



# Herring frequently asked questions

From 1 March 2015 a daily bag limit of 12 Australian herring for recreational fishers and closure of the commercial South Coast G-net Fishery came into force to ease fishing pressure on herring and help the stock recovery of this important species.

## **What factors have led to the decline in herring numbers?**

Research and monitoring have led our scientists to the conclusion that a combination of environmental factors and fishing pressure has diminished herring stocks in Western Australia's waters.

The latest herring stock assessment showed that the stock was in a depleted state due to a high rate of mortality.

As part of the assessment, long-term trends in recruitment (addition of young fish to the population) were considered. Our researchers analysed trends in the rate of new recruits entering the population each year – that is, the number of fish less than a year old.

When the breeding stock gets too low, or the environmental conditions are unfavourable for egg and larval survival, recruitment is poor. Since the year 2000, recruitment has been poor, and combined with the current catch taken by commercial and recreational fishers, this is a serious threat to the sustainability of the herring population.

## **What is a stock assessment and what has the herring stock assessment shown?**

To assess the health of a population of finfish like herring we use the 'weight of evidence' approach, which means using all available information to determine the stock status.

Firstly, we extensively sample the herring breeding stock each year by collecting hundreds of fish frames (filleted skeletons, with the heads and guts intact). They are donated by recreational fishers through the Send Us Your Skeletons program and also collected from commercial fishers.

These samples reveal the age, length and sex composition of the breeding stock, from which we can estimate the rate of fishing mortality (the numbers of herring removed by fishing). Current fishing mortality levels are too high and are not sustainable, which means that fishers are removing fish faster than they can be replaced by recruitment.

A comparison of the age composition in the mid-1990s with the current age composition indicates that the average age of herring has decreased and the older fish have become more rare. Herring have a maximum age of 10-12 years, but at the moment, it is rare to find a fish older than four years.

Secondly, we carry out fishery-independent surveys to determine the annual rate of new recruits entering the population each year.

Thirdly, we use information collected during surveys and in voluntary fishing log books to monitor the catches of commercial and recreational fishers and the trends in their average annual catch rates, which provide an index of fish abundance. Downward catch rates have indicated a shrinking herring population over the past 20 years.

Most herring taken along the south coast are either juveniles or adults yet to spawn for the first time. In fact, across Australia, it is estimated that somewhere between half and three quarters of all herring are caught before they spawn for the first time.

### **How do we know the stock assessment results are correct?**

The herring stock assessment was independently reviewed by a fisheries expert. The reviewer found that our assessment approach was appropriate and agreed with the findings.

### **What does it mean that herring are part of a single stock and why is that so important to herring management?**

Juvenile herring occur along WA's west coast, south of Shark Bay. They also occur along Australia's southern coast, from WA's south coast, across to South Australia and as far east as Port Phillip Bay in Victoria. However, all adults eventually migrate back to the south-west of WA to spawn.

The exact location of the spawning area is believed to shift slightly from year to year according to ocean conditions, but it would typically occur somewhere along the lower west coast (between Perth and Cape Leeuwin). This means all the herring come together to form a single breeding stock.

Overfishing in any region will affect the size of the breeding stock. In WA, we need to recognise this in our management strategies by putting measures in place to reduce catch rates in both the West Coast and South Coast bioregions, and across both the commercial and recreational fishing sectors.

### **Fishers on the south coast say that there seem to be plenty of herring around. How is this so?**

Unusual environmental conditions, especially the 2011 marine heatwave, disrupted the normal migratory behaviour of herring. Normally adults migrate from the south coast to the west coast to spawn during autumn. However, in 2011 very warm water discouraged this migration and most fish appeared to stay on the south coast. To a lesser extent, this also occurred in 2012 and 2013, which were also warm years, particularly on the south coast.

As a result there has been a build-up of herring along the south coast (leading to high south coast catch rates) and a very low abundance of herring on the west coast (leading to low west coast catch rates). In 2014 a return to more typical environmental conditions led to herring returning to more typical behaviour and distribution.

Importantly, however, these recent warm conditions resulted in poor spawning success for herring, as proven by the low recruitment observed. This was another blow to a herring stock that was already depleted.

