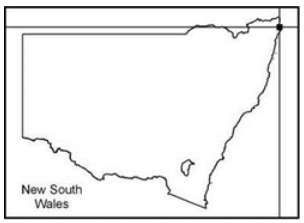
NSW NATIONAL PARKS & WILDLIFE SERVICE

Ti Tree Lake Aboriginal Area

Plan of Management



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This plan of management was adopted by the Minister for Energy and Environment on 3 April 2020.

Acknowledgments: Ti Tree Lake Aboriginal Area is in the traditional Country of the Bundjalung of Byron Bay (Arakwal) People, is of significance to the Bundjalung Nation and particularly to women.

This plan of management was prepared by staff of NSW National Parks and Wildlife Service (NPWS).

For additional information or any inquiries about Ti Tree Lake Aboriginal Area or this plan of management, contact the NPWS Byron Coast Area Office at Tallow Beach Road, Byron Bay or by telephone on (02) 6620 9300.

Cover photo: Broad-leaved paperbark (*Melaleuca quinquenervia*) in a swamp sclerophyll forest, Ti Tree Lake Aboriginal Area. D Mackey/DPIE
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1. Ti Tree Lake Aboriginal Area

1.1 Location, reservation and regional context

Features	Description
Location	Ti-Tree Lake Aboriginal Area (referred to as 'Ti Tree Lake Aboriginal Area' or 'the park' in this plan) is located six kilometres south of Byron Bay on the coastal sand plain between the villages of Suffolk Park and Broken Head, on the NSW Far North Coast (see Figure 1).
Area	The park is 10.5 hectares. It is located in the lower catchment of Ti Tree (Taylors) Lake, an intermittently closed and open lake or lagoon (ICOLL) (see Figure 2).
Reservation date	The park was reserved on 2 June 2010.
Previous tenure	Previously owned by Byron Shire Council, the park was reserved to protect its significant Aboriginal cultural heritage values. The park also supports significant native vegetation communities and native animal habitat. An Aboriginal place, Ti Tree (Taylors) Lake Aboriginal Place, was declared over 70 hectares of land on 22 September 2000, including land now forming the park (see Figure 3). Aboriginal places recognise and protect the special cultural significance of certain areas to Aboriginal people.
Regional context	
Biogeographic region	The park is located in the South Eastern Queensland biogeographic region. The park's plant communities complement a suite of wallum plant communities on the NSW Far North Coast protected within Broadwater, Bundjalung and Yuraygir national parks. The term 'wallum' refers to the vegetation of coastal dunes, beach ridge plains and backbarrier flats of southern Queensland and northern New South Wales (Griffith et al. 2003).
Surrounding land use	The northern boundary of Broken Head Nature Reserve is 650 metres south of the park. Land to the north-west and south supports high conservation value vegetation, partly owned by Byron Shire Council and partly privately owned. Residential areas occur north and east of the park. A quarry is located south-west of the park. Taylors Lake Road borders the park's western boundary. The quarry is zoned Primary Production, a firebreak south of Suffolk Park is zoned Rural Landscape and the village of Suffolk Park is zoned Low Density Residential in the *Byron Local Environmental Plan 2014* (LEP). Bushland north of the park is zoned Investigation and Residential and the park and other adjacent land is zoned Wetlands, Coastal Habitat and Coastal Lands in the 1988 LEP.
Other authorities	The park is in the Country of the Bundjalung Nation and is located within the areas of the Arakwal, the Jali Local Aboriginal Land Council, North Coast Local Land Services and Byron Shire Council.

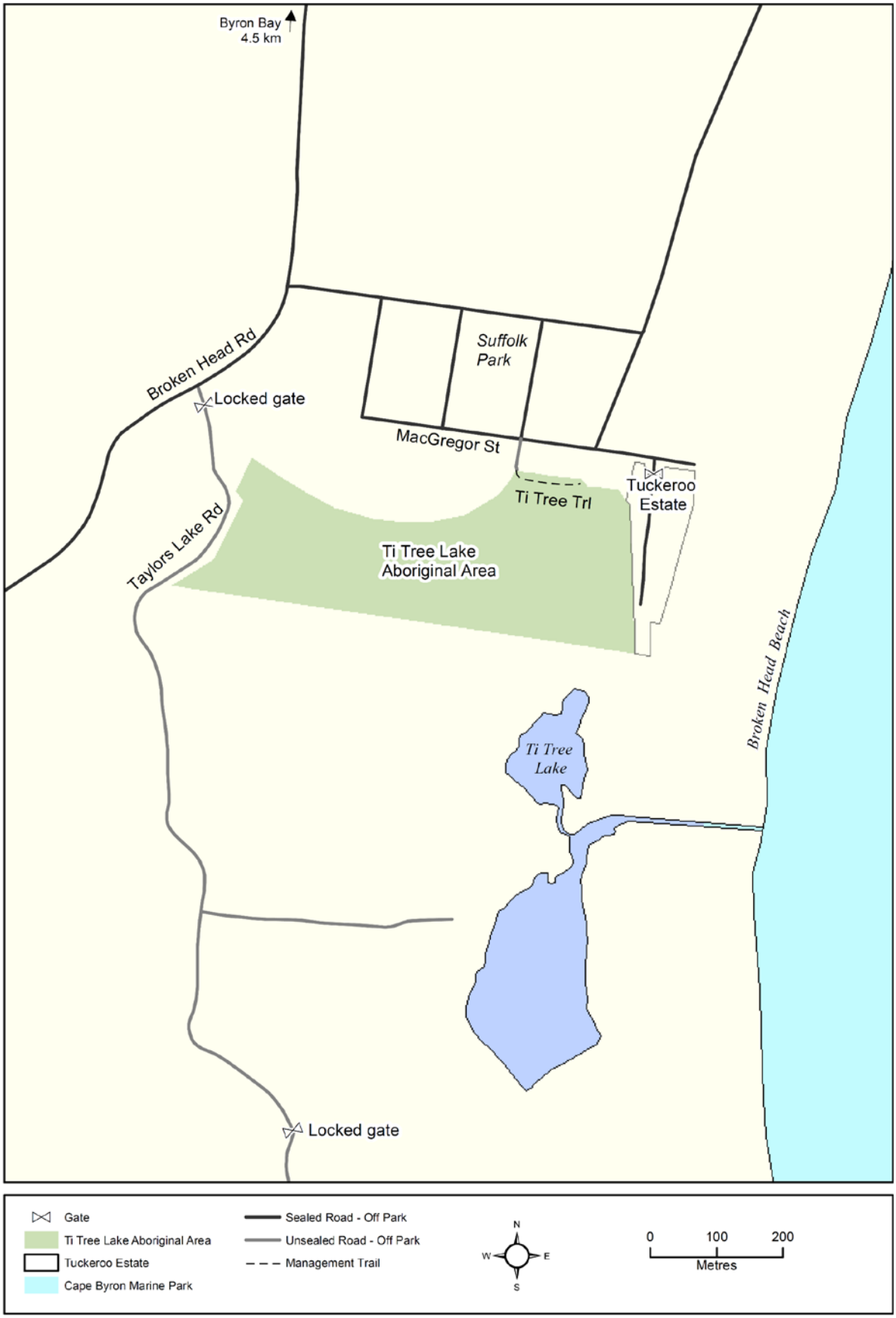

Figure 2 Ti Tree Lake Aboriginal Area2.

2. Legal rules

2.1 Government laws and National Parks and Wildlife policies

The management of Aboriginal areas in New South Wales is in the context of the legislative and policy framework of the NSW National Parks and Wildlife Service (NPWS) – primarily the *National Parks and Wildlife Act 1974* and Regulation, the *Biodiversity Conservation Act 2016* and NPWS policies.

Other legislation, strategies and international agreements may also apply. In particular, the *Environmental Planning and Assessment Act 1979* may require assessment of environmental impact of works proposed in this plan. The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* may apply in relation to actions that impact matters of national environmental significance, such as migratory and threatened species and ecological communities listed under that Act. The NSW *Heritage Act 1977* may apply to excavation in known archaeological sites or in sites with potential to contain archaeological relics.

A plan of management is a statutory document under the National Parks and Wildlife Act. Once the Minister has adopted a plan, the plan must be carried out and no operations may be undertaken in the park unless they are in accordance with the plan. This plan will also apply to any future additions to the park. Should management strategies or works be proposed in future that are not consistent with this plan, an amendment to the plan will be required.

2.2 Management principles for Aboriginal areas in New South Wales

Aboriginal areas are reserved under the National Parks and Wildlife Act to protect and conserve areas associated with a person, event or historical theme, or containing a building, place, feature or landscape of natural or cultural significance to Aboriginal people, or of importance in improving public understanding of Aboriginal culture and its development and transitions.

Under section 30K of the National Parks and Wildlife Act, Aboriginal areas are managed to:

- conserve natural values, buildings, places, objects, features and landscapes of cultural value to Aboriginal people in accordance with the cultural values of the Aboriginal people to whose heritage the buildings, places, objects, features or landscapes belong
- conserve natural and other cultural values
- allow use of the Aboriginal area by Aboriginal people for cultural purposes
- promote public appreciation and understanding of the area's natural and cultural values and significance where appropriate
- provide for appropriate research and monitoring, in accordance with the cultural values of the Aboriginal people
- provide for sustainable visitor or tourist use and enjoyment that is compatible with the Aboriginal area's natural and cultural values and the cultural values of the Aboriginal people

- provide for sustainable use (including adaptive re-use) of any buildings or structures or modified natural areas having regard to the Aboriginal area's natural and cultural values and the cultural values of the Aboriginal people.

