

**MONTAGUE ISLAND NATURE RESERVE
PLAN OF MANAGEMENT**

NSW National Parks and Wildlife Service

November 1995

Acknowledgments: This plan of management was prepared by the Field Services Division of the NSW National Parks and Wildlife Service in association with staff of Narooma District.

Acknowledgement is also made to the Conservation Plan prepared for the conservation of the cultural heritage of the island by Service officers Sue Feary and Ross Constable.

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SYNOPSIS

Montague Island Nature Reserve is located off the south coast of NSW approximately 9km southeast of Narooma. The island comprises two elevated sections divided by a ravine, with a total area of 82 ha. The marine environment around Montague Island is particularly rich because of the close proximity of the continental shelf and the warm Eastern Australian Current. This marine habitat supports the large number of birds that use the island and a colony of Australian fur seals.

Accordingly, Montague Island is one of the most important seabird nesting areas in NSW, particularly for little penguins, wedge-tailed shearwaters, short-tailed shearwaters, sooty shearwaters, silver gulls and crested terns. It is second only to Phillip Island in Victoria for numbers of penguins and is one of Australia's major shearwater breeding sites.

Large numbers of seals were commercially harvested during the early part of this century and the island contains the only remaining Australian fur seal haul out site along the NSW coast and the northern most colony of this marine mammal in eastern Australia.

The island's habitat values will be conserved by protecting them from human disturbance and by maintenance, and as far as possible, regeneration of native vegetation. In particular, the rapid spread of kikuyu and other weeds with associated smothering of native vegetation presents a significant threat to the continued maintenance of nesting areas on the island and will be controlled.

The nature reserve contains a number of Aboriginal sites which are valuable for research and a culturally significant lightstation complex. The lightstation and other significant historic features will be maintained and where appropriate restored.

In order to protect the important natural and cultural heritage of the nature reserve, this plan of management provides for its continued occupation by Service staff, limited and strictly controlled access to most of the island and continued encouragement of research.

Public access to the nature reserve will continue to be permitted by guided tours run by licensed operators. A business plan outlining the commercial opportunities and environmental constraints of the operation of these licences will be prepared. The restored relief lightkeepers quarters is being furnished as a house museum. Interpretive displays in the museum will be expanded.

The management of the island by the Service over the past few years has become a feature of the tourist scene in the Narooma area. This plan of management aims to maintain that

position without compromising the natural and cultural heritage values of this important nature reserve.

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1. INTRODUCTION

The National Parks and Wildlife Act, 1974, requires that a plan of management be prepared for each nature reserve. A plan of management is a legal document that outlines how the area will be managed in the years ahead.

The procedures for the adoption of a plan of management for a nature reserve are specified in the Act:

- * Where a plan of management has been prepared, the Director-General of National Parks and Wildlife is required to refer the plan to the National Parks and Wildlife Advisory Council for its consideration and advice.
- * The Director-General is then required to submit the plan to the Minister, together with any comments or suggestions of the Advisory Council.
- * The Minister may adopt the plan without alteration or with such alterations as he may think fit, or may refer it back to the Director-General and the Advisory Council for further consideration.

Once a plan has been adopted by the Minister, no operations may be undertaken within the nature reserve except in accordance with the plan.

Although not a requirement under the Act, this plan of management has been placed on public exhibition for comment on the proposals it contains. Any comments received will be referred to the Advisory Council with the plan when their consideration and advice is sought.

The planning process leading to the development of this plan has involved the collection and use of information, which for reasons of document size, has not been included in the plan. For additional information or inquiries on any aspect of the management of the nature reserve, please contact the Service's Narooma District Office at 36 Princes Highway, Narooma or by phone on (044) 76 2888.

The closing date for comments on the plan is 27th June 1994.

Comments should be forwarded to :

The District Manager
National Parks and Wildlife Service
Narooma District
PO Box 282
NAROOMA 2546

Following adoption of the final plan by the Minister, copies of all representations received will be available for public inspection in the library of the Service's Head Office at 43 Bridge Street, HURSTVILLE 2220 (telephone: 02 585 6444).

2. MANAGEMENT CONTEXT

2.1 NATURE RESERVES IN NEW SOUTH WALES

Reserving areas for nature conservation as a general purpose was introduced into Australia with the establishment of Royal National Park in 1879, some seven years after the world's first national park was created at Yellowstone in the United States of America.

Fauna reserves in New South Wales were first established under the Fauna Protection Act of 1948, which was replaced by the National Parks and Wildlife Act of 1967. Under the latter Act, fauna reserves were reclassified as nature reserves. The 1967 Act has been replaced by the National Parks and Wildlife Act, 1974.

Under the National Parks and Wildlife Act, nature reserves are areas of special scientific interest containing wildlife or natural environments or natural phenomena.

The purposes of nature reserves are defined in the Act as:

- "(a) the care, propagation, preservation and conservation of wildlife;
- (b) the care, preservation and conservation of natural environments and natural phenomena;
- (c) the study of wildlife, natural environments and natural phenomena; and
- (d) the promotion of the appreciation and enjoyment of wildlife, natural environments and natural phenomena.

Nature reserves are valuable refuge areas, where natural processes, phenomena and wildlife can be studied. They differ from national parks which include as a major objective the provision of appropriate outdoor recreation opportunities.

2.2 MONTAGUE ISLAND NATURE RESERVE

2.2.1 Location, History of Dedication and Regional Setting

Montague Island Nature Reserve is located off the south coast of NSW approximately 9km southeast of Narooma (see centre map). The island consists of two elevated sections divided by a ravine and has a total area of 82 ha. It is an important seabird nesting habitat and seal haul out site and contains significant historic buildings associated with the Montague Island Lighthouse. The site of the lighthouse is excluded from the reserve but the other lightstation buildings, the lightkeepers quarters and sheds, are dedicated as part of the nature reserve.

The island was managed from the 1880s for provision of lighthouse, weather recording and coastal surveillance functions. In 1953 it became a wildlife sanctuary under the control of the National Trust of Australia in conjunction

automation of the lighthouse, management of the island was transferred to the NSW National Parks and Wildlife Service and it was dedicated as a nature reserve in January 1990, except for a small area containing the lighthouse which remains under the control of the Australian Maritime Sea Safety Authority.

