

**TWEED HEADS HISTORIC SITE AND  
UKEREBAGH NATURE RESERVE  
PLAN OF MANAGEMENT**

**NSW National Parks and Wildlife Service**

**September 1999**

This plan of management was adopted by the Minister for the Environment on 7<sup>th</sup> September 1999.

**Acknowledgments:** The principal authors of the draft plan of management were Planning Officer Dorothy Mullins and Ranger Colin Browne. Following public exhibition this plan was revised by Planning Officer Graeme McGregor.

Photograph of Bora Ring in Tweed Heads Historic Site by B. Cheers.

**NSW National Parks and Wildlife Service**

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## FOREWORD

Tweed Heads Historic Site and Ukerebagh Nature Reserve is located in the rapidly developing urban area of South Tweed Heads in far northern NSW. It is within and adjacent to the estuary of the Tweed River.

The Historic Site and the Nature Reserve are of special cultural significance to the local Goori people and are of historic significance to the general community.

The Historic Site and the Nature Reserve are important for natural heritage conservation as it is an isolated remnant in a region of high species diversity where only a small proportion of coastal lowland vegetation has escaped urban development. Half of the Historic Site and the Nature Reserve consists of mangrove and saltmarsh communities and there are several small patches of littoral rainforest. While heavily degraded in parts, the habitat provides an increasingly important refuge for estuarine fauna, particularly birds.

Tweed Heads Historic Site is presently leased to the Tweed Aboriginal Cooperative Society Limited for the operation of the facilities including the cultural centre, museum and retail outlet. The Tweed Heads Historic Site will be managed cooperatively by the Minjungbal Trading Company and the Service to protect the cultural and natural values and to provide opportunities for nature based educational and recreational uses.

The overall strategy for management will be to reduce the threatening processes affecting the Historic Site and the Nature Reserve while creating a buffer for the more isolated core of the planning area. This will be achieved by the control and eradication of weeds and introduced animals (including dogs and cats) and management at the interface with residential areas through additional fencing, access control and signage. Cooperation from visitors will be sought to protect sensitive values, such as shorebird habitat. Cooperation from the local community will be sought to extend the effectiveness of this approach.

Visitor infrastructure will only be provided on the Historic Site and the adjoining intertidal area of the Ukerebagh Channel where the boardwalk is located. The Nature Reserve will remain undeveloped except for signposting, allowing for nature based pursuits which don't require visitor facilities. Within the Historic Site the focus is on visitor and cultural heritage management issues, while in the Nature Reserve the primary focus is on natural heritage management.

This plan of management establishes the scheme of operations for Tweed Heads Historic Site and Ukerebagh Nature Reserve. In accordance with the provisions of Sections 75 and 76 of the *National Parks and Wildlife Act, 1974*, this plan is hereby adopted.

BOB DEBUS

Minister for the Environment

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## PART A INTRODUCTION

The Tweed Heads Historic Site and Ukerebagh Nature Reserve are located in far northern NSW within and adjacent to the estuary of the Tweed River. In this plan these two reserves are referred to as the "Historic Site" and the "Nature Reserve" respectively, or collectively as the "planning area". The planning area does not include the waters of the Ukerebagh Passage or the Tweed River as the boundary of the Nature Reserve extends only to mean high water (refer to map 2).

The *National Parks and Wildlife Act, 1974* (referred to as the "Act" in this plan), requires that a plan of management be prepared for each Historic Site and Nature Reserve. A plan of management is a legal document that outlines how the area will be managed in the years ahead and will remain current until replaced by a subsequent plan or amended in accordance with the Act.

The procedures for the adoption of a plan of management are specified in the Act and involve five stages:

- The Director-General gives notice that a draft plan of management has been prepared.
- The plan is placed on public exhibition for at least one month and any person may comment on it.
- The plan and copies of all representations are referred to the National Parks and Wildlife Advisory Council for consideration.
- The Director-General submits the plan, together with the recommendations of the Advisory Council, to the Minister.
- The Minister may adopt the plan, with or without alteration, after considering the recommendations of the Advisory Council or may refer the plan back to the Director-General and Council for further consideration.

The draft plan of management was placed on public exhibition for three months from June to August 1998. Seven submissions, raising a total of eight issues, were received on the draft plan. All comments received were referred to the National Parks and Wildlife Advisory Council for its consideration and advice. The comments and suggestions of the Advisory Council were in turn considered by the Minister before adopting this plan of management for Tweed Heads Historic Site and Ukerebagh Nature Reserve.

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 enquires on any aspect of the plan, please contact the Service's Lismore District Office at the Colonial Arcade, Main Street, Alstonville or by phone on (02) 6627 0200.

## PART B MANAGEMENT CONTEXT

### 1 HISTORIC SITES IN NEW SOUTH WALES

The primary responsibility of the National Parks and Wildlife Service (referred to as the "Service" in this plan) is the conservation of the natural and cultural heritage of New South Wales pursuant to the *National Parks and Wildlife Act* together with the provision of opportunities and facilities for appropriate use of areas for which it is responsible.

Historic Sites are areas reserved under the Act to protect buildings, objects, monuments or events of national significance or areas in which relics or Aboriginal places of special significance are situated. Such areas are vested in the Director-General and are managed by the Service.

#### 1.2 TWEED HEADS HISTORIC SITE

##### 1.2.1 Location and regional setting

Tweed Heads Historic Site has an area of 8 hectares. The Historic Site is located at Tweed Heads about 1km south of the NSW/Queensland border (refer to map 1) it is bounded by Ukerebagh Nature Reserve, Ukerebagh Passage, a suburban street and the Tweed-Coolangatta Golf Club.

Tweed Heads is highly urbanised and is a focus for the rapid increase in population in the Northern Rivers region of NSW.

##### 1.2.2 Tenure

Tweed Heads Historic Site is presently leased from the Service by the Tweed Aboriginal Cooperative Society Limited. Within this lease there is a sub-lease to the Minjungbal Trading Company. The terms of the sub-lease gives the Trading Company responsibility for the management and operation of the Historic Site within the conditions of the lease and sub-lease. Proposals for significant changes need to be referred to the Service for approval. The lease and sub-lease will expire in 2008.

### 2.1 NATURE RESERVES IN NEW SOUTH WALES

Fauna Nature Reserves in New South Wales were first established under the *Fauna Protection Act 1948*. Under the *National Parks and Wildlife Act 1967*, Fauna Reserves were classified as Nature Reserves. The Fauna Protection Act was repealed by the *National Parks and Wildlife Act 1974*.

Under the Act, Nature Reserves are areas of special scientific interest containing wildlife or natural environments or natural phenomena. The purpose of Nature Reserves are defined in the Act as:

- The care, propagation, preservation and conservation of wildlife;

- The care, preservation and conservation of natural environments and natural phenomena;
- The study of wildlife, natural environments and natural phenomena; and
- The promotion of the appreciation and enjoyment of wildlife, natural environments and natural phenomena.

## **2.2 UKEREBAGH NATURE RESERVE**

### **2.2.1 Location and regional context**

Ukerebagh Nature Reserve is located at Tweed Heads about 1km south of the NSW-Queensland border and includes Ukerebagh Island and the area (Portion 224) adjoining the eastern boundary of Tweed Heads Historic Site and north of Tweed-Coolangatta Golf Club (refer to map 2. The Nature Reserve, including Ukerebagh Island and Portion 224, has an area of 125 hectares.

## **3 IMPORTANCE OF TWEED HEADS HISTORIC SITE AND UKEREBAGH NATURE RESERVE**

### **3.1 CULTURAL VALUES**

The planning area lies within the northern part of the traditional lands of the Minjungbal people. Association from pre-European times to the present day is evident in identified values of both traditional and contemporary historical significance. The Minjungbal peoples' lands occupy an area between Southport, Byron Bay and Murwillumbah (Piper, 1976).

#### **3.1.1 Pre-European cultural significance**

A bora ring occurs on the Historic Site and is one of the few remaining in the Tweed area and is part of a bora ground associated with the cultural and spiritual and ceremonial beliefs of the traditional owners. Wickman (pers com, 1997) states that "bora rings were ceremonial areas where both women and men participated, generally in preparation for other more specific gender related ceremonies."

The bora ground was comprised of two rings, a large ring where the first part of the ceremony was performed, and a smaller ring, connected by a track to the larger, where the final ritual, as well as other initiations involving advanced criteria, and other secret rituals relating to other mythological beliefs were held (Keats, 1988). It is the larger ring that is evident at Tweed Heads Historic Site. The site of the smaller ring is unknown. Keats (1988), Steele (1984) and McBryde (1978) agree that there are several known initiation sites within the Northern Rivers and Gold Coast region.

Few records are available concerning the population of the Tweed area prior to white settlement. Nayutah and Finlay (1988) agree that Joshua Bray (police magistrate, 1863) estimate of about 600 is reasonably accurate, however, this assessment was made after the introduction of exotic diseases.

### 3.1.2 Contemporary cultural significance

Contact with European people occurred at three stages. Initial contact was with those exploring the region. Following the explorers came temporary dwellers such as escaped convicts and absconding guards, and later, cedar getters. The third influx, farmers, cedar getters and their families, began the widespread clearing of land which heralded the beginning of the deterioration of the traditional lifestyle. Accompanying the settlers were exotic diseases to which the native inhabitants had no previous exposure. Diseases such as smallpox, dysentery, measles and the common cold caused widespread mortality. As a result of the loss of their traditional food sources, the dispossession of traditional lands, and the effects of disease, the Aboriginal population of the Tweed plummeted.

South Sea Islanders were 'recruited', often by force, to work on the Queensland cane fields during the latter part of the nineteenth century. These people often chose to remain in Australia after completion of their contracts and a number chose to settle in the Tweed. The descendants of both these groups share an Aboriginal and Islander heritage.

A mature palm tree (*Phoenix dactylifera*) on Ukerebagh Island marks the spot of a temporary mission and the birthplace of former Senator, Neville Bonner. Several mango trees on higher ground on Portion 224 indicate the location of previous habitation.

Ukerebagh Island was declared an Aboriginal Reserve in 1927 and remained so until 1951 when it was gazetted as "Reserved from sale for future public requirements". Many families lived on the Island during the 1920s and 30s. They supplemented their rationed diet with near-by natural food sources of fish, oysters, mud-crabs, kokers (pippies) and hunting of wallabies, lizards and birds.

The bora ground of the Historic Site and surrounding bush area was dedicated as a Nature Reserve for "the Preservation of Aboriginal Relics" in 1961. This came about largely due to the efforts of Margaret Kay, an Arakwal descendent of the area who took responsibility for the care of the bora ground. After restoring the area she successfully applied for its protection in an era where such initiatives were relatively uncommon.

An Aboriginal site survey of the area was undertaken by NPWS in 1975. Several sites were recorded. Some of these, on Ukerebagh Island, are not specifically identified in this report. An area associated with the "blue pool" at the eastern entrance to Ukerebagh Passage is an important gathering point to reaffirm traditional cultural practices (Mark Cora, pers. com.).

The bora ground and adjacent bush area was proclaimed as a Historic Site in July 1980, whilst the adjoining Ukerebagh Nature Reserve was declared in 1983. Minjungbal Cultural Centre was developed on the Historic Site during the 1980's. It includes a museum, library, craft shop, kiosk and a conference and community centre.

Together with Ukerebagh Nature Reserve, Tweed Heads Historic Site is instrumental in the maintenance of the cultural identity of the Aboriginal people.

### 3.2 NATURAL VALUES

Given the extensive removal of habitat in the lower Tweed estuary and current and future population pressures, the planning area is of considerable importance to the conservation of natural values in the region.

