



RESEARCH ANGLER PROGRAM

Newsletter No.23
July 2012



Welcome to the RAP Newsletter, providing feedback on the data you are collecting and keeping you informed about what is happening at the Research Division of the Department of Fisheries.

Australian herring tagging study begins

In May 2012, our researchers and volunteers captured, tagged and released 1,550 herring near Dunsborough, in the south-west of WA. This was the first batch of fish to be tagged during this three-year project. More herring will be tagged in late 2012, and there will also be tagging in 2013 and 2014. Researchers aim to tag around 20,000 herring over three years.

The success of this research will depend on a high level of recapture reporting. All tagged fish released in May this year have a recapture reward value written on the tag, ranging from \$5 to \$100. We hope the rewards will encourage herring fishers to report all the tagged fish they capture.

As we go to print, 28 tagged herring have been recaptured. Some fish were recaptured in Mandurah and Cockburn Sound, travelling an average of 10 km per day. Others were recaptured near where they were released.



Australian herring with orange plastic tag inserted under the dorsal fin.

Why are we tagging herring?

Australian herring are the most common finfish species taken by recreational fishers in WA and there is a large commercial herring fishery on WA's south coast. There are also recreational and commercial

herring fisheries in South Australia. Herring play an important role in the marine ecosystem – as both predators and prey for many other species. All herring in Australia are part of a single breeding stock.

Recently, our researchers have become concerned about the sustainability of the herring stock because:

- There is evidence of a widespread decline in herring numbers across southern Australia (in WA and SA) since 2000.
- Recruitment (the number of juvenile fish entering the stock each year) of herring has been low since 2000.
- The majority of fish in recreational and commercial catches in WA are breeding females.

Because of these risks to the herring population, researchers have spent the past two years developing new methods to rigorously assess the annual status of the herring stock. Tagging is the next stage of this research and it will provide extra information about movement and mortality rates in the breeding stock.

Australian herring spawn along the lower west coast of WA (between Perth and Augusta) from late May to early June.



Fisheries researchers catching herring to tag. Photo: Amber Howard

The Leeuwin Current transports the planktonic larvae and juveniles south along the west coast and then east along the south coast. Juveniles settle into coastal nurseries along the length of the flow of the Leeuwin Current, with some juveniles recruiting locally into west coast nurseries while others reach SA and Victoria. Once sexually mature (after 2-3 years), herring migrate from their nurseries to the lower west coast of WA to spawn. There is no return (post-spawning) migration - mature herring remain in the West Coast Bioregion after spawning. It is not yet clear whether herring move around within the West Coast Bioregion during their adult life, or stay within a particular

area. This research will hopefully answer this question.

What to do if you catch a tagged herring

The orange tag has a unique number, a monetary value and a phone number on it. If you catch a tagged herring please telephone the number on the tag (0459 846 772) giving the details of capture and the unique tag number. Outside office hours leave your details and you will be called back. To claim your cash prize take the fish, or the fish frame (filleted skeleton with the guts and head still intact) and the tag to one of our offices in Bunbury, Busselton, Fremantle, Geraldton, Hillarys or Mandurah.

Three ways to contribute to our herring research:

- 1. Assist with tagging.** More tagging events are scheduled for late 2012 and in 2013 and 2014. Volunteer fishers will be needed to assist researchers at these events.
- 2. Donate your frames.** Researchers can determine the age, sex, reproductive status and growth rate of an individual fish by examining the filleted frame. Data from frames donated by recreational fishers are an essential part of our annual assessment of herring. And remember, you could also win a prize for donating.
- 3. Keep filling in your logbook.** Catch rates reported in recreational fishers' log books give us a measure of the abundance of herring in each region of WA. This is an important part of our ongoing monitoring. So please remember to fill in your log book every time you go fishing.

If you would like further information on any of these activities.

