds or on marked sports grounds adjacent to any of these Exercise Areas).

(B) TRACKS AND RESERVES WHERE DOGS ARE ALLOWED

Controlled dogs are permitted without a leash unless otherwise specified.

Dunedin City

Market Reserve – Princes Street

Bethunes Gully (on a leash in lower picnic area)

Ferntree (on a leash)

Frasers Gully Recreation Reserve (on a leash)

Leith Valley Scenic Reserves (DOC)

Ocean Beach Domain

Ocean Grove Recreation Reserve

Ross Creek (on a leash)

Track from northern end of Esplanade to the scout den at the southern end of Kettle Park (on a leash)

Track from Forbury Road to the Middle Track and known as the "Paws Walking Track" (on a leash)

Woodhaugh Gardens (on a leash on defined walking Tracks only)

Flagstaff

Flagstaff/Swampy

Jim Freeman Track

Nicols Falls

Pineapple Track (on a leash)

Whare Flat

North of Dunedin

Aramoana Beach south of Keyhole Rock (DOC)

Bucklands Crossing

Cleghorn Street

Doctors Point

Evansdale Glen

Huriawa Pa (on a leash – Ngai Tahu and DOC)

Karitane Esplanade Reserve

Long Beach Recreation Reserve

Mapoutahi Pa (on a leash – Ngai Tahu and DOC)

Purakanui Recreation Reserve

Signal Hill Recreation Reserve

Scott Memorial

Truby King Reserve (on a leash)

Waikouaiti Recreation Reserve

Waikouaiti River Foreshore and Duncansby Street River Reserve (on a leash)

Warrington Recreation Reserve

Peninsula

Allans Beach south west of where the access track enters the beach (DOC)

Bacon Street to Highcliff Road

Camp Road

Greenacres Street

Karetai Road

Silverstream

Racemans Track

South of Dunedin

Brighton Recreation Reserve

Island Park Recreation Reserve

Ocean View Recreation Reserve

Westwood Recreation Reserve

Woodside Glen Track (DCC and DOC)

(C) AREAS WHERE A HUNTING PERMIT IS REQUIRED

Permits are necessary to take your dog into the following areas for hunting purposes.

Allans Beach Wildlife Management Reserve (DOC)
Chalkies (DOC)
Silverpeaks (DOC)
Maungatua Scenic Reserve (DOC)
Woodside Glen Track (DOC)
Taieri Gorge Scenic Reserve – Outram Glen (DOC)

(D) AREAS WHERE DOGS ARE PROHIBITED

Areas developed and equipped as children's playgrounds.
The designated playing area of all marked sports grounds.
All cemeteries.
Areas that from time to time the Council will notify by way of signage and advertising that there is a temporary dog prohibition in place because of wildlife, stock or other issue.

Commercial areas:

The Octagon, the Civic Centre, the Library Plaza and those areas of Princes Street and George Street which lie between the Exchange and Knox Church.
King Edward Street, South Dunedin between Hillside and Macandrew Roads.

Except

This prohibition does not apply to guide-dogs for the blind, hearing ear dogs, companion dogs, police dogs and dogs being used by security guards, working dogs, dogs confined in an efficient container, or securely confined in or by lead or restraint on a vehicle. No offence shall be committed when a dog securely controlled by means of a lead, leash or chain is being taken through the defined area to the nearest area where the dog may be exercised by a resident of the defined area.

Beach Areas:

Designated areas of bathing beaches where lifeguards mark the safe areas for swimming by the placement of flags during the periods when daylight saving is in force.

St Clair Beach and Esplanade:

a) All of the beach from the Salt Water Pool to the nearest piles on the beach to the north, **however,** dogs on a leash may have access to the beach between 8.00 pm and 8.00 am the

following day with access via end of Beach Street and the steps between shark warning bell and the end of the sea wall at the northern end of the Esplanade.

b) The park on Victoria Road adjoining the playground area, the playground area itself and the sealed area adjacent to this that starts at the Esplanade and extends past the Surf Club to the beach track.

c) The Esplanade area which fronts and runs parallel to the sea wall to where it meets Beach Street to the south.

d) The asphalt carpark that is accessed from the Esplanade.

e) The reserves park situated between the asphalt carpark that is accessed from the Esplanade and Bedford Street.

