Bowling Green Bay National Park

Management plan

Brigalow North Biogeographic Region

August 2000

Queensland Government
Queensland Parks and Wildlife Service

Summary

This management plan provides the framework and guidelines on how Bowling Green Bay National Park will be managed. It sets out the considerations, outcomes and strategies that are proposed to form the basis on which day-to-day management decisions are made.

This plan was prepared in October 1999 and, in accordance with s 125 of the Nature Conservation Act 1992, will be reviewed not later than 10 years after its approval. For further information on this plan or the planning process, please contact the Queensland Parks and Wildlife Service Northern Regional Centre in Townsville on (07) 4722 5296.

This management plan was prepared by Queensland Parks and Wildlife Service staff. The principal author was Dr P (Bill) Lavarack. Thanks are due to those groups and individuals who made submissions in response to the draft plan.

Cover photograph: Alligator Creek Falls

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Contents

1 Introduction

Bowling Green Bay National Park covers 55 300ha of coastal and mountainous country about 20km south of Townsville in north Queensland. A portion of the Mt Elliot section was gazetted in 1940 and the Alligator Creek area was added in 1967. Other areas including Cape Cleveland and Cape Bowling Green followed in recent years.

The importance of this park lies in the diversity of habitat types which range from mangroves at sea level to mountain top rainforests at 1200m altitude. Of outstanding importance among these varied habitats are the wetlands of Bowling Green Bay which are considered so valuable that they have been recognised under the Convention on Wetlands (Ramsar, Iran, 1971) (usually known as the Ramsar Convention). These wetlands are world famous for the mass congregations of waterfowl, in particular magpie geese and brolgas.

In common with many other reserves, Bowling Green Bay is subject to significant pressure and impact from park visitors. The Townsville-Burdekin area has a population in excess of 140 000 and, as it lies in a rain shadow, there are few habitats in the vicinity which offer pleasant creek-based recreation opportunities. The streams which flow off Mt Elliot provide the best opportunities and are therefore extremely popular during the summer months. Alligator Creek is the most accessible of these streams and attracts over 60 000 visitors each year. Most of the rest of the park is inaccessible and has few visitors apart from recreational fishers in the coastal estuaries. This concentration of visitor use has both advantages and disadvantages and this plan considers methods of dealing with the challenges of providing recreational opportunities while at the same time ensuring there is no conservation loss.

Bowling Green Bay would have been an area of cultural and spiritual significance to the area's original inhabitants and these values undoubtedly persist for their descendants today. It has several tangible reminders of the original lifestyle in the form of paintings, middens and other relics.

The plan identifies the purposes and desired outcomes (objectives) of the intended management of the area. To achieve these, a series of actions and guidelines are recommended. The plan also provides a zoning plan which incorporates a framework within which all new proposals and circumstances can be assessed.

2 Management directions and purposes

2.1 Management directions

Bowling Green Bay National Park will be managed to conserve the natural and cultural values of the area, in particular the wetlands. Where necessary the habitat will be managed by the use of fire and removal of exotic species.

In Bowling Green Bay National Park the management of fire will be a high priority, to ensure that habitats are maintained, and life and property of staff, visitors and neighbours are not threatened.

Recreation will be a lower management priority except in the Alligator Creek area, where provision will be made for intense recreational activities. Self-reliant activities such as walking, nature study and recreational fishing will be permitted in other areas, provided that these activities are ecologically sustainable.

In managing Bowling Green Bay National Park, opportunities will be provided for Aboriginal people and for the community to be involved in, and consulted about, decisions concerning the future of the national park.

2.2 Purposes

Bowling Green Bay National Park will be managed with the primary purpose of maintaining the naturally occurring diversity of flora, fauna, habitat types and other natural features of the area.

Particular attention will be given to maintaining the natural condition of the wetlands of Bowling Green Bay. This will be achieved by habitat manipulation if required.

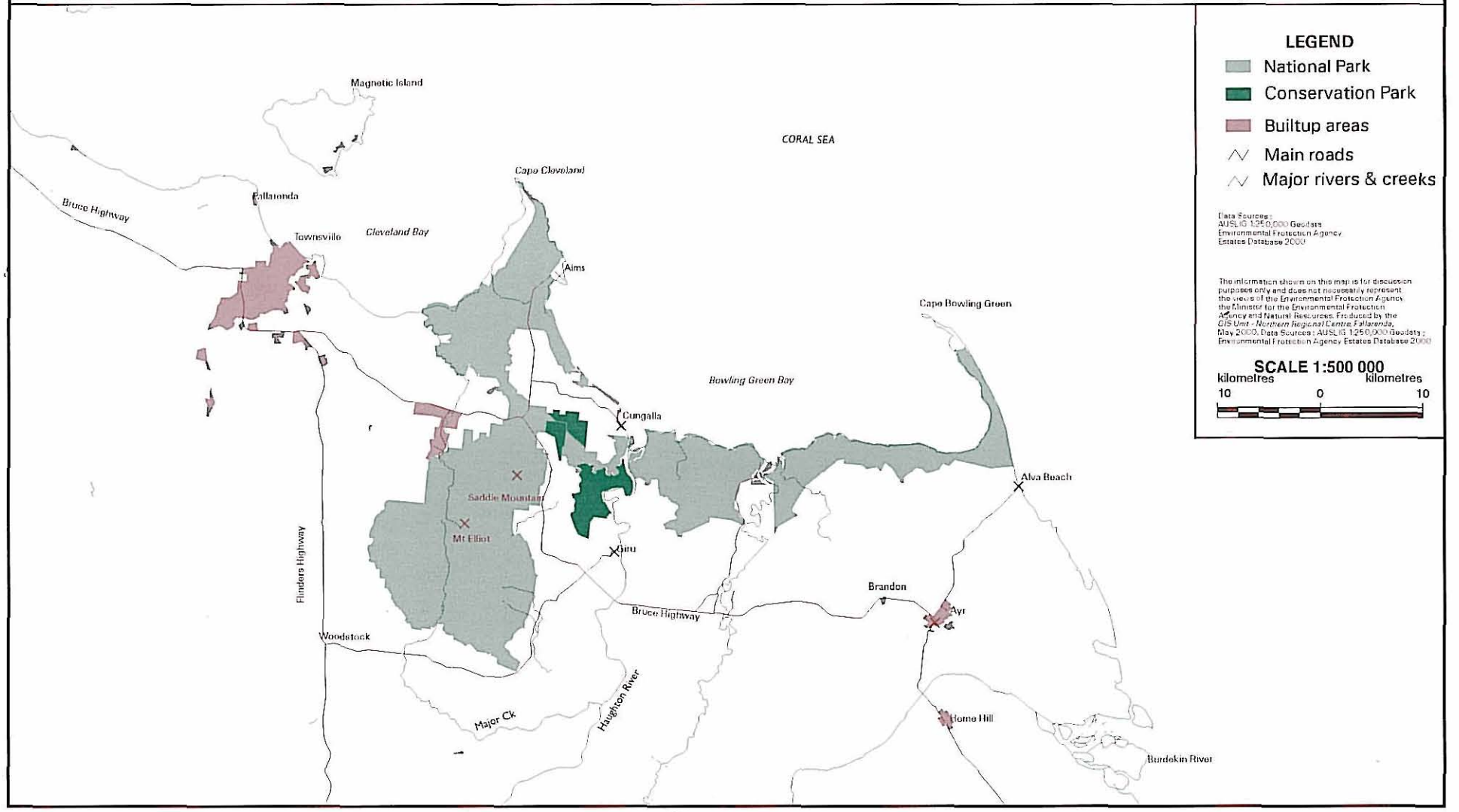
A primary purpose will be to ensure that the cultural and spiritual values of Bowling Green Bay National Park are not damaged or destroyed, and that cultural resources such as paintings are preserved and, with the support of traditional custodians, explained to the public (liaison and involvement with Aboriginal groups and individuals will be an important part of conservation, management, presentation and interpretation of cultural values).

Aboriginal people with a particular interest in the area are able to contribute to decision making with respect to the management of the park.

Where compatible with all the above purposes, management will also provide a range of appropriate nature-based recreation opportunities.

Secondary purposes will be to allow the continuation of existing infrastructure, being the power line, transmission towers and associated infrastructure and the water pipeline to Cungulla.

MAP 1 : BOWLING GREEN BAY NATIONAL PARK
REGIONAL SETTINGS



3 Basis for management

3.1 Regional context

Bowling Green Bay National Park lies in Townsville and Thuringowa cities and Burdekin Shire. It is less than 20km from the urban areas of Townsville and Thuringowa which have a combined population of 120 000 (see Map 1). To the south of the park are the densely-populated agricultural lands of the Burdekin delta and the towns of Ayr, Home Hill, Brandon and Giru which support another 20 000 people. These heavily settled agricultural and urban areas impact on the park in several ways including run-off into adjacent wetlands, edge effects such as weeds and agricultural chemicals, and also in terms of impact from large numbers of recreational users.

There are few national parks between Townsville and the Whitsundays and those that do exist such as Cape Upstart, are inaccessible and have little current recreational potential. This places significant pressure on Bowling Green Bay National Park.

3.2 Planning area

This plan covers Bowling Green Bay National Park only. As a national park the area is under the control of the Queensland Parks and Wildlife Service (QPWS). In areas where the coastline or a stream are shown as the boundary, the mean high water mark is the boundary. Estuaries are included in the national park where both banks are in the park.

The waters off the coast are part of the Central Section of the Great Barrier Reef Marine Park, but are not included in this plan.

3.3 Planning process

This management plan has been developed by QPWS.

The purpose of this management plan is to propose clear directions for management of Bowling Green Bay National Park. To do this, detailed management actions are proposed where necessary.

In accord with s 115 of the *Nature Conservation Act 1992*, advertisements giving notice of the publication of the draft plan were published on 5 May 1999 inviting public comment. Eleven submissions were received from a variety of individuals and interest groups. These submissions were used in preparing this plan.

3.4 Management obligations

The values of the area have been recognised in the declaration of the Bowling Green Bay National Park. The management of Bowling Green Bay National Park is subject to the following legislation, formal agreements and international conventions:

3.4.1 The *Nature Conservation Act 1992* and other Legislation

The management plan must comply with all relevant State and Commonwealth legislation. Of particular significance are the management principles for national parks in s 17 of the *Nature Conservation Act 1992* which states that a national park is to be managed to:

(a) provide, to the greatest extent, for the permanent preservation of the area's natural condition and protection of the area's cultural resources and values;
(b) present the area's cultural and natural resources and their values; and
(c) ensure that the only use of the area is nature-based and ecologically sustainable.

The Act further states that (a) is the "cardinal principle for the management of national parks".

3.4.2 International convention

Ramsar Convention
All of the coastal part of the park, including some upland areas such as Cape Cleveland, has been listed as a site under this convention and this imposes certain obligations on the Queensland Government to manage the area to maintain its values as a freshwater habitat supporting a range of wildlife. This includes an obligation to monitor the condition of the wetlands and to take action to correct any significant changes.

3.4.3 Leases and permits

A Telstra transmission tower and access road is situated on a special lease at the base of Mt Storth.

There is a radio transmission tower on a special lease near Cape Cleveland and it is operated by a local radio station.

3.4.4 Informal agreements

The following public infrastructure is important to the community and, while no formal agreements have been made, it is clear that the infrastructure should remain and is therefore regarded as an obligation on management:

- the power transmission line running through the park along the Alligator Creek valley; and
- the water pipeline to Cungulla which passes through part of the national park near Mt Burrumbush.

