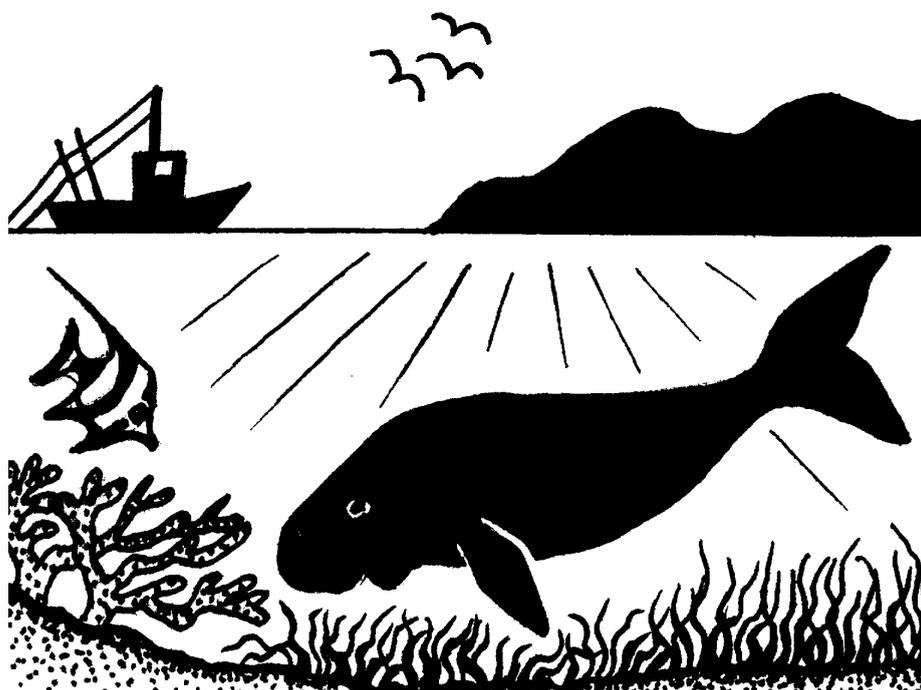


## SECTION 4: Coastal and Marine Environments

### KEY PRIORITIES

To encourage relevant agencies to develop a coastal zone management plan, and support community participation in the planning by providing appropriate participation opportunities and information and awareness activities; and

To progress the collaborative development of a long term plan for indigenous involvement in local natural resources management, in a spirit of reconciliation and of respect for traditional customs and legitimate Aboriginal aspirations.



### *COASTAL ZONE USE AND DEVELOPMENT*

Townsville-Thuringowa is a fast growing urban and industrial centre, with the population expected to reach approximately 200,000 by the year 2020. The sub-region has the second largest port in Queensland and has been earmarked for future development of heavy industry. Human activities already impact on a large variety of marine and coastal habitats and ecosystems locally. The rate and nature of development pose even more serious threats to marine and coastal resources, habitats and ecosystems. Unsound and uncontrolled land use practices in urban, rural and rural-residential areas (e.g. inappropriate land clearing practices) may cause severe downstream problems. The large number of short coastal catchments in the area provides the potential for impacts to be widely distributed along the coast. Coastal development and downstream effects of land-based practices are already resulting in degradation of habitats, including economically important fisheries habitats and habitats used by endangered species.

By providing a framework to address marine and coastal issues, this Section aims to set the groundwork for development of a Coastal Zone Management Plan for this region, as required under the *Coastal Protection and Management Act* (1995).

## **COASTAL PROCESSES**

Coastal erosion and human-induced changes to the natural dynamics of coastal sediments are major issues threatening marine and coastal environments. In Townsville-Thuringowa, problems have resulted from inadequate planning of past developments in the coastal zone. This highlights the need for a strategic approach to the future use of our coastline.

The disturbance of acid sulfate soils in the coastal zone is emerging as an issue with the potential for severe long-term implications for ecosystem health and productivity. It is important to have strategic planning and control by authorities, but the whole community has a responsibility for environmental care. Under the general duty of care, anyone who engages in earthworks in an acid sulfate risk area is legally liable for any negative impacts that may result. However, this Strategy recognises that improved community awareness and understanding of the environmental implications of activities is an important means of changing behaviour.

