

Magnetic Island (Yunbenun) Management Statement 2013

Park size:	3637.14ha
Bioregion:	Brigalow Belt
QPWS region:	Great Barrier Reef
Local government estate/area:	Townsville City Council
State electorate:	Townsville



Arthur Bay, Magnetic Island, Queensland
(Photo: Ezra Patchett © Tourism Queensland)

Legislative framework

✓	<i>Nature Conservation Act 1992</i>
✓	<i>Great Barrier Reef World Heritage Area</i>
✓	<i>Environment Protection Biodiversity Conservation Act 1999 (Cwlth)</i>
✓	<i>Native Title Act 1993</i>
✓	<i>Aboriginal Cultural Heritage Act 2003</i>

Plans and agreements

✓	China–Australia Migratory Bird Agreement (CAMBA)
✓	Japan–Australia Migratory Bird Agreement (JAMBA)
✓	Bonn Convention
✓	Republic of Korea–Australia Migratory Bird Agreement (ROKAMBA)
✓	Trustee Management Agreement—Bolger Bay Conservation Park
✓	Florence Bay Management Plan 1992
✓	Wulgurukaba People Indigenous Land Use Agreement

Thematic strategies

✓	Level 2 Fire Strategy 2007
✓	Level 2 Pest Strategy 2008

Vision

Magnetic Island's protected area estate will be managed to protect its rich natural and cultural heritage values and to provide opportunities for visitors and residents to experience nature-based recreation in a natural setting.

Stunning granite outcrops, Aboriginal rock art, wartime infrastructure, endangered semi-evergreen vine thicket and a healthy koala population represent just a fraction of the special values protected on the island. Thousands of visitors will cross Cleveland Bay every month to visit the island and appreciate the range of visitor opportunities available.

Collaborative partnerships with the community and Wulgurukaba Aboriginal Traditional Owners will foster communication and cooperative management of this incredible island.

Conservation purpose

Magnetic Island and surrounding waters are part of the Great Barrier Reef World Heritage Area. The island contains very high scenic coastal landscape values and supports a high diversity of ecosystems and plant and animal species of conservation significance. It also has a rich cultural heritage and contains significant indigenous and shared-history cultural heritage places. Magnetic Island is unique as it provides an opportunity for a large number of visitors and residents to undertake recreation in highly natural areas in an otherwise urban setting.

Protecting and presenting the parks' values

This management statement has been prepared for all of the protected area estate on Magnetic Island—Magnetic Island National Park (3616.46ha), Horseshoe Bay Lagoon Conservation Park (4.47ha), Bolger Bay Conservation Park (16.17ha) and Magnetic Island Base Reserve (0.0405ha). At the time of preparation, areas of unallocated state land were being converted to protected area estate. This management statement will apply to all new areas included in the estate.

Landscape

Magnetic Island is the largest continental island within the Northern Brigalow Belt Bioregion, and the seventh largest within the Great Barrier Reef World Heritage Area. It is likely that Magnetic Island represents the largest, most diverse assemblage of island flora in the dry tropics region of the Great Barrier Reef and contributes to the processes of dispersal, colonisation, and establishment of flora communities within the Great Barrier Reef World Heritage Area as a whole (DSEWPC, 2010).

Elevations on Magnetic Island reach 495m, making it one of the highest islands within the Great Barrier Reef World Heritage Area. Volcanic rocks generally form low domed hills with skeletal soils. Granitic rocks form ranges and low hills with rocky outcrops. Weathered dykes form valleys and saddles within the granitic landscape. Other landforms include perched valleys, captured watercourses, boulder scree and talus slopes. The island also has a wide range of more recent unconsolidated alluvial and Aeolian geologies including wetlands, different aged dune systems, and beach rock (Kenchington and Hegerl, 2005).

Magnetic Island is highly accessible and provides the opportunity for a large number of visitors and residents to view spectacular scenic landscapes including boulder-strewn headlands, hoop pines, sandy beaches and wetlands. The Forts complex is the most popular visitor location to take in sweeping views of the island and surrounding marine environment. As one of the higher points on the island the Forts has also been targeted by infrastructure providers needing an elevated position to locate service infrastructure such as communications antennae. This has significantly affected the aesthetics of the area as the infrastructure is an obvious feature in the landscape. Installation and maintenance of service infrastructure also causes impacts such as clearing and spread of pest plants which impact on the natural landscape.

Magnetic Island has eight catchments—Rollingstone Bay, Five Beach Bay, Horseshoe Bay (Endeavour Creek and Gorge Creek), Radical Bay, Arcadia (Petersen Creek), Nelly Bay (Gustav Creek), Picnic Bay (Butler Creek), and West Coast (Ned Lee Creek, Duck Creek, Chinamans Gully and Retreat Creek).

The island's protected area estate is adjacent to urban and residential properties and the lower reaches of some catchments are heavily impacted. Horseshoe and Picnic bays are rated heavily impacted, and Gustav Creek is slightly impacted (Connell Wagner, 2008). Horseshoe Bay Lagoon and the wetland at Endeavour Creek have been highly modified including encroachment of pest plants such as salvinia *Salvinia molesta* and para-grass *Brachiaria*

mutica. Significant intervention is required to improve the condition of these wetlands. The guidance of a professional hydrologist and cooperation with Townsville City Council is imperative to the success of any management program. The flow of surface waters in creeks along the West Point Road have also been modified by road drainage works and cooperation with Townsville City Council is required to return natural flow patterns.

Coastal development is the main threat to the landscape values of the island. Residential, tourist and community services infrastructure detract from the scenic landscape, fragment habitat, increase pest plants and alter natural drainage patterns. Run-off from residential and waste treatment facilities also degrades water quality. Despite these threats the protected area still contains large areas of exceptional natural beauty.

Effective management of landscape values will require a cooperative approach with Townsville City Council, infrastructure providers and the local residential community and its representative groups.

Native plants and animals

Over 80 native plants and 250 native animals have been recorded from Magnetic Island's protected area estate (Wildnet 2012). Thirty-six of these are species of conservation significance that are listed as either: (a) near threatened, vulnerable or endangered under the Nature Conservation (Wildlife) Regulation; (b) endangered or vulnerable under the Environment Protection and Biodiversity Conservation Act; or (c) are migratory species under the Bonn Convention or China–Australia, Japan–Australia or Republic of Korea–Australia migratory bird agreements.

Native plants

Magnetic Island contains a diverse assemblage of island plants and is an expression of continental plants. The protected area contains 11 plant species of conservation significance, including the vulnerable *Croton magneticus* which is endemic to the island (Table 3). Three of these species are listed as vulnerable under the Environment Protection and Biodiversity Conservation Act.

Little is known about the status, distribution or condition of these conservation significant plant species in the protected area and to date there is no specific management of these species. General threats include clearing, pests and inappropriate fire regimes. Further advice, assessment, recording and monitoring of these species is required.

A species of *Tephrosia* has been identified on Magnetic Island which, if confirmed, may be a new finding of a species endemic to the island. It has been recorded from Picnic Bay adjacent to the roadside and is threatened by weed encroachment.

Regional ecosystems and vegetation communities

The protected areas on Magnetic Island contain 10 regional ecosystems, including one endangered and 9 of concern regional ecosystems (refer Tables 1 and 2).

Park management to date has been based on the island's vegetation communities, rather than the regional ecosystems. Accordingly this management statement focuses on the vegetation communities while still providing details of the regional ecosystems. Of the 24 vegetation communities on the island, nine main vegetation assemblages have been identified by operational staff for the purposes of this management statement. These vegetation assemblages and associated vegetation communities are outlined in Table 1, as well as the endangered and of concern regional ecosystems they are found in on the island (established using geographic data).

The vegetation mapping for Magnetic Island is now almost 30 years old and a review is recommended to bring it in line with contemporary vegetation community and/or regional ecosystem mapping.

1. Araucaria forest and mixed low coastal forest—Occurs on rocky headlands and hills. Condition is fair to good, however pest plants (particularly rubber vine *Cryptostegia grandiflora*) are a threat in some areas and require management to maintain or improve the condition of this assemblage. The proposed development at Radical Bay is a potential threat to the mixed low coastal forest in the area.