3.4.5 Native title

The Bindal people have lodged a native title claim application which includes Bowling Green Bay National Park. The Commonwealth *Native Title Act 1993* provides for the recognition and protection of native title. This plan does not intend to affect, diminish or extinguish any native title rights.

3.5 Values of Bowling Green Bay National Park

3.5.1 Geology and landform

The park is dominated by the massive Mt Elliot Range which reaches an altitude of 1342m at Mt Elliot, one of Queensland's highest peaks. Other prominent peaks are Sharp Elliot (1231m), Saddle Mountain (869m) and Mt Storth (630m). There is a considerable area above 1000m altitude, a quite uncommon occurrence in Queensland. The other major mountainous feature of the park is Cape Cleveland which reaches an altitude of 558m. Also included in the park is Mt Burrumbush (276m), a feature of the coastal plains.

These mountainous areas comprise biotite granite and adamellite, with older intermediate lavas, acid volcanics and pyroclastics around the foothills of Saddle Mountain and Mt Elliot in the vicinity of Alligator Creek and St Margaret's Creek. Some deep ravines exist along fault lines.

The remaining low-lying areas of the park consist of Quaternary sand dunes, beach deposits, coastal mud flats and silt. Cape Bowling Green is one of the largest sand spits on the Queensland coast and is an area in which sand is actively being deposited. In the sheltered bay between Cape Bowling Green and Cape Cleveland there are extensive areas of mangrove and mud flats. These mangroves are backed on the landward side by significant seasonal fresh and brackish water wetlands.

The high mountains of Mt Elliot intercept the prevailing south-easterlies and result in a locally high rainfall area. The larger streams originating on the mountain such as Alligator, St Margaret's, Major, Spring and Double Creeks are perennial in all but the driest years and several other streams flow in good

rainfall years. The annual rainfall in the Mt Elliot area varies from about 1500 millimetres on the south-eastern side to about 1200 millimetres on the drier western side. No records are kept for the upland areas, but it is likely to be considerably higher than that recorded on the lowlands. Cape Cleveland has an annual average of about 1000 millimetres.

3.5.2 Plants and plant communities

The altitudinal range has resulted in an array of diverse vegetation communities. Bean (1991) listed 17 vegetation types with the Mt Elliot section accounting for nine vegetation types and 12 types in the Cape Cleveland section (see Appendix 1). Over 700 species of vascular plants are listed for the park. It is likely that this number will increase substantially in the future as more information is gathered.

About 3500ha of rainforest covers the higher altitude parts of the park, mostly above the 900 metre contour. These forests have close relationships with the wet tropics to the north, being regarded as the southern limit of the northern rainforests. Mt Elliot rainforests are also important as part of a chain of mountain top rainforests linking the wet tropics with the central coast rainforests of the Proserpine-Mackay area. The freshwater bulkuru swamps are a regionally significant vegetation type and are also a significant waterbird habitat. This is a vegetation type which is under considerable pressure in coastal Queensland due to agricultural development and invasion by introduced pasture and ponded pasture grasses. The coastal parts support mangrove communities of state significance.

Bean (1991) identified seven vegetation types as being rare or otherwise absent in the Townsville region. Three rare or threatened plant species are recorded from the park (see Appendix 1), but it is highly likely that more occur in the park.

Three ecosystems are classified as threatened (Young et al 1998). These are:

11.1.3 sedgelands in quaternary estuarine deposits which are rated as "Of Concern";

11.3.13 *Grevillea striata* woodland on alluvial plains rated as "Endangered"; and

11.3.25 stream fringing forest of *Eucalyptus tereticornis, Casuarina cunninghamiana* rated as "Of Concern".

3.5.3 Native animals and habitats

The park's large size, and diverse topography and vegetation, have resulted in a diverse fauna. Much more is currently known of the lowland fauna than that of the inaccessible uplands. What work has been done in the uplands has largely been confined to the ridges and peaks, where a less diverse fauna is suggested than that of comparable areas in the wet tropics. However there is a high level of endemism in the smaller, less geographically mobile species such as insects.

An endemic species of frog (*Cophixalus mcdonaldi*) is recorded from the upland rainforest of Mt Elliot. Estuarine crocodiles *Crocodylus porosus* are present in estuaries and some fresh water swamps in the park.

The avifauna is particularly diverse, ranging from seabirds to birds of the rainforest. Several rainforest birds reach the southern limit of their distribution at Mt Elliot. Squatter pigeons, of which the southern sub-species is considered vulnerable, occur in the park.

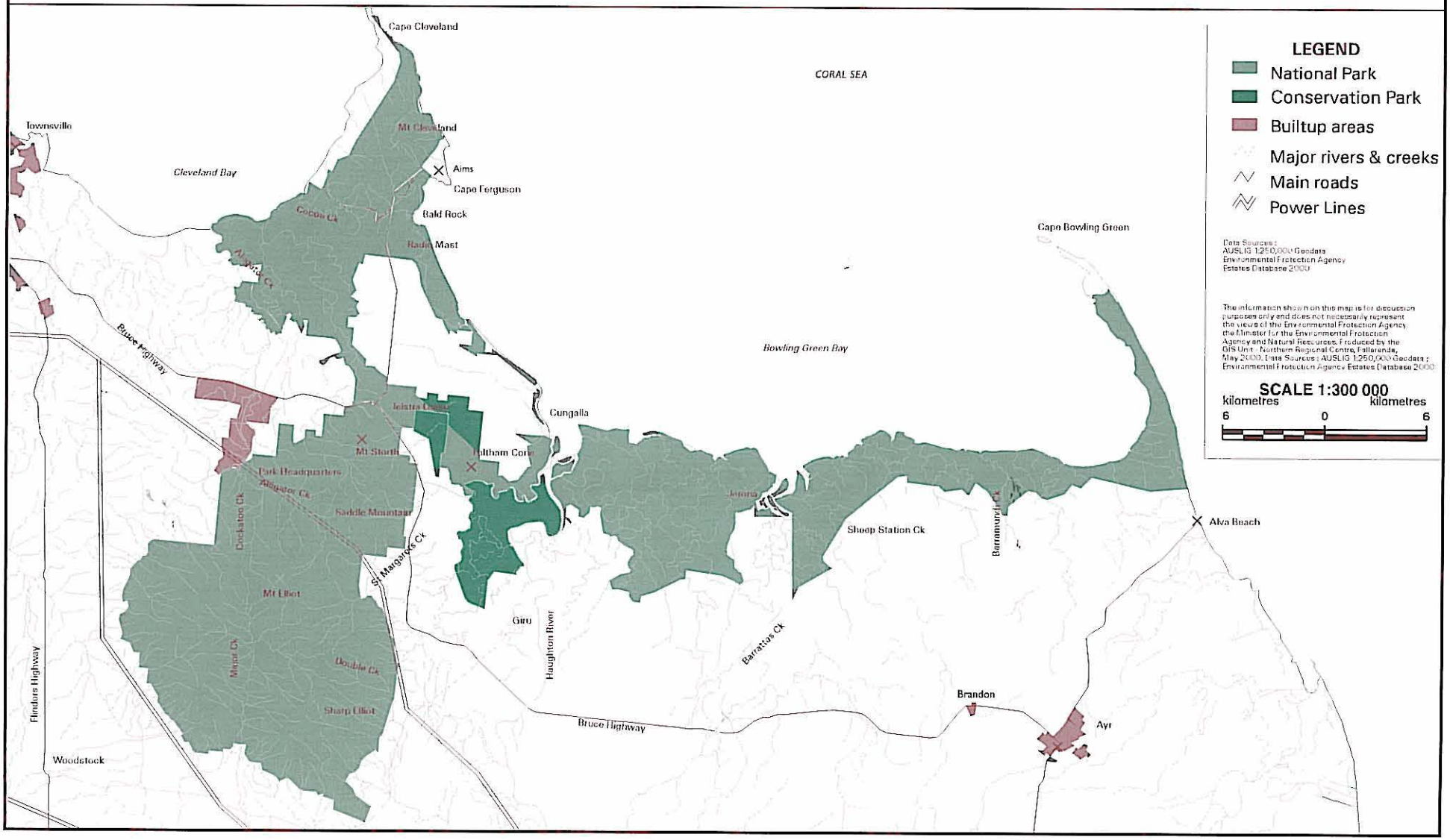
The Cape Bowling Green sand spit is significant regionally as there are no sand cays in the Central Section of the Great Barrier Reef and the sand spit provides a virtually identical habitat, which is used for nesting by turtles and for roosting and nesting by waders and sea birds.

The Mt Elliot rainforests do not support the same variety of mammals as the forests of the wet tropics. One northern species, the white tailed rat *Uromys caudimaculatus* reaches its southern limit at Mt Elliot and Cape Cleveland. The ever-increasing urbanisation and agricultural development in areas adjacent to

the park are making the park more valuable as a refuge for regional fauna. However it also results in impacts on park animals - for example the northern quoll *Dasyurus hallucatus* and the rufous bettong *Aepyprymnus rufescens* are now rarely seen at Alligator Creek where they were once relatively common. The rugged forested country of Cape Cleveland supports populations of the allied rock wallaby and the northern quoll.

There are substantial stocks of fish, including barramundi, and mud crabs in the mangrove and associated freshwater wetlands of the park. Some of the streams such as Barramundi Creek are breeding habitats for these sought-after species.

MAP 2 : BOWLING GREEN BAY NATIONAL PARK
PHYSICAL SETTINGS



3.5.4 Wetlands

The fresh and brackish water wetlands of Bowling Green Bay are recognised as being of international significance as habitats for waterfowl. This was recognised by the declaration of this area as a site under the Ramsar Convention. Large concentrations of brolgas, magpie geese and other waterbirds provide a spectacular sight at the end of the wet season as they congregate to feed on the tubers of the bulkuru sedge.

The wetlands are an important over-wintering site for about 30 bird species listed on international migratory bird agreements.

While similar wetlands occur along the central and north Queensland coast, few are protected in reserves and many face long-term problems from encroaching agricultural use and its side-effects, and this adds to the importance of the Bowling Green Bay National Park.

3.5.5 Landscape

Mt Elliot is the highest peak in the Townsville-Burdekin-Charters Towers area and dominates the landscape from many vantage points. Cape Cleveland is also a dominating feature of the coastline, particularly when viewed from Townsville. The two major features differ in their character with the rather dry slopes of Cape Cleveland contrasting with the densely forested eastern slopes of Mt Elliot. To the north-bound traveller on the highway, Mt Elliot is an outstanding feature after the previous 200km of flat country.

The landscapes of the wetlands and mangroves, while not so obvious to the casual observer, present a variety of sweeping, low-relief scenery, repeated in many coastal locations. But here the backdrop of the Mt Elliot Range makes for a particularly attractive scene. Cape Bowling Green is an interesting feature in that it is larger than most other sand spits on the coast, although this can only be appreciated from an elevated position.

Mt Elliot provides some creek and gorge scenery which is otherwise lacking in the Townsville-Burdekin region.

3.5.6 Water catchment

Mt Elliot is an important catchment for many of the streams in the Townsville-Giru area, including some streams flowing into the Ross River Dam. The dam is the major water supply for Townsville. The upper catchments of Major, Walker, Double and Spring Creeks are contained wholly in the park and provide water for small crop farms and orchards outside the park. These streams eventually flow into the Haughton River which services a large sugar cane growing area. The catchments of Palm, St Margaret, Emmett and Mackenzie Creeks feed the Cromarty wetlands. The water from Alligator Creek is used by small crop farms and orchards. All of these streams play an important role in maintaining ground-water levels and the wetlands of the Bowling Green Bay area.

