

Gascoyne Coast

BIOREGION

ABOUT THE BIOREGION

The marine environment of the Gascoyne coast bioregion represents a transition between the fully tropical waters of the North West Shelf and the temperate waters of the west coast. Offshore ocean temperatures range from about 22°C to 28°C, while the inner areas of Shark Bay regularly fall to 15°C in winter. The major fish stocks are generally tropical in nature, with the exceptions of pink snapper and tailor which are at the northern end of their range off Shark Bay.

The coastline is characterised by high cliffs in the southern half changing to fringing coral reefs in the north. Coastal waters are generally high-energy in terms of wave action due to the strong trade wind system, and the Exmouth Gulf section of the bioregion is seasonally influenced by extreme tropical summer cyclones. The Shark Bay end of the region receives very infrequent cyclones, but is affected at times by river outflows from inland cyclone-based summer rainfall. The limited local rainfall comes mostly from the northern edge of winter storm fronts.

The waters off the Gascoyne coast are also strongly influenced by the unusual southward-flowing Leeuwin Current, generated by flow from the Pacific through the Indonesian archipelago.

This tropical current becomes evident in the North West Cape area and flows along the edge of the narrow

continental shelf where, coupled with low rainfall and runoff, it has created the highly diverse Ningaloo Reef system and its associated fish fauna. The outer area of the large marine embayment of Shark Bay is also influenced by the warm winter current, while the inner waters of the embayment are hypersaline owing to the high evaporation and low rainfall of the adjacent desert areas. The World Heritage-listed Shark Bay is unusual for its extreme hypersalinity at the bay heads, the extensive Wooramel seagrass bank, and associated banks and channels. The sea floor of both Shark Bay and the

continental shelf is typically sandy compared with Exmouth Gulf which has more mud areas and turbidity.

In February 2002, an article in *Science* magazine (Roberts et al. 2002) identified the 18 world hotspots in terms of tropical reef endemism and the threats facing them. The article ranks the west-coast of Western Australia as the second most diverse marine environment in the world in terms of tropical reef species, and indicates that it is subject to the second lowest level of environmental threat of the 18 areas which were investigated.

Commercial fishing is a very significant industry in the region, with three of the State's most valuable managed fisheries – the Shark Bay Prawn, Exmouth Gulf Prawn and Shark Bay Scallop Fisheries – landing combined catches valued in the range of \$40-50 million annually. These fisheries have operated sustainably in the region since the mid-1960s and are internationally recognised as 'best practice' in terms of management and research. The region has also supported since the 1960s an offshore snapper fishery and the Denham-based beach seine fishery, which respectively provide most of the pink snapper and whiting catch for the State. A developing fishery for blue swimmer crabs, based primarily in Carnarvon but operating throughout the waters of Shark Bay, is currently the largest WA fishery for this important species. A small wetline sector takes demersal species including emperors, baldchin groper/tuskfish and, more recently, the deep-water-dwelling goldband snapper (jobfish). Mackerel are also taken by a number of wetliners who specifically target this high-value fish.

The special features of the Gascoyne coast, coupled with the warm, dry winter climate and productive fish stocks, have made it a focal point for winter recreation by the WA community. The Gascoyne is the second most significant recreational fishing region in the State, with fishing being a key component of many tourist visits. A full range of angling activities is available, including beach and cliff fishing (e.g. Steep Point and Quobba), embayment and shallow water boat angling (Shark Bay, Exmouth Gulf and Ningaloo lagoons), and offshore boat angling for demersal and larger pelagic species (e.g. off Ningaloo). Fishing is predominantly for tropical species such as emperors, lutjanid snappers, groupers, mackerels, trevallies and other game fish. Some temperate species at the northern end of their ranges, such as pink snapper, tailor and whiting, provide significant catches, particularly in Shark Bay.

In addition, the region supports extensive scuba diving and snorkelling activities, particularly inside the coral lagoons of



the Ningaloo reef system. Specialised 'eco-tourism' activities include whale shark and manta ray observation at Ningaloo and dolphin and dugong viewing in Shark Bay.

Aquaculture development in the Gascoyne is dominated by the production of pearls and pearl oysters in the major embayments. Because recruitment of both large species of pearl oysters in the wild is naturally irregular in this region and cannot be relied upon to provide shell for pearl production, hatchery production of oysters is of critical importance. Hatcheries in Carnarvon and Exmouth supply significant quantities of *Pinctada maxima* spat to pearl farms in Exmouth Gulf and the Montebello Islands, while several hatcheries supply juveniles of the blacklip pearl oyster *Pinctada margaritifera* to the region's developing black pearl farms.

ENVIRONMENTAL MANAGEMENT

Regional Overview

The naturally attractive features of the Gascoyne, including its protected coastal waters and productive fish stocks, have resulted in the area being a focus of marine management, beginning in the 1960s. The State's earliest marine habitat protection areas, in the form of extensive prawn nursery trawl closures over the sand flats and seagrass beds, were introduced in the 1960s in both Shark Bay and Exmouth Gulf. This system of fisheries closures, later expanded to cover all significant coral areas, has provided long-standing protection to virtually all fragile marine habitats in the bioregion (Gascoyne Coast Habitat Protection Figure 1).

The subsequent development of marine parks over Ningaloo Reef and the inner gulfs of Shark Bay (Gascoyne Coast Habitat Protection Figure 2) have added further, complementary protection to these highly valued areas.

Specific commercial fishing regulations implemented in the 1970s and 1980s also preclude the use of large-mesh gillnets and longlines throughout the Gascoyne, to prevent the incidental entanglement of the large populations of dugongs and turtles which inhabit the region. These

controls have also provided protection for the large shark species which are a feature of this region. More recently, bycatch reduction devices (grids) installed in trawl nets have increased the protection for sharks, rays and the occasional loggerhead turtle encountered on the trawl grounds.

These measures encompassed in the region's long-standing commercial management plans, coupled with recent recreational fishing controls, have enabled this region to retain its high biodiversity status through more than 30 years of commercial fishing and 15 years of significant recreational fishing pressure.

During 2003/04 the Department of Fisheries has provided extensive scientific and management advice and made submissions to Government in relation to the planning for, and in some cases legislative changes arising in relation to:

- the proposed southern extension of the Ningaloo Marine Park, and introduction of new sanctuary zones with the park; and
- the proposed Muiron Islands Marine Management Area, and the creation of sanctuary zones within this area.

The Department has also been working on the preparation of orders under the *Fish Resources Management Act 1994* in order to modify fisheries regulations to give effect to new sanctuary zone boundaries within the Shark Bay Marine Park.

The Fish Habitat Protection Area (FHPA) at Miaboolya Beach, Carnarvon, was established in April 2003, at which time the final management plan was released. A draft management plan for the proposed Quobba Point FHPA was developed in consultation with a range of stakeholder groups and released for public review in August 2003 for a period of two months. Following consideration of submissions, a final management plan has been prepared by the Department for release in July 2004.

In 2004 the Minister for Fisheries declared a total and permanent prohibition on the recreational collection of coral and live rock in Western Australian waters, which has been an issue of particular relevance to the Ningaloo Reef.

