

North Coast

BIOREGION

ABOUT THE BIOREGION

The oceanography of the north coast bioregion is generally tropical, with its origins in the flow of Pacific Ocean waters through the Indonesian archipelago. Ocean temperatures range between 22°C and 33°C, with localised higher temperatures in coastal waters due to the arid nature of the hinterland, particularly along the Pilbara coastline. Fish stocks in the north coast bioregion are entirely tropical, with most having an Indo-Pacific distribution extending through Indonesia to the Indian subcontinent and Arabian Gulf regions.

Coastal waters are generally low-energy in terms of wave action, but are seasonally influenced by infrequent but intense tropical cyclones, storm surges and associated rainfall runoff. These cyclone events generate the bulk of the rainfall, although the Kimberley section of the coastline does receive limited monsoonal thunderstorm rainfall over summer. Significant river runoff and associated coastal productivity is only associated with cyclone events, with runoff ceasing during winter. The entire north coastal region is subject to very high evaporation rates (3 m per year), although the Pilbara coastline is more arid than the Kimberley due to its lower cyclone frequency.

The second significant influence on coastal waters is the extreme tidal regime related to the wide continental shelf. Spring tides range from up to 11 metres along the Kimberley section of the coast down to around 2 metres at Onslow in the west Pilbara.

As a result of these factors, the generally tropical low-nutrient offshore waters are significantly influenced by rainfall runoff and tidal mixing to generate varying water quality in different sections of the bioregion. Along the Kimberley coastline, waters are turbid and relatively productive, while the Pilbara coast with its lower runoff and lesser tidal influence has the clear waters more typical of the tropics.

The coastal geography of the various sections of the coastline also differs. The Kimberley coast is highly indented, with bays and estuaries back by a hinterland of high relief. Broad tidal mudflats and soft sediments with fringing mangroves are typical of this area. The eastern Pilbara coast is more exposed than the Kimberley, with few islands and extensive intertidal sand flats. Softer sediments and mangroves occur around the river entrances. The western Pilbara coastline is characterised by a series of significant but low-relief islands including the Dampier Archipelago, Barrow Island and the Montebello Islands. Nearshore coastal waters include rocky

and coral reef systems, creating significant areas of protected waters. West Pilbara shorelines also include areas of soft sediment and mangrove communities.

The principal commercial fisheries in this region focus on tropical finfish, particularly the high-value emperors, snappers and cods which are taken by the Pilbara Fish Trawl Fishery and the Pilbara and Northern Demersal trap fisheries. The typical catch is in the order of 3,000 tonnes annually, making these fisheries, at an estimated annual value of around \$12 million, the most valuable finfish sector in the State. The region has a number of small, limited-entry trawl fisheries for prawns producing about 700 tonnes annually valued at around \$10 million. There are also significant fisheries for Spanish mackerel, barramundi/threadfin salmon and shark, and a developing fishery for blue swimmer crabs. A number of wetline activities, including offshore demersal line fishing and near-shore beach seining and gillnetting, also occur in the region.

Recreational fishing is experiencing significant growth in the north coast bioregion, with a distinct seasonal peak in winter when the local population is swollen by significant numbers of metropolitan and interstate tourists travelling through the area and visiting particularly the Onslow, Dampier Archipelago and Broome sections of the coastline. Owing to the high tidal range much of the angling activity is boat-based, with beach fishing limited to periods of flood tides and high water.

Creek systems, mangroves and rivers, and ocean beaches provide shore and small boat fishing for a variety of species including barramundi, tropical emperors, sea perches such as mangrove jack, trevallies, sooty grunter, threadfin, mud crabs and cods. Offshore islands, coral reef systems and continental shelf waters provide species of major recreational interest including many members of the demersal sea perch family such as scarlet sea perch and red emperor, cods, coral and coronation trout, sharks, trevally, tuskfish, tunas, mackerels and billfish.

Aquaculture development in the north coast bioregion is dominated by the production of pearls from the species *Pinctada maxima*. Wild pearl oysters seeded for pearl



WEST COAST
BIOREGION

GASCOYNE COAST
BIOREGION

NORTH COAST
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SOUTH COAST
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SOUTHERN INLAND
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production are obtained from the fishing grounds primarily off the Eighty Mile Beach, with smaller catches being taken around the Lacepede Islands north of Broome, near Port Hedland, and off Onslow and Exmouth Gulf. Wild stocks are supplemented by hatchery-produced oysters, with major hatcheries operating at Broome and King Sound. Pearl farm sites are located mainly along the Kimberley coast, particularly in the Buccaneer Archipelago, in Roebuck Bay and at the Montebello Islands.

