

## Marine Biodiversity

### Marine Parks and Reserves

Western Australia is blessed with a long and varied coastline and an abundance of marine life, from majestic whale sharks to tiny corals. The mainland coast of Western Australia is about 13,500 kilometres long and there are 12.6 million hectares of waters under State management (compared with one million in New South Wales). The State also has a multitude of islands (there are 3424 features above the high water mark on 1:100,000 maps).

Our marine areas are also significant in a global context. Western Australia is regarded as one of the world's biodiversity hotspots for coral reefs: a recent study placed our west coast second (behind southern Japan) in terms of its numbers of endemic species (the Gulf of Guinea, the Great Barrier Reef and the Hawaiian Islands were ranked third, fourth and fifth respectively). Apart from the remote oceanic islands of Lord Howe Island, St Helena and the Easter Islands, Western Australia's coastal waters were also considered to be amongst the most 'pristine' in the world.

The Western Australian coast boasts a big area of biogeographic overlap, between the tropical north (north of North West Cape) and the temperate south (east of Cape Leeuwin), where tropical and temperate species co-exist. The Indian Ocean is also the only ocean in the world that has an eastern boundary current (the Leeuwin Current) that transports warm waters from the equator to the southern coast of a continent. Hence, the Abrolhos Islands off our central west coast have extensive coral reefs at a latitude well outside the tropics-an astounding but fortunate anomaly.

To comply with and meet the obligations in national and international agreements and conventions, a National Representative System of Marine Protected Areas is being developed by the Commonwealth and all of the Australian States and the Northern Territory.

A comprehensive marine conservation reserve system is one in which all major bioregions have marine reserves within them. In WA, 18 major bioregions have been identified and the CAR ([Comprehensive, Adequate and Representative](#)) system will eventually consist of a network of marine reserves throughout the State.

Marine parks protect natural features and aesthetic values while allowing recreation and commercial uses that do not compromise conservation values. Western Australia's marine parks are underpinned by the concept of multiple use. This means that they cater for a wide range of recreational activities. As long as recreational and commercial activities are carried out on a sustainable basis, divers, snorkellers, fishers, ecotourists such as

whale watchers and other users of the marine environment can all enjoy Western Australia's world-class marine parks.

Recovery plans are developed to protect threatened marine species and communities, and wildlife management programs are formulated to protect exploited marine wildlife. A number of other complementary mechanisms are also used to help conserve and manage the marine environment, including pollution control, environmental impact assessment of development proposals, fisheries management, oil spill response capability and maritime safety regulations.

Marine parks have four management zone options - sanctuary, recreation, general use and special purpose:

- **Sanctuary zones** are 'look but don't take' areas managed solely for nature conservation and low-impact recreation and tourism.
- Recreation zones provide for conservation and recreation including recreational fishing (subject to bag and size limits established by the Fisheries Department).
- Special purpose zones are managed for a particular priority use or issue. This could be protection of a **Habitat**, a seasonal event such as wildlife breeding or whale watching or a particular type of commercial fishing. Uses compatible with the priority use or seasonal event are allowed in these zones.
- General use zones are areas of marine parks not included in sanctuary, recreation or special purpose zones. Conservation of natural resources in general use zones is a priority, but activities such as sustainable commercial fishing, aquaculture, pearling and petroleum exploration and production are permissible provided they do not compromise the conservation values.

## **Coral Reefs**

The *International Union for the Conservation of Nature (IUCN)* has named coral reefs as one of the life-support systems essential for our own survival. Found around coastlines in the tropics, coral reefs provide homes for about a third of all fish species on Earth and numerous other marine organisms.

Reefs are physically as well as biologically important; they play a fundamental role in protecting coastlines from erosion and contribute to the formation of white sandy beaches. These complex, fragile ecosystems are deteriorating at an alarming rate worldwide.

Coral reefs actually are communities of hundreds of thousands of tiny animals called coral polyps, which grow in sunlit shallows of warm, clear marine waters. The reefs are built up as new corals attach atop the skeletons of dead animals.

## Causes of Endangerment

### Pollution, Overexploitation and Recreation

The coral species that are the reef's foundation have very specific needs for light, temperature, salinity, and oxygen. They are easily damaged or killed because of these complex requirements for survival. Human-caused deterioration lessens the reef's ability to withstand natural events such as hurricanes, cyclones, and other storms. Reefs are sensitive to unusually warm waters caused by El Niño, a phenomenon thought to be connected to global warming. Large areas of reef died in Costa Rica, Panama, and the Galapagos during the El Niño event of 1984.

Population and development pressures have contributed significantly to loss of coral reefs and other coastal habitats, such as salt marshes, mangrove forests, and seagrass beds, and the fisheries that depend on these. Reefs are smothered by erosion from deforestation and dredging of rivers and bays.

They also are blown up by fishers using dynamite, poisoned by collectors working for the aquarium trade, and inadvertently damaged by recreationists (boaters and scuba divers). An estimated 80 percent of Philippine reefs, for example, have been damaged by sedimentation, explosives, and pollution.

Recently, scientists have become alarmed by increased occurrences of "coral bleaching." Coral reefs in many places in the world are turning white and sometimes dying. Coral gets its beautiful colours from algae that live symbiotically with it. Through photosynthesis, the algae produce oxygen and sugars for the coral polyps to eat. The coral, in turn, produces carbon dioxide and nitrogen which enhances algae growth. If coral polyps are stressed by environmental changes, they lose their algae coating and turn white.

Cyanide and other toxins are used to stun reef fish so they can be captured alive to be sent to fish markets in Hong Kong and as aquarium specimens for buyers in the United States. The accumulation of poisons is killing the reefs. In the past, the corals themselves were mostly sold as dried specimens for jewellery and decorations. Improvements in the ability to keep corals alive, however, has spurred a worldwide demand for live corals for aquariums.

Reef recreation, such as glass-bottom boat tours, snorkeling, and scuba diving, is increasingly popular. Damage from anchors and accidental boat groundings is a severe problem in some popular spots. Divers stand on reefs or inadvertently hit them with fins or dangling equipment, breaking off pieces of the fragile coral.

Trade in stony corals is allowed only with export permits. International agreements to control the rampant collection of reef fishes and other marine animals for the aquarium trade are also in place. However, poaching and smuggling are still widespread.

Some countries have made great strides in saving their endangered reefs. Australia's Great Barrier Reef Marine Park is the largest of its kind, covering an area bigger than the United Kingdom and including 2,900 separate reef formations and 300 reef islands, some 1,400 miles (2,250 km) long. Many other countries, including the United States, have created marine parks to protect coral reefs. Park management practices often include establishing buoys for anchoring and educating boaters and divers about how to prevent reef damage.