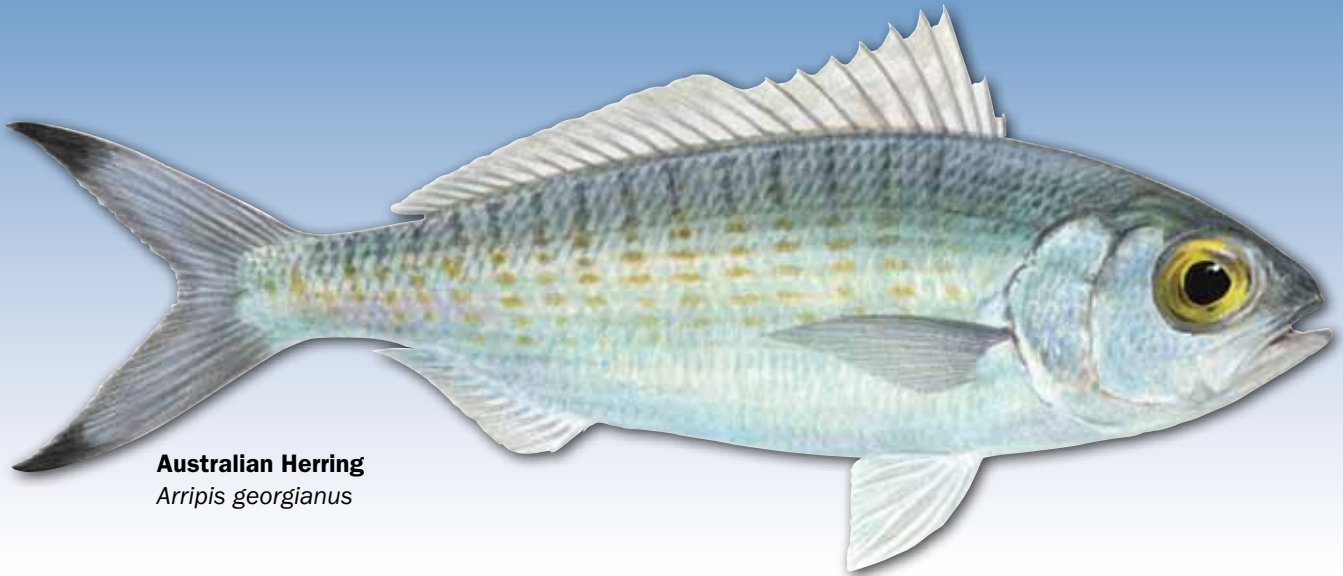




FISHERIES FACT SHEET

AUSTRALIAN HERRING



Australian Herring
Arripis georgianus

Australian Herring

A staple fish for recreational and commercial fisheries in the south of the State, Australian herring are a popular and abundant species with a life cycle dependent on prevailing currents.

Family likeness

Although named after their superficial resemblance to the herring found in the Northern Hemisphere, Australian herring are actually a member of the perch family (family *Arripidae*) rather than a true herring (family *Clupeidae*).

Sometimes known as a 'tommy ruff' in South Australia and Victoria, Australian herring is now the standard adopted name for the species throughout its entire distribution.

There are four members of the *Arripidae* family, including the Western Australian salmon (*Arripis truttaceus*), which in its juvenile stage can be easily confused with adult herring.

Herring have been reported to grow to a maximum length of 41 centimetres but are generally caught at a length of around 25 centimetres. Larger adults are often referred to as 'bull' herring.

Australian herring typically reach sexual maturity at a length of about 20 centimetres for females and 18 centimetres for males. This correlates to an age of between two and three years.

Identifying Australian herring and juvenile Australian Salmon

Juvenile Australian salmon (*Arripis truttaceus*) are silvery white, smooth scaled, have a yellow pectoral fin and have several rows of golden or brown spots on their backs and sides.



Adult Australian salmon

Australian herring (*Arripis georgianus*) are silvery in colour with vertical rows of golden spots on the upper side of the body and black tips to the caudal (tail) fin. The scales on the body are slightly rough in texture.



