Government of Western Australia
Department of Fisheries

RESEARCH ANGLER PROGRAM

Newsletter No.25
April 2013

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.

Determining squid dynamics in WA

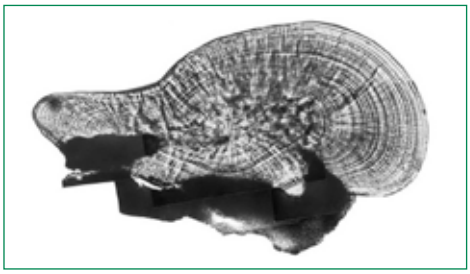
The Department, along with Murdoch and Curtin Universities, has launched a joint research project focusing on southern calamari (*Sepioteuthis australis*) to shed light on its biology and age structure.

Southern calamari has become an important catch component of recreational anglers in southern Australia. Tackle stores now stock squid-specific fishing equipment and dedicated recreational squid fishing competitions, such as the Calamari Classic in Cockburn Sound and the Southern Squid Challenge in Albany, attract professional teams from as far as Japan.

Research in other states has shown that southern calamari are fast-growing and short-lived, typically reaching a maximum age of one year. However, this research has also found that the biological characteristics of calamari can vary between populations. Therefore, we need to find out the specific characteristics of our southern calamari populations in WA. This information will help us to more accurately assess and manage local stocks, ensuring a positive future for the fishery.

When assessing the status of any fished population, understanding their growth and reproduction rates helps us better understand the species' inherent vulnerability to depletion (faster growing stocks are replenished more quickly and so can sustain higher levels of harvest). It's also important to determine the age structure of the population (i.e. the number of individuals in each age class), which provides information about rates of recruitment and mortality/survival. Our researchers, therefore, need to determine the age of each calamari specimen collected in this project.

Most readers of this newsletter know that fish can be aged by counting the annual or daily growth bands in their ear bones (known as 'otoliths'). Calamari and other squid are aged in a similar way, except that their ear bones, which contain daily growth bands, are known as 'statoliths'.



Section of a southern calamari statolith showing daily growth bands Photo: Corey Green

A vital part of this project is the collection of biological information for southern calamari in several regions of south-western WA. We are focusing on **Cockburn Sound, Geographe Bay, Albany (King George Sound)** and **Esperance Bay.**

If you catch southern calamari in these waters, here is how you can help researchers:

1. Measure the hood length of each squid and email this information, along with date, location and depth of capture, to p.coulson@murdoch.edu.au; or
2. Remove the pen/quill of the squid, dry it and put it in an envelope with the date, location and depth of capture (place the quills of all squid caught during the same trip in the same envelope); or
3. Keep the heads (the tasty tentacles can be removed if desired) with guts attached, along with the quill/pen of each squid you catch, and freeze them in individual bags labelled with the date, location and depth of capture.

In the last two cases, contact the researchers via email or phone to let them know that you have some samples available for the study and from where they can be collected. Researchers will be regularly travelling to the regions mentioned above and will collect any samples that you keep.

Remember, this is a project funded by recreational fishers for recreational fishers, so please get involved!

Southern Calamari Photo: Corey Green

This project involves Murdoch and Curtin universities as well as the Department of Fisheries. It was funded through the first round of the Recreational Fishing Initiatives Fund, which is funded from Recreational Fishing from Boat Licences (RFBLs) and overseen by Recfishwest.

For more information contact:

Dr Peter Coulson
T: 9360 2695/0407 730 652
E: p.coulson@murdoch.edu.au

A better understanding of juvenile dhufish

The West Australian dhufish (*Glaucosoma hebracium*) is one of the most highly targeted demersal species on the lower west coast. It is a large, long lived and slow-growing species and is found nowhere else in the world. While adult dhufish are usually found in waters of between 20 metres and 50 metres deep around rocky outcrops, they can also turn up in water just a few metres deep and on relatively flat substrate.

Mature dhufish can live to 40 years of age and weigh as much as 25 kilograms.

Small juvenile dhufish of less than 150 millimetres in length are rarely seen by fishers, divers or researchers. Until recently, only a few had been collected from a small area north-west of Fremantle. This had left scientists with a gap in their understanding of the juvenile stage, which is a vulnerable part of a dhufish's life cycle.

As a result, the Department of Fisheries began a Natural Resource Management (NRM)-funded project two years ago to identify habitats critical to juvenile dhufish, particularly those of less than 150 millimetres.

The project found very young dhufish along the WA coast between the Houtman Abrolhos Islands and Augusta in a depth range of between two metres and 48 metres. The critical habitat for the juveniles appears to be predominantly sandy areas with small patches of low-profile reef or seagrass beds. This is very different to the reef habitats which adults generally inhabit.