3.5.7 Cultural heritage

The Bindal people have lodged a native title claim application over an area that includes Bowling Green Bay National Park. The area now included in the Bowling Green Bay National Park supported a vigorous Aboriginal population who made use of the freshwater wetlands, coastal and marine resources and the moist inland environments of the Mt Elliot foothills. The area had important cultural and spiritual significance for them, and it is now important to their descendants.

As well as the tangible evidence such as paintings, rock shelters and middens, there is the written evidence of James Morrill who lived with the local indigenous people before the area was settled. He was able to provide a better insight into the lifestyle of the local indigenous people than has been possible in many other areas.

Several rock art sites are known in the Mt Elliot and Cape Cleveland areas. These vary in condition and none are extensive as most consist of one or two shields painted on the sheltered faces of rock overhangs. Some of these sites have been damaged, but it seems probable that others have yet to be recorded.

Two war-time plane wrecks occur in the park. There is a Mosquito Bomber on Saddle Mountain and a Hudson Bomber in the salt flats near Cape Cleveland. Such wrecks have an increasing historical value. There is a chance that such wrecks will be vandalised or that parts will be removed by souvenir hunters. A propeller from the Saddle Mountain crash site was removed some years ago.

The site of an old homestead near Cape Cleveland is now marked only by some mango and tamarind trees and a few ruins. The setting of the site has some historical value and it is possible that artefacts of value may exist there. A more recent site is on Alligator Creek some distance upstream from its junction with Cockatoo Creek. A farm was occupied here before the Second World War and some items of machinery and other things remain. It is unclear how much historical value this site has.

3.5.8 Recreation

Bowling Green Bay National Park is situated on the doorstep of the cities of Townsville and Thuringowa. The densely populated agricultural centres of Ayr and Home Hill are also nearby, providing a total population base of about 140 000 people. As there are few other freshwater creek recreation opportunities in the region, much attention is focussed on the Mt Elliot area, particularly on Alligator Creek where there are many rock pools and other attractions such as a picnic and camping ground. The presence of marine stingers in coastal waters in the summer months and of crocodiles in the larger streams and lagoons, places a demand on natural rock pools for recreational use by the local population. Suitable locations for this are very scarce in the Townsville-Burdekin region.

Annual visitor numbers to the park are about 65 000, and 60 000 of these use Alligator Creek. This extremely heavy use of Alligator Creek occurs largely in summer and is concentrated on weekends and holidays. The other park visitors are mostly fishers and bushwalkers. A few recreational users visit St Margaret's Creek and Double Creek, but the only access to these locations is through private property. For some time a low key tourist operation was conducted at Pangola Park, situated on the access to Double Creek. Currently a small resort, Mountain View Lake Holiday Park, has opened near the park, providing access to the St Margaret's Creek area.

The major recreational pursuits are swimming, bushwalking, camping, picnicking, nature study, and fishing in marine estuaries.

3.5.9 Tourism

Tourism provides an increasing part of park use. Of 4875 campers in 1994, 18.5 percent were from overseas, 28.2 percent were from interstate and 26 percent from areas beyond the Townsville-Burdekin region of Queensland. The most common reasons given for visiting the park were viewing the landscape and the flora and fauna. Much of the tourist use occurs in the winter months which fortunately avoids clashes with the heavy day-use by local visitors on weekends in summer. However there is an increasing trend for international tourists, in particular backpackers, to visit at all times of the year.

3.5.10 Education and interpretation

Fifteen to twenty schools use the park each year for environmental studies. Alligator Creek is popular with primary schools who view it as a safe camping area. Secondary schools use the park for more detailed studies and may camp in other locations such as St Margaret's Creek.

The high visitor numbers at Alligator Creek provides interpretation opportunities.

3.5.11 Research and scientific values

Staff of the Australian Institute of Marine Science and James Cook University frequently use the park for research projects, as it is conveniently located for both institutions and has a diverse array of habitats.

4 Management strategies

Background

This part of the management plan sets out the proposed strategies and actions which will be required to achieve the purposes of management previously listed. It consists of seven sections and each deals with an aspect of park management.

Proposed outcomes and actions are set in the framework of the zoning plan which allows any future proposals, not specifically covered by this plan, to be considered in the context of desired zone settings. The zoning plan also specifies where certain uses are permitted.

Detailed management strategies for the Ramsar Site will be developed as required for an International Agreement Area under the *Nature Conservation Act 1992*. During the formation of the Ramsar site plan, care will be taken to ensure that the two plans are integrated and compatible. In this plan indicators have not been developed to monitor the effect of the management strategies and actions proposed, except in a few critical areas. Detailed monitoring plans will be developed as an action plan subsequent to the completion of this plan.

4.1 Zoning plan

Bowling Green Bay National Park has been divided into four zones to provide broad guidelines for use and management of the area and to minimise existing and potential conflicts between user activities and uses (see Map 3 and Table 2). The zones are based on the obligations, the identified natural and cultural values, the threats to these values, current and potential recreational use and the desired management of this use. *The zoning plan is not a statutory part of the management plan but it represents guidelines for* decision making on future development and use applications.

MAP 3 : BOWLING GREEN BAY NATIONAL PARK MANAGEMENT ZONES

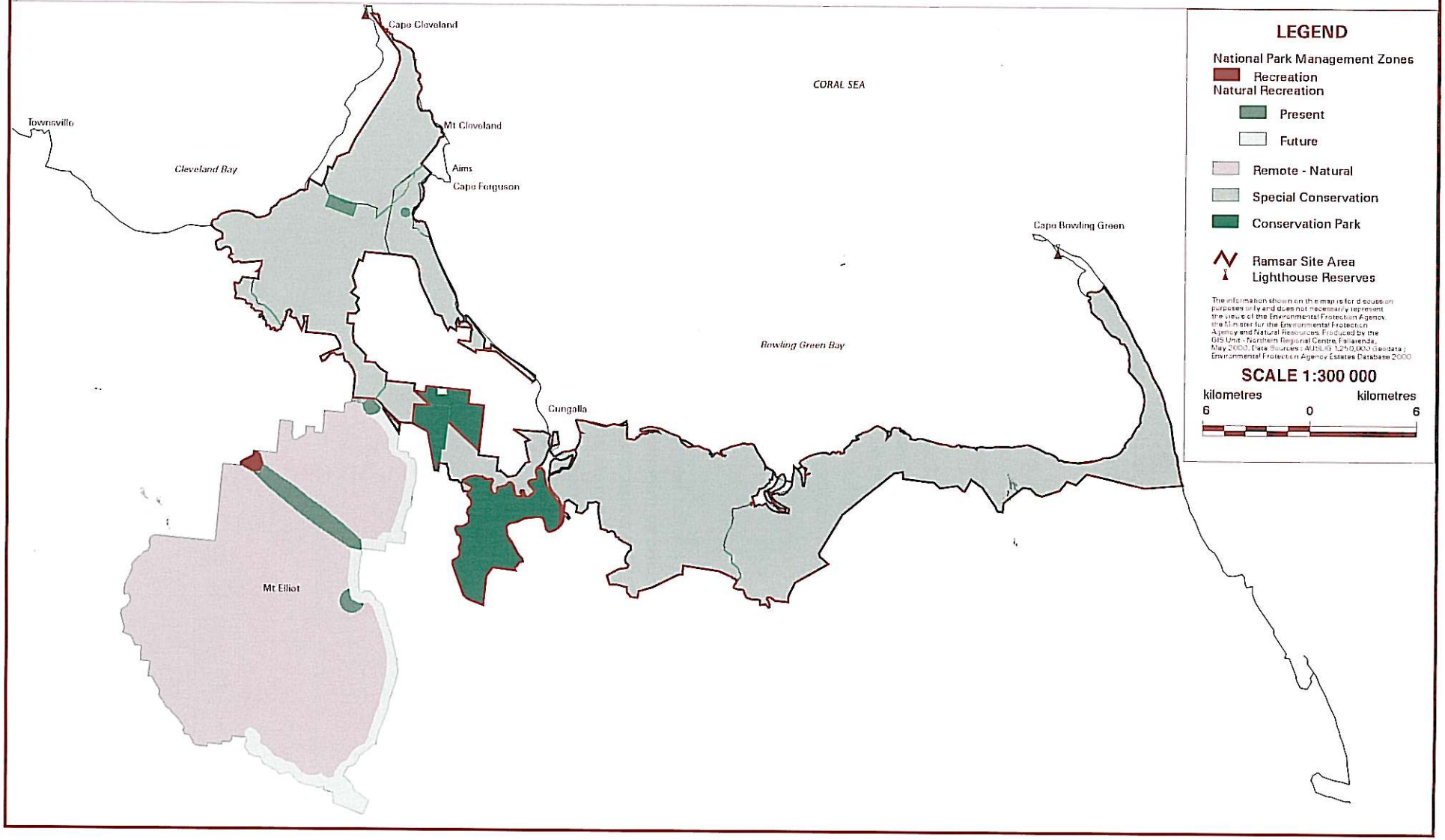


Table 1 Zoning plan

Recreation zone This zone comprises the existing developed area at Alligator Creek where there is an established recreational use involving camping, picnicking, swimming and bushwalking. This site has a history of use and this plan will maintain this level of use, any increase being subject to the master plan for the site which has been developed. In this zone moderate levels of activities such as those orientated to camping in a developed campground or walking on graded tracks will be provided for.	
Desired setting	Visitors in the recreation zone will have opportunities for nature-based recreational activities with a moderate level of facilities, in a natural setting. Commercial groups may be present on a regular basis and group sizes will vary from small to moderately large.
Purposes of management	To provide a recreational setting where visitors can experience nature-based activities in a natural environment which has been modified to provide basic comforts for visitors in camping and picnic areas. In these areas and along the tracks, contact between visitors will be frequent. To ensure the effects of visitor facilities and visitors on natural values are minimised. To provide opportunities for education and interpretation of the area's natural values and to promote responsible use of the area.
Guidelines for management	
Conservation	• Maintenance of the conservation values will be the major priority in this zone, but modification of the natural environment for visitor use in identified areas will occur.
Visitor use and recreation	• Opportunities will be provided for a range of nature-based recreation activities. • Use in some areas might be restricted to allow rehabilitation, or where there is a risk to public safety. • Limited commercially-operated recreational and tourist activities are appropriate in designated areas of this zone. • Interpretation will be given a high priority in this zone.
Facilities	• Recreational facilities in the form of toilets, picnic tables, shelter sheds, water supply, walking tracks, developed camping grounds and signs will be provided where appropriate.
Management activities	• Management presence will be frequent. • Prescribed burns will generally not be undertaken other than where they are needed for public safety or protection of facilities, or to manage ecological change. • Control of introduced plants and animals will be undertaken where practicable. • Rehabilitation works will be undertaken where required. • Research will be restricted to work which cannot be undertaken elsewhere, is of benefit to the management of the national park or of conservation in general, and where it does not compromise natural, cultural or recreational values.
Community infrastructure	• Any development shown to be essential for public safety and for which there is no other alternative might be approved subject to the Act.

Natural-recreation zone

The natural-recreation zone is intended to include those parts of the national park in which recreational use is at moderate levels and is catered for by means of tracks, trails and informal camping grounds.

This zone has been subdivided into two parts - the area currently zoned natural-recreation and an area zoned as future natural-recreation zone. The area zoned as future natural-recreation will be managed as remote-natural zone in the short term, but the developments set out below could be permitted there in the future.

