

BROULEE ISLAND NATURE RESERVE

PLAN OF MANAGEMENT

National Parks and Wildlife Service

Part of the Department of Environment and Climate Change

July 2008

This plan of management was adopted by the Minister for Climate Change and the Environment on 21st July 2008.

Acknowledgments

This plan of management is based on a draft plan prepared by staff of the Far South Coast Region of the Parks and Wildlife Group within the Department of Environment and Climate Change.

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ISBN 1 74122 313 X

FOREWORD

Broulee Island Nature Reserve is located on the South Coast of NSW adjacent to the seaside village of Broulee and covers the entire 43 hectares of Broulee Island to mean high water mark. A tombolo currently connects Broulee Island to the mainland at Broulee Head.

Broulee Island Nature Reserve contains a vegetation succession from mangroves on the shoreline rock platforms to an open forest dominated by southern mahogany on the plateau. Pockets of rainforest species occur in protected areas.

The plant and animal resources of the island and adjoining land and waters were utilised by Aboriginal people. To Europeans, the relatively sheltered anchorage afforded by Broulee Bay triggered the establishment of a short-lived settlement on the island. Later shell grit was collected from the northern side of the island and shipped to Sydney for use in cement production. Evidence of these past uses includes Aboriginal middens, ground disturbance marking the site of the island's hotel, a grave and the remains of a jetty.

The New South Wales *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 an area will be managed in the years ahead.

A draft plan of management for Broulee Island Nature Reserves was placed on public exhibition from 30th June until 9th September 2006. The submissions received were carefully considered before adopting this plan.

This plan contains a number of actions to achieve "Better environmental outcomes for native vegetation, biodiversity, land, rivers, and coastal waterways" (Priority E4 in the State Plan) including the management of weeds, feral animals and fire so as to enhance the natural values of the reserve, including the ongoing natural revegetation of disturbed areas.

This plan of management establishes the scheme of operations for Broulee Island Nature Reserves. In accordance with section 73B of the *National Parks and Wildlife Act 1974*, this plan of management is hereby adopted.

Verity Firth
Minister for Climate Change and the Environment

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1. MANAGEMENT CONTEXT

1.1 LEGISLATIVE AND POLICY FRAMEWORK

The management of nature reserves in NSW is undertaken within the context of a legislative and policy framework. This primarily consists of the *National Parks and Wildlife Act 1974* (NPW Act) and Regulations, the *Threatened Species Conservation Act 1995* (TSC Act), the statewide policies of the National Parks and Wildlife Service (NPWS), and internationally accepted principles of park management. Section 72AA of the NPW Act lists the matters to be considered in the preparation of a plan of management. These include nature conservation, Aboriginal and historic heritage conservation, recreation, commercial use, research and communication.

Other legislation, international agreements and charters may also apply to the management of Broulee Island Nature Reserve. In particular, the *Environmental Planning and Assessment Act 1979* (EPA Act) requires the assessment and mitigation of the environmental impacts of any works proposed in this plan.

A plan of management is a statutory document under the NPW Act. Once the Minister has adopted this plan, no operations may be undertaken within Broulee Island Nature Reserve except in accordance with the plan. The plan will also apply to any future additions to the nature reserve. Where management strategies or works are proposed that are inconsistent with this plan, an amendment to the plan will be required.

1.2 MANAGEMENT PURPOSES AND PRINCIPLES

Nature reserves are reserved under the NPW Act to protect and conserve areas containing outstanding, unique or representative ecosystems, species, communities or natural phenomena.

Under the Act, nature reserves are managed to:

- Conserve biodiversity, maintain ecosystem functions, and protect geological and geomorphological features and natural phenomena;
- Conserve places, objects, features and landscapes of cultural value;
- Promote public appreciation, enjoyment and understanding of the reserve's natural and cultural values; and
- Provide for appropriate research and monitoring.

2. BROULEE ISLAND NATURE RESERVE

2.1 LOCATION, GAZETTAL AND REGIONAL SETTING

Broulee Island Nature Reserve is located on the South Coast of NSW adjacent to the seaside village of Broulee, 23 kilometres south of Batemans Bay (by road). The nature reserve incorporates the entire 43 hectares Broulee Island to mean high water mark.

The island was initially reserved by the Crown in 1964 under the provisions of section 30 of the *Crown Lands Consolidation Act 1913*. Known as Reserve 84799, it was set aside from sale “for public recreation and the preservation of flora and fauna” and the Eurobodalla Shire Council was appointed as trustee. In 1972 this gazettal was revoked and the island was proclaimed a reserve under Section 9(1) of the *Fauna Protection Act 1948* for the purpose of “the protection and care of fauna, the propagation of fauna and the promotion of the study of fauna”. With the consolidation and amendment of the National Parks and Wildlife Act in 1974, the island was subsequently deemed to be dedicated as a nature reserve by virtue of clause 7(3) of the provisions of schedule 3 of the Act.

A tombolo currently connects Broulee Island to the mainland at Broulee Head. This spit of sand, the eastern end of Broulee Head and the northward sweep of Broulee Beach, inland to Coronation Drive, are managed as a foreshore reserve by Eurobodalla Shire Council. This combined area is zoned as Public Open Space in the *Eurobodalla Urban Local Environmental Plan (1999)* and managed so as to retain its environmental significance. Southwards from Broulee Head, Bengello Beach extends for 8 kilometres to the mouth of the Moruya River. Under the *Eurobodalla Rural Local Environmental Plan (1987)*, the beach and a narrow coastal strip of land are also zoned as Public Open Space. The adjoining forested hinterland is zoned as Rural. Within this zone, only those developments and activities that retain the existing character and environmental quality of the area are permitted.