2. Highland vegetation—This vegetation is significant habitat for the jewel butterfly and a significant food source for the glossy black cockatoo. She-oak recruitment occurred following an extensive wildfire in 1972 and it is unknown how long lived these she-oaks are, or if there have been any new recruits. This vegetation assemblage is in good condition, except at the navigation beacon site on Mount Cook where pest plants are an issue, particularly around the helipad. The site is maintained by the Royal Australian Air Force (RAAF) under a relevant authority.

3. Littoral scrub—This is a rare rainforest vegetation type and is represented by stands of forest trees growing on coastal sand dunes in Radical Bay, Florence Bay and Nelly Bay foreshore. This is the most accessible 'rainforest'

on the island and is an important food source for fruit-eating birds. Clearing and urban development has resulted in significant loss of littoral scrub on the island and some clearing has encroached into the protected area. Cooperative management efforts with Townsville City Council and North Queensland Dry Tropics, including pest plant control and bollarding, has resulted in some areas of recovery. The proposed Radical Bay development and associated road upgrade has the potential to significantly impact on this vegetation type.

4. Mixed eucalypt woodland, grasslands and acacia shrubland—*Lantana camara* and other pest plants from neighbouring properties are a threat. Implementation of pest control programs and fire management has resulted in improved condition in some areas. The overall condition of this vegetation complex is considered fair, however further assessment and expert advice is required to support this assumption.

5. Mixed low open scrub—Occurs on headlands at Rollingstone Bay. This vegetation type contains a significant rubber vine infestation and an integrated management program including pest control and burning is being implemented to manage the infestation. On-going control and monitoring will be required to significantly reduce the extent of rubber vine.

6. Mixed semi-deciduous woodlands—The condition of this vegetation community is not well known. Thickening appears to be occurring and further assessment and expert advice is required to guide management.

7. Poplar gum and bloodwood woodland and Moreton Bay ash flats—Areas of poplar gum and bloodwood woodland are located in the foothills of Nelly Bay and Arcadia. The majority of the Moreton Bay ash flats are located along the western side of the island. The Bolger Bay Conservation Park and some adjacent nature refuges capture this vegetation type. The condition of this vegetation assemblage is not well known and further assessment and expert advice is required, particularly in relation to fire regimes. In some areas poplar gum and bloodwood woodland is transitioning to mixed semi-deciduous woodland.

8. Vine forest—Occurs on hills around the island, and includes small pockets of vine thickets in sheltered gullies and low vine forest amongst boulders. Palm Valley in the foothills of Nelly Bay is a unique remnant of wetter times in history. The vine forest is generally a self-sustaining system in very good condition that requires little management. However, current proposals to expand power and water supply infrastructure have the potential to fragment habitat and introduce pests.

9. Wetlands and coastal vegetation—Occurs in low lying areas and coastal fore dunes and beaches. Wetlands, particularly bulkuru swamp in the Horseshoe Bay Conservation Park have been impacted by inappropriate flow regimes as a result of levees and bunds built to prevent salt water encroachment or to construct roads. Urban development has also contributed to significant habitat loss, siltation and pest incursion. The encroachment of melaleucas into the bulkuru swamp is also a management issue resulting from altered flow regimes. The condition of saltmarsh and samphire flats in new areas being converted to protected area estate is not well known and further assessment and expert advice will be required. The conservation values of these new areas are expected to be significant. Mangroves have expanded along the western side of the island in areas that were historically sandy beaches, this may be a consequence of ongoing dredging in Cleveland Bay.

Native animals

The protected area contains 25 species of animals and birds of conservation significance, including Sadlier's skink (tables 3 and 4).

In 1995, a specimen of the endangered bare-rumped sheath-tail bat was collected from Magnetic Island and lodged with the Queensland Museum. While this is the only recorded sighting of the species on Magnetic Island, it has been recorded elsewhere in ecosystems containing poplar gum which provides roosting and nesting habitat. It is likely that the species occurs on Magnetic Island. The vulnerable coastal sheath-tail bat is known to occur on the island.

A number of reptiles of conservation significance are found in the protected area, including a number of skinks and the common death adder. Sadlier's skink is a vulnerable species endemic to Queensland and is known only from Magnetic Island. The species may occur on parts of the nearby mainland, but no targeted surveys have been conducted to confirm this. Basic habitat requirements are poorly understood. Most surveyed species have been from the low lying areas on Magnetic Island. Within the lowland areas, Sadlier's skinks appear to prefer seasonally dry melaleuca swamps and areas with thick leaf litter.

Koalas were introduced to the island in the 1930s to protect them from perceived threats on the mainland. The island has sustained a stable, healthy koala population; however recent monitoring indicates a potential reduction in population numbers following severe tropical cyclone Yasi in February 2011. While listed as a species of 'least concern' under the Nature Conservation Act, the Environment Protection and Biodiversity Act lists the koala as vulnerable. The Forts complex and walking track is a popular location for visitors to view koalas in the wild.

Magnetic Island also supports great aggregations of over-wintering butterflies. Aggregations typically remain in

wetter areas between the early and late dry season.

Coastal areas provide habitat for a significant number of seabirds and migratory shorebirds, 14 of which are listed under international conservation agreements, such as the little tern and whimbrel (Table 4).

A population of agile wallabies also inhabits the island. Agile wallabies are not endemic to the island and the population has continued to expand following the escape of around four wallabies from the former koala park in Horseshoe Bay prior to 2003 (Winn pers comm). It is now common to see agile wallabies throughout Horseshoe Bay. Incidental sightings and analysis of scats also indicate the population has spread to Nelly Bay and Arcadia. The impacts of the population of agile wallabies are not well understood and further advice regarding management is required.

Native animals face a number of threats on Magnetic Island, including clearing and habitat degradation, domestic animals and feral cats, wildlife feeding and wildfire. The Queensland Parks and Wildlife Service (QPWS) implement a feral cat pest control program; however the involvement and cooperation of Townsville City Council is essential to effective implementation. Planned burns are also undertaken to reduce the risk of wildfire, and maintain species habitat. Wildlife feeding is occurring at a number of sites off park, particularly in Geoffrey Bay where rock wallabies are in very poor condition as a consequence of this inappropriate activity. Residents are also known to kill native snakes that they perceive as a threat. As most of the threats to native animals originate outside the protected area boundaries on neighbouring tenure, community awareness and education is essential for effective management.

QPWS works closely with the Department of Environment and Heritage Protection to manage protected native wildlife. Wildlife carers and the community also play a key role in reporting impacts on native wildlife and they are an important target for community education regarding threats, impacts and management.

Aboriginal culture

The Wulgurukaba people are the Aboriginal Traditional Owners of Magnetic Island and have lived on the island and nearby mainland for thousands of years. Aboriginal people have a strong sense of identification with the island and its culturally significant sites.

The Wulgurukaba people were able to maintain their traditional lifestyle until the mid-1890s when the Townsville port was established. As more European people moved into the area, the Wulgurukaba people were forced to move off their traditional lands and confrontations with settlers, loss of traditional food sources and disease took their toll. They remained on the island until the 1920s and 1930s but were eventually forced to live in missions on the mainland and Palm Island. A small group of Wulgurukaba people remain on, or have returned to, the island.

The Wulgurukaba people claim to hold native title over Magnetic Island and have registered an Indigenous Land Use Agreement (ILUA) for the claim area. The ILUA requires the negotiation of a memorandum of understanding regarding the preservation of cultural resources and values in the national park, including protection of cultural resources, employment, naming of protected areas, camping and signage. Progression of some ILUA commitments has commenced; however further work is required to determine future strategies.

The Wulgurukaba people are represented by the following registered Aboriginal corporations:

- Wulgurukaba Aboriginal Corporation (registered 9 May 1994)—the objectives of the corporation include the establishment of cultural heritage tourism activities including a cultural centre, guided tours, training programs and eventual self-sufficiency by the development of economic projects and industries.
- Wulgurukaba Yunbenun Aboriginal Corporation (registered 15 March 2012)—the objectives of the corporation include management of lands defined in the Wulgurukaba ILUA, as well as a number of other objectives to enhance the capacity of Wulgurukaba people.