Desired setting	In the natural-recreation zone visitors will have opportunities for self-reliant recreational activities in small groups in surroundings which are largely unmodified and predominantly natural. In some areas access by commercial operators will be available, but only for small groups. Visitors will be provided with only simple unobtrusive facilities such as tracks, trails and, in a few selected localities, toilets and picnic tables.
Purposes of management	To ensure that most human impact is concentrated within small designated areas and that the protection of nature is the predominant purpose over the remainder of the zone. To maintain recreational settings where visitors can experience nature-based activities in a natural environment with minimal evidence of previous use and with little contact with others.
Guidelines for management	
Conservation	• Maintenance of the conservation values will be the major priority in this zone. • Habitats will be managed (e.g. fire management, weed control) to ensure that natural values are maintained. • Control of introduced plants and animals will be undertaken where practicable.
Visitor use and recreation	• Opportunities will be provided for recreational activities in a remote setting. • Use in some areas will have to be restricted to reduce impact on fragile communities and to preserve the remote experience. • Areas where there are unacceptable environmental impacts or where there is a risk to public safety will be closed as required. • Limited commercially-operated recreational and tourist activities are appropriate in designated areas of this zone. Such operations will be characterised by small group sizes. • On-site interpretation will be limited to information necessary to prevent environmental degradation and for public safety.

Facilities	• Visitor facilities will be restricted to low-key recreational facilities provided at specific sites in the form of walking tracks and trails, informal camping areas and signs. Toilets will be provided where monitoring has revealed a potential health problem. Other structures will not be provided in this zone.
Management activities	• Management presence will be infrequent. • Prescribed burns will be undertaken where natural communities are reliant on fire and where pre-European fire regimes are not now operating. • Rehabilitation works will be undertaken where required. • Research will be restricted to work which cannot be undertaken elsewhere, and is of benefit to the management of the national park or of conservation in general.
Community infrastructure	• Any development shown to be essential for public safety and for which there is no other alternative might be approved subject to the Act. This would include transmission towers and radio antennae.

Remote-natural zone

Lack of easy access and rugged topography have maintained a large part of Bowling Green Bay National Park free of the effects of European civilisation. These natural barriers have limited concentrated use to a few sites, and will continue to do so in the future. This applies to most of the Mt Elliot section. Weeds and feral animals have penetrated the mountains, but despite this, these areas are sufficiently natural to be placed in the remote-natural zone.

Desired setting	Management in this zone will ensure that current levels of impact are not increased and that, given this constraint, opportunities are available for self-reliant, nature-based recreation in a completely natural environment with only a few localised indications of past use.
Purposes of management	To maintain an area of the national park where the protection of nature from significant human disturbance predominates. To maintain recreational settings where visitors can experience nature-based, self-reliant activities in a natural environment with little or no evidence of previous use, with little contact with others and with minimal impact on the environment.
Guidelines for management	
Conservation	• Maintenance of the conservation values will be the over-riding priority in this zone. • If necessary, the habitats will be managed (fire management, weed control) to ensure that natural values are maintained.
Visitor use and recreation	• Opportunities will be provided for self-reliant nature-based recreation with a high degree of isolation and solitude. • Limits on use in certain areas may be set to reduce impact on fragile communities and to preserve the amenity. • Areas where impacts are developing or where there is a risk to public safety will be closed as required. • Commercial activities will not be permitted in this zone. • No recreational or interpretive services will be provided in this zone.
Facilities	• No facilities will be provided
Management activities	• Prescribed fires will be used to maintain the existing mixture of vegetation types and to assist in public safety. • Opportunistic monitoring will be undertaken to determine the impacts of use. • Most visitor management will be carried out off-site by means of information sheets, videos and briefing sessions.
Community infrastructure	• Any development shown to be essential for public safety and for which there is no other alternative might be approved subject to the Act, although every effort will be made to find alternate locations. This would include transmission towers, radio antennae and power lines.

Special conservation zone
This zone is intended to provide the setting for the Ramsar site. It will include areas of wetland, both fresh and brackish, which are important to waterbirds. It is a habitat which has had some manipulation in terms of low dams, cattle grazing and the introduction of exotic pasture grasses and weeds.

Desired setting	In this zone the maintenance of the wetland habitat will be the over-riding consideration. It will be a largely natural setting, but may show evidence of manipulation where this is necessary to maintain the wetlands. Visitors will be able to experience a variety of nature-based experiences mostly related to waterbirds, ranging from intensive educational experiences to solitary or uncrowded bird watching.
Purposes of management	In the Bowling Green Bay section, to ensure the wetlands ecosystem is maintained. In the Cape Cleveland section, to maintain areas of the national park where the protection of nature from significant human disturbance predominates. To keep human impact to designated areas and to ensure the protection of the wetlands and other ecosystems in the remainder of the zone. To provide recreational settings where visitors can experience nature-based activities in either a developed or natural environment with minimal evidence of previous use and with little contact with others, and where visitors can learn about the values of the wetlands.
Guidelines for management	
Conservation	• Maintenance of the conservation values will be the over-riding priority in this zone. • If necessary, the habitats will be managed (fire management, weed control, drainage) to ensure that natural values are maintained.
Visitor use and recreation	• Opportunities will be provided for nature-based recreation (including recreational fishing) where this does not impact on the waterfowl habitat. • Interpretation will be given a high priority in this zone, but will not be allowed to compromise the scientific and conservation values of the zone. • Use in many areas will be restricted to reduce impact on fragile communities. • Areas where impacts are developing or where there is a risk to public safety will be closed as required. • Commercial activities may be permitted in this zone if they relate to the natural values of the area and have minimal impact.

Facilities	• Limited recreational facilities may be permitted in this zone. • Interpretive facilities relating to the wetland habitats may be developed.
Management activities	• Prescribed fires will be used to maintain the existing mixture of vegetation types and to assist in public safety where appropriate. • Activities such as the construction and maintenance of low dam walls may be permitted to ensure the survival of critical habitats. • Grazing by cattle may be carried out for ecological purposes including the control of exotic pasture grasses. • Regular monitoring will be undertaken to determine the impacts of use.
Community infrastructure	• Any development shown to be essential for public safety and for which there is no other alternative might be approved subject to the Act, although every effort will be made to find alternate locations. This would include transmission towers, radio antennae and power lines.

Table 2 Range of facilities, activities and other uses appropriate to the zones

Key: A = Generally acceptable
NA = Generally not acceptable

Activities / Facilities	Remote-natural zone	Special conservation zone	Natural-recreation zone	Recreation zone
Facilities				
Walking tracks	NA	A	A	A
Rough trails	A	A	A	NA
Roads	NA	A	NA	A
Camping grounds	NA	NA	A (bush camping only)	A
Picnic grounds	NA	A	NA	A
Interpretive centres	NA	A	NA	A
Interpretive signs	NA	A	A	A
Bird watching hides	NA	A	NA	A
Recreational activities				
Camping in a developed setting	NA	NA	NA	A
Bushcamping	A	NA	A	NA
Bushwalking	A	A	A	A
Walking on constructed tracks	NA	A	A	A
Picnicking	A	A	A	A
Hang gliding	NA	NA	A (one location only)	NA
Nature study	A	A	A	A
Private rock climbing and abseiling	A	A	A	A
Recreational fishing in coastal estuaries	A	A	-	-
Recreational fresh water fishing in streams to the east of the highway	-	A (with conditions)	-	-
Recreational fresh water fishing in streams to the west of the highway	NA	-	NA	NA
Motorised water sports	NA	NA	NA	NA
4 wheel driving on marked tracks	NA	A (only in designated areas)	A (only in designated areas)	-
Manipulation of environment				
Controlled burning	A	A	A	NA
Dams, levies etc for waterbird habitat	NA	A	NA	NA
Grazing (for ecological management only)	NA	A	NA	NA

Activities / Facilities	Remote-natural zone	Special conservation zone	Natural-recreation zone	Recreation zone
Education training activities and research				
School groups studying nature	NA	A	A	A
Education - study of water birds	NA	A	A	A
Adventure training	A (with conditions)	A (with conditions)	A	A
Armed forces excercises	A (with conditions)	NA	A	NA
Scientific research	A (with conditions)	A	A	A
Commercial use and public utilities				
Commercial grazing	NA	NA	NA	NA
New communication towers	NA (may be approved for public safety)	NA	NA (may be approved for public safety)	NA (may be approved for public safety)
New power lines	NA	NA	NA	NA
Organised commercial tours	NA	A	A (Small groups)	A
Commercial bushwalking tours	A (Small groups only)	A (Small groups only)	A (Small groups only)	A
Commercial rock climbing and abseiling tours	NA	NA	NA	A (school groups only)
Organised group activities (eg weddings, parties, etc)	NA	NA	NA	A

Zoning plan - location of zones (see map 3)

Remote-natural zone - all of the Mt Elliot section except those areas zoned natural-recreation or recreation will be in this zone.

Special conservation zone - Ramsar site - this includes all the Cape Cleveland and Bowling Green Bay sections with the exception of small areas near Bald Rock and Cocoa Creek which are zoned natural-recreation.

Natural-recreation zone
This zone has been subdivided into two parts - the area currently zoned natural-recreation and an area zoned as future natural-recreation zone

Present natural-recreation zone The zone follows the power line and walking track from park headquarters to the falls on Alligator Creek and to the east where the power line crosses the park boundary. At Bald Rock the zone will include an area 100m in diameter centred on the base of the rock. At Cocoa Creek the zone will include an area 100m across centred on the camping area and boat ramp. Also included are the Telstra lease and the nearby area from which hang gliders are launched and an area 50m wide along both banks of St Margaret's Creek 500m into the park from the park boundary.

Future natural-recreation zone In the short term at least, this area will be managed as remote-natural zone, but in the future parts may be changed to natural-recreation if access problems are resolved and impact studies indicate that some development of facilities would be appropriate. This will include a narrow strip of land along the eastern and south-eastern margin of the Mt Elliot section from the Telstra lease including Emmett Creek, Spring Creek, Double Creek to Major Creek. This will be 400m wide, however any development which occurs in the future will be limited to small, discrete areas. This zone will also act as a buffer between the remote-natural zone and the adjacent grazing and agricultural land. It includes all the possible sites for any future development of facilities, however this zoning will ensure that these are simple facilities only. It also includes the part of the park that fringes the Bruce Highway.

Recreation zone at Alligator Creek picnic area.

Non-conforming uses
There are three cases where public infrastructure is present in the above zones. These are:
- the lease to a radio station at Cape Cleveland (Special conservation zone);
- the water pipe line to Cungulla (Special conservation zone); and
- the power line along the valley of Alligator Creek (Natural-recreation zone).

These will be regarded as non-conforming uses and the zones will not be modified to accommodate them. Other cases which may come to light in the future should be similarly regarded, unless there is a recreational or educational component to their use.

4.2 Management of natural resources

4.2.1 Habitats (Geology and landforms, plants and plant communities, native animals and habitats)

Background Information

The primary value of Bowling Green Bay National Park lies in its diversity of natural habitats. These values have been listed in detail in a previous section of this plan.

The park presents an excellent opportunity for preservation of a sample of many vegetation types ranging from mountain top rainforests to mangroves and freshwater wetlands. In common with many

areas of coastal Queensland, the vegetation patterns in upland parts of the park show some evidence of change. This relates to a change in the frequency and timing of fire from previous Aboriginal burning regimes. This change may be reversing patterns thousands of years old in the space of a few decades and could result in the loss of diversity.