#### 3.2.1 Geology and landform values

The Tweed River catchment is dominated by the remains of a Tertiary age shield volcano, with Mt Warning being the remnant of the central volcanic vent. The erosion of overlying layers of volcanic rock has exposed basement rocks from the Paleozoic and Mesozoic Eras (Chesnut 1975). Basalt from the Mt Warning volcano and Paleozoic metasediments of the Neranleigh - Fernvale Group are evident at sites close to the planning area.

The planning area is located on the Tweed floodplain which is formed from Quaternary alluvial and ocean beach deposits of gravel, sand, silt, clay and peat (Drury and Curedale, 1979).

The Nature Reserve is generally an area of low relief and much of it is prone to tidal inundation and flooding from the Tweed River. Higher areas are generally the result of sand deposition from dredging works.

The Tweed Estuary in the vicinity of the planning area has been greatly altered over the last 100 years by the construction of ocean and river training walls, dredging and filling of channels (Drury and Curedale, 1979).

One outcome of these works has been to alter the tidal range, especially in the lower estuary adjacent to the planning area. For example, a rise of 16cm in mean spring high tide has been experienced between 1960 and 1991. Further minor changes, estimated 3cm rise in mean spring high tides, are likely to occur as a result of plans for dredging at the river mouth and a number of locations in the lower estuary (Drury and Curedale, 1979, Department of Public Works, 1991d, Ace Wargon Chapman, 1994).

The landform of Ukerebagh Island has also been altered more directly by the disposal of dredge spoil and the construction of flood levees. Substantial amounts of marine sand have been deposited on the north-western tip, the northern shore, the north-eastern tip and part of the eastern shore of the Island.

Rubble walls on parts of the eastern shore of Ukerebagh Island have partially collapsed. Foreshore erosion is occurring in several places, with the eastern shore of Ukerebagh Island of particular concern.

A flood levy bank (or bund wall) 1.0 - 1.5 metres high was built on the Historic Site in 1967-68 (refer to map 5). Apart from causing direct disturbance to the vegetation, its main effects on the planning area have been to exclude higher tides from low lying land on the landward side of the levee and cause intermittent ponding of freshwater runoff in the same area.

### 3.2.2 Flora values

The planning area is located in a region of high species diversity where biogeographic regions overlap and sub-tropical and temperate flora and fauna species reach the southern and northern most extents of their distribution.

Only 10% of the Tweed Shire coastal lowland vegetation has escaped urban development (Pressey & Griffith, 1987) making the planning area a highly important remnant for conservation.

The vegetation of the planning area was mapped and described by Andrew Murray and Henry James in 1992 as part of the Tweed Coastal Remnant Bushland Inventory. Murray and James have recorded the following significant species in the planning area:

- Stinking Cryptocarya (*Cryptocarya foetida*) (listed in Schedule 2 of the NSW Threatened Species Conservation Act 1995 - Vulnerable). This species is also listed as vulnerable in Schedule 1 Part 2 of the Commonwealth Endangered Species Protection Act 1992, Threatened Australian Flora (Leigh et al, 1993) and ROTAP (Briggs and Leigh, 1995).
- *Cordyline congesta* (listed as rare in ROTAP) (Briggs and Leigh, 1995).
- White Lace Flower (*Archidendron hendersonii*), Mangrove Fern (*Acrostichum speciosum*), Black Mangrove (*Bruguiera gymnorhiza*), Swamp Lily (*Crinum pedunculatum*), Grey Ebony (*Diospyros fasciculosa*), Broad-leaved Native Cherry (*Exocarpus latifolius*), Bennett's Ash (*Flindersia bennettiana*), Umbrella Cheese Tree (*Glochidion sumatranum*), *Hoya oligotricha ssp oligotricha*, Pink-flowered Doughwood (*Melicope elleryana*), Thin-leaved Coondoo (*Planchonella chartacea*), *Polyalthia nitidissima*, Red-fruited Kurrajong (*Sterculia quadrifera*), *Triumfetta rhomboidea* and Dune Bean (*Vigna marina*) (listed in Significant Vascular Plants of Upper North Eastern NSW) (Sherringham and Westaway, 1995).

The mapping of Murray and James indicates that over half the planning area consists of mangrove and saltmarsh communities (refer to map 3 and table 1). The balance consists of littoral rainforest, Eucalyptus forest, swamp forest and disturbance communities dominated by Coast Banksia (*Banksia integrifolia*) and Swamp She-oak (*Casuarina glauca*). Parts of the latter three communities have an open woodland structure.

Table 1 Vegetation communities of the planning area

Vegetation communities	Typical species	Common names
<b>Swamp Forest</b>	<i>Casuarina glauca</i> <i>Melaleuca quinquenervia</i> <i>Excoecaria agallocha</i> <i>Hibiscus tiliaceus</i>	Swamp She-oak Broad Leaf Paperbark Milky Mangrove Cottonwood
<b>Open Forest</b>	<i>Eucalyptus tereticornis</i> <i>Eucalyptus intermedia</i> <i>Lophostemon confertus</i> <i>Lophostemon suaveolens</i>	Forest Red Gum Pink Bloodwood Brushbox Swamp Turpentine
<b>Disturbance Community</b>	<i>Banksia integrifolia</i> <i>Casuarina glauca</i> <i>Leptospermum laevigatum</i> <i>Allocasurina equisitifolia</i> var. <i>incana</i> <i>Acacia sophorae</i>	Coast Banksia Swamp She-oak Coastal Tea-tree* Horsetail She-oak* Coastal Wattle*
* not naturally occurring in the planning area. <b>Rainforest</b>	<i>Cryptocarya triplinervis</i> <i>Elaeocarpus obovatus</i> <i>Euroschinus falcata</i> <i>Planchonella chartacea</i> <i>Syzygium francisii</i>	Three-veined Cryptocarya Hard Quandong Ribbonwood Thin-leaved Coondoo Giant Water Gum
<b>Saltmarsh</b>	<i>Sporobolus virginicus</i> <i>Baumea juncea</i> <i>Juncus kraussi</i>	Salt couch Bare Twig Rush Sea Rush
<b>Mangrove Forest</b>	<i>Avicennia marina</i> <i>Sporobolus virginicus</i> <i>Aegiceras corniculatum</i> <i>Rhizophora stylosa</i> <i>Excoecaria agallocha</i> <i>Bruguiera gymnorhiza</i>	Grey Mangrove Salt Couch River Mangrove Spider Mangrove Milky Mangrove Black Mangrove

**Swamp forest** communities in the planning area are generally dominated by Swamp She-oak, though Broad Leaf Paperbark (*Melaleuca quinquenervia*) is co-dominant in some areas. Some swamp forest communities are located in areas which are occasionally flooded on high tides. In these areas Milky Mangrove (*Excoecaria agallocha*), Whip Vine (*Flagellaria indica*), Cottonwood (*Hibiscus tiliaceus*) and Scrambling Clerodendrum (*Clerodendrum inerme*) are common in the mid stratum. Bare Twig Rush (*Baumea juncea*) and Salt Couch (*Sporobolus virginicus*) are common in the ground stratum. Other Swamp She-oak communities in the planning area are floristically distinctive from the aforementioned communities because they are located (a) in areas where fresh water ponds form for at least part of the year, or (b) on

slightly higher ground where the mid stratum may include a significant component of rainforest species. An area of Swamp She-oak forest in the south east corner of Portion 224 has died back in recent years, apparently due to increased tidal inundation, and has been replaced by a mangrove community.

One of the largest and least disturbed areas of **open forest** in the lower Tweed River characterised by Forest Red Gum (*Eucalyptus tereticornis*) occurs on Portion 224 and the Historic Site. Co-dominants include Swamp Turpentine (*Lophostemon suaveolens*), Brushbox (*Lophostemon confertus*), Pink Bloodwood (*Eucalyptus intermedia*) and Broad Leaf Paperbark (*Melaleuca quinquenervia*). The understorey in these communities consists of rainforest or heath species (or both), the mix depending on fire history.

Vegetation Communities of planning area include:

**Rainforest** occurs in the east of Portion 224 and the south-east corner of Ukerebagh Island. The majority of threatened and significant species recorded in the planning area are generally confined to the rainforest communities. Littoral rainforest is restricted in distribution, of high conservation significance and inadequately protected on the protected area estate (Pressey and Griffith, 1987) (Murray, 1987).

**Disturbance communities** are generally dominated by Coast Banksia and/or Swamp She-oak. Some species not naturally occurring in the planning area, principally Coastal Tea-tree, Horsetail She-oak and Coast Wattle, have been planted in well drained areas which have been filled.

All three **saltmarsh** associations: salt couch / samphire (*Sporobolus virginicus* / *Sarcocornia quinqueflora*), Sea Rush (*Juncus kraussii*) and Bare Twig Rush (*Baumea juncea*) occur on Ukerebagh Island and Portion 224. These saltmarsh associations are poorly reserved in NSW (Murray, 1987) and the Nature Reserve is one of only two areas in NSW to contain large areas of these associations (Pressey and Griffith, 1987).

**Mangrove forests** on Ukerebagh Island are of biogeographic significance as the lower Tweed Estuary is the only area to contain all five species of mangroves found in NSW (Pressey and Griffith, 1987). Mangrove communities in the Nature Reserve are structurally and floristically diverse, and include significant areas in which the less common species, including Black Mangrove (*Bruguiera gymnorhiza*), Spider Mangrove (*Rhizophora stylosa*) and Milky Mangrove (*Excoecaria agallocha*), dominate.

**Seagrass** is common in Ukerebagh Passage (refer to map 3) which is outside the planning area. The planning area and adjoining intertidal areas and channels cover approximately 180 hectares, forming one of the larger saline wetland systems in the Tweed estuary.

Approximately 28 species of bush foods and medicinal plants traditionally utilised by local Aboriginal people occur in the planning area. These include Pink Bloodwood (*Corymbia intermedia*), Swamp Mahogany (*Eucalyptus robusta*), Forest Red Gum,

Midgen Berry (*Austromyrtus dulcis*), Flax Lily (*Dianella caerulea*), Native Violet (*Viola hedracea*), Sarsparilla (*Smilax australis*) and Blueberry Ash (*Elaeocarpus reticulatus*) (Mark Cora, pers. com.). These plants present an excellent interpretive opportunity for the visitor.

Parts of the planning area have been colonised by exotic plant species. Their occurrence is generally greatest in disturbed areas, such as, flood levees, dredge spoil and at the edges of the planning area.

The following species may be spreading in relatively undisturbed littoral rainforest communities: Asparagus Fern (*Protasparagus aethiopicus*), Climbing Asparagus Fern (*P. plumosus*), Winter Senna (*Senna pendula*), Ochna (*Ochna serrulata*) and Umbrella Tree (*Schefflera actinophylla*). Similarly, Five-leaved Morning Glory (*Ipomoea cairica*) and Umbrella Treemay be spreading in relatively undisturbed Swamp She-oak communities (*Henry James pers com*).

Mangroves and saltmarsh communities are relatively free of exotic plants because few species in the region can tolerate waterlogging and high salinity levels (Murray, 1987). The exception is Groundsel (*Baccharis halimifolia*), which grows successfully in some saltmarsh and moderately saline Swamp She-oak communities. It is the only declared noxious weed of any concern in the planning area and may be a serious problem over approximately 5% of the Historic Site and mainland parts of the Nature Reserve (Max Murphy pers. com). There are also small occurrences on Ukerebagh Island.

Some other exotic plants commonly encountered in the planning area are Bitou Bush (*Chrysanthemoides monilifera*), Lantana (*Lantana camara*), Ground asparagus (*Protasparagus aethiopicus*), as well as a number of grasses.

### 3.2.3 Fauna values

The Tweed estuary provides regionally significant wetland habitat for vertebrate fauna, and is becoming increasingly critical for bird populations as mo habitat is lost to development in surrounding high population growth areas.

A number of vertebrate fauna surveys have been conducted within the area although the species recorded are not likely to be comprehensive.

