

**YURAYGIR NATIONAL PARK AND
YURAYGIR STATE CONSERVATION AREA
PLAN OF MANAGEMENT**

NSW NATIONAL PARKS AND WILDLIFE SERVICE

October 2003

This plan of management was adopted by the Minister for the Environment on 8th October 2003.

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Cover photo: Station Creek in southern Yuraygir National Park.
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FOREWORD

Yuraygir National Park and State Conservation Area are located on the north coast of New South Wales, less than an hour's drive from Grafton, Maclean and Coffs Harbour. The park extends over 60 kilometres of coastline from Lake Wooloweyah, a tidal lake at the mouth of the Clarence River, to the Corindi River in the south.

Yuraygir National Park and State Conservation Area are part of the traditional lands of the Gumbaingirr and Yaegl people.

This area, together with Bundjalung and Broadwater National Parks and Iluka Nature Reserve to the north, comprises a large conservation system that ranks in importance with only a handful of other conservation areas on the east coast of Australia. The park embraces one of the most scenically magnificent tracts of coastline on the east Australian seaboard. The main features of this coastline are its rocky headlands, sweeping beaches and diversity of natural environments which includes forests, heaths, freshwater streams, swamps, estuaries, coastal lagoons and lakes.

This plan of management emphasises the importance and purpose of management programs relating to the protection of natural and cultural heritage and the control of fire, weeds and feral animals. The plan also emphasises the importance of maintaining liaison with the local community, particularly neighbours of the park.

In particular, while ensuring the protection of life and property, priority is given to a reduction in the overall frequency of fire so as to provide for the rehabilitation of native vegetation communities that have become degraded from the too frequent occurrence of arson-lit wildfire during recent decades.

The plan provides for the protection of all Aboriginal cultural heritage values, and opportunities for the Aboriginal community to be involved in the management of Aboriginal cultural heritage in the park.

A wide range of recreation and environmental education opportunities based on maintaining a pattern of high standard access roads, walking tracks and visitor facilities as well as remote area recreation settings will continue to be provided.

Opportunities for visitors to pursue recreation activities in the park in a quiet and restful natural setting will be protected. Recreation facilities will continue to be provided at sites along the park's spectacular coastline.

This plan of management establishes the scheme of operations for Yuraygir National Park and Yuraygir State Conservation Area. In accordance with the provisions of Section 73(B) of the National Parks and Wildlife Act, 1974, this plan of management is hereby adopted.

Bob Debus

Minister for the Environment

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1 INTRODUCTION

Section 72 of the *National Parks and Wildlife Act, 1974*, (NPW Act) requires that a plan of management be prepared for each national park and state conservation area. A plan of management is a legal document that outlines how the area will be managed in the years ahead.

A draft plan of management for Yuraygir National Park was placed on public exhibition for a period of four months ending 29th January 1996. During the period of public exhibition, seventy-five representations were received which raised twenty-four issues. The representations were referred to the National Parks and Wildlife Advisory Council for review and report to the Minister. The comments and suggestions of the Advisory Council were in turn considered by the Minister when adopting this plan.

2 MANAGEMENT CONTEXT

2.1 NATIONAL PARKS IN NEW SOUTH WALES

The management of national parks in New South Wales (NSW) is in the context of a legislative and policy framework, primarily the National Parks and Wildlife Act 1974 (NPW Act), the Threatened Species Conservation Act 1995 (TSC Act) and the policies of the National Parks and Wildlife Service (NPWS). Section 72AA of the NPW Act lists the matters to be considered in preparation of a plan of management.

The policies are compiled from the legislative background, the NPW Regulations and internationally accepted principles of park and reserve management. They relate to nature conservation, Aboriginal and historic heritage conservation, recreation, commercial use, research and communication.

National parks are reserved under the NPW Act to protect and conserve areas containing outstanding or representative ecosystems, natural or cultural features or landscapes or phenomena that provide opportunities for public appreciation and inspiration and sustainable visitor use.

Under the NPW Act, national parks are managed to:

- conserve biodiversity, maintain ecosystem functions, protect geological and geomorphological features and natural phenomena and maintain natural landscapes;
- conserve places, objects, features and landscapes of cultural value;
- protect the ecological integrity of one or more ecosystems for present and future generations;
- promote public appreciation and understanding of the park's natural and cultural values;
- provide for sustainable visitor use and enjoyment that is compatible with conservation of natural and cultural values;
- provide for sustainable use (including adaptive reuse) of any buildings or structures or modified natural areas having regard to conservation of natural and cultural values; and
- provide for appropriate research and monitoring.

2.2 STATE CONSERVATION AREAS IN NEW SOUTH WALES

State conservation areas are reserved under the NPW Act to protect and conserve areas that contain significant or representative ecosystems, landforms or natural phenomena or places of cultural significance; that are capable of providing opportunities for sustainable visitor use and enjoyment, the sustainable use of buildings and structures or research; and that are capable of providing opportunities for uses permitted under other provisions of the Act.

Under the Act, state conservation areas are managed to:

- conserve biodiversity, maintain ecosystem functions, protect natural phenomena and maintain natural landscapes;
- conserve places, objects and features of cultural value;
- provide for the undertaking of exploration and mining, having regard to the conservation of the natural and cultural values of the state conservation area;
- provide for sustainable visitor use and enjoyment that is compatible with conservation of the area's natural and cultural values and with uses permitted in the area;
- provide for sustainable use (including adaptive reuse) of any buildings or structures or modified natural areas having regard to conservation of the area's natural and cultural values and with other uses permitted in the area; and
- provide for appropriate research and monitoring.

The Act also requires review of the classification of SCAs every 5 years to determine whether they should receive either a national park or a nature reserve classification. The classification review for SCAs is described in section 47M of the Act and is undertaken in consultation with the Minister administering the *Mining Act 1992*.

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

The plan of management is a statutory document under the NPW Act. Once the Minister has adopted a plan, no operations may be undertaken within the planning area except in accordance with the plan. The plan will also apply to any future additions to the planning area. Where management strategies or works are proposed for the planning area or any additions that are not consistent with the plan, an amendment to the plan will be required.

2.3 YURAYGIR NATIONAL PARK AND STATE CONSERVATION AREA

2.3.1 Location and Regional Setting

The area to which this plan of management applies includes Yuraygir National Park (approx. 31,898 hectares), Yuraygir State Conservation Area (approx. 3,146 hectares) and lands purchased but not yet gazetted as park (approx. 3,229 hectares), making a total area of approximately 38,273 hectares as at 30 June 2003. Collectively these lands are referred to as the planning area in this document.

The planning area encompasses coastal land between the Clarence and Corindi Rivers on the north coast of New South Wales (see map 1). It is located approximately 650 km north from Sydney and 400 km south from Brisbane.

The planning area was established in 1980, and incorporated the former Angourie and Red Rock National Parks (both reserved in 1975) and all Crown lands available for reservation at that time. Additional land was also zoned for future acquisition and addition to Yuraygir National Park (referred to as the park). Much of this land has since been purchased and added to the park.

Three national parks protect much of the long stretch of coastline between Red Rock to the south and the Richmond River to the north. Broadwater National Park lies to the north of Evans Head. Bundjalung National Park encompasses the coastline north of the Clarence River, between Iluka/Woombah and Evans Head. Yuraygir National Park, to the south of the Clarence River, encompasses the coastline from Yamba/Angourie to Red Rock. In addition, the offshore Solitary Islands group of nature reserves and the Solitary Islands Marine Park complement the on-shore conservation system. These areas are recognised as being one of a small number of groupings of protected areas of national and international significance which are found on the east coast of Australia.

This plan is consistent with the future gazettal of the intertidal zone into the planning area. Those beaches that adjoin the planning area are the ones that are proposed to be included in the park and form part of the planning area.

2.3.2 Landscape Context

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

The geology, landform, climate and plant and animal communities of the area, plus its location, have determined how it has been used by humans.

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

2.3.3 Importance of the planning area

The planning area continues to hold special significance to the Gumbaingirr and Yaegl people as a cultural landscape. The planning area contains sites, places, stories and resources that are essential in maintaining traditional and contemporary links to the land.

The planning area is located well within the Macleay-Macpherson overlap; an ecological transition zone between the temperate southern areas of eastern Australia and the tropical north. The zone of overlap has significance for the number and diversity of both plant and animal species.

The vegetation of the planning area comprises a full range of communities from coastal dunes, through hind-dune swamps and heathlands to tall open forests of the sub-coastal range. Plant communities of particular interest include the mangrove and estuarine communities of the Lake Woollooweyah foreshore, woodland communities on infertile soils, grassy clay heath, and remnant littoral rainforest near Shelley Headland. The pattern of vegetation varies according to soils, topography, drainage, exposure to coastal winds, aspect and fire history.

The planning area also has considerable significance because of the special circumstances of the in-shore coastal zone. The waters around the Solitary Islands are bathed by the warm southward flowing East Australian Current that begins its journey in the Coral Sea near the Equator. The coastline and inshore waters are subject to cooler currents from the south. The result is a fascinating mix of fish, marine bird, mammals and reptiles that are found regularly along the foreshores of the planning area.

Four species of birds and a frog species are recognised as endangered and therefore of high conservation status. A further twenty-four birds, fourteen mammals, one snake and two frog species are recognised as vulnerable under the *Threatened Species Conservation Act 1995*.

The Solitary Islands Marine Park was established in 1998 and is managed by the New South Wales Marine Park Authority to conserve one of the most outstanding aquatic environments in NSW. The marine park encompasses the coastline between Coffs Harbour and the Sandon River, and is contiguous with extensive areas of the planning area.

The marine park includes all estuaries within its boundaries, as well as secluded beaches, headlands, rock platforms and one of NSW's most important groups of offshore islands - the Solitary Islands. All the Solitary Islands, with the present exception of South Solitary are dedicated as nature reserves under the *National Parks & Wildlife Act, 1974*.

Most of the estuaries within the marine park remain in a relatively natural state due to the catchment protection afforded by the planning area and Moonee Beach Nature Reserve.

The Solitary Islands Marine Park in conjunction with the adjacent Yuraygir National Park, is one of the few areas in Australia, where a full combination of estuaries, beaches, headlands, islands and offshore waters as well as a significant proportion of the catchments of those estuaries are protected. Protected habitats and breeding areas mean fish stocks and areas of aesthetic and scientific importance are guaranteed into the future.

The Bundjalung/Yuraygir coastline attracts large numbers of visitors from many parts of the continent, with its primary visitor catchment extending from Sydney to Brisbane and westwards to the tablelands and inland plains.

The villages of Angourie, Brooms Head, Sandon, Minnie Water, Diggers Camp and Woolli lie on the Yuraygir coast between Yamba and Red Rock. Flanked by rocky headlands and sweeping beaches, these towns and villages have a backdrop of natural beauty. The recreational mix provided by this unique combination of villages and national park provides opportunities for boating, picnicking, camping, fishing, swimming, surfing and bushwalking on some of the best beaches in Australia.

Accommodation for visitors to these coastal parks includes motels, holiday cottages and caravan parks in the adjoining coastal villages, and within the parks themselves

at the Woody Head Camping Area (Bundjalung), and various small camping areas which cater for low-key, short-term camping (Black Rocks camping area in Bundjalung; and Station Creek, Pebbly Beach, Sandon River, Illaroo, Boorkoom, Red Cliff and Lake Arragan camping areas in Yuraygir). A range of national park picnic areas and day walks is also provided in these coastal parks.

The Clarence group of national parks and nature reserves is central to a section of the east coast of Australia which is characterised by both a high population density and a high rate of population growth.

The significance of the planning area can be summarised as follows:

Natural heritage values: The planning area;

- demonstrates the evolution of the Clarence Coast over the past two million years and protects examples of a wide range of coastal landforms;
- protects a wide range of coastal vegetation communities including wet and dry heathland, littoral rainforest, eucalypt forest and woodland as well as fresh water and estuarine wetlands;
- protects the most significant example of grassy clay heath remaining in New South Wales;
- protects habitats which support a diverse range of wildlife communities including refuges for plants and animals of ecological significance and species at the limit of their distribution;
- is an important link in the north-south migration of certain animal species; and
- is an important part of the broader nature conservation system of the north coast of NSW and complements other programs aimed at the conservation of biodiversity in the Clarence region.

Cultural heritage values: The planning area;

- includes areas which are of spiritual significance to the Aboriginal community;
- demonstrates the pattern of Aboriginal occupation and economy; and
- demonstrates patterns of Non-Indigenous use and development.

Educational and scientific values:

- The planning area provides opportunities for environmental education and field studies.

Recreation and tourism values:

- The planning area provides a range of opportunities for outdoor recreation and appreciation of the natural environment in a diverse coastal setting.

3 OBJECTIVES OF MANAGEMENT

National parks and state conservation areas are reserved under the NPW Act to protect and conserve areas containing outstanding or representative ecosystems, natural or cultural features or landscapes or phenomena that provide opportunities for public appreciation and inspiration and sustainable visitor use.

In addition to the management principles outlined in sections 2.1 and 2.2 above, the following specific objectives relate to the management of the planning area.

- * Protect the planning area as part of the system of regionally important protected areas on the Clarence and Richmond Coast of northern NSW.
- * Promote appropriate land use planning and management amongst neighbours and other land use authorities which will afford the highest practicable protection:
 - for the natural condition of the planning area;
 - the recreation setting provided by the planning area; and
 - the natural condition of adjacent lands.
- * Emphasise within the local community, particularly neighbours of the planning area, the importance and purpose of management programs relating to the protection of the natural and cultural heritage and the control of fire, weeds and feral animals.
- * Protect Aboriginal cultural heritage and provide opportunities for the Aboriginal community to be involved in the management of their heritage within the planning area.
- * Promote public awareness and appreciation of the planning area with emphasis on:
 - the importance of the planning area in the regional pattern of conservation areas;
 - the geological evolution of the Clarence Coast;
 - the biological significance of the coastal environment for the conservation of native plants and animals; and
 - appropriate use of the recreation resources of the planning area, particularly the recreational use of its beaches.
- * Ensure that the pattern of outdoor recreation in the planning area is appropriate with emphasis on providing a range of low-key facilities and alternative access opportunities to the coast.

Overall Strategy

The planning area will be managed to ensure the protection of the natural and cultural heritage values and the maintenance of its natural processes. Emphasis will be given to the restoration of native vegetation and the control and minimisation of any unacceptable impacts of public use.

Whilst ensuring the protection of life and property, priority will be given to a reduction in the overall frequency of fire so as to provide for the rehabilitation of native vegetation communities that have become degraded from the too frequent occurrence of arson-lit wildfire during recent decades.

The management of public use of the planning area will focus on maintaining an appropriate level and style of facilities and access to the coastline where visitors may pursue recreation activities in a quiet and restful natural setting.

4 POLICIES AND FRAMEWORK FOR MANAGEMENT

This chapter contains the policies and framework for the management of Yuraygir National Park and State Conservation Area together with relevant background information. Policies are summarised under the following section headings:

Natural Heritage;
Cultural Heritage; and
Use of the Area.

The policies established in this plan of management will provide the framework for management consistent with the anticipated resources available to the NSW National Parks and Wildlife Service (referred to as the NPWS in this plan) and with anticipated community trends for the next five to ten years.

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

4.1 NATURAL HERITAGE

4.1.1 Landforms, Geology, Soils and Hydrology

The planning area, like Bundjalung National Park to the north of the Clarence River, occupies the eastern land margins of the Clarence Basin. The Clarence Basin was laid down during the late Triassic (180 million years ago) as an intra-montane basin within the New England Fold Belt and has remained relatively undeformed by major geological events since. It originally extended some distance to the east.

The New England Fold Belt, within which the Clarence Basin is superimposed, was formed during a period of mountain building in the late Palaeozoic Era (about 260 million years ago). The New England Fold Belt stretches from the Hunter River to the central coast area of Queensland.

The Clarence Basin Triassic sediments are locally exposed at the Coast Range, The Bees Nest Range and the various relatively high headlands at Cassons Knob, Shelley Head and Woody Bluff.

In contrast the older sediments of the New England Fold Belt produce a more subdued landscape from Brooms Head south along the planning area's coastline, to Arrawarra.

The coast of eastern Australia formed during the late Mesozoic and early Tertiary Periods as a result of the rifting of eastern Australia when the Coral Sea and Tasman Sea were formed (90-65 million years ago). In contrast to the spectacular mountain and volcanic landforms of continental and oceanic plates in collision, the east coast of Australia is a 'trailing edge' of the Australian plate as it drifts across the planet's surface. Similar trailing edges of continental plates are the south-east coast of Africa, the Brazilian coast of South America and the west coast of India. All these coasts are characterised by a high escarpment delineating the inland margins of coastal plains and continental shelves.

The coastal plain and adjacent continental shelf of the north coast of NSW are much wider than those of the south coast of NSW. This condition has had some important consequences for the geology and topography of the coastline in this region.

For tens of millions of years since the opening of the Coral and Tasman Seas, the Clarence, Richmond and Evans Rivers eroded the land surface of the Clarence-Morton Basin, creating mature river valleys with part of their southern watershed in the vicinity of the planning area.