Broulee Island is a prominent landscape feature within the natural or near-natural coastal strip of land extending for some 15 kilometres from Burrewara Point in the north to Moruya Heads in the south. Although the villages of Broulee, Mossy Point and Tomakin impact upon the visual integrity of Broulee Bay, this influence is partially muted by a sense that these coastal settlements are hemmed in by a largely forested hinterland and the forested escarpment mountains that form the western skyline.

Broulee Island Nature Reserve is located entirely in Eurobodalla Shire and within the boundaries of the Mogo Local Aboriginal Land Council.

2.2 LANDSCAPE

Natural and cultural heritage and ongoing use are strongly inter-related and together define the landscape of an area. Much of the Australian environment has been influenced by past Aboriginal and non-Aboriginal land use practices, and the activities of modern day Australians continue to influence bushland through recreational use, cultural practices, the presence of introduced plants and animals and, in some cases, air and water pollution.



Map of Broulee Island Nature Reserve

The geology, landforms, climate and plant and animal communities of Broulee Island, together with its location, have determined how the area has been - and continues to be - used by humans. Prior to the arrival of Europeans, the plant and animal resources of the island and adjoining land and waters were utilised by Aboriginal people. To Europeans, the relatively sheltered anchorage afforded by Broulee Bay triggered the establishment of a short-lived settlement on the island. The most obvious legacies of this period are the grassy clearings that persist, regenerating areas of scrub and woodland, and the numerous weed species on the island. Despite these modifications, the island has retained important natural values.

Both Aboriginal and non-Aboriginal people place cultural values on natural areas, including aesthetic, social, spiritual and recreational values. Cultural values may be attached to the landscape as a whole or to individual components, for example to plant and animal species used by Aboriginal people. This plan of management aims to conserve both natural and cultural values. For reasons of clarity and document usefulness, natural and cultural heritage, public use and threats to the values of the reserve are dealt with individually, though their inter-relationships are recognised.

2.3 NATURAL HERITAGE

2.3.1 Geology, Landforms and Soils

The underlying geology of the island consists of a basement of Ordovician sediments covered by a residual capping of Tertiary basalt. The basalt forms a series of low headlands that separate pebble, sand and shellgrit beaches on the northern side of the island, and a broad rock platform that skirts the eastern and southern shores and is inundated at high tide.

A narrow shoreline terrace of sand and gravel sits atop the basalt. This is backed by a 20-25m thick layer of Tertiary sandstone and quartz gravel sediments that forms a cliff-girt plateau which slopes gently from the south-east to the north-west. The highest point on the island, which is close to the eastern cliffline, is only 27m ASL.

The tombolo that currently connects Broulee Island to the mainland is periodically breached by wave action only to be reconnected by sand accumulation. The isthmus was intact when surveyor Thomas Florance prepared a sketch map of the area in 1828. It remained so until 1873 when a severe storm following the clearing of vegetation on the spit resulted in the island being cut off from the mainland. Since then, the connecting isthmus has repeatedly reformed and been breached, with the most recent breaches occurring in 1966, 1969, 1971, 1974, 1981 and 1988.

Two ephemeral watercourses flow in a north-westerly direction across the island. Of these, the more southerly of the two creeks intermittently holds pools of freshwater after rain. It has formed a sharply-incised gully for a distance of several hundred metres along its course above where it terminates at the eastern end of Boat Harbour. The second, smaller drainage line consists of a shallow depression except for the final 30m of its course above Shellgrit Bay, where it has also formed a deep gully.

The soils of the island consist of sand and quartz gravels covered by a very thin surface humic layer.

2.3.2 Native Plants

The native vegetation of Broulee Island is typical of that occurring along the South Coast of NSW. Although the plant communities on parts of the island have been significantly modified and degraded, those found elsewhere are surprisingly intact.

The shoreline rock platform has been colonised by a few grey mangrove plants (*Avicennia marina* var *australasica*). Behind this, the narrow terrace that fringes the island is occupied by a mixture of perennial and annual plant species that form low shrubs or prostrate groundcover. These species include pigface (*Carpobrotus glaucescens*), *Sarcocornia quinqueflora*, grey saltbush (*Atriplex cinerea*), headache vine (*Clematis glycinoides*), hairy spinifex (*Spinifex hirsutus*) and native storksbill (*Pelargonium australe*).

On the steep slopes that rise abruptly behind the terrace species such as sea box (*Alyxia buxifolia*), coastal saltbush (*Rhagodia baccata*), toothed daisy bush (*Olearia tomentosa*), common fan flower (*Scaevola aemula*), coastal bearded heath (*Leucopogon parviflorus*), boobialla (*Myoporum insulare*), yellow tea tree (*Leptospermum flavescens*), swamp paperbark (*Melaleuca ericifolia*) and native wandering jew (*Commelina cyanea*) are present. Bushes of coastal rosemary (*Westringia fruticosa*) are dotted along the cliff edges.

