

# The importance of big old fish

BOFFFF stands for 'big old fat fecund female fish', and highlights the importance of larger, older female fish in the fish stock because they produce many more eggs than smaller, younger females.

Put simply, when it comes to the reproductive output for many demersal species, including the prized West Australian dhufish (WA dhufish), size really does matter.

Given that fishing often targets bigger fish, their removal from fish populations can limit the ability of a fish population to replenish itself or recover after heavy fishing.

## Case Study

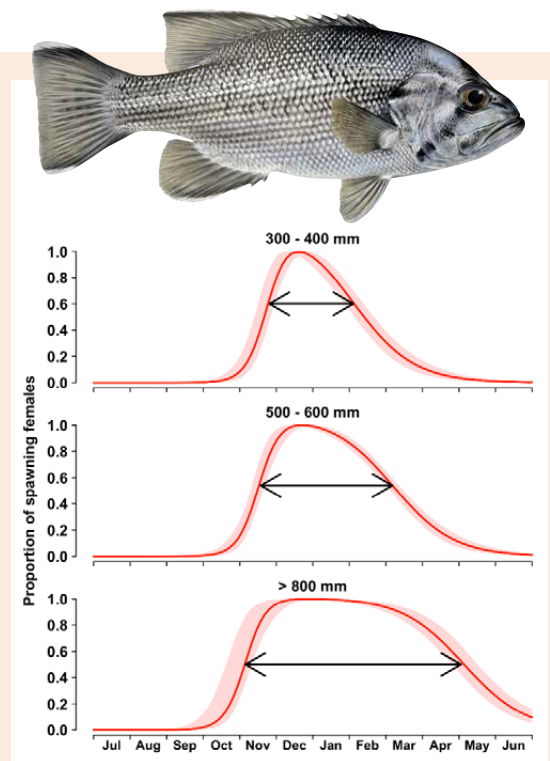
### BOFFFFs in WA dhufish

As with many marine fish species, WA dhufish are batch spawners, meaning they spawn batches of eggs on many occasions across a spawning season.

### Spawning duration and frequency

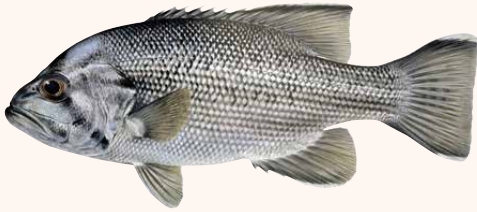
A larger (900 mm) dhufish can release around 280,000 eggs per batch, whereas a smaller (350 mm) dhufish can release about 7,000 eggs per batch. Those larger and older females were also shown to spawn for a longer duration (6 versus 2 months) and on more occasions each spawning season (155 versus 60 times) than the smaller (350 mm), younger females.

These larger females have higher annual fecundity, meaning they have greater reproductive capacity across any given spawning season. Additionally, a longer spawning season may increase the chance of spawning during more favourable environmental conditions, thus improving the survival rate of offspring.



**Figure 1** Monthly proportions of prespawning/spawning female WA dhufish in each length class (with 95% confidence intervals and predicted spawning period - black arrows)

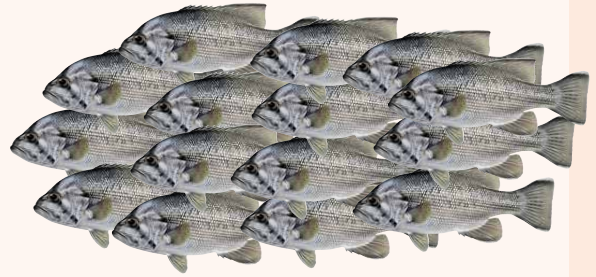
1 x 10 kg fish



Annually fecundity  
(egg production)



15 x 2 kg fish



In terms of annual fecundity (egg production), the reproductive output of one **10 kg female** would be equivalent to that of around **15 x 2 kg females**.

### Egg size and energy content

Larger (900 mm) mature WA dhufish, on average, produce eggs 25% larger in diameter than smaller (350 mm) mature fish. The larger fish also produce eggs with 67% greater estimated energy content compared to smaller fish. The larger, more energy-rich eggs produced by larger mature WA dhufish may increase their larvae's growth rates and chance of survival.

### Implications

Given the importance of large, older fish for reproductive output, it is vital that fishing pressure on a population is managed sustainably. This ensures that enough fish grow to a larger size before being caught. It also allows fish to spawn for many years, helping replenish the population.

### The harm of 'high-grading'

High-grading describes the practice of actively releasing fish of a smaller size with the aim of targeting and retaining fish of a larger size. Due to high rates of post-release mortality (PRM), particularly due to barotrauma, amongst many of the West Coast bioregion's demersal scalefish species, size limits were removed in 2023 for WA dhufish, baldchin groper and breaksea cod to minimise release rates and overall fishing mortality.

Given that larger WA dhufish play a bigger part in the stock's recovery compared to smaller fish, it is important that fishers do not engage in 'high-grading'. It not only has the potential to result in unnecessary fishing mortality but also means a greater number of larger fish are selectively taken out of the population.

### Reference

Evans-Powell, R.T., Hesp, S.A., Denham, A., Beckley, L.E., 2024. Implications of big, old, fat, fecund, female fish (BOFFFFs) for the reproductive potential of a demersal teleost stock. Fisheries Research 272.

<https://doi.org/10.1016/j.fishres.2023.106934>

### Important disclaimer

The Chief Executive Officer of the Department of Primary Industries and Regional Development and the State of Western Australia accept no liability whatsoever by reason of negligence or otherwise arising from the use or release of this information or any part of it.

Copyright © State of Western Australia (Department of Primary Industries and Regional Development), 2025