The Bowling Green Bay wetlands offer an opportunity to preserve a breeding and feeding habitat for a diverse array of waterfowl. The upland parts of Mt Elliot are important as they are part of a chain of rainforest remnants or stepping stones which allow the migration and evolution of rainforest plants and animals along the east coast of Australia. The summit rainforests are also a refuge area where species can survive periods of low rainfall. The permanent streams of Mt Elliot are popular with recreational users and this use is likely to grow as the Townsville-Thuringowa region expands. This will put added pressure on the few suitable sites and may well lead to a need to control visitor numbers or harden sites in the future.

Desired outcomes

The composition and distribution of the area's natural communities and species are maintained subject to natural change.

Visitor awareness of the area's natural values and of their impact on these values, is increased.

Negative human impacts are minimised and contained within sustainable levels.

Knowledge of the natural ecosystems of the area is increased.

Proposed guidelines and actions

(Note that several actions relevant to this section appear in subsequent sections.)

- Vegetation surveys consisting of comparisons of aerial photography or satellite images will be undertaken at regular intervals to detect any changes in vegetation patterns.
- Research into the park's flora and fauna will be encouraged.

4.2.2 Wetlands

Background information

The fresh and brackish wetlands of Bowling Green Bay and Cape Cleveland areas are of international significance as is shown by the declaration of the area as a Ramsar site. Most of the streams which supply water to the wetlands flow through private land before entering the park. This results in there being no absolute control over the quality of water flowing into the wetlands. Water passes through various combinations of grazing land, agricultural land and urban areas. Present indications are that this has caused few visible problems, but little monitoring of water quality has occurred and undetected problems may well be present. There are some weed species such as para grass and others which out-compete native species and may eventually cause the accumulation of silt in the swamps. Some control can be achieved over adjacent land by negotiating a co-ordinated conservation area over such properties. A co-ordinated conservation area is subject to one or more voluntary conservation agreements and can be very effective, providing landholders are sympathetic to the aims of management of the area.

In much of the wetland areas there has been continued cattle grazing under permit and this has kept the para grass problem under control. However, this ceased on the expiry of the permits in 1996. There has also been some modification of the habitat by the grazing industry including the building of low dams which enhance the freshwater areas and prevent salt intrusion. This practice interrupts the natural processes of the salt/fresh water balance, but can assist in the maintenance of freshwater swamps. It may be acceptable where the natural process has previously been compromised by other artificial factors such as the introduction of para grass. Artificial wetlands may also be justifiable on a national park if the natural wetlands in adjacent areas are being seriously degraded.

The freshwater swamps are a dynamic and finely balanced environment. Alterations of a few centimetres in water levels can cause sweeping habitat changes. Small changes in water nutrient levels and chemistry can affect the feeding and breeding of water birds. For these reasons it will be important to monitor the condition of the wetlands. Such a monitoring plan is required under the Ramsar Convention.

Desired outcomes

The critical parameters of the wetland habitat are monitored to detect any changes likely to degrade the wetlands.

If any potentially negative changes are detected, appropriate actions are devised to correct them.

Efforts are made to obtain the voluntary co-operation of neighbouring landholders to limit the quantities of pollutants in water draining into the park.

Damaging introduced species are controlled.

Proposed guidelines and actions

- Prepare a management plan for the Ramsar site as required by the Convention on Wetlands of International Importance and the *Nature Conservation Act (1992)* for an International Agreement Area.
- In the interim evaluate options to allow controlled grazing to continue on the wetland areas, for control of introduced grasses only (see section 4.2.5 Introduced plants and section 4.9 Grazing).
- In the interim, continue current management practices and ensure that no actions are taken which could have a detrimental effect on the wetlands.
- Consider negotiating a Co-ordinated Conservation Area over the Ramsar site and adjacent privately owned land.
- Seek to obtain the co-operation of adjoining landholders in conserving wetlands through Integrated Catchment Management and Landcare groups and through providing advice whenever possible.
- Encourage relevant research by institutions such as AIMS, CSIRO and JCU to establish existing threats to the wetlands and develop methods of dealing with them.
- Develop a program to monitor the essential parameters of the wetland habitat.
- If the plan developed for the Ramsar site identifies any shortcomings in this plan, then this plan will be amended.

4.2.3 Landscape

Background information

The landscape values of the park are considerable, and may increase as the Townsville-Thuringowa region becomes more urbanised and industrialised. Most prominent features in the region support telecommunication and radar towers (e.g. Castle Hill, Mt Stuart). Mt Elliot and Cape Cleveland at present are free from these visual intrusions, and previous requests to place towers on both these peaks were denied.

Desired outcomes

The landscapes of the park remain free of visual intrusions.

Proposed guidelines and actions

- Facilities such as toilets, signs and other structures will be managed in accordance with the zoning plan (see section 4) and will be designed to have minimal impact on landscape values.

- Any proposals likely to cause erosion scars, or where visible structures are to be placed on park mountains, will be rejected. This includes roads, television towers, radio antennae, power lines, cable cars and the like. Exceptions may be made where it can be shown that the development is essential to public safety and there is no feasible alternative.
- In the event that a development is approved under these guidelines, it must be constructed in a manner which minimises impacts, including visual impacts.

4.2.4 Fire

Background information

Fire management is the most valuable and complex tool for managing natural resources within Bowling Green Bay National Park. The park contains 10 vegetation communities which are dependent on fire (pyrophyllic) and 7 that are fire sensitive. The pyrophyllic communities cover 71.6 percent of the park and include eucalypt woodlands and forests, melaleuca forests, grassland and sedgeland. The fire sensitive communities cover 28.4 percent of the park, and include mangroves, casuarina forests and rainforests.

A range of issues and factors are considered when determining appropriate fire management within the park. Highest priority is given to the protection of human life and property. The park adjoins about 200 private properties, contains a camping ground with associated buildings, a Telstra microwave station and radio transmitting towers. All of these areas require protection from damage caused by high intensity fires.

The preservation of cultural sites is an important fire management objective. Section 4.3 of this plan discusses the management of cultural heritage within the park. A combination of fire exclusion and low intensity fire protection burns are used to safeguard sensitive cultural sites.

The maintenance of biological diversity is another important park management objective that is aided by appropriate fire management. Providing a variation in fire frequency, season and intensity is important for producing a mosaic landscape. A mosaic landscape has been shown to be the most appropriate method for managing wildlife in flammable habitats. Variations in fire frequency, season and intensity have each been shown to affect plant species composition in Australian vegetation.

The influence of fire on the stimulation of seed germination in a wide range of Australian species is well demonstrated. The seeds of many plants remain dormant in the soil or in protective fruit until broken by the passage of fire. Seed germination has been shown to be enhanced by the individual effects of heat, smoke and nitrogenous compounds associated with soil chemistry changes after fire. The physical removal of plant material during a fire, allowing light to reach the soil surface, also enables a pulse of seed germination in the post-fire environment.

The eucalypt and melaleuca woodlands and forests of Bowling Green Bay National Park contain a wide range of fauna and flora, each responding in subtly different ways to fire. Most plant species are capable of resprouting after being scorched in a fire. The seeds of a fire-killed species typically germinate soon after a fire.

Fire management can assist in the control of several woody weeds. Rubber vine in particular is fire sensitive, but a series of fires can be used to maintain low densities of other weeds such as lantana.

A fire management plan for Bowling Green Bay National Park is updated annually. The plan contains details of fire management objectives, including specific aims for each habitat, the proposed burning program for the upcoming year, details of fire sensitive sites, and wildfire response procedures. Approximately 40km of fire breaks are maintained throughout the park.

Fire management research and monitoring is carried out by QPWS, with various projects assisted by James Cook University. Fire management techniques are knowledge-based, with on-going assessment of operations used as a basis for refining further actions.

Desired outcomes

Biodiversity of the park is maintained.

The incidence of wildfires is reduced.

Risk to life and property is reduced.

Weed control is enhanced by appropriate fire management.

Community understanding of the role of fire as an effective tool for the management of national parks is enhanced.

Proposed guidelines and actions

- The fire management plan will be reviewed annually.
- Good neighbour relations will be maintained to ensure effective management of boundary fire issues.
- Monitoring of the implications of fire management within various habitats will be maintained.
- Increased effort will be put into undertaking and encouraging research into appropriate fire management for fauna and flora.
- Every opportunity will be taken to promote community understanding of the role of fire as an effective tool for national park management.

4.2.5 Introduced plants

Background information

Many weeds have become established in the park. There are major occurrences of rubber vine in the coastal areas and lantana on the mountainous parts. Para grass is a problem in some freshwater swamps as it can out-compete native species, leaving the wetlands unsuitable for waterbirds. The pasture grass, *Hymenachne amplexicaulis* has not yet been recorded in the park, but is on the park boundaries. Because it can invade deeper water than para grass, it has the potential to cause serious problems in the wetlands in the future.

Open forests on sand in the Cape Cleveland area are particularly susceptible to weed invasion. Weed control in the mountainous parts of the park is virtually impossible except by the use of hot fires at a critical stage in the plant's life cycle. Other weeds including Chinee apple occur sporadically and some of these have the potential to become a problem.

Desired outcomes

Introduced plants do not significantly degrade the values of the wetland areas.

Weed infestations are restricted to an acceptable level in non-wetland parts of the park.

No new weed species become established in the park.

Proposed guidelines and actions

- Weed outbreaks will be monitored, with particular emphasis on the wetlands.
- Monitor wetlands for the appearance of *Hymenachne amplexicaulis* and take immediate action to eradicate if discovered.
- Take all necessary and feasible steps to remove weeds from non-wetland areas of the park.
- Cattle may be used under strict guidelines to control para grass in some wetland areas.

- Fire will be used to control lantana where feasible. Where fire is used it will be followed up where feasible with herbicides.
- Priority will be given to controlling rubber vine in low lying parts of the park.
- No non-native plants will be planted on the park. Fruit trees and other garden plants will be acceptable at the ranger's residence, provided that species likely to establish in the wild are not grown.

4.2.6 Introduced animals

Background information

Large numbers of pigs live in virtually all parts of the park, from the mangroves to the mountain summit. Pigs may destroy some turtle nests within the Cape Bowling Green Bay area. Control is extremely difficult, given the rugged nature of the mountainous landscape and the inaccessible nature of the mangroves and coastal swamps. If pigs are successfully removed from one area, they quickly recolonise it from adjacent areas. Therefore trapping, shooting and poisoning campaigns are usually little more than a cosmetic approach. Despite many years of research no practical method of pig control in rugged terrain has been developed.

Despite this, it is important that the Service attempts to control pigs in particularly sensitive areas such as wetlands, turtle nesting areas and around park boundaries where they can be a problem for neighbours.

There have been reports of foxes on the eastern Bowling Green Bay foreshores. Foxes are known predators of birds and turtles.

Wild horses are also present in the open forests of Mt Elliot. These are currently a minor problem, but have the potential to cause significant problems if not controlled.

Cane toads are present in all but marine parts of the park. No controls are known which will reduce numbers significantly. They are an obvious problem as they compete with native animals for food.

Desired outcomes

Pig numbers in wetland areas and around the margins of the park are reduced.

Feral pigs and foxes have no impact on turtle nesting on the park.

Wild horse numbers are reduced where feasible.

No new feral animals are introduced into the park.