Aboriginal areas are places that have been identified as having special significance to Aboriginal people. The primary purpose of Aboriginal areas is the conservation of Aboriginal heritage.

2.3 Ti Tree (Taylors) Lake Aboriginal Place

In the 1990s, Arakwal women Elders and the Jali Local Aboriginal Land Council requested that the Ti Tree Lake and a surrounding buffer zone be declared an Aboriginal place under the National Parks and Wildlife Act. Seventy hectares of land centred on the lake, including land that now forms the park, was declared as Ti Tree (Taylors) Lake Aboriginal Place on 22 September 2000 (see Figure 3). An Aboriginal place is an area of special significance to Aboriginal culture. Declaration provides recognition of the significance of the area and its heritage values, which relate to traditions, observances, customs, beliefs or history of Aboriginal people. The Aboriginal place is of particular significance to women and is an acknowledged mythological site. In recognition of the cultural sensitivity of this area, no additional information is publicly available.

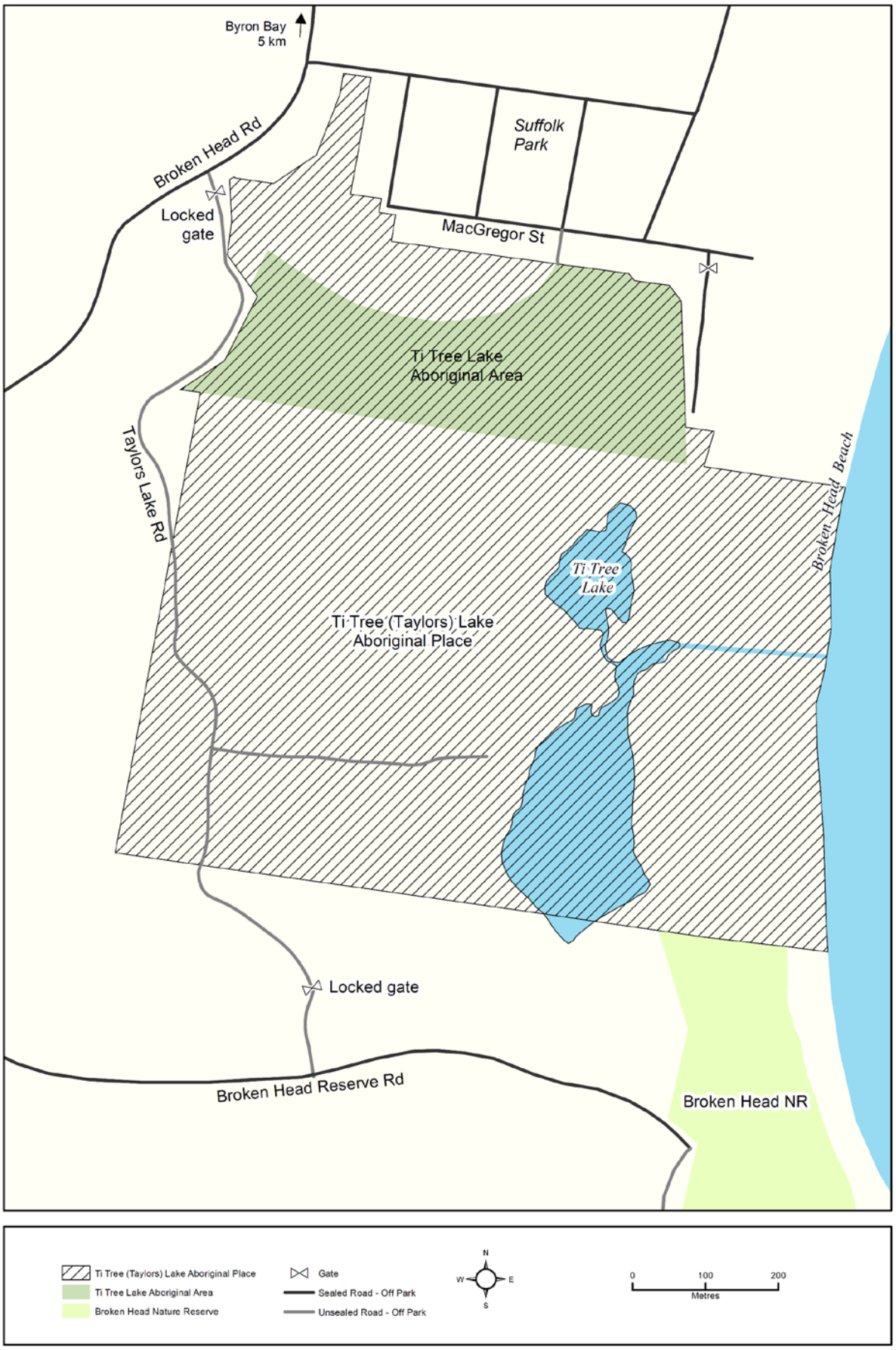

Figure 3 Ti Tree (Taylors) Lake Aboriginal Place

3. The importance and management of Ti Tree Lake Aboriginal Area

3.1 Respecting Country – key values associated with the park

The park has many values that are important to Bundjalung People, including:

'Looking after Country' – park conservation and management

- The park protects Country and provides for Bundjalung People to continue their connection to Country through their cultural aspirations and obligations.
- The park protects cultural heritage values, including special places and related cultural stories of Bundjalung People.
- The park protects a regional wildlife corridor, wetlands, heaths, eucalypt and swamp forest and littoral rainforest. The park supports an endangered ecological community and is likely to support threatened species and their habitats.

'Using and knowing about Country' – use of the park, information, research and monitoring

- The park provides Bundjalung People with opportunities for maintaining culture, including for cultural renewal associated with the sustainable use of wild resources; the transfer of cultural knowledge, customs and stories; and ceremonial and other cultural practices.
- Opportunities for visitors and the wider Byron Bay community to understand and respect the culture and heritage of the Bundjalung People in relation to the park will be provided off site.
- The park provides off-site environmental education opportunities relating to Aboriginal cultural values, coastal processes, threatened ecological communities and threatened species.
- The park provides opportunities for appropriate research and monitoring.

4. Looking after Country

4.1 The story of Country that is now the park

A living ancestry and culture

The park lies within the Country of the Bundjalung Nation who traditionally occupied the area between the Clarence and Logan rivers. The Arakwal are part of the Bundjalung Nation and are recognised as the descendants of Indigenous people who lived and/or held native title in the Byron Bay area at the time of first contact with European settlers in the 1820s and 1830s. The Arakwal and other Bundjalung People have a long and ongoing cultural association with the landscape around Byron Bay, including the park. Research into the Bundjalung lands of south-east Queensland indicates they have occupied that Country for at least 22,000 years (Neal & Stock 1986).

The land, water, plants and animals within a landscape are central to Aboriginal spirituality and contribute to Aboriginal identity. Aboriginal communities associate natural resources with the use and enjoyment of foods and medicines, caring for the land, passing on cultural knowledge, kinship systems and strengthening social bonds. Aboriginal heritage and connection to nature are inseparable and need to be managed in an integrated manner across the landscape.

Ti Tree (Taylors) Lake and the surrounding area, including the park, form a cultural landscape of particular significance to Bundjalung women. In recognition of the cultural sensitivity of the area, no additional information regarding its Aboriginal cultural heritage values is publicly available. The area is a declared Aboriginal place under the National Parks and Wildlife Act (see Section 2.3).

Aboriginal sites are places with evidence of Aboriginal occupation or that are related to other aspects of Aboriginal culture. They are important as evidence of Aboriginal history and as part of the culture of local Aboriginal people. Collins (1990) surveyed a small section of the land which now forms the park as part of a European and Aboriginal heritage study of the Broken Head area. No Aboriginal sites exhibiting physical evidence of Aboriginal occupation were located, however, the cultural heritage significance of the lake was documented.

The lake, surrounding (former) Crown land and the land which now forms the park are the subject of an Indigenous land use agreement (ILUA) under the Commonwealth *Native Title Act 1993.* This agreement, between the NSW Government and the Bundjalung of Byron Bay (Arakwal) People, was registered in 2008 and is identified as the Ti Tree Lake (Taylors Lake) Indigenous Land Use Agreement (ILUA 3). The terms of the agreement provided for reservation of the lake and surrounding area under the National Parks and Wildlife Act, establishment of a committee of Aboriginal women to advise NPWS on management of the area and preparation of a plan of management. The Crown land which forms the majority of the ILUA 3 lands was also claimed by the Jali Local Aboriginal Land Council under the NSW *Aboriginal Land Rights Act 1983*. The land claim was granted and as a result, the ILUA cannot proceed as envisaged.

A Native Title consent determination, which includes Ti Tree Lake Aboriginal Area, was granted by the Federal Court in 2019. In accordance with this, a new ILUA (Cavanbah (Byron Bay) Arakwal Indigenous Land Use Agreement) was registered.

While the NSW Government has legal responsibility for the protection of Aboriginal sites and places, NPWS acknowledges the right of Aboriginal people to make decisions about their own heritage. Aboriginal communities will be consulted and involved in managing Aboriginal

sites, places and related issues, and in promoting and presenting Aboriginal culture and history.

An ethnobotanical study has been undertaken with the Arakwal to document culturally valued plants within Byron coastal parks and reserves (Low et al. 2003a). Appendix A lists some culturally valuable plants known from the park.