Invertebrates are poorly studied. The presence of two significant butterfly species is highly likely: *Hypochrisops epicurls* (confined to mangroves), and *Ogyris amaryllus* (associated with mangroves). The first is at risk in NSW and the second is locally common but becoming scarce (Sands in Pressey and Griffith, 1987). The sword-grass brown butterfly (*Tisiphone abeona morrisi*) is also likely to be found perhaps reaching the northern extent of its range having recently disappeared in coastal southern Queensland as a result of intensive urban development (BdWoffatt, pers. com.).

Undergraduate students from Southern Cross University surveyed the Historic Site for fauna in 1994. A survey of Ukerebagh Nature Reserve was carried out by the Service for the Natural Resources Audit Council (NRAC) in 1995.

Ukerebagh Island is important within the region as a potential fauna refuge because of its ability to be isolated from predators such as cats, dogs and foxes when the low-tide rubble crossing is removed (refer to Area 7 strategies in the Appendix). The mainland portion of the planning area provides a buffer between human activity associated with the surrounding residential neighbourhood and the more inaccessible Island and Ukerebagh Passage.

Ukerebagh Passage is an important feeding ground for estuarine birds (Martindale, 1987), (PWD, 1991). It was also found to have the highest species diversity of waterbirds in the lower Tweed estuary at the time of the autumn survey (Rohweder, 1997).

The little tern is listed as endangered on Schedule 1 of the *Threatened Species Conservation (TSC) Act, 1995*. Bird species listed as vulnerable on Schedule 2 of the *TSC Act* include the collared kingfisher, sprey, pied oystercatcher, black bittern, mangrove honeyeater, great knot, rose-crowned fruit-dove and white-eared monarch. There is an unconfirmed report of the marbled frogmouth in the Reserve.

Significant migratory birds known to utilise the planning area include the bar-tailed godwit, great knot, Pacific golden plover, whimbrel, eastern curlew and little tern. The planning area is of State conservation significance for migratory birds (Martindale 1987). Martindale asserted that since the planning area has greater than 1% of the State's eastern curlew and whimbrel population, there is an obligation under international treaties (refer to section 6.3) to protect and enhance all relevant habitats.

Several important shorebird high tide roosts have been recorded at Ukerebagh Island (Dept. of Public Works, 1991c). These are near to feeding grounds in the Passage. Other studies of estuarine birds in the area include those by WBM Oceanics (1996), and Rohweder (1997).

The Tweed estuary is at the southernmost extent of the mangrove kingfisher's range and the planning area is a particularly important habitat where they are present in high numbers (David Charleypers. com.). The Tweed estuary is also important for the mangrove honeyeater which occurs in high numbers.

Reptiles recorded in the planning area include the lace monitor (*Varanus varius*), the grass skink (*Lampropholis delicata*) and the three-toed skink (*Saiphos equalis*).

Amphibians include the brown-striped frog (*Limnodynastes peronii*), eastern dwarf tree frog (*Litoria fallax*) and the introduced cane toad (*Bufo marinus*).

Mammal species listed as vulnerable on Schedule 2 of the *TSC Act* recorded in the planning area include the koala (*Phascolarctos cinereus*) and Beccari's mastiff-bat (*Mormopterus beccarii*).

Before the mid 1980s, koalas were known to occur widely throughout the area (Bruce Chick, pers. com.). The population of koalas inhabiting the planning area and

adjacent bushland has declined and may no longer be viable. A koala survey and radio tracking program, undertaken in the area during November and December 1995 (Woodward-Clyde 1996) located only six koalas. The Australian Koala Foundation surveyed Tweed Shire for koala habitat in 1996 and mapped large parts of the Historic Site and Portion 224 of the Reserve as primary habitat.

Habitat values have generally been degraded and efforts need to be directed to assist ecosystem protection and recovery. Pest species such as cats, dogs, foxes and cane toads have had an adverse impact on ground dwellers and small marsupial populations.

### **3.3 EDUCATIONAL VALUES**

Tweed Heads Historic Site contains the Minjungbal Cultural Centre with a museum, library, meeting room, kiosk, retail outlet, activities area, offices and a public picnic area. The museum focuses on the historical and cultural aspects of Aboriginal life and the influences of European settlement. The cultural and natural features of the planning area are interpreted by wayside signs along a walking track and boardwalk and by interpretive programs conducted by centre staff.

In association with the Minjungbal Cultural Centre, Ukerebagh Nature Reserve provides opportunities for the interpretation of the Nature Reserve's natural resources particularly in relation to traditional use by indigenous people. Bush foods are receiving greater attention by the general public and the development of more extensive interpretation and the propagation nursery would provide an important educational resource.

## **PART C OBJECTIVES OF MANAGEMENT**

The Tweed Heads Historic Site and the Ukerebagh Nature Reserve are closely interrelated and together are important for their natural and cultural heritage values. However each has a different emphasis. The Historic Site is largely of cultural significance and the Nature Reserve, while also having important contemporary and traditional cultural values, has significant natural values requiring protection and management.

These different attributes have been reflected in protective legislation with different purposes, supported by the following objectives for management and therefore some very different management strategies.

### **4.1 TWEED HEADS HISTORIC SITE**

#### **4.1.1 General objectives for Historic Sites.**

The following objectives relate to the management of historic sites in New South Wales:

- conservation of features of cultural significance;
- provision of opportunities for public access and the interpretation of the site as an educational resource; and
- provision of opportunities for historic, archaeological and architectural research.

Opportunities for use of an historic site will only be considered where they do not detract from its cultural significance and natural values.

#### **4.1.2 Specific objectives for Tweed Heads Historic Site**

In addition to the following general objectives for the whole planning area, the management of Tweed Heads Historic Site will be subject to the following specific objectives.

- To jointly manage the Historic Site with the local Aboriginal community, consistent with the objectives and strategies in this plan.
- To provide educational and recreational opportunities which are consistent with the natural and cultural values of the Historic Site.
- To protect and conserve the bora ring.
- To promote public awareness and appreciation of neighbouring Ukerebagh Nature Reserve and its sensitivity to increasing pressures from human activity.
- To protect and enhance the wetland (SEPP 14) and koala habitat values, while providing an essential buffer to the Nature Reserve.

## **4.2 UKEREBAGH NATURE RESERVE**

### **4.2.1 General objectives for Nature Reserves**

The following objectives relate to the management of Nature Reserves in New South Wales:

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

### **4.2.2 Specific objectives for Ukerebagh Nature Reserve**

In addition to the following general objectives for the whole planning area, the following specific objective will apply to the management of Ukerebagh Nature Reserve.

- To protect and maintain the diversity of native plant communities, particularly the littoral rainforest and saltmarsh communities.
- To ensure the impacts from surrounding residential areas are minimised.
- To provide for a low level of passive, nature based recreation activities not requiring visitor facilities.

## **4.3 GENERAL OBJECTIVES FOR THE PLANNING AREA**

These objectives are common to both the Historic Site and Nature Reserve and are designed for management of the area as an interrelated whole where appropriate.

- To control and manage activities and environmental impacts so that they do not conflict with the purposes of dedication under the Act.
- To protect and manage native flora and fauna, principally by precluding fire and controlling introduced flora and fauna, so as to:
  - maintain natural floristic and structural diversity;
  - conserve threatened or uncommon communities and species;
  - conserve and enhance habitat values especially for shorebirds, koalas and ground-dwelling fauna.
- To promote public awareness and appreciation of the planning area with emphasis on:
  - its importance in the regional pattern of conservation areas on the NSW north coast;
  - appreciation of Aboriginal and historic heritage;

- its importance in the lower Tweed River as one of the last remnants of coastal lowland vegetation in an increasingly urban environment;
  - the physical and biological significance of the estuarine environment;
  - the conservation of native flora and fauna; and
  - passive, nature based use of the Nature Reserve.
- To identify, protect and preserve Aboriginal sites and places in partnership with local Aboriginal communities.
  - To ensure appropriate opportunities for the local Aboriginal communities to participate in the protection and management of the planning area, consistent with the objectives and strategies in this plan.
  - To ensure appropriate opportunities are made available to the local Aboriginal communities to reaffirm their traditional links with the land.
  - To protect the natural, geological and landform values of the planning area and assist in the development of management requirements for the lower Tweed estuary.
  - To involve local residents, Tweed Shire Council, relevant committees and interest groups in the protection of the natural and cultural values of the planning area particularly with a view to reducing the impact of introduced species on flora and fauna.
  - To cooperate with neighbours to protect the planning area and private property from wildfires and prevent fire damage to rainforest.
  - To provide for appropriate scientific study which enhances the information base or assists in the management of the planning area.
  - To monitor the implementation of the plan of management and its ability to fulfil the objectives.

#### **4.4 OVERALL STRATEGY**

The protection and enhancement of the cultural and natural values of the planning area will be the primary concern for management. It needs to be emphasised that the Historic Site and the Nature Reserve have different planning objectives which need to be reflected in appropriate management strategies.

The Minjungbal Trading Company will be primarily responsible for the management of Tweed Heads Historic Site while the Service will retain overall responsibility for the management of Ukerebagh Nature Reserve. The Historic site will be managed by the Minjungbal Trading Company with the NPWS providing advice or assistance where required. Mechanisms have been provided for in the plan to explore opportunities for joint management with local Goori people on a more formal basis. The resources of the Trading Company and the Service will be shared on an 'availability' basis to achieve the objectives detailed in this plan.

The natural and cultural values are under threat from increasing urbanisation of the region which is likely to result in further recreational demands of the planning area. For this reason the overall strategy will be to contain activities and impacts on the Historic Site which is conveniently located at the perimeter to the residential streets where the main access points are located.

Provision of recreational and educational opportunities for both the indigenous and general communities will be based on appropriate use and assist with the appreciation and protection of the Historic Site and the Nature Reserve. All educational and recreational use will be directed towards the already developed areas on the Historic Site which is managed by the local Goori people. Access will be via the formed walking track and boardwalk to avoid damage to natural and cultural values.

Public access to the Historic Site and Nature Reserve is managed by the provision of gates, fencing and signs that inform visitors of management issues. This overall approach of encouraging public use of the Historic Site rather than the Nature Reserve will provide a degree of protection of the more sensitive and diverse ecosystems of the nature reserve. The strategies outlined in Part D of this plan detail how this can be achieved.

## PART D STRATEGIES AND FRAMEWORK FOR MANAGEMENT

This chapter contains the strategies and actions for management of Tweed Heads Historic Site and Ukerebagh Nature Reserve together with relevant background information. Strategies and actions are summarised under the following section headings:

- Section 5 Cultural Resources.
- Section 6.1 Natural Resources.
- Section 6.2 Fire Management
- Section 7 Use of the Area.

The strategies and actions identified in this plan will provide the framework for management consistent with anticipated resources available to the Service for a period of up to 10 years after which time this plan will be reviewed.

Priority will be given to those strategies and actions requiring implementation in the foreseeable future. Others may be developed over the duration of this plan that are consistent with the objectives set out above.

### 5 MANAGEMENT OF CULTURAL RESOURCES

The planning area has both traditional and contemporary significance, with continuity of Aboriginal association from pre-European times to the present day. It is part of the traditional hunting, fishing and gathering area for the Minjungbal people.

Tweed Heads Historic Site contains a bora ring which is one of the few remaining in the Tweed area. Bora rings provide tangible evidence of sacred ritual and organised religious ceremony within Aboriginal culture and hold significance to Aboriginal people today.

Access is provided via the walking track and large numbers of people visit the Historic Site regularly. With good management, the Historic Site provides an important educational opportunity for Aboriginal culture.

Ukerebagh Island is of particular significance to local indigenous people as it is a traditional camping ground, food/medical and resource area and was an inhabited Aboriginal Reserve between 1927 and 1951. The exotic palm tree which is known as the birthplace of Neville Bonner is to be protected for its contemporary cultural significance.