Proposed guidelines and actions

- An action plan for feral animal control will be compiled.
- In the interim pig numbers will be reduced around the boundary of the park and in wetland areas by trapping and opportunistic shooting.
- Baiting will be used only in defined areas and extreme care will be taken to avoid death of non-target species.
- Wild horses will be controlled by mustering if feasible, otherwise opportunistic shooting will be carried out.
- Care will be taken to ensure that no new feral animals are introduced to the park.
- Monitor the impact of feral pigs and foxes on turtle nesting in the park and undertake control measures as necessary.

4.3 Native title

Background information

The Bindal people have lodged a native title claim application over an area which includes Bowling Green Bay National Park.

Desired outcomes

Any native title rights which may exist over this national park are not adversely affected by this management plan.

Aboriginal people with a particular interest in the area are involved in decision making concerning matters in which they have an interest.

Guidelines and actions

- Consult with relevant Aboriginal people to establish principles and guidelines to co-operative management of native title, cultural heritage and other issues.
- Work programs and management activities will consider the requirements of native title legislation to ensure native title rights are not compromised.

4.4 Management of cultural heritage

Background information

A reasonable record of the original lifestyle of Aboriginal people in the area is available through the recollections of James Morrill who lived with the Aborigines for 17 years from 1846. This was before Europeans settled in the area. His reminiscences could be developed into an interesting interpretive program, providing an insight into the lifestyle of the original inhabitants.

The indigenous people who originally lived in the area left little tangible evidence of their lifestyle. There are some paintings, middens and a few artefacts. Some of these paintings have been vandalised, but most are protected because their locations are not generally known. It will be important to ensure that these are not damaged through vandalism or ignorance of their significance. The advice and assistance of Aboriginal people will be sought for the maintenance of these sites. It is not immediately clear whether any of these sites should be open to the public.

European history is not a prominent feature of this park. There are two wartime plane crash sites present - a Mosquito bomber on Saddle Mountain and a Hudson bomber on the salt flats near Cape Cleveland. Both are valuable and require some protection from souvenir hunters. The only existing evidence of an old homestead site near Cape Cleveland, are some mango and other ornamental trees.

Desired outcomes

Places of cultural heritage significance, of Aboriginal and non-Aboriginal origin are protected from active and passive disturbance by visitors, unwanted effects of management activities, feral animals and where practicable, natural processes (in accordance with the principles of the Burra Charter).

The interests of Aboriginal communities are reflected in the management of cultural resources.

No management actions are taken which detract from the park's cultural and spiritual significance to indigenous people.

Knowledge and understanding of heritage resource are increased.

The wartime plane wrecks and the old homestead site are not vandalised.

Proposed guidelines and actions

- Encourage indigenous people with links to the area to renew their association with the national park.
- Liaise with relevant Aboriginal groups when undertaking works which have a cultural heritage component or which have an impact on cultural heritage places.
- Ensure that public use does not damage cultural sites, in particular the rock paintings.
- Encourage research into cultural heritage in order to improve understanding of the nature and distribution of cultural materials.
- Interpret cultural resources in accordance with the wishes of the Aboriginal people and the findings of research projects. Where ever possible involve Aboriginal people in on-site interpretive activities.
- Train staff in the recognition of cultural heritage places.
- Undertake monitoring of sites to an appropriate level and take appropriate action if threats to the sites are discovered.
- Do not publicise the plane wrecks or allow any relics to be removed without a permit.

4.5 Management of recreation and tourism

4.5.1 Visitor use

Background information

Bowling Green Bay National Park offers the visitor a cool relaxing natural setting at Alligator Creek, in largely unspoilt surroundings. It also provides creek scenery at a few other locations such as St Margaret's and Double Creeks, but use of these areas is limited by a lack of dedicated access to them. Visitors can also enjoy spectacular waterfowl and wetland experiences in the Bowling Green Bay area. The estuaries of Bowling Green Bay and the Cape Cleveland area are popular for recreational fishing.

This park provides one of the few relatively good areas for nature-based recreation near Townsville and visitor pressure in one or two areas is very high. This pressure is almost certain to grow as the population of the Townsville-Burdekin region expands. Rugged topography protects much of the park from overuse, but the lowland creek sections are vulnerable as they are limited in extent and support some vulnerable habitat types. Demands for use are likely to increase beyond the sustainable capacity of ecosystems and the point may be reached where the quality of visitor experience is threatened.

A significant proportion of visitors are not interested in the natural history of the area and see the park as a freshwater recreation site only. This is a problem and in the past it has lead to unacceptable behaviour and disruption to other visitor groups.

Current use patterns are for very heavy use at Alligator Creek and minimal use elsewhere. Of the 65 000 average annual visits to the park, 60 000 are at Alligator Creek. Useable flat land is limited at Alligator Creek and overcrowding is likely if measures are not taken to find alternatives, or to limit visitor demand. Whether this level of use is acceptable, or whether another site (if a suitable one exists) should be opened for public use, is a significant issue in terms of future management of this park. However there is no suitable access to the most likely alternate sites and the cost of acquiring land for this purpose is likely to rule out this option in the foreseeable future.

Tourism is increasing in the park with almost three-quarters of campers coming from areas other than the Townsville-Burdekin region. Commercial tours account for a small percentage of park visitors at present, but this could increase in the future. The proposed wetland interpretive centre on private land at Cromarty will result in an increase in commercial tours to the park if it is established. It will be vital

to maintain good communications with tour operators, to keep them informed of all relevant matters and to provide information on flora and fauna.

There is a walking track of about 8km to Alligator Falls. This is one of the few tracks available in the Townsville region and it receives moderate use from bushwalkers who do day or overnight trips to the falls. The track follows the power transmission line for part of the way and this is a minor detraction from the overall experience. Many walkers follow the track to the junction of Cockatoo Creek which is about two kilometres from the parking area. Other more adventurous walkers scramble up Cockatoo Creek for varying distances, enjoying the gallery rainforest and the small falls and creek scenery.

At Double and St Margaret's Creeks ad hoc trails along the creek banks lead to falls and creek bank features. At both locations private landholders adjacent to the park run (or have run) small resorts. Close consultation between park management and the owners of any such operations will be needed to ensure that the resulting use and pressure on the park is at an acceptable level.

The Mt Elliot section of the park is used by bushwalkers who climb to the summit or walk over the saddle between Cockatoo and Major Creeks, camping out for one to three nights. Such use is not heavy and poses few environmental problems. The terrain is rugged, with no marked trails, making this part of the park suited to experienced and fit walkers only.

The Bald Rock area in the Cape Cleveland section supports low level fishing and camping. This has resulted in the development of informal vehicle tracks around the rock on the salt flats and a tendency for new tracks to develop as old ones become boggy or rough. Some informal camping also occurs at this point, and people climb Bald Rock to see the outstanding views of the wetlands. This is an area which could be developed in a low-key way for interpretive purposes.

There is a moderate amount of use at Cocoa Creek, where there are rough, informal boat ramps and some bush camping occurs. The access road crosses salt flats and becomes boggy after wet weather and is also very rough.

There are other rough bush tracks, such as one to an area on the east side of Cape Cleveland, known as "Blacksoil". Use of such tracks may be acceptable while it is at low levels, but if usage becomes higher, the impact becomes unacceptable as new tracks are pushed through the bush to avoid boggy areas or fallen trees.

Other opportunities for 4WD and walking tracks may exist at Cape Cleveland, although the rugged nature of the Cape, its inhospitable environment, and the problem of access which is dominated by the AIMS facility, makes this a difficult proposition.

There has been moderately heavy use of the Cape Bowling Green sand spit by fishers who gain access by boat or by beach buggies from Alva Beach. This use has the potential to disrupt turtle and sea bird breeding. Some illegal structures have been erected.

Off-road vehicles have caused damage to foredunes near Cungulla and at Cape Bowling Green and on the salt flat. Such activity is illegal in national parks unless a permit is issued. It is unlikely that permits would be issued for this type of use in such fragile areas. A rough track runs north from Cungulla behind the beach dunes.

There is regular use of the Mt Storth area by the Townsville Hang Gliding Association. This is done with the permission of Telstra who have the lease on a repeater tower and road access on the eastern side of Mt Storth, and with the approval of other authorities such as Civil Aviation Authority and Queensland Department of Transport.

Rock climbing is not a major activity in the park as there are better, more accessible sites outside the area (such as Mt Stuart). Rock climbing currently occurs privately by individuals and small groups. There are no permits for commercial or organised groups to use any rock faces in the park, with the exception of some schools who use a small rock face near the Alligator Creek picnic area for training.

Desired outcomes

Visitor use is managed so that it is ecologically sustainable.

Conflicts between different user groups are avoided.

Visitors are aware of the park values and of the code of acceptable behaviour required for national parks.

The development of a diversity of well-managed nature-based recreational opportunities for visitors to the Bowling Green Bay National Park is encouraged.

Proposed guidelines and actions

Alligator Creek

- A long-term development plan has been prepared for the Alligator Creek area and this will be the basis of future development.
- The strategy for the short to medium term will be to continue to concentrate visitor use at Alligator Creek. The lack of access to potentially suitable sites, and the cost of establishing any facilities at another location, effectively constrains any other strategy.
- The number of day visitors which can be accommodated at Alligator Creek is finite. The Development Plan controls this by placing a limit on the number of parking spaces provided. This is set at 105 with 81 provided in the main day-use area and 24 in the area between the park boundary and the Ranger's Residence. With an average of four people per car this will give a maximum of about 420 at one time.
- Two camping areas will be provided. One for private visitors will include 26 sites, while one for large commercial groups will have a capacity of 50 people. These will be separated from day-use areas and will have separate facilities.
- The gates to the Alligator Creek camping and picnic area will be locked each night to minimise unacceptable behaviour.
- As a separate project, the possibility of developing other walking tracks in the vicinity of Alligator Creek will be investigated.
- When finances allow, the existing track to the Alligator Creek Falls will be re-routed to avoid following the power lines.

Private resorts adjoining the park

- Consult regularly with owners of resorts on land adjoining the park to ensure that their use of the park is of an acceptable level and type.
- Where adjacent resort owners request facilities on the park, these should either be freely accessible to the public or, if this is not possible due to lack of access, they should be funded by the resort, but built to QPWS standards and become the property of the Service.

Cape Bowling Green sand spit

- No vehicles will be permitted on the national park and warning signs to this effect will be erected.
- It is recommended that the beach in the adjacent State marine park is also managed to exclude vehicles. This issue should be examined and vehicles either banned totally, or banned during sensitive times of the year when nesting is occurring.
- All illegal structures on the national park will be removed using the proper procedures.

- It is recommended that any illegal structures on the lighthouse reserve also be removed. If this area is added to the park, as proposed, it should be managed in a similar manner to the adjacent park, giving highest priority to protecting nesting and roosting sea birds and turtles from disturbance.
- Develop a communications strategy to inform the public of the above decisions.

Bald Rock

- The use of the Bald Rock area will be reviewed. The existing track will be closed to vehicles as its impact is clearly unacceptable. The alternatives of (a) providing an alternative road on higher ground or (b) limiting access to a walking track only or (c) closing the area entirely will be assessed.
- If access is permitted to Bald Rock, a sign warning of the dangers of climbing the rock will be installed as a high priority.

Cocoa Creek

- The road to Cocoa Creek will be upgraded as resources permit and simple bush camping facilities will be provided.

Off-road vehicles

- Erect warning signs at the foredunes at Cungulla advising that it is an offence to drive on the dunes.
- Prepare an action plan for the management of off-road vehicles. Considerations will include warning signs, closure of roads where the impact is not sustainable, and provision of constructed roads where appropriate.