NPWS supports non-commercial cultural use of wild resources by the Aboriginal community, such as gathering of medicinal plants and bush tucker, subject to NPWS policies and licensing.

Story of land use

The 1906 (Edition 7) parish map shows the land which now forms the park included in a conditional purchase by Frederick D Nixon. Prior to this, the land had not been selected. The land was acquired by FL Suffolk in the 1920s and the village of Suffolk Park is named after this family. By 1928 the road to Broken Head which adjoins the western boundary of the park had been constructed by Mr David Taylor to provide access to his farm located south of the lake (Collins 1990). The Taylor family's association with this area is acknowledged in one of the local names for the lake – Taylors Lake – and in the name of the Aboriginal place. A 1958 aerial photograph (see Photo 1) shows little disturbance to the land that now forms the park other than a track bisecting the north-west corner and connecting the early subdivision at Suffolk Park with the road to Broken Head.

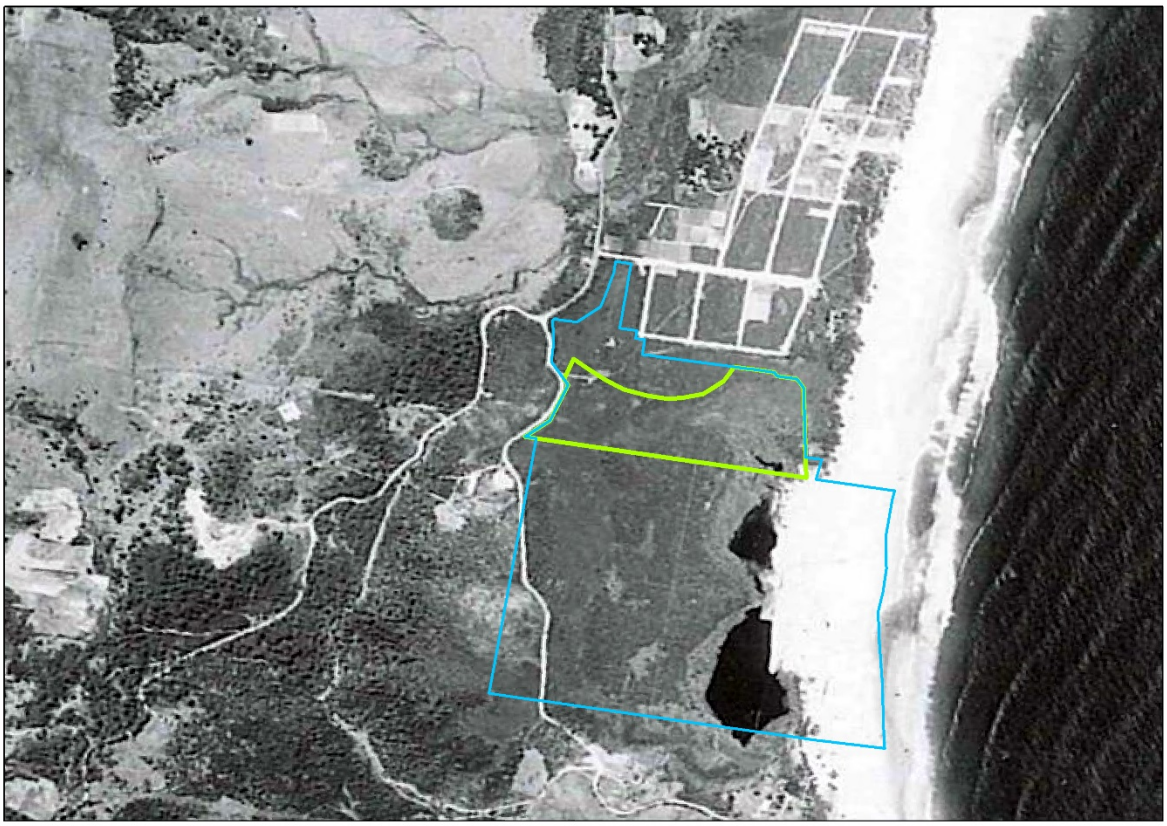

Photo 1 A 1958 aerial photograph showing the Suffolk Park subdivision and the land which now forms the park (green border) and the Aboriginal place (blue border). Source: Land & Property Information.

The land was later acquired by Eric Freeman who developed Tuckeroo Estate, a small residential development east of the park. The development consent for Tuckeroo Estate included provision for the remaining undeveloped land to be dedicated to Byron Shire Council. In 2007, Council resolved to transfer part of the remaining undeveloped land to the

Minister for the Environment for reservation under the National Parks and Wildlife Act in recognition of its important cultural and natural heritage values. Transfer of council's land to NPWS was also proposed in ILUA 3.

Desired outcomes

- Manage the park to protect its Aboriginal cultural heritage and biodiversity values.
- Involve the Aboriginal community in efforts to conserve and protect the park's cultural heritage and biodiversity values and incorporate Aboriginal knowledge, insights and values in these efforts.

Management response

4.1.1 Record the location of any Aboriginal and non-Aboriginal heritage sites in the park.

4.2 Native plants and animals

Native plants

Although small, the park supports a wide diversity of vegetation classes including littoral rainforest, coastal swamp forest, coastal dune dry sclerophyll forest, coastal heath swamps and wallum sand heaths. The park supports the endangered ecological community (EEC) Littoral Rainforest in the NSW North Coast, Sydney Basin and South East Corner Bioregions (see Photo 2), listed under the Biodiversity Conservation Act.

Littoral rainforest is also listed under the Environment Protection and Biodiversity Conservation Act as a critically endangered ecological community: Littoral Rainforest and Coastal Vine Thickets of Eastern Australia.

Photo 2 Littoral rainforest growing on a hind dune in the east of the park.

The park complements a suite of wallum plant communities on the NSW Far North Coast which are protected within Broadwater, Bundjalung and Yuraygir national parks. Wallum

plant communities occur on dunefields, beach ridge plains and backbarrier flats of southern Queensland and northern New South Wales on low-nutrient, acidic soils often with impeded drainage (Griffith et al. 2003).

Dunes in the east of the park support brush box (*Lophostemon confertus*) forest, coast banksia (*Banksia integrifolia*) forest and patches of littoral rainforest dominated by tuckeroo (*Cupaniopsis anacardioides*), three-veined laurel (*Cryptocarya triplinervis*) and lilly pilly (*Acmena smithii*). Low-lying areas support swamp sclerophyll forest dominated by broad-leaved paperbark (*Melaleuca quinquenervia*) with occasional swamp oak (*Casuarina glauca*), blueberry ash (*Elaeocarpus reticulatus*) and beach acronychia (*Acronychia imperforata*). Swamp sclerophyll forest intergrades with littoral rainforest at lower elevations on the hind dunes.

Although they are floristically similar, the swamp sclerophyll forests of the park are located on aeolian, rather than alluvial, soils and are therefore not considered part of the listed endangered ecological community Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions.

Drainage lines in the east of the park support common reed (*Phragmites australis*) and the sedge *Cladium procerum*. Cladium is regarded as regionally rare with a sporadic distribution (Sheringham et al. 2008). Red-fruit saw-sedge (*Gahnia sieberiana*) and pouched coral fern (*Gleichenia dicarpa*) dominate drainage lines in the central and western parts of the park (see Photo 3).

Central and western areas also support dry and wet heaths dominated by *Banksia* spp. and *Leptospermum* spp. and dry sclerophyll forests dominated by scribbly gum (*Eucalyptus signata*), pink bloodwood (*Corymbia intermedia*), red bloodwood (*C. gummifera*) and turpentine (*Syncarpia glomulifera*) (see Photo 4).

Photo 3 Drainage line supporting red-fruit saw-sedge and pouched coral fern.

Photo 4 Bloodwood-dominated dry sclerophyll forest in the west of the park.

The following vegetation communities (OEH 2012a) have been identified from initial analysis of aerial photography of the park (P Sheringham [OEH] 2013, pers. comm.):

- Broad-leaved Paperbark (*Melaleuca quinquenervia*) Swamp Sclerophyll Forest with Rainforest Elements on Coastal Floodplains North of the Richmond River, South Eastern Queensland Bioregion (Community 27)
- Red-fruited Saw-sedge (*Gahnia sieberiana*) – Olive Tea-tree (*Leptospermum liversidgei*) Fernland and Sedgeland of Sandy Coastal Floodplains and Adjacent Foothills, South Eastern Queensland Bioregion (Community 82)
- Knotted Scale-rush (*Sporadanthus interruptus*) – Spear Grasstree (*Xanthorrhoea fulva*) Wet Heathland of North Coast Wallum Swales, South Eastern Queensland Bioregion and NSW North Coast Bioregion (Community 88)
- Wallum Banksia (*Banksia aemula*) – Prickly Moses (*Acacia ulicifolia*) – *Caustis recurvata* Dry Heathland on Coastal Sands, South Eastern Queensland Bioregion and NSW North Coast Bioregion (Community 121)
- Scribbly Gum (*Eucalyptus signata*) – Bloodwood (*Corymbia* spp.) Heathy Open Forest on Poorly Drained Sandy Soils, South Eastern Queensland Bioregion and North East Parts of the NSW North Coast Bioregion (Community 194).

Landmark et al. (1999) mapped vegetation associations in the park, noting that the scribbly gum – bloodwood vegetation association was locally rare, uncommon in the region and, at the time, was not reserved. A scribbly gum – wallum banksia association was also mapped in the park (see Photo 5). The study notes that the regional conservation significance of this association is unknown.