## **CONSERVATION OF COASTAL AND MARINE RESOURCES**

The coastline of Townsville-Thuringowa has areas of exceptionally high conservation values with international, national, regional and local significance. The integrity of these environments, which include the Great Barrier Reef World Heritage Area and part of a Ramsar Wetland Site, is fundamental to the preservation of Australia's biological diversity. Two Dugong Protection Areas (seagrass beds in Cleveland and Bowling Green Bays) are very important for protecting declining Dugong populations and other threatened marine fauna). Some coastal wetlands in Townsville-Thuringowa have been identified as nationally important for the conservation of migratory shorebirds.

Some local beach ridge systems are unique for their diversity and species composition but are currently considered at risk of disappearing because of pressures from coastal development. There are also habitats of extreme importance for regional and local fisheries, including two Fish Habitat Areas. Seagrass beds and mangroves are nursery and feeding habitats for a range of economically and recreationally important species, including barramundi, mangrove jack and prawns.

This Section addresses issues for coastal and marine environments, including wetlands, seagrass beds, dunes and beach ridge systems and fringing reefs. It also looks at issues for individual species of particular significance for biodiversity conservation (endangered species); the interactions of such species (e.g. estuarine crocodiles) with human populations; and education and community understanding through activities such as involvement in the protection of charismatic mega-fauna.

## **TRADITIONAL MANAGEMENT OF SEA COUNTRY**

Traditionally, indigenous communities have used marine and coastal resources based on a system of rights and responsibilities that pre-dates colonisation. This system makes consideration for protection and maintenance of significant sites and continued survival of flora and fauna. The increasing number of interests and uses placing pressure on coastal and marine resources in Townsville-Thuringowa may come into conflict with this traditional system, the protection of sites, and the use of resources by traditional owners. This Section aims to address these issues in collaboration with local indigenous communities.

## **STRATEGY 4.1 COASTAL ZONE USE AND DEVELOPMENT**

### **❖ WHAT ARE THE ISSUES?**

Townsville-Thuringowa is a fast growing, coastal centre, with the population expected to reach 200,000 in the year 2020. The sub-region has been earmarked for future development of heavy industry and currently has the second largest port in Queensland. The rate and nature of development poses serious threats to the integrity of marine and coastal habitats, while an increasing number of interests and uses are increasing pressure on limited coastal and marine resources.

Townsville-Thuringowa is located largely along a coastline with areas of exceptionally high values for conservation and sustainable natural resource use. These include the Great Barrier Reef World Heritage Area; two Dugong Protection Areas; two habitats of international significance for migratory shorebirds; diverse habitats for fisheries, including two declared Fish Habitat Areas and a Ramsar Site (a Ramsar Site is a wetland of international significance for the protection of water birds).

Unsound land-use practices in urban and rural areas (e.g. inappropriate land clearing practices) may result in severe downstream impacts. The large number of short coastal catchments in Townsville-Thuringowa may spread these impacts widely along the coast. Degradation of habitat values will have serious long-term economic and ecological implications. Our community needs to protect our coasts and maintain the sustainable use of our resources. We need to prepare a framework for coastal zone use and development that minimises conflicts and integrates planning and management programs. This can be best achieved by encouraging the effective participation of all the community in planning for the future use of coastal resources and then putting these plans into actions.

### **❖ WHY IS THE COASTAL ZONE IMPORTANT?**

The coastal and marine environments in Townsville-Thuringowa:

- include diverse ecosystems with high conservation values, supporting a great variety of wildlife species;
- include habitats important for the productivity of recreational, commercial and traditional fisheries;
- contribute to the unique landscape and provide a "sense of place";
- provide opportunities for a wide range of nature-based recreational activities;
- represent an attraction and an important asset for the local tourism industry; and
- provide economically important opportunities for maritime transport and port facilities.