Aboriginal sites demonstrating the pattern of Aboriginal occupation have been recorded in the Nature Reserve but access to these sites is not provided. Interpretation of Aboriginal culture and sites is conducted at the Minjungbal Cultural Centre and has potential for further development.

While the Service presently has legal responsibility for the management of historic sites and the protection of Aboriginal sites it acknowledges the right of Aboriginal people to make decisions about their own heritage. The leasing arrangements with

the Tweed Aboriginal Co-operative Society and the Minjungbal Trading Company allows Aboriginal people to have a significant input into management of the Tweed Heads Historic Site.

### Objectives

- **To jointly manage the Historic Site with the local Aboriginal community, consistent with the objectives and strategies in this plan.**
- **To identify, protect and preserve Aboriginal sites and places in partnership with local Aboriginal communities.**
- **To protect and conserve the bora ring.**

### Strategies and actions

- The Service will continue its leasing arrangement with the Tweed Aboriginal Co-operative Society and the Minjungbal Trading Company (refer to section 7.5.1).
- Matters involving all aspects of management of Aboriginal sites and values in the planning area will be negotiated with the Tweed-Byron Local Aboriginal Land Council, the Tweed Aboriginal Co-operative Society, Minjungbal Trading Company and other relevant Aboriginal community organisations.
- Aboriginal sites will be protected from disturbance or damage by human activities.
- The palm tree (*Phoenix dactylifera*) situated to the central north of Ukerebagh Island is to be protected for its contemporary cultural significance.
- The bora ring will be protected and its significance interpreted for the public.
- The fence, walking track, grassed area and interpretive signs associated with the bora ring will be repaired and maintained to a high standard.
- All works with the potential to impact on Aboriginal sites will be preceded by an archaeological and cultural assessment in partnership with the Aboriginal community.
- The location of Aboriginal sites will not be publicised except where:
  - the agreement of the Tweed-Byron Local Aboriginal Land Council and other relevant Aboriginal community organisations has been obtained;
  - a conservation study has been prepared and any management works necessary to protect the site from damage have been implemented; and
  - the site will be interpreted to promote public knowledge and appreciation of Aboriginal culture.

## 6.0 MANAGEMENT OF NATURAL RESOURCES

The planning area is an isolated remnant of natural ecosystems which is highly susceptible to the impacts of human activity and the encroachment of urban development. Land use practices which recognise the importance of protecting natural habitats and processes will greatly enhance the value of the planning area.

The occurrence and distribution of flora and fauna in the planning area (including those protected under the *Threatened Species Conservation Act* (TSC)) are recorded on the Service's Geographic Information System (GIS) and Wildlife Atlas computer databases. This information is available to the public on application.

### Objectives

- **To protect and manage native flora and fauna, principally by precluding fire and controlling introduced flora and fauna, so as to:**
  - **maintain natural floristic and structural diversity;**
  - **conserve threatened or uncommon communities and species;**
  - **conserve and enhance habitat values especially for shorebirds, koalas and ground-dwelling fauna.**
- **To provide for appropriate scientific study which enhances the information base or assists in the management of the planning area.**

### Strategies and actions

- The Service will promote and encourage land use practices which recognise and protect the important nature conservation values of the planning area, such as proper rubbish disposal; appropriate use of pesticides and herbicides; pollution reduction measures; appropriate weed control practices and exclusion of domestic animals.
- Records of plants and animals will continue to be updated and progressively incorporated into a GIS and Wildlife Atlas database.

## 6.1 MANAGEMENT OF GEOLOGY AND LANDFORM ISSUES

The Tweed River Management Plan Advisory Committee (TRMPAC) is currently overseeing implementation of a management plan for the Tweed Estuary. NPWS is represented on the Committee. Issues identified in the Estuary Management Plan which are relevant to the planning area together with strategies proposed for their management are summarised in the Appendix, for example, management of vegetation encroachments to shorebird roosts (refer to map 3), siltation and tidal flushing of the Ukerebagh Passage. Those directly affecting the planning area have been integrated into relevant sections of this plan.

Of particular concern is erosion to the northern and eastern shores of Ukerebagh Island, where the disintegration of rubble training walls is allowing current scour and

boat wash to erode the foreshore formed from dredge spoil early this century. Of particular concern is the badly eroded site to the mid-eastern shore of the Island. Any restoration of eroded areas, again using dredge spoil, could provide improved habitat for waterbirds (refer to section 6.3) particularly where located at existing roost sites or adjacent to foraging areas (refer to map 3).

Both the Historic Site and the Nature Reserve have significant areas covered by the State Environmental Planning Policy No 14 - Coastal Wetlands (SEPP 14) (refer to map 4). In managing the land, any significant activity which would be covered by this policy will be subject to environmental assessment which will be placed on public exhibition.

Potential acid sulphate soils are present in the planning area (refer to map 4) and their disturbance should be avoided or subject to assessment during a Review of Environmental Factors (REF) for any proposed activity, such as the reconstruction of the boardwalk.

The bund wall around the perimeter of the Historic Site has substantially altered the hydrology of that portion of the planning area excluding occasional salt water inundation and withholding freshwater runoff (refer to map 5).

### **Objective**

- **To protect the natural, geological and landform values of the planning area and assist in the development of management requirements for the lower Tweed estuary.**

### **Strategies and actions**

- The Service will maintain its representation on the RMPAC to advise on concerns in relation to erosion of Ukerebagh Island and management of the Passage.
- The Service will obtain engineering advice as to the most appropriate way to repair and mitigate the effects of erosion to Ukerebagh Island with priority to the mid-eastern shore.
- Any works, other than maintenance of existing infrastructure, proposed for the SEPP 14 wetland areas will be subject to an appropriate form of environmental assessment.
- An environmental and hydrological assessment will be undertaken to determine the effects to the Historic Site if the bundwall is breached so as to restore the original tidal regime. The bundwall will only be opened if there is no significant additional flood risk to surrounding properties and there are environmental benefits to the Historic Site.
- Disturbance of potential acid sulphate soils will be avoided.

- Where an activity may be necessary in a location that has a high probability for acid sulphate soils (refer to map 4), a Review of Environmental Factors will assess the potential for acid release in consultation with the Department of Land and Water Conservation (DLAWC).
- Monitor any effects of changed hydrological regimes on flora and fauna in the vicinity of the bund wall (refer to map 5).

## 6.2 MANAGEMENT OF NATIVE AND INTRODUCED FLORA

Bush foods and medicinal plants have been widely used and are important to local Aboriginal people. The further propagation of these plants is being undertaken in a nursery on the Historic Site to enable wider interest in interpretation and plant propagation to be satisfied (refer to sections 3.3 and 7.1.1).

Tweed Council is preparing a Vegetation Management Plan which will guide its biodiversity management approach, the preparation of a Koala Management Plan and planning policy changes into the future. It would be valuable for the Service to participate in this process to ensure a coordinated approach, the designation of appropriate vegetation corridors and policy innovations which could benefit the planning area.

The planning area has been extensively invaded with pest plant species. These are mainly environmental weeds with groundsel being the only declared noxious weed. The *Noxious Weeds Act 1993* places an obligation upon public authorities to control noxious weeds on land that it occupies to the extent necessary to prevent such weeds spreading to adjoining lands. The *Noxious Weeds Act* also provides that landowners have a duty to fully and continuously suppress certain notifiable weeds on their properties and to control the spread of other classes of weeds.

The *Noxious Weeds Act* provides for review of the Schedule of Noxious Weeds for the Far North Coast County District. The Service will seek the cooperation of the County District authorities in including weed species on the Schedule which pose an environmental or other threat to the planning area.

Where human disturbance has occurred on bund walls and dredge spoil edges appropriate rehabilitation techniques will need to be applied to suppress weeds.

Alterations to tidal regimes as a result of dredging have already occurred. Dieback of swamp she-oak has been observed on Ukerebagh Island near to tidal limits of saltwater intrusions (refer to map 4). This should be monitored informally for any noticeable change and referred to the Tweed River Management Plan Advisory Committee (TRMPAC).

Any works undertaken in the planning area will need to ensure the seagrass beds of Ukerebagh Passage are undisturbed.

## Objectives

- **To protect and manage native flora and fauna, principally by precluding fire and controlling introduced flora and fauna, so as to:**
  - maintain natural floristic and structural diversity;
  - conserve threatened or uncommon communities and species;
  - conserve and enhance habitat values especially for shorebirds, koalas and ground-dwelling fauna.
- **To involve local residents, Tweed Shire Council, relevant committees and interest groups in the protection of the natural and cultural values of the planning area particularly with a view to reducing the impact of introduced species on flora and fauna.**

## Strategies and actions

- Only plants indigenous to the planning area will be used for rehabilitation and soil stabilisation works, including plants used to demonstrate Aboriginal bush tucker and other cultural programs on the Historic Site. Plants not indigenous to the planning area, with the exception of the gardens surrounding the Injungal Resource Museum (refer to map 5 for gardens area) and the date palm associated with Neville Bonner which is of cultural significance (refer to section 5), will be progressively removed.
- The report entitled *Proposed Regeneration Program incorporating Weed Control Strategy* (Joseph, 1998) will be used as the basis for vegetation rehabilitation works and control of introduced plants in the planning area.
- Introduced plant species will be controlled and where possible eradicated in accordance with the current NPWS policy and guidelines; the weed control strategy (Joseph 1998) and appropriate legislation (especially the Noxious Weeds Act).
- Investigate the need to rehabilitate disturbed areas such as bund walls formed of imported material and beaches formed from dredge spoil where they have become weed infested particularly with bitou.
- Monitor the effect of vegetation encroachments on important migratory bird habitat (refer to map 3) and remove vegetation where the value of that habitat is being degraded by the encroachment.
- The cooperation of relevant authorities and park neighbours will be sought in support of the NPWS implementation of the weed control strategy (Joseph 1998).
- The Service will liaise with neighbours, particularly with the Tweed-Coolangatta Golf Club, Tweed Shire Council and land use authorities to encourage retention of areas of native vegetation close to the planning area.

- Monitor dieback of mature swamp she-oak near to tidal limits (refer to map 3) on Ukerebagh Island and refer to TRMPAC if change continues to occur.
- The Service will seek to have Ukerebagh Passage incorporated into Ukerebagh Nature Reserve and, with the support of NSW Fisheries, seek its inclusion as a seagrasses protected area under the NSW Fisheries Habitat Protection Plan # 2

### 6.3 MANAGEMENT OF NATIVE AND INTRODUCED FAUNA

The effective management of the planning area is becoming increasingly important as habitat for fauna in the region, particularly coastal estuarine habitat, is being lost or degraded by rapid urban development. Concurrent threats to fauna habitat include recreational use, impact of cats, dogs and other pest species, water pollution, ongoing river management (dredging and construction), fishing and degradation of habitat by human use and weed invasion.

Ukerebagh Island has the potential to be isolated from some mainland pressures on fauna if well managed. For example, threats from pest species such as foxes, rabbits and cane toads and domestic animals such as cats and dogs could be virtually eliminated on the Island. Human activity is also difficult to manage given the expectations of users and ease of access to the planning area.

Protecting habitat for shorebirds is a priority recommendation from the Lower Tweed Estuary Management Plan (refer to the Appendix). Management strategies and actions proposed below are consistent with those in a number of reports but are most comprehensively covered by Martindale (1987) and Smith (1990)

Shorebird numbers have been monitored by NPWS with assistance from TRMPAC. This should continue in order to provide comparative data but could also include issues requiring further investigation in the planning area, such as the relative importance of feeding grounds and roosts (refer to map 3), and factors affecting the quality of habitat.

The planning area is important as over-wintering habitat for migratory birds covered by two international conservation agreements (for a list of species recorded in the planning area refer to section 3.2.3). These agreements are between the Australian Government and:

- the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA); and
- the Government of the People's Republic of China for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (CAMBA).