The park's vegetation was also mapped by Murray and Baverstock (1991) as part of a broader study of the Broken Head area. The land now forming the park and lands around Ti Tree (Taylors) Lake were regarded as the areas of highest conservation significance in the study area. Appendix B lists the vegetation types recorded in the park.

Two significant plants are known or likely to occur in heathland in the park. The rare shrub *Strangea linearis* is known to occur and is approaching its southern limit of distribution in Australia (Harden 2002; Sheringham & Westaway 1995). Smooth parrot-pea (*Dillwynia*

glaberrima) has been recorded in heathland around Ti Tree (Taylors) Lake and is also likely to occur in the park. Sheringham and Westaway (1995) regard it as regionally uncommon in north-east NSW and the local occurrence is close to the northern limit of its distribution in New South Wales.

Photo 5 Scribbly gum – wallum banksia vegetation association in the west of the park.

Native animals

The diverse vegetation communities and habitats of the park support a wide range of native animals and this is likely to include threatened species. The park forms part of a regional coastal wildlife corridor connecting it to coastal habitats around Byron Bay to the north and Broken Head to the south (Scotts 2003).

The diverse habitats of the park support a range of sedentary, nomadic and migratory native animals. The longer growing, flowering and fruiting season on the NSW North Coast during autumn–winter provides a reliable and plentiful supply of food for migratory and nomadic birds, flying-foxes and micro-bats at a time of year when food is often in short supply elsewhere. Many of these species move from higher elevation, higher latitude or lower latitude habitats occupied during spring–summer to 'winter' on the coastal lowlands (Scotts 2003).

Although no native animal surveys of the park have been conducted, threatened species recorded in adjacent habitat around Ti Tree (Taylors) Lake and at Broken Head are indicative of the threatened species likely to occur in the park. These include the following vulnerable species: wallum froglet (*Crinia tinnula*), common blossom-bat (*Syconycteris australis*), common planigale (*Planigale maculata*), eastern long-eared bat (*Nyctophilus bifax*), grey-headed flying-fox (*Pteropus poliocephalus*), little bentwing-bat (*Miniopterus australis*) and Olongburra frog (*Litoria olongburensis*). The vulnerable southern myotis (*Myotis macropus*) may also forage in open water in the main drainage line in the east of the park.

The park includes small rainforest patches which are likely to expand under favourable climatic conditions in the absence of fire. Birds utilise these patches as 'stepping stones' between larger coastal and hinterland rainforests. This process supports dispersal of rainforest plants, facilitating rainforest regrowth and helps to maintain the ecological

functioning of nearby rainforest remnants. Fruit-eating bats, such as the threatened grey-headed flying-fox, also play a key role in rainforest seed dispersal.

Rainforest is critical to maintaining migratory pathways for fruit doves and cuckoo-shrikes (Brodie et al. 2002). Birds arriving from higher elevations in winter, for example from the New England Tablelands and nearby areas of the Great Dividing Range, rely on the food and habitat resources available in the network of Big Scrub remnants and coastal rainforests. The Big Scrub comprised 75,000 hectares of lowland subtropical rainforest on volcanic soils located between the Nightcap Range, the coast, Lismore and Wardell, and was largely cleared for agriculture in the late 19th century (NPWS 1997).

Threats to native plants and animals

Major threats to the park's native animals and plants are weeds, pest animals and pathogens, such as amphibian chytrid fungus (*Batrachochytrium dendrobatidis*) and myrtle rust (*Uredo rangelii*) (see Section 4.3), and climate change (see Section 4.6). Inappropriate fire regimes also threaten the park's native species but to a lesser extent (see Section 4.5).

Strategies for the recovery of threatened species, populations and ecological communities have been set out in a statewide *Biodiversity Conservation Program* (OEH 2017, formerly known as the *Threatened Species Priorities Action Statement*). These actions are currently prioritised and implemented through the *Saving our Species* program which aims to maximise the number of threatened species that can be secured in the wild in New South Wales for 100 years (OEH 2013a). Individual recovery plans may also be prepared for threatened species to consider management needs in more detail.

The *Northern Rivers Regional Biodiversity Management Plan* (Northern Rivers BMP) (DECCW 2010a) meets regional recovery planning requirements for the park's littoral rainforest endangered ecological community. The Northern Rivers BMP encourages a range of recovery actions including the control of weeds, pest animals and pathogens (see Section 4.3) and the application of appropriate fire regimes (see Section 4.5).

Desired outcome

- Conserve native plants and animals and minimise impacts from introduced species (including pathogens), inappropriate fire regimes and climate change (see Sections 4.3, 4.5 and 4.6).

Management response

4.2.1 Implement actions in the *Biodiversity Conservation Program* and the *Northern Rivers Regional Biodiversity Management Plan* for threatened species and ecological communities in the park.

4.2.2 Encourage native plant, vegetation and native animal surveys of the park, including surveys of threatened species and ecological communities.

4.3 Pests

Pest species are plants, animals and pathogens that have negative environmental, economic and social impacts and are most commonly introduced species. Pests can have impacts across the range of park values, including biodiversity, cultural heritage, catchment and scenic values.

NPWS prepares regional pest management strategies which identify pest species and priorities for control, including relevant actions listed in the *Biodiversity Conservation*

Program (see Section 4.2), threat abatement plans, and other strategies such as the NSW *Biodiversity Priorities for Widespread Weeds* (DPI & OEH 2011) and the *NSW Biosecurity Strategy 2013–2021* (DPI 2013).

The NPWS pest management strategy for the Northern Rivers Region (OEH 2012b) identifies pest species and priority programs for this park. The overriding objective of the pest management strategy is to minimise adverse impacts of introduced species on biodiversity and other park and community values while complying with legislative responsibilities. The strategy also identifies where other site- or pest-specific plans or strategies need to be developed to provide a more detailed approach.

The *Biosecurity Act 2015* and its regulations provide specific legal requirements for the response, management and control of biosecurity risks, including weeds and pest animals. These requirements apply equally to public and privately owned land. Under this framework Local Land Services (LLS) has prepared regional strategic management plans for each of its 11 regions, including North Coast LLS regional weed plans (North Coast LLS 2017) and regional pest animal plans (North Coast LLS 2018). These priorities will be implemented via the relevant NPWS pest management strategy.

Weeds

The NPWS regional pest management strategy identifies bitou bush (*Chrysanthemoides monilifera* subsp. *rotundata*), *Watsonia* sp., fishbone fern (*Nephrolepis cordifolia*) and whisky grass (*Andropogon virginicus*) as target weeds for the park.

Weed control programs commenced in the park in 2012. Appendix C lists weeds recorded in the park. Initial targets for weed control include the park's north-east boundary and part of the eastern boundary where dumped garden weeds have spread, and occurrences of weeds in the adjacent low-lying eastern part of the park. The remainder of the park appears largely weed-free, except along edges.

The weeds Brazilian pepper tree (*Schinus terebinthifolius*), camphor laurel (*Cinnamomum camphora*), crofton weed (*Ageratina adenophora*), lantana (*Lantana camara*) and the aquatic weed salvinia (*Salvinia molesta*) occur in the park. Salvinia occurs in the north-south drainage line in the park (see Photo 6). A biological control program for salvinia commenced in 2013 but eradication may take a number of years and may require a combination of control techniques.

Photo 6 Infestation of the aquatic weed Salvinia molesta in the north-south drainage line.

Six plants regarded as Weeds of National Significance occur in the park: salvinia, lantana, bitou bush, climbing asparagus (*Asparagus plumosus*), ground asparagus (*A. aethiopicus*) and Madeira vine (*Anredera cordifolia*). These weeds are regarded as among Australia's worst invasive plants.

Cane toads

Cane toads (*Rhinella marina*, formerly *Bufo marinus*) are known to occur in the park. A plan has been prepared to guide the management and control of cane toads in parks and reserves in New South Wales (OEH 2013c). The park is not identified as a priority for cane toad control in the plan in view of their widespread distribution and low likelihood of eradication.

Key threatening processes

Pest species and other processes with the potential to threaten the survival or evolutionary development of species, populations or ecological communities may be declared key threatening processes under the Biodiversity Conservation Act and/or the Environment Protection and Biodiversity Conservation Act. Table 1 lists key threatening processes relevant to the park.

The Biodiversity Conservation Act provides for threat abatement plans to be prepared for key threatening processes. A threat abatement plan has been prepared for predation by the red fox (OEH 2011b) and invasion of native plant communities by bitou bush (DEC 2006). A plan is also being developed for predation by feral cats. Threat abatement strategies are also listed in the *Biodiversity Conservation Program*.

Table 1. Key threatening processes relevant to the park

Key threatening process	BC Act	EPBC Act
Alteration to the natural flow regimes of rivers, streams, floodplains and wetlands	X	
Anthropogenic climate change	X	X
Competition from feral honeybees	X	
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	X	X
Invasion and establishment of the cane toad	X	X
Invasion of native plant communities by *Chrysanthemoides monilifera*	X	
Invasion of native plant communities by exotic perennial grasses	X	
Invasion and establishment of exotic vines and scramblers	X	
Invasion, establishment and spread of *Lantana camara*	X	
Introduction and establishment of exotic rust fungi of the Order Pucciniales pathogenic on plants of the family Myrtaceae	X	
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	X	X
Predation by feral cats	X	X
Predation by the European red fox	X	X

BC Act: Biodiversity Conservation Act (NSW).