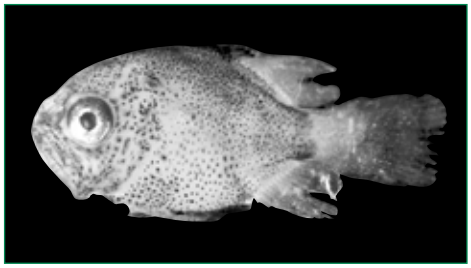
Now that juvenile habitats have been found, these sites could be used in future to monitor the annual recruitment of small dhufish. Potential monitoring methods include the use of divers or video cameras and small, purpose-built artificial reefs for small juveniles, and baited cameras and/or recreational fishing logbooks for slightly larger juveniles. Additional sites and methods are now being investigated for future monitoring purposes.

Understanding the annual strength of dhufish recruitment several years before they join the fishery will enable us to make management decisions to ensure the long-term sustainability of this species.

Juvenile dhufish (TL=120mm) on a predominantly sandy habitat with some refuge

Looking for dhufish larvae

In a related project, the Department of Fisheries, in collaboration with researchers at the CSIRO, began a Fisheries Research and Development Corporation-funded project in 2011 to locate the planktonic eggs and larvae of dhufish. Previously, only a single larval dhufish had been identified along the west coast despite extensive sampling carried out over many years by various research groups.



A 33-day-old larval dhufish measuring less than one centimetre long.
Photo: Julia Shand, University of WA

Plankton was sampled primarily in oceanic waters between Cape Naturaliste and Cape Leeuwin during January and February 2012, the peak of the dhufish spawning period. Working at selected sampling sites, the project used computer modelling of ocean currents and satellite-tracked oceanic drifter buoys to predict the likely direction and speed of travel of larvae away from known dhufish spawning locations in the area. A DNA sequencing technique was also developed to rapidly detect the presence of dhufish DNA in plankton samples.

Higher concentrations of dhufish larvae were found in warmer waters, at sites of between 20 metres and 30 metres deep, in the Capes region.

The hydrodynamic modelling and drifters, along with observations of larvae, has helped researchers to understand how the transport of eggs/larvae by ocean currents varies depending on the location and time of spawning. Variations in the strength and direction of ocean currents in the Capes region have implications for the survival of dhufish larvae, which determines annual recruitment success.

In future it may be possible to sample dhufish larvae to monitor annual recruitment strength. However, we still need to determine exactly how larval abundance relates to future adult abundance and to learn more about larval behaviour before this approach can be applied.

For more information about juvenile dhufish contact:

Paul Lewis
E: paul.lewis@fish.wa.gov.au or

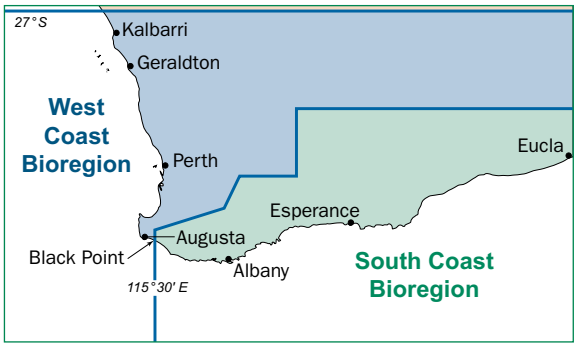
Dr David Fairclough
E: david.fairclough@fish.wa.gov.au

‘Fish frames’ needed from the west and south coasts

You can help with vital long-term monitoring of valuable fish stocks by sending us your fish frames (skeletons with the heads and guts intact).

This research is critical for us to make science-based management decisions and ensure the sustainability of WA’s fish stocks. By donating your frames you can help protect the quality of recreational fishing in WA – you could also win some great fishing prizes, including a week-long charter trip for two to the Montebello Islands.

We need frames of the species listed below from the West Coast Bioregion (just north of Kalbarri to east of Augusta) and the South Coast Bioregion (east of Augusta to the WA/South Australia border.)



Species	Needed from the West Coast Bioregion:	Needed from the South Coast Bioregion:
 **West Australian dhufish** (*Glaucosoma hebraicum*)	✓	
 **Pink snapper** (*Pagrus auratus*)	✓	✓
 **Baldchin groper** (*Choerodon rubescens*)	✓	
 **Redthroat emperor** (*Lethrinus miniatus*)	✓	
 Bight redfish (*Centroberyx gerrardi*)	✓	✓
 **Blue morwong** (*Nemadactylus valenciennesi*)		✓
 **Australian herring** (*Arripis georgianus*)	✓	✓
 **Tailor** (*Pomatomus saltatrix*)	✓	✓
 **Whiting** (all species) (*family Sillaginidae*)	✓	✓

How to donate your fish frames

Hand your fish frames (fresh or frozen) in to any of the drop-off points listed on the Department of Fisheries’ website at:

W: www.fish.wa.gov.au/frames

Remember we need the frame with heads and guts, but you can keep the fish’s wings (pectoral fins) and cheeks if you like – these are not required for research.