The latest major events in the geological history of the region have seen the sea level rise and fall in large cycles with the onset and melting of icecaps and glaciers brought on by successive ice ages over the past two million years. Because the continental shelf is both wider and shallower in the north compared to the south coast of NSW, successive incursions of the sea over the continental shelf swept abundant amounts of sand and other weathered littoral debris onshore. The north coast, therefore, is typically sandy with well-developed beaches and sand dunes.

Three phases of this coast building process are of importance to the understanding of the Clarence coast landscape:

- During earlier periods of high sea level extensive deposits of marine sediments were laid down, forming the inner dune barrier. This formation is not well developed in planning area but is a feature of Bundjalung National Park to the north of the Clarence River.
- A drop in sea level produced the swampy plains of the inland coastal plain sections of the planning area which are fluvial and/or estuarine in origin. The age of these deposits is unknown but active reworking is likely to have taken place during the latter part of the last glacial period (50,000 – 17,000 years ago). Some swamps are probably caused by the surface exposure of impermeable clay layers laid down earlier in the Quaternary period.
- The latest and most important rise in sea level took place between 17,000 - 6,000 years ago. This incursion of the sea drowned the shoreline and produced the current coastline. The progradation of the coast by deposition has resulted in offshore islands being encapsulated in the mainland and rocky bays and coves being filled with sand deposits.

The Quaternary sands of the beach barrier systems and coastal plain therefore overlay the Clarence Basin Triassic sediments. The characteristic dune swale formations of the barrier systems give an insight into past fluctuations in sea level.

The landscape of the planning area is a complex mix of coastal depositional and erosional landforms. In the northern section of the planning area the main physical features are a former continental peninsula (the north-south ridge west of Lake Arragan) and a number of former offshore islands that have been linked by sand deposition. The depositional landforms include irregular longitudinal sand ridges through which meander freshwater and saline drainage depressions and swamps. In the central section of the planning area lie the most unusual features of freshwater lakes surrounded by exceptionally high sand-dunes. The southern area of the planning area features clay and heavy soil formations with sand-dunes mainly confined to the coast front where they are separated by elevated outcrops of Triassic Clarence Basin Rocks. These sand dunes give rise to a most distinctive landscape. South of Station Creek are two open plains separated by a broad ridge.

Well preserved exposures of Pleistocene age carbonaceous sandrock occur in the Woolli River area and other parts of the coast.

Fifteen broad soil groups have been recognised in Yuraygir National Park. These are based on the distribution of parent rock materials within the planning area:

Quaternary marine-aeolian sands have developed four soil types; siliceous sands, sand podsols, humus podsols and acid peats.

Alluvial and estuarine sediments support six soil types; grey earths, solonchaks, solods, alluvial soils, gleyed podsols and humic clays; and

The Mesozoic and Palaeozoic sedimentary and metasedimentary rocks support red podsolics, yellow podsolics, yellow earths, grey earths and in the steep upper slopes of the Coast Range, lithosols.

The soils of both coastal and sedimentary origin present constraints on use. The sand podsols are infertile and poorly structured. The sedimentary podsols are also poorly structured with a highly dispersible and infertile topsoil and a heavy clay subsoil. The soils are highly erodible and low lying swampy coastal areas may contain acid sulphate soils.

The Wooli, Corindi and Sandon Rivers are important hydrological systems in the planning area. Low salinity levels and restricted tidal flow in the lower reaches of most of these three rivers result from sub-surface freshwater movement from wetlands that cover the majority of their catchments. The upper catchments of these three coastal rivers lie outside the planning area, mainly in State forest.

Lake Arragan, Cakora Lagoon and Station Creek are small estuaries located entirely within Yuraygir National Park. They are periodically open to the sea, during periods of heavy rainfall.

Lake Minnie Water and Lake Hiawatha, located in the central area of the planning area, are modified dune lakes. These water bodies are 'perched' on an underlying impervious layer of organically bound sand; the so called 'coffee rock'. The lakes have great scenic beauty, are of geomorphological and scientific interest and are the sole water supply for the villages of Minnie Water and Wooli respectively. The beds of these lakes are not reserved as part of the planning area.

Mineral sands mining was a significant activity in the planning area for the extraction of rutile, zircon and ilmenite for up to fifty years. In June 1977, the Government established the current policy on coastal mineral sands mining whereby the granting of new mining approvals in existing and proposed national parks ceased. As established leases expired they were not re-granted and sand mining was progressively phased out in conservation areas along the NSW coast. All mining operations had ceased in Yuraygir by the late 1970's, and all mining leases have subsequently expired.

Policies

- * Outstanding natural features and areas of scientific interest will be protected, including:
 - the freshwater and estuarine systems of the Wooli, Sandon and Corindi Rivers, Cakora Lagoon, Lake Arragan and Station Creek;
 - the beach dune system;
 - the high dunes;
 - Lake Minnie Water and Lake Hiawatha; and
 - outcrops of carbonaceous sandrock.

- * The Wooli and Sandon Rivers and catchments within the planning area will be managed to protect their special scenic, natural and catchment values.

- * All management activities, where relevant, will incorporate soil erosion management principles and practices developed in consultation with the Department of Infrastructure, Planning and Natural Resources.
- * Research will be encouraged in sand-mined areas to establish the long-term effects of mining and the ecological processes of restoration.

Actions

- Liaise with, and maintain, a cooperative approach with local government and other government authorities to manage and maintain the natural setting of the catchment and waterways of the Corindi, Wooli and Sandon Rivers and Lake Arragan, Cakora Lagoon and Station Creek; and where appropriate the adjacent waters of Lakes Wooloweyah, Hiawatha and Minnie Water.
- Past mineral sands mining restoration works will be monitored and where necessary further maintenance and protection of areas being restored will be undertaken.
- Existing pit toilets will be replaced with toilets using modern non-polluting technologies. Any changes will be subject to appropriate environmental review.

4.1.2 Native Plants and Animals

The vegetation of Yuraygir National Park has been extensively surveyed (Griffith 1984) and is mapped on a computerised geographic information system.

The distribution of plant communities in the planning area is predominantly influenced by topography, hydrology, soils and exposure to coastal influences. Griffith identified and mapped nine major groupings of plant associations within Yuraygir National Park:

Forests, which includes five groups of a large number of plant associations which are found over a wide range of topographic, hydrological, soil and parent materials:

Littoral rainforest includes two associations; a forest dominated by tuckeroo *Cupaniopsis anarcardioides* and a closed forest dominated by rusty fig *Ficus rubiginosa*.

Wet sclerophyll forest includes one association dominated by brush box *Lophostemon confertus*. Blackbutt, *Eucalyptus pilularis* occurs as a wet sclerophyll forest on red podsolic soils which have developed on the mid to upper slopes of the sedimentary and meta sedimentary rocks of the New England Fold Belt and the Clarence Basin. It also occurs as a gallery forest on alluvial soils. Other associations mapped as dry sclerophyll may also take the form of wet sclerophyll communities under favourable conditions.

Dry sclerophyll forest includes a number of associations that generally occur on the sedimentary and meta-sedimentary rocks of the New England Fold Belt and the Clarence Basin. These include forests of blackbutt, smooth barked apple *Angophora costata*, red bloodwood *Corymbia gummifera* and needlebark stringybark *Eucalyptus planchoniana*; an association dominated by tallowwood *E. microcorys*; an association of broad-leafed ironbark *E. siderophloia*, white mahogany *E. acmenoides/umbra ssp. carnea* and forest red gum *E. tereticornis*; an association of broad leafed ironbark, white mahogany

and grey box *E. propinqua* and a spotted gum *Corymbia henryi*-broad leaved ironbark association. These occur on the lithosols, red podsolics and/or yellow podsolics of the sedimentaries and metasediments of the park.

Communities developed on gleyed podsolics of Quaternary sedimentary deposits include an association dominated by scribbly gum *E. signata* and a tall open to closed forest comprising swamp box *Lophostemon suaveolens*, pink bloodwood *Corymbia intermedia* and forest red gum. These soils occur on blocked drainage depressions or on poorly drained river flats.

Communities developed on the marine/aeolian beach deposits include an association dominated by *Allocasuarina littoralis*; an association of pink bloodwood and smooth-barked apple that is found on coastal sanddunes; a forest association comprising Ramornie stringybark *E. tindaliae*, red bloodwood and pink bloodwood and an association of red mahogany, forest red gum, and red bloodwood.

A forest dominated by *Callitris columellaris* is found only on the south-east shore of Lake Wooloweyah

An association of red mahogany *E. resinifera*, forest red gum and fine veined paperbark *Melaleuca quinquinervia* occurs where humic clays have developed on recent estuarine sediments.

An association dominated by needlebark stringybark and an association of Baileys stringybark *E. baileyana* and needlebark stringybark occurs on the low ridges and gentle slopes of the coastal lowlands.

Swamp sclerophyll forest comprises four associations; one dominated by swamp mahogany *Eucalyptus robusta*, a forest dominated by fine veined paperbark, a mid-high closed forest of *Melaleuca sieberi* and *M. nodosa* and a mid-high to tall open to closed forest dominated by fine veined paperbark and swamp oak *Casuarina glauca*. These associations occur on the solods of the alluvial flats and gentle lower slopes, on blocked drainage depressions or on poorly drained river flats.

Mangrove forest comprises three associations all found on Holocene estuarine reeds and intertidal deposits. The first is dominated by grey mangrove *Avicenna marina* var. *australasica*; the second is dominated by river mangrove *Aegicera corniculatum* and milky mangrove *Excoecaria agallocha*; and the third is dominated by red mangrove *Rhizophora stylosa* and large leaved or black mangrove *Bruguiera gymnorhiza* that is at its most southern limits.

- **Woodland**, which includes;

Dry sclerophyll woodland comprises four associations of tall woodland; one dominated by Bancrofts red gum *Eucalyptus bancroftii*, one dominated by narrow-leaved red gum *Eucalyptus seeana* var. *seeana*, a third comprising swamp box, pink bloodwood and forest red gum and one dominated by smooth-barked apple. The third of these associations occur on blocked drainage depressions or on poorly drained river flats.

Swamp sclerophyll woodland includes three associations found on the solods of the alluvial flats and gentle lower slopes; a mid-high woodland dominated by swamp mahogany, a mid-high woodland dominated by fine veined paperbark and a tall woodland of red mahogany and *Melaleuca sieberi*.

- **Shrubland/scrub**, which includes;

Dry sclerophyll mallee which comprises three associations of very tall mallee form, generally with a closed canopy; the first is dominated by needlebark stringybark, the second is dominated by blackbutt and the third dominated by brush box.

Dry sclerophyll shrubland comprises one association of very tall open to closed shrubland dominated by *Banksia aemula* that occurs on sand podsols.

Wet (or swamp) sclerophyll shrubland includes two associations; a very tall closed shrubland dominated by *Banksia ericifolia* var. *macrantha* and tall closed shrubland which grades into closed forest of *Melaleuca sieberi* and *M. nodosa*.

- **Heathland**, which includes;

Dry (sand) heath which occurs as two associations; a tall closed heathland dominated by *Banksia aemula* and a tall closed heathland with *Banksia aemula* and black she oak.

Graminoid clay heathland comprises one association of a low to mid-high closed heathland *Banksia oblongifolia* and a black she oak *Aristida warburgii* and *Ptilantherium deustum* association. Both associations are found on the yellow podsolics and yellow earths that have developed on the lower gentle hillslopes of the New England and Clarence Basin rocks.

Wet heathland consists of three associations; a mid-high closed heathland dominated by *Xanthorrhoea fulva*; a mid-high closed heathland with *Banksia oblongifolia*-*Leptospermum liversidgei*, *Sprengelia sprengelioides* and *Xanthorrhoea fulva* and a tall closed heathland dominated by prickly tea-tree *Leptospermum juniperinum*. This formation is developed on blocked drainage depressions or on poorly drained river flats, the humus podsols of the Quaternary marine aeolian sands and on grey earths of alluvial or estuarine sediments.

- **Sedgeland**, which includes five associations of tall or very tall closed sedgeland. The first association recognised is a *Leptocarpus tenax*, *Restio pallens* and *Schoenus brevifolius* community, the second is dominated by *Baumea rubiginosa*, the third dominated by *Lepironia articulata*, the fourth by *Baumea juncea* and finally a *Baumea articulata*-*Lepironia articulata* community. This formation is developed on humus podsols and acid peats of the Quaternary marine aeolian sands.

- **Grassland**, which includes two subformations;

Headland grassland is characterised by a low closed sod grassland developed on the Red Cliff Coal Measures at Red Cliff that is dominated by *Themeda australis* but also with abundant dwarf heath shrubs; and

'Swamp' grassland which comprises two associations of tussock grassland; one dominated by *Ischaemum australe* and one composed of *Aristida warburgii*, *Eremochloa bimaculata* and *Schoenus brevifolius*.

- **Fernland/sedgeland**, which is represented in the park by a very tall closed *Ghania sieberana* and pouched coral fern *Gleichenia dicarpa* association.
- **Saltmarsh complex** comprising three associations; a dwarf closed chenopod shrubland/tussock grassland *Sarcocornia quinqueflora* and *Sporobolus virginicus*, a very tall closed sedgeland with *Juncus kraussii* and a tall closed sedgeland with *Baumea juncea*. These occur on Holocene estuarine muds and intertidal deposits.
- **Frontal dune complex** which includes five associations; a tall closed shrubland to mid-high closed forest dominated by coast banksia *Banksia integrifolia* var. *integrifolia*, a mid-high woodland to closed forest dominated by horse-tailed oak *Casuarina equisetifolia* var. *incana*, a low to mid-high closed shrubland dominated by coast wattle *Acacia sophorae*, a low to tall closed sedgeland/forbland of *Carex pumila-Phylla nodiflora* and a mid high open tussock grassland to tussock grassland of *Spinifex hirsutus*.

Six hundred and fifty-eight native plants have been recorded from this area. Twenty-two of the species are considered to have high conservation and/or ecological significance. These include two species considered to be vulnerable under Schedule 2 of the *Threatened Species Conservation Act 1995*; *Oxax angulata* and *Rutidosis heterogama*.

A further eleven species are rare and or restricted to the NE of NSW and southern Queensland. These include *Macrozamia fawcettii*, *Podocarpus spinulosus*, *Eriachne pallescens*, *Acacia baeuerlenii*, *Bursaria longisepala* var. *longisepala*, *Cissus opaca*, *Eucalyptus baileyana*, *E. pyrocarpa*, *E. seeana* ssp. *seeana*, *Melichrus adpressus* and *Pultenea petiolaris*. In addition there is one undescribed species of *Callistemon*.

Seven species are at the southernmost limit of their range within the park; *Bruguiera gymnorrhiza*, *Callitris columellaris*, *Melicope elleryana*, *Melichaus adpressus*, *Terostylis woollsi*, *Glochidion sumatranum* and *Rhizophora stylosa*. Two species, *Hybanthus vernonii* and *Ceratopetalum gummiferum* are at their northernmost limit of occurrence.

Also recorded as being of unusual occurrence within the park are a succulent fern, *Asplenium obtusatum*, and a prostrate form of the shrub *Viminaria juncea* that occupy littoral niches exposed to high levels of salt spray.

The dune swale sequences include distinct vegetation patterns that are functions of both localised relief and ground water levels. The Quaternary sands also form low coastal plains supporting wet heath, sedgeland and swamp forest. These communities are particularly complex.

The northern and central sections of the park are dominated in the east by wet and dry heathlands with minor occurrences of sedgeland, melaleuca woodlands and eucalypt forest; and in the west, along the foothills and slopes of the Bees Nest Range and Coast Range by eucalypt forest.

The southern section of the park is dominated by wet heathland and sedgeland communities, melaleuca woodlands and eucalypt forest.

Yuraygir's large size, location and history all contribute to a diversity of topographic and vegetational features which provide a broad range of habitats for wildlife, particularly birds.

One hundred and eighty eight bird species have been recorded in the park.

One of these, the little tern *Sterna albifrons*, is listed as endangered on Schedule 1 of the *Threatened Species Conservation Act* primarily because of threats to its habitat. A small community of these birds nests annually at Jones Beach, a small island in the Red Rock River and at Station Creek. The Station Creek and the Red Rock colonies are threatened by continual disturbance by off-road vehicles, walkers, predator species and heavy seas. Committees of concerned and local citizens have been established to assist in programs aimed at protecting these birds from disturbance by human activity.

The beach stone-curlew *Burhinus neglectus* is also listed as endangered. One resident pair also nests on the island used by little terns in the Red Rock River and uses the adjacent Yuraygir National Park as habitat.