Aboriginal cultural material

Veth and George (2004) outline the following cultural material evidence for past and continuing Aboriginal use of Magnetic Island:

- **Shell middens** are located within all catchments on the island. Relatively undisturbed sites may contain features of cooking hearths, stone arrangements, artefact knapping horizons and terrestrial dietary remains. The island has a representative sample of the different kinds of middens found along the North Queensland coast and islands within the Great Barrier Reef. Some middens also contain European materials in their upper levels that date to the last half of the 19th century and represent contact sites. Some sites have been disturbed by visitors or pests.
- **Pigment art** is known at a number of localities both from the coast and the interior of the island. As they are in more remote locations they have not been disturbed by visitors. Weathering, particularly rainfall, has threatened some sites and drip lines have been installed to divert water from damaging the art.

- As well as being found in middens, a number of discrete locations contain **stone artefact scatters** that illustrate past habitation, food processing and implement manufacturing activities.
- **Quarry and knapping sites**—a number of volcanic suites have been actively quarried on the northern sections of the island and contain preforms for scraper, blade and axe productions. Although some walking tracks pass near these sites their overall integrity is high.

There are a number of known historic Aboriginal **burials** on the island. Aboriginal skeletal remains have been exposed during earthworks (such as Nelly Bay) and as a result of natural processes such as foreshore erosion (such as Bolger Bay). Some ground penetrating radar work was undertaken in Florence Bay to assess the presence of burial sites, none have been identified to date.

- The remains of a number of stone-wall **fish traps** are thought to occur within at least two bays on the island, which were badly disturbed by the development of breakwaters and walkways in the late 19th century.
- A considerable number of small **rockshelters containing cultural deposits** are known from various bays and upper portions of catchments. Some shelters also display pigment art.

The majority of Aboriginal material culture sites are intact, and QPWS works closely with the Wulgurukaba people to identify and manage them appropriately. An inventory of material culture sites is currently being developed collaboratively and includes recommendations for management. The inventory is currently maintained by QPWS.

There is an Aboriginal Cultural Heritage Register that has been established under the Aboriginal Cultural Heritage Act and is maintained by the Department of Aboriginal and Torres Strait Islander and Multicultural Affairs. Places assessed by the relevant Aboriginal party can be listed on the register by completing a cultural heritage site recording form. QPWS supports any decision by the Wulgurukaba people to conduct a formal cultural heritage study of the island under the Aboriginal Cultural Heritage Act to ensure cultural heritage places are recognised and recorded in the register.

QPWS also supports opportunities for interpretation of material culture sites including signs and website information.

Shared-history culture

As Townsville developed through the mid-19th century, Magnetic Island became a valuable location for the gathering of hoop pine, coral, sand, stone and granite for building materials. The island was a popular picnic spot for European tourists from the mainland during the 19th century and the first resort was established in 1890. Development continued and the island now supports a number of residential communities, resorts and tourism infrastructure. Some parts of the island were lightly grazed over 30 years ago and remnant vegetation generally shows no sign of impacts. Such a situation is rare for lowland ecosystems, with similar areas on the mainland usually having a long and continuing history of cattle grazing (MICDA and MINCA, 2004). Historically, residents also carried out mixed farming, fruit growing and dairying. Grazing and farming did result in the introduction and spread of pest plants, many of which still persist and have spread into new areas.

During 1942–43, the Forts complex was established on Magnetic Island. A signal station and coastal battery were built for controlling shipping and defence of the Townsville harbour. Two 3,000,000 candle-powered searchlights were located at Horseshoe and Florence bays, and a radar screen was located high in the hills above Arthur Bay. The Australian Coast Artillery Units operated the Forts complex from 1943 until the end of the Pacific War in 1945. Today the Forts complex is protected under the *Queensland Heritage Act 1992* and is among the best examples of such fortifications on Queensland's east coast.

Additional historical military infrastructure is likely to occur on the island and further advice from the Department of Defence should be sought. With a large presence in Townsville the Department of Defence occasionally uses protected areas such as Magnetic Island for training exercises and they have also contributed to management by assisting with walking track construction and maintenance. Further collaboration is encouraged.

The Forts complex is the most popular visitor site in the protected area. However, the infrastructure is deteriorating and some buildings are unsafe, and resource constraints have resulted in limited management. Graffiti, fires and damage from termites and tree roots all contribute to the degradation of the infrastructure. As the complex is protected under the Queensland Heritage Act, no work can be undertaken on the infrastructure unless a cultural heritage management plan is developed. Without active management, the site will continue to deteriorate.

A number of other shared-history cultural sites are known on the island including scar trees left by early surveyors, bottle dumps, the pink granite quarry site used as a source for materials to build the Customs House on the mainland, the Florence Bay scout camp site, and the West Point quarantine station site which includes marked and unmarked gravesites.

Tourism and visitor opportunities

Magnetic Island and the surrounding waters are a key recreation and tourism destination in the local region. It provides opportunities for nature-based recreation in a predominantly natural setting close to an urban centre. Prior to residential settlement, the island sustained a popular picnic culture whereby people travelled across to the island from the mainland for the day to enjoy daytime recreation, particularly picnics and swimming. This culture continues today with large numbers of Townsville locals and visitors travelling to the island, particularly on weekends and school holidays. On 27 April 2011, the Townsville Bulletin reported that almost 5,800 residents and holiday makers were transferred to and from the island on the passenger ferry over the 2011 Easter long weekend, a 22 per cent increase on 2010 figures and post severe tropical cyclone Yasi. Another recent survey (JCU 2011) funded jointly by SeaLink Queensland and the former Department of Employment, Economic Development and Innovation indicates that around 60 per cent of visitors surveyed were day trippers. The area can sustain high visitor numbers over short periods. However constant high visitation throughout the year at elevated levels would not be sustainable for most visitor sites, particularly popular sites such as the Forts. Impacts such as erosion of walking tracks, trampling of vegetation and a change in visitor experience would warrant greater investment in infrastructure and maintenance to protect natural and cultural values. Ongoing visitor monitoring is required to identify trends, potential management issues and options.

The island is also a popular destination for interstate and international tourists. It is easily accessible by vessel with passenger and vehicle ferries running throughout the day from Townsville to Nelly Bay Harbour. Sealed and unsealed roads across the island provide ready access to the protected area and a series of walking tracks provide opportunities for visitors to access a diversity of landscapes. A well-established bus service runs throughout the day and hire cars are also available. There is a lack of quality communication material available to visitors and options to improve communications are currently being considered by QPWS including updating the departmental website and development of a communications plan. In 2010 Townsville Enterprise Limited prepared a proposal to identify strategic gaps in the broader Magnetic Island trail network and improve visitor engagement of walking trails. To date, no action has been taken; however recent advice suggests the proposal will now be progressed. QPWS is identified as a key stakeholder and ongoing involvement from this early stage is necessary to ensure an holistic management approach.

The majority of park visitor sites provide a natural setting, generally free from human modification of the environment. There are no camping areas in the protected area estate; however there are a range of overnight accommodation options available elsewhere on the island. Visitor facilities in adjacent areas, including council barbeque and picnic areas, and camping at Bungalow Bay Village, provide a variety of other settings catering for more developed visitor opportunities. Visitor opportunities will be managed to maintain the natural landscape while providing a range of visitor experiences, without compromising conservation outcomes. Built infrastructure such as lookouts or steps that support visitor access will be designed to minimise impacts on the natural landscape. Any new visitor facilities will maintain the natural setting to a desired Landscape Classification Setting (LCS) of 3–4. The Landscape Classification System is used by QPWS to assess how natural the landscape setting is at visitor sites, assess implications of visitor activities and assess management actions that would modify the area's natural character. Landscape Classification Settings are used to describe natural, social and managerial characteristics of a site, with settings ranging from 1 (most natural) to 9 (most urbanised).