Brighton Beach:

All of the area within the bay from the Big Rock to the small cliff at the North end of the domain including the estuary and all of the beach within the confines of Brighton Road.

Recreation

Macandrew Bay Beach Reserve

Broad Bay Beach Reserve

Botanic Garden

Woodhaugh Gardens (other than on defined walking tracks).

Conservation/Wildlife Areas

Okia Reserve (DCC and Yellow Eyed Penguin Trust)

Boulder Beach (DOC)

Sandymount and associated track network (DOC)

Sandfly Bay (DOC)

Seal Point Road to Sandfly Bay (DOC)

Lighthouse Reserve (Taiaroa Head and DCC)

Taiaroa Head (DCC and DOC)

Allans Beach north east of where access track enters the beach (DOC)

Pilots Beach Recreational Reserve (DCC)

Warrington Spit and Island (DCC)

Aramoana Beach from Keyhole Rock north to Heyward Point (DOC)

Aramoana Ecological Area – salt marsh and wetland (DOC)

Deep Stream Scenic Reserve (DCC and DOC)

Grangers Road Track (DOC)

Hyde-Middlemarch Rail Trail (DOC)

Mill Creek Track (DOC)

Outram Glen to Lee Stream (DOC)

Sutton Salt Lake Scenic Reserve (DOC)

Aramoana-Hayward Point (DOC)

Careys Creek (DOC)

Grahams Bush Walk (DOC)

Hawksbury Lagoon (DOC)

Leith Saddle (DOC)

Matanaka (DOC)

Organ Pipes (DCC)

Mount Cargill (DCC)

Orokonui (DOC)

Tunnel Beach (DOC)

Burns Park (DOC)

Goat Island (DOC)

Quarantine Island (DOC)

Otekiho Reserve (DCC and Yellow Eyed Penguin Trust)

Tracks

Highcliff Road to Hoopers Inlet

Lime Kilns (Private)

Mount Charles (Private and DOC)

Paradise Road and Track

Pipikaretu Beach (Private)

Quion Cliff (Private)

41 Peg Track

District Road Track

Ridge Road Track

Nyhon Track

Bacon Street Track

Buskin Road (Otago Peninsula)

Aramoana – Heyward Point Track (DOC)

10 RESERVES

Reserves

Approved by Council: 4 April 2005
Date of Effect: 1 May 2005

10

PART 10: RESERVES

10.1 Interpretation - The expression "reserve" in this Bylaw means any open space, plantation, park, garden, ground track or land set apart for public recreation, enjoyment, conservation, beautification, education, research, or other values, and under the management or control of Community and Recreation Services (Parks and Reserves) whether or not dedicated as a reserve under the provisions of the Reserves Act 1977, and also includes the buildings, amenities, vegetation, and memorials therein.

Vehicle – Vehicle includes a contrivance equipped with wheels, tracks, or revolving runners on which it moves or is moved, skateboards, in-line skates, and roller skates. For the purpose of this bylaw, vehicles exclude emergency, service, or authorised vehicles.