The adjacent mainland supports mainly forestry, dairying and, in summer, tourism. The Narooma coast, including the waters immediately around the island, is an important commercial fishing area and is heavily used for recreational fishing, boating and diving.

Public access to the island is restricted to guided tours conducted by the Service in association with private operators.

2.2.2 Importance of Montague Island Nature Reserve

Montague Island is the largest island off the NSW coast other than Lord Howe Island. It has been classified by the National Trust as a Landscape Conservation Area for its scenic, scientific and historical values. The lightstation buildings are entered on the Register of the National Estate because of the architectural quality of the tower and residences. The significant natural and cultural features of the nature reserve are described below.

Natural Values

Montague Island is one of the most important breeding areas along the NSW coast for seabirds, particularly little penguins (*Eudyptula minor*), wedge-tailed shearwaters (*Puffinus pacificus*), short-tailed shearwaters (*Puffinus tenuirostris*), sooty shearwaters (*Puffinus griseus*), silver gulls (*Larus novaehollandiae*) and crested terns (*Sterna bergii*).

Montague Island is second only to Phillip Island in Victoria for numbers of penguins and is one of Australia's major shearwater breeding sites. The island is at the southern breeding limit of the wedge-tailed shearwater.

The threatened sooty oystercatcher (*Haematopus fuliginosus*) breeds on the island and the wandering albatross (*Diomedea exulans*) and fleshy-footed shearwater (*Puffinus carneipes*) have been recorded on the island or in adjacent waters.

The island contains the only remaining Australian fur seal (*Arctocephalus pusillus*) haul out site along the NSW coast and the northern most colony in eastern Australia. Large numbers of seals were commercially harvested during the early part of this century.

Longterm monitoring of shearwater populations on the island has been undertaken since 1960 by scientists from the Commonwealth Scientific and Industrial Research Organisation. There are few comparable long-term monitoring programs for seabirds in Australia and none of these other surveys provide a comparison between related species breeding at the same time at the one site (Pacey, 1991).

Cultural Values

The island contains numerous Aboriginal sites, comprising artefact scatters and middens. These have high scientific value because of their potential to provide information about Aboriginal use of island resources such as mutton birds and penguins, the use and manufacture of water craft and the transportation of raw materials for making stone artefacts. Island Aboriginal sites are rare.

The island is linked by an Aboriginal legend to Mount Dromedary and to Little Dromedary. It is also reported that the island was used by the Aborigines for traditional ceremonial purposes.

The southern section of the island is a significant historic place. Over 110 years of lightkeeping are represented on the island by the tower, the keepers quarters and associated features such as sheds, gardens, tracks and jetties.

The lightstation retains most of its original form and fabric and has changed little from the time of construction to the present day. This enhances its historical character.

The modifications that have been made to the lightstation reflect progressive changes in lighthouse technology and the living standards and working conditions for lighthouse staff and their families.

The lightkeepers quarters were designed by the colonial architect James Barnet and demonstrate the Georgian style which Barnet perfected during his career. The style and materials used in their construction were an adaptation to the exposed island environment and the distinctive architectural style of the quarters reflects the social values and work ethic of the time.

The historic features scattered over the island provide evidence of the harsh island lifestyle, the special requirement of a remote existence and adaptation by the families that occupied the island for 100 years. These features have high potential for cultural research.

The island is a well known district feature and has high social significance to the local community, both Aboriginal and European.

The island was the first National Trust 'property' in Australia and was managed by the Trust as a Flora and Fauna Reserve from 1953 until dedicated as a nature reserve in 1990.

Landscape and Aesthetic Value

The island and the lightstation are visually highly significant and are district landmarks.

The island gives a feeling of peace and isolation. It has high scenic values which vary according to weather and light

island and large numbers of birds can be seen and heard on the island and in the surrounding waters.

The spectacular island setting is characterised by exposed granitic rock covered by tussock grasses which form a dramatic backdrop to the built environment. The lightstation has high aesthetic value and from all directions dominates the island.

Eco-tourism and Educational Value

The presence of large populations of easily visible wildlife and interesting historic features gives Montague Island high value for eco-tourism and education. It offers a unique destination and combination of features close to the popular coastal tourist area around Narooma and within reasonable distance of the major population centres of Sydney, the Illawarra and Canberra. Montague Island is one of only three lightstations in NSW open to the public.

Eco-tourism to and around the island contributes to the local economy. The lightstation is a symbol of the character of the district and is used in its promotion.

Summary of Conservation Significance

Montague Island Nature Reserve is of state conservation significance for the following reasons:

- the island is one of the most significant seabird breeding areas in NSW and contains the only seal haul out site in the state;
- the lightstation demonstrates the development of lightstations in NSW and is an excellent example of lightstation construction in the late 19th Century;
- it was the last manned island lighthouse in NSW and is the only remaining occupied island lightstation on the NSW coast;
- the lightstation contains evidence of a lifestyle that reflects adaptation to a remote and lonely existence;
- Aboriginal sites on the island provide an opportunity for the understanding of Aboriginal use of offshore islands;
- the unusual and easily visible marine wildlife and significant and interesting cultural features within a small island area provide an educational and tourism resource which is unique in NSW.

3. OBJECTIVES OF MANAGEMENT

3.1 GENERAL OBJECTIVES FOR NATURE RESERVES

The following general objectives relate to the management of nature reserves in New South Wales:

- * protection and preservation of scenic and natural features;
- * maintenance of natural processes as far as is possible;
- * conservation of wildlife;
- * preservation of Aboriginal sites and historic features; and
- * encouragement of scientific and educational inquiry into environmental features and processes.