A further 28 species of birds are listed as endangered in Schedule 1 and vulnerable in Schedule 2 of the *Threatened Species Conservation Act*. They are:

- | | |
|-------------------------------|---|
| - red goshawk | <i>Erythrotriorchis radiatus</i> (E) |
| - regent honeyeater | <i>Xanthomyza phrygia</i> (E) |
| - square tailed kite | <i>Lophoictinia isura</i> (V) |
| - osprey | <i>Pandion haliaetus</i> (V); |
| - great knot | <i>Calidris tenuirostris</i> (V) |
| - sanderling | <i>Calidris alba</i> (V) |
| - large sand plover | <i>Charadrius leschenaulti</i> (V) |
| - black tailed godwit | <i>Limosa limosa</i> (V) |
| - pied oystercatcher | <i>Haematopus longirostris</i> (V); |
| - sooty oystercatcher | <i>Haematopus fuliginosus</i> (V); |
| - black bittern | <i>Dupetor flavicollis</i> (V); |
| - comb crested jacana | <i>Irediparra gallinacea</i> (V) |
| - black-necked stork (jabiru) | <i>Xenorhynchus asiaticus</i> (V); |
| - brolga | <i>Grus rubicundus</i> (V); |
| - wompoo fruit dove | <i>Ptilinopus magnificus</i> (V) |
| - rose crowned fruit dove | <i>Ptilinopus regina</i> (V) |
| - masked owl | <i>Tyto novaehollandiae</i> (V) |
| - barking owl | <i>Ninox connivens</i> (V) |
| - powerful owl | <i>Ninox strenua</i> (V) |
| - sooty owl | <i>Tyto tenebricosa</i> (V) |
| - grass owl | <i>Tyto capensis</i> (V); |
| - mangrove honeyeater | <i>Lichenostomus fasciocularis</i> (V) |
| - turquoise parrot | <i>Neophema pulchella</i> (V) |
| - swift parrot | <i>Lathamus discolor</i> (V) |
| - ground parrot | <i>Pezoporus wallicus wallicus</i> (V); |
| - glossy-black cockatoo | <i>Calyptohynchus lathamii</i> (V); and |
| - red-tailed black cockatoo | <i>Calyptohynchus magnificus</i> (V). |
| - grey-crowned babbler | <i>Pomatostomus temporalis temporalis</i> (V) |

The vulnerable masked booby *Sula dactylatra* and Goulds petrel *Pterodroma leucoptera* has been recorded in the waters adjacent to Yuraygir National Park.

These species are considered endangered or vulnerable in accordance with one or more of the following criteria;

- the population of the species is decreasing because of over-exploitation, extensive destruction of habitat or other environmental disturbance;
- the population of the species has been seriously depleted and its ultimate security has not yet been assured;
- the species is still abundant but is considered under threat from severe adverse factors throughout its range; and/or
- the species has a small population which is contained in restricted areas or habitats or thinly scattered over a more extensive area.

The species listed above mainly fall into the first or fourth categories.

The planning area is rich in bird species because of its diversity of habitats. Different species of birds have different habitat requirements that are provided by the physical and biological features of the planning area. Important habitats for birds include the following:

- **Coastal forests, including rainforest remnants, eucalypt forest and woodland, and swamp forests of melaleuca and casuarina**, provide homes for most of the passerine (perching) species that occur in the planning area. These include the common species eastern whipbird *Psophodes olivaceus*, noisy friarbird *Philemon corniculatus* and scarlet honeyeater *Myzomela sanguinolenta*.
- **Heathlands** in the planning area include wet, dry and grassy clay heaths. All types have flowering plants that attract the nectar feeding birds such as the very common white-cheeked honeyeater *Phylidonyris nigra*. Banksias predominate in these areas. The vulnerable and rare ground parrot and eastern grass owl prefer the wet heath areas and swamp fringes. In autumn, the heaths of the planning area are used by the northward migrating silver-eyes *Zosterops lateralis* and yellow faced honey eaters *Lichenostomus chrysops*.
- **Swamp and freshwater habitats** attract the pacific heron *Ardea pacifica*, brolga, cormorants and several species of ducks. The great crested grebe *Podiceps cristatus* and the hoary-headed grebe *Poliiocephalus poliocephalus* occur on Lake Hiawatha and the little grassbird *Megalurus gramineus* is found in the reed beds of the water's edge.
- **The marine and littoral zones** provide feeding, resting and breeding areas for many seabirds and shorebirds. Rock platforms are the habitat of the sooty oystercatcher, which nests on off-shore islands, the pied oystercatcher, the eastern reef egret *Ardea sacra*, (which is rather rare in the area), the white-faced heron *Egretta novaehollandiae* and the ruddy turnstone *Arenaria interpres*. The turnstone often feeds amongst washed up kelp or seaweed. The double-banded plover *Charadrius bicinctus* is a winter visitor from New Zealand. Other estuarine birds include the striated heron *Butoroides striatus* and the chestnut teal *Anas castanea*.
- **The grasslands** of the planning area comprise native species growing in association with heath or swamps and exotic pasture. The dominant introduced pasture species is setaria grass. Native quail have adapted to this artificial habitat, including the red-backed button-quail *Turnix maculosa*, an uncommon species in New South Wales, and the red-chested button-quail *Turnix pyrrhorthorax* which is also uncommon on the north coast.

The planning area, together with Moonee Beach Nature Reserve in the south and Iluka Nature Reserve, Bundjalung and Broadwater National Parks in the north, comprise a large coastal conservation system that is important for both seasonal north-south and east-west migration links for bird and microbat species.

The planning area is important for many species of wading birds for resting, feeding and/or roosting on sand and mud flats in estuaries and beaches and on rock platforms during their annual migration. These species are covered by international conservation agreements; particularly:

- the Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA); and
- the Agreement between the Peoples Republic of China and the Government of Australia for the Protection of Migratory Birds and their Environment (CAMBA).

Species recorded in Yuraygir National Park and which are identified in one or both of these two agreements, in addition to the little tern, ruddy turnstone, Mongolian plover, pied oyster-catcher and sooty oyster-catcher noted above, include:

white-bellied sea eagle	<i>Haliaeetus leucogaster</i>
eastern curlew	<i>Numenius madascariensis</i>
red-necked stint	<i>Caladrus ruficollis</i>
common sandpiper	<i>Tringa hypolaucas</i>

The last three of this group are summer visitors.

Other birds of significance include the raptors, wedge-tailed eagle *Aquila audax*, smaller brahminty kite *Haliastur indus* and whistling kite *Haliastur sphenurus*. Welcome swallows *Hirundo neoxena*, tree martins *Hirundo nigricans* and white-throated needletails *Hirundapus caeiacutus*, (formerly known as spine-tailed swifts) are common birds of the sky. The needle-tail is only present during the warmer months as it nests in Asia during the southern winter.

The planning area provides core habitat for the coastal emu *Dromaeius novaehollandiae* which has recently been listed as an endangered population. Emu populations on the east coast have declined as a result of habitat fragmentation, frequent fire regimes and predation by vertebrate pests. Of the estimated 80 birds, approximately 50 birds utilise the Yuraygir National Park. The NPWS has been coordinating annual surveys with the assistance of local coastal communities, and road awareness programs.

The planning area and adjoining State Forests are considered to contain high quality dingo habitat and have been listed on Schedule 2 of the RLP Act.

Mammals listed as threatened under the *Threatened Species Conservation Act* include:

- | | |
|---------------------------|--------------------------------------|
| - rufous bettong | <i>Aepyprymnus rufescens</i> (V) ; |
| - spotted-tailed quoll | <i>Dasyurus maculatus</i> (V) |
| - eastern pygmy possum | <i>Cercartetus nanus</i> (V) |
| - brush-tailed phascogale | <i>Phascogale tapoatafa</i> (V); |
| - squirrel glider | <i>Petaurus norfolcensis</i> (V); |
| - common planigale | <i>Planigale maculata</i> (V) |
| - yellow bellied glider | <i>Petaurus australis</i> (V) |
| - koala | <i>Phascolarctos cinereus</i> (V); |
| - eastern chestnut mouse | <i>Pseudomys gracilicaudatus</i> (V) |

- | | | |
|---|--------------------------------|---------------------------------------|
| - | common blossom bat | <i>Syconycteris australis</i> (V); |
| - | hoary wattled bat | <i>Chalinolobus nigrogriseus</i> (V); |
| - | little bentwing-bat | <i>Miniopterus australis</i> (V) and |
| - | yellow bellied sheath-tail bat | <i>Saccolaimus flaviventris</i> (V). |
| - | grey-headed flying fox | <i>Pteropus poliocephalus</i> (V) |

Significant amphibians and reptiles found in the planning area include the Schedule 1 (endangered) green and golden bell frog *Litoria aurea* and Schedule 2 (vulnerable) wallum froglet *Crinia tinnula*, wallum tree frog *Litoria olongburensis* and the white-crowned snake *Cacophis harriettae*.

Marine turtles, including loggerhead turtles *Caretta caretta* and dolphins occasionally enter the Wooli, Sandon and Corindi Rivers. Green turtles *Chelonia mydas* which are listed as vulnerable under the *Threatened Species Conservation Act* have been sighted using remote Yuraygir beaches to nest.

A number of important plant communities and animal habitats extend onto neighbouring lands. In particular, important habitats are located adjacent to the planning area on the estuary of the Corindi River and adjacent to Lake Wooloweyah.

Policies

- * The genetic continuity and stability of native plants and animals will be protected by:
 - limiting the collection of native plants and animals to that required for scientific, educational or management purposes; and
 - use of endemic material for restoration and amenity planting programs.
- * The management of native plants and animals will place emphasis on protecting significant ecosystems, habitats of vulnerable and endangered species (as listed under Schedules 1 and 2 of the *Threatened Species Conservation Act*), those that are locally rare or approaching their known limit of distribution and species covered by conservation agreements.
- * The understanding and protection of native plants and animals will be promoted through interpretation programs.
- * The cooperation of neighbouring landholders, land use planning and management agencies and community groups will be sought to protect important wildlife habitats within and adjacent to the planning area.
- * Research into the distribution, abundance and habitat requirements of native animals with emphasis on vulnerable and endangered species will be encouraged.

Actions

- A priority list for research and monitoring for rare and endangered and other significant species will be established (refer to section 4.3.3).
- A systematic inventory of the fire ecology of plant and animal species will be established and results utilised to modify fire management prescriptions.
- Cooperative programs for the protection of important wildlife habitats and threatened species within and adjacent to the planning area will be identified and initiated.

- Programs for the protection of the little tern colonies at Station Creek, Red Rock and the coastal emu population will continue with the assistance of local community groups.

4.1.3 Introduced Plants and Animals

Introduced plants and animals are those species not native to an area. In the planning area, introduced plants and animals can seriously impact upon the biodiversity of reserved lands by modifying species richness and abundance, and ecosystem function. They can also have significant impacts upon the cultural values of the planning area, and the economic and social values of neighbouring areas. The control of weeds and feral animals is recognised as a crucial land management activity.

The NPWS has a number of statutory responsibilities in relation to pest management and has also established a number of related policies. The NPWS North Coast Region has also developed a Regional Pest Management Strategy outlining the strategic direction for pest management activities, the major pest problems, the criteria for prioritising control programs and a brief summary of programs to be undertaken.

Over eighty introduced plant species and five introduced animal species have been recorded in the park. Long-term control programs are well established for the most serious weeds and most feral animals, whilst the remainder require the development or expansion of effective strategies. A Pest Management Plan will be prepared for Yuraygir National Park setting out specific details of operational pest control programs, including priorities, strategies and techniques.

Introduced Plants:

The *Noxious Weeds Act 1993* places an obligation upon NPWS to control introduced plants declared as noxious weeds on reserved lands to the extent necessary to prevent such weeds spreading to adjoining lands. Noxious weeds are listed in the Schedule of the Act and are classified into four categories with differing control requirements. In addition to weeds identified under the *Noxious Weeds Act*, the NPWS controls other introduced plants considered to be weeds where these have an unacceptable environmental impact.

Some eighty introduced plant species have been recorded in the park with levels of infestation varying in extent and severity of environmental impacts. Five of the most severe and widespread weed species in the planning area are aggressive invaders of native plant communities, and are favoured by disturbance of natural ecosystems. These species are - groundsel bush, bitou bush, glory lily, lantana and slash pine.

Six other weed species are well established but remain fairly localised to the previously disturbed areas of their original introduction. These species are - *Setaria*, tea tree, willow wattle, buffalo grass, carpet grass and giant parramatta grass. Most other weed species occur on a small scale and are being managed in recognition of their invasive potential to prevent their further spread. These include: ochona, cassia, ground asparagus fern, morning glory, umbrella tree, crofton weed, Formosa lily, painted spurge, whisky grass, spiny burrgrass, kikuyu, crowsfoot grass and *Paspalum wetsteinii*.

Groundsel bush

Groundsel bush (*Baccharis halimifolia*) is a declared noxious plant, native to eastern North America that is controlled as a matter of priority when discovered in the

planning area. It is an aggressive invader of disturbed areas, and readily invades and proliferates in undisturbed low-lying areas, generally on poorly drained soils or adjacent to estuarine areas, watercourses, coastal wetlands and swamp forests. It has a rapid growth rate and produces vast quantities of windborne seed, which germinates readily. It successfully out-competes and shades native species, prohibiting natural regeneration, and often forms dense thickets that grossly alter the structure and floristic composition of native plant communities.

Groundsel bush is widespread in the planning area with infestations varying in size and density. Large dense infestations occur in northern Yuraygir NP in the Brooms Head – Sandon area, and southern Yuraygir NP in the Station Creek area. Less serious infestations occur near Woolli village, along watercourses in central Yuraygir NP, and in many of the riparian zones of the recent additions to the planning area.

The incidence of groundsel bush within the planning area is closely linked to previous levels of disturbance. The more severe infestations are located where groundsel bush has invaded former sugar cane fields in the Brooms Head and Sandon area, and grazing land near Station Creek, where it has spread from a serious infestation in the neighbouring Barcoongere State Forest. In the aftermath of disturbance by wildfires, burnt areas adjacent to mature groundsel plants are at risk from rapid colonisation by groundsel in the early post-fire regeneration phase.

A major program of spraying of groundsel bush has been implemented throughout the planning area, particularly in the area between Brooms Head and Sandon River. Conventional herbicide application is the favoured control method, though aerial application has been conducted in the past and may be utilised again where appropriate. Large infestations across land tenures require a cooperative management approach between neighbouring land managers.

The NPWS also has a cooperative program with the Allan Fletcher Research Station in Queensland, Maclean Council and the NSW Department of Agriculture for the release of insects in the park as part of a program designed to develop a biological method of groundsel bush control. Two species in particular have been released in the park; a gall fly *Rhotallomyia californica* was released ten years ago and which is now widespread throughout the park, and a stem boring moth larvae *Oidaematophonus ballanotes*, was released in March 1992. The gall fly seems to be of only limited success, and it is too early to yet determine the success of the moth larvae although it is established and effective in the control of groundsel bush in small areas to the south of the planning area near Coffs Harbour.

Bitou bush

Bitou bush (*Chrysanthemoides monilifera* subsp. *Rotundata*) is a native of South Africa. It is declared noxious throughout NSW, and listed as one of 20 Weeds of National Significance. It readily invades a wide variety of disturbed and undisturbed coastal plant communities, and out-competes native vegetation to the extent where it becomes a monoculture, and dominates and suppresses the growth and regeneration of native species. It readily forms dense vigorous stands on foredune sands to the exclusion of native species, and has colonised formerly shrub-free kangaroo grass headlands. It also assumes a scrambling habit in hind-dune woodlands and scrub where it may rise through and smother the canopy of native vegetation. Bitou bush has been a vigorous coloniser of bare sand dunes resulting from natural processes, past mineral sands mining, bushfire or agricultural activities. Bitou infestations rapidly increase in density and area in the immediate post-fire regeneration phase.

Invasion by bitou bush leads to a decline in the species diversity of affected plant communities, and their associated faunal assemblages. Mature bitou plants are capable of producing up to 50,000 seeds per year, with the soil seed bank of

established infestations containing up to 5,000 seeds per square metre, with a seed viability of up to 10 years. Invasion by bitou bush is listed as a Key Threatening Process under the *Threatened Species Conservation Act 1995*. In the planning area, invasion by bitou bush threatens the habitat of three endangered plants (*Chamaesyce psammogeton*, *Sophora tomentosa* and *Thesium australe*) and several ROTAP listed species, as well as the habitat of at least two endangered shorebirds (beach stone-curlew and little tern).

The distribution and density of bitou bush within Yuraygir National Park has been mapped, where it is found in varying densities along the entire length of coastline within the planning area. Light infestations occur on the dunes south of Station Creek.

A joint biological control program for bitou bush by means of the release of the bitou tip moth (*Comostolopsis germana*), commenced in the early 1990s involving the NPWS, local councils, the Allan Fletcher Research Station in Queensland and the NSW Department of Agriculture. The tip moth was released in the area of Diggers Camp and has established a viable population. In conjunction with the well-established and widespread bitou seed fly (*Mesoclanis polana*), they are substantially reducing seed production and plant vigour. In June 2000, a leaf-rolling moth (*Tortricidae*), was released south of Wilsons Headland. This insect is the most damaging herbivore of bitou in its native South African habitat.