EPBC Act: Environment Protection and Biodiversity Conservation Act (Commonwealth).

Desired outcomes

- The impacts of pest plants and animals on native plants and animals are minimised.
- Community members dispose of garden plants and other waste responsibly.

Management response

4.3.1 Manage pest species in accordance with pest management strategies relevant to the park.

4.4 Repairing the park

Geology and soils

The park is located in the lower catchment of Ti Tree (Taylors) Lake, an intermittently closed and open lake or lagoon (ICOLL). The majority of the park is located below 10 metres above sea level and consists of coastal dunes and an estuarine plain situated on a sandplain. The sandplain dates from the Pleistocene period, up to approximately 130,000 years ago, when sea levels were several metres higher than today. The dunes closest to the coast were deposited during the Holocene period which began approximately 11,500 years ago and continues today. Almost one-third of the park is a low elevation estuarine plain associated with the lake. Soils of the estuarine plain are composed of mud, sand and clay.

Most of the park's soils belong to the black rock soil landscape which is associated with the dunes, estuarine plain and sandplain. Dune soils are either well-drained podosols or

silica-rich sands; less well-drained humus and peaty podosols occur in depressions, and waterlogged acid peats are found in swales. These soils are highly permeable, highly acidic and infertile and are highly susceptible to wind erosion (Morand 1994).

Soils of the Bagotville soil landscape occur in a narrow band up to 600 metres wide on the western boundary of the park. This soil landscape is derived from Bundamba Group sediments which are composed of sandstone, siltstone, claystone and conglomerate. Characteristic white quartz pebbles are associated with the geology of the low hills and footslopes in and adjacent to the park. The Bundamba Group was formed in the late Triassic to the mid-Jurassic Period (170 to 215 million years ago). The soil profile is composed of grey, coarse sand overlaying a brown, sandy, clay loam which in turn overlays a mottled clay yellow podosolic subsoil. Soils are moderate to highly erodible, strongly to very strongly acid and of low to very low fertility. The upper and lower soils in the soil profile have high aluminium toxicity potential (Morand 1994).

Repair priorities

The extent and history of the park's drainage system and its impacts on biodiversity have not been fully investigated. The 1:25,000 topographic map (Byron Bay 9640-4S) shows only part of the park's drainage system when compared with field observations. The map shows a drainage line commencing close to a sediment dam in the Broken Head Quarry, which overflows from time to time. This results in sediment flows into the park which can smother vegetation and change the type of vegetation occurring. Other mapping (Land and Property Information GIS data) shows a drainage line commencing at the quarry and connecting through the park to the lake, south of the park.

Drainage lines run west to east through the park, and a north-south drainage line connecting to the lake appears to have been augmented to more efficiently drain stormwater. Three stormwater drains connecting the adjacent residential area to the park occur on the park's northern boundary. Runoff from urban areas typically has elevated nutrient levels and pollutants. These can build up to unhealthy levels in the lake; this has been documented by water sampling over the past 15 years (Baker & Pont 1998; Coleman 1999; DECCW 2010b; Hall 2011). There are no known legal interests in these drains and the associated infrastructure. Rehabilitating constructed drains within the park requires further investigation.

Stormwater from Suffolk Park also deposits rubbish in the park, principally in the form of plastic bags, plastic containers and aluminium and glass beverage containers. During floods, this rubbish is distributed throughout the low-lying areas in the east of the park.

Some parts of the park which were affected by past disturbances such as clearing, drain enhancement and fire are still recovering from these impacts. Control of pest plants is the principal action required to assist recovery of vegetation communities. For example, the park has been invaded by bitou bush planted to stabilise adjacent mined areas, by environmental weeds in dumped garden waste and by weeds in stormwater (see Section 4.3).

Byron Shire Council's coastline hazard mapping (BMT WBM 2013) indicates the park is unlikely to be directly affected by coastal erosion in the medium term (by 2050) and the east of the park is likely to be directly affected by 2100.

Acid sulfate soil risk mapping (Naylor et al. 1998) indicates the park has a low probability of occurrence of acid sulfate soils.

Desired outcome

- The park's drainage system is mapped.
- The history and location of drains constructed in the park is recorded.

- Adverse impacts on the park caused by runoff from the adjacent quarry and residential subdivision is mitigated, and eliminated where possible.
- Pest plants are progressively removed from the park.

Management response

4.4.1 Map the park's drainage system and record information on the history of drains constructed in the park.

4.4.2 Work with relevant stakeholders, including the NSW Environment Protection Authority, Department of Planning, Industry and Environment, Byron Shire Council and the proprietors of Broken Head Quarry, to mitigate impacts of stormwater runoff on the park.

4.4.3 Investigate rehabilitating drains in the park.

4.5 Fire

The primary objectives of NPWS fire management are to protect life, property, community assets and cultural heritage from the adverse impacts of fire, while also managing fire regimes in parks to maintain and enhance biodiversity. NPWS also assists in developing fire management practices that contribute to conserving biodiversity and cultural heritage across the landscape, and implements cooperative and coordinated fire management arrangements with other fire authorities, neighbours and the community (OEH 2013b).

Fire is a natural feature of many environments and is essential for the survival of some plant communities. However, inappropriate fire regimes can lead to the loss of particular plant and animal species and communities, and high frequency fires have been listed as a key threatening process under the Biodiversity Conservation Act. The park's rainforests are fire-sensitive, however, some of the park's vegetation communities, such as dry and wet heaths, swamp sclerophyll forests, and dry sclerophyll forest and woodlands are adapted to fires at specific intensities and intervals. In these vegetation communities too-frequent or too-infrequent fire can lead to changes in biodiversity and threaten cultural values.

The fire history of the land now forming the park is not well-documented. However, small fires have often occurred in bushland behind houses on MacGregor Street (NPWS 2000). Larger fires occurred in the area in 1989, 1994 and 1996 (Ferguson 1996; Murray & Baverstock 1991; NPWS 2000). No fires have occurred since the park was reserved.

Notwithstanding this uncertain fire history, some vegetation communities in the park may be considered 'long unburnt'. Others, such as the area's sclerophyll forests display evidence of periodic fires, for example blackened trunks, which significantly influence the pattern and species composition of vegetation (see Photo 7) (Murray & Baverstock 1991). The successional patterns of vegetation present are typical of fire-affected vegetation: early recovery stages are dominated by sedges, restiads and grass trees which are gradually replaced by shrubs such as *Banksia* spp. and *Leptospermum* spp. growing from rootstocks that survive fire. These plants are eventually replaced by plants growing from seed. Overall, taller plants replace lower plants (Murray & Baverstock 1991).

Photo 7 Blackened tree trucks and restiads such as plume rush (Baloskion tetraphyllum) are indicative of past fire history.

In accordance with the *Rural Fires Act 1997*, the Far North Coast Bush Fire Management Committee has prepared a bush fire risk management plan which covers both public and private lands. The plan identifies community assets at risk, appropriate treatments and a coordinated program to reduce risk to assets. NPWS is actively involved with the Far North Coast Bush Fire Management Committee. The bush fire risk management plan identifies the residential area of Suffolk Park as a very high fire risk asset north of and adjacent to the park. To address this risk the bush fire risk management plan identifies maintaining an asset protection zone on the interface with bushland south of Suffolk Park, including the park.

A park-specific fire management strategy is being prepared. It outlines the park's recent fire history, key assets within and adjoining the park including sites of natural and cultural heritage value, fire management zones and fire control advantages such as management trails and water supply points. It also contains fire regime guidelines for conservation of the park's vegetation communities. Signage is the only built asset on the park vulnerable to fire.

Houses in Suffolk Park adjoin the park at the eastern end of MacGregor Street, on the northern boundary of the park, and in the Tuckeroo Estate residential subdivision on the park's eastern boundary. NPWS maintains an asset protection zone in a largely cleared area of the park south of houses on MacGregor Street. Council maintains a contiguous asset protection zone to the west which adjoins a large block of bushland in council ownership. A large area of freehold native vegetation occurs south of the park. Two large-lot residential blocks occur west of Taylors Lake Road on the park's western boundary. A quarry is located south of these blocks and south-west of the park. Some associated activities continue at the quarry west of Broken Head Road, however, extractive operations no longer occur.

NPWS maintains cooperative arrangements with surrounding landowners, the Rural Fire Service and other responsible agencies identified in the bush fire risk management plan. Cooperative arrangements include fuel management and information sharing.

Desired outcome

- Negative impacts of fire on life, property and the environment are minimised.
- The potential for spread of bushfires on, from or into the park is minimised.

- Culturally significant sites are protected.
- Fire regimes are appropriate for conservation of native plant and animal communities and the maintenance of cultural values.

Management response

4.5.1 Finalise and implement the park fire management strategy.

4.6 Climate change

Human-induced climate change is listed as a key threatening process under the Biodiversity Conservation Act (NSW SC 2000) and habitat loss caused by human-induced greenhouse gas emissions is listed under the Environment Protection and Biodiversity Conservation Act (TSSC 2001). Projections of future changes in climate for New South Wales include higher temperatures, increasing sea levels and water temperatures, more intense but possibly reduced annual average rainfall, increased temperature extremes and higher evaporation. These changes are likely to lead to greater intensity and frequency of fires, more severe droughts, reduced surface flow and water availability, more extreme flood events and increased erosion.