3.2 SPECIFIC OBJECTIVES FOR MONTAGUE ISLAND NATURE RESERVE

In addition to the above general objectives, the management of Montague Island Nature Reserve will be subject to the following specific objectives:

- * conservation of the island's habitat value as a major seabird breeding area and seal haul out site;
- * protection of all native animals, particularly the seabird and seal colonies, from human disturbance;
- * conservation of the cultural values of the island and in particular preservation of the lightstation buildings within the reserve;
- * maintenance, and where necessary regeneration, of natural vegetation cover;
- * elimination of introduced plants and animals, apart from those plants or areas of exotics which have cultural significance or where the removal of exotics would threaten breeding habitats of sea-birds;
- * provision of opportunities for scientific research;
- * provision of opportunities for education and appreciation of the reserve by the public; and
- * development of awareness and appreciation of the values of the reserve by the public, particularly the boating community.

3.3 OVERALL STRATEGY

Montague Island will be managed to protect its value for breeding seabirds and the seal colony, and to conserve significant cultural features primarily by:

- continued staffing of the island;
- strict control of public access;
- maintenance of historic structures in accordance with the Montague Island Conservation Plan; and
- control of introduced species;

Limited and controlled public visitation will be permitted to enable appreciation of the island's features and promote support for both natural and cultural heritage conservation on the island without compromising the islands values.

4. POLICIES AND FRAMEWORK FOR MANAGEMENT

This chapter contains the policies and framework for the management of Montague Island Nature Reserve together with relevant background information. Policies are summarised under the following section headings:

- Natural Heritage
- Cultural Heritage
- Use Of The Area

The policies established in this plan of management will provide the framework for management consistent with anticipated resources available to the Service and with anticipated community trends, for the next five to ten years.

The actions identified are those to which priority will be given in the foreseeable future. Other management actions may be developed over the life span of this plan consistent with the policies set out in the plan.

4.1 NATURAL HERITAGE

4.1.1 Geology, Landform and Soils

Montague Island is roughly rectangular, 1.4km long and 525 metres wide and is oriented north-south. A ravine divides it into a northern section, covering approximately one third the total area, and a larger southern section on which the lighthouse and other developments are located. The two sections are commonly referred to as the north and south "islands".

The island is part of the Cretaceous Mount Dromedary Igneous Complex. The southern section consists of banatite, an intrusive coarse grained granitic rock. The northern section is composed of an older volcanic complex consisting of andesitic lava and tuffs.

The island was previously joined to the mainland at Cape Dromedary by a sand spit. This sand spit was submerged by rising sea levels about 9 000 years ago, after the last ice age.

The southern section of the island has many rock outcrops and reaches a height of 64 metres above sea level. The northern section is slightly lower with fewer rock outcrops. The coastline is rugged with steep cliffs, especially around the northern section. These features, combined with the lightstation, give the island its dramatic landscape quality.

Much of the island is covered by remnant sand dunes up to 1m thick. The soils formed on the dunes are thin. Where the dunes have been indurated by the leaching of iron oxides and humates a distinctive 'coffee rock' horizon has developed which is most evident on the eastern side of the island. Swampy areas occur on the slopes, particularly near the southern end.

- on some edges of the northern section;
- in a former sand extraction area adjacent to the residences; and
- along some tracks, particularly the old garden track.

The sand extraction area has disturbed an Aboriginal site.

Policies

- * The high scenic value of the island will be maintained.
- * All works carried out in the reserve will be designed and undertaken so as to minimise soil erosion.
- * Where soil erosion occurs as a result of visitors or management use or threatens significant habitats or other values, measures such as rehabilitation and restriction of public use will be undertaken.
- * No rock, sand or other material will be extracted from the island.

Actions

- * The old garden track will be stabilised and hardened where necessary to prevent further erosion.
- * Erosion control and rehabilitation will be undertaken elsewhere where necessary.

4.1.2 Plants and Animals

Photographic records show that at the turn of the century much of the southern section of the island was covered by scattered small trees and shrubs, which probably included banksias, acacias and casuarinas. No native trees and few shrubs remain today. The loss of trees has probably resulted from burning for firewood by the lightkeepers and grazing by rabbits and goats.

Botanical collections were made on the island in the 1930s, 1950s, 1973 and 1988 (Heyligers and Adams, 1989). More than 160 species were recorded in these collections, of which nearly half were introduced. A number of species recorded in the earlier collections were not seen in 1973 and 1988.

The native plant species demonstrate the islands previous connection to the mainland. The dominant vegetation is matrush (*Lomandra longifolia*) which thickly covers the ground over much of the island. Blady grass (*Imperata cylindrica*), bracken (*Pteridium esculentum*) and tussock grass (*Poa labillardiera*) commonly occur with the matrush and are sometimes locally dominant. Tussock grass is extensive on the slopes of the north island. A few shrubs including *Westringia fruticosa*, *Pelargonium australe*, *Melaleuca armillaris* and *Correa alba* occur in sheltered places and on cliff edges where they were protected from grazing by rabbits and (formerly) goats. One *Acacia*

wetter areas support reed (*Phragmites australis*) and the rushes *Juncus sp.* and *Scirpus nodosus*. Ferns occur in some moist sheltered places below cliffs. A variety of herbs and ground covers also occur.

Open grassy areas, predominantly kikuyu (*Peniosetum clandestinum*) and some buffalo grass (*Stenotaphrum secundatum*), have replaced native vegetation around the buildings and along tracks. These grasses are invading extensive areas of native vegetation near the lightstation and isolated patches elsewhere, particularly along the coastline.

Kikuyu on the northern section of the island threatens the shearwater population as these birds require bare earth or rock to launch into flight.

Research on Phillip Island in Victoria (Phillip Is Penguin Reserve Committee of Management, 1989) and Bowen Island in Jervis Bay (Fortescue, 1992) has shown that kikuyu presents an impenetrable barrier to movement and burrowing by penguins and shearwaters. On Bowen Island, penguins subsequently used areas from which kikuyu was eliminated and replaced with matrush. An investigation is underway to determine the impact of kikuyu on the penguin population on Montague Island in order to design an effective kikuyu control program.

The other main species of concern is rambling dock (*Acetosa sagittaria*) which displaces native plants. It occurs in large patches on the south island.

Other introduced species occur in small numbers, mainly along tracks and drainage lines from the residences and in the former garden area. Some of the introduced species have cultural significance and will be retained. Invasion of grass from these areas will be controlled as far as possible.