10.2 Prohibited Activities

10.2.1 No person, in any reserve, shall -

(a) Enter or leave any enclosed reserve except through the openings, gateways, entrances or exits provided for that purpose and all gates shall be left open or closed as they are found; or

(b) Enter or remain on any reserve if the reserve has been closed by the Council; or

(c) Ride, lead, or take, any animal (except a dog being exercised in accordance with the Bylaw Part 5 – Control of Dogs) on any part of any reserve except upon parts of which have been clearly set aside for such purposes; or

(d) Cause or permit wastage of any water supply on any reserve or permit any tap or shower on any reserve to run for any longer period than reasonably required; or

(e) In any manner pollute any water on any reserve; or

(f) Wilfully obstruct, disturb, annoy or interfere with any other person in the use of enjoyment of the reserve, or behave in a sexually inappropriate manner causing alarm to another person, or use any abusive, or obscene language, or be intoxicated or under the influence of drugs, or noisy or riotous, or in any way misbehave; or

(g) Place or leave any rubbish or litter of any description, except in any receptacle provided; or

(h) Throw sticks, stones or other missiles in a way likely to be injurious to any person or likely to damage property; or

(i) Play musical instruments or sound reproduction equipment to the annoyance of others; or

(j) Abandon any vehicle on a reserve; or

(k) Dispose of grey water or sewage except in designated disposal points (such as those provided at campgrounds on reserves).

10.3 Restricted Activities

(1) The activities listed below in sub clause (2) of this clause are prohibited on all reserves unless either -

(a) The Council has resolved that the activities shall be permitted on all reserves or on any particular reserve; or

(b) The person or persons engaging in the activity have the written permission of the Council or have made a booking, to undertake the activity. Written permission may be limited by conditions. Conditions can cover, but are not limited to: the charging of fees, the time of the activity, and location of the activity.

(2) The restricted activities referred to above in sub clause (1) of this clause are -

(a) Taking on to any reserve, and the use on any reserve of any firearm, air gun, bow and arrow, catapult, animal trap, or other weapon or device of a dangerous character; or

(b) The flying of model aircraft; or

(c) The playing or practice of golf; or

(d) The erection of stalls, tents, swings, amusement devices or structures of any kind; or

(e) Any trading other than in accordance with a Mobile Trading Licence specifically permitting trading in the reserve; or

(f) The posting or distributing of notices and the erection of signs; or

(g) Disturbing any soil, uprooting any plant or taking any cutting or interfering with, picking or removing any flowers, fruits, seeds, pods, cones, ferns, greenery or other foliage; or

(h) Collection of organisms or other objects for scientific, educational or other purposes, disturbance of the environment for the purpose of collecting such objects; or

(i) Doing anything that causes any damage to any part of a reserve including the ground surface of the reserve, any plants in the reserve and any building, structure or fixtures thereon; or

(j) Holding or conducting or taking part in, any public meeting, or assembly of any kind within any reserve that causes damage to the reserve or unduly restricts other people's use of the reserve; or

(k) Setting off any fireworks; or

(l) Encroaching into any reserve in a manner that could create an impression that the area is not part of the reserve, including access, gardens, buildings, and structures; or

(m) Driving or riding any vehicle (including bicycles), on any part of any reserve except upon parts which have been clearly set aside for such purposes; or

(n) Parking or driving a motorised vehicle on a reserve in an area other than in a recognised car park or roadway, or in a way that causes damage to the reserve, inhibits proper use of the reserve, restricts access to the reserve or facilities, or obstruct normal and safe movement of other vehicles or pedestrians; or

(o) Parking or storing a vehicle, boat or vessel, on a reserve on a regular, periodic, or continuous basis; or

(p) Camping on any reserve, unless set aside for that purpose; or

(q) Using of power tools, parking a vehicle or trailer, or using equipment, for removing or cutting vegetation on a reserve; or

(r) Lighting or cause to remain alight, any fire within any reserve except within a barbecue provided by the Council for that purpose; or

(s) Depositing or storing any refuse, trade waste, garden refuse, rubble, or debris on a reserve.

10.4 Conditions of Use

(a) Any person using any reserve is required to obey all lawful or safety directions, signs and conditions of permission, given by any person authorised in that regard by the Council.

(b) Organised sport may take place only on reserves or parts of reserves set aside for that purpose or as directed or permitted by the Council with a booking and upon payment of any fee fixed by the Council.