Other developing marine aquaculture initiatives include growing trochus and black tiger prawns. A focus of aquaculture development in the region is provided by the Department's Broome Tropical Aquaculture Park, which houses a commercial pearl oyster hatchery, an Aboriginal-owned multi-species hatchery and the Kimberley TAFE aquaculture training facility.

ENVIRONMENTAL MANAGEMENT

Regional Overview

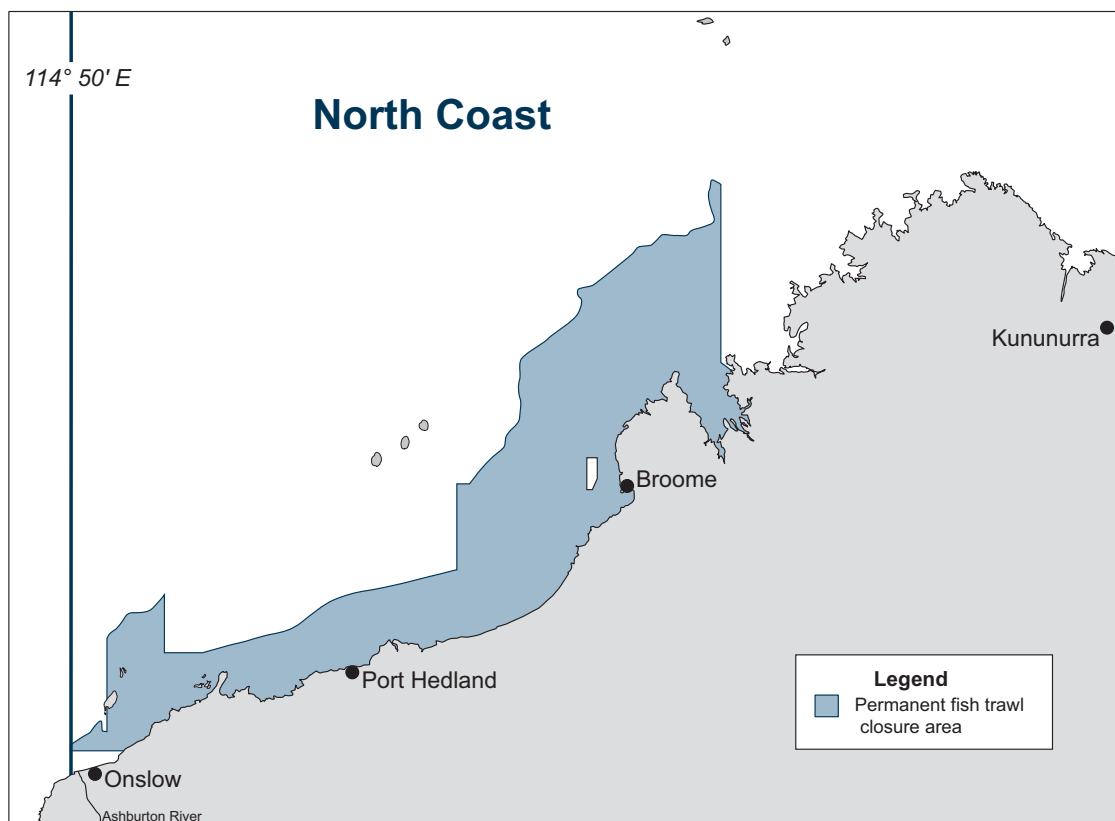
On the north coast, marine habitats have been locally affected by port developments, oil and gas exploration and extraction, and some fishing activities across the continental shelf. The offshore Pilbara area in particular was heavily trawled by international vessels in the 1960s and 1970s, however this activity was completely phased out by the Australian

Government in the early 1980s. Since that time, extensive fisheries closures over coastal and most offshore waters have been introduced to manage finfish trawling by Australian vessels (North Coast Habitat Protection Figure 1). Trawling for prawns is permitted at a number of locations and occurs on a series of small grounds associated with inshore nursery areas (see specific commercial trawl fishery reports). In each of these fisheries, trawling occurs over a small proportion of the habitat, and is managed to ensure that impacts are acceptable and localised to areas of high target species abundance.

In addition to the extensive fisheries closures protecting marine habitats, the bioregion has a number of reef protected areas under Fisheries legislation and marine parks and reserves around offshore islands and reefs (North Coast Habitat Protection Figure 2).

During 2003/04 the Department of Fisheries has provided 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 Dampier Archipelago Marine Park and Cape Preston Marine Management Area;
- changes to the boundary and zoning scheme of the Rowley Shoals Marine Park; and
- the proposed Montebello marine conservation reserves (consisting of the Montebello Marine Park, the Barrow Island Marine Park, and the Montebello Marine Management Area).



NORTH COAST HABITAT PROTECTION FIGURE 1

Map showing areas permanently closed to trawling for finfish in the north coast bioregion.