The vegetation of the plateau reflects changes in local topography and micro-climates and a history of past disturbance. This disturbance is most pronounced in the eastern, southern and far western parts of the island where evidence exists of previous sowing of couch grass and clover. Small clearings of exotic grasses and bracken (*Pteridium esculentum*) are interspersed with scrub thickets and groves of regenerating sheoaks (*Allocasuarina verticillata*), saw banksia (*Banksia serrata*), coast banksia (*B. integrifolia*) and various wattle species (*Acacia* spp). A pure stand of sheoaks with an open understorey of exotic grasses occupies the western end of the island opposite the isthmus.

Relatively undisturbed open forest dominated by southern mahogany (*Eucalyptus botryoides*) occupies the northern and central parts of the island. Here, the open understorey consists of bracken and tussocks of spiny-headed mat-rush (*Lomandra longifolia*) dotted with the occasional native cherry (*Exocarpos cupressiformis*), banksia, and shrubs of tall white everlasting (*Helichrysum elatum*) and rusty velvet bush (*Lasiopetalum ferrugineum*).

The number of rainforest species existing on the island indicate the presence of littoral rainforest, an endangered ecological community listed under the *Threatened Species Conservation Act 1995*. This community is most commonly found on south-facing aspects and in the vicinity of the two drainage lines. These include small groves of cheese tree (*Glochidion ferdinandi*), scentless rosewood (*Synoum glandulosum*), brush cherry (*Syzygium australe*) and lilly pilly (*Acmena smithii*), with a number of large individuals lining the southern creekline. Vines such as snake vine (*Stephania japonica* var *discolor*) are commonly present as are kangaroo apples (*Solanum* sp). The limited fern flora consists of *Blechnum camfieldii*, sickle fern (*Pellaea falcata*) and a small number of rough tree ferns (*Cyathea australis*) that survive along the more southerly of the two creeklines.

Little is known of the non-vascular plants (lichens, mosses, fungi, liverworts) of the reserve.

2.3.3 Native Animals

The vegetation communities of the reserve provide habitats for a variety of native animals that are commonly found along the South Coast.

The recorded mammal fauna of the island is very limited, though this may partially be due to the lack of systematic surveying of the reserve. Eastern grey kangaroos (*Macropus giganteus*) and swamp wallabies (*Wallabia bicolor*) have been observed on the coastal terrace and in the open forest. Individual Australian fur seals (*Arctocephalus pusillus*) are occasionally encountered along the shoreline of the island. These animals, which are from the colony on the northern end of nearby Montague Island, are listed as Vulnerable under the *Threatened Species Conservation Act 1995* (TSC Act).

The shoreline and adjacent waters of the reserve are utilised by a number of seabird species, none of which are known to breed on Broulee Island. These include great cormorants (*Phalacrocorax carbo*), little black cormorants (*Phalacrocorax sulcirostris*), little pied cormorants (*Phalacrocorax melanoleucus*), white-faced storm-petrels (*Pelagodroma marina*), silver gulls (*Larus novaehollandiae*), Australasian gannets (*Morus serrator*), crested terns (*Sterna bergii*), short-tailed shearwaters (*Puffinus tenuirostris*) and fluttering shearwaters (*Puffinus gavia*). Sooty oyster catchers (*Haematopus fuliginosus*) and pied oyster catchers (*Haematopus longirostris*) are also commonly observed along the shoreline. Both of these species are listed as Vulnerable under the TSC Act.

A pair of white-bellied sea eagles (*Haliaeetus leucogaster*) is frequently seen soaring over the reserve, as is the occasional whistling kite (*Haliastur sphenurus*). The vegetation communities of the island are frequented by numerous common bird species including little wattlebirds (*Anthochaera chrysoptera*), red-browed finches (*Neochmia temporalis*), welcome swallows (*Hirundo neoxena*), silvereyes (*Zosterops lateralis*), eastern spinebills (*Acanthorhynchus tenuirostris*), white-cheeked honeyeaters (*Phylidonyris nigra*) and superb fairy wrens (*Malurus cyaneus*).

Little is known of the reptile, amphibian or invertebrate fauna of the reserve.

2.4 CULTURAL HERITAGE

2.4.1 Aboriginal Heritage

Broulee Island lies within Yuin country, which extends southwards from the Shoalhaven River to near the Victorian border and inland to the eastern edges of the tablelands. Documentary records provide several different names for the small groups of people who occupied the Broulee area, though no single name has been verified as correct.

Prior to the arrival of Europeans, the plant and animal resources of Broulee Island, together with those of the adjoining land and sea, would have been utilised by Aboriginal people for food, clothing, shelter, decoration, ceremonial and medicinal purposes, bonding agents and the production of tools and utensils. Certain plants,

animals and landforms would also have been imbued with spiritual meanings and associations.

Early encounters between Yuin people and European explorers and settlers ranged from hostile and violent to helpful. In 1841, a schooner named the *Rover* was wrecked in Broulee Bay during a severe storm. Eleven of the 23 people aboard the ship were saved by the joint actions of Aborigines and Europeans who formed a human chain to rescue them.

The disruption of Aboriginal society in the Broulee area would have commenced before the arrival of European settlers in the 1820s through the transmission of introduced diseases, such as smallpox and influenza, by Aboriginal people moving up and down the coast. As elsewhere, these diseases decimated the local Aboriginal population.