Existing walking tracks (approximately 20km), visitor nodes and day use areas in the protected area estate are:

- Hawkings Point walking track and lookout
- Nelly Bay to Arcadia Heritage track
- Nelly Bay to Arcadia walking track including a 400m return sidetrack to the Sphinx Lookout
- Junction walking track linking the Nelly Bay to Arcadia walk and the Forts walk
- Forts to Horseshoe Bay walking track
- Forts walk including lookouts and historic WWII fortifications and infrastructure
- Arthur Bay walking track
- Arthur Bay lookout (off Radical Bay Road)
- Searchlight Tower walking track and lookout on the headland between Arthur and Florence bays
- Florence Bay walking track and day use area including toilets and car park
- Radical Bay to Balding and Horseshoe bays walking track including footbridge (scheduled for removal) and toilets at Balding Bay
- Horseshoe Bay Lagoon walking track

- Picnic Bay walking track.

Visitor infrastructure is not provided in the Bolger Bay Conservation Park to maintain a natural wilderness visitor experience.

The Forts complex is the most popular visitor node on the island and allows visitors to view and appreciate most of the natural, scenic and cultural World Heritage values of the protected area. However, management needs to be improved as resource constraints have resulted in degradation of the walking track, interpretive facilities and the Forts complex. A high number of visitors use the council car park to access the Forts walking track and visitor site, but lack of toilet facilities has resulted in human waste management issues in the national park. Effective management of this issue is urgently needed and requires a cooperative approach with Townsville City Council to provide a public toilet facility at the car park which is on council reserve.

There are some existing walking tracks managed by QPWS that extend into neighbouring properties. QPWS is currently investigating options to resolve this such as relocating the tracks to inside the protected area boundaries, or entering into an agreement with the property owner for use.

A number of other walking tracks have also suffered as a result of resource constraints, and some have been closed due to erosion and related safety issues. Closed walking tracks include the old junction track to Horseshoe Bay, Alma Bay to Curlew Flat, the track from the Forts to Florence Bay, historic track to Mount Paluma and Dent Street to Horseshoe Bay. The impacts of extreme weather events add to the pressures and issues regarding walking track maintenance.

A number of potential new visitor experiences and opportunities have been identified. Some are associated with new areas to be converted to protected area, or where use is increasing. An assessment of their feasibility, impacts and management is recommended.

- Rocky Bay walking track—An informal track has been worn by visitors from the main road through the national park down to Rocky Bay. The bay is a popular 'clothing optional' destination for guests at the nearby backpacker hostel. An opportunity to formalise the track and provide safe access to the bay is presented.
- Horse riding—Commercial horse riding activities are undertaken in Horseshoe Bay, including land scheduled to be transferred to conservation park in the near future. A QPWS report on commercial horse riding activities in current and future protected area estate in Horseshoe Bay (2009) identifies a number of potential issues, including erosion, waste (dung), weed transfer and interactions with other users. This commercial activity may continue to be permitted in the new conservation park when it is gazetted. The report recommends a number of actions to ameliorate impacts including options to ensure horse riding activities do not significantly impact on other users; developing more appropriate and environmentally sustainable trails; working with the operator to develop better management strategies including weed control, feed and trail management; and continued liaison with Townsville City Council to facilitate co-management.
- Horseshoe Bay Lagoon Conservation Park bird hide and interpretation facility—Horseshoe Bay Lagoon supports a range of waders and waterbirds and is a popular location for visitors to view these birds in their native habitat. The construction of a bird hide and interpretation facility has been identified as an opportunity to improve the visitor experience at the lagoon.
- Mountain bike riding—This activity is growing in popularity on the island and there is increased demand for use of existing walking tracks, including large scale organised events such as the Adventurethon multi-sport challenge. Demand is likely to continue and a proactive management approach is required including assessment of options for providing and maintaining mountain bike tracks in close consultation and involvement with the mountain biking community.
- Waterholes—A number of popular waterholes are located in areas that are scheduled to be transferred to national park in the near future and steep slippery banks are a safety concern. An assessment of these sites needs to be undertaken to identify management issues and options, including access and safety.
- Rock-climbing/bouldering—The boulder strewn coastline of Magnetic Island is becoming an increasingly popular destination for rock-climbing enthusiasts, particularly in locations that are scheduled to be transferred to national park. This presents a potential new visitor opportunity; however identification and assessment of sites needs to be undertaken to identify any safety and other management issues.
- Re-open closed tracks—If appropriate resources are allocated there would be an opportunity to re-open some walking tracks that have been closed including the historic track to Mount Paluma and the track from the Forts to Florence Bay.

The Wulgurukaba Traditional Owners have expressed an interest in developing Aboriginal visitor opportunities on the island, including interpretation facilities and guided tours. A recent visitor survey (JCU, 2012) indicates that 48 per cent of survey respondents would be supportive of the introduction of guided Aboriginal cultural tours on the

island. QPWS is also highly supportive and will continue to encourage and work with the Wulgurukaba people to develop opportunities for Aboriginal tours.

Visitor use has the potential to impact on the protected area's natural and cultural values and some impacts are already evident. Vehicles have been driving on tidal wetlands between West Point and Cockle Bay, damaging sensitive saltmarsh habitats. Regulatory signs have been successful in discouraging this inappropriate vehicle use, whereas previous attempts using bollards were not. Vehicle access is also likely to be an issue in Horseshoe Bay where tidal areas are scheduled to become conservation park.

While the protected area contains a number of walking tracks, some visitors still divert from tracks and if this occurs regularly trampling of vegetation and erosion can eventuate. Visitors also transport pest plants in their shoes and clothing, resulting in a prevalence of pest plants at visitor sites, along walking tracks and bushwalking routes.

Education and science

Magnetic Island is within close proximity to education and research institutions such as schools and James Cook University and offers a range of research opportunities in natural, cultural and social themes. Scientific research and monitoring programs can provide valuable information towards improved management.

A number of scientific research permits are issued for the protected area, including research on the distribution, abundance and biology of a number of native plant and animal species. Whilst QPWS encourages research organisations to provide results as a contribution to improved management, the majority of research results are not received by park managers.

Given the proximity of the protected area to the residential community, a great opportunity exists to establish a children's program in the local primary school to encourage and experience sustainable natural resource management.

Partnerships

Magnetic Island's protected area lies adjacent to urban and residential settlements and successful management is dependent on building strong partnerships with a wide range of stakeholders, many of whom are mentioned elsewhere in this management statement. QPWS has established partnerships with a range of government departments, organisations, community groups and neighbours, including Wulgurukaba Aboriginal Traditional Owners, Townsville City Council, Department of Environment and Heritage Protection (EHP) and Department of Natural Resources and Mines (NRM), and is represented on a number of committees such as the Magnetic Island Fire Management Committee.

QPWS holds regular meetings with resident Traditional Owners to discuss management programs and issues. Traditional Owners are also consulted through contact protocols established by the Wulgurukaba Yunbenun Aboriginal Corporation and Wulgurukaba Aboriginal Corporation. QPWS has an Indigenous identified ranger position for Magnetic Island which is currently filled by a Wulgurukaba person.

QPWS is represented on the Bolger Bay Conservation Park Steering Committee. The State of Queensland (acting through QPWS) entered into a trustee management agreement with the Magnetic Island Nature Care Association (MINCA) (acting through the Bolger Bay Sub Committee) in 2005 for Bolger Bay Conservation Park. The conservation park was secured as protected area as a result of a combined initiative between the Commonwealth, State and MINCA to purchase and protect the land. As part of these arrangements MINCA was to become sole trustee; a steering committee with Commonwealth, State and MINCA representatives was to be established and a management plan to be prepared. The steering committee has been established and meets twice annually and MINCA are developing a management plan.

QPWS also works closely with a number of other not for profit community based organisations including the Magnetic Island Community Development Association (MICDA), Magnetic Island Fauna Care Organisation, Magnetic Island Resident and Rate Payers Association and Magnetic Island Network for Turtles. Additionally, QPWS is represented on the Tourism Operators and Businesses Magnetic Island Association.

A strong, successful partnership has been established with the Townsville City Council and NRM to control pest plants on a monthly basis under the WeedBlitz program. A cooperative partnership also exists with NRM whereby NRM trainees undertake a number of activities such as pest plant control and track maintenance on the protected area. Volunteers also provide assistance with park management. QPWS leads the Magnetic Island Fire Committee which includes a number of agencies and community representatives that meet pre and post fire season to share knowledge and ensure cooperative management of fire across the variety of different tenures on the island.

