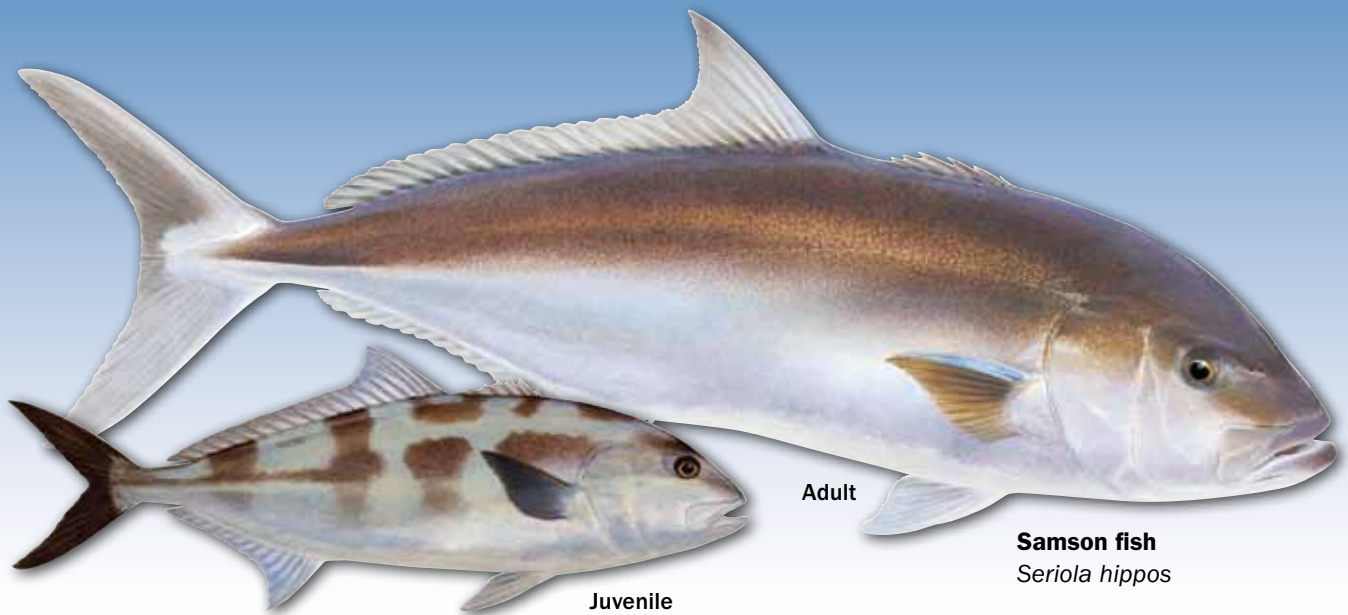




FISHERIES FACT SHEET

SAMSON FISH



Juvenile

Adult

Samson fish
Seriola hippos

Strong name, strong fish

Named after the biblical figure of Samson who was granted superhuman strength from God, Samson fish are a powerful and large predatory fish of the open water.

Jacks of all kinds

Samson fish belong to the family Carangidae, which includes fish such as trevallies, queenfish, darts and scads. In the genus *Seriola* to which Samson fish belong, there are a further three species found in Western Australian waters – yellowtail kingfish (*S. lalandi*), amberjack (*S. dumerili*) and almaco jack (*S. rivoliana*).

Samson fish are powerful predatory fish, inhabiting open water and lurking around reef structures to find their food.

Samson fish are carnivorous and their diets include both pelagic and demersal prey such as pilchards, yellowtail scad, red snappers, squid and cuttlefish.

Ear bones of fish, called otoliths, contain a detailed record of their life, including their age. Each year, as a fish grows, tiny bands of calcified material are laid down in the ear bone, similar to growth rings in a tree.

Samson fish grow very fast, attaining a size of 60 centimetres after just two years. Females reach maturity at 89 centimetres and four years of age. Samson fish can grow to at least 175 centimetres, weigh 55 kilograms and live to at least 32 years.