Historical estimates of the Aboriginal population in the Broulee area are limited in extent and accuracy. The settler Francis Flanagan recorded that in 1834 there were 28 Aborigines living in the Broulee area. In 1842, Captain William Oldrey listed 194 Aboriginal people by name at the Broulee Post Office at the time of the annual blanket distribution. Some of these people, he noted, had travelled there from places as distant as 60 miles away. An 1845 report estimated that the Aboriginal population in the district had halved in the previous five to ten years due to deaths from cutaneous and venereal diseases. Five years later Crown Land Commissioner Lambie considered, "*There is every probability of the few Aborigines belonging to this District soon becoming extinct, from the number that die annually of Influenza and Consumption.*" His view reflected a widespread belief amongst Europeans that Aboriginal people throughout the country were rapidly dying out.

Despite the major changes occurring within their society by this time, the Yuin people of the Broulee area continued their seasonal patterns of travel throughout their country and attended to ceremonial responsibilities. A German immigrant named Hermann Lau recorded a corroboree he witnessed near Boat Harbour at Broulee in the 1850s:

"Twelve powerful young men, naked, their arms and legs covered in white stripes, were chanting a monotonous wild song, in time with the beat of possum drums. With exact regularity, they clashed their weapons together, the boomerang against the spear, the nulla nulla against the shield. One by one, each demonstrated his individual skill. The others threw themselves on the ground, but immediately bounded up again. They were followed by a young girl, in a white shift, who leaped around wildly, but with a curious grace. The dancing lasted until dawn."

By the late 1850s, Aboriginal people of the South Coast were involved in a variety of economic activities. Many worked for European settlers gathering maize and potatoes, stripping bark, as domestic labourers, or in the whaling industry, while a small number were self-employed as farmers or contractors. From the 1860s onwards, the displacement of the Yuin from their country and culture was further entrenched as many people were moved to government reserves established in the region or as far afield as northern NSW. Yet, even in the late 1800s an Aboriginal camp continued to be used at Broulee, it being linked to camps at Congo, South Head and Bingi by a track that ran along the cliff tops and dunes.

During the 1870s and 1880s fishing boats were provided by the government to Aboriginal communities along the South Coast. Fishing soon became an important

industry and cultural activity for many families, a small number of whom continue to professionally fish the waters adjoining Broulee Island. Aboriginal fishermen commonly look for schools of fish from cliff edges on the island.

Despite resettlement, the separation of family members, the forced abandonment of traditional practices and a great loss of cultural knowledge, the Yuin people of the area have retained important strands of their culture, including a sense of identity and belonging. On the island, the remaining physical evidence of Aboriginal culture includes three middens.

2.4.2 Non-Aboriginal Heritage

In 1827, Thomas Florance, then Assistant Surveyor in the Surveyor General's Department of the colony of NSW, was instructed to undertake a triangulation survey of the South Coast. One of his sketch maps from the following year shows an island named "Broulee" connected to the mainland by an isthmus. Although Florance did not provide any explanations for his choices of names, it was departmental policy at this time to assign phonetically-derived Aboriginal names to noteworthy landscape features. It is likely that "Broulee" was one such name.

By the late 1820s a small number of pastoralists had moved into the country north of the Moruya River which then marked the boundary of the southernmost of the 19 counties of the colony, the County of St Vincent. As early as 1836, the growing number of European settlers in the region were using the bay on the northern side of "Broulee" Island, marked on Florance's map as Ark Harbour, as a place to load and unload goods, stock and people from anchored ships using small boats. While this harbour (soon to be known as Boat Harbour) was far from an ideal anchorage, it was considered preferable to the only other alternative along this section of coast, the Moruya River, the mouth of which was choked by a dangerous sand bar.

Lobbying from local settlers resulted in the colonial administration surveying and gazetted a township at Broulee in 1837, despite the lack of enthusiasm at senior levels. Writing to the Colonial Secretary at this time, the Surveyor General of NSW Major Thomas Mitchell considered, "*Broulee...appears not to possess the same advantages as Uladulla nor indeed any favourable feature for the formation of a town. The boat harbour is too open and the space for laying out streets is limited...*"

In James Larmer's 1837 survey of Broulee, the island was referred to as East Broulee and contained a village subdivision called "Boat Harbour". It consisted of a grid of eight streets - Oldrey Crescent, Sibella Terrace, McDonald Street, Huntley Street, East Cliff, Signal Cliff, Hawdon Street and Fountain Street and 54 separate allotments. Further allotments were surveyed near Broulee Head, at what was called West Broulee. Blocks were first offered for sale on January 9th 1840, with a minimum asking price of £2 per acre. The early sales attracted speculators, and of the 36 blocks initially offered, 32 were sold to absentee investors.

By mid-1841, a brisk sea trade had opened up between Broulee and Sydney, with farmers punting their produce, mainly wheat and potatoes, down the Moruya River and then overland or by sea to Broulee. The port at Broulee also became a depot for the Jervis Bay whaling fleet. A correspondent for the *Sydney Morning Herald* of October 30th 1841 noted, "*Broulee is becoming daily of greater importance; scarcely a day*

passes without the arrival or departure of some vessel. I have seen as many as six vessels at anchor in harbour at the same moment."