Based on regional scenarios (DECCW 2010c), the likely impacts of climate change for the park are:

- Salt water intruding into water tables is likely to raise the saltwater table on the coastal sandplain and push the freshwater sitting above it towards the surface. In lower areas, salt water is likely to approach or reach the surface. These physical changes in the water table will change the composition of vegetation communities in affected areas to favour plants able to cope with these new conditions. Ecosystems likely to be affected include littoral rainforest, coastal heath swamps, wallum sand heaths, coastal swamp forests (see Photo 8) and coastal dune dry sclerophyll forest.
- Short, intense rainfall events will increase urban runoff and flooding. Flooding is likely to increase in frequency, height and extent, although this may be mitigated by the lake to the south opening to the sea.
- In areas where the water table is lower, higher temperatures in combination with higher evaporation rates will result in drier soils year round and particularly in winter and spring, increasing water stress in vegetation. This is likely to be exacerbated by more severe short-term droughts.
- Littoral rainforest, an endangered ecosystem, and dry sclerophyll forest on coastal dunes, are particularly at risk from weeds, fire and changes in soil moisture.

Climate change may significantly affect biodiversity by changing the size of populations and distribution of species, modifying species composition, and altering the geographical extent of habitats and ecosystems. Species most at risk are those unable to migrate or adapt, particularly those with small population sizes or with slow growth rates. The potential impact of climate change is difficult to assess since it depends on the compounding effects of other pressures, particularly barriers to migration and pressure from feral animals. Programs to reduce pressures caused by such threats will help reduce the severity of the effects of climate change (see Sections 4.3 and 4.5).

The Department has mapped climate change corridors along climatic gradients for native animals occupying coastal, dry and moist habitats (DEC 2007). These corridors are predicted to be important for wildlife adapting to the threatening processes of climate change.

A corridor for native animals occupying coastal habitats encompasses the park and connects it to Arakwal National Park and Cape Byron State Conservation Area to the north and Broken Head Nature Reserve to the south. Long-nosed potoroo (*Potorous tridactylus*) and wallum froglet are identified as threatened species at particular risk within this area. There are numerous records of wallum froglet on the property south of the park and suitable habitat exists in the park. The park also supports suitable habitat for long-nosed potoroo.

Desired outcome

- The effects of climate change on natural systems are reduced (see Sections 4.3 to 4.5 for specific management responses).

Photo 8 Coastal swamp forests are vulnerable to salt water intruding into the water table due to climate change.

5. Using and knowing about Country

5.1 Keeping connected with Country – cultural renewal

Aboriginal people have adapted and sustained their cultural identity despite the impacts brought about by European settlement. The links Aboriginal people maintain with Country continue to be expressed through stories, descent, occupation and use. Aboriginal people maintain their cultural identity and links with Country through cultural learning passed on by Elders to the following generations.

NPWS recognises that the Arakwal and other Bundjalung People may want to undertake cultural activities in the park and that these activities are important to transfer knowledge and to maintain, renew or repair cultural associations with Country. Cultural activities may include the use of wild resources.

Desired outcome

- The Aboriginal community has access to the park for cultural activities while ensuring the park's biodiversity values are protected.

Management response

5.1.1 Permit cultural activities in accordance with NPWS consent.

5.2 Managing use of the park

NPWS parks provide a range of opportunities for recreation and tourism including opportunities for relaxation and renewal as well as appropriate active pursuits. Visitor opportunities provided in the natural and undeveloped settings afforded by the park system are mostly those at the low-key end of the spectrum. NPWS aims to ensure that visitors enjoy, experience and appreciate the park at the same time as conserving and protecting park values.

The park is located within the NSW North Coast Region. The region's population was approximately 584,100 in 2011 and is projected to grow to 699,650 by 2031 (Department of Planning and Environment 2014).

The park experiences low levels of visitation and there are no visitor facilities. Planning for visitor use of the park focuses on low-key use such as bushwalking, birdwatching and nature appreciation. These opportunities are provided in a naturally vegetated coastal setting supporting heath, wetland, woodland and forest, including rainforest. Visitor access is not promoted due to the park's small size and difficult access due to its swampy terrain and dense vegetation. Promoting visitor use is also considered incompatible with the cultural sensitivity of the park which is linked to the cultural significance of the adjacent lake.

Locally, the Cape Byron State Conservation Area at Byron Bay, six kilometres north, and the Broken Head Nature Reserve, 650 metres south, provide a broad range of recreation opportunities, information and visitor facilities.

There is no public vehicle access to the park and none is proposed. The 100-metre Ti Tree Trail on the north-east boundary (see Figure 2) is the only vehicular access and this is only available for management purposes. This trail is managed as an asset protection zone for

firefighting and bushfire hazard reduction purposes and emergency vehicle access is required at all times.

The management trail is maintained at a standard suitable for management purposes. The trail connects to the public road network and is contiguous with a firebreak on council-owned land to the west.

The park has a number of neighbours, with a higher concentration of neighbours on the east and north-east boundaries in the Suffolk Park residential area. Clearly establishing park boundaries in the field will assist management operations.

Horse riding

Horse riding is a popular recreational activity that has cultural associations for many Australians. The NPWS *Strategic Directions for Horse Riding in NSW National Parks* (OEH 2012c) provides a framework to improve horse riding opportunities in eight priority regions in New South Wales, including the Northern Rivers Region. Horse riding is currently permitted nearby at Nightcap, Goonengerry and Mount Jerusalem national parks.

Horse riding opportunities in numerous national parks in the region are being progressed in accordance with the *Northern Rivers Region Horse Riding Work Plan 2013* (OEH 2013d).

Horse riding is not known to occur in the park. Under NPWS policy, horse riding is not permitted in Aboriginal areas due to their cultural heritage significance, except by consent on park or public roads. There are no park or public roads in the park.

Cycling

In accordance with NPWS policy and the *Sustainable Mountain Biking Strategy* (OEH 2011a) cycling is allowed on management trails and park roads in Aboriginal areas where safe. Recreational cycling is permitted on Ti Tree Trail, although usage is currently minimal. There are no park roads or formal walking tracks in the park. Competitive cycling is not permitted in the park.

Camping

Camping is not permitted in the park in keeping with the primary purpose of Aboriginal areas to safeguard cultural heritage significance. Providing visitor facilities for camping would result in unacceptable impacts on natural and cultural heritage values due to the need to clear significant vegetation. Camping is available at several nearby campgrounds including at Suffolk Park, Broken Head and Byron Bay (see Figure 1).

Commercial and group activities

No commercial or group activities currently occur in the park. In view of the park's cultural sensitivity, lack of visitor facilities and small size, no commercial activities or group activities (commercial or non-commercial) will be permitted.

Cultural activities

Cultural activities undertaken by the Aboriginal community in accordance with this plan will be managed in accordance with NPWS consent (see Section 5.1).

Easements

There are no easements within the park. Stormwater infrastructure is located in the north-east part of park. Byron Shire Council has provided NPWS with maps indicating it owns some of this infrastructure. Further investigation is required to determine the ownership of all stormwater infrastructure. Where appropriate, easement agreements will be put in place.

Desired outcome

- Visitor use is ecologically sustainable and culturally appropriate.
- Legal interests in existing infrastructure are established, where appropriate, and park boundaries are clearly identified in the field.

Management response

5.2.1 Cycling is permitted on Ti Tree Trail shown in Figure 2.

5.2.2 Erect signs on Ti Tree Trail in accordance with the NPWS Cycling Policy.

5.2.3 Camping, horse riding and public vehicle access are not permitted in the park.

5.2.4 Commercial activities and group activities are not permitted.

5.2.5 Determine ownership of infrastructure and create easement agreements where appropriate.

5.2.6 Clearly mark park boundaries in the field.

5.3 Talking about Country – providing information

Providing information assists the protection of cultural and natural heritage, promotes support for conservation, and increases the enjoyment and satisfaction of visitors. Limited information is publicly available about the park's Aboriginal cultural heritage values due to its cultural significance and the cultural sensitivity of such information. Basic information about the park is available at the nearby Cape Byron State Conservation Area along with information on cultural and biodiversity values of other parks and reserves of the Byron coast. Broken Head headland in the nearby Broken Head Nature Reserve is a good vantage point from which to view the park's broader landscape setting.

Neighbour relationships are strategically important to maintaining the significant natural and cultural heritage values of the park. The actions of park neighbours can directly and indirectly impact park values in positive or negative ways, particularly as the park is small with a high ratio of boundary to area which makes it more susceptible to edge effects. NPWS engages with park neighbours to increase their awareness of the park and its values, and park management activities, and to encourage their support and cooperation in maintaining these important values.

Desired outcome

- There is widespread community understanding and appreciation of the park's natural values.
- There is widespread community understanding that the park is a special place with significant Aboriginal cultural heritage values.

Management response

5.3.1 Consult and involve the Aboriginal community in the development and delivery of information programs on the park's Aboriginal cultural values and biodiversity.

5.3.2 Develop visitor information to support public inquiries about the park through the following channels: digital (NPWS website and social media), phone (National Parks Contact Centre and Environment Line) and face-to-face (visitor centres and NPWS offices).

5.4 Understanding Country – research and monitoring

Knowledge of Country was traditionally passed from Elders to appropriate members of the Aboriginal community. This process continues today. NPWS respects this intellectual property and wishes to add to this body of knowledge. Research is an important part of 'Looking after Country' (see Section 4) and 'Using and knowing about Country' (see Section 5) as it ensures park values are clearly identified and managed as well as possible.