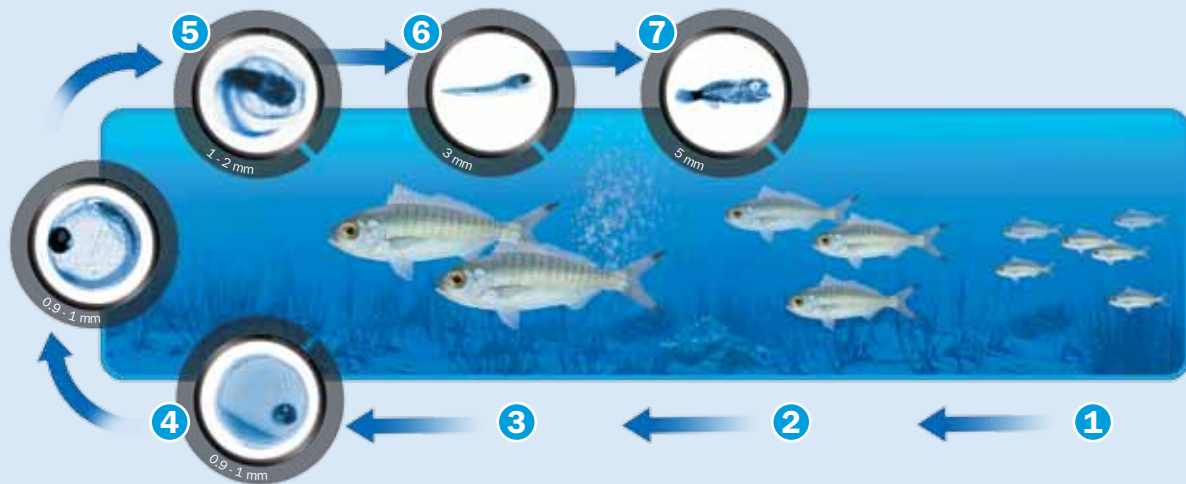
Juvenile Australian salmon

Australian herring have a larger eye and more rounded head than juvenile Australian salmon.

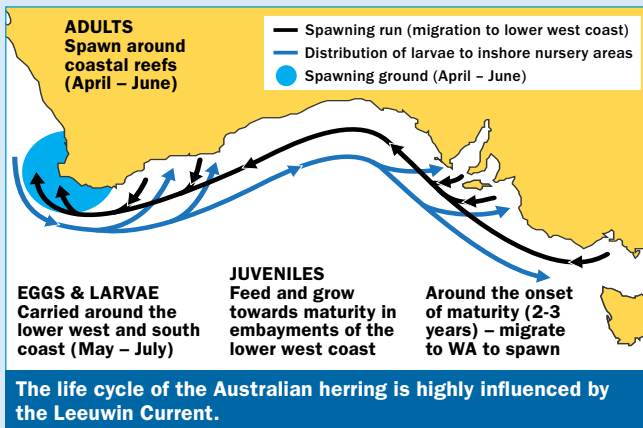


Adult Australian herring

Life cycle



- Juvenile Australian herring feed and grow in bays and nearshore waters along the lower west coast and southern Australian coast, moving to more exposed coastal areas as they grow bigger (see migration map below).
- Most herring reach sexual maturity at about two to three years of age and an average of 20 centimetres in length.
- These migrating herring spawn west of Albany on the south coast and off the lower west coast of Western Australia. Spawning takes place over a short period of time, between late May and early June.
- Each female releases about 100,000 eggs on average.
- Planktonic eggs, larvae and juveniles are carried back eastward along the south coast by prevailing winds and currents, particularly the Leeuwin Current.
- Large numbers of the tiny juveniles settle during winter in nearshore waters along the south coast, as far east as South Australia and Victoria. Numbers of juveniles also settle close to where they were spawned along the lower West Coast, particularly in Geographe Bay – which is thought to be an important source of recruitment for the west coast fishery.
- Young herring feed on small crustaceans living in and among the driftweed and seagrass.



Migration or immigration?