The Townsville City Council is responsible for the management of a significant portion of land adjoining the protected areas. Regular meetings are recommended to ensure ongoing communication about management

issues and to establish cooperative management approaches wherever possible.

Other key issues and responses

Pest management

Pest plants

Magnetic Island's protected area estate contains 11 pest plants declared under the *Land Protection (Pest and Stock Route Management) Act 2002*, seven are class 2 pests and four are class 3. Of these rubber vine, belly-ache bush *Jatropha gossypifolia* and lantana are Weeds of National Significance. Table 5 provides a list of declared pest plants and their level of threat identified in the QPWS Level 2 Pest Strategy for Magnetic Island.

Pest plants are a significant management issue on Magnetic Island, particularly in the urban interface where the protected area meets neighbouring properties and garden escapees are invading the native forest, and choking wetlands and lagoons such as the bulkuru swamp in Horseshoe Bay Lagoon Conservation Park. Roadsides, walking tracks and fire access tracks also harbour pest plants, particularly exotic grasses. Some vegetation assemblages are particularly vulnerable to pest invasion in the urban interface, including wetlands and coastal vegetation, littoral scrub, poplar gum and bloodwood woodland, Moreton Bay ash flats, and mixed eucalypt woodland, grasslands and acacia shrubland.

Pest plants are also an issue in areas where community services infrastructure is present in the protected area, such as roads or tracks, water tanks, pipelines and helipads. These sites are managed through authority conditions and environmental management plans, but resources for enforcement are limited and pest plants continue to be a problem in and around infrastructure footprints. Weed hygiene stations may help to reduce the spread of weeds throughout the protected area and further consideration of this management option should be investigated in consultation with infrastructure providers.

On the slopes behind Rollingstone Bay, rubber vine has colonised the area aggressively, and forms thickets that smother the mixed low open scrub. It is also found in other coastal locations around the island but not at these densities. Lantana is also known to occur in medium to high densities along coastal hills and creeks and in the highlands, but the dynamics of infestations are not comprehensively understood in these areas.

QPWS undertakes pest plant control in accordance with a Level 2 Pest Strategy (2008) and approved pest activity proposals; however the pest strategy is in need of a review. Pest activity proposals include rubber vine control at Rollingstone Bay, lantana control in the coastal hills, creeks and highlands, weed control in wetlands, foreshores and lagoons, and pest plant control along walking tracks, fire access tracks, roads and the urban interface.

A successful WeedBlitz program is also undertaken with Townsville City Council and NRM to cooperatively manage pest plants in strategic locations adjacent to the protected area. Further work with Townsville City Council and landholders should be supported, particularly in relation to weed hygiene.

Pest animals

Feral cats *Felis catus* and stray domestic cats and dogs *Canis familiaris* pose a threat to native wildlife in the protected area, including threatened reptile species such as the striped-tailed delma, Sadler's skink and koalas. Feral cats and domestic cats and dogs are a particular concern in vegetation adjacent to urban areas and waste management facilities (such as Picnic Bay) where they occur in higher densities. Feral cats are a Class 2 declared pest animal under the *Land Protection (Pest and Stock Route Management) Act 2002*. QPWS undertakes trapping to reduce the numbers of feral cats in accordance with an approved activity proposal. Control efforts are concentrated adjacent to residential areas. Trapping also occurs on adjacent tenure with permission of the relevant landholder including Townsville City Council. Collaborative control efforts with council should be pursued to ensure more effective results. Stray domestic dogs are a council management issue and QPWS does not implement control programs.

Cane toads *Rhinella marina* are present on Magnetic Island. Cane toads produce highly toxic venom and can cause death if ingested by most native animals. They also consume a wide variety of insects, frogs, small reptiles, mammals and even birds. The cane toad is not a declared pest in Queensland and there is no legal requirement to control them. QPWS does not manage cane toads on the island, but is supportive of any community volunteer program designed to reduce numbers.

Common myna birds *Sturnus tristis* are an emerging threat to the island. Whilst there are no established populations they have been found in the Nelly Bay ferry terminal. Townsville City Council has implemented a control program targeted at preventing establishment on the island and removes any myna birds reported.

The Magnetic Island Level 2 Pest Strategy does not currently address feral animals and requires review.

Fire management

Fire management is undertaken in accordance with the Level 2 Fire Strategy (2007). The strategy requires review to include new areas of the estate and incorporate new information that has become available such as planned burn guidelines for the bioregion. The broad objectives for fire management are to develop and maintain a mosaic of fire frequency, intensity and season consistent with the ecological limits of the vegetation communities; preserve the overall diversity of the various vegetation communities on the Island; protect life and property in the protected area and neighbouring lands; and preserve and protect cultural resources from damage by fire.

Planned burns are conducted in accordance with approved fire activity proposals for conservation purposes, hazard reduction, wildfire mitigation, species management, pest plant control or a combination of objectives. For example:

- a proposed burn at Horseshoe Bay will aim to reduce the encroachment of melaleucas into the lagoon
- low to medium intensity burns in known koala habitat maintain the eucalypt woodland which provides healthy food and habitat
- the introduction of a high intensity fire on the slopes behind Rollingstone Bay will help to reduce the density and abundance of the rubber vine infestation
- planned burning in the vegetation surrounding fire-sensitive communities such as mangrove communities and coastal she oak woodlands, araucaria forest, littoral scrub, vine forest and mixed low coastal forest reduces fuel loads and the risk of wildfire which could otherwise irreversibly alter the species composition and structure of these communities
- mosaic burning in fire-adapted communities such as eucalypt woodlands, grasslands and acacia shrublands provides a range of fire-intervals, intensities, seasons of burn and patch-sizes required to maintain floristic and structural diversity
- implementation of appropriate fire regimes through planned burns at the unique ecotone of ironbark woodland and spinifex grassland found within the mixed low open scrub at Rollingstone Bay will maintain the species structure and composition of this transition vegetation
- hazard reduction burns around residential properties, infrastructure and cultural resources help to reduce the risk of wildfire and possible damage being caused to people and property. Maintenance of fire tracks provides access for fuel reduction burns, and contributes to a reduction in wildfire risk through slashing, burning and brush cutting.

A number of fire monitoring points have been established across the island and many years of photo data has been collected. However insufficient resources and knowledge have prevented staff from examining the results. A great deal of fire management information is contained in the photo monitoring data; however expert advice from a fire ecologist is needed to interpret the information. It is recommended that resources be provided for an expert to evaluate the data and provide advice and recommendations to guide future fire management.

QPWS works very closely with the Magnetic Island Fire Management Committee to implement burns on the island. The Committee includes representatives from the Queensland Fire and Rescue Service, Horseshoe Bay and West Point rural fire brigades, Townsville City Council, State Emergency Service, Queensland Police Service, Queensland Ambulance Service, NRM and Wulgurukaba Aboriginal Traditional Owners. Annual meetings provide the opportunity to present QPWS burn proposals, discuss operational and communication requirements, and seek cooperation for burn implementation. This approach has seen the successful coordination of a number of cooperative planned burns on the island and QPWS should continue to support and facilitate this group.

Other management issues

Resource use

Magnetic Island supports a growing residential community which demands the provision of service infrastructure. Some of this infrastructure is located in the protected area estate and is authorised under the Nature Conservation Act. The department is also assessing applications for relevant authorities to legalise existing unpermitted infrastructure or to allow new infrastructure.

There are currently five section 35 authorities under the Nature Conservation Act for use of the Forts Command Post and Signal Station for communications infrastructure—Department of Emergency Services (including State Emergency Services and Queensland Fire and Rescue Service), Queensland Police Service, Surf Life Saving Queensland, Townsville City Council (on behalf of MICDA) and Townsville City Council. They have been issued for 10 years and will expire in either 2015 or 2017 unless renewed. The poles and antennae attached to the top of this

heritage infrastructure is an obvious feature in the landscape. The building also has a room that is used by the infrastructure providers to house further supporting infrastructure.

The Townsville–Thuringowa Water Supply Board has a section 34 authority for use of the Forts service track to access their water reservoir which is located on adjacent freehold property. It was also issued for 10 years and will expire in 2014 unless renewed.

Mount Cook is the highest point on the island and the Royal Australian Air Force has an obstruction beacon and helicopter landing pad on the mountain. An application for a section 35 authority is currently under assessment as the previous authority under the old National Parks and Wildlife Act has expired.