(c) In areas set aside for use by motorised vehicles, excluding sealed carriageways/driveways on reserves listed in Appendix 1, the Council may by resolution prescribe a speed limit to such parts and make other rules for the orderly conduct of traffic and parking. Where no speed limit has been fixed by resolution the driving of any vehicle on that part of the reserve at a speed in excess of 20 kilometres per hour is prohibited. Vehicles must be driven in a manner that does not compromise the safety of other reserve users.

(d) Road Bylaws will apply to the sealed carriageways/driveways on reserves listed in Appendix 1.

(e) Any horse being taken into a permitted area (as listed in any management plan or Appendix 2 of this Bylaw) on a reserve will use designated access points.

10.5 Enforcement

(a) Any vehicle, whether attended or not, in breach of this Bylaw may be removed by any Police or Council officer and impounded at the expense of the driver or owner.

(b) The Council may remove or alter a work or thing that is, or has been, constructed in breach of a Bylaw, and may recover costs of removal or alteration from the person who committed the breach.

(c) It is not a defence to any charge that an offence has been committed against part of this Bylaw (other than where compliance with a sign, notice or road marking is an ingredient of the offence) if no sign, notice or road marking was in place at the time such offence was alleged to have been committed.

Appendix 1 List of Sealed Carriageways/Driveways (Considered to be Public Roads) on Reserves – (This list does not include legal roads)

Road Name	Locality	Park Name
Braid Road	Dunedin	Town Belt
Burma Road	Dunedin	Ross Creek Reserve
Butts Road	Dunedin	Logan Park, New Caledonian Sports Ground, Northern Cemetery, University Oval
Carnforth Street	Green Island	Green Island Railway Beautification Lease
Chamberlain Street	Dunedin	Town Belt
Church Street	Port Chalmers	Old Port Chalmers Cemetery, Port Chalmers Town Belt, and unnamed reserve
Cluny Street	Dunedin	Bethunes Gully
Como Street	Dunedin	Town Belt
Cosy Dell Road	Dunedin	Town Belt
Cowan Road	Dunedin	Mount Cargill Reserve
Drivers Road	Dunedin	Town Belt
Duchess Avenue	Dunedin	Town Belt
Duke Street	Dunedin	Town Belt
Esplanade	Warrington	Warrington Domain
Evansdale Glen Road	Evansdale	Evansdale Glen
George King Memorial Drive	Outram	Outram Bridge Recreation Reserve
Harcourt Street	Dunedin	Town Belt
High Street	Dunedin	Town Belt
John Wilson Ocean Drive	Dunedin	Ocean Beach Domain
Kettle Park Road	Dunedin	Ocean Beach Domain
Kyle Street	Dunedin	Cosy Dell
Lachlan Avenue	Dunedin	Town Belt
Leithbank	Dunedin	Shingle Reserve
Littlebourne Road	Dunedin	Town Belt
Logan Park Drive	Dunedin	Logan Park
Lonsdale Street	Dunedin	Town Belt
Lovelock Avenue	Dunedin	Botanic Garden
Magnet Street	Dunedin	Otago Harbour Recreational Reserve
Maori Road	Dunedin	Town Belt
Meadow Street	Dunedin	Town Belt
Melrose Street	Dunedin	Town Belt
Moana Rua Road	St Kilda	Ocean Beach Domain
Newington Avenue	Dunedin	Town Belt
Opoho Road	Dunedin	Botanic Garden
Peninsula Beach Road	Port Chalmers	Port Chalmers Domain
Portobello Road	Macandrew Bay	Macandrew Bay Beach
Preston Crescent	Dunedin	Town Belt
Queens Drive	Dunedin	Town Belt, Littlebourne Ground
Scarba Street	Dunedin	Town Belt
Sligo Terrace	Dunedin	Town Belt
Stafford Street	Dunedin	Town Belt
Stuart Street	Dunedin	Town Belt
Tolcarne Avenue	Dunedin	Town Belt
Wallace Street	Dunedin	Town Belt
William Street	Careys Bay	Unnamed reserve (questionable status)

Appendix 2 Reserves where Horses are Permitted

(a) Ocean Grove Recreation Reserve – Tomahawk Beach (beach only), Smaills Beach (below high tide line).