After spawning, adult fish stay mainly in Western Australia, feeding inshore on small fish such as whitebait, blue sardines, juvenile fish and small crustaceans. Some move north up the west coast as far as Shark Bay.

A number enter estuaries along the south coast to feed on abundant food items, such as shrimp, and may grow larger and fatter than their coastal relatives. When trapped inside an estuary by a closed sand bar, they can remain there throughout their lives, without breeding.

Southern stock

An endemic Australian species, herring are abundant in the coastal waters of southern Australia, from Shark Bay in Western Australia to Port Phillip Bay in Victoria. They are found mainly inshore, around offshore islands and in southern estuaries such as Wilson Inlet and Oyster Harbour. Australian herring consist of one genetic stock of fish.



Leeuwin lifeline

The herring's life cycle is highly influenced by the Leeuwin Current, which transports warm tropical water southwards along the continental shelf of the WA coast.

In years when the Leeuwin current is strong, pre-spawning adults tend not to travel as far up the west coast because they are swimming against the current. However, a strong current will transport and disperse larvae all along the south coast to Victoria. In years of a weak current, most larvae remain in Western Australian waters, recruiting to nurseries in the lower west coast, close to where they were spawned.

These factors in turn affect juvenile recruitment success, and the catchability and abundance of adult fish.



The life cycle of the Australian herring is highly influenced by the Leeuwin Current.

Recreational fishing favourite

Despite its small size, herring are highly acrobatic fish that are a favourite among both novice and experienced recreational fishers. A herring school can be 'berlied up' into a feeding frenzy by using berley consisting of pollard and fish oils. In this situation it is possible to catch a fish nearly every cast.

The National Recreational and Indigenous Survey conducted from May 2000 to April 2001 showed that Australian herring were the most common species retained by recreational fishers in Western Australia, accounting for 39 per cent of the number of finfish caught.



Measure of maturity

Herring can potentially live for 14 years. However, most fish caught by recreational and commercial fisheries are aged only one to four years, with fish up to 10 years only caught occasionally. This suggests that the stock experiences a high rate of mortality due to fishing and predation. Also, since herring mature at two to three years, most fish are only being allowed a very limited opportunity to breed before being caught.

Monitoring the annual age structure of the herring population to determine the proportion of older fish is one method that Department of Fisheries researchers use to assess whether the current level of fishing pressure is sustainable.



A herring otolith that can be analysed to determine the fish's age.

Fishy science

The significant reduction in commercial fishing for herring means commercial catch rates are increasingly less reliable as an index of herring abundance.

As a result, the reliance on recreational fishing data is growing. Catch rate data collected since 2005 from Research Angler Program (RAP) logbooks provide a more reliable picture of abundance.

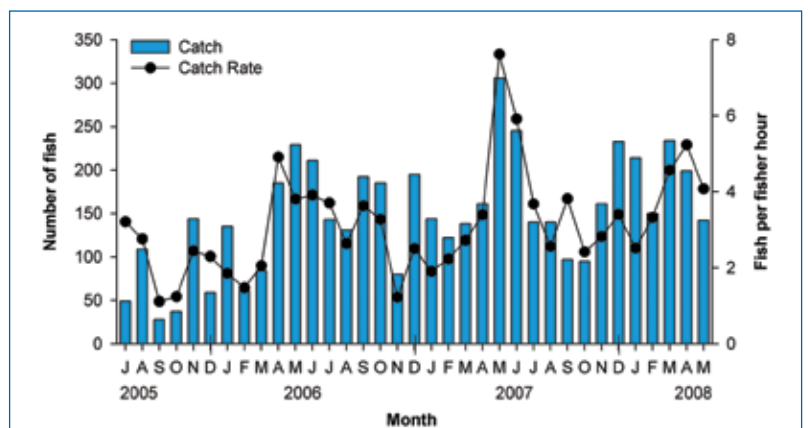
The Department of Fisheries also conducts annual beach seine sampling to survey juvenile herring. This gives an indication of recruitment from year-to-year and is used to forecast adult abundance and fishery catches two-to-three years later. Recruitment since 2000 has been very low in both the lower west and south coasts when compared to the late 1990s.