Townsville City Council has an existing water pipeline and balance tank in the national park which supplies water to Horseshoe Bay. Council has also indicated that they may need to duplicate the water pipeline to cater for growing demand. The department is in discussions with council to legalise the existing unpermitted infrastructure, most of which was present when the national park was declared.

Ergon Energy also has existing unpermitted electricity lines in the protected area. The department is currently assessing an application for Ergon Energy to install new 22kV supply cables along the same alignment as the existing Townsville City Council water pipeline. As part of this assessment the department will also work with Ergon Energy to legalise the existing unpermitted infrastructure.

The Scout Association of Australia previously had a special lease under the Land Act to use an area of land at Florence Bay. The lease has expired and an application for a section 34 authority is currently under assessment. The buildings contain asbestos and QPWS has been working with the Scout Association of Australia to ensure the area is safe for use.

Encroachments

There are a number of locations around the island where neighbouring property encroaches into the protected area estate. Encroaching property from neighbouring residential areas include garden sheds and improvements, pathways, fencing and a swimming pool. Clearing, erosion and pests are common associated management issues. QPWS communicates with neighbours to educate them about estate boundaries and encroachment management issues, and to resolve problems wherever possible. Re-surveying boundaries to clearly delineate the protected areas may also be effective in those situations where community education is not effective.

Encroachment of council-owned infrastructure is also a problem in some areas, including concrete drainage and water infrastructure. Several units and a camping area at the X-Base Backpackers Resort also encroach into the protected area. These issues are currently being resolved under the Wulgurukaba ILUA tenure transfer process through boundary surveys and excision of infrastructure from the protected area estate.

The walking track in Arthur Bay follows the creek and is inundated at high tide. The walking track route is not readily identifiable to visitors, particularly at high tide and some visitors have become lost. Its current alignment also goes through an Aboriginal shell midden. Re-alignment of the track is favoured; however part of the driveway of an adjacent private property encroaches into the national park and any realignment of the walking track would need to follow this part of the driveway. Revegetation and signage could be used to discourage visitors from accessing the private property. Negotiations with the landholder are required to rectify this management issue.

QPWS works closely with the State Land Asset Management unit of NRM to resolve tenure issues on the island, including encroachments.

Asbestos

Asbestos is a naturally occurring mineral rock made up of strong fibres that have fire, heat and chemical resistant properties. While asbestos is now banned from use, it was a component in thousands of different products used in the community and industry from the 1940s until the late 1980s (Queensland Government, 2012).

Asbestos can pose a risk if fibres of a respirable size become airborne, are inhaled and reach deep into the lungs in sufficient quantities. These respirable fibres are a major health hazard and can cause serious asbestos-related diseases that can take decades to become apparent. Due to the health risks associated with asbestos, it is essential that exposure is effectively managed (Queensland Government, 2012).

Materials containing asbestos have been found in a number of locations on Magnetic Island including Florence Bay. Exposure of buried asbestos material is also evident following severe weather events, such as Cyclone Yasi. Resources are required to ensure ongoing management including locating and recording asbestos, sampling, area closures, removal and soil and air monitoring in accordance with Queensland Workplace Health and Safety legislation.

References

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- JCU (2011), *Magnetic Island Visitor Survey 2011–12*, James Cook University, Townsville.
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- Veth and George (2004) *Statement of Aboriginal values on Magnetic Island: The Need for Consideration of Cultural Values in World Heritage Areas*. In E Evans-Illidge (ed.) *Magnetic Island's Heritage Values: a preliminary assessment*, MICDA and MINCA, Townsville, pp. 31–4.

Management directions

Desired outcomes	Actions and guidelines
<p>Landscape</p> <p>Improved hydrology and a return of more natural flows.</p> <p>Halt and reverse the decline in the size of Horseshoe Bay Lagoon.</p> <p>High scenic coastal landscape values are maintained.</p>	<p>A1. Work collaboratively with Townsville City Council and the Queensland Wetlands Program to improve the hydrology of surface water flows on the island, particularly along West Point Road and at Horseshoe Bay Lagoon.</p> <p>A2. Ensure any new proposals for service facilities (antennae) at the Forts are co-located on existing poles/masts.</p> <p>A3. Manage existing and future service facilities (such as electricity, water, telecommunications) so that they are contained to already disturbed areas and have no greater impact on the aesthetics of the area.</p>
<p>Native plants and animals</p> <p>Enhanced awareness and recording of species of conservation significance.</p> <p>Habitat for species of conservation significance is conserved.</p> <p>Koala populations are healthy and self-sustaining.</p> <p>Improve the condition of rock wallabies being fed off park.</p>	<p>A4. Enhance knowledge and understanding of plant and animal species of conservation significance by:</p> <ul style="list-style-type: none"> • identifying locations where species have been recorded • becoming familiar with the species to enable identification and recording • increasing incidental monitoring • recording species sightings into WildNet • confirming that species previously reported as endemic to Magnetic Island are still considered endemic (found only on the island), or if they have since been found elsewhere. <p>A5. Assess the condition, trend and management of vegetation communities in new areas being converted to protected area, such as saltmarsh and samphire flats.</p> <p>A6. Investigate whether there are any she-oak recruits in the highlands to inform fire management and assess present and potential implications when adult trees start dying.</p> <p>A7. Protect mixed low coastal forest and littoral scrub at Radical Bay by recommending any works associated with development of the freehold property and roads be contained to previously disturbed areas.</p> <p>A8. Work collaboratively with Townsville City Council and developers to minimise impacts on the protected area, including clearing and spread of pest plants and feral cats.</p> <p>A9. Seek an update to the vegetation community mapping which is now almost 30 years old. Ensure the revised mapping is consistent with contemporary vegetation community and/or regional ecosystem classifications.</p> <p>A10. Work collaboratively with the wildlife team (Department of Environment and Heritage Protection), wildlife carers, tour operators, researchers and the community to protect native wildlife. In particular focus on protection of koalas and eliminating feeding of rock wallabies by the public.</p> <p>A11. Seek advice on impacts and management of non-endemic agile wallabies that are spreading out from Horseshoe Bay where they originally escaped.</p>

Desired outcomes	Actions and guidelines
<p>Aboriginal culture</p> <p>Develop cooperative relationships with Traditional Owners to protect Indigenous cultural heritage.</p> <p>Wulgurukaba people are actively involved in management.</p> <p>Visitors and island residents are familiar with Aboriginal stories, histories and sites that Wulgurukaba people are content to share.</p>	<p>A12. Develop cooperative relationships with Wulgurukaba Traditional Owners (through established communication protocols with the Wulgurukaba Yunbenun Aboriginal Corporation and Wulgurukaba Aboriginal Corporation) to protect and maintain Indigenous cultural heritage.</p> <p>A13. Implement QPWS commitments under the Wulgurukaba People Indigenous Land Use Agreement, including the development of a memorandum of understanding.</p> <p>A14. Continue to identify and record places of Indigenous cultural heritage in the Cultural Heritage Inventory and manage them appropriately with the involvement of Traditional Owners.</p> <p>A15. Support Traditional Owners in undertaking a formal cultural heritage study of the island so that important cultural heritage places can be formally entered onto the cultural heritage database and register established under the Aboriginal Cultural Heritage Act. Maintain confidentiality as requested by the Wulgurukaba Traditional Owners.</p>
<p>Shared-cultural heritage</p> <p>The Forts complex is preserved as a valuable representation of Queensland's historic island coastal defence fortifications and provides an enduring safe visitor opportunity.</p>	<p>A16. Prioritise undertaking a cultural heritage assessment of the Forts complex and developing a cultural heritage management plan to guide management decisions and ensure protection of this important coastal defence site. Consult with infrastructure providers to assess visitor safety and the stability of the Forts Signal Station for ongoing use as a communications facility.</p> <p>A17. Work collaboratively with the Department of Defence to catalogue sites on the island and ensure they are well known and managed.</p> <p>A18. Identify record and manage places of shared-cultural heritage significance.</p>
<p>Tourism and visitor opportunities</p> <p>Present the area's natural and cultural values by providing safe, sustainable nature-based recreation opportunities.</p> <p>Recreation opportunities encourage visitor enjoyment and understanding.</p> <p>The Forts complex is Magnetic Island's premier visitor experience.</p>	<p>A19. Maintain visitor facilities to a natural setting (LCS 3–4) while providing a range of opportunities and experiences for visitors. Ensure each visitor opportunity on the island has an established and desired LCS.</p> <p>A20. Manage the Forts complex as the island's premier visitor opportunity by redeveloping the area, including:</p> <ul style="list-style-type: none"> • rebuilding the walking track • working collaboratively with Townsville City Council to upgrade the car park, including provision of toilet facilities to improve management of human waste • providing opportunities for interpretation of koalas, Indigenous cultural heritage and shared-history cultural heritage • improving the safety of infrastructure. <p>A21. Consider management options and feasibility for emerging and increasing visitor activities, including:</p> <ul style="list-style-type: none"> • continued use of the new conservation park area at Horseshoe Bay for horse riding (implement recommendations of QPWS 2009 report) • maintaining visitor access and safety to swimming holes in areas being converted to national park • managing vehicles in the new conservation park area at Horseshoe Bay • visitor use and safety issues at rock climbing/bouldering sites in areas being converted to national park in close consultation with user groups • formalising a walking track to Rocky Bay • mountain bike riding in consultation with representative groups • reopening closed tracks such as the Forts to Florence Bay walking track and the historic Mount Paluma track • a bird hide and interpretation facility at Horseshoe Bay Lagoon, in consultation with Townsville City Council, Townsville Region Bird Observers Club and tourism groups.