(b) Waikouaiti Beach (below high tide line)

(c) Island Park Recreation Reserve Beach (Beach and formal access tracks to beach only)

(d) Ocean View Recreation Reserve (area leased by Brighton Pony Club)

Access to permitted areas is via formal access tracks only. Horses are not permitted in the dunes of any reserve.

Appendix 7

Statutory Acknowledgement for Te Tai O Arai Te Uru (Otago Coastal Marine Area)

Ngai Tahu Claims Settlement Act Schedule 103

Statutory Acknowledgement for Te Tai O Arai Te Uru (Otago Coastal Marine Area)

Specific Area

The statutory area to which this statutory acknowledgement applies is Te Tai o Arai Te Uru (the Otago Coastal Marine Area), the Coastal Marine Area of the Moeraki, Dunedin Coastal and Molyneaux constituencies of the Otago region, as shown on SO Plans 24250, 24249, and 24252, Otago Land District and as shown on Allocation Plan NT 505 (SO 19901).

Under section 313, the Crown acknowledges Te Rūnanga o Ngai Tahu's statement of Ngai Tahu's cultural, spiritual, historic, and traditional association to Te Tai o Arai Te Uru as set out below.

Ngai Tahu Association with Te Tai o Arai Te Uru

The formation of the coastline of Te Wai Pounamu relates to the tradition of Te Waka o Aoraki, which foundered on a submerged reef, leaving its occupants, Aoraki and his brothers, to turn to stone. They are manifested now in the highest peaks in the Ka Tiritiri o Te Moana (the Southern Alps). The bays, inlets, estuaries and fiords which stud the coast are all the creations of Tu Te Rakiwhanoa, who took on the job of making the island suitable for human habitation.

The naming of various features along the coastline reflects the succession of explorers and iwi (tribes) who travelled around the coastline at various times. The first of these was Maui, who fished up the North Island, and is said to have circumnavigated Te Wai Pounamu. In some accounts the island is called Te Waka a Maui in recognition of his discovery of the new lands, with Rakiura (Stewart Island) being Te Puka a Maui (Maui's anchor stone). A number of coastal place names are attributed to Maui, particularly on the southern coast.

The great explorer Rakaihautu travelled overland along the coast, identifying the key places and resources. He also left many place names on prominent coastal features. Another explorer, Tamatea, sailed along the Otago coast in the waka Täkitimu. After the waka eventually broke its back off the coast of Murihiku, Tamatea and the survivors made their way overland back to the North Island, arriving at the coast by the place Tamatea named O-amaru (Öamaru).

Place names along the coast record Ngai Tahu history and point to the landscape features which were significant to people for a range of reasons. For example, some of the most significant rivers which enter the coastal waters of Otago include: Waitaki, Kakaunui, Waihemo (Shag), Waikouaiti, Kaikarae (Kaikorai), Tokomairiro, Mata-au (Clutha), Pounawea (Catlins). Estuaries include: Waitete (Waitati), Otakou (Otago), Makahoe (Papanui Inlet), Murikauhaka (Mate-au and Koau estuaries), Tahaukupu (Tahakopa estuary), Waipatiki (Wapati Estuary). Islands in the coastal area include Okaihe (St Michaels Island), Moturata (Taieri Island), Paparoa, Matoketoke, Hakinikini, and Aonui (Cooks Head).

Particular stretches of the coastline also have their own traditions. The tradition of the waka (canoe) Arai Te Uru and its sinking at the mouth of the Waihemo (Shag River) has led to the coastal area of Otago being known as Te Tai o Araiteuru (the coast of Arai Te Uru). Accounts of the foundering, the wreckage, and the survivors of this waka are marked by numerous landmarks almost for the length of the Otago coast. The boulders on Moeraki coast (Kai Hinaki) and the Moeraki pebbles are all associated with the cargo of gourds, kumara and taro seed which were spilled when the Arai Te Uru foundered.