A preference for the west

The distribution of Samson fish is confined to the waters off southern Australia and the northern waters of New Zealand's North Island. They are generally more common off Western Australia than elsewhere.

The species is found southward from Shark Bay in Western Australia, along the west and south coasts to the Yorke Peninsula in South Australia. On the east coast of Australia, Samson fish occur from Moreton Bay in Queensland down to Jervis Bay in New South Wales, but their abundance is patchy.



A whole dried Samson fish otolith. Photo: Andrew Rowland

A colourful life

Samson fish undergo considerable changes in colouration and pattern during their lives. As a small juvenile, Samson fish body colour varies from green to yellow, with five dark vertical bands running down its body. The eyes and dorsal fins are a bronze-red, while the caudal fin is transparent with two yellow blotches. This unusual colour combination is thought to help the fish camouflage itself among floating macroalgae – an important habitat for the fish in open water.

As a juvenile Samson fish grows, its body becomes more silvery, with blotchy brown markings. In adults, these blotches become less obvious and the body varies in colour from pale silver to a dull purple-brown on its upper part, with a silvery underside and a yellow stripe following the lateral line. Samson fish can be quite pale when captured but after death often change to a darker grey colour.



Photos: Andrew Rowland

A summer at Rottnest

Samson fish are capable of undertaking long distance migrations to reach spawning grounds in the lower west of Western Australia, particularly in waters to the west of Rottnest Island.

Here they form large spawning aggregations from November to February in an area that contains many shipwrecks, known to fishers as the 'Rottnest Barges'.



Spawning aggregation of Samson fish. Photo: Russell Cocker

An emerging target

Historically, Samson fish were often considered an exhausting nuisance by those boat fishers after 'good-eating' demersal species, such as dhufish and pink snapper. Hook-ups of Samson fish often resulted in tangled lines on the boat, break-offs and loss of valuable fishing time.

These days, the brute force of Samson fish has meant that it is fast being recognised as a world-class sportfishing species. As increased catch restrictions, such as lower bag limits and closed seasons, have had to be placed on popular demersal species on the west coast to ensure their survival, the popularity of Samson fish is growing as a catch-and-release species.

The location of regular haunts and aggregations of Samson fish, including off Rottnest Island and other reef structures, are widely known.



Sought after by sportfishers, Samson fish are a popular catch-and-release species. Photo: Mike Mackie

Current timing

The time of year that Samson fish arrive and form spawning aggregations off Rottnest Island coincides with the increase in prevailing southerly winds during summer. These southerly winds push the Leeuwin Current further offshore and drive a northern-flowing inshore current, called the Capes Current. It is thought the Capes Current helps adult Samson fish arrive at breeding grounds in the lower west coast from southern Australia.

The weakening of the southerly winds and the increase in flow of the Leeuwin Current during autumn is a likely cue to conclude the spawning aggregations. The Leeuwin Current is thought to disperse Samson fish eggs and larvae into nursery areas across southern Australia. Similarly, the Leeuwin Current may greatly aid adult Samson fish returning to feeding grounds in southern waters.



The Capes Current appears to assist adult Samson fish arrive at their breeding grounds.

Hunger strike

Most fish need to feed vigorously or rely on stored fats to provide energy for the production of eggs and the exhausting spawning events that follow. To the surprise of researchers who have worked on the spawning aggregations that occur off Rottneest Island, Samson fish do not appear to feed actively during these events. In order to be captured for research purposes, the fish needed to be actively enticed to feed by the use of flashing metal jigs.

This non-feeding behaviour allows Samson fish to maximise the number of eggs produced during spawning activity, as an empty stomach provides space for larger ovaries. As a result, fish leaving aggregations after spawning may be in relatively poor condition and, if caught, may need extra care when released to ensure their survival.

Catch and release

Samson fish are treasured by recreational fishers for their fighting ability rather than eating quality, leading to many fish being captured and then released. Research is being conducted around Australia on the survival of post-released Samson fish.