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Photo: Henrique Kwong

Shark tagging

Sharks are of major interest to many people for a variety of reasons. At the Department of Fisheries we are studying a number of shark species to better understand their behaviour and improve their sustainable management.

One of these studies uses acoustic transmitter tags which are implanted into the shark's body cavity. The procedure does not leave the shark at all incapacitated as the small surgical wounds quickly heal. The transmitters are programmed to send a coded message, approximately 400 – 600 metres in all directions, that identifies each individual shark. The battery life of these transmitters may last up to ten years, providing a considerable amount of information over the adult lifetime of a shark.

There are four shark species targeted commercially in West Australian waters that we are tagging in this way:

- Gummy shark (*Mustelus antarcticus*)
- Whiskery shark (*Furgaleus macki*)
- Dusky whaler (*Carcharhinus obscurus*)
- Sandbar shark (*Carcharhinus plumbeus*)

Sharks tagged internally will also be given a yellow identification tag in their dorsal fin, so they are easily recognised.



A researcher internally tags a dusky whaler shark.
Photo: Silas Mountford

Each yellow identification tag has an individual ID number and contact details of our shark research section.

Another species of shark being tagged with a similar acoustic transmitter is the white shark (*Carcharodon carcharias*). Due to their larger size and the logistics in catching and handling them in a way suitable for internal tag surgery, white sharks have so far only been tagged externally. The transmitter is attached to the shark by a short tether fastened to a spearhead, this is embedded into the dorsal musculature using a long tagging pole. Due to the long-distance movements of this species across state and even international boundaries, this project has been undertaken in collaboration with scientists from CSIRO.

Numbers of acoustic transmitter tags deployed so far are:

- Sandbar shark: 101
- Dusky whaler: 47
- White shark: 98

(Researchers are currently in the field tagging gummy and whiskery sharks so numbers are not finalised, but we aim to tag 100 of each species).

Along with the acoustic transmitters and their yellow ID fin tags, a large number of sharks of various species have previously been tagged with orange identification fin tags, also in their dorsal fins. These sharks are part of longer ongoing studies looking at population size, along with movement, growth rates and mortality rates.

To detect the coded messages transmitted by the acoustic tags, we have deployed four 'curtains' of acoustic receivers. These extend from the beach (400 metres from shore) and across the continental shelf to about 200 metres in depth at the following locations: Perth,



Researchers measure a juvenile tiger shark, which has an orange fin tag.
Photo: Silas Mountford

Hamelin Bay (Augusta), Chatham Island (Walpole) and Bald Island (Albany). In addition to these receivers, data has been collected from similar receiver arrays managed by the Australian Animal Tracking and Monitoring System (AATaMS) off Ningaloo Reef. These receivers are anchored to the seafloor and must be recovered every six or twelve months to download the recorded data, change the batteries and for servicing. In shallow waters they are retrieved by divers, while in deeper waters they have been retrieved using acoustic release systems. In future, a Remotely Operated Vehicle (ROV) will be used to recover many of these receivers.

The information we hope to gain from these projects will be invaluable

in increasing our understanding and knowledge of these shark species and for ensuring management of their populations is adequate. If one of these tagged sharks is caught, we would like the captor to note the **tag number, date and location** (latitude and longitude) where the shark was caught, and contact our Shark Research Section.

If the shark is healthy and looks as if it might live, note the details and release the tagged shark back into the water as soon as possible.