The NPWS has established an effective program for the control of bitou bush in the planning area based on the release of biological control insects, assisted by annual herbicide ground spraying and mechanical removal. This effort is augmented by regular Green Corps programs, and dune care and volunteer groups that are established at Angourie, Diggers Camp, Sandon and Minnie Water, and which are having a localised but important impact on bitou bush control in these areas of the planning area. These cooperative joint community programs rely heavily upon ongoing access to target funding programs such as Coastcare, Envirofund and the Environmental Trust.

The most effective control program is a spraying program of low concentration glyphosate herbicide in winter, with annual follow up maintenance and revegetation with native plants from local seed sources. NPWS has conducted helicopter boom spraying of bitou bush using low concentrations of glyphosate in winter in several heavily infested areas. This treatment has proven effective in reducing the density and area of infestations, and will continue to be utilised where appropriate. NPWS is committed to ongoing support for the Sandon to Woolli Community Nursery based at Minnie Water, which produces local provenance seedlings for native vegetation restoration projects after bitou control.

Glory lily

Glory lily (*Gloriosa superba*) is an ornamental plant discovered in the planning area in the early 1990s. This plant is an aggressive perennial scrambler or climber from tropical Asia and Africa. It is established within the planning area on sandy soil south of Brooms Head, around Sandon Bluffs and around Diggers Camp, with isolated plants around Minnie Water. It is considered a weed that presents a threat to native vegetation. It contains harmful alkaloids that can cause fatal poisoning of mammals, including humans. Control is difficult and may be achieved by labour intensive bush regeneration techniques and herbicide application where appropriate.

Lantana

Lantana (*Lantana camara*) is native to South America and is moderately to well established throughout the planning area, where it assumes the habit of a straggling shrub, or liana. It is most common in disturbed areas, along drainage lines, and roadsides in moister areas, though it also occurs at low density in the dunal systems.

Red lantana is toxic to stock and may impact upon neighbouring livestock if allowed to spread. Current chemical control programs occur as a component of bush regeneration programs, and to facilitate access around visitor precincts. The successful release of several species of insects, *Uroplata*, *Octotama*, *Teleonemia*, and *Ophiomyia* for biological control of lantana has taken place over the past four decades, and have adverse impacts upon plant vigour. Research into the effectiveness of further agents is ongoing.

Slash Pine

In the Station Creek area of the park the exotic slash pine (*Pinus elliotii*), has become a major weed species, with heath and woodland harbouring dense stands, scattered wildlings and mature seed trees that have spread from the adjoining pine plantations in Barcoongere State Forest. Cockatoos, wind and water carry seeds long distances, where they can readily establish even in undisturbed environments. Dense stands radically alter the structural and floristic characteristics of vegetation, creating dense shade, altering soil chemistry, depleting nutrients, displacing native species and impacting upon fire behaviour. An intensive effort is maintained by the NPWS in hand cutting this fast growing and rapidly spreading weed species.

Other introduced plants

A number of former agricultural properties have been purchased and added to the park and several of these have required revegetation. An extensive area of former sugar cane land has been restored by the Soil Conservation Service under contract to the NPWS. This program restored drainage by creating cross drains to prevent erosion and provided a seed source for regeneration by mulching disturbed earth with heath. There are some additional, smaller areas in the planning area that require restoration, which will be carried out as part of a continuing program. On former grazing land supporting dense stands of *Setaria*, a strategy will be developed to control setaria and restore native vegetation.

Large tracts of the coastal dunes in northern Yuraygir NP were sandmined during the 1970s and 80s. Several weed species were introduced to these areas during post-mining rehabilitation that have resulted in large scale, multi-species infestations. These include bitou bush, coastal tea tree (*Leptospermum laevigatum*) and willow wattle (*Acacia saligna*). Programs for the removal of these weeds and the restoration of native coastal vegetation are underway in the Angourie, Lake Arragan and Greycliff areas.

A program aimed at the removal of the introduced plants lantana, winter cassia and *Ochna serrulata* from Red Cliff Headland and the restoration of the littoral rainforest is also current.

A reduction in fire frequency in the planning area is an important management strategy to slow weed invasion. Fire favours most weeds by opening up native vegetation and enabling weeds to become established, and also by stimulating the mass germination of weed seed in the soil. Several serious weed species – including groundsel bush, bitou bush, willow wattle and exotic grasses – particularly *Setaria* and whisky grass, require urgent control actions following bushfires to prevent major infestations developing in the immediate post-fire period.

Introduced Animals:

The pest animal provisions of the *Rural Lands Protection Act 1998* (RLP Act) set out the conditions under which species may be “declared” pest animals on either a statewide or local basis, and the conditions that apply to the control of each declared pest species. Wild dogs, feral pigs and rabbits have been declared noxious pest animals throughout NSW. The RLP Act requires NPWS to fully and continuously

suppress and destroy pest animals found in the planning area to the extent necessary to minimise the risk of the pest causing damage to any land.

Wild dogs (*Canis familiaris*)

Wild dogs and/or dingoes (*Canis lupus dingo*) are known to occur throughout the planning area. NPWS considers dingoes to be part of the native fauna of NSW that it has a responsibility to conserve. However NPWS recognises that wild dogs may inflict losses or disruption to livestock on adjoining and nearby lands and accepts the need to minimise attacks. Dingo habituation and aggression towards humans has also been identified as a potential risk, with a high level of recreational visitation and a number of coastal villages. Hybridisation with domestic and feral dogs threatens the survival of native dingo populations within the planning area.

The Pest Control Order for wild dogs intends that the general destruction obligations for lands listed in Schedule 2 of the Order will be satisfied through a wild dog management plan that addresses both control and conservation objectives, and has been approved by the RLP Board for the district. The planning area and adjoining State Forests are considered to contain high quality dingo habitat and have been listed on Schedule 2 of the RLP Act. These areas are to be managed with the dual objective of controlling wild dogs to the extent necessary to minimise the risk of damage to livestock from wild dog attacks, while at the same time conserving populations of purebred dingoes.

A Wild Dog Management Plan will be prepared in conjunction with the RLPB and the local Wild Dog Control Association. Strategic cooperative ground baiting control programs will be undertaken in conjunction with affected landholders where identified in the plan. The dingo awareness and public education campaign in the campgrounds of the park and coastal villages will be continued to educate and protect visitors and nearby residents. NPWS will monitor wild dog populations, maintain a wild dog incident database, and undertake campground audits and enforcement action. Appropriate action, including culling, will be undertaken with dogs displaying aggressive and habituated behaviour towards park visitors and nearby residents.

The program of research into the genetic purity of the planning area's dingo population will be continued and expanded to all areas where dingoes have been recorded.

Feral pigs (*Sus scrofa*)

A small, transient and highly mobile feral pig population utilises areas within the planning area, particularly during autumn and winter. This pig population is part of a much larger population that ranges across the timbered hilly country of the Clarence Valley. The impact of feral pigs on conservation values is substantial, as they forage, wallow and root in wetland areas, and cause major disturbance and damage to soils, roots, sensitive ground flora and wetland environments. They have been known to uproot threatened ground orchids (eg *Phaius* sp.), and rip up improved pastures and canefields on neighbouring properties. Areas disturbed by feral pigs are at risk from subsequent weed invasion and soil erosion.

Over the past decade, most feral pig activity has been in southern and central Yuraygir National Park. However, in the early 1990s feral pig control programs were also undertaken around the Lake Wooloweyah foreshore. Pigs are either trapped and shot, or poison baits are laid out using special bait stations with the assistance of neighbours and Rural Lands Protection Board staff. Park neighbours are encouraged to contact NPWS staff where they are aware of feral pigs, so pig control can be as thorough as possible. Feral pig control programs may utilise trapping, poisoning where appropriate, and both ground and aerial shooting.

Foxes (Vulpes vulpes)

Foxes occur in low number throughout most areas of the planning area, particularly around coastal villages. Research in similar habitats elsewhere on the NSW North Coast indicates densities vary between 2-7 per square km, with highest densities in urban interface areas. Foxes are known to prey upon ground nesting birds, ground dwelling mammals up to 5kg in weight, and reptiles, and spread the seeds of fleshy-fruited weeds.

Predation by the European red fox is considered a Key Threatening Process under Schedule 3 of the TSC Act and under the Commonwealth's *Environmental Protection and Biodiversity Conservation Act* (EPBC Act). A Fox Threat Abatement Plan (TAP) has been prepared, which identifies threatened species most at risk from foxes in NSW, and nominates a number of sites where fox control programs are an essential protective measure. Two broad shorebird breeding areas within the park were identified as Fox TAP sites for the protection of beach stone curlews, little terns, pied oystercatchers, and brolgas. Since the finalisation of the Fox TAP, the North Coast Bio-region Population of Emus has been listed on Schedule 2 of the TSC Act as an Endangered Population, and is also a priority species for the protection of emu chicks from fox predation. Both the emus and the rufous bettong, the priority threatened mammal species in the Fox TAP are widespread within the planning area, and will benefit from large-scale fox control programs planned under the Fox TAP.

Feral horses (Equus caballus)

Feral horses are known in the planning area and adjoining leasehold properties, with small populations located in southern Yuraygir, south of the Wooli River, and on the coastal plains around Brooms Head. Feral horses pose a threat to biodiversity through the trampling of nesting grounds of threatened shorebirds, destructive trampling and grazing of salt marshes, heath and regenerating rainforest at Redcliff, and the spread of weeds. Development of effective strategies in conjunction with adjoining land managers and owners is required to remove feral horses from the planning area.

Feral cats (Felis catis)

Feral cats are known to occur in many areas of the planning area, with most sightings adjacent to coastal villages, along roads and trails, and in areas of low grassy heath. Predation by feral cats impacts upon small to medium sized native mammals, ground nesting birds and small reptiles, and has been listed as a Key Threatening Process under the TSC Act and the EPBC Act. Current feral cat control methods have limited success and are largely ineffective. Research into effective feral cat control is continuing.

Cane Toads (Bufo marinus)

Cane toads are only known from the Mara Creek, Angourie and Lake Wooloweyah areas of the northern section of the planning area, which is the southern limit of their permanent national distribution. NPWS organises an annual community cane toad roundup based around Angourie and Yamba to remove toads from the area and suppress toad numbers. Regular surveys are conducted in northern Yuraygir NP to ensure cane toads are not spreading south of current distribution limits. Individual cane toads are sporadically collected from caravan parks and camping areas in Brooms Head and Wooli where they have been accidentally introduced through inadvertent transportation. A community education campaign promoting awareness of inadvertent transport and the potential threats from the spread and establishment of cane toads. All reports of cane toads in new locations are investigated within 72 hours.

Other Introduced Animals

Cattle grazing is not permitted in Yuraygir National Park. Grazing causes physical damage to conservation values in the park, particularly coastal ecosystems. The presence of cattle on Yuraygir National Park also conflicts with the natural setting the park provides for coastal recreation. Graziers also traditionally burn in spring to provide green pick for their animals and this practice is an unacceptable fire threat to the park.

Coastal heaths and forests, both inside and adjacent to the planning area, are used for honey production and over-wintering of bees. Twenty-seven sites within Yuraygir National Park are currently licensed for beekeeping. They are located away from visitor and facility areas and are generally dependent on access from the management trail system. The sites are mostly used in winter, coinciding with the flowering of heathlands and when other food sources in the region are generally scarce.

Recent investigations have established that European honeybees compete with and displace native animals, particularly native bees, nectar feeding birds and small mammals and have damaging effects on native plants. Competition from feral honeybees was listed as a Key Threatening Process in December 2002. However, apiary consents current on the 31st December 1989 and those on other Crown land current at the time of subsequent gazettal as part of Yuraygir National Park will be renewed in accordance with NPWS policy.

Policies

- * Non-native plant and animal communities within the planning area will be controlled and, where practicable, eradicated.
- * Emphasis in the control of introduced plants and animals will be placed on techniques that have minimum impact on native ecosystems.
- * Priority for the control and, where ever possible, eradication of introduced species:
 - that are declared noxious or for which a national emergency control program has been declared, or are known to be an important problem in other parks or states;
 - that is an action specified in a threat abatement plan developed for a pest species that is listed as a key threatening process under the TSC Act, 1995;
 - that has significant environmental impact, including damage to threatened species, catchment values and recreation values;
 - that may affect neighbouring lands, cultural or recreational values, or are considered of high priority by the community;
 - where ongoing management of an established infestation is required to maintain benefits gained from previous control programs, or to allow another high priority management program to be effective; or
 - where a window of opportunity occurs (ie a period of extended drought, or immediately following a bushfire or flood etc);
 - that is a new infestation with limited distribution.
- * Existing successful community based cooperative programs underway at Diggers Camp, Angourie and Sandon that include intensive control and active regeneration will continue to be supported. External funding opportunities for these programs will continue to be pursued.

- * The NPWS may enter into cooperative arrangements with neighbours to control introduced pest plant and animal species on, or adjacent to the planning area boundary.
- * Lands disturbed by past agricultural land use will be regenerated to natural ecosystems.
- * Attempts will be made to maintain a core population of purebred or near pure dingoes.
- * Cane toads will be prevented from spreading elsewhere in the planning area. New populations will be prevented from establishing.
- * Domestic stock will be excluded from the planning area and neighbours will be encouraged to maintain adequate stock-proof boundary fencing.
- * No additional apiary licences will be granted within the park. The 27 sites within the planning area that are current will be renewed in accordance with NPWS policy.

Actions

- A Pest Species Management Plan for will be prepared for the planning area, incorporating operational control programs for introduced pest plants and animals.
- The program of introduced plant and animal control will continue to be implemented as a component of the conservation strategy for the planning area with emphasis on the bush regeneration approach integrating weed control with native vegetation restoration where possible and appropriate.
- The “Sandon to Wooli Community Nursery” facility at Minnie Water will continue to be supported and utilised in native vegetation restoration programs.
- Continue to support local Landcare, Dunecare and other volunteer groups working on, or adjacent to, the planning area providing such works are in accordance with this plan. External funding opportunities for these programs will continue to be pursued.
- Continue the dingo awareness campaign targeting park visitors and residents of coastal villages to minimise the risk of scavenging, habituation and aggression towards humans.
- Maintain databases of wild dog activity to provide information for strategic targeted programs.
- An ongoing large-scale fox control program for the planning area will be conducted aimed at mitigating threats to priority threatened species listed in the Fox TAP.
- Feral pig control will be carried out in all areas where pigs are observed, signs of pig activity are recorded, or neighbouring properties are conducting pig control programs.
- A wild dog management plan for the planning area and adjoining lands will be prepared as per PCO II of the RLP Act 1998.
- Continue research into the genetic purity of dingoes in the planning area.

- Appropriate action, including culling, will be undertaken with wild dogs displaying aggressive and habituated behaviour towards park visitors and nearby residents.
- Conduct regular cane toad distribution surveys during summer months. Community involvement in the annual “Cane Toad Roundup” will be maintained. A community education campaign warning of the dangers of inadvertent cane toad transport will continue. Reports of new infestations will be investigated within 72 hours.
- Cattle and horses present within the planning area will be removed.
- The abundance and distribution of introduced plant and animal species will continue to be monitored and mapped where possible.

4.1.4 Fire Management

Fire has been an important factor influencing the environment of the planning area for many thousands of years. Together with climate and soil type, fire or its absence, has been largely responsible for determining plant and animal distribution. Many species of Australian plants and animals have developed mechanisms or behaviour to survive fire and some plants actually require fire for reproduction or stimulation of new growth. On the other hand, some vegetation communities such as rainforest are particularly sensitive to fire.

A draft Fire Management Plan was developed for Yuraygir National Park and former Crown Reserve (now the State Conservation Area) in 2000. It incorporated substantial community input and is currently being revised to cover recent park additions. All other NPWS fire management policies are described in the Fire Management Manual (NPWS, 2001).

Fire responsibilities

The NPWS, like other land owners and managers in NSW, is bound by the *Rural Fires Act 1997*. As well the NPWS is bound by the *National Parks and Wildlife Act* and the NPWSs fire policy.

The NPWS is a fire authority under the *Rural Fires Act*. It is responsible for all fire management within the planning area, including the control and suppression of fires and the implementation of fuel management strategies to protect life and property from fires. The NPWS is also responsible for, and assists with, the control and suppression of fire in other areas as may be required by local fire authorities.

The Clarence Valley Zone Bush Fire Management Committee has been established under Section 52 of the *Rural Fires Act*. The NPWS is a member of this committee which is responsible for the development and fostering of cooperative fire fighting and the reduction of bush fire hazards. To implement these responsibilities, the committee has prepared a plan of operations and a bush fire risk management plan which are required under Section 52 of the *Rural Fires Act*.

These plans address operational arrangements, fuel management planning and include a resources directory. The commitments each organisation makes in these plans are legally binding. The NPWS contributes to these plans by providing preferred fuel management prescriptions for areas it manages. The fuel management plan is subject to annual review.

The NPWS is actively involved in cooperative fire fighting, both with providing assistance to local authorities and brigades, and accepting assistance for the control of fires within the planning area.