Records of the planning area show it to hold greater than 1% of the State's eastern curlew and whimbrel population (Martindale, 1987). This is the benchmark for conservation significance which, under the terms of CAMBA and JAMBA, governments are obliged to protect and enhance all relevant habitats within the estuary (Martindale, 1987).

Migratory birds fly up to 25,000km to spend the warmer months in the southern hemisphere. It is therefore very important for their habitat to be protected from disturbance to allow them to conserve energy for a long return journey. High tide roosts and nesting sites need to be free of vegetation encroachments with enough sight distance to allow an unrestricted view of predators (Martindale, 1987).

The high tide roosts in the planning area are subject to a variety of disturbances, including people landing on Ukerebagh Island to picnic, sometimes accompanied by their dogs. These roosts have in the past become less important than other more isolated locations because of their accessibility to human impact (Dept. of Public Works, 1991c) and intrusion by weeds and native vegetation. Changes in tidal regimes caused by dredging can also affect roosts.

The koala population has been under severe pressure with limited and degraded habitat. Opinions about their future viability differ considerably. Koala management will need to be in the context of a number of management plans currently being prepared. These include a Koala Recovery Plan and Threat Abatement Plan for NSW and Tweed Council's Koala Management Plan.

Tweed Shire Council is required by the State Environmental Planning Policy (SEPP 44) to prepare a plan of management for koala habitat and the Service needs to work in cooperation with the Council to achieve best practice on and adjacent to the planning area. Meanwhile, however, koalas are well known for coexisting in residential areas given the right conditions so some effort should be put to maximising that potential.

All native fauna in the planning area are under pressure from introduced animals particularly cats and dogs entering from surrounding residential areas. Foxes, cats and dogs are threats to koalas and roosting shorebirds. Restrictive fencing is not a practical option, however, limiting access points and installing signage which explains the reasons for excluding domestic animals would be useful (refer to section 7.5.5 and map 5). Elimination of pest species from Ukerebagh Island will be a priority.

Public cooperation could be the most effective way to limit the impact of cats and dogs on native fauna on the mainland portion of the planning area. This could be achieved by targeted leaflets, Shire-wide publicity through Tweed Council publications or with the rate notices, or through wider involvement of the community (refer to section 7.5.3).

Because of its potential for isolation from the mainland Ukerebagh Island would benefit from a pest animal eradication program.

## Objectives

- **To protect and manage native and introduced flora and fauna so as to:**
  - **maintain natural floristic and structural diversity;**
  - **conserve threatened or uncommon communities and species;**
  - **conserve and enhance habitat values especially for shorebirds, koalas and ground-dwelling fauna.**

- **To provide for appropriate scientific study which enhances the information base or assists in the management of the planning area.**
- **To involve local residents, Tweed Shire Council, relevant committees and interest groups in the protection of the natural and cultural values of the planning area particularly with a view to reducing the impact of introduced species on flora and fauna.**

### Strategies and actions

- The lessee or sub-lessee of the Historic Site may operate a nursery for the propagation of locally native species where used for regeneration on the Historic site. The nursery may also be used for the propagation of bush tucker plants to be used only in the garden area (refer to map 5) of the Minjungbal Resource Museum or for sale to the public.
- Continue to update terrestrial fauna records for inclusion in the Wildlife Atlas.
- Encourage invertebrate studies in the planning area.
- Monitor the population of ospreys and their nesting sites.
- Continue to monitor the population of estuarine birds.
- Investigate the relative quality of shorebird habitat (refer to map 3) and opportunities for mitigating pressures on that habitat.
- No works or activities within Ukerebagh Passage (such as maintenance dredging) will be supported by the Service until the impacts on estuarine birds and other fauna are adequately assessed and found to have minimal or least adverse impact.
- Provide directional signage away from bird roosts and important feeding areas (refer to map 3) providing information about seasonal sensitivities (where appropriate) with the aim of reducing human disturbance.
- A greater level of protection for seagrasses and estuarine birds will be sought for Ukerebagh Passage (refer to strategy in section 6.2).
- The koala population occurring in and surrounding the planning area will be monitored to ascertain their population and seasonal nature of their presence in the planning area.
- Formal study of the viability of the local koala population will be encouraged.
- Review koala management to ensure consistency with any future Koala Recovery Plan and Threat Abatement Plan for NSW and Tweed Council's Koala Management Plan.

- Liaise with Tweed Shire Council during the preparation of the Koala Management Plan.
- Limit the number of access points to the planning area so as to reduce the impact of human visitation on wildlife habitat (refer to sections 7.5.5 and 7.5.6).
- Install signage at designated access points (refer to sections 7.5.5 and 7.5.6) explaining the prohibition on dogs in the planning area and the need for such a prohibition to protect native fauna.
- Manage the impact of pest species, such as foxes, on native fauna populations, with Ukerebagh Island being the highest priority.
- Encourage cooperation from residents in the vicinity of the planning area to restrict the movement of their cats and dogs so as to reduce the impact on native fauna.
- Seek cooperation from Tweed Shire Council to develop a policy to restrict the movement of cats and dogs.

## **6.4 FIRE MANAGEMENT**

Fire is a natural feature of the environment of the planning area and is essential to the survival of some plant communities. Frequent or regular fire, however, can cause loss of particular plant and animal species and communities. Fire can also damage some types of Aboriginal sites, historic sites and recreation facilities and threaten visitors and neighbouring land.

Management of fire in the planning area is an important and complex issue. Management must aim to achieve both long term conservation of natural communities and ongoing protection of life and property within and adjacent to the planning area

### **6.4.1 Fire history**

The pre-European fire history of the planning area is not known. Traditional fire practices of Aboriginal people in NSW have not been well researched and are therefore poorly understood. Aboriginal people are likely, however, to have had burning regimes which kept corridors open in lands they travelled through. From research conducted elsewhere it appears likely that the frequency and intensity of fire now is different from traditional Aboriginal burning practices.

Two major fires have occurred in the planning area during the last twenty years. The most recent fire in 1992 burnt most of the non-wetland component of the planning area and about half of the Historic Site. There is no data available on the fire that occurred in 1984.

### 6.4.2 Ecological requirements

Fire frequency, intensity and season of occurrence are major factors influencing the distribution and composition of plant and animal communities. A variety of fire regimes is needed in order to conserve floristic diversity and provide diversity of habitat for animals. For example, rainforest species are fire sensitive and can take many years to recover. Small patches of rainforest are particularly vulnerable.

Fire management aims to maintain diversity by restricting planned and, if possible, unplanned fires to only a part of the distribution of a vegetation community within the planning area at any one time.

At this stage in the management of the planning area, the knowledge required to implement an ecologically sound fire management regime is not available. However, frequent burning of parts of the historic site has led to the death of native vegetation and invasion by weeds. Until a more comprehensive understanding of the fire ecology of the planning area is gained, fire management will aim to contain fire within the minimum possible area.

### 6.4.3 Fire protection and cooperative arrangements

A variety of fire management strategies have been developed by the Service including fuel reduction, fire trails, detection and cooperative arrangements. Some, or at times all, of these are applied where appropriate to best protect life, property and natural and cultural assets within and adjacent to the Historic Site and the Nature Reserve. Especially where close to the planning area boundaries, fuel reduction programs and fire trail maintenance systems will be designed and implemented in cooperation with neighbours. A fire management plan will be prepared to detail fire management strategies and programs. Until a fire management plan has been prepared for the planning area fuel reduction burning is not appropriate.

Under the *Rural Fires Act, 1997* the Service is a fire authority and is responsible for controlling fires in the planning area and ensuring that they do not cause damage to other land or property. An important part of the Service's fire management is participation in local cooperative fire management arrangements. The Tweed Bush Fire Management Committee aims to coordinate fire management and fire control on a district basis.

Bushfire suppression operations may require the construction of temporary trails, helipads and fire lines. These will be closed and rehabilitated as part of post fire operations.

## Objectives

- **To cooperate with neighbours to protect the planning area and private property from wildfires and prevent fire damage to rainforest.**
- **To control and manage activities and environmental impacts so that they do not conflict with purposes of dedication under the Act.**

## Strategies and actions

- A fire management plan will be prepared for the planning area detailing strategies for the protection of life, property and the natural and cultural resources.
- Fire will be managed in accordance with a fire management plan and the principles below to ensure:
  - protection of human life and property within and adjacent to the planning area;
  - conservation of threatened and biogeographically significant plant and animal species and communities;
  - protection of fire sensitive plant communities containing threatened species especially rainforest (refer to map 3);
  - appropriate management of koala habitat (refer to section 6.3)
  - maintenance of plant and animal species and communities through the provision of fire regimes compatible with their conservation, and
  - protection of Aboriginal Sites, visitor facilities and management structures.
- The use of heavy machinery for fire suppression will be avoided wherever possible and will avoid known threatened plants, Aboriginal sites and wetlands.
- Where appropriate, areas disturbed by fire suppression operations will be rehabilitated as soon as practicable after the fire.
- Records and maps will be maintained of all fires as they occur.
- Research will be encouraged into the ecological effects of fire in the planning area, particularly the fire response of vulnerable and threatened plant species and the requirements of the koala.
- Close contact and cooperation will be maintained with volunteer bush fire brigades, Council fire officers and the NSW Fire Brigades. The Service will continue to actively participate in the Tweed Bush Fire Management Committee.
- As far as possible fuel management will be carried out in cooperation with neighbours for mutual protection.

- The NPWS will liaise with the Tweed-Coolangatta Golf Club in relation to fire management issues affecting the Nature Reserve.
- The Historic Site and/or the Nature Reserve may be closed to the public during periods of extreme fire danger.

## 7 USE OF THE PLANNING AREA

Certain public and private uses may be appropriate in Service areas provided that they do not conflict with the primary purpose of conservation of natural and cultural heritage and are consistent with the objectives and strategy of the plan of management. The major categories of use that may be appropriate in Service areas are:

- education and promotion of the area, the Service and the conservation of natural and cultural resources;
- involvement of the public in aspects of management;
- nature based recreation;
- research; and
- management operations by the Service and other authorities with statutory responsibilities in the area.

The Historic Site and the Nature Reserve have different attributes reflected in different purposes of dedication and objectives for management (refer to Part C). The extent to which the above categories of use will be provided for in planning area is indicated below. Where different uses for the Historic Site and the Nature Reserve need to be clear, they are defined in separate sections.

The overall strategy will be to concentrate and control use on the Historic Site which is already developed and close to the interface with residential areas (refer to map 5). Recreation activities will only be provided for on the Historic Site, not in the Nature Reserve. Promotion and interpretation will be conducted from the Historic Site except where management signs require more information to enlist user cooperation.

### 7.1 PROMOTION AND INTERPRETATION

The planning area has a significant role to play as a community resource for the study and appreciation of traditional Aboriginal culture and the interpretation of the natural values.

#### 7.1.1 Tweed Heads Historic Site

Educational use of the Historic Site is promoted by the Minjungbal Trading Company and the Service by way of leaflets describing the Historic Site's resources and facilities. The local Aboriginal and Torres Strait Islander community, the general public, local schools, tour groups and holiday makers are targeted.

The Minjungbal Cultural Centre has been developing at the Tweed Heads Historic Site since the mid 1980's (refer to map 5). Its facilities include:

- a museum providing static displays of the traditional way of life and the effects of European occupation. The displays consist primarily of traditional tools, early photographs and anecdotal historical accounts of both the Historic Site and the region;
- a library and video resources area;

- a conference centre which is available to visiting groups for appropriate group activities;
- an information desk, souvenir shop and kiosk;
- an outdoor activities area which provides a venue for dance, art and craft and bush tucker tasting, and
- a bush tucker nursery which propagates indigenous plants predominantly for regeneration purposes.

The aim of the Cultural Centre is to give visitors and Aboriginal people a sense of origin, culture and interaction with the environment, and to provide insight into the laws and way of life in Australia prior to European settlement.