### **Why are fishers allowed to fish for herring on the south coast if these are the juvenile stocks?**

While commercial and recreational fishers do catch many of the pre-spawning herring along the south coast, it's important to recognise that west coast fishers also catch pre-spawning herring. And west coast fishers (especially around the metropolitan area) catch large numbers of older breeding female fish when they 'aggregate' (gather) before spawning.

In fact, the recreational catch on the west coast during the spawning season is heavily dominated by females (with the total catch comprised of up to 80 per cent females at certain times).

So everyone who catches herring, regardless of where, is contributing to the current stock issue, and as such their activities must be taken into account in developing a solution and arrangements for managing herring.

## **What changes are being made to address the herring stock issue?**

After considering the science and the views of the peak commercial and recreational fishing bodies, and listening to the wider West Australian community, the Minister for Fisheries has decided to reduce fishing pressure on herring through changes to both recreational and commercial fishing.

From 1 March 2015, the daily recreational bag limit for herring was reduced from 30 to 12 and the commercial South Coast G-net Fishery was closed.

The Minister has also said that based on the Department's ongoing monitoring of the herring stock, he will review the herring stock status and the new management arrangements before the end of 2016.

## **What is a joint harvest strategy?**

This is an approach recommended by the Department to co-manage the herring fishery as a whole (single stock) across WA and South Australia.

The Minister for Fisheries has met with the South Australian Government to discuss the herring stock issues and they have expressed a willingness to consider management options for how they might also contribute to the recovery of this popular species.

On this basis, the Department will be working with South Australian fishing authorities to explore the development of a WA/SA joint harvest strategy for herring.

## **What approach will be taken to monitor the recovery of the herring stock?**

We will continue to monitor fishing mortality levels annually. These levels will be the main indicator of the status of the herring stock. This means we will be collecting as many fish frames as we can to provide information on the age structure. This will be a critical, ongoing part of our monitoring strategy.

## **How can I help the recovery of the herring stock?**

Members of the community are encouraged to get involved in our fisheries research to assist with the collection of the crucial data needed to monitor the herring stock.

You can sign up to participate in the Research Angler Program, or you can donate frames of herring you catch.

You can also assist by promoting the new herring rules among your family and friends, and helping them to understand why the changes have been made, and why they are important.

Finally, we encourage fishers to be reasonable about the resource. Bag limits are set as guidelines based on the sustainability of the stocks, they are not a target, so catch only enough to meet your immediate needs.

## **How long will the stock take to recover under the new management strategy?**

We estimate that it will take at least six years before any signs of recovery may be detected through our monitoring. Additionally, we expect it will take eight to 10 years before we can conclude with any confidence that we have been successful in our management of herring.

## Why isn't a minimum size limit being introduced for herring like there is for other fish species?

Size limits are normally set for a species at the size at which that species reaches sexual maturity.

Herring reach maturity at 18-20 centimetres. It is indicated from our recreational fishing surveys that relatively few herring under this size are retained. For this reason, a size limit wouldn't result in any more herring being released than are being released now.

Additionally, the impact of post-release mortality – mature fish being thrown back but dying anyway due to handling and stress – should be taken into account when considering implementing size limits.

Given this, bag limits are the preferred management tool, as they don't encourage 'high grading' (releasing a fish in the hope of catching a bigger one) and the number of fish being thrown back is kept to a minimum.

## Several occurrences of herring spawning have been reported on the south coast – how can this be happening, and will it be looked into further?

Many years of sampling has failed to find any evidence that herring spawn on the south coast. Sometimes fish in 'ripe' (pre-spawning) condition will be caught, but it is thought that these fish still migrate to the west coast before actually spawning.

Future changes in the climate and ocean conditions could lead to a behavioural change in herring. Samples of herring obtained through our Send Us Your Skeletons program and from commercial fishers will help us to monitor these changes.

## Further information

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### HEAD OFFICE

3rd Floor, The Atrium  
168 St Georges Terrace, Perth WA 6000  
(08) 9482 7333  
customerservice@fish.wa.gov.au  
ABN: 55 689 794 771

[www.fish.wa.gov.au](http://www.fish.wa.gov.au)

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