The primary aims of the NPWS in relation to fire management are:

- protect life, property and community assets from the adverse impacts of fire;
- develop and implement cooperative and coordinated fire-management arrangements with other fire authorities, reserve neighbours and the community;
- manage fire regimes within reserves to maintain and enhance biodiversity;
- protect Aboriginal sites, historic places and culturally significant features known to exist within NSW from damage by fire; and
- assist other fire agencies, land management authorities and landholders in developing fire-management practices to conserve biodiversity and cultural heritage across the landscape.

The responsibility of the NPWS is to specify fire management principles and activities for the planning area that will address the protection of life and property from fire while conserving the natural ecosystems of the planning area.

In accordance with the NPWS wide program on fire management planning, fire management strategies are being finalised for the planning area to identify the bushfire threat, requirements for the conservation of native plants and animals and provide the basis for management strategies and prescriptions. The fire management strategy is establishing community protection measures in areas where it is identified that fire is a threat to both property and biodiversity.

Fire management strategies will be finalised for the planning area during 2004.

Fire History

Historical evidence as well as current understanding of the biological impact of fire on the environments of the planning area has established that fire has been a management tool used by both Indigenous people and European settlers. The use of fire in the bushland of the Clarence coastline resulted in more frequent fire events and modification of the landscape.

Prior to, and since reservation, Yuraygir National Park has a high incidence of arson lit fires. Forty-five fires were deliberately lit by arsonists over the 1990/91 and 1991/92 fire seasons which effectively burnt out almost the whole of the park over that period. Much of the arson activity has been focussed in the Woolli area where 40 separate fires were lit between September 1987 and April 1991 and which burnt out almost all of the park between the Woolli and Sandon Rivers

The incidence of arson has declined in recent years although there were a spate of such attacks during the 2001/02 and 2002/03 seasons. Over these seasons fires burnt large areas of the planning area.

Fire Strategies

Arson lit fires are virtually the only occurrence of fire in the park. Fire from natural causes, and at a frequency and intensity that is consistent with the management of the native plant and animal communities, is negligible. The overwhelming priority in fire management is to reduce, and if possible eliminate, the occurrence of arson. Not until this is achieved can a practical, socially responsible and scientifically based fire regime be implemented. Under these circumstances, the strategy of fire management in the planning area is to provide safe and secure protection for each village by a system of asset protection zones, strategic zones, fire management trails

and by regular hazard reduction immediately adjacent to each village and rapid response to contain and extinguish any fires that may occur away from the villages.

It is essential in the circumstances of arson occurrence in the planning area that the system of fire management trails be maintained to allow for a quick response to the illegal lighting of fire. Yuraygir has an extensive system of fire management trails that provide access for fire management and fire control. These trails as well as major public roads and certain natural features provide effective fire control lines and facilitate the control and suppression of fire within a limited area, thus reducing their impact on the natural heritage of the planning area.

A sub-committee of the Clarence Valley Zone BFMC has been developing Village Protection Plans within the planning area. This has involved NPWS, DLWC and RFS as well as representatives of the communities adjacent to the planning area. These include the coastal villages of Sandon, Minnie Water, Diggers Camp, Wooli, Red Rock, Angourie and Wooloweyah. This strategy has a twofold purpose; to minimise the threat of wildfire to the villages and their residents, and to thus provide the basis for fire management throughout the rest of the planning area by reducing the frequency of arson. The process is expected to be completed by 2005.

Much of the western boundary of the planning area is contiguous with State Forest. Both State Forests of NSW and the NPWS maintain a system of boundary fire management trails and cooperate in fire management.

Fire management activities, including the construction of control lines in fire emergencies, can damage Aboriginal cultural heritage values in and adjacent to the planning area. It is important to ensure the local Aboriginal community is involved in the development of fire management strategies, particularly during fire emergencies, to protect Aboriginal cultural heritage values.

Fire management planning for the park uses a geographic information system (GIS) which is a computerised system for the storage, analysis and presentation of spatial data. Using this GIS, natural and cultural assets and values are assessed for bushfire risk and strategies developed to reduce that risk.

Policies

- * Wherever practical fire will be suppressed in the planning area with the objective of reducing the level of unscheduled fire and its impact on the natural and cultural heritage of the planning area.
- * Fire management in the planning area will aim to:
 - protect human life;
 - maintain species habitat and diversity, avoid local extinctions of native plant and animal species and enhance the conservation of rare and endangered species, protect rainforest and dunal areas;
 - protect adjoining coastal towns, villages and assets;
 - prevent fire moving off the planning area onto neighbouring properties;
 - prevent fire moving into the planning area from neighbouring properties;
 - reduce fire fuel hazards which may threaten life or adjoining towns, villages or properties; and

- maintain a network of strategic fire management trails.
- * The role of and management of fire within the planning area will be promoted in the community, particularly amongst neighbours.
- * The protection of coastal towns and villages from fire will be consolidated and improved, in consultation with local communities, bush-fire brigades by the Clarence Valley BFMC Village Protection sub-committee.
- * New temporary management trails will be constructed where necessary for fire control or other emergency operations. All new trails constructed for emergency operations will be closed and rehabilitated as soon as possible after each emergency.
- * The cooperation of councils, bushfire brigades, adjoining land use authorities and neighbouring land holders will continue to be sought in achieving an ecologically and socially responsible fire management regime for the planning area.
- * Research into fire behaviour, fire hazard and risk assessment, and the impact of fire on the planning area's plant and animal communities will be encouraged.

Actions

- Fire management strategies will be finalised for the planning area during 2004.
- Continue to seek assistance and employ methods to reduce and, if possible, eliminate the incidence of arson within the planning area.
- Continue to participate as a member of the local Bush Fire Management Committee and actively contribute to preparing fire and fuel management plans.
- Liaise with the RFS and local Aboriginal communities to ensure local Aboriginal communities are involved in the development of fire management strategies, particularly during fire emergencies, to protect Aboriginal cultural heritage values.
- Maintain all fire management trails and restrict usage to authorised vehicles only.
- Coordinate fire hazard reduction by burning or mechanical means (as determined by an annual hazard/risk assessment) in village hazard reduction zones and other strategic areas.
- Liaise with councils, other land use authorities and neighbouring landholders to maintain quick response and cooperative fire management arrangements.
- Encourage research into the effects of fire regimes on plant and animal communities to improve the basis for fire management.
- Maintain records of fire occurrence with particular emphasis on mapping and recording of the area, frequency, seasonality and intensity of fire.
- Protect significant natural (eg. rare, threatened and significant flora and fauna) and cultural heritage sites from fire.

4.2 CULTURAL HERITAGE

4.2.1 Aboriginal Cultural Heritage

The planning area encompasses parts of the country of the Gumbaingirr and Yaegl people. The name 'Yuraygir' is derived from the Yaegl (Yaygirr) language group.

The planning area falls within the jurisdiction of four Local Aboriginal Land Councils (LALC). These are Coffs Harbour LALC (far southern portion), Grafton-Ngerrie LALC (southern and central) and Yaegl LALC (north western) and Birriagan-Gargle LALC (northern). In addition, there are Elders groups and Aboriginal Cooperatives associated with these LALCs and the park.

Many Gumbaingirr and Yaegl Elders still living in the area still speak their respective languages and retain traditional knowledge of the park landscape, its resources and the locations of places of mythological and spiritual significance. A cultural heritage study undertaken in Southern Yuraygir National Park identified a number of additional sites and places of importance to local Aboriginal communities (Brown and Murphy *et al*; 2001).

Evidence of past occupation includes open campsites, middens, scarred trees and quarry sites along coastal headlands, bays and estuaries. A large midden located in Station Creek camping area has been carbon dated and found to contain material dated as 1650 years before present (Yarrawarra Aboriginal Corporation 1997).

Numerous sites along the coast have been disturbed or destroyed as a result of sand mining activities in the 1960s and 70s. However, many other places in the planning area which have spiritual and ceremonial significance remain intact and relevant stories are still retained by local Elders. A number of sites and places in the Lower Clarence have been included in a tourist drive. This self-guided tour is a joint initiative between NPWS and LALCs aimed at informing the wider community of the importance of Aboriginal culture within the Clarence Valley.

Despite the displacement and in some areas, massacres of Aboriginal people following European occupation, local Aboriginal people maintain strong links to this landscape. The NPWS acknowledges the importance of the planning area to local Aboriginal communities, and the wealth of information and spiritual association they retain with the area. An Aboriginal consultative committee for Southern Yuraygir was formed at the request of LALCs and Elders to assist in the management of cultural heritage within the park. Similar consultative forums could be established to cover all of the planning area.

While there is some information about Aboriginal cultural heritage within the planning area, a wider assessment of values, particularly covering the central and northern sections, will provide an improved basis for addressing and protecting Aboriginal cultural heritage values. It is acknowledged that the Aboriginal community, including Local Aboriginal Land Councils and Elder groups, are the primary custodians of this knowledge and expertise. In addition, the Aboriginal community has expertise and training programs that can assist with park management activities.

Policies

- * Aboriginal cultural heritage will be conserved and managed in conjunction with local Aboriginal communities
- * Understanding and appreciation by visitors of the cultural heritage of the planning area will be encouraged.
- * Research into the cultural heritage values of the planning area will be encouraged.

Actions

- Cultural heritage assessments will be prepared on the central and northern sections of the planning area in consultation with local Aboriginal communities.
- Collaborate with relevant Aboriginal stakeholders about the interpretation of Aboriginal cultural heritage.
- Actively encourage Aboriginal people to take part in park management by holding regular meetings with Local Aboriginal Land Councils and Elders groups to develop and implement management works and provide opportunities for employment of local Aboriginal people wherever possible.
- Investigate the need for, and support from, Aboriginal communities to establish further consultative forums for the planning area.

4.2.2 Non-Indigenous Cultural Heritage

European settlement and land use since the mid 19th century has left some tangible evidence in the form of huts, yards, stock fences and relics, however the most noticeable impacts are modifications to dunal systems resulting from sand mining activities and the clearing of forested areas for pastoralism. Some of the European occupation of the southern part of Yuraygir has been documented in the cultural heritage study mentioned above (Brown and Murphy *et al*; 2001).

Intensive mineral sand mining and subsequent rehabilitation over the last thirty years has left extensive areas of modified beach ridge system throughout the planning area. Other land uses included cattle grazing and timber cutting. Some structures from previous landuses have survived in the form of fences, stockyards and other cultural items. Recent additions to Yuraygir National Park have included areas formerly managed by NSW State Forests (NSWSF).

Slovenski's statue located in the former New Foundland State Forest was constructed by Mr Jonas Zillinskas, a timber cutter and trapeze artist in the 1940s. This statue and the artist have gained local and regional popularity with the NPWS and Pristine Waters Council investigating strategies to conserve the statue and interpret its significance in the context of the land uses of that era.

Buchanan's Hut, constructed entirely of tea tree, located south of the Wooli River is a surviving example of past grazing activities in Yuraygir National Park over the last 100 years.

There is a very long history of recreational use of the Yuraygir coast dating back to the earliest days of settlement in the Clarence Valley. Recreation during the twentieth century has focused on the beaches, rivers, towns and villages within the external boundaries of the planning area. Apart from a number of beach huts

located in the park at Sandon River, recreation activities in the park have left little tangible evidence.

The huts located on park at Sandon were generally constructed between the 1930's and 1960's on Crown lands under Permissive Occupancies granted by the former Lands Department prior to the creation of this section of Yuraygir National Park in 1983. The huts at Sandon are significant because of their role in the history of early coastal recreation from Grafton and commercial fishing use. The cultural heritage value of the Sandon huts as a whole and individually requires further assessment.

Policies

- * The provisions of the Burra Charter (ICOMOS revised 1987) for the conservation of places of cultural significance will guide management of the cultural heritage of the planning area.
- * Understanding and appreciation by visitors of the cultural heritage of the planning area will be encouraged.
- * Research into the cultural heritage values of the planning area will be encouraged.

Actions

- Undertake further investigation of the post-European history of the planning area.
- Sites and places of historic value will be researched and recorded, and where appropriate, protected and interpreted.
- Develop and implement conservation plans to protect, and where appropriate interpret, Slovenski's Statue and Buchanan's Hut.
- Undertake a cultural heritage assessment of the Sandon huts located within Yuraygir National Park.
- Encourage the involvement of local historians and interested members of the community in the identification and assessment of historic items in the planning area.

4.3 USE OF THE PLANNING AREA

The planning area will be managed to ensure that its use, whether by the general public, special interest groups, NPWS managers or other authorities, is appropriate and conforms with the management objectives and strategy of this plan.

The major categories of use that may be appropriate within NPWS managed areas are:

- environmental education;
- promotion of the NPWS and natural and cultural heritage conservation;
- scientific research;
- recreation in a natural setting, and
- management operations by the NPWS and other authorities.

The extent to which these categories of use are appropriate to the planning area are indicated below.

4.3.1 Promotion of the Planning Area

Existing programs for the promotion of public awareness and appreciation of the planning area include the presentation of interpretation material in the form of brochures on the park generally as well as specific items of its natural and cultural heritage. Information is provided within the planning area at many recreation nodes and along walking tracks. Discovery Ranger programs are conducted during the NSW school holiday periods.

Where resources allow, the existing programs will be extended with emphasis on the importance of the planning area as part of the system of regionally important national parks and nature reserves on the Clarence and Richmond Coast of northern NSW and in particular:

- the importance of the planning area in the regional pattern of conservation areas, both terrestrial and marine;
- the Aboriginal cultural heritage values within the planning area;
- the geological evolution of the Clarence Coast;
- the biological significance of the coastal environment for the conservation of native plants and animals; and
- appropriate use of the recreation resources of the planning area, particularly the recreational use of its beaches.

Some limited formal environmental education use of the planning area takes place. For example, the Shelley Beach walking track is used by local schools for studies of coastal environments and the University of New England uses the camp ground at Illaroo for environmental education purposes. The planning area, given its topography and relative proximity to residential villages and roads, is also a suitable location for navigational training.

An important program of public awareness is to keep members of the local community, particularly neighbours of the planning area, councils and other authorities informed of programs of management undertaken on the planning area with respect to fire management, feral animal control and weed control. To this end, the Region emphasises the importance of maintaining liaison with local authorities such as Bush Fire Management Committees and Local Rural Lands Protection Boards. Liaison meetings with councils and meetings with district bush fire brigades, Dune Care groups, progress associations and government departments are held as required on issues affecting the management of the planning area.

Increasing public awareness of the NPWS and its responsibilities in natural and cultural heritage management assists with the protection of the natural and cultural resources of the planning area and is a major aspect of managing visitor use. The planning area has a significant role to play in the community as a resource for environmental study and education. Visitors have a strong expectation that information on the features of the area and management is readily available.

The planning area provides opportunities for commercial recreation and education licensed under the *National Parks and Wildlife Act*. These activities may complement park management and provide increased opportunities for visitors consistent with the objectives of the NPWS and this plan of management. Commercial tour operators provide the NPWS with an opportunity to more extensively promote the importance of nature conservation and cultural heritage conservation and the appreciation and understanding by visitors of the importance of the planning area.

There are currently six licensed commercial tour operators using the park.

Policies

- * Public awareness programs will be maintained to encourage people to visit and enjoy the planning area and to understand and appreciate its natural and cultural features and their management with emphasis on:
 - the importance of the planning area in the regional pattern of conservation areas, both terrestrial and marine;
 - the geological evolution of the Clarence Coast;
 - the biological significance of the coastal environment for the conservation of native plants and animals;
 - the past occupation and present use of the coastal zone by the Aboriginal community;
 - appropriate recreational use of the planning area, particularly beaches and rivers; and
 - fire management.
- * Use of the planning area by school and university groups will continue to be encouraged for environmental and park management education and research.
- * Commercial recreation and educational activities that are consistent with the conservation and appreciation of the natural and cultural values of the planning area will be encouraged. Commercial activities are required to be licensed under the *National Parks and Wildlife Act* and will be subject to NPWS policies and this plan of management.
- * Any publicity and interpretation undertaken by commercial operators will be required to be consistent with environmental education and interpretation programs for the planning area.

Actions

- An interpretation strategy will be prepared for the planning area.
- Interpretive information will continue to be provided at facilities and in association with walking tracks to promote understanding and enjoyment of natural and cultural features.
- Interpretation signs and displays along selected walking tracks will be maintained and upgraded where necessary.
- Interpretation facilities within villages adjacent to the planning area and within local tourist centres will be maintained and upgraded where possible.
- Promote awareness of NPWS fire management programs to community groups and neighbours of the planning area.
- Guided educational activities will be conducted during peak visitor periods.

4.3.2 Recreation Opportunities

The management of outdoor recreation in the planning area is undertaken in the wider sub-regional context of Yuraygir, Bundjalung and Broadwater National Parks that provide important opportunities for coastal outdoor recreation in the Clarence and Richmond River Valleys. These three parks offer recreation settings ranging from remote stretches of coastline to those which are readily accessible by vehicle. Each park offers a number of access roads, camping areas, walking tracks, day use and interpretive facilities for recreation and environmental education purposes.