By this time, Broulee had become the place of Petty Sessions and Court business for the Moruya region and the centre of the Broulee Police District that extended from Jervis Bay to Eden. The courthouse and the lock-up were sited across the sand spit from the island near Broulee Head. Both were temporary structures built from timber slabs and bark. Far more substantial was the hotel constructed on the island on the south-west corner of Huntley and Hawdon Streets during 1840-41 by Captain William Oldrey. Oldrey was an avid promoter of the virtues of the fledgling township. His hotel was built from American redwood and leased by one Bernard McCauley in 1842 who named it the Erin-Go-Bragh (Ireland Forever). The hotel is depicted in an engraving made by the colonial artist John Skinner Prout who visited Broulee in 1841. It shows the hotel as a low shingled weatherboard bungalow painted white and located near the edge of a cliff. Behind the beach at the foot of the cliff are several outbuildings and a small stockyard used for the shipping of cattle.

Even during its short-lived boom period, Broulee was a small settlement. In 1841 the village consisted of only six buildings which housed a total of 46 inhabitants. On Broulee Island, the surveyed streets were never formed, the proposed wharf was never constructed, and only three buildings were ever completed.

Following floods that temporarily scoured out the sand bar at the mouth of the Moruya River allowing easier shipping access to the growing town of Moruya, Broulee quickly became redundant as a harbour. The Erin-Go-Bragh Hotel closed in 1844 only to reopen in 1846 as the Union Inn. It too soon failed. By 1848 Broulee consisted of only four buildings and was home to 22 inhabitants.

By 1851, Broulee had a population of one. Sometime during the 1850s the only substantial building on the island, the hotel, was moved to Campbell Street in Moruya. (The building was demolished in 1978.)

Although ships occasionally called to land passengers or take them on board, by 1856 no freight was being loaded or discharged at Broulee. By this time, the township – or what little remained of it – had also become known as "Oldrey's Folly". The fate of the settlement was conclusively sealed in 1873 when a severe storm broke through the isthmus which had recently been cleared of vegetation to widen a track across to the island.

The closure of the mouth of the Moruya River again in 1891 saw a revival of interest in Broulee as a harbour. Concerned Moruya citizens formed the Broulee Harbour Jetty League which advocated the construction of a stone wall linking the island and the mainland and the laying of a tramway between Moruya and Broulee. Following a government inquiry, nothing became of these proposals.

Little occurred at Broulee until 1920 when shellgrit was collected from the northern side of the island for use in cement production in Sydney. After World War II, a motorised barge was used to transport the shellgrit from Broulee Island to a wharf in the Tomaga River from where it was shipped to Sydney. To enable the barge to be loaded at the island, a 50-60 foot long jetty was built together with a light rail track that carried a small dump truck at what had become known as Shellgrit Bay.

During the late 1950s and early 1960s the freehold blocks on the island were once again put up for auction, this time by the Eurobodalla Shire Council on account of unpaid rates. Shortly afterwards the government decided to resume all of the blocks on the island and to reserve the area for public recreation and the protection of flora and fauna. Resumption was effected on 22 January 1964 with a value of £130 placed on each block that had been sold.

Tangible evidence of the European history of Broulee Island remains in the form of:

- Ground disturbance marking the site of the Erin-Go-Bragh Hotel;
- A single grave; and
- Remains of the jetty at Shellgrit Bay.

(A single fence post [morticed for two rails] and a nearby rubbish tip containing bottle and pottery remains were recorded in 1985. Neither of these features has been sighted in recent years.)

The hotel site is considered to have high level local significance for providing evidence of the mid-19th century surveyed township of Broulee, the first settlement on the far South Coast. The hotel was a significant location in the context of the social life of the village. Documentary evidence concerning the hotel and township provides insights into the early settlement of the district.

The grave of Mrs Elizabeth Maleber is located at the eastern end of the island. It consists of a sandstone headstone, a stone border and a sandstone footstone. The grave is surrounded by a chain wire and pipe fence constructed by the National Parks and Wildlife Service in 1972. At the same time the Service cemented back broken pieces of the headstone and footstone. The carved inscription on the headstone reads, "Sacred to the Memory, Elizabeth Maleber, died June 27 1842, aged 45 years, wife of Abraham Maleber". While the headstone cites "Maleber", it seems that the name was generally spelt "Malabar". Elizabeth lived with her husband Abraham at Pomphrey Point (on the Moruya River). Abraham was a convicted sea captain on conditional pardon who made a living punting goods up and down the Moruya River and occasionally from the river mouth to Broulee.

The grave has regional historic significance in being one of only a few known graves of this age in the South Coast region. It has local social significance to descendants of the Malabar family and members of the Broulee community.

The jetty remains are situated at the eastern end of Shellgrit Bay. All that survives are two timber piles, two sections of small gauge rail and a mound of shellgrit. The site has local historic significance as evidence of the establishment of small-scale extractive operations and the processes involved in shipping materials, in this case shellgrit, to market in the early and middle decades of the 20th century.

2.5 PUBLIC USE

Broulee Island is a popular destination with local residents and visitors to the seaside village of Broulee and neighbouring settlements. For most people, a visit to the reserve consists of walking along all or part of the shoreline of the island.

Visits to the island often form an extension of walks along the adjoining Broulee Beach from various pedestrian access points provided along Coronation Drive in nearby Broulee township. Carparks at the end of Bay Side Street and Harbour Drive are the closest vehicular access points to the island. A 200m-long sand track from the end of Harbour Drive provides pedestrian access to the small beach on the southern side of the isthmus, known locally as Shark Bay. This beach, and the island, are also accessed by people walking around Broulee Head from the carparks at the northern end of Bengello Beach. All access to the island is across land managed by Eurobodalla Shire Council as foreshore reserve.

There are no formal walking tracks on the top of the island, which is visited by very few people. The precipitous slopes that girt most of the island discourage access.