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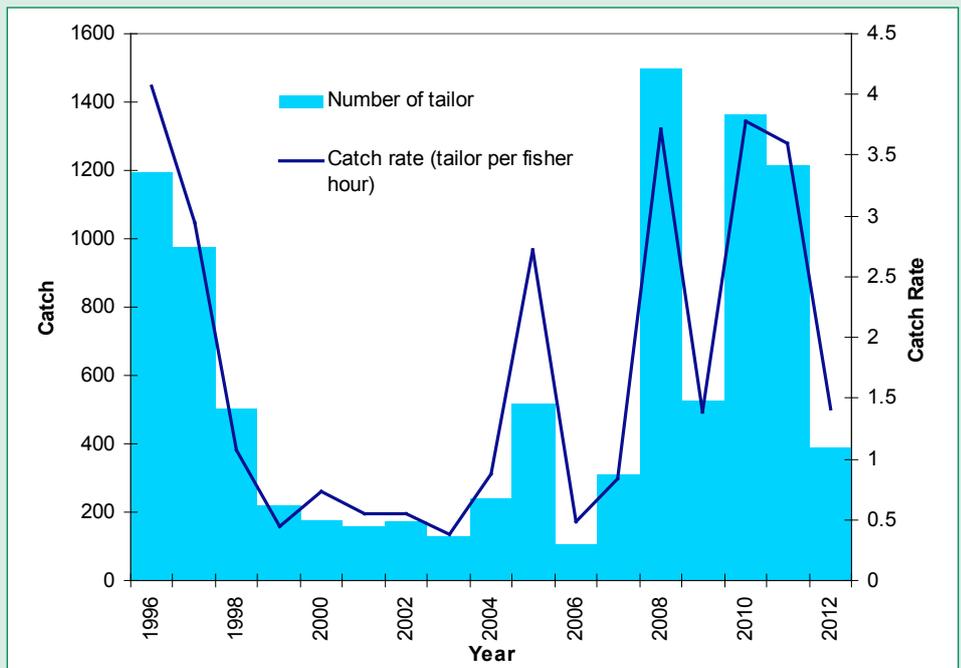


An internally tagged dusky whaler shark is successfully released. Note the yellow fin tag.
Photo: Silas Mountford

A good year for tailor fishers in the West Coast Bioregion

Fishers throughout the West Coast Bioregion have been reporting good catch rates of tailor over the past 12 months. This is the result of strong juvenile recruitment observed by our Point Walter volunteer anglers in 2008, 2010 and 2011. The good catch rates are expected to continue next year.

The Tailor Angling Recruitment Survey at Point Walter has been running for 18 years. The survey runs from February to April each year. In 2012, there was a decrease in both the catch and catch rate of juvenile tailor from previous years. Only 393 fish were caught in 2012, compared to 1,215 in 2011. The catch rate was 1.38 fish per fisher hour, compared to 3.6 fish per fisher hour in 2011. Volunteers and researchers will be back next year at the Point Walter jetty to continue this long running and successful project.



Catch and catch rate graph (Feb to April).

Tailor tagging

Researchers need more information about the movement of tailor in WA so they can better understand the population structure. Tailor are common along the west coast, from Carnarvon to Augusta, and appear to form multiple breeding aggregations over this range. Are these separate stocks? Or do adult fish move between regions, resulting in a single breeding stock of tailor in WA? Tagging will hopefully provide the answers.

If you are a recreational fisher who regularly targets tailor, you are invited to join this project. You will work independently, tagging tailor during your usual fishing activities. This can be in any region of WA and all equipment will be provided. However, you will first need to attend a brief training session at our Marine Research Laboratories in Hillarys.

For further information please contact:
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Fisher of the month prize!

Winners of the RAP 'fisher of the month' prizes were randomly selected by drawing one log sheet returned in each month.

Congratulations to the following 'fishers of the month':

December	John Burt	(West Coast)
January	Jarrad Louw	(West Coast)
February	Tony Sheehan	(West Coast)
March	Simon McLernon	(West Coast)
April	Jim Allison	(West Coast)

Each winner will receive a cap and stubby holder together with a family pass to the Naturaliste Marine Discovery Centre. Make sure you fill out your log book and send your returns in to ensure your chance of winning!

THANK YOU FOR YOUR ONGOING SUPPORT AND HAPPY FISHING

The research angler program is managed by the nearshore and estuarine finfish research team

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Fish for the future