Priority will be given to controlling weed species on the island in accordance with a number of criteria including the following:

- their impact on native plant and animal communities;
- their impact on the cultural heritage;
- where they are new isolated occurrences;
- where they have the potential to be spread along tracks; and
- the cost effectiveness of control methods.

A weed control plan is proposed on the basis of these criteria.

Tracks are major sites for weed invasion and only tracks essential for management will be retained. In the long term the sealing of tracks or construction of boardwalks may be necessary for the effective control of weeds.

Over 90 species of birds, predominantly seabirds, have been recorded on or over the island (Fullager, 1988 and 1990).

Seventeen species are permanent residents or regular visitors.

Fifteen species of bird breed on the island, of which 7 are seabirds. Penguins (*Eudyptula minor*), are widely distributed, although more abundant at the southern end and 10 000 breeding pairs have been estimated to use the island (Fullagar and Heyligers, 1992). The silver gull (*Larus novaehollandiae*) is present over much of the island, with estimates of up to 10 000 breeding pairs. There are two communities of crested terns (*Sterna bergii*) totalling up to 1 000 breeding pairs; in one site west of the lighthouse and in one site on the north-west side of the island.

The three species of shearwater which breed on the island occupy mixed colonies, mainly on the north island but also on parts of the north eastern side of the south island. These species produce chicks in numbers varying from 100 per year (the sooty shearwater (*Puffinus griseus*)) to 12 000 per year (the short-tailed shearwater (*Puffinus tenuirostris*)) (Fullager, 1973). The size of the colonies appears to be increasing (Fullager, 1988), possibly as a result of increased protection human impacts since the 1950s.

Penguins are resident on the island all year while the other breeding seabirds mainly occur on the island between September and November. Penguins and shearwaters nest in burrows under the matrush and amongst tussock grass in sandy soils. Nests are very densely spaced so that humans walking amongst them would be likely to crush eggs or young birds. Gulls and terns nest on the ground and are extremely vulnerable to human disturbance during the breeding season.

The November 1992 Penguin Census Report (Fullagar and Heyligers), however, found a low percentage of burrow-using penguins. The majority of nest sites were found on the surface in the cover afforded by ground vegetation. This leaves the colony vulnerable to drought and fire. The report also emphasises the importance of "penguin walkways" within kikuyu infested areas which provide access for penguins to nesting sites. The research currently being undertaken on the impact of kikuyu on penguin habitat will assess the value of existing tracks as "walkways".

Regeneration of light tree cover, mainly *Banksia integrifolia*, on Bowen Island was accompanied by improvement in penguin breeding success because of decreased burrow temperatures, increased humidity and protection from predators (Fortescue, 1992). The penguin population rapidly increased and as a consequence penguins displaced shearwaters in those areas with easy access from the sea. Shearwaters were found, however, to still breed in woodland areas accessible only by flight.

Regeneration of a scattered tree cover and shrubs on Montague Island would therefore improve its habitat value, particularly for penguins. It is expected that there would be little impact on the shearwater population as the areas where the shearwater colonies are located are further from the water and hence relatively inaccessible to penguins.

Other waterbirds commonly recorded on the island include the

of cormorant, the white faced heron (*Ardea novaehollandiae*), white fronted tern (*Sterna striata*), Australian gannet (*Morus serrator*) and black-browed albatross (*Diomedea melanophrys*).

Land birds commonly recorded include the ground pipit (*Anthus novaeseelandiae*), banded landrail (*Callirallus philippensis*), leaden flycatcher (*Myiogra notatus*), willy wagtail (*Rhipidura leucophrys*) and golden headed fantail warbler (*Cisticola exilis*) which breeds on the island.

Raptors include the Australian kestrel (*Falco cenchroides*), peregrine falcon (*Falco peregrinus*), black-shouldered kite (*Elanus notatus*) and white-breasted sea eagle (*Haliaeetus leucogaster*).

Few animals other than birds occur. Reptiles recorded are the skinks, *Egernia whitii* and *Lampropholis guichenoti*.

Numbers in the Australian fur seal (*Arctocephalus pusillus*) colony at the northern end of the island vary between about 25 for most of the year and 700 during the breeding season. Numbers appear to be increasing. The seals which migrate to the island from breeding areas in Bass Strait have not been competitive in the mating and breeding processes. It is thought that Montague Island is not a breeding colony, although fishermen over the years claim that some seal pups have been born there (Pacey, 1991). There is only limited knowledge of the pattern of seal use of the island and of the management needs of the colony.

Research in Victoria indicates that the major barrier to recovery of the seal population to pre-European levels is limited food supply and that competition from commercial fishing is a significant factor (Shaughnessy and Warneke, 1987). The marine environment around Montague Island is particularly rich because of the close proximity of the continental shelf and warm Eastern Australian Current. These waters support the large number of birds that use the island, and the seal colony. The waters around Montague Island also attract professional and amateur fishing boats and it is common in summer for large numbers of boats to be in the vicinity of the island. It is probable that fishing affects the islands seal and bird populations although the significance of this is not known.

The seal colony is also subject to disturbance by sightseers approaching too closely on boats. The effect of this is unknown and monitoring and research are needed.

In 1993, a joint research project by the Taronga Park Zoo and the NSW National Parks and Wildlife Service, was commenced into the population dynamics, biology and range of the Australian fur seal community on Montague Island.

Unauthorised landing on the island is not permitted to protect the bird and seal colonies from disturbance by trampling and fire and to protect important historic places. Human disturbance of breeding crested terns, for example, has been observed to result in egg destruction by the more aggressive silver gull while the nests are left unguarded.

Introduced animals on the island are the house mouse (*Mus musculus*) near the buildings and rabbit (*Oryctolagus cuniculus*). Rabbits are not numerous but have changed the vegetation of the island and contributed to soil erosion. They are a major hurdle to regeneration of shrubs and trees on the island. Other introduced animals, notably goats, have been present on the island in the past but were eradicated following transfer of management of the island to the Service. Rabbits are subject to continuing control programs.