Research and monitoring assists NPWS to assess the success of park management programs and may trigger specific management actions. In particular, monitoring of plant and animal communities, species and habitats is important to identify changes in their distribution and abundance due to human impacts and the impacts of introduced species, management activities and climate change, as well as responses to natural phenomena.

Research and monitoring which assists management of the park will be encouraged, such as into Aboriginal and non-Aboriginal cultural heritage, threatened species and ecological communities, climate change, and pest species and fire and their impacts on native plants and animals (see Sections 4.1 to 4.6).

Desired outcome

- Research programs enhance NPWS capacity to manage the park's values.
- Research and monitoring has minimal impact on the park's natural and cultural values and complies with NPWS licensing and consent requirements.

Management response

5.4.1 Permit research and monitoring, subject to NPWS licensing and consent requirements, which enhances management and has minimal impact on the park's natural and cultural values.

6. Plan implementation

This plan of management establishes a scheme of operations for the Ti Tree Lake Aboriginal Area. Implementation of this plan will be undertaken within the annual works program of NPWS.

Identified activities for implementation are listed in Table 2. Relative priorities are allocated against each activity as follows:

- **High priority** activities are imperative to achieve the objectives and desired outcomes of this plan. They must be undertaken in the near future to avoid significant deterioration in natural, cultural or management resources.
- **Medium priority** activities are necessary to achieve the objectives and desired outcomes of the plan, but they are not urgent.
- **Low priority** activities are desirable to achieve the objectives and desired outcomes but can wait until resources become available.
- **Ongoing** activities are undertaken on an annual basis, or in response to an issue that arises.

This plan of management does not have a specific term and will stay in force until amended or replaced in accordance with the National Parks and Wildlife Act.

Table 2 List of management responses

Section number	Management response	Priority
4.1	**The story of Country that is now the park**	
4.1.1	Record the location of any Aboriginal and non-Aboriginal heritage sites in the park.	High
4.2	**Native plants and animals**	
4.2.1	Implement actions in the *Biodiversity Conservation Program* and the Northern Rivers Regional Biodiversity Management Plan for threatened species and ecological communities in the park.	Medium
4.2.2	Encourage native plant, vegetation and native animal surveys of the park, including surveys of threatened species and ecological communities.	Ongoing
4.3	**Pests**	
4.3.1	Manage pest species in accordance with pest management strategies relevant to the park.	High
4.4	**Repairing the park**	
4.4.1	Map the park's drainage system and record information on the history of drains constructed in the park.	Ongoing
4.4.2	Work with relevant stakeholders, including the NSW Environment Protection Authority, Department of Planning, Industry and Environment, Byron Shire Council and the proprietors of Broken Head Quarry, to mitigate impacts of stormwater runoff on the park.	Ongoing
4.4.3	Investigate rehabilitating drains in the park.	Medium
4.5	**Fire**	
4.5.1	Finalise and implement the park fire management strategy.	High
5.1	**Keeping connected with Country – cultural renewal**	

Section number	Management response	Priority
5.1.1	Permit cultural activities in accordance with NPWS consent.	Ongoing
5.2	**Managing use of the park**	
5.2.1	Cycling is permitted on Ti Tree Trail shown in Figure 2.	High
5.2.2	Erect signs on Ti Tree Trail in accordance with the NPWS Cycling Policy.	High
5.2.3	Camping, horse riding and public vehicle access are not permitted in the park.	Ongoing
5.2.4	Commercial activities and group activities are not permitted.	Ongoing
5.2.5	Determine ownership of infrastructure and create easement agreements where appropriate.	Medium
5.2.6	Clearly mark park boundaries in the field.	High
5.3	**Talking about Country – providing information**	
5.3.1	Consult and involve the Aboriginal community in the development and delivery of information programs on the park's Aboriginal cultural values and biodiversity.	High
5.3.2	Develop visitor information to support public inquiries about the park through the following channels: digital (NPWS website and social media), phone (National Parks Contact Centre and Environment Line) and face-to-face (visitor centres and NPWS offices).	High
5.4	**Understanding Country – research and monitoring**	
5.4.1	Permit research and monitoring, subject to NPWS licensing and consent requirements, which enhances management and has minimal impact on the park's natural and cultural values.	Ongoing

References

Baker A & Pont D 1998, A Pilot Study of Water Quality in Taylors Lake, Broken Head, unpublished report to the Surfrider Foundation, Byron Bay.

BMT WBM Pty Ltd 2013, *Byron Shire Coastline Hazards Assessment Update*, report prepared for Byron Shire Council, Brisbane, www.byron.nsw.gov.au/publications/byron-shire-coastline-hazards-assessment-update-bmt-wbm-2013.

Brodie RS, Green R & Graham M 2002, Mapping groundwater-dependent ecosystems: a case study in the fractured basalt aquifers of the Alstonville Plateau, New South Wales, *Proceedings of the International Groundwater Conference*, Darwin.

Coleman H 1999, Taylors Lake – A Snap Shot, unpublished study for Diploma of Environmental Technologies, Canberra Institute of Technology.

Collins JP 1990, Aboriginal and European Heritage Study, Broken Head NSW, a report to Byron Shire Council.

DEC 2006, *NSW Threat Abatement Plan – Invasion of Native Plant Communities by* Chrysanthemoides monilifera *(Bitou Bush and Boneseed)*, Department of Environment and Conservation, Hurstville, www.environment.nsw.gov.au/bitoutap/.

DEC 2007*, Landscape Selection Process – Key Altitudinal, Latitudinal and Coastal Corridors for Response to Climate Change*, a report prepared for the Northern Rivers Catchment Management Authority, Department of Environment and Conservation, Hurstville.

DECCW 2010a, *Northern Rivers Regional Biodiversity Management Plan*, National Recovery Plan for the Northern Rivers Region, Department of Environment, Climate Change and Water, Sydney, www.environment.gov.au/biodiversity/threatened/publications/recovery/northern-rivers.html.

DECCW 2010b, *State of the Catchments 2010 – Estuaries and Coastal Lakes, Northern Rivers Region*, Department of Environment, Climate Change and Water, Sydney. www.environment.nsw.gov.au/soc/stateofthecatchmentsreport.htm.

DECCW 2010c, *NSW Climate Impact Profile: The impacts of climate change on the biophysical environment of New South Wales*, Department of Environment, Climate Change and Water, Sydney, NSW, http://climatechange.environment.nsw.gov.au/Impacts-of-climate-change/2010-NSW-climate-impact-reporting.

Department of Planning and Environment 2014, *North Coast,* viewed 18 June 2014, www.planning.nsw.gov.au/Plans-for-your-area/Regional-Plans/North-Coast/Plan.

DPI & OEH 2011, *Biodiversity Priorities for Widespread Weeds*, Department of Primary Industries and Office of Environment and Heritage, Orange, www.dpi.nsw.gov.au/biosecurity/weeds/strategy/handbook/cmas.

DPI 2013, *NSW Biosecurity Strategy 2013–2021*, Department of Primary Industries, a division of NSW Department of Trade and Investment, Regional Infrastructure and Services, Orange, www.dpi.nsw.gov.au/biosecurity/biosecurity-legislation/strategy.

Ferguson A 1996, *Natural and Cultural Values of Coastal Byron Shire Between Belongil Creek and Broken Head*, a report prepared for NSW NPWS and the Cape Byron Consultative Committee.

Griffith SJ, Bale C, Adam P & Wilson R 2003, Wallum and related vegetation on the NSW North Coast: description and phytosociological analysis, *Cunninghamia* vol. 8, no. 2, pp. 202–252, www.rbgsyd.nsw.gov.au/science-conservation/scientific-publications/cunninghamia.

Hall A 2011, Can the Water Quality at Taylors Lake, Suffolk Park, New South Wales Support a Healthy Ecosystem?, Undergraduate Environmental Chemistry Study, Southern Cross University, Lismore.

Harden G (ed.) 2002, *Flora of New South Wales*, vol. 2, New South Wales University Press, Sydney.

Landmark Ecological Services Pty Ltd, Ecograph & Terrafocus Pty Ltd 1999, *Byron Flora and Fauna Study 1999*, a report prepared for Byron Shire Council, Byron Shire Council, Mullumbimby, www.byron.nsw.gov.au/biodiversity.

Low T & Oliver G (ed.) with Kelly L, Vidler L & Nicholls D 2003a, *Culturally Significant Plants in Byron Bay Arakwal Country – a Resource Document*, National Parks and Wildlife Service Northern Rivers Region.

Low T with Kelly L, Vidler L & Nicholls D 2003b, *Place of Plenty: Culturally Useful Plants around Byron Bay*, National Parks and Wildlife Service, Northern Rivers Region.

Morand DT 1994, *Soil Landscapes of the Lismore-Ballina 1:100000 Sheet (Mullumbimby, Byron Bay, Casino, Kyogle)*, Department of Conservation and Land Management including the Soil Conservation Service, Sydney.

Murray AS & Baverstock PR 1991, *A Study of the Flora and Vertebrate Fauna of Broken Head*, a report prepared for Byron Shire Council.

Naylor SD, Chapman GA, Atkinson G, Murphy CL, Tulau MJ, Flewin TC, Milford HB & Morand DT 1998, *Guidelines for the Use of Acid Sulfate Soil Risk Maps*, 2nd ed., Department of Land and Water Conservation, Sydney.