In a recent study, Samson fish were caught in depths ranging from 80 to 133 metres and then placed into an at-sea enclosure to monitor their survival. This study showed that the survival rate of the Samson fish that were released was 93 per cent. Handling, the time spent out of water and exhaustion was thought to have contributed to the mortality, or death, of the remaining seven per cent of fish.

Information about catch and release techniques specifically developed for Samson fish can be found in Fisheries Occasional Publication No. 43: 'Catching and caring for Samson fish (*Seriola hippos*)', which is available on the Department of Fisheries website at www.fish.wa.gov.au

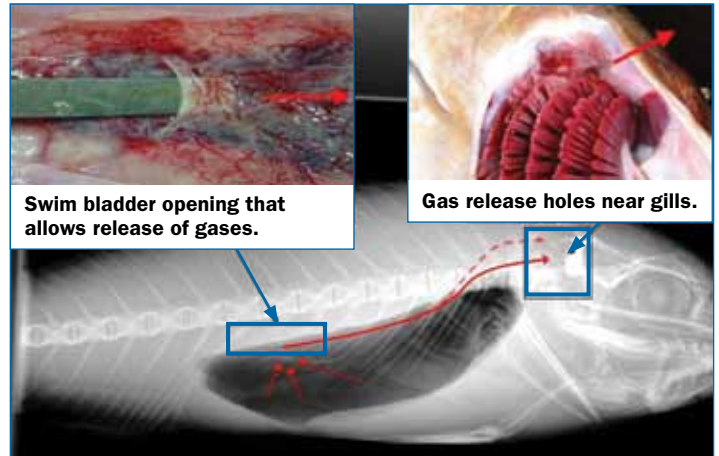


Returning a Samson fish to the water after capture. Photo: Mike Mackie

Take the pressure down

Not only are Samson fish pelagic by nature, they also inhabit a wide variety of depths, due to a clever de-pressurisation adaptation of its swim bladder that helps it avoid barotrauma.

After carrying out autopsies on Samson fish captured from deep water, researchers have discovered that while the swim bladders of the fish were fully inflated, rarely were they over-expanded or ruptured.



Swim bladder opening that allows release of gases.

Gas release holes near gills.

X-ray image of Samson fish. Image and photos: Andrew Rowland

Observations of Samson fish ascending to the surface revealed that as the fish rose, they commonly released air bubbles, fizzing from the gill cover area, about five metres or so from the water's surface. It was discovered that this gas release was occurring from one or two holes about six to 10 millimetres in diameter beneath the dorsal area of the gill cover. These holes each connect to the swim bladder via a small tube, helping de-pressurisation when a fish ascends.



A hooked Samson fish releasing air. Photo: Garry Lilley

Tame fish

Over the years, people have been hand-feeding Samson fish and yellowtail kingfish at some of the commercial mooring areas at the Abrolhos Islands, 50 kilometres off the coast from Geraldton. The fish have become very tame, and feeding them is a popular attraction for both visitors and resident commercial rock lobster fishers.

Feeding wild animals changes their behavior and feeding strategies, leaving these resident fish an easy target for fishers. It is therefore prohibited to catch Samson fish and yellowtail kingfish around anchorage areas of inhabited islands at the Abrolhos.

Samson science

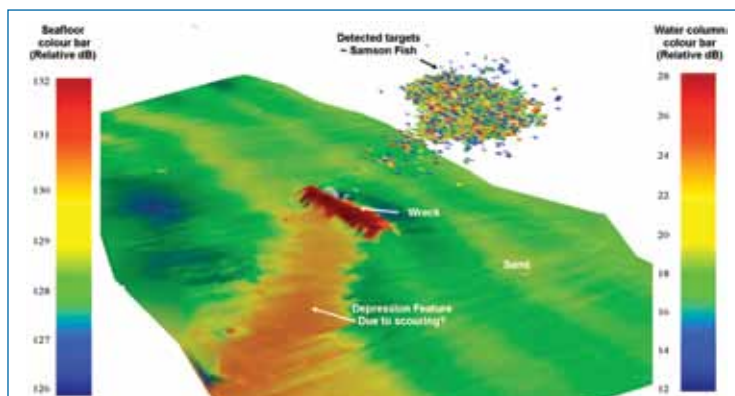
A collaborative research team, using a large number of well-trained fishers, used Samson fish aggregations off Rottnest Island to study the biology of the fish and assess the impact of the sports fishery. It also provided an opportunity to evaluate methods and protocols for monitoring fish aggregations using cutting-edge video and acoustic technology.