Under the right conditions, the surf break at Pink Rocks on the northern side of the island is popular with surfers. Although the reserve is managed as a day-use destination, people are known to occasionally camp on the island. Snorkelling and diving are also undertaken in the waters adjoining the reserve.

Recreational fishing is undertaken from the low headlands and rock platforms that skirt the island. Professional fishermen are permitted to drive along the sand track from Harbour Drive to Shark Bay and the track from there across the isthmus to Boat Harbour to launch boats.

The shoreline, particularly the rock platform, of the reserve is occasionally visited by students and staff of local schools on educational excursions.

Visitor-related infrastructure in the reserve is limited to reserve entry signs located on both sides of the island near where it adjoins the isthmus, and a sign erected near the eastern end of Boat Harbour concerning the erection of plaques. This sign, which is a response to the unauthorised erection of 9 memorial plaques on the island near Pink Rocks during the 1990s, informs visitors that:

- Any additional memorial plaques erected will be immediately removed;
- Existing plaques are not to be replaced if destroyed or damaged;
- Maintenance of existing plaques is not permitted; and
- The placement of flowers, wreaths and associated objects is prohibited.

The prohibition of these activities is in accordance with the provisions of the National Parks and Wildlife Regulations.

2.6 THREATS TO RESERVE VALUES

2.6.1 Introduced Plants

The relatively high number of introduced plant species present in the reserve is largely a legacy of past activities associated with the former use of the island as a settlement. Weed infestations are primarily, though not exclusively, concentrated in those parts of the island that have previously been cleared or highly disturbed.

Bridal creeper (*Myrsiphyllum aparagoides*) is an especially widespread species, though the rust fungus *Puccinia myrsiphylli* was released on the island in September 2002 and

appears to be impacting upon targeted infestations. Bitou bush (*Chrysanthemoides monilifera*), perhaps the most recognisable weed species present, once infested up to a quarter of the island. A decade of spraying and hand-pulling has reduced the species to a number of isolated populations and individuals. Other common weed species present include asparagus fern (*Asparagus scandens*), turkey rhubarb (*Rheum palmatum*), spear thistles (*Cirsium vulgare*), nettles (*Urtica spp.*), morning glory (*Ipomoea cairica*), caper spurge (*Euphorbia lathyris*), twiggy mullein (*Verbascum virgatum*), cobbler's peg (*Bidens sp*) and flatweed (*Hypochoeris radicata*). Exotic grasses are especially prevalent on previously cleared or degraded parts of the island, including the shoreline terrace. A small localised infestation of blackberries (*Rubus fruticosus*) exists in the southern creekline just behind the beach at the eastern end of Boat Harbour. The herbaceous sea spurge (*Euphorbia paralias*) is occasionally found on the sandy terrace on the eastern side of the island.

Garden escapes include the common passionfruit (*Passiflora edulis*) and a cactus known as century plant (*Agave americana*) which occurs as a localised population on the steep grassy slope above Boat Harbour.

Management of introduced plant species in the reserve is undertaken in accordance with the provisions of the Far South Coast Region Pest Management Strategy. This document details weed control priorities and describes the control methods, management strategies and performance measures that apply to individual species.

2.6.2 Introduced Animals

Only two introduced animal species are known to currently inhabit the reserve. Both feral cats (*Felis catus*) and red foxes (*Vulpes vulpes*) are widespread species on the South Coast of NSW and are likely to occur throughout the greater Broulee area. Rabbits (*Oryctolagus cuniculus*) formerly occurred on the island but have not been sighted in recent years. A warren located near the southern creekline is no longer utilised.

Management of feral animals on the island is undertaken in accordance with the provisions of the Far South Coast Region Pest Management Strategy. This document details feral animal control priorities and describes the control methods, management strategies and performance measures that apply to individual species.

2.6.3 Fire

This section of the plan outlines the basis and proposed strategies for fire management within Broulee Island Nature Reserve. In this respect, the following information constitutes a Type 1 Reserve Fire Management Strategy as defined by the National Parks & Wildlife Service Fire Management Planning Policy 2.1.

Fire is a natural feature of many environments and is essential to the survival of some plant communities. Inappropriate fire regimes however can lead to loss of particular plant and animal species and communities. Fire can also damage cultural heritage sites, recreation and management facilities and can threaten visitors and neighbouring land.

There have been two recorded wildfires on the island since it was first reserved in 1964. The first occurred in 1965 and burnt a large part of the reserve, while the second fire

burnt 3ha of the north-west corner of the island in 1999. Both fires are thought to have resulted from escaped campfires lit by people camping on the island. Campfires and arson represent the key fire risks to the reserve.

The nearest assets to the reserve are the houses of Broulee township, the closest of which are located 500m to the west on and behind Broulee Head. These properties are considered to be at low risk from fires originating in the reserve due to the:

- Fuel levels and structure of the dune vegetation on the intervening isthmus;
- Direction of the prevailing winds during extreme fire danger periods; and
- Topography of Broulee Island and Broulee Head.

The Service has assessed Broulee Island Nature Reserve for fire management planning purposes and has zoned the reserve as a Heritage Management Zone (HAMZ). The primary fire management objectives within this zone are to prevent the extinction of all species that are known to occur naturally within the reserve, and to protect culturally significant Aboriginal and non-Aboriginal sites.

