



FISHERIES FACT SHEET

BLACK BREAM



Black bream
Acanthopagrus butcheri

Black beauty

Black bream is one of the most important recreational and commercial fish species in the estuaries of south-western Australia. A ‘true estuarine’ species, black bream complete their whole life cycle within an estuary, and are reliant on healthy rivers and estuaries for their survival.

A southern star

Found throughout southern Australia, black bream are common in the rivers and estuaries from Myall Lake, New South Wales, to the Murchison River in Western Australia. They are also found in tidal rivers in Tasmania, around Flinders and Kangaroo Islands, and are occasionally found in coastal waters, particularly in the Gulf region of South Australia.

The ‘Sparidae’ family

Black bream is a member of the sea bream family, otherwise known as ‘Sparidae’. Six closely related species of ‘bream’ are found in Australian waters. In Western Australia, related species include western yellowfin bream, tarwhine (silver bream) and pink snapper. Black bream can sometimes be confused with western yellowfin bream, however they are not commonly found in the same areas.



i Black bream are able to cope with salinity and temperature changes that would kill many other species of fish.

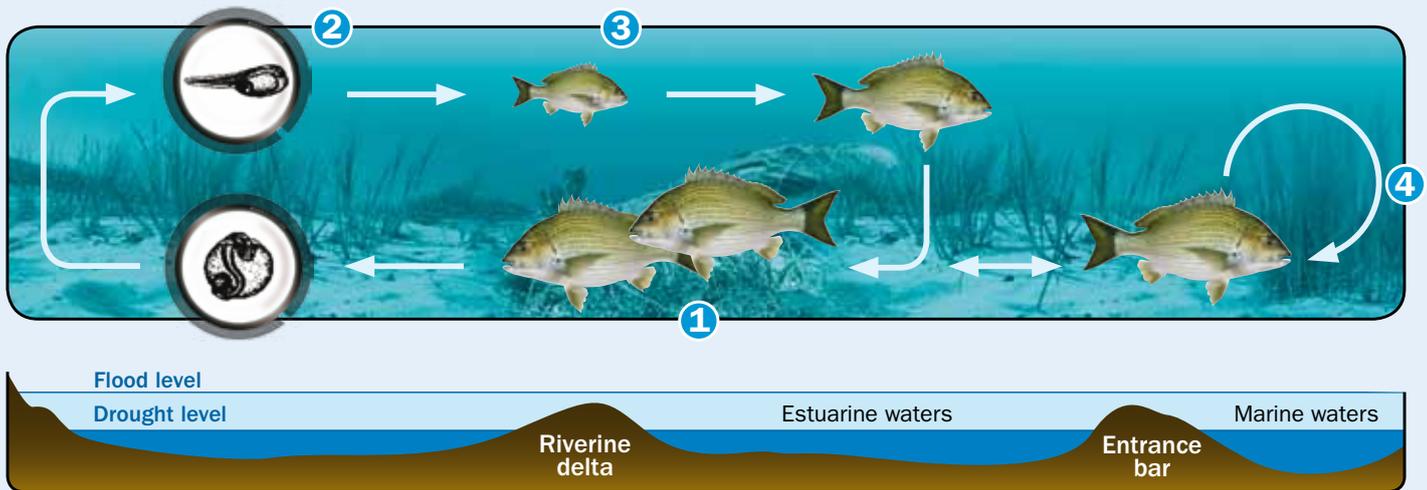
Home is where the estuary is

Unlike many other fish found in estuaries, black bream do not migrate to the ocean to spawn, completing their whole life cycle within the confines of the ever-changing estuary environment. They are considered a true estuarine species.

Black bream are well adapted to life in a ‘euryhaline’ environment, coping well with salinity changes that range from freshwater to ‘hypersaline’ (extreme salinity). Their preferred adult habitat includes overhanging banks among the branches of dead trees, found in the bottom of deep pools in most rivers in Western Australia. Juvenile bream tend to inhabit shallower waters.

Black bream almost never leave the estuary unless flushed out to the ocean under conditions of extreme flooding. This has led to genetically distinct populations within each estuarine system, as stocks are not replenished by eggs or larvae from the ocean.

Life cycle



1. Spawning: Black bream take two to three years on average to reach maturity, when they are around 15-20 centimetres in length. As 'rudimentary hermaphrodites', they possess immature ovaries and testes when young, but will turn either male or female before their first spawning. During spawning, eggs and sperm are released into the water and fertilisation occurs externally. In Western Australia, black bream mainly spawn in spring or summer. Water temperature, salinity, dissolved oxygen levels and the availability of suitable habitat all play a major role in spawning and the survival of eggs, larvae and juveniles. Spawning typically takes place where fresh and brackish water meet, at the boundary of the 'salt wedge' (where freshwater from the river runs over a 'wedge' of denser salt water running from the ocean).