Neal R & Stock E 1986, Pleistocene occupation in the southeast Queensland coastal region, *Nature*, no. 323, pp. 618–621.

North Coast LLS 2017, *North Coast Regional Strategic Weed Management Plan 2017–2022*, North Coast Local Land Services, https://northcoast.lls.nsw.gov.au/biosecurity/weed-control.

North Coast LLS 2018, *North Coast Regional Strategic Pest Animal Management Plan 2018-2023*, North Coast Local Land Services, https://northcoast.lls.nsw.gov.au/__data/assets/pdf_file/0020/820802/north-coast-regional-pest-plan.pdf

NPWS 1997, Big Scrub Nature Reserves (incorporating Andrew Johnston Big Scrub, Victoria Park, Davis Scrub, Hayters Hill, Boatharbour and Wilson Nature Reserves) Plan Of Management, National Parks and Wildlife Service, Hurstville, www.environment.nsw.gov.au/parkmanagement/ParkManagementPlans.htm.

NPWS 2000, Draft Conservation & Management Plan, Ti-Tree Lake Aboriginal Place (Taylors Lake), National Parks and Wildlife Service Northern Rivers Region, Alstonville.

NSW SC 2000, *Final Determination to List Anthropogenic Climate Change as a Key Threatening Process on Schedule 3 of the TSC Act*, New South Wales Scientific Committee, www.environment.nsw.gov.au/threatenedspecies/HumanClimateChangeKTPListing.htm.

OEH 2011a, *Sustainable Mountain Biking Strategy*, Office of Environment and Heritage, Sydney, www.environment.nsw.gov.au/research-and-publications/publications-search/sustainable-mountain-biking-strategy.

OEH 2011b, NSW *Threat Abatement Plan for Predation by the Red Fox (*Vulpes vulpes*)*, Office of Environment and Heritage, Sydney, www.environment.nsw.gov.au/resources/pestsweeds/110791FoxTAP2010.pdf.

OEH 2012a, Vegetation Classification for the Northern Rivers Catchment Management Area of New South Wales, OEH, South Sydney.

OEH 2012b, Regional Pest Management Strategy 2012 – 2017, Northern Rivers Region: a new approach for reducing impacts on native species and park neighbours, Office of Environment and Heritage, Sydney, www.environment.nsw.gov.au/pestsweeds/PestManagementPrograms.htm.

OEH 2012c, *Strategic Directions for Horse Riding in NSW National Parks*, Office of Environment and Heritage, Sydney, www.environment.nsw.gov.au/parkmanagement/horseridestrat.htm.

OEH 2013a, *Saving our Species*, Office of Environment and Heritage, Sydney, www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/saving-our-species-program.

OEH 2013b, *Living with Fire in NSW National Parks. A strategy for managing bushfires in national parks and reserves 2012–2021*, Revised edition, Office of Environment and Heritage, Sydney, www.environment.nsw.gov.au/fire/120690livfire.htm.

OEH 2013c, *Management Plan for Cane Toads in National Parks and Reserves 2012*, Office of Environment and Heritage NSW, Sydney, www.environment.nsw.gov.au/pestsweeds/13772canetoadmp.htm.

OEH 2013d, *Northern Rivers Region Horse Riding Work Plan 2013*, Office of Environment and Heritage, Sydney.

OEH 2017, *Biodiversity Conservation Program*, Office of Environment and Heritage, www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/programs-legislation-and-framework/biodiversity-conservation-program.

Scotts D 2003, Key Habitats and Corridors for Forest Fauna: A Landscape Framework for Conservation in North-east New South Wales, NPWS Occasional Paper 32, National Parks and Wildlife Service, Sydney.

Sheringham PR, Benwell Dr A, Gilmour P, Graham MS, Westaway J, Weber L, Bailey D & Price R 2008, *Targeted Vegetation Survey of Floodplains and Lower Slopes on the Far North Coast*, a report prepared by the Department of Environment and Climate Change for the Comprehensive Coastal Assessment, Department of Environment and Climate Change (NSW), Coffs Harbour, NSW.

Sheringham P & Westaway J 1995, *Significant Vascular Plants of Upper North East NSW*, National Parks and Wildlife Service, Hurstville.

TSSC 2001, *Commonwealth Listing Advice on Loss of Terrestrial Climatic Habitat Caused by Anthropogenic Emissions of Greenhouse Gases,* Threatened Species Scientific Committee, www.environment.gov.au/cgi-bin/sprat/public/publicshowkeythreat.pl?id=7.

Appendix A: Plants important for wild resource use

Common name	Scientific name	Use
Bangalow palm	*Archontophoenix cunninghamiana*	Sled, etc.
Blue lilly pilly	*Syzygium oleosum*	Edible fruit
Brown kurrajong	*Commersonia bartramia*	Fibre for weaving nets and bags
Coast morning glory	*Ipomoea brasiliensis*	Skipping rope
Five corners	*Styphelia viridis*	Edible fruit
Geebung	*Persoonia adenantha, P. stradbrokensis*	Edible fruit
Grass tree	*Xanthorrhoea* spp.	Firewood, aromatic insect-repelling oils, nectar
Coast banksia (also called honeysuckle)	*Banksia integrifolia*	Nectar, flowers for combs, seedpods for firewood
Long yam	*Dioscorea transversa*	Edible tuber
Mat-rush	*Lomandra longifolia*	Fibre for weaving baskets and bags
Molucca bramble	*Rubus moluccanus*	Edible fruit
Midjem	*Austromyrtus dulcis*	Edible fruit
Native parsnip	*Trachymene incisa*	Edible root
Pandanus	*Pandanus tectorius*	Food
Broad-leaved paperbark	*Melaleuca quinquenervia*	Roofing shelters, baby blanket, bandage wounds, wrap meat for cooking
Raspberries	*Rubus* spp.	Edible fruit
Sandpaper fig	*Ficus coronata*	Leaves for sandpaper
Soft twig-rush	*Baumea rubiginosa*	Fibre for weaving bags
Strangler fig	*Ficus watkinsiana*	Edible fruit
Supplejack	*Flagellaria indica*	Canes for weaving
Wallum banksia	*Banksia aemula*	Edible nectar, brush, fuel
Wallum geebung	*Persoonia virgata*	Edible fruit
Water vine	*Cissus* spp.	Edible fruit, water in stems, vine for climbing

Source: Low et al. 2003a & 2003b.

Appendix B: Vegetation types

Floristics	Structure
Brush box (*Lophostemon confertus*)	Low to mid-high closed forest
Blackbutt (*Eucalyptus pilularis*) – red bloodwood (*Corymbia gummifera*) – pink bloodwood (*C. intermedia*) +/- scribbly gum (*Eucalyptus signata*), turpentine (Syncarpia glomulifera)	Mid-high to tall open to closed forest
Scribbly gum (*Eucalyptus signata*) – wallum banksia (*Banksia aemula*)	Low to mid-high woodland
Coast banksia (*Banksia integrifolia*) +/- regrowth littoral rainforest	Mid-high open (- closed) forest and woodland
Broad-leaved paperbark (*Melaleuca quinquenervia*)	Mid-high to tall open forest and woodland
Broad-leaved paperbark (*Melaleuca quinquenervia*) – tea-tree (*Leptospermum* spp.)	Mid-high (open) woodland and tall (closed) heathland
Wallum banksia (*Banksia aemula*) – tea-tree (*Leptospermum* spp.)	Tall dry heathland
Leptospermum whitei – olive tea-tree (*L. liversidgei*) – fern-leaved banksia (*Banksia oblongifolia*) – red-fruit saw-sedge (*Gahnia sieberiana*)	Tall (wet) heathland
Red-fruit saw-sedge (*Gahnia sieberiana*) – pouched coral fern (*Gleichenia dicarpa*)	Tall closed sedgeland/fernland
Cladium procerum – common reed (*Phragmites australis*)	Tall closed sedgeland/rushland

Source: Murray & Baverstock 1991

Appendix C: Weeds

Common name	Scientific name
Crofton weed [O]	*Ageratina adenophora*
Coralberry [O]	*Ardisia crenata*
Madeira vine [WONS, O]	*Anredera cordifolia*
Ground asparagus [WONS, O]	*Asparagus aethiopicus*
Climbing asparagus [WONS, O]	*Asparagus plumosus*
Groundsel bush [R]	*Baccharis halimifolia*
Bitou bush [WONS, S]	*Chrysanthemoides monilifera*
Camphor laurel [O]	*Cinnamomum camphora*
Papyrus	*Cyperus papyrus*
Lantana [WONS, S]	*Lantana camara*
Japanese honeysuckle [O]	*Lonicera japonica*
Mickey Mouse plant [O]	*Ochna serrulata*
Golden shower	*Pyrostegia venusta*
Salvinia [WONS, S]	*Salvinia molesta*
Mother-in-laws tongue	*Sansevieria trifasciata*
Umbrella tree [O]	*Schefflera actinophylla*
Brazilian pepper tree (also called broad-leaf pepper tree) [R]	*Schinus terebinthifolius*
Winter senna	*Senna pendula var. glabrata*
Climbing nightshade [O]	*Solanum seaforthianum*

Source: NPWS bush regeneration record sheets 2012–2013, Mackey D 2014, pers. comm.

KEY:

[WONS] Weeds of National Significance

[S] State-level priority weed (North Coast LLS 2017)

[R] Regional priority weed (North Coast LLS 2017)

[O] Other priority weed (North Coast LLS 2017)