Desired outcomes	Actions and guidelines
	<p>A22. Minimise disturbance by encouraging visitors to stay on designated walking tracks through education such as publications and signs, and closing and rehabilitating tracks as required.</p> <p>A23. Maintain existing protected area access points, signs, walking tracks and lookouts. Wherever possible QPWS managed walking tracks should be contained to protected area boundaries.</p> <p>A24. Improve the natural condition of closed walking tracks through stabilisation and pest plant control efforts.</p> <p>A25. Establish the level of visitor use at particular visitor sites (such as the Forts) by installing electronic visitor counting systems.</p> <p>A26. Encourage and support Wulgurukaba people to develop opportunities for tourism such as Indigenous tours.</p>
<p>Education and research</p> <p>Information about natural and cultural values and visitor opportunities is available to the public.</p> <p>Visitors are responsible and aware of risks and restrictions on access or activities.</p> <p>External research contributes to protection and sustainable use of the protected area.</p>	<p>A27. Develop and implement a communication package in consultation with the Wulgurukaba people, Townsville Enterprise and Townsville City Council, including:</p> <ul style="list-style-type: none"> • develop and implement a statement of interpretative intent that includes improved visitor communication material regarding visitor sites, access and natural and cultural values and website material • recognition of Aboriginal cultural heritage through the use of Aboriginal place names • improve community awareness of impacts from feeding wildlife and living near snakes • feasibility of a children's program in consultation with relevant management units. <p>A28. Ensure educational and research organisations provide a summary of their results to QPWS park managers as a contribution to improved management.</p> <p>A29. Encourage and support research into species biology, ecology (such as preferred fire regimes) and population dynamics to inform management and guide conservation efforts.</p>
<p>Partnerships</p> <p>Maintain and strengthen existing partnerships and develop new partnerships with government, industry and the community.</p>	<p>A30. Establish regular meetings with Townsville City Council to identify management issues and discuss options.</p> <p>A31. Ensure the Wulgurukaba Traditional Owners, Townsville City Council, Townsville Enterprise, community groups and the broader community are aware of management strategies and given opportunities to become involved in ongoing planning and implementation programs.</p> <p>A32. Ensure QPWS is represented on established community groups such as Tourism Operators and Businesses Magnetic Island Association and Bolger Bay Steering Committee.</p> <p>A33. Develop improved partnerships with James Cook University and other research institutions to optimise opportunities to encourage research relevant to protected area management.</p> <p>A34. Encourage further opportunities for the Department of Defence to contribute to park management, such as maintenance of the Forts walking tracks and cultural heritage infrastructure.</p>
<p>Pest management</p> <p>The threats posed by pest plants and animals on species diversity and integrity are managed.</p> <p>Reduce abundance of pests in the urban interface.</p>	<p>A35. Review the Level 2 pest strategy. Include feral animals and the new areas being converted to protected area.</p> <p>A36. Implement the Level 2 pest strategy through approved activity proposals and monitoring. Concentrate efforts towards:</p> <ul style="list-style-type: none"> • reducing the prevalence of weeds at Horseshoe Bay Lagoon and other wetlands • control of rubber vine at Rollingstone Bay • control of pest plants along walking tracks, fire access tracks and roads • reducing the abundance of pest plants along protected area boundaries in collaboration with residents, the Department of Natural Resources and Mines

Desired outcomes	Actions and guidelines
	<p>and Townsville City Council</p> <ul style="list-style-type: none"> • control of feral cats in collaboration with Townsville City Council. <p>A37. Ensure authority holders for service infrastructure such as electricity and water are compliant with permit/authority conditions to control pests and inform QPWS when undertaking works. Ongoing monitoring and management of pest plants should be undertaken by authority holders, with particular emphasis on the first three years following construction activity.</p> <p>A38. Investigate options for establishing deseeding stations on the island in consultation with Townsville City Council and other infrastructure providers.</p> <p>A39. Work collaboratively with Townsville City Council and the Magnetic Island community to contain pest plants and animals to private property.</p>
<p>Fire management</p> <p>The protected area and neighbouring residential/urban areas are protected from wildfire.</p> <p>Vegetation communities and species habitats are conserved.</p>	<p>A40. Review the Level 2 fire strategy. As part of the review have a fire ecologist review the fire monitoring data collected to determine whether QPWS fire management is appropriate and to advise on future monitoring and fire management. In particular seek advice on the condition, trend and ongoing fire management for the following:</p> <ul style="list-style-type: none"> • poplar gum, bloodwood woodland and Moreton Bay Ash flats • mixed eucalypt woodland, grasslands and acacia shrubland • mixed semi-deciduous woodlands where thickening appears to be occurring, especially given anticipated climate change impacts • she-oaks in the highlands that appeared following wildfire in 1972 • Aboriginal bush tucker species • conservation significant plant and animal species • and to retain ecotones. <p>A41. Revise burn proposals and monitoring in response to the review of the fire strategy.</p> <p>A42. Communicate with stakeholders and the community regarding planned burning and ensure the department is represented on the Magnetic Island Fire Management Committee.</p>
<p>Other issues</p> <p>Minimise and contain impacts from infrastructure providers.</p> <p>Reduce the number of encroachments into the protected area.</p> <p>Manage asbestos to ensure safety of staff and visitors.</p>	<p>A43. Ensure all infrastructure providers with infrastructure in the protected area have a relevant authority under the Nature Conservation Act and comply with the conditions of the authority. Seek to optimise outcomes for protected area management when negotiating with infrastructure providers and developing the conditions of the authority.</p> <p>A44. Seek a resolution to encroachments in the protected area such as fences and driveways in consultation with those responsible for the encroachments and the State Land Assets Management Team (NRM). Prioritise resolving issues relating to the Arthur Bay walking track.</p> <p>A45. Consider conducting a cadastral survey to locate and mark the boundaries of the protected area and identify encroachments. Reference all marks with star pickets or some other marker system to ensure boundaries can be identified when on site.</p> <p>A46. Identify and manage asbestos in accordance with Queensland Workplace Health and Safety legislation.</p> <p>A47. Develop and implement a strategy for management of asbestos that includes regular monitoring for the presence of asbestos, particularly following severe weather events, and safe handling and disposal.</p>

