



Solitary Islands Marine Park

Summary of natural values

Introduction

NSW marine parks conserve marine biodiversity, maintain valuable ecosystems and support sustainable uses of the marine environment. Solitary Islands Marine Park extends north, from Coffs Harbour to the Sandon River along about 75 kilometres of the coastline and includes the Solitary Islands group.

The Solitary Islands Marine Park contains important natural values that contribute to a healthy environment. It also supports a wide variety of uses, including:

- diving and snorkelling, boating, marine mammal watching, beach activities and nature appreciation, which rely on the park's aesthetic and biodiversity values
- recreational and commercial fishing, which rely on the provision of habitat for harvested fish and the maintenance of ecological processes
- the ongoing traditional use and connection to the marine and coastal environment in its natural state by local Aboriginal communities.

This document provides a summary of the natural values of the Solitary Islands Marine Park.

Marine and coastal ecosystems

Subtidal rocky reef habitats

There are extensive subtidal rocky reefs throughout the marine park.

The rocky reef habitats can be divided into three broad categories. These are:

- **inshore reefs** – less than 1.5 kilometres from the shore, containing shallow reefs less than 25 metres deep. They are dominated by kelp and other species of brown algae and have high algal diversity.
- **mid-shelf reefs** – those around 1.5 to 6 kilometres offshore, containing shallow and intermediate reefs less than 60 metres deep. Shallow reefs contain a range of habitat types, including those dominated by coral, kelp, boulder, gravel, algae and urchin barrens. Surveys of intermediate reefs indicate that they support encrusting and turfing algae, sponges, sea-whips and gorgonian sea-fans.

- **offshore reefs** – those more than 6 kilometres offshore containing shallow and intermediate reefs (primarily around the islands), and deep reefs greater than 60 metres deep. Shallow reefs are dominated in exposed areas by filamentous turfing algae and cunjevoi, with greater dominance by hard corals in sheltered areas. Intermediate reefs are characterised by sponges, ascidians, black corals, and gorgonians (corals with flexible, often branching, skeletons), anemones and soft corals. Limited surveys of deep reefs indicate that they are likely to be dominated by sponges and ascidians.

The rocky reefs of the Solitary Islands support a diversity of mobile animals and provide a range of important functions including:

- over 530 species of reef fish have been recorded in the marine park to date, with over 50% of these regarded as primarily tropical, about 13% are subtropical and 10% are primarily temperate, while the rest are tropical–subtropical or subtropical–temperate
- over 30% of the species are endemic to Australia, with about 12% restricted to the east coast, and 5% restricted to the subtropical east coast
- rocky reefs support a total of 91 hard coral species, many of which are at the limit of their distribution and form unique communities comprised of tropical, subtropical and temperate species
- rocky reefs support many species of reef-associated fish which are of recreational and commercial significance including snapper, tusk-fish, blue morwong and pearl perch, which is an endemic subtropical species. Reef-associated pelagic species such as kingfish are also targeted.
- rocky reefs support a diversity of invertebrates including molluscs (e.g. shellfish, nudibranchs and cuttlefish) crustaceans (e.g. crabs, rock lobsters and shrimps) echinoderms (e.g. urchins and seastars) and marine worms.

Rocky intertidal habitat

Intertidal rocky shores are found between marine and terrestrial environments, and include the intertidal zone and the adjacent wave surge zone. In the Solitary Islands Marine Park intertidal habitats are very diverse in nature due to variation in rock composition (i.e. platform, cobble or boulder), exposure (i.e. protected or exposed), and slope (steep, inclined or flat). Rocky shores provide habitat for a range of species, including barnacles, snails, worms and algae. They also provide roosting & feeding habitat for seabirds such as the sooty oystercatcher.

Unconsolidated habitats

Unconsolidated habitats include areas of sandy substrate varying in particle size and shell content and may contain small amounts of boulders, cobbles or pebbles, particularly adjacent to areas of rocky reef. Unconsolidated habitats are extensive throughout the marine park. Unconsolidated habitats in the marine park support a wide range of organisms, including:

- 241 species of macrobenthic infauna, consisting mainly of marine worms, molluscs and crustaceans, which provide food and habitat for fish species of ecological and commercial importance
- a range of plants and animals living above the sediment such as sponges, sea squirts, bryozoans and sea-whips which form a diversity of habitats
- a diverse fish, shark, ray and crustacean community that is very different from those occurring on reefs in the marine park.