Policies

- * The native plant and animal communities of the reserve will be protected from human disturbance.
- * Regeneration of native vegetation will be encouraged.
- * The spread of introduced plants will be controlled. Where practicable introduced plants will be eradicated from all areas except around historic buildings as provided in section 4.2.2. Priority will be given to:
 - eradication of rambling dock;
 - eradication of kikuyu where it:
 - . threatens bird breeding colonies; or
 - . occurs in isolated patches; and
 - control of kikuyu elsewhere on the island.
- * Only tracks considered essential for penguin walkways or for management purposes will be retained. Tracks proposed to be retained are shown on the map, centre pages.
- * Domestic animals will not be permitted on the island.

Actions

- * Rabbits will be controlled and, if possible, eradicated.
- * Vegetation changes will be monitored. A tree and shrub regeneration and weed control program will be prepared and implemented in accordance with the results of research undertaken on the island.
- * The impact of visitors to the island on the seal colony and seabird colonies will be monitored and controlled where necessary.
- * The impact of commercial and recreational fishing on the seal colony and seabird colonies will be monitored.

4.1.3 Fire

Fires occur occasionally on the island, generally from lightning strikes. They are usually limited in extent but the entire island has been burnt during extreme conditions

Fires can have a devastating effect on nesting birds and result in wind erosion and habitat destruction. Fires on the island are therefore suppressed as quickly as practicable. The appropriate fire frequency for the native vegetation communities of the island is not known, although it appears that the dominant vegetation whilst not requiring fire for ecological reasons will readily regenerate following fire. Limited and controlled fire could be a useful tool in the control of introduced species.

Policies

- * Fire will be managed on Montague Island to:
 - maintain the habitat value of the island, particularly for breeding seabirds;
 - encourage regeneration of native tree and shrub cover;
 - protect the historic places and Aboriginal sites; and
 - protect human life and property.
- * All unscheduled fires will be suppressed as quickly as possible unless determined to be useful for habitat improvement and/or weed control.
- * Fire suppression methods will, as far as possible, avoid disturbance to bird nesting colonies and habitat.
- * Prescribed burning may be used to assist in weed control programs.
- * Prescribed burning, and as far as possible wildfire, will be confined to small parts of the island only and outside the bird breeding season.

Action

- * A fire management plan will be prepared by June 1995.

4.2 CULTURAL HERITAGE

The cultural heritage of Montague Island is an important component of the environment that may have aesthetic, historic, scientific and/or social significance to present and future generations. The cultural heritage includes both Aboriginal and non-Aboriginal history.

4.2.1 Aboriginal Sites

Montague Island was called Barunguba by Aboriginal people. According to legend, Montague Island is part of a social and cultural complex which includes several important landscape features, particularly Mount Dromedary (Rose, 1990).

The island was an important seasonal food source for the Aboriginal community. Observations were valuable because of

their high fat content and together with fish, penguins, other seabirds, eggs and possibly seals would have made the dangerous trip to the island worthwhile. Freshwater springs on the island would have enabled extended visits by groups of Aborigines (Pacey, 1991).

A thin scatter of artefacts and hearth stones occurs over most of the island but concentrations appear to coincide with the locations of bird breeding colonies, particularly shearwaters (Sullivan 1975). One shell midden occurs near a beach on the south island and another site adjacent to a beach on the north island may be a midden. The middens comprise fragmented shells of intertidal molluscs which could have been collected from rock crevices around the island during calm weather.

Most of the artefacts found on the island are made from silcretes and other acid-rich stone which must have been carried over from the mainland since this rock type does not occur on the island. A minority of the artefacts are made from a volcanic rock similar to the andesites of the northern part of the island and it is possible that Aboriginal quarries exist on the island where the rock for these implements has been extracted.

The Aboriginal sites have not been dated although they are unlikely to be older than 4,000 years and almost certainly post date the last rise in sea level. The sites are small and have little depth, indicating seasonal use of the island by small hunting groups.

The Sydney Gazette, 23rd of June, 1827, describes a boat trip to Sydney by survivors from the ship "Mary" which broke up in Twofold Bay in 1821. The Gazette stated that in their search for food, "On Montague Island some nuts were found in a native hut, recently abandoned; eagerly and ravenously were they devoured".

Aborigines were still visiting the island well after European contact. A newspaper article in the Moruya Examiner dated 1892 recounts a story by local Aborigines about the drowning of 150 members of the Wagonga Tribe when their canoes were swamped in a squall during their return from the island early in the 19th century.

Policies

- * Aboriginal sites will be protected from disturbance or damage by human activities.
- * Sites threatened by natural causes will be protected if possible or identified as priority sites for detailed recording and research.
- * All work involving ground disturbance will be preceded by an inspection for Aboriginal sites.
- * The Service will liaise with the Wagonga Local Aboriginal Land Council concerning all aspects of Aboriginal site management.
- * Non-destructive research into past Aboriginal use of

4.2.2 Historic Places

The history of the island is described in the Montague Island Conservation Plan (Feary and Constable, 1992). It is summarised below.

The island was sighted by Lieutenant James Cook when he sailed along the Coast in 1770, although Cook thought it was the tip of a cape extending from Mt. Dromedary. The island was later named after George Montagu Dunk, Earl of Halifax.

The island was visited several times by shipwrecked sailors (Pacey, 1991). During the mid-nineteenth century goldrush at Nerrigundah, sea bird eggs were collected from Montague Island to sell to the miners at the Gulf Mine on Mt. Dromedary (Gibbney, 1989).

As the foreign and coastal shipping trade to New South Wales developed in the mid 1800s, pressure increased for installation of a navigation aid on Montague Island. Construction of the lightstation commenced in 1878 and the light was lit for the first time in 1881.

The early lightkeepers faced an isolated lifestyle dependent on boats and rudimentary signalling systems for contact with the mainland. Keepers and their families had to be self-sufficient and depended to a large extent on the garden produce, chickens, milking cows, goats and rabbits which were husbanded on the island and the eggs of seabirds which they found there.