Tables – Conservation values management

Table 1: Vegetation assemblages

Vegetation assemblage	Vegetation communities	Of concern regional ecosystems*	Endangered regional ecosystems
Araucaria forest and mixed low coastal forest	Araucaria forest Mixed low coastal forest	11.2.2, 11.2.4, 11.12.12, 11.12.16	11.3.11
Highland vegetation	Highland vegetation communities (includes the following vegetation types: Cabbage Tree Palm and Forest Sheoak Forest, Mallee Brush Box Forest, and Sheoak and Grass Tree Shrubland)	11.12.15, 11.12.16	
Littoral scrub	Littoral scrub	11.2.2, 11.2.3, 11.12.12, 11.12.16	11.3.11
Mixed eucalypt woodland, grasslands and acacia shrubland	Mixed eucalypt woodland Grassland +/- sparse trees and shrubs Acacia shrubland	11.2.1, 11.2.2, 11.2.3, 11.2.4, 11.3.25, 11.12.12, 11.12.15, 11.12.16	11.3.11
Mixed low open scrub	Mixed low open scrub	11.12.16	
Mixed semi-deciduous woodlands	Mixed semi-deciduous low open woodland Mixed semi-deciduous woodland	11.2.1, 11.2.3, 11.3.25, 11.12.12, 11.12.15, 11.12.16	11.3.11
Poplar gum and bloodwood woodland, and Moreton Bay ash flats.	Poplar gum and bloodwood woodland Moreton Bay ash flats	11.2.1, 11.2.2, 11.2.3, 11.2.4, 11.3.25, 11.3.27, 11.12.16	
Vine forest	Low vine forest amongst boulders Vine forest	11.2.1, 11.2.3, 11.3.25, 11.12.12, 11.12.16	11.3.11
Wetlands and coastal vegetation	Coastal she oak woodland Forest red gum forest Grey mangrove forest Mixed mangrove shrubland Saltmarsh and samphire flats Bulkuru swamp Weeping tea-tree swamp Stilted mangrove forest	11.2.1, 11.2.2, 11.2.3, 11.2.4, 11.3.25, 11.3.27, 11.12.16	11.3.11

* Determined from extract of the following geographic data:

Sandercoe (1990), Vegetation of Magnetic Island, for Queensland Parks and Wildlife Service.

Queensland Herbarium (2010), Bioregions and subregions of Queensland, version 5.0, Department of Environment and Resource Management.

Note: See also page 3 and action A9 regarding vegetation communities and regional ecosystems.

Table 2: Endangered and of concern regional ecosystems

Regional ecosystem number	Description	Biodiversity status
11.2.1	<i>Eucalyptus platyphylla</i> , <i>Corymbia tessellaris</i> woodland on sandy coastal plains	Of concern
11.2.2	Complex of <i>Spinifex sericeus</i> , <i>Ipomoea pes-caprae</i> and <i>Casuarina equisetifolia</i> grassland and herbland on foredunes	Of concern
11.2.3	Microphyll vine forest (beach scrub) on sandy beach ridges	Of concern
11.2.4	Lagoons in swales	Of concern
11.3.11	Semi-evergreen vine thicket on alluvial plains	Endangered
11.3.25	<i>Eucalyptus tereticornis</i> or <i>E. camaldulensis</i> woodland fringing drainage lines	Of concern
11.3.27	Freshwater wetlands	Of concern
11.12.12	<i>Araucaria cunninghamii</i> woodland on igneous rocks (boulder-strewn coastal hills)	Of concern
11.12.15	<i>Allocasuarina torulosa</i> , <i>Livistona drudei</i> woodland on igneous rocks, coastal hills	Of concern
11.12.16	<i>Acacia</i> spp. low woodland on igneous rocks, coastal hills	Of concern

Table 3: Plant and animal species of conservation significance

Scientific name	Common name	Nature Conservation Act 1992 status	Environment Protection and Biodiversity Conservation Act 1999 status	Back on Track status
Plants				
<i>Acacia jackesiana</i>		Near threatened		Low
<i>Bonamia dietrichiana</i>		Near threatened		Low
<i>Cassia</i> sp. (Paluma Range G.Sankowsky + 450)		Near threatened		Low
<i>Corchorus hygrophilus</i>		Vulnerable		Medium
<i>Croton magneticus</i>		Vulnerable	Vulnerable	Low
<i>Grewia graniticola</i>		Near threatened		Low
<i>Leucopogon cuspidatus</i>			Vulnerable	Low
<i>Livistona drudei</i>	cabbage palm	Vulnerable		Medium
<i>Marsdenia brevifolia</i>		Vulnerable	Vulnerable	High
<i>Peripleura scabra</i>		Near threatened		Low
<i>Solanum sporadotrichum</i>		Near threatened		Low
Animals				
<i>Acanthophis antarcticus</i>	common death adder	Near threatened		Medium
<i>Delma labialis</i>	striped-tailed delma	Vulnerable	Vulnerable	Medium
<i>Ephippiorhynchus asiaticus</i>	black-necked stork	Near threatened		Low
<i>Esacus magnirostris</i>	beach stone curlew	Vulnerable		High
<i>Glaphyromorphus mjobergi</i>		Near threatened		Low
<i>Haematopus fuliginosus</i>	sooty oystercatcher	Near threatened		Low
<i>Lampropholis mirabilis</i>		Near threatened		Low
<i>Menetia sadleri</i>	Sadlier's skink	Vulnerable		Low
<i>Numenius madagascariensis</i>	eastern curlew	Near threatened		Low
<i>Phascolarctos cinereus</i>	koala	Least concern	Vulnerable	Low
<i>Saccolaimus saccolaimus nudicluniatus</i>	bare-rumped sheath-tail bat	Endangered	Critically endangered	High
<i>Sternula albifrons</i>	little tern	Endangered		High
<i>Taphozous australis</i>	coastal sheath-tail bat	Vulnerable		High

Table 4: Bird species listed in international agreements

Family	Scientific name	Common name	BONN	JAMBA	ROKAMBA	CAMBA
Laridae	<i>Hydroprogne caspia</i>	Caspian tern	✓			✓
Laridae	<i>Sternula albifrons</i>	little tern	✓	✓	✓	✓
Laridae	<i>Thalasseus bengalensis</i>	lesser crested tern	✓			✓
Laridae	<i>Thalasseus bergii</i>	crested tern	✓	✓		
Scolopacidae	<i>Arenaria interpres</i>	ruddy turnstone	✓	✓	✓	✓
Scolopacidae	<i>Calidris acuminata</i>	sharp-tailed sandpiper	✓	✓	✓	✓
Scolopacidae	<i>Limosa lapponica</i>	bar-tailed godwit	✓	✓	✓	✓
Scolopacidae	<i>Limosa limosa</i>	black-tailed godwit	✓	✓	✓	✓
Scolopacidae	<i>Numenius madagascariensis</i>	eastern curlew	✓	✓	✓	✓
Scolopacidae	<i>Numenius phaeopus</i>	whimbrel	✓	✓	✓	✓
Scolopacidae	<i>Tringa brevipes</i>	grey-tailed tattler		✓	✓	✓
Scolopacidae	<i>Tringa hypoleucos</i>	common sandpiper	✓	✓	✓	✓
Scolopacidae	<i>Tringa nebularia</i>	greenshank	✓	✓	✓	✓
Scolopacidae	<i>Tringa stagnatilis</i>	marsh sandpiper	✓		✓	✓

BONN – Bonn Convention

CAMBA – China–Australia Migratory Bird Agreement

JAMBA – Japan–Australia Migratory Bird Agreement

ROKAMBA – Republic of Korea–Australia Migratory Bird Agreement

Table 5: Declared pest plant species

Pest plant	Class 2	Class 3	Weed of National Significance	Threat level (pest strategy)
American rat's tail grass <i>Sporobolus jacquemontii</i>	✓			Extremely high
belly-ache bush <i>Jatropha gossypifolia</i>	✓		✓	Emerging
Captain Cook tree <i>Thevetia peruviana</i>		✓		Emerging
Chinese apple <i>Ziziphus mauritiana</i>	✓			Emerging
lantana <i>Lantana camara</i>		✓	✓	Extremely high
mother of millions <i>Brophyllum spp.</i>	✓			Moderate
prickly pear <i>Opuntia spp.</i>	✓			Low
rubber vine <i>Cryptostegia grandiflora</i>	✓		✓	Extremely high
salvinia <i>Salvinia molesta</i>	✓			Moderate
Singapore daisy <i>Sphagneticola trilobata</i>		✓		Emerging
yellow bells <i>Tecoma stans</i>		✓		Emerging