### **❖ WHAT CAN WE DO ABOUT IT?**

We can plan and manage development in the coastal zone, whether for urban, industrial or rural purposes, in a way that ensures the protection of the coast's conservation and amenity values and the sustainable use of its biological resources.

### **❖ WHAT CAN THIS STRATEGY ACHIEVE?**

- ★★★ Informed community input in a long-term Coastal Zone Management Plan for the Dry Tropics based on effective participation, with opportunities for open public debate on broad directions for the use and development of our coasts.
- ★★ Effective protection mechanisms for key coastal and marine sites, resources and values, including World Heritage Area values.
- ★★ Development and implementation of management approaches to reduce inappropriate uses of the coast and minimise the impacts of current and future urban, industrial, agricultural and tourist activities.
- ★★ Increased community awareness and stewardship of our marine and coastal resources.

## **STRATEGY 4.2 COASTAL EROSION**

### **❖ WHAT ARE THE ISSUES?**

Coastal erosion is the receding of the shoreline due to loss of sediments from shore areas, including beaches, beach ridges, foredunes, mangroves, mudflats, estuaries, saltmarshes and headlands. Changes in the coastline occur naturally, but erosion has been greatly accelerated by human activities.

In the past, we have not given sufficient consideration to the consequences of human-induced changes to coastal sediment dynamics and shoreline habitat stability. Many of the problems we currently face (such as erosion at Rowes Bay, for example) have resulted from inadequate planning of development in the coastal zone. Major long-term human causes of coastal erosion include changes to long-shore drift due to construction of hard structures (eg, breakwaters); habitat reclamation and degradation in mangroves, saltpans and beach fronts; and trapping of sediment in rivers behind dams and weirs.

Our community must encourage the relevant authorities to acknowledge and understand the consequences of major coastal modifications on sediment movements and ensure that lessons from past mistakes are incorporated into long-term regional planning for the coastal zone. Residents too must take responsibility for reducing the detrimental impacts of our activities along the coastline. These activities include the inappropriate clearing of coastal vegetation; introduction of exotic plants; use of concrete and other materials to “stabilise” the shore; and some recreational activities, such as four-wheel driving and the removal of drift wood and natural debris.

### **❖ WHY MANAGE COASTAL EROSION?**

Shore areas:

- provide transition zones between terrestrial and marine habitats, and as such they are important for ecosystem functioning and biodiversity;
- provide natural controls for storm surge, flood and salt water retention;
- contain areas important for fisheries and the local and regional economies;
- afford popular opportunities for recreation;
- are important components of the regional landscape; and
- are important to indigenous communities.

### **❖ WHAT CAN WE DO ABOUT IT?**

We can minimise human impacts on the ecological and physical values of shorelines, and the natural coastal sediment dynamics of Townsville-Thuringowa.

### **❖ WHAT CAN THIS STRATEGY ACHIEVE?**

- ★★ Improved understanding and management of the long-term impacts of human-induced catchment and coastline modifications on natural processes and sediment dynamics, and integration of the information into regional coastal zone planning.
- ★★ Improved management of coastal areas for physical values, including appropriate restoration of degraded areas and effective protection of areas vulnerable to erosion.

## **STRATEGY 4.3 ACID SULFATE SOILS**

### **❖ WHAT ARE THE ISSUES?**

Acid sulfate soils are common in northern Australia along low-lying coasts less than 5 m above sea level. These soils formed naturally over thousands of years in coastal areas such as mangroves, salt pans and brackish swamps. When these soils are water-logged, they are not acidic, so they are termed Potential Acid Sulfate Soils. However, draining water-logged coastal soils can be disastrous, because when they are exposed to air they can produce sulfuric acid (the same as battery acid), soluble aluminium and iron flocs. These chemical pollutants can impact on soil and vegetation, drain into waterways and cause fish kills, and threaten aquatic ecosystems and sometimes human health.

