

Snapper stock structure

A snapshot of WA snapper stocks

Snapper (*Chrysophrys auratus*) are one of Western Australia's (WA) best-known and most sought-after fish, prized by commercial and recreational fishers alike, and seafood lovers for their excellent taste. In WA, snapper range from the South Australian border to north of Karratha in the Pilbara region, which includes waters of the South Coast, West Coast, Gascoyne Coast and North Coast bioregions.

Snapper are broadcast spawners, releasing multiple batches of eggs across a spawning period. The eggs hatch after a couple of days, after which the larvae drift and later swim in the water column for up to a month before settling in suitable habitats. Juvenile snapper remain in sheltered, inshore nursery areas until around 2 years of age. Subadult snapper may move significant distances, which along with egg and larval dispersal by ocean currents, are the main ways by which snapper stocks mix along our coast. After maturity, adults tend to move less along the coast, with some individuals known to repeatedly return to the same place to spawn, such as Cockburn Sound.

What is stock structure and how do we study it?

'Stock structure' describes the different genetic, behavioural and biological characteristics that may occur for a given species across its distribution. Stock boundaries can be created by differences in spawning timing, features of ocean currents, physical oceanography and proximity to major spawning locations.

Separate populations of a species within its geographical range will have limited interbreeding and movement between them.

Studies of genetics, otolith microchemistry (which provides a record of the environments lived in), growth patterns, timing of sexual maturity and dispersal of different life-history stages can all be used to inform the understanding of stock boundaries.

One species, one state and 6 stocks

Within WA there is evidence of 6 snapper stocks.

An analysis of genetics across the state indicates there are 3 broad oceanic stocks:

1. a **Mid-west stock**
(from Lancelin northwards)
2. a **South-west stock**
(from the northern Metro to Albany)
3. a **South Coast stock**
(east of Albany).

Within those 3 oceanic stocks, modelling of dispersal of eggs and larvae from spawning sites indicates that they will tend to settle as juveniles into nearby nursery habitats. Otolith microchemistry also supports this.

After juveniles leave their nurseries and move along the coast, they mature sexually to become adults and then generally do not move substantial distances across the different management areas that encompass each stock (Figure 2). Amazingly, only a very small number of tagged adults have been recorded as having moved hundreds of kilometres.

There are also **3 stocks within the inner gulfs of Shark Bay** (the Eastern Gulf, Denham Sound and Freycinet Estuary), with limited movement and interbreeding between them.

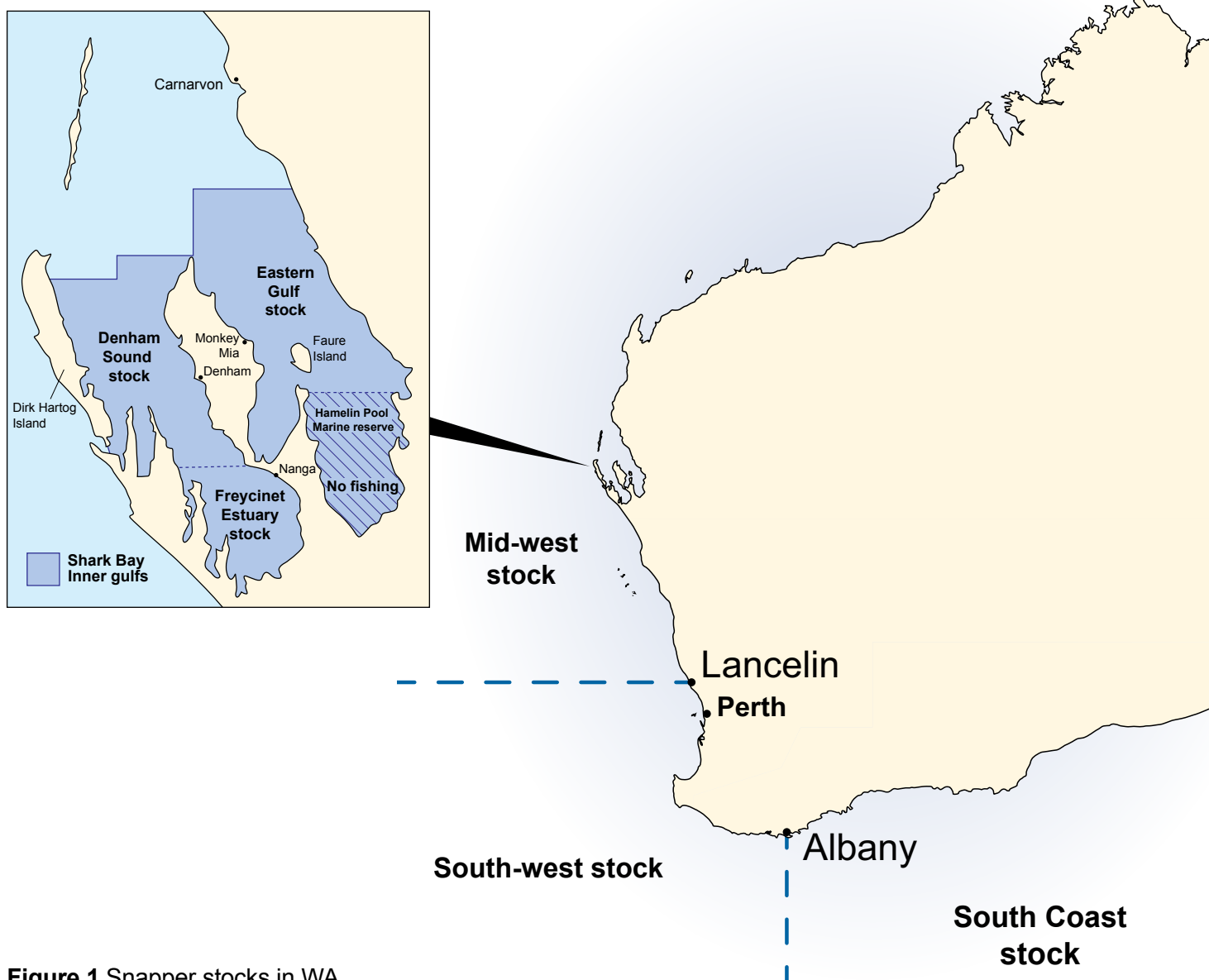


Figure 1 Snapper stocks in WA

Why does stock structure matter?