Trips to the island by locals and tourists for picnicking, fishing and shooting were popular from earliest European settlement on the adjacent coast, until 1953 when the island became a reserve under National Trust protection. During the 1890s a number of large public excursions were undertaken with up to 200 people at a time being taken for picnics to the island (Pacey, 1991).

Big game fishing began in Australia when a black marlin was caught off Montague Island in 1933. Several fishing shacks dating from the 1930s are believed to have existed on the western shore but no evidence remains of these structures.

The first recorded scientific visit to the island was by an amateur ornithologist, A.F. Basset Hull in 1907 and other visits followed. Scientists from the Commonwealth Scientific and Industrial Research Organisation and members of the National Trust, particularly Judith Cassell, were regular visitors from the 1950s onwards.

The southern section of the island contains numerous scattered historic relics within a landscape altered by tree loss and other degradation by introduced species. This area also has high natural values which over-ride the historic values except where specific and significant historic features are located.

A conservation plan has been prepared to guide the management of the culturally significant heritage on the island. The conservation plan recognises a number of sites

The lightstation complex contains the lighthouse, residences, brick fuel store, a weatherboard shed and communications mast. The lighthouse was constructed of granite blocks quarried from a large rock outcrop to the north east of the tower. The quarry illustrates stone working technology and the debris from its construction is still evident at the base of the rock face.

The residences consist of two buildings constructed of three layers of brick brought from the mainland. They are structurally sound and in good physical condition.

The relief lightkeepers quarters are being restored to their original condition with sympathetic fittings to enable use for interpretation, a display and as a shop.

In November 1992, the Service was successful in gaining a Commonwealth grant for conservation works which allowed a number of projects to be completed on the island.

The old jetty area is situated on the western shore of the island south west of the lighthouse. It contains the remains of the island's first wharf, a slipway and small boat harbour. The waters adjacent to the jetty have some potential for archaeological survey.

The new jetty site in Jetty Bay comprises a concrete platform, vessel buffer timbers, crane, vehicle ramp, bollards, boatshed and mooring pins. Jetty Bay was used during initial construction of the lightstation, but was not established as the permanent landing point until the early 1960s. The boatshed is of weatherboard construction similar to the paint store and is in a generally sound condition.

The poultry shed/navy complex is located north of the lightstation. The poultry shed formerly consisted of a timber, iron and wire enclosure with small sheds at its southern end. Only the sheds remain. A weatherboard tractor shed, which may originally have been used as a stable, is located adjacent to the poultry shed but is in poor structural condition.

Close to the poultry shed is a timber and fibro hut, the only remaining building from a navy facility established during the late 1950s for submarine detection research.

The old garden area is situated 150 metres north east of Jetty Bay and consists of old fence lines, shed frames and garden plot mounds all of which are now overgrown by kikuyu. The site may have potential for research and interpretation of the gardens to visitors.

A former rubbish disposal area is located below the high tide level north east of the lightstation. A flying fox was used to carry refuse away from the buildings. Other tip sites and the original construction camp are located south west and north west of the lightstation

complex. These sites may contain archaeological information about early life on the island.

A grave site consisting of three graves and two headstones is located at the southern end of the island. The headstones are in poor condition and require stabilisation.

Tracks to the jetties, graves and old garden are also of historical interest as they are believed to follow the original routes. They are not sufficiently significant, however, to warrant retention where this conflicts with the conservation natural features.

A wooden staircase is located on the eastern side of the island which was constructed by a former lightkeeper to gain access for fishing. The stairs are in poor condition and of little significance. They will not be actively conserved and will be removed or replaced when they become hazardous.

A number of isolated artefacts are known to occur on the island outside of the localities described above and others may be scattered over the island and in adjacent waters.

Policies

- * The historic places of Montague Island will be conserved in accordance with the Burra Charter of Australia ICOMOS and the Montague Island Conservation Plan.
- * All the buildings will be maintained.
- * Priority will be given to works which maintain the buildings in a stable and weatherproof condition.
- * All work involving ground disturbance will be preceded by a survey for historic places and relics.
- * The buildings may be adapted for management purposes. Any adaptation will take into account the cultural significance of the original form, fabric and style of the building.
- * Any material removed during alterations to the original buildings will be stored unless deemed to be of minimal significance.
- * The 1881 architectural style of the residences will be retained. No new openings will be put in original walls. The later additions (except for the original alteration to the relief quarters described in the conservation plan) may be removed if necessary for management purposes.
- * All restoration work will be based on available research, including oral history.
- * The residences adjacent to the lighthouse will be adapted for use as staff quarters and will be maintained in a condition that meets Government housing standards with respect to fittings, floor coverings and

- * Internal renovations will be permitted where a need for the replacement of deteriorated fittings has been identified or the convenience and comfort of staff need to be addressed. All renovation will be undertaken in a manner that minimises disturbance to the form and fabric of the building. All original fittings that are part of the building form will not be affected by any alterations.
- * The immediate precinct around the lightstation will be retained as a cultural landscape. The grassed area will be maintained by regular mowing.
- * The Jetty Track will be retained as a grassed path.
- * Exotic plantings (other than grass) in the old garden area will be maintained. Wildings which escape from the old garden area will be eradicated.
- * Introduced plants may be removed from all other historic places.
- * Historic relics will be recorded and conserved. Artefacts will be left in situ and may be interpreted if appropriate.
- * Archaeological research at the tip sites, old jetty and construction camp will be permitted.

Actions

- * Research will be undertaken into the original furnishings and fittings of individual rooms in the relief quarters.
- * Appropriate furnishings, fittings and furniture will be purchased and installed in the relief quarters.
- * The remains of the old jetty and boat ramp will be recorded in detail.
- * Kikuyu will be removed from the base of the quarry face to facilitate research and interpretation of the working area of the quarry.
- * The old garden area will be cleared of kikuyu and fully recorded.

4.3 USE OF THE AREA

It is an important aspect of the management of Montague Island Nature Reserve to ensure that its use, whether by the general public, special interest groups, Service managers or other authorities is appropriate, that is, in conformity with the National Parks and Wildlife Act and the management objectives and management strategy of this plan.