The villages of Angourie, Brooms Head, Sandon, Minnie Water, Diggers Camp and Wooli are located on the Yuraygir coast between Yamba and Red Rock. The recreational mix provided by this combination of villages and national parks provides opportunities for boating, picnicking, camping, fishing, swimming, surfing and bushwalking on some of the best beaches in Australia.

Accommodation for visitors to the Clarence Valley includes motels, holiday cottages and caravan parks in the adjoining coastal resorts and villages. The planning area provides a less developed, more natural style of camping areas to those provided by the private sector and local government in the surrounding region. A major camping area is maintained at nearby Woody Head in Bundjalung National Park. In contrast a number of camping areas which cater for low-key, short-term camping are provided at Black Rocks in Bundjalung National Park, and at Station Creek, Pebbly Beach, Sandon River, Boorkoom, Red Cliff, Illaroo and Lake Arragan Camping Areas in Yuraygir National Park.

A number of picnic areas and day walks are also provided in nearby coastal national parks.

The planning area affords excellent opportunities for long distance walking, utilising the sweeping coastline with its outstanding landscapes, coastal villages and existing infrastructure. Opportunities exist for visitors to use NPWS camp grounds or private accommodation and to traverse the length of the planning area or sections in between and beyond.

One of the major user groups of the planning area are people engaged in recreational fishing. Amateur anglers fish on the adjoining surf beaches and rock platforms and along estuaries of the Corindi, Wooli, Sandon Rivers and Station Creek. Recreational fishing is regulated by NSW Fisheries under the *Fisheries Management Act 1994* and by the Marine Parks Authority under the Solitary Islands Marine Park zoning plan.

Boating activities on the waterways within and adjacent to the planning area are controlled by either the NPWS, Waterways or the Marine Parks Authority.

Horse riding is an activity with a limited demand and opportunity within the planning area. Much of the planning area is swamp or wet heathland and is unsuitable for horse riding. On walking tracks horse riding is unacceptable because the use is incompatible with walkers, while on roads and trails horse riding can have an adverse environmental impact and conflict with other park users. There are a number of environmentally suitable alternative areas in the general area that are available for horse riding.

Visitor use of the planning area is monitored by a number of techniques including vehicle counts, visitor census, campsite receipts and participation levels in the Discovery Ranger programs.

Policies

- * A range of outdoor recreational and education opportunities will be provided which:
 - are consistent with the protection of natural features and processes;
 - are appropriate to the appreciation and understanding of the natural features; and
 - complement those opportunities provided elsewhere in the region.
- * Opportunities will be provided in the planning area for:
 - nature-based activities such as bird and whale watching
 - picnicking;
 - back pack camping;
 - long distance walking;
 - low key, vehicle-based camping;
 - bushwalking for short, intermediate and long walks;
 - non-motorised cycling;
 - recreational fishing;
 - boating;
 - surfing and;
 - car touring.
- * Certain recreational activities and pursuits require the approval of the Regional Manager. These activities include:
 - group activities involving more than 40 people;
 - competitive activities;
 - training activities;
 - adventure activities including rock climbing, abseiling and hang gliding;
 - commercial recreation ventures.
- * Power boats, used for recreational purposes, will be prohibited from Lake Arragan and Cakora Lagoon, both of which are within the planning area.
- * Access will be provided for recreational fishing activities on the planning area by means of:
 - public vehicular access system;
 - vehicle-accessible beaches;
 - vehicle free beaches (pedestrian use only); and
 - walking tracks,subject to compliance with the *National Parks & Wildlife Act* and the *National Parks & Wildlife Regulation 2002*.
- * Horse riding will not be permitted in the planning area. The one exception is the commercial operator accessing Browns Knob (close to the south-western boundary of the park), which is an existing interest pursuant to Section 39 of the *National Parks & Wildlife Act*. Such use will be confined to those trails to which the existing license applied. This authority is not transferable.

Actions

- The program of monitoring visitor use of the planning area will be maintained and used to assist in park planning and management.

- The impacts of visitor use will be monitored and where necessary, measures will be taken to protect natural and cultural features.

Public Vehicular Access:

Vehicular access to the planning area is via all-weather roads maintained by Pristine Waters and Maclean Councils to all coastal towns and villages within the planning area except Sandon Village. Access to Sandon Village is by four-wheel drive vehicle along the beach or by boat across the Sandon River. During periods of high seas, the 'back track' behind the beach is available for residents at Sandon to gain access to the village.

The Wooli and Sandon Rivers divide the planning area into three sections. Access from the Pacific Highway to each section of the planning area is as follows:

Northern section: via the road to Yamba and Angourie and then to the Angourie Bay facilities in Northern Yuraygir; and from Maclean via the Brooms Head Road to Brooms Head, Red Cliff Lookout, Lake Arragan Camping Area and to the Sandon River Camping Area

Central section: via the Wooli Road to the Minnie Water turnoff. Illaroo Camping area is 1km north of Minnie Water; and via the Wooli Road to Diggers Camp Road. Boorkoom and Wilsons Picnic Areas are 4kms from the Wooli Road.

Southern section: via Barcoongere Forest Way (44km south of Grafton and 46km north of Coffs Harbour) to Station Creek Camping Area.

The public access system for vehicles within the planning area comprises two types of road or trail:

Public roads: open to the public, but excluded from the planning area and generally maintained by other authorities. Wooli-Minnie Water, Brooms Head, Diggers Camp Road, sections of the Sandon Road are public roads excluded from the planning area; and

Park roads: which are reserved as part of the planning area and are open to the public. These roads are maintained by the NPWS.

The NPWS has constructed and maintains approximately 19km of park roads within Yuraygir National Park for access to recreation facilities and other features of interest. These roads provide access to ten picnic and camping areas and eleven beaches in the park:

- the Angourie Bay Road from near Wooloweyah to Angourie Bay;
- the road from the Angourie Bay Road to Mara Creek;
- the loop road from the Brooms Head Road to Lake Arragan and Red Cliff camping areas;
- the road from 'Wire Fence' to the Sandon Camping Area;
- the road from Minnie Water to Illaroo Camping Area;
- the road from the Diggers Camp Road to Boorkoom and Wilsons Headland Picnic Areas; and

- the road to Station Creek Camping Area from the planning area boundary.
- the four wheel drive access trail to Station Creek Beach from the Station Creek Road.

The public access system is outlined on maps 1 and 2.

Management trails are required for management operations and are not open to private vehicles. These are maintained by the NPWS (refer section 4.3.4). An exception within the planning area is the Sandon Village 'back track' which is restricted to Sandon Village residents for emergency access only.

Policies

- * Vehicles will be permitted only on the public and park roads unless specifically authorised otherwise for park management, for fire management purposes, for access to licensed bee sites or for access by other Government agencies to carry out their duties within the planning area.
- * Sandon Village residents will be permitted to use the Sandon ('backtrack') management trail for vehicle access when the Sandon-Illaroo beach is impassable.

Actions

- Maintain, and if necessary, upgrade the park road system.
- The Sandon 'backtrack' will be gated and keyed access restricted to Sandon Village residents.
- Park roads may be temporarily closed during periods of excessive and prolonged wet weather to protect environmental values, ensure public safety and prevent road damage.

Camping and Day Use Areas:

Yuraygir National Park's seven camping areas are accessible by road and provide picnic and simple short-term camping facilities, toilets and garbage services. Visitor use within the planning area is monitored by a number of techniques including vehicle counts, visitor census, campsite receipts and participation levels in the Discovery Ranger programs.

Red Cliff and Lake Arragan Camping Areas are located close to the popular fishing and swimming spots around Red Cliff Beach, Brooms Head Beach and Lake Arragan. The low heath vegetation on the headland allows spectacular views up and down the Yuraygir coastline.

Sandon River Camping Area is located 10km south of Brooms Head. Surrounded by trees at the mouth of the Sandon River the camping area gives access to both river and beach.

Illaroo Camping Area is located 1km north of Minnie Water village. It has good access for beach fishing and a seaside picnic area. Access is through Minnie Water village.

A number of management issues exist in the vicinity of the Illaroo camping area, including;

- Vehicle access through the Minnie Water Village into the camping area on the national park / village interface presents significant public safety and traffic problems associated with high traffic volumes and constraints on road design.
- Vehicle access through the camping area and onto the Illaroo-Sandon Beach and associated conflicts with swimmers, walkers and campers.
- Poor fire protection measures surrounding the camping area. During the 1994 bushfire emergency, many facilities were destroyed and campers threatened by fire.
- The camping area receives high usage from campers, with limited opportunity for resting of sites during the year.
- Poor location of current beach access point intercepting a creek line as it flows to the beach presenting erosion and causing access problems.

These management issues will be alleviated by:

- Redirecting vehicle traffic around the village of Minnie Water along an existing fire trail west of the village onto the existing Illaroo access road. This will alleviate long-standing problems experienced on the park boundary including traffic problems and safe access for both park users and residents in Minnie Water and at Sandon Village, and
- Redirecting vehicle traffic around the present camping area to the north along a disused access trail to the beach. This trail will also improve fire management and protection of the camping area, allow a further camping node to be established which will allow resting of sites, while maintaining existing camping sites and opportunities.

Boorkoom Camping Area is located adjacent to the village of Diggers Camp. The small sheltered camping area also provides picnic facilities and access to isolated coves and the spectacular Wilsons Headland coastal walking track.

Station Creek Camping Area is hidden in Angophora and Banksia woodland beside Station Creek estuary and is a favourite place for bird watchers. The beach is a short stroll away.

Pebbly Beach Camping Area is situated north of Station Creek Beach and accessible by four-wheel drive vehicle and by foot (see map 2). This remote camping area is nestled amongst a significant community of horse-tailed oaks (*Casuarina equisetifolia* var. *incana*) (refer to section 4.1.2) and Banksias and has good access to beach fishing and a walking track to isolated beaches to the north.

New toilets have been constructed at Pebbly Beach but minimal additional facilities will be provided in order to preserve the “remote” recreation experience. The nearby Station Creek Camping Area provides a greater range of visitor facilities.

Pebbly Beach provides the opportunity for vehicle based camping in a relatively remote and natural setting. There are, however, currently few restrictions on the number of people that can access and camp at Pebbly Beach apart from the physical confines of the site and over 300 campers use the area at peak periods. Such level of use places significant pressures on the environment and diminishes the recreation experience that should be enjoyed in such a location. The horse-tailed oak community is showing signs of stress associated with excessive levels of visitor use as evidenced by tree loss and dieback, and soil compaction.

Limited vehicle access will continue to be permitted to sections of Station Creek Beach and Pebbly Beach (see map 2), however, such use will be monitored, and where necessary regulated, to ensure protection of significant habitats (especially for the coastal dune community and nesting shorebirds), preservation of the special recreation experience afforded by this area, and public safety.

If vehicle based recreation at Pebbly Beach cannot be managed in a sustainable manner, as determined by monitoring, it may be discontinued in favour of walk-in camping and day use. In order to reduce the impacts of vehicles and campers at Pebbly Beach, a precinct plan will be prepared that examines the environmental impacts of visitor use and develops strategies for sustainable use that reduces the current area available for camping. The precinct plan will examine options for managing visitor numbers, including the introduction of a booking system.

Should ongoing environmental impacts be unacceptable, vehicle access and camping may be further modified, restricted or prohibited at Pebbly Beach.

The following conditions apply to use and occupation of all camping areas in the planning area:

- Persons must not camp for a continuous period of more than 21 days unless signposted otherwise, and
- Generators are prohibited.

The more remote sections of the planning area offer a different style of recreation setting for back-pack camping and bushwalking to that provided at the visitor precincts. Although not a major recreation activity in the planning area as yet, there is a small but growing interest in back pack camping.

Basic facilities are provided for back-pack camping and picnicking at Shelley Beach and Rocky Point.

The main areas in the park that provide for day use only are:

Angourie Bay and Mara Creek Picnic Areas are situated close to the beach at Angourie Point. Walkways give access to informal picnic areas and fishing spots.

Wilson's Headland Picnic Area is immediately south of Diggers Camp village. Visitors can walk from the picnic areas to isolated coves on the rocky headland.

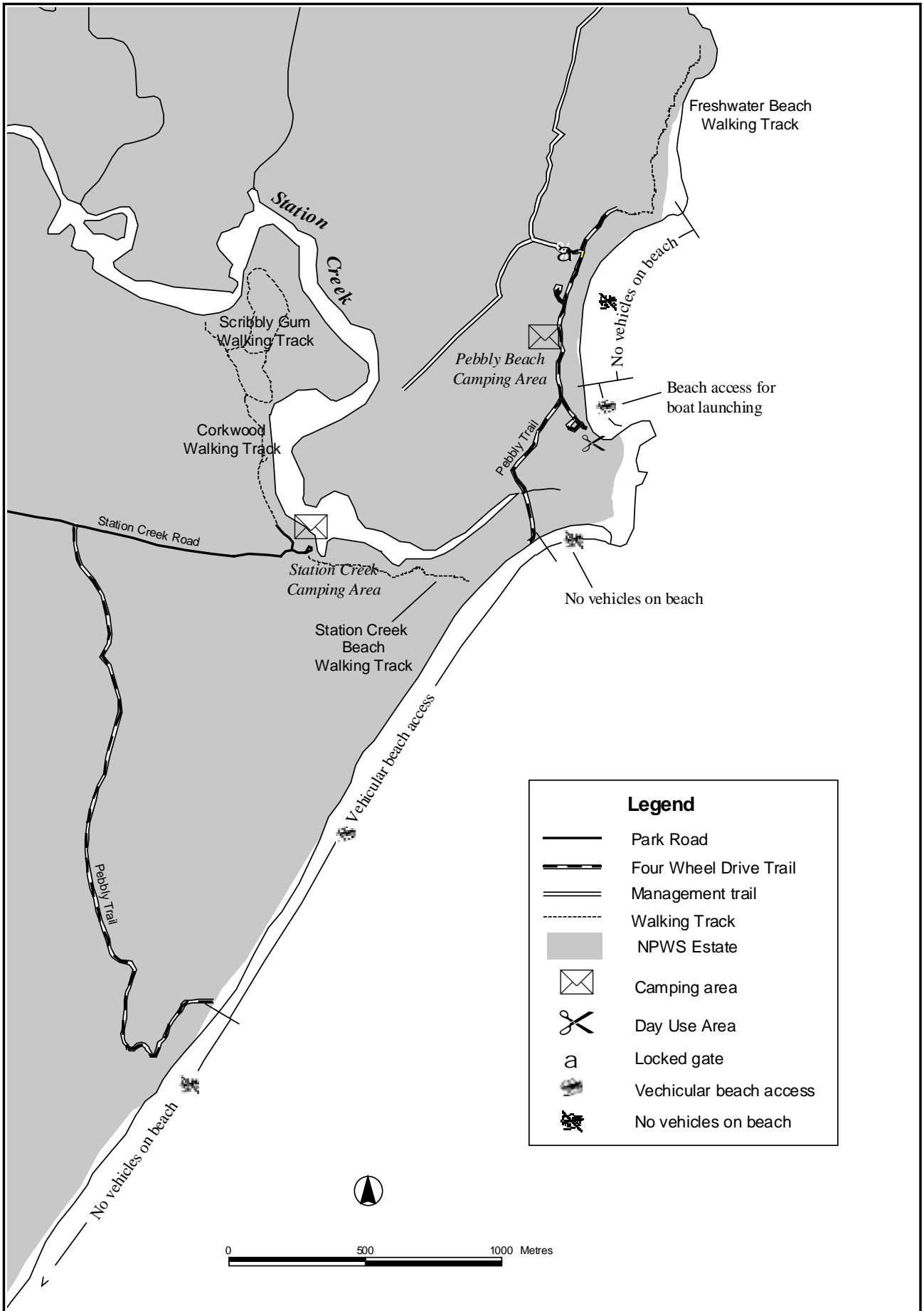
Designated day use areas, where facilities are provided for picnicking, occur at the camping areas at Station Creek, Illaroo, Sandon River and Lake Arragan.

Policies

- * Vehicle-based camping will continue to be provided within the planning area at the following camping areas.
 - Red Cliff/Grey Cliff Area;
 - Lake Arragan;
 - Sandon River;
 - Illaroo;
 - Boorkoom;
 - Station Creek.
 - Pebbly Beach

- * Public vehicle access will be prohibited from the following areas within the Pebbly Beach – Station Creek precinct (see map 2):

- On the beach south of the access point along the Station Creek Beach towards Red Rock;
 - On the beach north of the trail accessing the Pebbly Beach camping area;
 - On Pebbly Beach, except for launching boats within the designated area;
 - North and west of Pebbly Beach;
 - Off designated beach access tracks or above the mean high water mark unless designated by signage, and
 - Where restricted by barriers or signage indicating the extent of the beach nesting fauna on Station Creek Beach.
- * Walk-in camping and day use will be encouraged at Pebbly Beach.
- * Picnic areas, all of which are available for day use only, will continue to be provided in the planning area at the following sites;
 - Mara Creek;
 - Angourie Bay; and
 - Wilson's Headland.
- * Portable private generators will not be permitted in any camping or day use area unless required for medical purposes and approved by the relevant Area or Regional Manager.
- * Back-pack camping will be permitted throughout the planning area with the exception of:
 - The catchments of Lake Minnie Water and Lake Hiawatha which provide water supply for Wooli and Minnie Water villages;
 - Coastal foredunes; and
 - An area within a 500 metres radius of any visitor facility area or coastal village and a distance of 500 metres from a walking track (not including designated back-pack camp sites), road or management trail.
- * Back-pack campers will be encouraged to use alternatives to wood fires, particularly at Shelley Beach walk-in camp site.
- * The code of minimal impact bushwalking and camping will be promoted amongst visitors to the planning area.
- * Back-pack camping and picnicking will continue to be provided for at:
 - Shelley Beach, and
 - Rocky Point.
- * Vehicle and boat-based camping is only permitted at designated camping grounds.