Investigating stock structures of fish allows stock assessment and fisheries management measures to be implemented at an appropriate spatial scale.

This is extremely important because differences in biological characteristics, such as growth, age and size at maturity, and maximum sizes occur between snapper stocks. These differences influence how the species may respond to fishing pressure and environmental changes in different places.

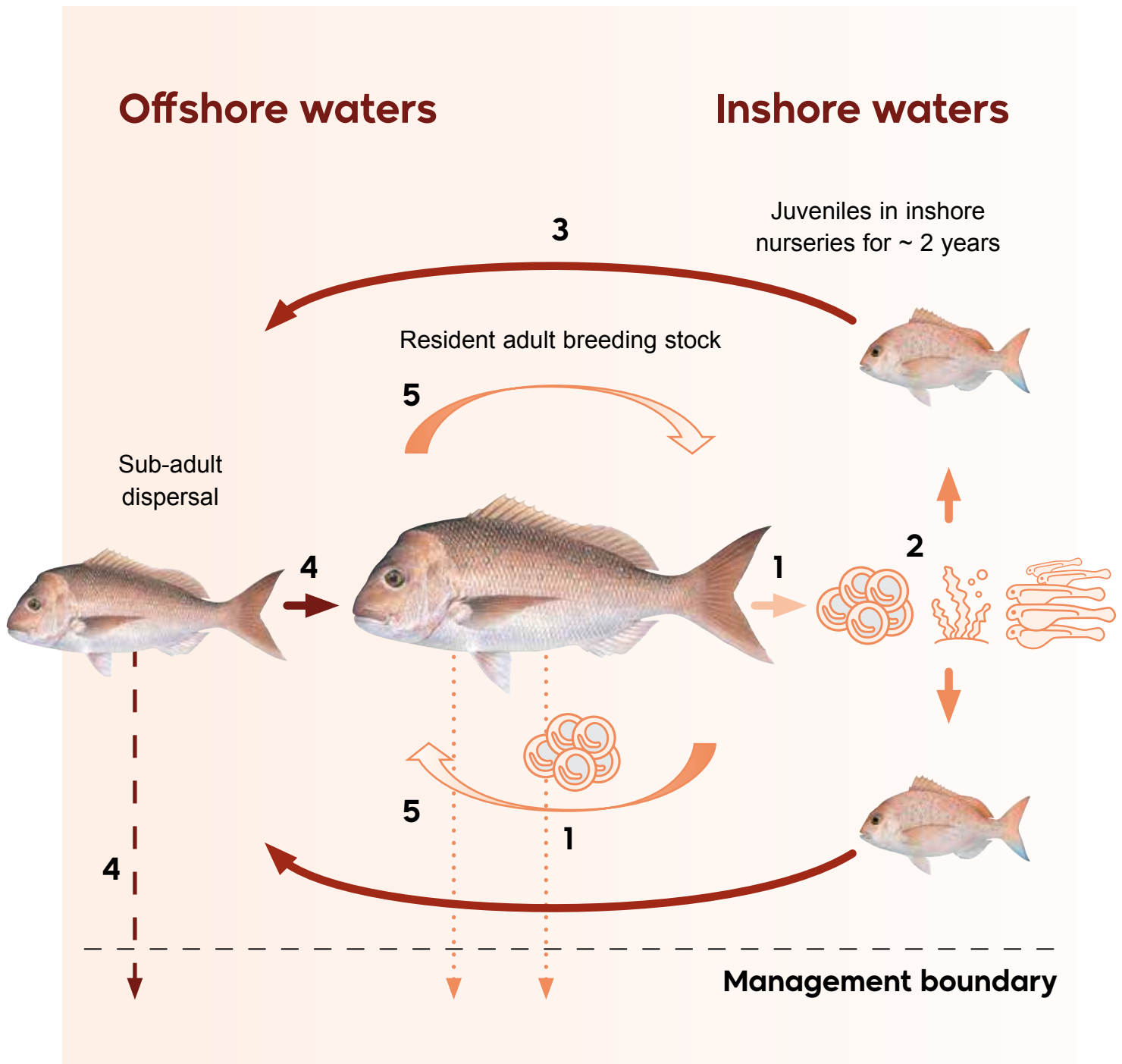


Figure 2 Life stages of snapper (1-5) and movement within and between management boundaries

Reference

Bertram, A., Fairclough, D., Sandoval-Castillo, J. et al. 2022. Fisheries genomics of snapper (*Chrysophrys auratus*) along the west Australian coast. *Evolutionary applications* 15:1099-1114,

<https://doi.org/10.1111/eva.13439>

Jackson, G., Fairclough, D., Fisher, E. et al. 2023. Where did the snapper go? Determining factors influencing the recovery of snapper (*Chrysophrys auratus*) stocks on the West coast of Australia. Final Report to the Fisheries Research and Development Corporation. FRDC 2018/050. Department of Primary Industries and Regional Development, Western Australia, 129 pp

<https://www.frdc.com.au/project/2018-050>

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