

Poster: Nearshore for sure

Region

North Coast, Gascoyne Coast, West Coast, South Coast, Indian Ocean Territories

Summary

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There are a number of finfish species found within Western Australia's nearshore environment – waters from the high tide mark, seawards to a depth of approximately 20 m. Despite generally nutrient poor waters in WA, our nearshore environments benefit from nutrients released from macrophytes – seaweed and seagrass. Nearshore environments vary across our State, ranging from the tidal mud flats in our north to the turbulent surf in our south. Fish species have adapted to survive in these unique environments but could come under increasing threat from human pressures.

Interstate Travellers
 Australian herring spawn in the coastal waters north of Cape Leeuwin, mainly around Rottnest Island. Spawning is synchronous with the arrival of the warm Leeuwin Current, which is likely to take the eggs, larvae and post larval fish eastward along the lower west and south coasts of Western Australia to South Australia and even Victoria. This occurs in the winter months of May through to July. Then, at approximately two years of age, the larvae and juveniles that settled in South Australian waters swim back on the long migration back to their spawning grounds in south-western Australia in early to mid summer. This migration is aided by strong westerly winds, which occur in South Australia from November through to March. Understanding this interstate connectivity is important in terms of management – to ensure such a stock remains sustainable, appropriate management from all states has to be implemented to reflect the herring's typical migratory pattern.

ADULTS
 Spawn around coastal reefs (April – June)

EGGS & LARVAE
 Claimed around the lower west and south coast (May – July)

JUVENILES
 Feed and grow towards maturity in embayments of the lower west coast

Around the onset of maturity (2-3 years) – migrate to WA to spawn

The vulnerable west coast
 Compared to anywhere else in the State, fishing effort is most heavily concentrated within the West Coast Bioregion (Kalbarri to Augusta), with a sizeable amount of that effort targeting nearshore species. Scientists have chosen a number of nearshore indicator species, including Australian herring and tailor, within the West Coast Bioregion to determine the sustainability of these stocks. These species have been chosen for their vulnerability, their high catch frequency and their iconic status. Jamprag fisheries in the West Coast Bioregion are sustainable not only now, but also in the future.

Bread and butter
 Species most accessible to fishers (such as herring, tailor and threadfin) are the most common nearshore species targeted by recreational fishers, often referred to as our 'bread and butter' species. These species, then, are real concerns about the sustainability of the stocks. Nearshore areas are also impacted by non-fishing activities, such as coastal developments (for example, marinas, harbours and breakwaters), dredging works and pollution. Such activities adversely impact the nearshore environment and consequently local fish stocks.

Adaptation
 With a broad diversity of nearshore environments across Western Australia, fish have adapted to not only survive, but also thrive. In the south-west, mullet have adapted to the turbulent coastal waters by having large otoliths (ear bones). The large otoliths help mullet maintain their balance in rough water. In clear sandy bays, fish such as flounder and whiting use camouflage as a tool for predation and as protection. Further to the north, threadfin have developed extensions of their pectoral fins that they use to find food in muddy tidal areas with poor visibility. It is this variation in fish species throughout nearshore waters that makes it such a unique and special environment.

Nearshore nursery
 Nearshore habitats offer both high productivity and protection from predators, making them ideal nursery areas for many species of juvenile fish. Many nearshore environments are highly productive due to the high level of nutrients released from macrophytes (seaweed and seagrass), estuaries and run-off from adjacent land. This high productivity ensures that there is plenty of accessible food for growing juveniles. Seagrass meadows, inshore reefs and macrophytes also offer the vulnerable juveniles protection from predators, such as large fish and diving birds. However, the main threat to these young fish is humans. Due to the accessibility of these nursery areas to anglers, juvenile nearshore species are becoming exposed to recruitment overfishing that could ultimately result in localised depletion.

Tailor vulnerability
 The distribution and schooling behaviour of tailor make the stock relatively vulnerable to growth overfishing (catching too many small fish) and potentially to recruitment overfishing (catching so many fish that reproduction is reduced). In the past, thousands of anglers used to line metropolitan beaches targeting schooling tailor, however due to a decline in catch the numbers of anglers participating in such events have dwindled.

What are indicator species?
 With over 3,000 species of finfish spread along 12,500 km of coastline around the State, it is difficult for researchers to monitor in detail what is happening to each and every one. For management purposes, the Department has split the state into four bioregions, with each bioregion home to a variety of nearshore fish species. It is not possible to individually assess the stocks of each and every species, nor is it possible to manage large numbers of individual species. For this reason, scientists have chosen indicator species to gain an understanding of the status (condition) of all nearshore species within each bioregion. Indicator species are chosen based on two main criteria: the vulnerability of a species to the impacts of fishing based on robust, scientific knowledge of their biology and how frequently the species is caught in both commercial and recreational catches.

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