Map 2: Station Creek - Pebbly Beach area – Recreation opportunities

Actions

- Recreational use of camping and day use areas will be monitored. Where such use is causing unacceptable environmental impact or unacceptable conflict with other visitors to the planning area, it may be modified, restricted or prohibited.
- The main access onto Station Creek Beach and Pebbly Beach will be formalised and vehicle access off this trail will not be permitted.
- Vehicle-based camping and picnicking will be permitted at Pebbly Beach. The area available for camping and picnicking will not exceed its current extent. The day use/camping area at Pebbly Beach will be defined by signage, barriers and vegetation and/or a ceiling placed on visitor numbers, based on an assessment of sustainable levels of visitor use and the capacity of the site and existing facilities to accommodate visitor numbers. Visitor facilities may be redesigned to meet both physical and environmental site constraints.
- A precinct plan will be prepared for the Pebbly Beach Camping Area that examines the environmental impacts of visitor use and develops strategies for sustainable use. The proposed precinct plan will examine options for managing visitor numbers, including the introduction of a booking system and a reduction in the current area available for camping and vehicle movements.
- The proposed precinct plan for Pebbly Beach will also designate areas for day use within the precinct.
- Actions arising from the proposed precinct plan, and supported by monitoring at Pebbly Beach, may be implemented if considered necessary to protect park values or visitor safety.
- Measures will be implemented to protect significant stands of horse-tailed oak, shorebird habitat and the dune systems.
- Increased law enforcement will be supported by signage to ensure the protection of significant habitat and sensitive dune areas.
- Vehicular access to Illaroo Camping Area will be redirected from the present access to an upgrading of the existing fire trail to the west of Minnie Water village through Yuraygir National Park subject to appropriate environmental and cultural assessment.
- Vehicular access to the Sandon-Illaroo Beach will be redirected via an access trail to the north of the present camping area and onto the beach subject to appropriate environmental and cultural assessment.
- Subject to appropriate environmental and cultural heritage assessment, an additional northern camping node specifically for group camping may be constructed at Illaroo camping area if demand for the additional capacity can be demonstrated.
- Shelley Beach walk-in campsite will be a fuel stove only area and campfires are not permitted.

Management of Beaches:

When Yuraygir National Park was reserved in 1980, the NPWS inherited a pattern of vehicle use on almost all beaches and headlands by off-road vehicles. This use was largely uncontrolled and had severely degraded many beach and headland areas.

There are approximately 17 beaches either wholly or partly within Yuraygir National Park, covering the 65km coastline adjoining the planning area. Of these 17 beaches, 16 were open to vehicles and only one physically inaccessible to vehicles at the time of reservation of the park.

In balancing conflicting community expectations, the NPWS accepts that it is important to plan for a range of recreational uses of the planning area's beaches. Some beaches will be available for controlled use by four-wheel drive vehicles while others will be managed as vehicle-free beaches for those preferring a more passive recreational use or where natural values, such as shorebird habitat, are high.

Yuraygir National Park reservation is presently limited to mean high water mark. Where access to a beach is only through national park, access to the beach is the responsibility of the NPWS. Where access to a beach is across a Crown Reserve, management is the responsibility of the Department of Lands, Maclean Council or Pristine Waters Council. Where beaches adjoin the planning area for part of their length and Crown reserve for the remainder, management is a joint responsibility.

From Sandon Bluffs to Red Rock the area below mean high water is managed by the Marine Parks Authority as part of the Solitary Islands Marine Park.

By law, all vehicles using vehicle accessible beaches must be registered and drivers licensed. Approved access points only are to be used and use of vehicles across or along the frontal dunes is prohibited.

Uncontrolled vehicular access to beaches in the planning area has in some places severely damaged beach and headland areas. Conflict also arises between visitors to the planning area who are attracted by its quiet and restful setting and the numbers of vehicles using the beaches. Four-wheel drive vehicles using beaches can be a hazard to pedestrians, especially family groups that are surfing, sunbathing, walking or fishing. The use of vehicles on beaches raises important issues of visitor safety in these areas and there is a need to separate incompatible uses where such conflicts are unacceptable.

Observation has shown that the breeding and feeding of shorebirds is disrupted by recreational vehicle use of Station Creek Beach. The little tern and beach stone-curlew, both of which occur on Station Creek Beach, are listed as endangered under the *Threatened Species Conservation Act*. Little Terns usually feed at the low-water mark in the breakers or just beyond. Therefore, fencing off a nesting area is not always an effective measure in protecting tern hatchlings (runners). Due to this habitat disturbance, the need to balance vehicle usage on beaches adjoining the planning area and the long standing conflict between vehicle and pedestrian based recreational use of Station Creek and nearby Pebbly Beach, the use of vehicles on Station Creek Beach will only be permitted on that section of beach between the designated Station Creek beach access trail and the Pebbly Beach Camping Area access trail (see map 2). Vehicle access will be limited to below the mean high water mark except on the entry to the beach or when crossing to and from Pebbly Beach as directed by signage. Under this scenario vehicle access to 50% of Station Creek beach is still permitted.

Minnie Water Back Beach, a small (2km) beach which lies between the villages of Diggers Camp to the south and Minnie Water to the north will also be managed as a vehicle-free beach. Pedestrian access is readily available from either Minnie Water

or Diggers Camp and this usage is increasing. Vehicle access onto the Minnie Water Back Beach is difficult and is not widely used.

This approach to management of vehicle use of beaches is consistent with the Solitary Islands Marine Park Zoning Plan.

Vehicle access on this middle section of the coast within Yuraygir National Park is still permitted on the two long beaches between Minnie Water and Sandon and between Wooli and Wilson's Headland.

The system of vehicle accessible beaches and vehicle free beaches is outlined on maps 1 and 2.

Policies

- * Vehicle access to beaches will be managed in accordance with map 1.
- * All vehicles, except for essential management or emergency purposes, will be excluded from vehicle free beaches.
- * Subject to the provisions in this plan of management, vehicular access will only be permitted on those beaches designated on maps 1 and 2.
- * The use of vehicles on the designated beaches may be modified, restricted or prohibited where it is causing unacceptable environmental damage or unacceptable disturbance to other park visitors.
- * Vehicles driven on beaches are prohibited above the intertidal zone so as to reduce the potential impact on beach dwelling birds and dune vegetation.

Actions

- The impact of vehicles on beaches approved for vehicular use will be monitored.
- The access trail to Minnie Water Back Beach will be maintained as a management trail and access for emergency vehicles but public vehicle access will not be permitted.
- Actively discourage vehicles from using the section of Sandon Beach adjacent to the Illaroo camping ground south of the beach access point.
- Seek to incorporate the inter-tidal zone into the park where it adjoins the planning area.
- Develop and implement a 4WD beach driving education, information and signage strategy.

Walking Tracks

An important recreational value of the planning area is the opportunity it provides for bushwalking in a coastal setting. The walking track system is an important means of promoting the appreciation and awareness by visitors of the natural and cultural heritage of the park and in providing access for visitors along the planning area's scenic coastline. It has the potential to form part of a long distance coastal walking track complemented by areas to the north and south of the planning area.

The following walking tracks are located in the planning area:

The Angourie walking track links Mara Creek Picnic Area in the north with Lake Arragan Camping area to the south. This 10km walking track features specially constructed stairs and boardwalks, and is one of the most magnificent coastal walks in Australia.

The Wilsons Headland walking track links the picnic area at Wilsons Headland with the Boorkoom Camping Area. This path runs for 3km along the coast providing panoramic ocean views and a great diversity of wildflowers in the heathlands.

The ‘Corkwood Walk’ and ‘Scribbly Gum Walk’ at Station Creek passes through diverse coastal forest offering views and access to Station Creek.

The ‘Freshwater walking track’ links the camping area at Pebbly Beach to Freshwater Beach, and offers spectacular views of headlands and beaches.

The Angophora Grove walking track at Illaroo provides links to the walk-in camping area at Rocky Point; Minnie Water village and the camp ground water supply point.

Policies

- * Any proposal for a new walking track or for significant relocation of existing tracks will require public exhibition of an amendment to this plan of management. Routine maintenance and minor re-routing of existing walking tracks will not require amendment to this plan of management.
- * Bicycles are prohibited on walking tracks.
- * The use of horses, trail bikes and off-road vehicles are not permitted on walking tracks except where required for management purposes.

Actions

- The walking track system will be managed and maintained to provide opportunities for outdoor recreation and interpretation of the coastal environment and cultural sites.
- Signposting and interpretation of the walking track system will be reviewed and upgraded to indicate the appropriate use of tracks.
- Improvements to the walking access from Station Creek camping area to Pebbly Beach will be undertaken.
- Improvements to the walking access from Lake Arragan to Shelley Beach will be investigated and may be undertaken providing such works do not involve a significant relocation of route.

Other Recreational Facilities:

A canoe launching platform and short access track from the car park to platform is provided at Lake Arragan. This facility was established as a part of a project to rehabilitate the remains of a road previously used for sand mining and to provide a low key canoe launching site near a popular visitor precinct.

At Station Creek a small jetty and stairs near the camp ground is popular with canoeists, fishers and swimmers.

The cliff top lookout at Red Cliff offers a magnificent vantage point over the ocean with sweeping views south to Broom Head and north along the coastline. Basic facilities are provided including a short track, toilet, car park and safety barrier.

Actions

- Manage and maintain the Lake Arragan track and platform to provide safe and environmentally responsible access for non-powered watercraft.
- Manage and maintain the Station Creek jetty to provide safe and environmentally responsible access for water users.
- Manage and maintain the Red Cliff lookout.

4.3.3 Scientific Use

The planning area is an important scientific resource and has an established but limited history of scientific research and tertiary education.

The NPWS, however, has limited resources to undertake long term monitoring or research in the planning area and relies on work undertaken by outside institutions.

The need for research into park management issues has been identified in a number of sections of this plan. Research projects relying on field study sites require support from management in site protection.

Fauna and flora surveys have been carried out in Yuraygir National Park as part of a series of major biodiversity planning studies in North Eastern NSW. The data gathered is available for park management purposes on the NPWS GIS data system. All records of plants and animals throughout NSW are also collected and stored in the NSW Wildlife Atlas; a database established by the NPWS. Information about locality, habitat and breeding records of species is used to increase the knowledge of, and assist in, the management of native wildlife on and off park.

Policies

- * Research relating directly to natural and cultural resource management issues and recreational use will be encouraged.
- * Research priorities will be determined from those areas identified in this plan as requiring research.
- * All research will be subject to NPWS policy and procedures for the granting of permits, conduct of research and provision and dissemination of results.

Actions

- A prospectus will be prepared and updated as a guide to preferred research projects in the planning area. Preferred topics will be those of direct relevance to management and will include:
 - additional surveys of native animals;
 - habitat requirements of endangered and vulnerable plants and animals, such as the beach stone curlew and the plant *Olax angulata* have been recognised as a high priority;

- the fire history of the planning area;
- the ecological significance of fire in the planning area and its use in the conservation of native plants and animals;
- the ecology and hydrology of Minnie Water and Lake Hiawatha and the impact of water use for town water supplies on the lake ecology;
- the impact of proposals to restore the former drainage and water level of Lake Hiawatha;
- biological control of introduced plants;
- recordings of local Aboriginal and European oral history;
- surveys of Aboriginal sites and other places of significance; and
- surveys of visitor use and expectations in the planning area.

4.3.4 Management Operations

Management Trails:

In addition to the public access system described in section 4.3.2 there is a network of management trails in the planning area.

The primary purpose of the management trail system is fire management. The trails are used for fire suppression and as boundaries for hazard reduction burning and are only available for use by authorised vehicles.

Management trails also provide access for other essential management operations such as research and introduced plant and animal control and are used for walking and the riding of non-motorised bicycles.

A review of all management trails in the planning area south of the Woolli River will be undertaken with the objective of reducing or eliminating management trails in this area. This review will also include measures for reducing the impact of management use of the beaches. The Freshwater trail from Pebbly Beach to Freshwater Beach was closed to public access in 1999 to protect important wetlands and heath from degradation. This trail will remain closed to the public.

Gravel is required to maintain roads and trails in the planning area. Existing quarries within the planning area, near Brooms Head and another near Woolli (Faulkner's) may be required to provide gravel for future park management purposes.

Policies

- * The existing management trail system will be maintained in an environmentally stable condition and its use restricted to vehicles authorised by the Regional Manager.
- * New trails will be constructed only where necessary for fire control or other emergency operations. All new trails constructed for emergency operations will be closed and rehabilitated as soon as possible after each emergency unless retention of the trail is approved by the Director, Northern Directorate, for management purposes.

- * Management trails may be used without specific authorisation for walking and non-motorised bicycling.
- * Gravel extraction from quarries near Brooms Head and Wooli (Faulkner's) within Yuraygir National Park will be for park management purposes only.

Actions

- A review of all management trails in the planning area south of the Wooli River will be undertaken.
- Management plans for gravel extraction will be prepared for the Faulkner's Quarry and the park quarry near Brooms Head.

4.3.5 Non-Park Management Activities

A number of statutory authorities, corporations and individuals currently occupy or use the planning area for activities not directly associated with park management. These works, facilities and operations affect the natural and cultural features and recreational opportunities within the planning area. It is a requirement that all such works, facilities and operations be covered by a lease, licence or easement under the *National Parks and Wildlife Act* or other relevant legislation.

The fifteen huts at Sandon River (thirteen are on the north side of the river and two on the south side) are privately occupied but the land on which the huts exist is national park. In 1983 the original permissive occupancies were terminated by the Lands Department at the time of dedication of the land as an addition to Yuraygir National Park. Occupancy of the huts is not covered by any lease or licence arrangement. The occupiers pay no fees for residing on Yuraygir National Park or for the services provided. Huts need to meet appropriate for health, safety, building and occupation standards, thereby minimising the risk to NPWS and occupants. Given the proximity to the Sandon River it is important that waste management systems associated with the huts meet acceptable standards.

Policies

- * All activities undertaken within the planning area by other authorities and organisations will be licensed under the *National Parks and Wildlife Act*.
- * It is a long term aim of the NPWS to reduce, and if possible eliminate, the number of inappropriate power lines and other utilities (including roads used for their maintenance) that do not serve the planning area. These facilities within the planning area need to be held under lease or licence. To this end such occupancies will be kept under regular review and where warranted, the facility, including associated roads, will be relocated and/or closed and the site rehabilitated.
- * Non-park uses shall be managed in accordance with the principles and objectives of this plan of management and the conditions specified on the licence, agreement or lease.
- * Proposals for the occupation of areas within the planning area for purposes inconsistent with the *National Parks and Wildlife Act* or this plan of management will be opposed by the NPWS.
- * No additional licences or easements will be permitted except by the Minister's approval to an amendment to this plan.

Actions

- A register of all non-park uses and facilities will be maintained and all unlicensed non-park uses and facilities identified.
- Review the occupation and management arrangements of the Sandon huts and develop a process to address these issues into the future.
- Identify and resolve legal implications of hut occupation on national park and ensure compliance with relevant health, safety, environmental and building standards.
- Negotiate licences, leases or agreements to cover unlicensed activities, facilities or operations.

Solitary Islands Marine Park:

A Solitary Islands Marine Reserve was gazetted in 1991 and was managed by NSW Fisheries to conserve one of the most outstanding aquatic environments in the State. The reserve encompassed the coastline between Coffs Harbour and the Sandon River, and is contiguous with extensive areas of Yuraygir National Park.

It included all estuaries within its boundaries, secluded beaches, headlands and rock platforms. Most of the estuaries are still in a relatively natural state due to the catchment protection afforded by the planning area.

The Government established the Solitary Islands Marine Park in 1998 over the same area as the former marine reserve. The Marine Parks Authority, oversees the management of the marine park

A zoning plan for the management of the Solitary Islands Marine Park has been adopted following four years of community consultation.

The boundary between the marine and national park is mean high water mark.

Policy

- * The NPWS will maintain liaison with the Marine Park Authority in the integration of management of the Solitary Islands Marine Park with that of the adjoining planning area.