Disturbance of acid sulfate soils may have long term implications by increasing the environment's concentrations of aluminium and heavy metals, which are highly toxic to animals and humans and cause increased susceptibility of organisms to diseases (notably "red-spot" disease in fish). Moreover, vegetation will not grow on disturbed and untreated acid soils. In Townsville-Thuringowa, excavations and earthmoving activities for construction often disturb acid sulfate soils. Acid run-off corrodes concrete, steel and plastic infrastructure and has been known to cause significant damage, including the collapse of bridges and the destabilisation of roads and rail lines. In the coastal rural parts of Townsville-Thuringowa, excavation of agricultural dams and drains, construction of levees and land clearing for development (e.g. sugarcane, aquaculture) are likely to disturb acid sulfate soils.

This problem has only recently received attention from environmental managers in local and state government agencies. As a consequence, knowledge of the extent of the problem in Townsville-Thuringowa is limited and public awareness of the issues is quite low.

### **❖ WHY MANAGE ACID SULFATE SOILS?**

Acid Sulfate Soils are naturally occurring soils that, when disturbed, release toxic pollutants with potentially serious implications for:

- aquatic ecosystems, including marine environments;
- human health;
- economically and traditionally important wild fish populations;
- viability of aquaculture ventures; and
- expensive public and private infrastructure, such as house stumps and bridge pylons.

### **❖ WHAT CAN WE DO ABOUT IT?**

We can minimise disturbance of acid sulfate soils, and if disturbance does occur, we can ensure that ecological impacts do not result.

### **❖ WHAT CAN THIS STRATEGY ACHIEVE?**

- ★★★ Minimisation of disturbance of potential acid sulfate soils through development controls, planning and site management.
- ★★★ Increased awareness and understanding of the problem among landholders, developers, managers and the general public in Townsville-Thuringowa.
- ★★★ Systems for early detection of acid sulfate soil impacts, to allow prompt solutions.

## **STRATEGY 4.4 BEACH AND DUNE SYSTEMS**

### **❖ WHAT ARE THE ISSUES?**

Beach dunes and ridges that retain their natural vegetation provide protection for the coastline from storm surges by stabilising the sediments. They also support important native flora and fauna species. The destruction of dune vegetation increases wind erosion and weakens the dune against water inundation. Once native vegetation is removed, introduced species take over dunes and are hard to control.

Significant beach ridge forest communities with high value for conservation of native vegetation and habitats occur behind the beaches north and south of the City. Important areas occur between Ollera Creek and Toomulla, at Saunders Beach, along the Cleveland Bay shoreline south of Ross River, and at Long Beach on Cape Cleveland.

Native coastal vegetation in foreshore areas is protected in Queensland, and local councils have the responsibility for enforcing the relevant legislation. Despite this, many of our beaches bear the signs of detrimental changes to the natural vegetation. Much damage is caused by nearby residents "improving" the landscape and access. A recent report for The City of Thuringowa found that many of the Thuringowa's beaches are covered by inappropriate exotic species and much of the native vegetation has been cleared.

Current arrangements under the *Beach Protection Act* do not provide adequate protection of natural values in beach and dune areas. There is a need to revise the legislation and management arrangements in light of problems experienced by local authorities and the concerned public, and in light of the obvious decline in cover and condition of native vegetation in foreshore areas.

### **❖ WHY PROTECT BEACH DUNES?**

Vegetation communities associated with beach ridges, dunes and swales:

- include regionally important ecosystems that are under threat from coastal development pressures;
- maintain natural sediment dynamics by stabilising beach dunes and protecting the sand from wind erosion;
- provide habitats for native flora and fauna species; and
- buffer the coast from storms.

### **❖ WHAT CAN WE DO ABOUT IT?**

We can protect beach dunes and restore disturbed and degraded beach fronts to secure the long-term integrity of beach dune vegetation systems.

### **❖ WHAT CAN THIS STRATEGY ACHIEVE?**

- ★★ A review of the adequacy of current legislation for the protection of beach dune landforms and native vegetation.
- ★★ Mechanisms to increase government resources for the protection of vegetation communities on foreshore reserves and Unallocated State Lands.
- ★★ A comprehensive revegetation and site management program for coastal and estuarine sites.
- ★★ Formal protection of the diversity of coastal vegetation systems.
- ★★ A community of coastal residents that understand and feel responsible for the integrity of natural beach systems.