The reserve has been designated as a HAMZ because it is not adjacent to built assets which would be exposed to a high level of bushfire risk, does not have a history of frequent bushfire ignitions or known areas of high bushfire behaviour potential. The HAMZ does not require intensive management and focuses on those actions appropriate to conserve biodiversity and cultural heritage including exclusion of fire from the reserve or the burning of particular vegetation communities to maintain biodiversity values.

The following table outlines the key vegetation types occurring in the reserve and fire regime guidelines.

Vegetation Type	Fire Regime
Southern Coastal Hind Dune/Headland Scrub and Southern Coastal Dune Scrub Complex	A decline in biodiversity is predicted if there is no fire for more than 30 years or multiple fires occur less than 7 years apart.
Coastal Headland Heathlands/Open Forest	A decline in biodiversity is predicted if there is no fire for more than 30 years or multiple fires occur less than 7 years apart.

A diversity of fire regimes is needed to maintain natural diversity. Management of fire should ideally aim to provide a pattern of fires of high, moderate and low intensity, frequency and extent. Extinctions are most likely when fire regimes of relatively fixed intensity, frequency and extent prevail without variation. Further, areas burnt too frequently are reduced to pyrogenic species such as bladey grass (*Imperata cylindrica*) and bracken (*Pteridium esculatum*), an understorey that accumulates fuel quickly and is capable of further frequent burning. The burning of disturbed areas may facilitate the perpetuation and spread of weed infestations. Fire should also be excluded from those parts of the island where rainforest species persist.

The Service maintains cooperative arrangements with Eurobodalla Shire Council and local Rural Fire Service brigades and is actively involved in the Eurobodalla Bush Fire Management Committee. Cooperative arrangements include approaches to fuel management, support for neighbours fire management efforts and information sharing.

3. MANAGEMENT ISSUES AND STRATEGIES

Current Situation	Desired Outcomes	Strategies	Priority
<p>Natural Heritage</p> <p>There is incomplete knowledge of the native plant and animal species and communities present.</p>	<p>Improved knowledge of native plant and animal species and communities present.</p> <p>All native plant and animal species and communities are conserved and the condition of disturbed areas is enhanced.</p>	<p>Investigate and pursue opportunities to survey and map the flora and fauna of the reserve through the involvement of field naturalists or other appropriate groups or individuals.</p> <p>Implement the relevant provisions of recovery plans for all plant and animal species found to occur in the reserve that are listed under the TSC Act. (This includes recovery plans prepared for sooty and pied oystercatchers.)</p> <p>Manage weeds, feral animals and fire so as to enhance the natural values of the reserve, including the ongoing natural revegetation of disturbed areas (refer also to the Introduced Species and Fire Management prescriptions).</p> <p>Minimise the use of management vehicles on the island, which will be restricted to low-impact vehicles used for weed spraying.</p> <p>Discourage visitation to the top of the island, so as to minimise disturbance to the natural values of this part of the reserve.</p>	<p>Medium</p> <p>High</p> <p>High (o)</p> <p>High (o)</p> <p>Medium (o)</p>
<p>Cultural Heritage</p> <p>There is incomplete knowledge of the cultural heritage values of the reserve.</p>	<p>Improved knowledge of the cultural heritage values of the reserve.</p>	<p>Undertake a survey of Aboriginal sites in the reserve.</p> <p>Investigate and record Aboriginal cultural values and knowledge, as appropriate, including traditional uses of plant and animal species.</p> <p>Investigate and pursue opportunities to record oral histories of Aboriginal and non-Aboriginal people with traditional and historical connections to the island through the involvement of appropriate organisations and individuals.</p>	<p>Medium</p> <p>Medium</p> <p>Medium</p>

<p>There is only limited appreciation of changes in the condition of known cultural heritage sites.</p> <p>Limited knowledge of Aboriginal people with traditional or historical connections to the island or their views on management of their cultural values.</p>	<p>All Aboriginal and non-Aboriginal cultural heritage values are appropriately conserved.</p> <p>Aboriginal people are closely involved in the management and interpretation of the Aboriginal cultural values of the reserve.</p>	<p>Fully record the Aboriginal sites on the island and the hotel, grave and jetty sites. Initiate annual monitoring of the condition of these sites and undertake maintenance work as necessary.</p> <p>Do not publicise the locations of:</p> <ul style="list-style-type: none"> - Aboriginal cultural heritage sites; - the site of the Erin-Go-Bragh Hotel; - the grave of Elizabeth Maleber; or - additional heritage sites or objects identified in the future. <p>Encourage the public to use the shoreline of the island only, so as to minimise disturbance of the hotel and grave sites.</p> <p>Actively engage with all relevant Aboriginal organisations, families and individuals in managing and interpreting Aboriginal values of the reserve.</p>	<p>Medium (o)</p> <p>Medium (o)</p> <p>Medium (o)</p> <p>Medium (o)</p>
<p>Public Use</p> <p>Existing recreational use results in minimal environmental degradation. People walking dogs in the reserve remains a problem, as does illegal camping and the lighting of campfires, littering and the installation of memorial plaques.</p> <p>Limited interpretive material is currently produced by the Service for the reserve.</p>	<p>Visitor use is undertaken in ways that minimise disturbance to the natural and cultural values of the reserve.</p> <p>Public understanding and appreciation of the values of the reserve, the recreational</p>	<p>Direct visitors to the shoreline of the island only.</p> <p>Continue to prohibit public vehicle access to the reserve.</p> <p>Continue to prohibit camping in the reserve.</p> <p>Continue to prohibit the lighting of campfires in the reserve.</p> <p>Liase with Eurobodalla Shire Council concerning a possible prohibition on exercising dogs at Shark Bay and Boat Harbour.</p> <p>Remove campfire rings as detected.</p> <p>Remove new and replacement memorial plaques, wreaths of flowers and other associated objects if and when detected.</p>	<p>Medium (o)</p> <p>High (o)</p> <p>High (o)</p> <p>High (o)</p> <p>Medium (o)</p> <p>Medium (o)</p> <p>High (o)</p>