Past Mining Activities:

Mineral sands mining was carried out intermittently for almost half a century and has had a significant impact on the planning area.

In June 1977, following protracted controversy, the then Government revised the policy on coastal mineral sands mining. The granting of new mining approvals in existing and proposed national parks ceased. This has led to the phasing out of the industry as established leases expired. Mining ceased in Yuraygir National Park in 1979.

Mining impacts extended beyond the immediate areas of mining because of the linear nature of ore bodies and the associated mining infrastructure, including roads, plant sites and drains. Primary restoration of mined and disturbed areas is almost completed. Because of the long history of mining the standard of restoration varies throughout the planning area.

There is a continuing requirement to protect the mined areas against weed invasion, damage from fire and unregulated visitor use. Refer to sections 4.1.1 (Landforms, Geology, Soils and Hydrology) and 4.1.3 (Introduced Plants and Animals) for appropriate policies and actions.

Commercial Fishing:

Commercial fishing is an activity regulated by NSW Fisheries, under the *Fisheries Management Act 1994*. Within the Solitary Islands Marine Park, commercial fishing is also regulated by the *Marine Parks Act 1997* and the *Marine Parks Amendment (Solitary Islands) Regulation 2002* and the associated zoning provisions.

Commercial netting is prohibited within Lake Arragan, Station Creek and the Wooli, Sandon and Corindi Rivers.

Oyster growing is permitted within special use zones in the Sandon and Wooli rivers.

Beach netting has been a commercial activity from beaches adjacent to the planning area between Brooms Head and the Sandon River. Limited opportunistic netting of beaches adjacent to the planning area south of Sandon River occurs from time to time between July and August.

Policies

- * Access to planning area for the purpose of commercial fishing activities will continue pursuant to the NPWS legislative and policy framework.
- * Subject to compliance with the National Parks & Wildlife Act 1974, and the National Parks & Wildlife Regulation 2002, access will continue to be provided for commercial fishing activities on the planning area's vehicle-accessible beaches.

5 PLAN IMPLEMENTATION

This plan of management is part of the system of management developed by the NPWS. The system includes the *National Parks and Wildlife Act*, the NPWS Corporate Plan, management policies and established conservation and recreational philosophy. It also includes regional and district strategic planning.

The orderly implementation of this plan of management will be undertaken within the annual program of the NPWS North Coast Region. Priorities will be determined during the development of these programs and will be subject to regional priorities and to funding, staff and special requirements of the Minister or Director-General.

Region programs are subject to on-going review within which works and any other activities carried out in the planning area will be evaluated in relation to objectives laid down in this plan.

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

In accordance with Section 81 of the *National Parks and Wildlife Act*, this plan shall be carried out and given effect to by the Director-General and no operations shall be undertaken in relation to the area unless those operations are in accordance with this plan. If after adequate investigation, operations not included in the plan are found to be justified, this plan may be amended in accordance with Section 73B of the Act.

Other lands may be added to the park during the currency of this plan. Such lands will be managed in accordance with the objectives and policies of this plan.

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

ACTION (Summary – refer to body of plan for full wording of actions)	PRIORITY	SECTION
Liaise with, and maintain, a cooperative approach with local government and other government authorities to manage and maintain the natural setting of the catchment and waterways ...	High	4.1.1
Past mineral sands mining restoration works will be monitored and where necessary further maintenance and protection ... undertaken.	Low	4.1.1
Existing pit toilets will be replaced with toilets using modern non-polluting technologies.	High	4.1.1
A priority list for research and monitoring for rare and endangered and other significant species will be established.	Medium	4.1.2
A systematic inventory of the fire ecology of plant and animal species will be established and results utilised to modify fire management prescriptions.	Medium	4.1.2
Cooperative programs for the protection of important wildlife habitats and threatened species ... will be identified and initiated.	High	4.1.2
Programs for the protection of the little tern colonies ... and the coastal emu population will continue with the assistance of community groups.	High	4.1.2

ACTION (continued) (Summary – refer to body of plan for full wording of actions)	PRIORITY	SECTION
A Pest Species Management Plan will be prepared...	High	4.1.3
The program of introduced plant and animal control will continue ... with emphasis on the bush regeneration approach integrating weed control with native vegetation restoration.	High	4.1.3
The “Sandon to Wooli Community Nursery” facility at Minnie Water will continue to be supported and utilised in native vegetation restoration programs.	High	4.1.3
Continue to support local Landcare, Dunecare and other volunteer groups ... External funding opportunities ... will continue to be pursued.	High	4.1.3
Continue the dingo awareness campaign targeting park visitors and residents of coastal villages ...	High	4.1.3
Maintain databases of wild dog activity to provide information for strategic targeted programs.	Medium	4.1.3
An ongoing large-scale fox control program for the planning area will be conducted ...	High	4.1.3
Feral pig control will be carried out ...	Medium	4.1.3
A wild dog management plan for the planning area and adjoining lands will be prepared ...	Medium	4.1.3
Continue research into the genetic purity of dingoes in the planning area.	Low	4.1.3
Appropriate action, including culling, will be undertaken with dogs displaying aggressive and habituated behaviour ...	High	4.1.3
Conduct regular cane toad distribution surveys during summer months. Community involvement in the annual “Cane Toad Roundup” will be maintained. A community education campaign ... will continue.	High	4.1.3
Cattle and horses present within the planning area will be removed.	High	4.1.3
The abundance and distribution of introduced plant and animal species will continue to be monitored and mapped where possible.	High	4.1.3
Fire management strategies will be finalised for the planning area during 2004.	High	4.1.4
Continue to seek assistance and employ methods to reduce and, if possible, eliminate the incidence of arson within the planning area.	High	4.1.4
Continue to participate as a member of the local Bush Fire Management Committee and actively contribute to preparing fire and fuel management plans.	High	4.1.4
Liaise with the RFS and local Aboriginal communities to ensure local Aboriginal communities are involved in the development of fire management strategies ... to protect cultural heritage values.	High	4.1.4
Maintain all fire management trails and restrict usage to authorised vehicles only.	High	4.1.4
Coordinate fire hazard reduction by burning or mechanical means (as determined by an annual hazard/risk assessment) in village hazard reduction zones and other strategic areas.	High	4.1.4
Liaise with councils, other land use authorities and neighbouring landholders to maintain quick response and cooperative fire management arrangements.	High	4.1.4

ACTION (continued) (Summary – refer to body of plan for full wording of actions)	PRIORITY	SECTION
Encourage research into the effects of fire regimes on plant and animal communities ...	Medium	4.1.4
Maintain records of fire occurrence with particular emphasis on mapping and recording of the area, frequency, seasonality and intensity of fire.	High	4.1.4
Protect significant natural and cultural heritage sites from fire.	High	4.1.4
Cultural heritage assessments will be prepared ... in consultation with local Aboriginal communities.	High	4.2.1
Collaborate with relevant Aboriginal stakeholders about the interpretation of Aboriginal cultural heritage.	High	4.2.1
Actively encourage Aboriginal people to take part in park management ... to develop and implement management works and provide opportunities for employment of local Aboriginal people wherever possible.	High	4.2.1
Investigate the need for, and support from, Aboriginal communities to establish further consultative forums for the planning area.	High	4.2.1
Undertake further investigation of the post-European history of the planning area.	Low	4.2.2
Sites and places of historic value will be researched and recorded, and where appropriate, protected and interpreted.	Low	4.2.2
Develop and implement conservation plans to protect, and where appropriate interpret, Slovenski's Statue and Buchanan's Hut.	Medium	4.2.2
Undertake a cultural heritage assessment of the Sandon huts located within Yuraygir National Park	Medium	4.2.2
Encourage the involvement of local historians and interested members of the community in the identification and assessment of historic items ...	Medium	4.2.2
An interpretation strategy will be prepared for the planning area.	Medium	4.3.1
Interpretive information will continue to be provided at facilities and in association with walking tracks to promote understanding and enjoyment of natural and cultural features.	Medium	4.3.1
Interpretation signs and displays along selected walking tracks will be maintained and upgraded where necessary.	Medium	4.3.1
Interpretation facilities within villages adjacent to the planning area and within local tourist centres will be maintained and upgraded where possible.	Medium	4.3.1
Promote awareness of NPWS fire management programs to community groups and neighbours ...	Medium	4.3.1
Guided educational activities will be conducted during peak visitor periods.	Medium	4.3.1
The program of monitoring visitor use of the planning area will be maintained and used to assist in park planning and management.	Medium	4.3.2
The impacts of visitor use will be monitored and where necessary, measures will be taken to protect natural and cultural features.	High	4.3.2
Maintain, and if necessary, upgrade the park road system.	High	4.3.2

ACTION (continued) (Summary – refer to body of plan for full wording of actions)	PRIORITY	SECTION
The Sandon 'backtrack' will be gated and keyed access restricted to Sandon Village residents.	High	4.3.2
Park roads may be temporarily closed during periods of excessive and prolonged wet weather to protect environmental values, ensure public safety and prevent road damage.	High	4.3.2
Recreational use of camping and picnicking areas will be monitored. Where such use is causing unacceptable environmental impact or unacceptable conflict with other visitors to the planning area, it may be modified, restricted or prohibited.	High	4.3.2
The main access onto Station Creek Beach and Pebbly Beach will be formalised and vehicle access off this trail will not be permitted.	High	4.3.2
Vehicle-based camping and picnicking will be permitted at Pebbly Beach. The area available for camping and picnicking will not exceed its current extent. The day use/camping area at Pebbly Beach will be defined by signage, barriers and vegetation and/or a ceiling placed on visitor numbers ... Visitor facilities may be redesigned to meet both physical and environmental site constraints.	High	4.3.2
A precinct plan will be prepared for the Pebbly Beach Camping Area that examines ... options for managing visitor numbers, including the introduction of a booking system and a reduction in the current area available for camping and vehicle movements.	High	4.3.2
The proposed precinct plan for Pebbly Beach will also designate areas for day use within the precinct.	High	4.3.2
Actions arising from the proposed precinct plan ... may be implemented ... to protect park values or visitor safety.	High	4.3.2
Measures will be implemented to protect significant stands of horse-tailed oak, shorebird habitat and the dune systems.	High	4.3.2
Increased law enforcement will be supported by signage to ensure the protection of significant habitat and sensitive dune areas.	High	4.3.2
Vehicular access to Illaroo Camping Area will be redirected from the present access to an upgrading of the existing fire trail to the west of Minnie Water village through Yuraygir National Park subject to appropriate environmental and cultural assessment.	Medium	4.3.2
Vehicular access to the Sandon-Illaroo Beach will be redirected via an access trail to the north of the present camping area and onto the beach subject to appropriate environmental and cultural assessment.	Medium	4.3.2
Subject to appropriate environmental and cultural heritage assessment, an additional northern camping node specifically for group camping may be constructed at Illaroo camping area if demand for the additional capacity can be demonstrated.	Medium	4.3.2
Shelley Beach walk-in campsite will be a fuel stove only area and campfires will not be permitted.	High	4.3.2

ACTION (continued) (Summary – refer to body of plan for full wording of actions)	PRIORITY	SECTION
The impact of vehicles on beaches approved for vehicular use will be monitored.	Medium	4.3.2
The access trail to Minnie Water Back Beach will be maintained as a management trail and access for emergency vehicles but public vehicle access will not be permitted.	High	4.3.2
Actively discourage vehicles from using the section of Sandon Beach adjacent to the Illaroo Camping Ground south of the beach access point.	Medium	4.3.2
Seek to incorporate the inter-tidal zone into the park where it adjoins the planning area.	Medium	4.3.2
Develop and implement a 4WD beach driving education, information and signage strategy.	Medium	4.3.2
The walking track system will be managed and maintained to provide opportunities for outdoor recreation and interpretation of the coastal environment and cultural sites.	Medium	4.3.2
Signposting and interpretation of the walking track system will be reviewed and upgraded to indicate the appropriate use of tracks.	Low	4.3.2
Improvements to the walking access from Station Creek Camping Area to Pebbly Beach will be undertaken.	Low	4.3.2
Improvements to the walking access from Lake Arragan to Shelley Beach will be investigated and may be undertaken ...	Low	4.3.2
Manage and maintain the Lake Arragan track and platform to provide safe and environmentally responsible access for non-powered watercraft.	Medium	4.3.2
Manage and maintain the Station Creek jetty to provide safe and environmentally responsible access for water users.	Medium	4.3.2
Manage and maintain the Red Cliff lookout.	Medium	4.3.2
A prospectus will be prepared and updated as a guide to preferred research projects ...	High	4.3.3
A review of all management trails in the planning area south of the Wooli River will be undertaken.	Medium	4.3.4
Management plans for gravel extraction will be prepared for the Faulkner's Quarry and the park quarry near Brooms Head.	Medium	4.3.4
A register of all non-park uses and facilities will be maintained and all unlicensed non-park uses and facilities identified.	Medium	4.3.5
Review the occupation and management arrangements of the Sandon huts and develop a process to address these issues into the future.	High	4.3.5
Identify and resolve legal implications of hut occupation on national park and ensure compliance with relevant health, safety, environmental and building standards.	High	4.3.5
Negotiate licences, leases or agreements to cover unlicensed activities, facilities or operations.	Medium	4.3.5

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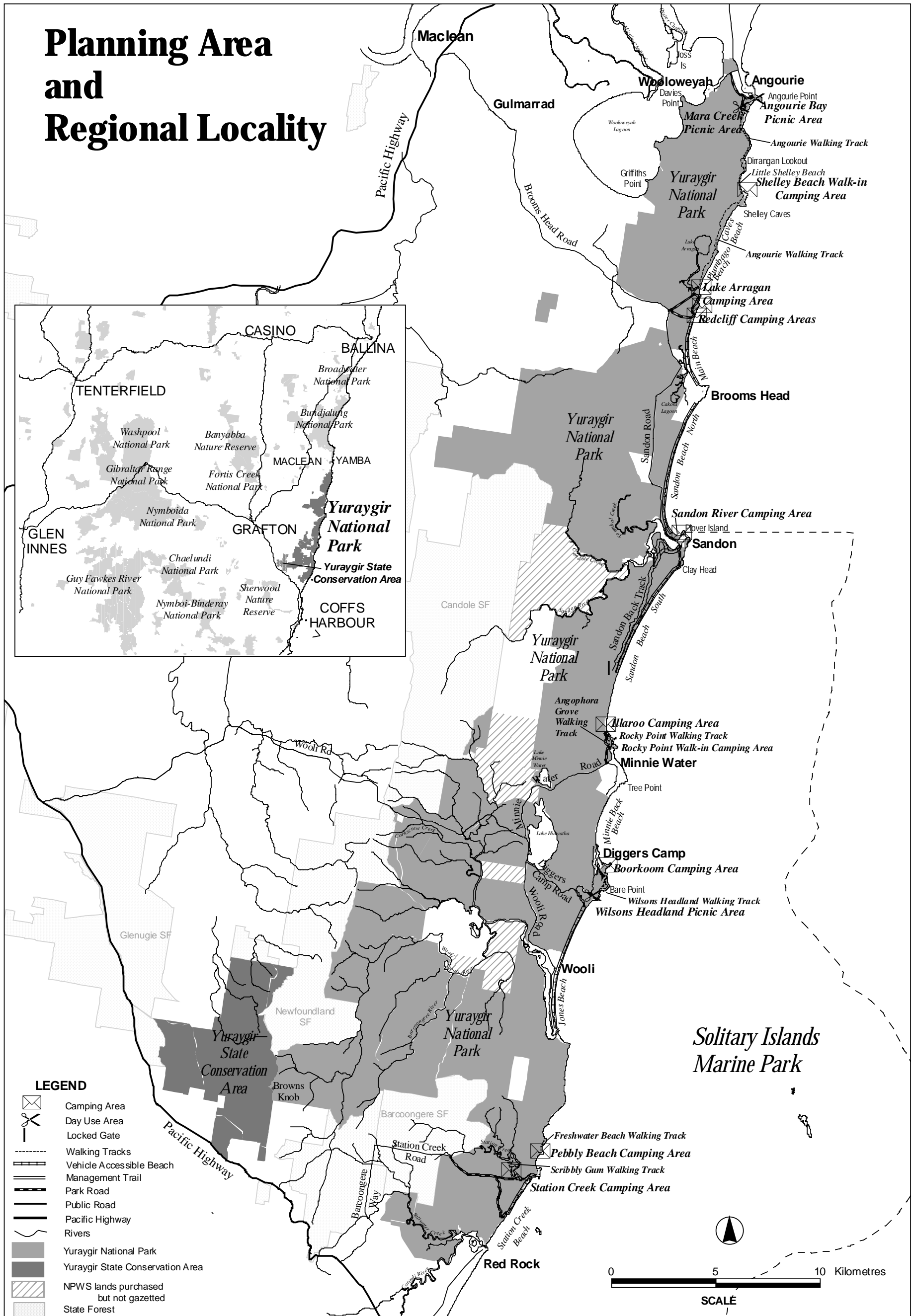
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Planning Area and Regional Locality



Map 1: Yuraygir National Park and State Conservation Area and Regional Setting