## **STRATEGY 4.5 FISH HABITATS**

### **❖ WHAT ARE THE ISSUES?**

Fish habitats are defined as lands, waters and vegetation essential to the life cycle of fish (including crustacean) populations. Fish habitats are protected by legislation, through protection of marine plants and through the declaration of Fish Habitat Areas. There are declared Fish Habitat Areas in the Bohle River and Bowling Green Bay, both of which are inshore marine environments. Declaration of a third one in Cleveland Bay is currently under consideration. A number of other areas have been identified as worthy of protection for their fish habitat values. These include the State Land reserve adjacent to Lorna Creek; the Esplanade areas of Crystal Creek; the State Land between the mouths of Hencamp and Rollingsstone Creeks; the State Land esplanade between the mouths of Leichardt and Sleeper Log Creeks; and the mangroves and swamps on the western side of the Black River mouth.

The major processes threatening fish habitats in Townsville-Thuringowa include: degradation and loss of habitat, via wetlands reclamation; changes to the natural catchment hydrology and physical barriers to fish movements; decreased water quality; and the introduction of exotic fish species that compete for resources or directly feed on early life stages of native fish populations.

At present, we have little information on the local freshwater fish resources, populations and habitat conditions. This gap makes it hard to manage land use practices to minimise impacts on fish habitats. Our community must ensure that the real values of fish habitats, for both fisheries and conservation, are adequately acknowledged in regional management policies, and in the assessment of individual development proposals.

An emerging problem is the dumping of aquarium pets in urban waterways, especially the Ross River. There is a need for greater understanding in the community about the consequences of this practice for the health of the habitats that support our native fish populations.

### **❖ WHY PROTECT FISH HABITATS?**

Fish habitats, including marine, estuarine and freshwater environments:

- function as essential nursery areas and support wild populations of native fish species that perform important functions in the aquatic ecosystems and contribute to the region's biological diversity; and
- support the productivity of fisheries that are important to commercial and recreational fishers, the tourism industry and local indigenous communities.

### **❖ WHAT CAN WE DO ABOUT IT?**

We can ensure that freshwater, estuarine and marine fish habitats are protected and managed sustainably for ecological, economic and traditional uses.

### **❖ WHAT CAN THIS STRATEGY ACHIEVE?**

- ★★★ Integrated catchment management for fish habitats, including formal protection of locally and regionally valuable marine and freshwater fish habitats.
- ★★★ Understanding and reduction of threats to fish habitats and aquatic ecosystems (including changes in water quality; exotic fish species; changes in natural hydrology; and loss of in-stream habitat connectivity).
- ★★★ Education programs to reduce impacts of human activities on fish habitats.

## **STRATEGY 4.6 MARINE RESOURCES AND BIODIVERSITY**

### **❖ WHAT ARE THE ISSUES?**

The coastline of Townsville-Thuringowa is rich in natural resources. Important marine ecosystems for endangered wildlife and commercially important fish populations include coral reefs and seagrass beds. Fringing coral reefs occurring around Magnetic Island and smaller, uninhabited continental islands are part of the Great Barrier Reef World Heritage Area. A variety of reefs characterised by many different coral species grow around the protected headlands of Magnetic Island. These reefs are easily accessible places for high-quality snorkelling, diving and fishing, for both local residents and the tourism industry alike.

Our coastal shores and waters are home to a rich and diverse marine and coastal wildlife. Dugongs, Green and Flat-back Turtles, Little Terns, Beach Stone-Curlews, Estuarine Crocodiles, Jungle Perch, Irrawaddy and Humpback Dolphins are just a few of the most vulnerable species. They live here because of the variety of significant habitats including turtle nesting areas, Dugong feeding grounds, fish nurseries, and mangroves.