Creeks on the eastern side of Mt Elliot

- As a long-term strategy, the provision of access to the park at key sites such as Double, Major and St Margaret's Creeks will be considered. Such sites will be developed only if there is access and suitable attractions for recreational use, and an assessment of potential impact has been carried out.

Long distance bushwalking

- Long-distance bushwalking will be permitted, but will not be given prominence as a major opportunity on the park.
- No long-distance trails will be developed in the Mt Elliot section in the short term.
- The possibility of a long-distance trail to the Cape Cleveland lighthouse from AIMS will be examined.
- All long-distance walkers will be required to provide details of proposed trips by filling out a remote area bushwalking registration form (see 4.5.4).
- Any park literature which mentions bushwalking off marked tracks will emphasise that the park is suited to fit, experienced walkers only.
- Maximum group size for off-track bushwalking will be six. Exceptions may be made for school or other educational groups where a larger size may be permitted at the discretion of the Ranger-in-Charge.

Hang gliding

- Hang gliding at Mt Storth will be assessed. This assessment will include the impact on the site (including the possible provision of launching facilities and access), the approval of Telstra who hold the lease covering the access road and the approval of Department of Transport concerning safety issues involved with the road and railway line.
- If this assessment recommends the continuation of hang gliding at the site, hang gliding in the Mt Storth area will be declared a special activity and a regulatory notice to this effect will be erected in a suitable location at or near the telecommunications tower. Organisations or persons wishing to hang glide from this area will then be required to obtain a Special Activities Permit which will be reviewed annually.

- Vehicles to retrieve hang gliders will not be permitted on the salt flats.
- Hang gliding will not be permitted in other parts of the park.

Rock climbing

- Rock climbing by private individuals will be monitored. As long as it remains at a low level, no controls will be put in place. If it approaches levels where there is significant impact or clashes with other users, this will be reviewed.
- The placement of anchor points, bolts, hangers, or other artificial modifications to rock faces will not be permitted.
- Commercial tours involving rock climbing and/or abseiling will not be approved, except for educational institutions who use a small rock face at Alligator creek for training.

4.5.2 Access

Background information

As discussed previously much of the Mt Elliot section of the park has little or no dedicated public access. Where roads do reach the park boundary, it is often in places with no recreational values. Popular recreational sites such as Double and St Margaret's Creeks have no dedicated access and this places constraints on their use, as access is at the discretion of landholders adjoining the park.

The lack of access to the park's boundary is a problem for management, particularly along the eastern side of Mt Elliot. There is a need to gain access for the construction of fire breaks and for monitoring boundary issues with neighbours.

Access along most of Bowling Green Bay is also a problem because of the mangroves and salt flats. Boat access from the ocean is possible in most areas, depending on the tides. Boat ramps, both official and informal are present on many of the larger streams outside the park. Some informal tracks lead across the park to estuaries in the mangroves. These can present management problems as vehicles cause damage to the salt pans and litter is left behind by some users.

The Cape Cleveland section of the park has an access road to the AIMS area, and a gazetted road to the coast near Cocoa Creek, but there is little other road access apart form some informal 4WD tracks. Most of the Cape is too rugged for roads, but as it provides relatively few recreational opportunities, this is not a problem for management.

Desired outcomes

The development of new informal, unplanned access does not occur and any existing informal tracks or boat ramps are removed where they cannot be justified.

Existing roads and 4WD tracks are not causing unacceptable levels of impact on the area.

Better access to other parts of the Mt Elliot section is provided where feasible.

Proposed guidelines and actions

- Provide improved road access to Cocoa Creek, as resources allow (see also 4.5.1).
- Assess the need for better vehicle access to Bald Rock, and if appropriate, construct a new vehicle access or walking track access (subject to the availability of funds), or close the area (see also 4.5.1).
- As a long-term strategy, suitable blocks of land which provide access to potential recreation sites or provide access for management purposes, will be considered for purchase if funds become available.
- All areas on the Mt Elliot section which have gazetted road access will be assessed to see if there is any potential for the development of recreation facilities.

- All informal access roads in the park will be assessed. Those which serve a useful purpose and which cause little impact or where the impact could readily be controlled, may be kept open. Others will be closed (see also 4.5.1).

4.5.3 Public contact and information

Background information

At Alligator Creek there is an obvious need to inform the public of the park's values, recreation opportunities, and the code of behaviour expected. This is being achieved through signs, brochures and other literature and personal contact by rangers. There is an identified need to inform the public about the limited facilities in the Bowling Green Bay and Cape Cleveland sections of the park. The name of the park can be misleading and some visitors proceed to Cape Cleveland or Bowling Green Bay itself expecting developed facilities. These problems have been corrected by strategically placed signs.

Large numbers of campers use the area on long weekends such as Easter, and this provides opportunities for education and interpretive activities such as talks and ranger-guided walks. Such activities offer education in appropriate behaviour and an understanding of nature.

Opportunities for interpretation of the previous Aboriginal lifestyle exist in several places such as Bald Rock and Mt Storth. Parts of the park are ideally placed to allow an interpretation program, run by Aborigines, to focus on paintings and traditional food plants. However, care must be taken to ensure that any areas opened to the public for this purpose are not subject to unacceptable levels of impact, and that Aboriginal people are involved in and supportive of any decisions made on these matters.

Desired outcomes

Understanding, enjoyment and responsibility towards the natural and cultural values of the area are promoted.

Minimal impact use practices are promoted.

Proposed guidelines and actions

- Interpretation facilities such as signs and track guides will not be provided in the primitive zone. All necessary information in this zone will be provided off park i.e. brochures and videos (see Table 2 and Section 4).
- An on-site static display featuring a diagrammatic orientation of the park and its natural values is located at the Alligator Creek picnic ground.
- Visitor information sheets and brochures containing general resource and management information on plants, birds, geology and general biology will be produced.
- A sign will be strategically placed on the Cape Cleveland road to inform visitors that no facilities are provided at the Cape and direct them to Alligator Creek.
- At a suitable place encourage the development of an interpretive program which is run by Aborigines and explains the lifestyle of the original inhabitants.

4.5.4 Visitor safety and risk management

Background information

Part of the attraction of a wilderness area such as the Mt Elliot section of the park lies in the personal challenge, risk or danger that it involves. No matter how much care is taken with the building of trails, there is always a chance of an accident, or of visitors becoming lost. There are also dangerous animals such as snakes and crocodiles and a range of marine animals including the box jellyfish. While it is not feasible or desirable to remove such animals, it is important that all visitors are aware of dangers arising from them.

There have been some problems in the past with broken glass in the creek bed and these have been addressed by signs prohibiting the use of glass containers in the vicinity of the creek. The creek has numerous large rocks surrounded by deep water, so it is particularly dangerous to dive and jump from elevated positions. There have been diving and jumping injuries, and they are difficult to prevent, but appropriate signs and the regular presence of rangers are deterrents.

Hang gliding and rock climbing involve some risks. The management of these activities is covered in visitor use (4.5.1).

Desired outcomes

Risk to visitors is minimised, while allowing personal freedom to undertake challenging activities.

Visitors are aware of risks involved in undertaking park activities.

The number of injuries decreases.

Proposed guidelines and actions

- All visitors intending to go bushwalking overnight will be required to make contact with a QPWS staff member, if possible, to ensure that they are informed of conditions, and that their proposed itinerary is recorded. All bushwalkers will be required to fill in and lodge a remote bushwalking registration form before setting out (see 4.5.1).
- A plan will be developed for search and rescue in remote parts of the park. This should involve the police and SES as lead agencies as well as QPWS staff.
- Interpretive materials both on- and off-site will make mention of dangerous animals and other risks, such as diving into pools in Alligator Creek.
- Erect signs stating that glass containers are not allowed in and adjacent to the creek bed at Alligator Creek picnic area.
- A regulation will be prepared which prohibits glass containers in the bed of Alligator Creek.
- Activities with a potential for injury such as hang gliding will be declared special activities and will be subject to a permit (see section 4.5.1).
- Jumping into the creek from rocks will be prohibited in a defined area below the lookout at Alligator Creek. This will be done by restricting access to an area on the cliffs. Dangers at other areas will be assessed and similar action taken if necessary.
- Pictograms denoting that diving is prohibited will be erected near popular swimming locations.

4.6 Management of education use

Background information

The Mt Elliot section of the park has been popular with school groups as it is close to Townsville and has a variety of habitat types and pleasant camping sites. Alligator and St Margaret's Creeks have been used for this purpose in the past. Between 15 and 20 schools use the park each year for both day visits and overnight camps. Adventure training groups use the park for overnight bushwalks.

There are opportunities for private enterprise to make use of land adjoining the park at sites such as St Margaret's Creek. Close consultation between park management and the owners of any such operations will be needed to ensure that the resulting use and pressure on the park is of an acceptable level.

Private interests are proposing to develop an educational and conservation facility of international standard on private land at the Cromarty Swamps adjacent to the park. If this eventuates, it is likely that it will result in an increased emphasis on the educational use of the park. Walking tracks and bird hides and interpretive material may be required on the park. In the short term this should be the major focus of interpreting the wetlands. If this project fails to proceed, some other alternative to interpret the

birdlife of the wetlands should be investigated as this is one of the most outstanding interpretive and educational opportunities of coastal north Queensland.

Desired outcomes

Low-impact nature-based education and training activities which have minimal impact on natural values and other visitors are encouraged.

Understanding, enjoyment and responsibility towards the natural and cultural values of the area are promoted.

Proposed guidelines and actions

- Provide written information on the park and its values to educational groups.
- Consult with organisers of educational activities and ensure that planned activities are appropriate (nature-based) and of acceptable impact.
- Park management will liaise with the proponents of the proposed wetlands centre at Cromarty and will ensure that QPWS is intimately involved in the plans for this site.

4.7 Management of scientific research and monitoring

4.7.1 Scientific research

Background information

All sections of the park provide excellent opportunities for scientific research as all are relatively accessible and are located close to Townsville, a large city which is home to several research institutes and agencies. Mt Elliot provides opportunities to study the ecology of a sample of undisturbed moister country close to Townsville. The marine areas of Bowling Green Bay and Cape Cleveland sections are adjacent to the Australian Institute of Marine Science at Cape Ferguson and have already been used extensively by that institute and others. The fresh and brackish wetlands behind the mangroves in the park have been studied by QPWS biologists and others for at least 30 years.

QPWS is carrying out fire management research on a series of plots near Cape Cleveland. This research is aimed at providing more information on appropriate fire regimes for lowland eucalypt woodlands.

Research on national parks in general is assessed against standard criteria - Is it of low impact? Could it be carried out elsewhere? Is it high quality research which will add to existing knowledge and assist in management of the park? Potential costs and benefits have to be weighed up for each proposed research project. However, given the above considerations, QPWS sees Bowling Green Bay National Park as a suitable area for scientific research.

Desired outcomes

Opportunities are available for low-impact research which will contribute to baseline information on the resources of the park and to park management.

Proposed guidelines and actions

- Research will be encouraged where the Regional Service Director is satisfied that: it is important high-quality research; it is useful to the management of the national park or some other related matter; it is of acceptable impact and it cannot be performed satisfactorily off the national park.
- Research should not be undertaken in the primitive zone unless no alternative is available.