Fine mesh beach seine nets are used to sample juvenile Australian herring at key locations.

A sampling study of the recreational catch of herring in the West Coast Bioregion in the 1990s found females accounted for 70 per cent of the catch taken during autumn (the spawning period). It is thought that females may need to feed more vigorously when producing eggs. Given they are heavily targeted by fishers during their spawning period over autumn, catching such a high percentage of pre-spawning females is a concern for fisheries managers.

Recent Department of Fisheries research has focused on determining the age structure (how many individuals of each year class are present) of the herring stock. Researchers are able to determine the fishes' age from their otoliths (or ear bones). Researchers are also trying to determine what proportion of the herring catch is coming from each nursery area. Differences in juvenile otolith shape and chemical composition can provide a unique 'nursery signature' that can be used to tell where the adult fish originate from.



Catch rates of Australian herring by shore based Research Angler Program (RAP) log book fishers in the West Coast Bioregion.

Survival schools

Herring are food for many predators such as Australian salmon, mulloway, yellowtail kingfish, sea birds, seals and sea lions. They school in large numbers – an essential defence mechanism against these predators – and hover over seagrass meadows and reefs, which gives them additional protection. They normally school at depths of only one to two metres from the surface.

Commercial fisheries

The commercial fishery for Australian herring has a long history in WA, having operated for over 50 years on the south and west coasts.

The bulk of the commercial catch is caught using long trap nets (also called 'G' trap nets), on a limited number of south coast beaches. Seine nets, gillnets and line fishing on both the west and south coasts take the remainder of the commercial landings.

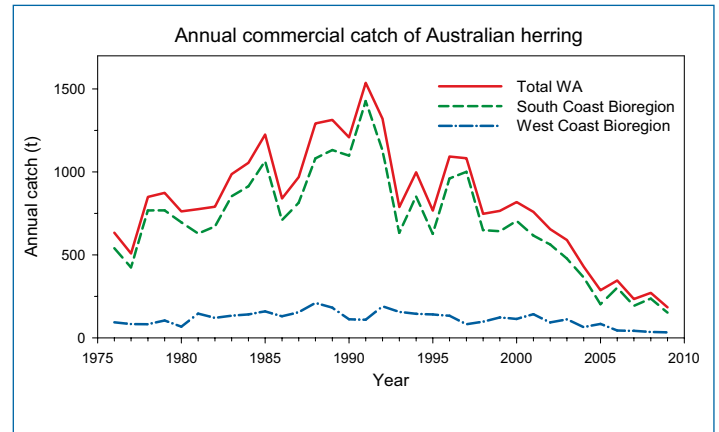
The catch is sold to the fresh fish markets or as bait for the western rock lobster and southern rock lobster fishing industry and as pet food.



The Australian herring, a former WA commercial fishing industry staple, now in decline due to low marketability. Photo: Sandy Clarke

Catch rates from compulsory monthly returns submitted by commercial fishers have been used to monitor the herring stock.

At its peak in the early 1990s, the commercial herring catch was over 1,500 tonnes. Since that time both catch and effort have declined significantly. In 2007, both catch and effort reached historically low levels. The decline in commercial catch and effort has been strongly influenced by economic factors such as low marketability. Fish processors have effectively restricted the commercial catch in recent years by purchasing only limited quantities of herring.



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Glossary

Age structure

The number of fish of different ages within a population

Berley

Surface level bait consisting of fish oils and pollard aimed at attracting fish

Catch

Total number or weight of fish caught in a specified time.

Effort

The amount of time spent fishing by a given group of fishers

Endemic

Restricted to, or only found in, one place

Maturity

Stage at which a fish can reproduce or breed

Migrate

To move regularly from one habitat to another, usually for purposes of breeding or spawning

Nursery area

Area where juvenile fish grow.

Otolith

Fish ear bone

Predator

Animal that lives by preying upon other animals

School

A large number of fish of the same type moving together as a group

Spawn

To produce or deposit sperm or eggs

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FURTHER INFORMATION

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