The major categories of use that can be appropriate, to varying degrees, on Service areas are:

- environmental education and promotion of the area, the Service and the conservation of natural and cultural Heritage;
- certain types of recreation;
- research; and
- management operations, by the Service itself and other authorities with statutory responsibilities in the area.

The extent to which these categories of use are appropriate to Montague Island Nature Reserve is indicated below.

4.3.1 Public Use and Interpretation

The primary purposes of nature reserves are the conservation of wildlife, natural environments and significant cultural features and the encouragement of scientific research into these resources. Educational use and enjoyment are recognised as appropriate uses where they do not conflict with the conservation objectives of the reserve. Eco-tourism can promote support for conservation and provide funds for conservation programs.

Public access to Montague Island is permitted only by authorised tour. Tours are carried out by a licenced commercial operation and currently involve a boat trip from Narooma, landing at the new jetty, viewing the lightstation and other features and circling the island by boat to view the seal haul out site. Evening tours include viewing the penguins as they return to the island at Jetty Bay. Tours are dependent upon favourable weather and sea conditions. Embarking and disembarking onto and from the island can be difficult and this factor precludes visits by young children.

Tourist numbers are strictly limited, as are the frequency and timing of visits, to minimise impacts on the wildlife, historic places and walking tracks and to maximise public safety. Two 14 metre vessels are licenced to land passengers on the island and each vessel is surveyed by the Maritime Services Board to carry a maximum of 25 passengers. Tours are currently operated only from Narooma to minimise travel time at sea for visitors.

The licences to run tours to the island are for a period of three years and will expire on the 31st October 1994. The Service intends to continue licenced operations after this date but the number of licences to be issued and the conditions attached to any new licence will be subject to the recommendations of a proposed business plan. The process of allocating new licences will be consistent with the policies outlined in this plan of management, the need for adequate revenue return to the Service and the commercial viability of the tour operations.

The tours are led by Service authorised guides or by Service staff. Facilities to cater for visitors on the island are limited and will not be expanded from the current level except as provided for in this plan of management. These

limits on the number of visitors also allow guides to provide a more detailed understanding and awareness of the importance of the island and its management to visitors than would be possible if dealing with larger groups. To reduce the impact of visitors on the islands wildlife, steps are needed in the new jetty area to divert departing visitors away from late-arriving penguins.

An interpretative/educational display is located in the restored lightstation relief quarters. The display provides visitors with an insight into the historical significance of the lightstation, the lifestyle of lightkeepers and their families and the future management of Montague Island. The display is currently limited, however, and needs expansion and further interpretive detail.

The old jetty and graves will be interpreted in the shop display to avoid the need to provide regular access and to upgrade the tracks, with consequent impact on natural, cultural and landscape values.

The old garden area has high potential interpretive value. Public access will be permitted following clearing and track improvement work described in 4.1 and 4.2.

Overnight accommodation is not provided for tourists because of the lack of basic services such as medical facilities, the increased impact that would occur on the conservation values of the island and the risk of tourists being stranded by bad weather.

The lighthouse is excluded from the nature reserve and is the responsibility of the Australian Maritime Sea Safety Authority. Public access inside the lighthouse is not permitted, but the Service is negotiating with the Authority to arrange for some visitor access.

An exhibition on Montague Island is located in the Narooma Tourist Information Centre which includes the original lens of the lightstation which was removed when the light was automated.

Policies

- * Access to the island will continue to be by guided tours or for authorised management or research purposes only.
- * Short term licences to land passengers on the Island will be issued following the expiry of the current licences on the 31st October 1994. The number and conditions of any new licences will be consistent with the provisions of this plan of management and will ensure that the revenue return to the Service is adequate and that the commercial viability of existing and potential operations is considered.
- * A business plan outlining the commercial opportunities on Montague Island will be prepared as part of the tendering process for the new licence/s.

- * Vessels licenced to land visitors on the island are to be restricted to maximum length of 18 metres to protect the structural integrity of the island's jetty.
- * The number of visitors on the island will not exceed 90 visitors in any given 24 hour period (midnight to midnight).
- * The limit of management staff on the island will not exceed 15 for any given 24 hour period.
- * A limit has been set by this plan on the number of visitors permitted on the island on any one day. All licences and other formal agreements will be consistent with these numbers. Any review of this number will be by amendment to this plan consistent with the following criteria:
 - no deleterious impacts on the wildlife, tracks and historic places;
 - the physical capacity of the display area and the limited water supply on the island;
 - the capacity of the guides to communicate with and control the visitors;
 - maintenance of low key, high quality tours which maximise experience of the islands features and character; and
 - the capacity of the local emergency services and disaster infrastructure to deal with a tour related emergency.
- * All tours will be conducted on existing hardstand areas and tracks only.
- * The number of visitors will be reduced during certain breeding or moulting seasons at the discretion of the District Manager and this will be accomodated within the licence agreement/s as specified in the business plan.
- * Visitation (except for approved research) will be restricted to the southern end of the island; to the new jetty, lightstation, poultry shed complex and, following clearing and track stabilisation, the old garden area. Access will be by foot only.
- * The following themes will be emphasised in interpretation:
 - the importance of the island for seabird breeding, bird nesting ecology and the vulnerability of nests;
 - the importance of the seal colony and the vulnerability of the seals to disturbance;
 - Aboriginal use and significance;

- European history of the island, particularly the role of the lighthouse and the lifestyle of the lightkeepers; and
 - the management of the nature reserve and the need for strict control of public use.
- * The relief lightkeepers quarters will be open for public inspection and will be managed as a house museum with a shop and display area.
 - * The island will also be interpreted by means of brochures, guided tours and displays in the relief lightkeeper's quarters.

Actions

- * A business management plan will be prepared to develop the requirements for the licencing of tour operators. This document will be available for tenderers for new licences.
- * The interpretive display in the relief lightkeepers quarters will be expanded in accordance with the above themes. It will also include an explanation of restoration work undertaken in the lightstation.
- * The agreement of the Australian Maritime Safety Authority to permitting public access to the lighthouse will be sought.
- * Steps will be constructed at Jetty Bay to separate departing tourists from the route used by the penguins.