Female black bream release eggs more than once during the same spawning season. As they grow, larger females produce more eggs each year and become an

increasingly valuable part of the breeding stock. However, many eggs and larvae will not survive to become mature fish. Nevertheless, a notably hardy black bream may live for up to 29 years.

- 2. Larvae:** The larvae hatch from the free-floating eggs after 2.5 days. After about four weeks, the larvae are around 10 millimetres in length. They then develop into juveniles and 'settle' to the bottom of the estuary.
- 3. Juveniles:** After nearly 12 months in the upper estuary, juveniles either actively migrate or are flushed downstream at the onset of autumn rains.
- 4. Seasonally sea-bound:** In a permanently open estuary, some fish maybe flushed out to sea when the rains arrive before returning to the estuary. Fish may also be affected in a similar way in estuaries closed by sandbars, which open up when the estuary is running high.



The number of eggs spawned by female bream in any one 'release' varies, depending on the size of the fish. On average, bream in captivity produce 40,800 eggs per kilogram of female body weight per day (equivalent to 3.8 million eggs per kilogram per year). It's possible that really big females produce more than six million eggs per year in the wild.

Go-go gonads!

Spawning season timings can be determined by the gonads (or reproductive organs) of mature fish. These are located internally between the fish's anal vent (the opening by its anal fin) and its swim bladder.

As a fish population approaches its spawning period, the gonads in mature fish become larger and heavier. When fully ripe, gonad weight peaks just prior to spawning. At spawning, the gonad weight will decrease rapidly as eggs or sperm are shed.

By taking monthly measurements of gonad weight, it is possible to estimate when and where a population of fish will spawn. Gonads reach a peak weight of about seven to eight per cent of total body weight just before spawning.

A gonadosomatic index (GSI) is a simple, relative index used to monitor reproductive development in fish. GSI takes into account the effect of fish body size.

One size doesn't fit all

Growth rates between black bream populations are highly varied. Fish in the Swan River grow faster and mature earlier than those in the Moore River and estuaries along the south coast. In the Swan River, black bream usually reach sexual maturity at 2.2 years (21.5 centimetres) but this may take 4.3 years (17.9 centimetres) in the Walpole-Nornalup Inlet.

In all Western Australian estuaries, the legal minimum length is set above the length at maturity, which helps protect each breeding stock.



Getting the measure of a small black bream. Photo: Gilbert Stockman

An estuary health barometer

Since black bream cannot migrate to other estuaries, they are reliant on a healthy habitat, a productive food chain and good water conditions to maintain healthy populations within a particular estuary. Hardy as black bream are, they can be seriously affected by water temperature and salinity changes.

In many estuaries, particularly on the west coast, the impacts of environmental factors are likely to be at least as important on stock abundances as fishing pressure. Factors include loss of bankside vegetation, increased salinity arising from catchment clearing, acid sulphate soils, and increased pesticide, herbicide and fertiliser run-off. That's why maintaining healthy catchments and estuary ecosystems is essential to ensure the sustainability of black bream stocks in the future.



Environmental pressures are likely to be at least as significant as fishing pressures on estuary dependent species such as black bream. Photo: Cliff Young

Prise biters

As opportunistic feeders, the diet of black bream varies depending on the particular estuary and the availability of food. They use their peg-like teeth to prise mussels, barnacles and tubeworms from rocks, piles and pylons. They also consume small crabs, river bloodworms, small fish and vegetation.

A fish on the move

Scientists believe many adult black bream migrate upstream during drier parts of the year when salinity levels are higher in the upper estuary. They then migrate back downstream during winter when the upper areas of the estuary are fresher.

Using acoustic transmitters, University of Western Australia researchers closely tracked the movement of black bream in the Wellstead Estuary at Bremer Bay.

The study showed black bream are highly mobile and are capable of withstanding very high salinity. Some fish moved up to six kilometres upstream and downstream every few days for periods of several months.