For Ngai Tahu, traditions such as these represent the links between the cosmological world of the gods and present generations. These histories reinforce tribal identity and solidarity, and continuity between generations, and document the events which shaped the environment of Te Wai Pounamu and Ngai Tahu as

an iwi.

Because of its attractiveness as a place to establish permanent settlements, including pa (fortified settlements), the coastal area was visited and occupied by Waitaha, Ngati Mamoe and Ngai Tahu in succession, who, through conflict and alliance, have merged in the whakapapa (genealogy) of Ngai Tahu whanui. Battle sites, urupa and landscape features bearing the names of tüpuna (ancestors) record this history. Prominent headlands, in particular, were favoured for their defensive qualities and became the headquarters for a succession of rangatira and their followers. Notable pa on the Otago coast include: Makotukutuku (Oamaru), Te Raka-a-hineatea (Moeraki), Te Pa Katata, Pa a Te Wera, (Huriawa Peninsula), Mapoutahi (Purakaunui), Pukekura (Taiaroa Head), Moturata (Taieri Island). The estuaries from the Waitaki River to the Chaslands also supported various hapu.

Tüpuna such as Waitai, Tukiauau, Whaka-taka-newha, Rakiiamoa, Tarewai, Maru, Te Aparangi, Taoka, Moki II, Kapo, Te Wera, Tu Wiri Roa, Taikawa, Te Hautapanuiotu among the many illustrious ancestors of Ngati Mämoe and Ngai Tahu lineage whose feats and memories are enshrined in the landscape, bays, tides and whakapapa of Otago.

The results of the struggles, alliances and marriages arising out of these migrations were the eventual emergence of a stable, organised and united series of hapu located at permanent or semi-permanent settlements along the coast, with an intricate network of mahika kai (food gathering) rights and networks that relied to a large extent on coastal resources. Chiefs such as Korako (several), Tahatu, Honekai, Ihutakuru, Karetai, Taiaroa, Potiki, Tuhawaiki, and Pokene being some among a number who had their own villages and fishing grounds. Otago Peninsula (Muaupoko) had many kaunga nohoanga with a multitude of hapu occupying them. At one time up to 12 kainga existed in the lower Otago harbour, some larger and more important than others.

The whole of the coastal area offered a bounty of mahika Käi, including a range of kaimoana (sea food); sea fishing; eeling and harvest of other freshwater fish in lagoons and rivers; marine mammals providing whale meat and seal pups; waterfowl, sea bird egg gathering and forest birds; and a variety of plant resources including harakeke (flax), fern and ti root. In many areas the reliance on these resources increased after the land sales of the 1840s and 1850s, and the associated loss of access to much traditional land-based mahika kai.

Many reefs along the coast are known by name and are customary fishing grounds, many sand banks, channels, currents and depths are also known for their kaimoana. One example is Poatiri (Mt Charles — Cape Saunders) the name of which refers to a fish hook. Poatiri juts out into the Pacific, close to the continental shelf, and is a very rich fishing ground. Another example is Blueskin Bay which was once a kohanga (breeding ground) for the right whale, although it is well over 150 years since it has seen this activity.

Other resources were also important in the coastal area. Paru (black mud used for dying) was obtained from some areas. Some of the permanent coastal settlements, such as those at the mouth of the Mata-au (Clutha River), and at Otakou and Purakaunui, were important pounamu manufacturing sites. Trading between these villages to the south and north via sea routes was an important part of the economy.