4.3.2 Research

As an island ecosystem, important seabird breeding area and the northern-most seal colony in eastern Australia, Montague Island Nature Reserve provides unique and valuable research opportunities. The cultural heritage of the reserve also offers opportunities for research into Aboriginal use of offshore islands and past use of the island for lighthouse and other purposes. Access for researchers is difficult and accommodation is limited.

Research into the biology and ecology of the island's breeding seabirds and seal colony is important for developing an improved understanding of the management needs of these species. As mentioned in section 2.2.2, a long term shearwater monitoring program is being carried out by the Commonwealth Scientific and Industrial Research Organisation. Research is also being undertaken by the Organisation into penguin populations and the habitat requirements of penguins and shearwaters.

Mention has also been made in 4.1.2 above of the joint programme between Taronga Park Zoo and the Service on the population dynamics, biology and range of the Montague Island seal colony.

A considerable amount of research has been undertaken in the

It is important that the results of all research be made available to assist management of the island.

Policies

- * Scientific research into the biology, habitat and management needs of the bird and seal colonies will be encouraged.
- * Only research programs which cause minimal disturbance to the reserve will be permitted unless alternative opportunities are not available elsewhere and the results of the research can be demonstrated to offer significant benefits for improvement of management programs or knowledge of the natural and cultural heritage of the island.
- * The results of research will be required to be provided to the reserve managers. The results of past research which has been undertaken on the island will be obtained and collated.

Action

- * A prospectus will be prepared which outlines preferred research to be undertaken on the island.

4.3.3 Management Operations

Montague Island Nature Reserve has unique management needs. Continued operation of the Service owned vessel and other off-island support is essential.

Permanent staffing on the island is necessary to protect the island's significant resources and Service staff are accommodated in the residences adjacent to the lighthouse. These residences also include accommodation for visiting Service staff. Staff of the Australian Maritime Sea Safety Authority , other authorities and researchers may also be accommodated in these buildings.

Water is obtained from roof catchment and effluent is disposed of by a septic tank. Rubbish is removed from the island.

Power is currently provided by diesel generators which are switched off at night to conserve power. This poses problems for the resident staff. Installation of a low power night supply system and alternative power generation methods could be less costly as well as more environmentally appropriate. Visual impacts would have to be considered when providing an alternative power system.

A helipad is located adjacent to the lightstation which requires maintenance of a grassed area and track. Relocation of the helipad to a site adjacent to the poultry shed which is also grassed, will reduce the area of the island required to be maintained as grassland.

Bureau of Meteorology weather monitoring equipment and radio facilities for The School of the Air, Royal Flying Doctor

Service, Eurobodalla Shire Council and the Surf Life Saving Association are located on the island.

An emergency action plan has been prepared which details procedures in situations such as land or maritime accident, fire and illness or stranding of tourists on the island during bad weather.

Policies

- * Management facilities will be maintained and items such as the generator will be replaced when necessary.
- * New structures will be built only if necessary for management of the nature reserve as provided for in this plan of management. Any new structure will be of the same scale and form as the existing structures and/or will be located so as not to detract from the visual integrity of the historic places or the island as a whole.
- * The tracks to the old jetty and graves will be low grade management tracks suitable for occasional foot access. Other tracks will be maintained to a minimal standard for public walking use. No new tracks will be constructed.
- * The northern section of the island will be visited by Service staff and others only for essential management or research purposes.
- * Staff on the island may use containers for gardening within the dwelling courtyards, with appropriately designed drainage to prevent damage to historic structures.
- * Weather monitoring and existing radio communication equipment will continue to be permitted where they have minimal impact on ecological, landscape and historic values.
- * Non-Service users of the island may be charged for transport and accommodation to and on the island to cover Service costs.

Actions

- * Alternative methods of power generation will be investigated including provision of a night-time power supply. If found to be cost effective and appropriate an alternative system will be implemented.
- * The helipad will be relocated to a site adjacent to the poultry shed complex.
- * The existing helipad site will be revegetated.

5. PLAN IMPLEMENTATION

This plan of management is part of a system of management developed by the National Parks and Wildlife Service. The system includes the National Parks and Wildlife Act, management policies, established conservation and recreation philosophies and strategic planning at corporate, regional and district levels.

The orderly implementation of this plan will be undertaken within the annual programmes of the Service's Narooma District. Priorities, determined in the context of district and regional strategic planning, will be subject to the availability of necessary staff and funds and to any special requirements of the Director-General or Minister.

District programmes are subject to ongoing review, within which, works and other activities carried out at Montague Island Nature Reserve are evaluated in relation to the objectives laid out in this plan.

The environmental impact of all development proposals will continue to be assessed at all stages of the development and any necessary investigations undertaken in accordance with established environmental assessment procedures.

Section 81 of the Act requires that this plan shall be carried out and given effect to, and that no operations shall be undertaken in relation to the nature reserve unless they are in accordance with the plan. However, if after adequate investigation, operations not included in the plan are found to be justified, this plan may be amended in accordance with section 76(6) of the Act.

As a guide to the orderly implementation of this plan, relative priorities for identified activities are summarised below:

Activity	Plan ref
High Priority	
. Prepare a fire management plan	4.1.2
. Prepare and progressively implement regeneration and weed control program	4.1.2
. Develop a list of research priorities	4.3.2
. Prepare a Business Management Plan	4.3.1
. Clear and record old garden	4.2.2
. Stabilise old garden track	4.1.1
. Progressively undertake works detailed in the Conservation Plan	4.2.2
Medium Priority	
. Undertake erosion control	4.1.1

- . Control rabbits 4.1.2
- . Monitor impact of tourism and fishing on seal colony 4.1.2
- . Continue negotiations for public access to lighthouse 4.3.1
- . Expand interpretive display 4.3.1
- . Investigate alternative power generation 4.3.3

Low Priority

- . Clear quarry base of grass 4.2.2
- . Record old jetty area 4.2.2
- . Relocate helipad 4.3.3
- . Revegetate site of existing helipad 4.3.3

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