Label your frame with who caught the fish (name, phone number and email if available), the date the fish was caught and where the fish was caught. In the case of fish caught from the shore, please give us the general location, while for boat catches, please let us know the latitude/longitude or distance and bearing from the nearest port and the name of the port. Note that we’ll keep all location information strictly confidential.

Everyone who donates frames of the species listed, with the correct information, before 1 July, 2013, will go into a draw for some great fishing prizes, including a grand prize of a fantastic week-long charter fishing trip for two to the Montebello Islands, courtesy of Montebello Island Safaris (www.montebello.com.au). For more information on prizes, visit:

W: www.fish.wa.gov.au/frames

Keen crabbers needed for new research

The Department of Fisheries is seeking help from local crab fishers to investigate the status of iconic blue swimmer crab stocks in WA.

Crabbers are invited to join us in our research into this popular species in three key locations; the Swan-Canning Estuary, Leschenault Inlet and Geographe Bay.

The project is being funded by Recreational Fishing from Boat Licence (RFBL) fees, through the Recreational Fishing Initiatives Fund, which is being overseen by Recfishwest.

The project's objectives are to:

1. Gather RAP logbook data from recreational crabbers in the target locations.
2. Develop methods for the ongoing assessment of blue swimmer crab recruitment and breeding stock levels in the target locations
3. Trial tagging methods to provide information on the movement of blue swimmer crabs between the target locations and their adjacent marine environments.

How you can help:

The crabbing catch and effort data provided by RAP logbook fishers will form an important part of this project. Researchers need about 50 dedicated recreational crabbers in each of the three regions to keep a logbook during the three years of the study.

In addition, two logbook fishers in each area will be invited to participate in a tagging program during field trips in May and November, in each year of the project.

Community seminars will be held in Perth, Bunbury and Busselton in May 2013 to formally introduce the project to new and existing logbook participants, and to call for tagging volunteers.

If you are interested in getting involved, please call or email David Harris or Michelle Foster.

David Harris
E: David.Harris@fish.wa.gov.au
T: 9203 0252

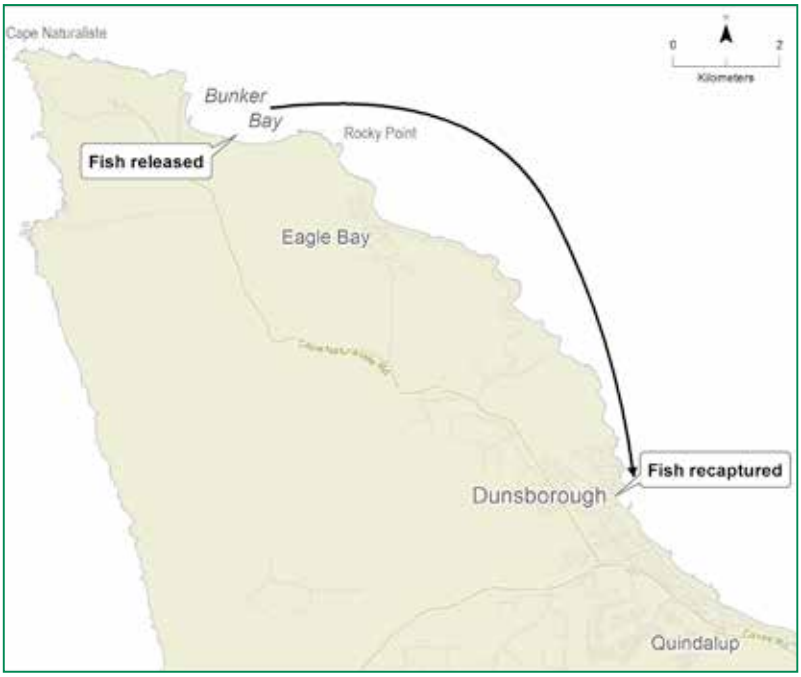
Michelle Foster
E: Michelle.Foster@fish.wa.gov.au
T: 9203 0182

First tagged tailor recaptured

We have had our first tailor recaptured as part of our tailor tagging program. The fish was tagged at Bunker Bay in December and was recaptured two weeks later at the Old Dunsborough boat ramp.

If you regularly catch and release tailor and would like to be involved in tagging please contact Amber Howard.

E: amber.howard@fish.wa.gov.au



Thank you for your ongoing support

The Research Angler Program is run by the Nearshore and Estuarine Finfish Research Team:

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Fish for the future