The Historic Site also features a bora ring and a sealed walking track with a board walk component. The 1.6 kilometre circuit walking track, starts and finishes at the Cultural Centre. The boardwalk extends beyond the Historic Site into the intertidal zone of Ukerebagh Passage.

Trackside interpretive signs present information on the natural environment of the planning area and traditional Aboriginal activities. Interpretive signs at the bora ring present information on Aboriginal custom and ceremony.

Tweed Heads Historic Site's potential as a tourist venue has not yet been fully realised. The Minjungbal Trading Company has developed a business plan which aims to promote the Historic Site, improve the quality and variety of the Cultural Centre's operations and to recover on-going management and development costs.

### **Objectives**

- **To jointly manage the Historic Site with the local Aboriginal community, consistent with the objectives and strategies in this plan.**
- **To promote public awareness and appreciation of the planning area with emphasis on:**
  - **its importance in the regional pattern of conservation areas on the NSW north coast;**
  - **appreciation of Aboriginal and historic heritage;**
  - **its importance in the lower Tweed River as one of the last remnants of coastal lowland vegetation in an increasingly urban environment;**
  - **the physical and biological significance of the estuarine environment;**
  - **the conservation of native flora and fauna; and**
  - **appropriate use of the Nature Reserve.**

### **Strategies and actions**

- Tweed Heads Historic Site will be promoted as a place of Aboriginal cultural significance and learning.

- Opportunities will be provided at Tweed Heads Historic Site to learn about, and experience, various aspects of Aboriginal Culture and the natural history of Ukerebagh Nature Reserve and the Tweed estuary.
- Minjungbal Trading Company will continue to design and implement various educational and interpretive programs focused on Aboriginal culture.
- Use of the Historic Site by school and community groups will be encouraged.
- The Historic Site will be actively promoted to visitors. The improvement or further development of visitor facilities and expansion of the goods and services offered for sale will be supported by NPWS as described in the terms of the lease and sub-lease.
- Where new facilities or development are proposed, they will be concentrated within the immediate vicinity of the Minjungbal Cultural Centre. Such facilities will be designed and located to visually harmonise with the existing environment.
- The existing walking track, picnic facilities, outdoor theatre, museum and craft shop will be maintained and operated to a high standard by the Minjungbal Trading Company.
- The provision of trackside signs or a self guided walk showing a variety of bush foods will be investigated.

### 7.1.2 Promotion and interpretation of the Ukerebagh Nature Reserve

The purposes of dedication of a Nature Reserve under the *National Parks & Wildlife Act* are to protect sensitive natural values from human and other impacts. A large proportion of Ukerebagh Island is subject to tidal inundation making access difficult. Access to the rest of the Nature Reserve has created some unsustainable impacts, such as erosion and weed dispersal. The public will not be encouraged to use the Nature Reserve except for the pursuit of research, nature based activities or for the maintenance of traditional cultural links by Aboriginal people.

Since promotion and interpretation opportunities are provided for at the adjacent Historic Site no additional provision on the Nature Reserve is warranted unless associated with essential management needs. Managers of the Historic Site have expressed a desire to provide more educational material to the public from their facilities, such as pamphlets on endangered flora and fauna, the damage caused by feral animals and the important features of the Nature Reserve.

#### Objectives

- **To ensure that the type and level of activities in the Nature Reserve is in accordance with conservation objectives and reduces the severity of impacts from surrounding residential areas.**

- **To control and manage activities and environmental impacts so that they do not conflict with the purposes of dedication under the Act.**

### **Strategies and actions**

- No interpretative facilities will be provided in the Nature Reserve except for where associated with signage for essential management needs.
- Investigate interpretative options for the Nature Reserve that can be conducted from the Historic Site in cooperation with the Minjungbal Trading Company. These options should:
  - not be designed to encourage use, rather to discourage inappropriate use;
  - explain the sensitivity of the Nature Reserve and reasons for limited recreation opportunities;
  - be aimed at developing cooperative attitudes in users.
- Subject to available stocks, NPWS educational material will be provided to the Minjungbal Trading Company for distribution from the Cultural Centre.

## **7.2 RECREATION OPPORTUNITIES**

Opportunities for recreation in the planning area will be limited to the Tweed Heads Historic Site.

### **7.2.1 Tweed Heads Historic Site recreation**

Tweed Heads Historic Site provides opportunities for recreation that are associated with the facilities of Minjungbal Cultural Centre (refer to map 5). In addition to the facilities described in section 7.1.1, picnic and barbecue facilities are provided adjacent to the Cultural Centre.

Approximately 9,000 people visited the Historic Site in 1996 with 3,540 paying to enter the Museum (MarkCora, pers. com.). Visitor statistics do not give a break down of those visiting the Historic Site for recreational purposes and those visiting for educational purposes. Most visitors use the circuit walking track and boardwalk. Both the bitumen track and boardwalk are in need of refurbishment.

The location of the Historic Site within an urban environment, and the availability of unrestricted access, gives rise to the occurrence of inappropriate recreational activities such as bike riding, ball games and dog walking. Erection of a fence around sections of the perimeter of the Historic Site, with a limited number of access points that direct visitors past regulatory signs (refer to map 5), should decrease the occurrence of inappropriate activities.

### **Objectives**

- **To jointly manage the Historic Site with the local Aboriginal community, consistent with the objectives and strategies in this plan.**

- **To provide educational and recreational opportunities which are consistent with the natural and cultural values of the Historic Site.**

### **Strategies and actions**

- Any new facilities proposed will be concentrated within the immediate vicinity of the Minjungbal Cultural Centre. These will be designed and placed to blend visually with the built and natural environment (refer to section 7.1.1).
- Opportunities will be provided within Tweed Heads Historic Site for appropriate culturally based recreational activities.
- The existing picnic facilities, outdoor theatre, museum and craft shop will continue to be maintained and operated to a high standard.
- The refurbishment of the bitumen walking track and boardwalk will be undertaken to ensure a high level of public safety.
- Signs indicating appropriate and inappropriate uses and recreational activities will be erected at access points to the planning area.
- A Review of Environmental Factors will be undertaken where it is proposed to erect fences.

### **7.2.2 Ukerebagh Nature Reserve recreation**

Except for a section of the boardwalk originating from the Historic Site, no visitor facilities, including walking tracks, are provided in the Nature Reserve. The Nature Reserve is, however, regularly accessed by boats using the Tweed River. To assist public cooperation in respecting sensitive areas on the Nature Reserve, management signs should provide information specifying the possible impacts from human disturbance.

Several sites have been identified on Ukerebagh Island that are used regularly for picnicking and camping. The intensity of use of these sites has not been monitored in recent years, and there are concerns from the local community that increased usage is resulting in environmental degradation and accumulation of litter. If unchecked, use of these sites will continue to increase as the population of the Tweed area grows and as improvements to waterways and navigation are made.

Uncontrolled human activities encroaching on the Nature Reserve have the potential to cause erosion, significantly damage vegetation and cause seasonal disturbance to migratory bird roosts and habitats of other vulnerable flora and fauna. Picnicking will not be encouraged and camping will be prohibited except where essential for maintaining Aboriginal cultural linkages. Horse-riding is prohibited in all Nature Reserves.

## Objectives

- **To ensure impacts from surrounding residential areas are minimised.**
- **To control and manage activities and environmental impacts so that they do not conflict with the purposes of dedication under the Act.**

## Strategies and actions

- No visitor facilities, including walking tracks, will be provided **Ukerebagh Nature Reserve.**
- Signs, indicating appropriate and inappropriate recreational activities and the reasons for these, will be erected at the access points indicated on map 5 and at appropriate locations **Ukerebagh Island (refer to map 3).**
- Where appropriate, management signs should provide information specifying the possible impacts from human disturbance to assist public cooperation in respecting sensitive areas in the Nature Reserve.
- Lighting of fires and camping will not be permitted **Ukerebagh Nature Reserve** except where specifically approved by the District Manager for the maintenance of Aboriginal cultural linkages.

## 7.3 ABORIGINAL USE

The Minjungbal Cultural Centre plays a key role in the lives and activities of the Tweed Valley local **Goori** community. It provides a venue for meetings, informal gatherings, celebrations, training **functions** and is a place used to unite the community.

The local **Goori** community also utilise Tweed Heads Historic Site and **Ukerebagh Nature Reserve** to reaffirm their traditional links with the land and to educate the young about traditional practices, spiritual beliefs and mythology.

## Objectives

- **To ensure appropriate opportunities for the local Aboriginal communities to participate in the protection and management of the planning area, consistent with the objectives and strategies in this plan.**
- **To ensure appropriate opportunities are made available to the local Aboriginal communities to reaffirm their traditional links with the land.**

## Strategies and actions

- A Memorandum of Understanding will be negotiated with the local Aboriginal and Torres Strait Islander community to provide for the continuation of traditional activities in the planning area.
- Subject to an agreed Memorandum of Understanding, local Aboriginal and Torres Strait Islander people will be permitted to carry out activities in the planning area related to the maintenance of traditional links to the land providing such activities comply with the objectives and strategies of this plan of management, have minimal environmental impact and do not require taking (as defined in the Act) from the Nature Reserve.
- A land management training program will be offered as required to people who will be involved in managing the planning area.

## 7.4 RESEARCH

The purpose of scientific study in the planning area is to improve understanding of its natural and cultural heritage and the processes which affect them. Research also establishes the requirements for management of particular species.

The Service must direct its limited staff and financial resources for research towards the area of greatest need. Research by other organisations and students may also provide valuable information for management. A prospectus will be prepared to encourage involvement of other organisations in priority research areas.

Existing research activities include natural resource inventories and specific studies mainly undertaken by Southern Cross University. This research enhances the Service's information base concerning the planning area's natural and cultural resources and values.

### Objectives

- **To provide for appropriate scientific study which enhances the information base or assists in the management of the planning area.**

### Strategies and actions

- Service conducted research will aim to provide information on the natural and cultural values and on human use of the planning area in order to facilitate management.
- Provide appropriate opportunities for the local Aboriginal community to participate in research projects.

Researchers from external organisations will be encouraged to undertake research which provides information which is of direct benefit for management purposes.

- A list of desirable research projects will be compiled periodically and submitted to Southern Cross University and other relevant parties for their consideration.

## **7.5 MANAGEMENT OPERATIONS**

Management of the planning area is undertaken by the Lismore District of the NSW National Parks and Wildlife Service. Except where the responsibility of the lessee and sub-lessee, general maintenance and future works will be undertaken by the Murwillumbah Sub-District works staff and other staff as required.

The current situation is dealt with below (section 7.5.1) and refers only to the Historic Site. Opportunities for further joint management of the planning area by the local Aboriginal people are dealt with (sections 7.5.2 and 7.5.7) as are opportunities for wider community participation (section 7.5.3) and closer cooperation with Tweed Council (section 7.5.4).

### **7.5.1 Lease and sub-lease of the Historic Site**

Both the lease and sub-lease specify responsibilities which have been delegated by NPWS for the management of the Tweed Heads Historic Site. The Historic Site is leased from the NPWS by the Tweed Aboriginal Co-operative Society Ltd. The sub-lease which delegates most of the management responsibilities is between the Co-operative and the Minjungbal Trading Company. Clause 4a (I) of the lease and Clause 3a (I) of the sub-lease state that any activities conducted on the Historic Site shall be in accordance with the "scheme of operations". This could infer any subsequent plan of management for the Historic Site could become the scheme of operations.

### **Objectives**

- **To jointly manage the Historic Site with the local Aboriginal community, consistent with the objectives and strategies in this plan.**
- **To control and manage activities and environmental impacts so that they do not conflict with the purposes of dedication under the Act.**

### **Strategies and actions**

- From the date of its adoption, this plan of management will become the instrument referred to as the "scheme of operations" in the lease and the sub-lease between the NPWS and the lessee and sub-lessee.
- The NPWS will negotiate with the Tweed Heads Aboriginal Co-operative Society Ltd and the Minjungbal Trading Company to ensure that the lease and the sub-lease are consistent with this plan of management and also satisfactorily meet the needs of the parties.