The Otago coast was also a major highway and trade route, particularly in areas where travel by land was difficult. Pounamu and titi were traded north with kumara, taro, waka, stone resources and carvings coming south. Travel by sea between settlements and hapu was common, with a variety of different forms of waka, including the southern waka hunua (double-hulled canoe) and, post-contact, whale boats plying the waters continuously. Hence tauranga waka (landing places) occur up and down the coast in their hundreds and wherever a tauranga waka is located there is also likely to be a nohoanga (settlement), fishing ground, kaimoana resource, rimurapa (bull kelp

— used to make the poha, in which titi were and still are preserved) with the sea trail linked to a land trail or mahika kai resource. The tüpuna had a huge knowledge of the coastal environment and weather patterns, passed from generation to generation. This knowledge continues to be held by whänau and hapu and is regarded as a taonga. The traditional mobile lifestyle of the people led to their dependence on the resources of the coast.

Numerous urupa are being exposed or eroded at various times along much of coast. Water burial sites on the coast, known as waiwhakaheketupapaku, are also spiritually important and linked with important sites on the land. Places where kaitangata (the eating of those defeated in battle) occurred are also wahi tapu. Urupa are the resting places of Ngai Tahu tupuna and, as such, are the focus for whänau traditions. These are places holding the memories, traditions, victories and defeats of Ngai Tahu tüpuna, and are frequently protected in secret locations.

The mauri of the coastal area represents the essence that binds the physical and spiritual elements of all things together, generating and upholding all life. All elements of the natural environment possess a life force, and all forms of life are related. Mauri is a critical element of the spiritual relationship of Ngai Tahu whänui with the coastal area.

Appendix 8

Accidental Discovery Protocol

1. Introduction

This protocol records those procedures that will be followed in the event that koiwi, taoka, wahi tapu, or archaeological sites, are unearthed or discovered within the Okia Reserve.

2. Definitions

In this Protocol the following terms are used:

Archaeological Sites – as defined by the Historic Places Act 1993 (as amended).

"Koiwi takata" means human skeletal remains.

"Taoka" means cultural artefacts including implements, weapons or decorations traditionally and historically utilised by tangata whenua and include parts or the remains thereof.

"Wahi tapu" means any site of religious, cultural or spiritual significance for takata whenua.

3. Nominated Contacts

The Manager
Community and Recreation Services
Dunedin City Council
(03) 477 4000

Te Rūnanga o Ōtākou
Tamatea Rd
RD 2
Otakou
DUNEDIN 9077
(03) 478 0352

4. Accidental Discovery Protocol

The following procedure shall be adopted in the event that koiwi takata, taoka or wāhi tapu are unearthed or discovered, or are reasonably suspected to have been unearthed or discovered, within the Okia Reserve.

a. If koiwi takata (human skeletal remains), taoka or a wahi tapu site are uncovered all activity in the immediate vicinity of the site shall cease and the Dunedin City Council shall be notified of the discovery.

b. The Dunedin City Council shall take steps immediately to secure the area in a way that ensures that the discovery remains untouched so far as possible in the circumstances.

c. The Dunedin City Council will immediately advise Te Rūnanga o Ōtākou of the occurrence.

d. The Dunedin City Council shall, dependent on the nature of the discovery, notify the New Zealand Police and the Public Health Unit (in the event of a koiwi takata discovery); the New Zealand Historic Places Trust; and the Department of Conservation.

e. The Dunedin City Council will ensure that assistance is made available to guide takata whenua and staff to the site, assisting with any requests that they may make.

f. The Dunedin City Council shall ensure that kaumatua are given the opportunity to undertake karakia and such other religious or cultural ceremonies and activities at the site as may be considered appropriate in accordance with tikanga Maori (Maori custom and protocol).

g. Where the koiwi takata, taoka or wahi tapu are of Maori origin, any materials discovered will be handled and removed by the kaumatua who are responsible for the tikanga (custom) appropriate to their removal or preservation.

This protocol is effective as from [insert date]

The Manager
Community and Recreation Services
Dunedin City Council

For and on behalf of Te Rūnanga o Ōtākou

DUNEDIN CITY
COUNCIL
Kaunihera-a-rohe o Otepoti