	<p>opportunities available and relevant restrictions are improved.</p> <p>The local community is involved in management of the reserve.</p>	<p>Investigate and pursue opportunities to provide interpretive shelters or signs, including liaising with Eurobodalla Shire on the possibility of joint interpretive sites at strategic access points to the reserve.</p> <p>Displays or signs may include information on:</p> <ul style="list-style-type: none"> - the natural values of the reserve/area; - the Aboriginal and non-Aboriginal cultural heritage values; - directing people to visit the shoreline of the island only; - what can be observed when walking around the island shoreline; - restrictions on camping, fires and domestic dogs; and - impacts dogs can have on wildlife. <p>Prepare a schedule of projects for which voluntary assistance from the community will be sought. Encourage appropriate groups and individuals to assist with the implementation of these projects.</p>	<p>Medium</p> <p>High</p>
<p>Introduced Species</p> <p>There is incomplete knowledge of the weed species present and their distributions.</p> <p>There have been reductions in the distributions of major weed species, though the impact of some weeds on the values of the reserve remains considerable.</p>	<p>Improved knowledge of weed species present and their distributions.</p> <p>The impact of weed species on the values of the reserve is minimised.</p>	<p>Continue to survey and map all major weed species present in the reserve.</p> <p>Continue weed control programs in accordance with the Regional Pest Management Strategy. Priority will continue to be given to bitou bush control.</p> <p>Eradicate weed species of localised distribution, including known populations of:</p> <ul style="list-style-type: none"> - century plant (Boat Harbour); - blackberry (southern creek behind Boat Harbour); and - sea spurge. <p>Continue to monitor the effectiveness of the biological control of bridal creeper on the island.</p> <p>Introduce appropriate biological control agents to the island as they become available.</p>	<p>High (o)</p> <p>High (o)</p> <p>High (o)</p> <p>High (o)</p> <p>High (o)</p>

<p>There is incomplete knowledge of the introduced animal species present and their distributions</p> <p>Impacts of feral animal species are not considered to be significant.</p>	<p>Improved knowledge of the introduced animal species present and their distributions.</p> <p>The impact of introduced animal species on the values of the reserve is minimised.</p>	<p>Monitor and map changes in the distribution of major weed species in response to control programs. Alter control programs as required in response to monitoring results.</p> <p>Liase with Eurobodalla Shire Council and neighbouring landowners concerning the coordination of weed control programs including:</p> <ul style="list-style-type: none"> - bitou bush programs; - biological control of bridal creeper; and - discouragement of garden planting of exotic species with the potential to spread to the reserve and surrounding areas. <p>Survey for the presence of feral animals.</p> <p>Continue feral animal control programs in accordance with the Regional Pest Management Strategy.</p>	<p>High (o)</p> <p>Medium (o)</p> <p>High (o)</p> <p>High (o)</p>
<p>Fire Management</p> <p>The incidence of wildfires in the reserve in the recent past is low.</p> <p>Fire management in the reserve has been confined to the suppression of all wildfires.</p>	<p>Manage fire to:</p> <ul style="list-style-type: none"> • protect human life and property within and adjacent to the reserve; • maintain plant and animal species and communities through the provision of fire regimes compatible with their conservation; and • protect Aboriginal and European cultural sites, and management infrastructure. 	<p>Continue to map and enter prescribed and unplanned burn areas into the Service corporate GIS database.</p> <p>Continue to participate in the Eurobodalla District Bush Fire Management Committee.</p> <p>Maintain coordination and cooperation with Rural Fire Service brigades, Council fire control officers and neighbours with regard to fuel management and fire suppression.</p> <p>Exclude fire from:</p> <ul style="list-style-type: none"> - previously disturbed areas that are regenerating and/or contain significant weed infestations; and - areas containing remnant rainforest species. 	<p>High (o)</p> <p>High (o)</p> <p>High (o)</p> <p>High (o)</p>

	Control all wildfires occurring in the reserve and minimise impacts associated with fire suppression operations.	<p>Consider prescribed burning of other vegetation if the fire regime thresholds described in Section 2.6.3 of this plan have been reached or exceeded.</p> <p>Control all unplanned fires in the reserve as soon as possible.</p> <p>Rehabilitate any areas disturbed by fire suppression operations as soon as practical after a fire.</p>	<p>High (o)</p> <p>High (o)</p> <p>High (o)</p>
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High priority activities are those imperative to achievement of the management objectives and desired outcomes for the reserve. They must be undertaken in the near future to avoid significant deterioration in the natural or cultural values of the reserve.

Medium priority activities are those that are necessary to achieve the management objectives and desired outcomes but are not urgent.

Low priority activities are desirable to achieve management objectives and desired outcomes but can wait until resources become available.

(o) Ongoing activities are those that are undertaken in the course of day-to-day reserve management.