- Joint management of the planning area will take into account responsibilities delegated within the terms of both the lease and the sub-lease.

### 7.5.2 Joint management

Some joint management of the planning area has been established by the leasing arrangements for the Tweed Heads Historic Site where certain management responsibilities have been delegated by the NPWS. Local Aboriginal groups have expressed an interest in having a wider role in management activities both on the Historic Site and the Nature Reserve.

A Memorandum of Agreement will facilitate easy liaison between NPWS and a local Aboriginal management group and provide a framework for participation in activities in the planning area that go beyond the terms of the leases. These activities would need to be in accordance with the plan of management and local Aboriginal people have also requested some on-the-ground coordination and training.

#### Objective

- **To ensure appropriate opportunities for the local Aboriginal communities to participate in the protection and management of the planning area, consistent with the objectives and strategies in this plan.**

#### Strategies and actions

- Negotiate with local Aboriginal people to develop a Memorandum of Understanding to ensure participation in management of the planning area.
- Seek funding to provide training and employment options for local Aboriginal people wishing to participate more actively in joint management of the planning area.
- The NPWS will retain some responsibility for the provision of technical support and financial assistance where appropriate and available.

### 7.5.3 Neighbourhood involvement in management

The involvement of residents and/or local interest groups in management, either on an *ad hoc* issue basis, or along the lines of other “friends” groups, has a number of benefits provided it is consistent with the plan of management and the purpose of dedication of the Historic Site and the Nature Reserve. The local Aboriginal community has expressed an interest in being pro-active in promoting wider involvement in some management issues in the planning area.

In addition to providing much needed effort and resources, community participation can assist in promotion and usage of educational opportunities; modifies behaviour to support management objectives and assist in gaining cooperation from local residents, for example, in controlling domestic pets.

## Objectives

- **To involve local residents, Tweed Shire Council, relevant committees and interest groups in the protection of the natural and cultural values of the planning area particularly with a view to reducing the impact of introduced species on flora and fauna.**

## Strategies and actions

- Encourage the establishment of a “friends” group for volunteer activities which are
  - conducted in cooperation with the NPWS and joint managers;
  - consistent with the NPWS volunteers policy ;
  - in accordance with this plan of management;
  - in accordance with relevant Acts and Regulations.
- Encourage involvement of local residents in individual volunteer management operations, such as CleanUp Australia Day activities.

### 7.5.4 Cooperation with Tweed Shire Council

Cooperation between the NPWS and Tweed Shire Council in the management of the planning area is essential to mitigating threats to the key values of the planning area including flora, fauna and the estuarine environment. Areas of cooperation could include:

- management of flora and biodiversity by participating in the preparation of the Shire-wide Vegetation Management Plan (refer to section 6.2);
- protection of the koala by cooperating in the preparation of the Koala Management Plan for the Shire;
- reduction of the impact of cats and dogs on the planning area either by the introduction of a curfew (refer to section 6.3) or by encouraging cooperation in the community to adopt a voluntary curfew (refer to section 7.5.3)
- dissemination of information on issues of mutual interest via Council publications, such as *Tweedlink* or with the rate notices.
- participation in the Tweed River Management Plan Advisory Committee (TRMPAC) (refer to section 6.1 and the Appendix).

## Objectives

- **To involve local residents, Tweed Shire Council, relevant committees and interest groups in the protection of the natural and cultural values of the planning area particularly with a view to reducing the impact of introduced species on flora and fauna.**

## Strategies and actions

- Liaise with Tweed Shire Council to cooperate in management activities which have an impact on the planning area.

### 7.5.5 Access

The bund walls at the northern and eastern boundaries of the Historic Site (refer to map 5) have provided convenient access for casual visitors by foot and bicycle. Local Aboriginal people have requested that restriction of this access be upgraded. Gates have been installed but more fencing and signage is necessary.

Access is also being gained directly to portion 224 of the Nature Reserve along the bund from the bitumen pathway. Erosion of the imported material from which the bund was constructed is washing into the adjacent wetland. This and another random access point from the edge of the boardwalk, are leading to defined tracks across a saltmarsh community.

## Objectives

- **To ensure the impacts from surrounding residential areas are minimised.**
- **To control and manage activities and environmental impacts so that they do not conflict with the purposes of dedication under the Act.**

## Strategies and actions

- Gates will be relocated and fencing and turnstiles or chicanes installed to control access from residential streets to the bund wall on both the western and the southern boundaries of the Historic Site (refer to map 5).
- The riding of bicycles in the planning area will be prohibited.
- Signage will be installed at the access points above to inform the public of the sensitivity of the Nature Reserve and to enlist cooperation in not bringing dogs and bicycles into the Nature Reserve.
- Monitor the affects of the use of entry points and pathways into the Nature Reserve. Any access control measures, such as steps, platforms or fencing, should be designed not to encourage use or divert it, but to mitigate impacts.

### 7.5.6 Fencing

Access to the mainland portion of Nature Reserve at the southern end of the bund wall (referred to in section 7.5.5) is also gained from the boundary to the Nature Reserve. An old bitumen access road is encouraging access to the Nature Reserve by cyclists or visitors with dogs.

The southern boundary of the Historic Site adjacent to the boundary of the Nature Reserve, referred to above, is unfenced and allows random access which has also resulted in plant and equipment being damaged or stolen from the Historic Site.

### **Objective**

- **To ensure the impacts from surrounding residential areas are minimised.**
- **To control and manage activities and environmental impacts so that they do not conflict with the purposes of dedication under the Act.**

### **Strategies and actions**

- Provide fencing, gates, pedestrian turnstiles or chicanes to the southern entrance to the Nature Reserve and the southern boundary of the Historic Site (refer to map 5) in consultation with the lessee.
- Provide fencing and gates where necessary to secure the southern boundary of the Historic Site (refer to map 5) in consultation with the lessee.

### **7.5.7 Aboriginal management**

The *Native Title Act, 1993* and Schedule 1, an amendment to the *National Parks and Wildlife Act, 1974* (Aboriginal ownership), provide avenues for local Aboriginal people to establish more formal joint management with the Service for all, or part of, the planning area.

The Service is supportive of cooperative management of the planning area with local Aboriginal people.

### **Objectives**

- **To ensure appropriate opportunities for the local Aboriginal communities to participate in the protection and management of the planning area, consistent with the objectives and strategies in this plan.**
- **To provide opportunities for the local Aboriginal communities to reaffirm their traditional links with the land.**

### **Strategies and actions**

- Action by the local Aboriginal and Torres Strait Islander community to establish formal joint management of the planning area will be supported by the Service providing management is in accordance with NPWS policies and this plan of management.

## 7.6 MONITORING

The planning area is susceptible to degradation by overuse given its location adjacent to an expanding urban area and popular waterway. Potential for increased use of Tweed Heads Historic Site as a tourist venue could also increase pressures on the planning area.

It is essential that the effects of management and visitor use of the planning area is monitored to assist management and to ensure that the natural and cultural resources are not adversely affected.

### Objectives

- **To monitor the implementation of the plan of management and its ability to guide the fulfilment of the plan objectives.**

### Strategies and actions

- Monitoring the impact of use and external influences on the planning area will be undertaken, with emphasis on:
  - visitor use in terms of numbers, activities, trends, impact on the natural and cultural resources and the adequacy of facilities and services;
  - natural or induced deterioration of the landscape and vegetation, including erosion and weed infestations,
  - effectiveness of signage.
- An annual review of the effects of management policies and programmes in relation to management objectives will be established. Such a review will be conducted jointly by the NPWS, lessee and the Minjungbal Trading Company.

## PART E PLAN IMPLEMENTATION

This plan of management is part of the system of management developed by the National Parks and Wildlife Service. The system includes the *National Parks and Wildlife Act*, the Service's Corporate Plan, management policies and established conservation and recreational philosophies. It also includes regional and district operational planning.

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

District programs are subject to ongoing review within which works and other activities carried out in the Historic Site and the Nature Reserve will be evaluated in relation to the objectives set out this plan.

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

In accordance with Section 81 of the Act, this plan shall be carried out and given effect to by the Director-General and no operations shall be undertaken in relation to Tweed Heads Historic Site and Ukerebagh 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 Sections 75(7) and 76(6) of the Act.

As a guide to the implementation of this Plan, priorities for identified activities are provided below. Priorities are based on:

**High** Those strategies and actions which are imperative to the achievement of the management objectives set out in this Plan and/or which need to be implemented in the near future on the basis that to not undertake the work will result in:

- unacceptable degradation of the natural and cultural values or physical resources of the planning area;
- contribute significant additional cost associated with rehabilitation at a later date, or
- present an unacceptable risk to public safety.

**Medium** Those strategies and actions that are necessary to achieve the management objectives set out in this Plan, but will be undertaken as resources become available since the timeframe for their implementation is not so critical.

**Low** Those strategies and actions which are desirable to achieving the management objectives set out in this Plan, but can wait until resources are available later in the planning period.

The implementation of this plan will be undertaken within the NPWS Lismore District annual programs. The undertaking of prioritised activities is subject to the availability of necessary staff and funds and to any special requirements of the Director-General or Minister.

ref. | **STRATEGIES AND ACTIONS** (summarised, refer to plan text for full details)

### HIGH PRIORITY

5	The Service will continue its leasing arrangement with the Tweed Aboriginal Co-operative Society and the Minjungbal Trading Company.
5	Aboriginal sites will be protected from disturbance or damage by human activities.
5	The bora ring will be protected and its significance interpreted for the public.
5	The fence, walking track, grassed area and interpretive signs associated with the bora ring will be repaired and maintained to a high standard.
5	All works with the potential to impact on Aboriginal sites will be preceded by an archaeological and cultural assessment.
5	The location of Aboriginal sites will generally not be publicised.
6	The Service will promote and encourage land use practices which recognise and protect the important nature conservation values of the planning area.
6	Records of plants and animals will continue to be updated and progressively incorporated into a GIS and Wildlife Atlas database.
6.1	The Service will obtain engineering advice as to the most appropriate way to repair and mitigate the affects of erosion to Ukerebagh Island with priority to the mid-eastern shore.
6.1	Any works, other than maintenance of existing infrastructure, proposed for the SEPP 14 wetland areas will be subject to an environmental assessment.
6.1	Disturbance of potential acid sulphate soils will be avoided.
6.1	Where an activity may be necessary in a location that has a high probability for acid sulphate soils, a Review of Environmental Factors will be undertaken.
6.2	Only plants indigenous to the planning area will be used for rehabilitation and soil stabilisation works, including plants used to demonstrate Aboriginal bush tucker.
6.2	The report entitled <i>Proposed Regeneration Program incorporating Weed Control Strategy</i> (Joseph, 1998) will be used as the basis for vegetation rehabilitation works and control of introduced plants in the planning area.
6.2	Introduced plant species will be controlled and where possible eradicated.
6.2	Investigate the need to rehabilitate disturbed areas.
6.2	The cooperation of relevant authorities and park neighbours will be sought in support of the NPWS implementation of the weed control strategy (Joseph 1998).
6.3	Continue to update terrestrial fauna records for inclusion in the Wildlife Atlas.
6.3	Investigate the relative quality of shorebird habitat and opportunities for mitigating pressures on that habitat.
6.3	No works or activities within Ukerebagh Passage will be supported by the Service until the impacts on estuarine birds and other fauna are adequately assessed.
6.3	Review koala management to ensure consistency with any future Koala Recovery Plan and Threat Abatement Plan for NSW and Tweed Council's Koala Management Plan.