Beach habitats

Solitary Islands Marine Park contains approximately 40 sandy beaches ranging from 100 metres to many kilometres long. They support a diverse range of invertebrates, including crustaceans, beach worms and molluscs. They also provide important ecosystem services, including:

- important habitats for a range of baitfish species such as pilchards and anchovies, and commercially and recreationally important fish species such as mullet and sand whiting
- sandy beach shallows, which are important nursery areas for a variety of fish species
- surf areas of exposed sandy beaches, which are important nursery grounds for some species of fish that were previously considered to be estuary-dependent
- the support of important bait species for recreational fishermen including pipis and beach worms.

Sandy beaches are also key feeding and roosting sites for shorebirds, seabirds and migratory wading birds, including threatened species such as the little tern and pied oystercatcher. Beaches are also important for migratory wader species listed under international agreements.

Estuarine ecosystems

There are 15 estuaries in the marine park which are either barrier lagoons, which have larger catchment areas, large variations in salinity, and a high diversity of marine and brackish water plant species, or intermittently closed and open lakes and lagoons (ICOLs), which have smaller catchment areas, lower average salinity, brackish to fresh waters, a lower diversity of marine vegetation, and a higher diversity of brackish and fresh water vegetation. Sandon River, Wooli Wooli River, Corindi River, Moonee Creek and Coffs Creek are barrier lagoons that, in most cases, are permanently open. Station Creek, Arrawarra Creek, Darkum Creek, Woolgoolga Lake, and Hearn's Lake are ICOLs.

Estuarine habitats are categorised into mangroves, seagrass beds and saltmarshes.

Seagrass habitats

Solitary Islands Marine Park contains two species of seagrass, *Zostera capricorni* (eelgrass) and *Halophila ovalis* (paddle weed). Seagrass beds occur in the estuaries subject to regular tidal flushing, and in Woolgoolga Reef, Minnie Water Lagoon and Sandon Headland. Seagrasses are of particular ecological importance for a range of reasons, including:

- providing habitat for a diverse assemblage of flora and fauna
- generally supporting a much higher diversity and abundance of fish than unvegetated areas, and providing habitat for juvenile commercial and recreational species such as snapper, yellow-fin bream, tarwhine and luderick
- maintaining sediment stability through their roots
- maintaining water quality by using nutrients and stabilising sediments in shallow water
- increasing rates of primary production.

Mangrove habitats

Mangroves are found in all estuaries in the marine park. All seven species of mangroves recorded in NSW are found in the Sandon River and Wooli Wooli River, reflecting the marine park's location in the transition between subtropical and temperate climates. Mangrove habitats provide a range of important functions including:

- they often contain terrestrial, estuarine and marine animal species, including many fish, birds and invertebrates which makes them high in biodiversity
- the habitat often contributes significantly to the productivity of estuaries, by cycling nutrients and trapping sediments and leaf litter
- mangroves are nursery areas for many commercially important species of fish, crabs and prawns, providing shelter among their submerged roots and trunks. They are also important as habitat for a variety of adult fish including bream, mullet and whiting.

Saltmarsh habitats

Saltmarsh is a distinct habitat found in the upper intertidal area of shorelines in estuaries and bays dominated by soft sediment. Significant saltmarsh communities exist in the Sandon, Wooli Wooli, Corindi and Moonee Creek estuaries. Saltmarshes generally contain a diverse range of grasses, saltbushes, rushes and sedges. Saltmarshes provide a range of important functions including:

- helping to control floods and erosion
- helping reduce pollution
- providing organic material for the detritus in estuaries
- trapping sediments.

Unvegetated habitats

Estuaries are generally dominated by unvegetated soft-sediment areas, reflecting the input of sediments from marine and freshwater sources. They occur as intertidal sand, mudflats and deep muddy basins. The ecological benefits of these habitats include:

- providing habitats for many fish, sharks and rays, and invertebrates such as mud crabs
- forming an important part of estuarine ecosystems, transforming food and nutrients that run off the catchment and providing new food for marine ecosystems and fish
- forming part of a network of important nursery habitats for many species.

Other marine species

At least 35 species of shark and ray, and 30 species of marine mammal have been recorded in the marine park.

There are over 120 species of coastal and marine birds occurring in the region.

Threatened and protected, rare and endemic marine species

While the marine park aims to conserve all marine species occurring naturally in the region, particular emphasis is given to conserving species that are threatened, protected or endemic to the area. The marine park contains significant habitat for the endangered grey nurse shark. Several marine turtle species are also known to occur in the marine park. The most

important breeding site on the east coast of Australia for the regionally endemic wide-band anemonefish is at North Solitary Island.

Threatened seabird species occurring in the marine park include pied and sooty oystercatchers and ospreys.

Migratory bird species undertaking seasonal movements to breeding and feeding grounds pass through the marine park and are present for short periods each year.

Contacts

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