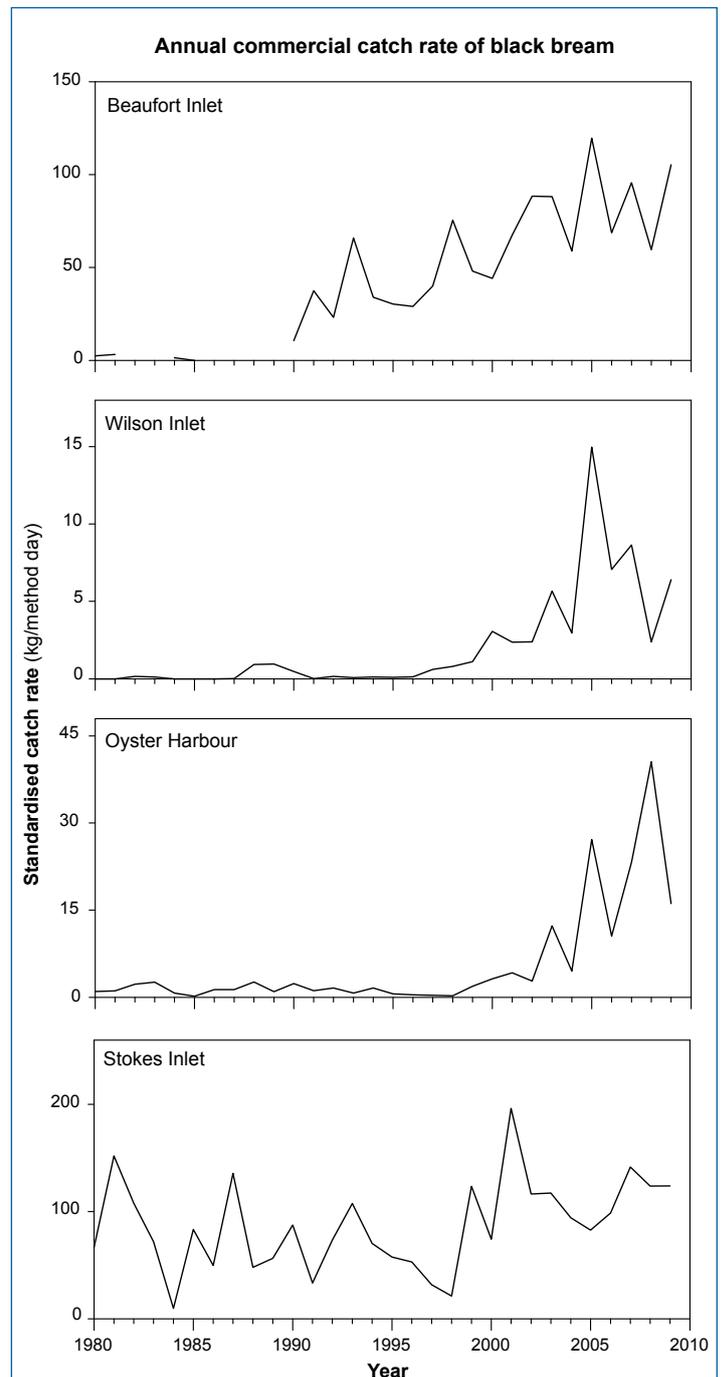
Black bream with transmitter implant. Photo: Paul Close

Recreational and commercial importance

Black bream are a popular commercial and recreational fishing target, including catch-and-release charter tours and fishing tournaments. In the Swan-Canning estuary, black bream is the finfish species most commonly kept by recreational anglers.

Commercial black bream landings are highly variable from year to year, as a result of estuarine environmental factors. Sometimes higher catches of black bream coincide with higher rainfall in the estuary catchments. While this could indicate an increase in stock abundance due to strong recruitment, it could also reflect a higher 'catchability' where floodwaters have flushed fish in the tributaries downstream into commercial fishing areas.

The graphs below show how black bream have been increasing in a number of estuaries in WA. Scientists are currently unsure as to the reasons why this has been occurring.



Annual commercial catch rates of black bream in Beaufort Inlet, Wilson Inlet, Oyster Harbour and Stokes Inlet 1980-2009.

Fish fatalities

Harmful algal blooms and other environmental factors in upper estuaries during summer and autumn represent a high risk to black bream populations. During late summer and early autumn, a large proportion of black bream eggs, larvae, juveniles and adults are present in upper estuaries until they are flushed down with the first rains in late autumn. It is during this period that some rivers and estuaries (particularly those in developed areas) are likely to experience harmful algal blooms and hypoxia resulting in fish kills. In 2003, a fish kill in the Swan River killed over 200,000 black bream alone. The Murray, Serpentine and Collie rivers have also experienced recent fish kills.



Black bream gasping on the surface following an algal bloom.
Photo: Shane Heriot

Seeing red

Common throughout the south-west, red spot disease (or epizootic ulcerative syndrome) is a fungal disease that affects estuarine fish such as black bream. The disease begins as a reddening over a single scale that subsequently spreads to involve a number of adjacent scales.

Red spot is common not only in south-west Western Australia, but is also present elsewhere in Australia and overseas. However, it is thought that the disease is not a major threat to black bream populations.

The disease is non-toxic to humans, however people should not eat infected fish. Instead they should be returned to the water where they were caught.



A black bream infected by the red spot disease.

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Glossary

Endemic

Restricted to, or only found in, one place

Euryhaline

Adapted to live in a wide range of salinities

Salt wedge

When less dense freshwater flows out of the estuary over a wedge of denser salt water entering from the ocean

Recruitment

Addition of fish to a stock or population as a result of reproduction, migration or growth to legal size

Swim bladder

A fish organ which controls its buoyancy

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FURTHER INFORMATION

Visit the Department's website at www.fish.wa.gov.au or contact:

DEPARTMENT OF FISHERIES – HEAD OFFICE
3rd Floor, The Atrium,
168 St George's Terrace, Perth 6000
Ph (08) 9482 7333 Fax (08) 9482 7389
e-mail: headoffice@fish.wa.gov.au
ABN: 55 689 794 771