6.3	Liaise with Tweed Shire Council during the preparation of the Koala Management Plan.
6.3	Manage the impact of pest species, such as foxes, on native fauna populations, with Ukerebagh Island being the highest priority.
6.3	Encourage cooperation from residents in the vicinity of the planning area to restrict the movement of their cats and dogs so as to reduce the impact on native fauna.
6.3	Seek cooperation from Tweed Shire Council to develop a policy to restrict the movement of cats and dogs.
6.4	A fire management plan will be prepared for the planning area detailing strategies for the protection of life, property and the natural and cultural resources.
6.4	Fire will be managed in accordance with a fire management plan.
6.4	The use of heavy machinery for fire suppression will be avoided wherever possible and will avoid known threatened plants, Aboriginal sites and wetlands.
6.4	Where appropriate, areas disturbed by fire suppression operations will be rehabilitated as soon as practicable after the fire.
6.4	Records and maps will be maintained of all fires as they occur.
6.4	Research will be encouraged into the ecological effects of fire in the planning area.
6.4	The Historic Site and/or the Nature Reserve may be closed to the public during periods of extreme fire danger.
7.1.1	Tweed Heads Historic Site will be promoted as a place of Aboriginal cultural significance and learning.
7.1.1	Opportunities will be provided at Tweed Heads Historic Site to learn about, and experience, various aspects of Aboriginal Culture and the natural history of Ukerebagh Nature Reserve and the Tweed estuary.
7.1.1	Minjungbal Trading Company will continue to design and implement various educational and interpretive programs focused on Aboriginal culture.
7.1.1	Use of the Historic Site by school and community groups will be encouraged.
7.1.1	The existing walking track, picnic facilities, outdoor theatre, museum and craft shop will be maintained and operated to a high standard by the Minjungbal Trading Co.
7.2.1	The existing picnic facilities, outdoor theatre, museum and craft shop will continue to be maintained and operated to a high standard.
7.2.1	The refurbishment of the bitumen walking track and boardwalk will be undertaken to ensure a high level of public safety.
7.2.1	Signs indicating appropriate and inappropriate uses and recreational activities will be erected at access points to the planning area.
7.2.2	No visitor facilities, including walking tracks, will be provided on Ukerebagh Nature Reserve.
7.2.2	Signs, indicating appropriate and inappropriate recreational activities and the reasons for these, will be erected on Ukerebagh Island.
7.2.2	Lighting of fires and camping will not be permitted on Ukerebagh Nature Reserve except where specifically approved by the District Manager for the maintenance of Aboriginal cultural linkages.

7.3	A Memorandum of Understanding will be negotiated with the local Aboriginal and Torres Strait Islander community to provide for traditional activities.
7.3	A land management training program will be offered as required to people who will be involved in managing the planning area.
7.5.1	From the date of its adoption, this plan of management will become the instrument referred to as the "scheme of operations" in the lease and the sub-lease between the NPWS and the lessee and sub-lessee.
7.5.1	The NPWS will negotiate with the Tweed Heads Aboriginal Cooperative Society Ltd and the Minjungbal Trading Company to ensure that the lease and the sub-lease are consistent with this plan of management and meets the needs of the parties.
7.5.1	Joint management of the planning area will take into account responsibilities delegated within the terms of both the lease and the sub-lease.
7.5.2	Negotiate with local Aboriginal people to develop a Memorandum of Understanding to ensure participation in management of the planning area.
7.5.2	Seek funding to provide training and employment options for local Aboriginal people wishing to participate more actively in joint management.
7.5.2	The NPWS will retain some responsibility for the provision of technical support and financial assistance where appropriate and available.
7.5.5	The riding of bicycles in the planning area will be prohibited.
7.5.5	Signage will be installed to inform the public of the sensitivity of the Nature Reserve and to enlist cooperation in not bringing dogs and bicycles into the Nature Reserve.
7.6	An annual review of the effects of management policies and programmes in relation to management objectives will be established. Such a review will be conducted jointly by the NPWS, lessee and the Minjungbal Trading Company.

### MEDIUM PRIORITY

5	Matters involving all aspects of management of Aboriginal sites and values in the planning area will be negotiated relevant Aboriginal community organisations.
6.1	The Service will maintain its representation on TRMPAC to advise on concerns in relation to erosion of Ukerebagh Island and management of the Passage.
6.1	Monitor any effects of changed hydrological regimes on flora and fauna in the vicinity of the bund wall.
6.2	Monitor the effect of vegetation encroachments on important migratory bird habitat.
6.2	Monitor dieback of mature swamp she-oak near to tidal limits of Ukerebagh Island.
6.2	The Service will seek to have Ukerebagh Passage incorporated into Ukerebagh Nature Reserve and seek its inclusion as a seagrasses protected area.
6.3	Encourage invertebrate studies in the planning area.
6.3	Monitor the population of ospreys and their nesting sites.
6.3	Continue to monitor the population of estuarine birds.

6.3	Provide directional signage away from bird roosts and important feeding areas.
6.3	A greater level of protection for seagrasses and estuarine birds will be sought for Ukerebagh Passage.
6.3	The koala population occurring in and surrounding the planning area will be monitored to ascertain their population.
6.3	Formal study of the viability of the local koala population will be encouraged.
6.3	Limit the number of access points to the planning area so as to reduce the impact of human visitation on wildlife habitat.
6.3	Install signage at designated access points explaining the prohibition on dogs in the planning area.
6.4	Close contact and cooperation will be maintained with volunteer bush fire brigades, Council fire officers and the NSW Fire Brigades.
6.4	As far as possible fuel management will be carried out in cooperation with neighbours for mutual protection.
6.4	The NPWS will liaise with the Tweed-Coolangatta Golf Club in relation to fire management issues affecting the Nature Reserve.
7.1.1	The Historic Site will be actively promoted to visitors by an improvement in, or further development of, visitor facilities and expansion of the goods and services.
7.1.2	No interpretative facilities will be provided in the Nature Reserve except for where associated with signage for essential management needs.
7.2.1	Opportunities will be provided within Tweed Heads Historic Site for appropriate culturally based recreational activities.
7.2.1	A Review of Environmental Factors will be undertaken where it is proposed to erect fences.
7.3	Subject to an agreed Memorandum of Understanding, local Aboriginal and Torres Strait Islander people will be permitted to carry out activities in the planning area related to the maintenance of traditional links to the land.
7.4	Service conducted research will aim to provide information on the natural and cultural values and on human use in order to facilitate management.
7.4	Provide appropriate opportunities for the local Aboriginal community to participate in research projects.
7.4	Researchers from external organisations will be encouraged to undertake research which provides information which is of direct benefit for management purposes.
7.4	A list of desirable research projects will be compiled periodically and submitted to Southern Cross University and other relevant parties for their consideration.
7.5.4	Liaise with Tweed Shire Council to cooperate in management activities which have an impact on the planning area.
7.5.5	Gates will be relocated and fencing and turnstiles or chicanes installed to control access from residential streets to the bund wall.
7.5.6	Provide fencing, gates, pedestrian turnstiles or chicanes to the southern entrance to the Nature Reserve and the southern boundary of the Historic Site.
7.5.6	Provide fencing and gates where necessary to secure the southern boundary of the Historic Site.

7.6	Monitoring the impact of use and external influences on the planning area will be undertaken.
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### LOW PRIORITY

5	The palm tree on Ukerebagh Island is to be protected for its contemporary cultural significance.
6.1	An environmental and hydrological assessment will be undertaken to determine the effects to the Historic Site if the bundwall is breached so as to restore original tidal regime
6.2	The Service will liaise with neighbours to encourage retention of areas of native vegetation close to the planning area.
6.3	The lessee or sub-lessee may operate a nursery for the propagation of locally native species where used for regeneration on the Historic site. The nursery may also be used for the propagation of bush tucker plants to be used only in the garden area of the Minjungbal Resource Museum or for sale to the public.
7.1.1	Where new facilities or development are proposed, they will be concentrated within the immediate vicinity of the Minjungbal Cultural Centre.
7.1.1	The provision of trackside signs or a self guided walk showing a variety of bush foods will be investigated.
7.1.2	Investigate interpretative options for the Nature Reserve that can be conducted from the Historic Site in cooperation with the Minjungbal Trading Company.
7.1.2	Subject to available stocks, NPWS educational material will be provided to the Minjungbal Trading Company for distribution from the Cultural Centre.
7.2.1	Any new facilities proposed will be concentrated within the immediate vicinity of the Minjungbal Cultural Centre.
7.2.2	Where appropriate, management signs should provide information specifying the possible impacts from human disturbance to assist public cooperation.
7.5.3	Encourage the establishment of a "friends" group for volunteer activities.
7.5.3	Encourage involvement of local residents in individual volunteer management operations, such as Clean Up Australia Day activities.
7.5.5	Monitor the affects of the use of entry points and pathways into the Nature Reserve.
7.5.7	Action by the local Aboriginal and Torres Strait Islander community to establish formal joint management of the planning area will be supported by the Service.

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## APPENDIX

### RIVER MANAGEMENT PLAN OF THE LOWER TWEED ESTUARY (extract)

This management plan was completed in 1991 (Dept of Public Works, 1991b) and provides the basis for the future management by Tweed Council and other agencies via the community based Tweed River Management Plan Advisory Committee (TRMPAC) of which NPWS is a member.

#### Relevance to NPWS plan of management

The strategies below have been designed to ameliorate the following impacts. Some of these issues are operating within the planning area while others may directly or indirectly effect its management.

- the old rubble training walls have disintegrated on both the eastern and western sides of the Island currents and boat wash are causing erosion;
- stormwater systems discharge into the Ukerebagh Passage carrying litter and sediment;
- evidence suggests the passage is undergoing significant sedimentation which may need to be managed to ensure tidal flushing to protect seagrass and maintain important migratory bird feeding area and fish nursery ;
- feral animals and weeds are a threat to habitat;
- habitat and fish nursery are under threat from siltation and stormwater pollutants (higher quality bird roosting Sites are now located at more remote Sites);
- remnants of a causeway exist at the eastern end of the passage facilitating the access of feral animals which are a threat to bird roosting Sites.

#### Strategies from Estuary Management Plan

A number of strategies have relevance to the Ukerebagh Nature Reserve plan of management.

#### Area 7: Ukerebagh Passage

Promote as important bird roost and fish nursery:

- prevent feral animal access at eastern end;
- remove urban siltation;
- maintain tidal flushing.

Improve water quality:

- install trash racks;

Encourage passive recreation:

- promote bird watching.

### Area 8: Terranora Inlet

Priority to maintaining navigation channel:

- establish suitable dredge disposal areas;

Discourage access to Ukerebagh Island

### **Works identified**

Actions identified for an Early Works Program which may have relevance to the NPWS plan of management include:

- removal of sedimentation at major stormwater outlets;
- erect trash racks or trash booms on major stormwater outfalls;
- prevention of access to eastern end of Ukerebagh Passage;
- installation of tidal gates to the eastern end of the Passage;
- ventilation dredging in Ukerebagh Passage;
- security strategy for bird roosting and foraging areas.

### **Other works recommended**

- maintenance dredging to Terranora Inlet;
- develop concept design and estimates for maintenance dredging;
- following river deepening, construct artificial reefs at specific points in the river;
- stormwater delta removal (Ukerebagh Passage);
- design limited maintenance dredging works in Ukerebagh Passage to maintain the existence of the Island (including any necessary removal of mangrove intrusions);
- correct bank erosion at Ukerebagh Island (suggested design attached);
- actively manage the fishery activity to encourage preservation of nursery function;
- prepare an estuary wide strategy for creating secure bird roosting and foraging areas;
- formulate a program of foreshore planting for the Lower Estuary;
- take action to protect shore bird and migratory bird habitat;
- establish a program to monitor key ecological indicators and a program to quantify and describe influent pollutants discharging into the waterway.

Some of these strategies have been integrated into the plan of management where appropriate, while others will be monitored via Service representation on TRMPAC