A total of 10,287 Samson fish were tagged between November 2001 and January 2007, mainly at the Rottnest aggregations, with a small number tagged along the coast between Mandurah and Busselton. Over 200 fish have been recaptured so far, after being at liberty for up to 1,795 days.

Tagging data suggest that Samson fish in these aggregations return to resident locations during winter months, either south or east of Rottnest Island. Only seven fish were captured to the north of Rottnest Island. Two fish tagged at Rottnest Island have been recaptured in South Australia after traveling some 2,500 kilometres.



A tagged Samson fish. Photo: Mike Mackie



3D visualisation of the substrate and Samson fish aggregation off Rottnest Island.

Commercial fisheries

Samson fish are not considered a major target by the commercial fishing sector, due to a low market price and demand. Most Samson fish sold commercially are processed as fillets and labeled as 'kingfish', while high quality specimens are sold for sashimi, or raw fish, for Japanese cuisine. They are caught mainly in the West Coast Demersal Scalefish Fishery (WCDSF) and in both the West Coast and Southern Demersal Gillnet and Demersal Longline Fishery (WCDGDLF and JASDGDLF).

The total commercial catch rose significantly in the mid-1980s, peaking at over 126 tonnes in 1987. In 2009, 16 tonnes of Samson fish were caught in the WCDSF, while in 2008/09 eight tonnes were caught in the WCDGDLF and the part of the JASDGDLF that operates within the boundaries of the WCDSF.

References

Websites

Department of Fisheries, Western Australia

www.fish.wa.gov.au

Recfishwest

www.recfishwest.org.au

Australian Museum

www.australianmuseum.net.au/fishes

Murdoch University – Centre for Fish and Fisheries Research

www.cffr.murdoch.edu.au

Western Angler magazine

www.westernangler.com.au

Publications

Department of Fisheries. 2007. **Catching and caring for Samson fish (*Seriola hippos*)**. Fisheries Occasional Publication 43. Department of Fisheries, Western Australia.

Pepperell, J. G. 2010. **Fishes of the Open Ocean: A Natural History and Illustrated Guide**. University of Chicago Press.

Mackie, M.C., McCauley, R.D., Gill, H.S., Gaughan, D.J. 2009. **Management and monitoring of fish spawning aggregations within the West Coast Bioregion of Western Australia**. Final FRDC Report Project Number 2004/051. Fisheries Research Report 187. Department of Fisheries, Western Australia.

Rowland, A.J. 2009. **The biology of Samson fish *Seriola hippos* with emphasis on the sportfishery in Western Australia**. Doctor of Philosophy Thesis. Murdoch University, Perth.

Glossary

Aggregation

The behavioural grouping of animals in a high concentration for reasons such as the concentration of food organisms or spawning

Barotrauma

Expansion of gases in a fish's body due to a sudden decrease in pressure, similar to 'the bends' in humans

Camouflage

Coloration or patterns on an animal that helps it to blend in with its natural surroundings

Demersal

Bottom-dwelling, or living near the ocean floor

Ecosystem

A complex set of relationships among the living resources, habitats and residents of a particular area

Lateral line

A line along the sides of a fish connecting to pressure sensitive nerves that enable the fish to detect vibrations in the water

Pelagic

Associated with the surface or middle depths of a body of water

Spawning

The release or depositing of spermatozoa or ova, of which some will fertilise or be fertilised to produce offspring

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Fish illustrations

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FURTHER INFORMATION

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