Increasing pressures on the coast, resulting from urban development and global warming, pose serious threats to the health and integrity of our coastal environment. Coral reefs are seriously threatened by human-induced disturbances, particularly increases in suspended sediments and nutrients, and changes in salinity. Major threats to reefs come from coastal development; a growing population; increased pollution; increasing tourism and recreation in the bays of Magnetic Island; increasing shipping; and maintenance of the port. Localised impacts also result from activities such as trampling at low tide and anchor damage. Other coastal habitats suffer as a result of urban and industrial growth, decreased quality of coastal waters and destructive fishing practices. Irresponsible boating, littering and illegal netting can result directly in the death of animals.

We must ensure that the conservation, fishing and tourism values of local reefs are protected through appropriate planning and management of developments in the coastal zone. We must also address the potential consequences of greenhouse gases emissions on the future of our coasts. Effective communication, accurate information, continuing research and responsible attitudes are required to protect key marine habitats and local marine wildlife populations.

### **❖ WHY PROTECT MARINE RESOURCES AND BIODIVERSITY?**

Marine ecosystems in Townsville-Thuringowa:

- are highly diverse and have high value for marine conservation;
- represent key habitats for traditionally, commercially and recreationally important fisheries;
- provide opportunities for underwater recreation, tourism and wildlife observation;
- contain populations of endangered species and species with important roles in ecosystem functions;
- support charismatic animals like turtles, dolphins and dugongs, that are treasured by the community; and
- have strong cultural and dietary significance for indigenous communities.

### **❖ WHAT CAN WE DO ABOUT IT?**

We can plan and manage current and future activities on the land, along our coast and in marine environments to ensure the long-term health of marine ecosystems and the protection and/or sustainable harvesting of wildlife populations.

### **❖ WHAT CAN THIS STRATEGY ACHIEVE?**

- ★★ Sound knowledge base of the ecology and condition of local marine ecosystems and their values for conservation, fishing, tourism and indigenous culture.
- ★★ Effective integrated planning and management programs to minimise impacts of land-based activities on marine resources and ecosystems.
- ★★★ Improved protection measures for local Dugong and turtle populations.
- ★★ Increased participation in management and ecologically sustainable use of marine natural resources by the broader community.

## **STRATEGY 4.7 TRADITIONAL USE OF THE COAST AND THE SEA**

This Strategy has been prepared by the Wulgurukaba Traditional Owners. It may not necessarily reflect the values and objectives of other indigenous groups in the region.

### **❖ A WULGURUKABA PERSPECTIVE**

Traditional use of marine resources by indigenous communities in coastal Australia is based on traditional rights and responsibilities that pre-date colonisation. Those rights and responsibilities include the protection and maintenance of coastal and marine sites of significance and the continued survival of the flora and fauna that form part of that environment, all of which play a pivotal role in the survival of coastal indigenous groups and their way of life. The continuing problem is the failure to have those rights and responsibilities fully recognised, firstly through the legislative process and secondly through the everyday management and survival of those coastal and marine environments and the resources contained in them. Areas of particular concern include: the long-term effects of commercial and recreational fishing; the potential impacts of development of tourism on the environment; conservation (protected areas, zoning, management plans, protected species etc.); the potential impact of existing and future shipping and port operations; industrial development in the coastal zone and potential impacts on the marine and coastal environment; potential impacts of military training operations in marine environments; and the continued survival and protection of marine and coastal flora and fauna, especially the mangrove ecosystems which play an intrinsic role in the continued survival and replenishment of marine resources.

### **❖ SOME KEY ASPIRATIONS OF THE WULGURUKABA ARE:**

- the recognition of cultural practice and its continued survival;
- sustainable resource use management;
- generating sustained social and economic benefits;
- education; and
- respect for Wulgurukaba aspirations in natural resource planning and management.

### **❖ WHAT DO WE WANT?**

We want greater control and involvement in the management of the marine and coastal environment to which we are and always have been linked.

### **❖ WHAT DO WE WANT TO ACHIEVE?**

- 1 The recognition of the hunting and collection of traditional foods.
- 2 The protection of cultural sites of significance.
- 3 The involvement and employment of our people, particularly at the decision making level, in the management of the marine and coastal environment, i.e. the recognition of traditional knowledge for sustainable management.