4.7.2 Monitoring

Background information

Monitoring of the state of the environment of the park will be an important aspect of future management. A few aspects of park management stand out as requiring particular attention. The requirement to monitor the Ramsar site has already been mentioned (see 3.4). The intensively used Alligator Creek area will require monitoring to ensure that environmental impact is ecologically sustainable. The fire management plan will require intensive monitoring to ensure that the predicted results are, in fact, being achieved. There are also numerous smaller issues where some monitoring is required. This monitoring can range from a formalised survey (e.g. with transects or quadrats) to the written notes of an observant ranger. In many cases limitations on resources result in only informal monitoring being undertaken.

Monitoring actions are best considered in an action plan after the adoption of the management plan.

Desired outcomes

A monitoring plan is put in place to measure any changes to park ecosystems and identify causes.

Impacts of recreation activities are monitored.

Proposed guidelines and actions

- As part of the Ramsar site plan, develop a monitoring strategy for the wetlands.
- Establish a monitoring program to study the long-term effects of the fire management plan.
- Develop a monitoring action plan to ensure that, among other things, the effect of heavy visitor use at Alligator Creek is documented.

4.8 Management of community infrastructure

Background information

There is a Telstra telecommunication tower and bitumen road on the eastern side of Mt Storth. This is situated on a special lease on the park. The road is not open to the public, with the exception of the Townsville Hang Gliding Association who have gained permission from Telstra to launch hang gliders from a platform rock about 100m from the tower.

There is a radio transmission tower near Cape Cleveland operated by a local radio station. This is on a special lease.

There are two power transmission lines running through the park along the Alligator Creek valley. No official easement, lease or agreement covers the existence and maintenance of this line.

The water pipeline to Cungulla passes through part of the national park near Mt Burrumbush. No official lease or agreement covers this at present.

As Mt Elliot is the highest peak in the vicinity of Townsville, there have been requests to construct facilities on the summit. A recent example was a proposal by the Civil Aviation Authority for a radar station for the Townsville Airport on Mt Elliot or, failing that, on the summit of Cape Cleveland. This request caused considerable debate and was eventually withdrawn in favour of a less contentious site. The altitude and position of Mt Elliot makes it likely that other requests will be received.

Desired outcomes

Appropriate permits and clearly defined agreements are in place for maintenance of the leases and the power line to ensure that damage to the park from maintenance operations is of an acceptable level.

No additional infrastructure is built on the park unless it can be shown that there are no feasible alternatives and that the proposal is essential for the public good.

Proposed guidelines and actions

- All proposals for public utilities on Bowling Green Bay National Park will be subject to detailed environmental impact assessment and approval will be granted only if it can be shown that the proposal meets the requirements of the relevant legislation, is vital to public safety, and there are no feasible alternatives.
- Particular efforts will be made to keep the higher parts of Mount Elliot and Cape Cleveland (above 500 metres) and the wetland parts of the Ramsar site free from infrastructure.
- Negotiate an agreement and issue an authority to Ergon Energy concerning maintenance and any future plans for the power lines at Alligator Creek.
- Review the lease for the transmission tower at Mt Storth shortly before it is due for renewal and determine if any new conditions are required.
- Review the lease for the radio transmission tower at Cape Cleveland shortly before it is due for renewal and determine if any new conditions are required.
- Ensure that the appropriate authority is issued for the Cungulla pipeline.

4.9 Management of resource use

4.9.1 Grazing

Background information

All previous grazing leases on the park have now expired. Grazing under permit controlled the introduced grasses effectively for many years. However para grass infestations are rapidly causing the wetlands to degrade to the point where they will no longer be suitable habitat for water birds. If this occurs, it could have implications for the continued Ramsar listing of the site. Most grazing permits on Queensland national parks have expired and grazing is not permitted under the *Nature Conservation Act 1992*. Many experiments have been carried out using fire, chemicals and even removing the top layer of soil with bulldozers, but no cost effective method of removing para grass and other pasture grasses has been found. Experience of land managers and wildlife researchers has shown that in wetland areas where cattle have been present in the past, controlled grazing is the only feasible method to control para grass.

The limited use of cattle to control an introduced pest, such as para grass, should not be misinterpreted as having wider industry implications.

Desired outcomes

Grazing is used solely as a tool to manage wetlands through the control of para grass and other introduced species.

Any permitted grazing has no unwanted effects outside the area being managed.

Proposed guidelines and actions

- Determine which areas would benefit from continuing grazing in terms of the control of para grass and determine numbers of cattle and other requirements (e.g. are cattle required in equal numbers at all times of the year?).
- Determine the best method of allowing grazing - option (1) QPWS uses own cattle or option (2) QPWS issues a contract for the use of cattle to control the para grass.
- Monitor the effect of the permitted grazing and alter cattle numbers as required.
- Monitor effects of grazing, so that data is available for use in similar or future situations.
- Before commencing grazing prepare a grazing action and monitoring plan.

4.9.2 Fishing

Background information

Recreational fishing is a popular activity in many estuaries in the national park. It is an activity which has been occurring for more than a century and predates the gazettal of the national park. Most fishing is from small boats either from Townsville or from the numerous boat ramps in the area. The *Nature Conservation Regulation 1994* as amended in 1997 prohibits fishing in streams in the park to the west of the Bruce Highway. There has been little history of significant fishing in freshwater streams in the national park.

Because of the complex nature of national park boundaries, it is often difficult, particularly for visitors in boats, to determine whether or not a part of an estuary is in the park.

Desired outcomes

Recreational fishing inside the national park is conducted according to the provisions of the *Nature Conservation Act 1992* and the *Fisheries Act 1995*.

Recreational fishing is ecologically sustainable.

Fishing is not occurring in freshwater streams to the west of the Bruce Highway.

Proposed guidelines and actions

- Current legislation allows recreational fishing in Bowling Green Bay National Park to the east of the Bruce Highway and the park will be managed to accommodate this activity. Fishing in freshwater streams in the park to the west of the Bruce Highway, will not be permitted.
- Limited additional fishing access (e.g. possibly at Bald Rock) may be provided, but only as a result of a detailed impact assessment and a clearly defined need.
- All fishing in the national park will be subject to the *Fisheries Act 1995*, referring to bag limits, seasonal closures and minimum and maximum sizes, taking of female crabs etc.

4.10 Liaison with neighbours

Background

A large number of properties adjoin the national park, including the following uses: residential, grazing, agricultural and tourism. There are many issues which concern local landholders such as fire management, feral animals and weeds, and an ongoing working relationship between park staff and landholders is necessary. There are progress associations at Alligator Creek and Cungulla and Landcare groups for the Burdekin and for Townsville-Thuringowa which provide some opportunities for contact.

Desired outcomes

Neighbours and other local community members are aware of service policy on managing protected areas and are consulted about management actions which may affect them.

Proposed guidelines and actions

- Liaise with park neighbours regarding relevant values and issues associated with park management identified in this plan.
- Staff will participate in community groups such as progress associations, Landcare groups or bushfire brigades where appropriate.

4.11 Additions to the park

Background

There has been considerable confusion concerning some park boundaries and this needs to be clarified to make management more efficient. There are other areas adjacent to, and including some wetland areas, which should be added to the park to assist in management (see also section 5.)

When this final plan was being prepared, parts of the lighthouse and reserves at Cape Bowling Green and Cape Cleveland were in the process of being added to the national park.

Desired outcomes

Park boundaries are rationalised so that more complete ecosystems are managed.

Uncertainty about park boundaries is removed.

Proposed guidelines and actions

- Finalise current proposals for additions to the national park.
- National park boundaries will be adjusted where feasible to produce a more manageable park, while the rights of neighbouring landholders will be considered.
- When finalising areas including wetlands for addition to the park, consideration will be given to declaring the areas as conservation park, so that they can be grazed if required to control introduced pasture grass.
- Those parts of the lighthouse reserves at Cape Bowling Green and Cape Cleveland to be added to the park, will be managed in a similar manner to the adjacent national park.
- At Cape Bowling Green, highest priority will be given to the protection of sea birds and turtles from disturbance.
- At Cape Cleveland, the site will be considered as a day-visit locality.

4.12 Park infrastructure and staffing

Background information

The ranger's residence and associated infrastructure are currently located at Alligator Creek. This is satisfactory with respect to the management of the heavily used facilities at Alligator Creek, but is not satisfactory for management of the Bowling Green Bay or Cape Cleveland sections of the park, or, for that matter, for the southern and western parts of the Mt Elliot section. Present resources do not allow the development of alternative sites for the park headquarters, but it is probable that in the future, another site somewhere between Mt Elliot and the Barattas will be considered more suitable.

An ideal situation would be to have staff stationed at: Alligator Creek, Cape Cleveland, Ayr and at a central park headquarters. This implies some seven to ten staff and it is probable that this number will be required in the future to adequately patrol the more remote coastal parts of the park and provide interpretation and other services to the public.

The Lighthouse Reserve at Cape Cleveland may be added to the national park, or may become a conservation park. This includes two houses and associated sheds etc. The future use of these buildings remains unclear at the time of preparation of this plan. They could be used for tourism purposes if a feasible proposal is received.

Desired outcomes

Resources are provided to meet future park management pressures.

Proposed guidelines and actions

- Monitor use and impacts of remote parts of park and prepare submissions for other bases as appropriate.

5 Complementary management of Ramsar site areas outside the national park boundary

Background

Some areas included in the Ramsar site are not included in the national park, due to delays in gazettal of additional to the park. While these areas are outside the national park this plan cannot have direct jurisdiction over them. However, to clarify the intended management of these areas, recommendations are made below.

Desired outcomes

The entire Ramsar site is managed for the conservation of the natural environment with particular emphasis on wetlands.

Guidelines and actions

- Areas included in the Ramsar site, but currently excluded from the park, should be managed in a manner designed to protect the habitat of fresh and brackish water birds. This may include cattle grazing to keep introduced pasture grasses under control.
- Consideration should be given to gazettal of these additional areas as conservation park rather than as national park, if necessary to facilitate the use of grazing as a management tool.
- It is recommended that the guidelines and actions in 4.2.2 *Wetlands* will apply to these areas.

6 References

Bean, A.R. (1991) *Natural Resource Inventory - Bowling Green Bay National Park.* DEH internal report.

Brayshaw, H. (1990) *Well Beaten Paths - Aborigines of the Herbert Burdekin district, north Queensland . An Ethnographic and Archaeological Study.* Department of History, James Cook University of North Queensland.

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7 APPENDIX 1

Vegetation Types and rare or threatened plant species from Bowling Green Bay National Park

From **Bean, A.R. (1991)** *Natural Resource Inventory - Bowling Green Bay National Park.* DEH internal report.

PLANT COMMUNITIES

I Intertidal communities
1 Mangroves
2 Salt marshes and samphire flats

II Trees absent
3 Grassland
4 Bulkuru shrubland
5 Brush box shrubland

III Open woodland and woodland
6 Beach she oak woodland
7 Open woodland on cliff lines
8 Beefwood woodland
9 Paperbark - Moreton Bay ash woodland
10 Mixed eucalypt woodland

IV Open forests
11 Weeping paperbark swamp
12 Riverine open forest
13 Wet sclerophyll forest

V Closed forests
14 Tall notophyll rainforest
15 Hoop pine closed forest
16 Lowland riverine rainforest
17 Semi-deciduous vine forest

RARE OR THREATENED PLANT SPECIES

Huperzia phlegmarioides	V	veg. type 14
Bonamia dietrichiana	2RC	veg. type 17
Cassia sp "Paluma"	2RC	veg. type 15

Kailarsenia jardinei (3RC) which was recorded from Mt Elliot in the 1860s by Dallachy has not been found in the park or in the Townsville area.