

SPANISH MACKEREL

F&F research |
results unveiled |

Spanish mackerel has been in the news a lot recently with management of this species currently under review by the Queensland Fisheries Service (QFS). However, there is surprisingly little information available describing the biological characteristics of catches landed by commercial and recreational fishers. This is despite the fact that Spanish mackerel is one of the most important species to both the recreational and commercial fishing sectors in Queensland with between 650 and 850 tonnes being harvested by recreational fishers and 680 and 730 tonnes by commercial fishers each year (from QFS data).



Andrew
Tobin



Amos
Mapleston

Researchers from the CRC Reef Research Centre's Fishing and Fisheries group have recently completed an 18 month study of the Queensland east coast Spanish mackerel fishery with funding from the Fisheries Research and Development Corporation. Though some historical information existed for commercial catches taken from Townsville waters, prior to this research no information was available to describe the catches of commercial fishers in more southern regions of the State. Further, little



A recreational fisher with a couple of one year old Spanish mackerel landed during 2002. Half of the recreational sector sample collected during 2002 consisted of mackerel of this age.

information was available to describe the recreational catches of Spanish mackerel from any region of Queensland. This type of information is fundamental in developing efficient management strategies that will help ensure the fishery is sustainable.

The project determined the biological characteristics (length, sex and age information) of the Spanish mackerel landed by both commercial and recreational fishers from four coastal regions of Queensland - Townsville, Mackay, Rockhampton and south-east Queensland. With the assistance of recreational and commercial fishers, fish processors and tackle shops CRC researchers collected samples from over 5,000 Spanish mackerel captured from locations as far north as Lizard Island (north of Cairns) and as far south as the Tweed River Nine Mile Reef.

Catch characteristics

The largest Spanish mackerel collected was a 180cm 10 year old female fish weighing 48kg, caught east of Mackay. The oldest fish collected was another female of 17 years that in comparison weighed only 23kg. In general, the larger mackerel surveyed were

female with some exceeding 30kg and 160cm total length. Conversely, male Spanish mackerel were considerably smaller than female fish of the same age. All male Spanish mackerel collected by the project were less than 20kg and 140cm total length.

Results from this research project indicated that there were some differences in the sizes of Spanish mackerel being targeted and caught by recreational and commercial fishers.

Most of the mackerel caught by commercial fishers surveyed for the project were between 90 and 130cm

total length and weighed between 4 and 10kg. Commercial fishers tend to avoid large mackerel (above 10kg) as larger fish are not favoured by most commercial markets due to a perception of increased risk of ciguatera poisoning from large fish.

Recreational catches of Spanish mackerel tended to consist of a wider size range of fish, including greater numbers of smaller and very large Spanish mackerel compared to catches from commercial fishers. Smaller Spanish mackerel tend to frequent inshore shoals and can form large schools in these areas. Due to easy access and the use of new technology such as GPS and sounders, these areas also tend to be favoured recreational fishing grounds and at times Spanish mackerel are opportunistically targeted by recreational fishers in these areas. In these instances catches landed by recreational fishers are dominated by fish in the 75 to 100cm total length range. However, some recreational fishers have a preference for targeting and capturing very large Spanish mackerel as 'trophy' fish. Indeed, most of the larger mackerel collected by project staff were captured by recreational fishers using gear aimed at targeting large Spanish mackerel.

August 2003
issue no. 22

inside

International visit

Torres Strait Reef Line
Fishery Research

QDPI Coastal
Monitoring - Shark,
Mangrove Jack, &
Trawl bycatch

editor:

annabel jones

phone: 07-47816365

fax: 07-47814099

email:

annabel.jones@jcu.edu.au

Published by
CRC Reef Research
Centre's F&F Project
located at
James Cook University
Townsville 4811

PROJECT UPDATE

a word from the project leader - Gavin Begg



Once more I am pleased to announce that the past few months have been extremely productive for the F&F team, although I regret that this has been offset by some more sombre activities that have, and will, affect a number of us.

F&F researchers have continued to progress with their respective tasks, with a number of tasks coming to completion. Draft reports on the Effects of Line Fishing (ELF) Experiment and the Spanish mackerel projects have been submitted to the relevant funding bodies and stakeholder groups, where information from both these projects will soon be available. Also, I am pleased to inform you that the much awaited and highly successful Student Stakeholder Workshop report is completed, as too is the Torres Strait reef line fishery review.

On a more sombre note, it is with much regret that Dr Bruce Mapstone will soon be leaving us to head to cooler waters, where he has taken up a CEO position for the Antarctic Climate and Ecosystems CRC. Bruce has been the

cornerstone from which the F&F team has been built and will be missed by all of us. We will, however, continue to develop the work that Bruce has founded, none more so than the ELF Experiment, which Dr Annabel Jones will now lead. Similarly, another of our researchers, Dr Andrew Tobin, who has been leading our Spanish mackerel research, is moving on to other opportunities. To Bruce and Andy I wish you all the best and we will certainly miss you!

Finally, with much sadness I wish to pass on my condolences and thoughts to Cecily Bauer and family, on the passing of Allen who assisted a number of us in the F&F team, and was a friend to many.

INTERNATIONAL VISITOR

The F&F team was fortunate to host a visit from world renowned fisheries researcher Dr Steven Campana from the Canadian Department of Fisheries and Oceans. F&F researchers had the opportunity to discuss their work with Steve and his advice and guidance will be real benefit to them. Steve also gave a number

of presentations to the wider scientific community in Townsville on his world leading research. He was very impressed with the level and breadth of the research being conducted by the F&F team and his visit fostered increased collaboration between the research groups.

FISHING IN TORRES STRAIT

Growing interest in commercial harvest of reef fish in the Eastern Torres Strait, by both Islanders and non-indigenous fishers, has raised concerns for the sustainability of reef fish stocks in the region and the effects commercial activity is having on subsistence fishing. To date, there has been no formal



F&F Researcher, Cameron Murchie and Mr Morris of Yorke Is discuss sales of fish to the local freezer facility by islander commercial fishers. Data such as this collected from a number of Torres Strait islands are providing some of the best information about commercial fishing by islanders in Torres Strait.

evaluation of the reef line fishery in the Eastern Torres Strait, and it is considered that current management strategies do not adequately meet the special circumstances that exist in the region.

This highlights an urgent need to investigate the fishery to provide Torres Strait Islanders, managers and other stakeholder groups with some basic information allowing them to make management decisions on a more informed basis. The Australian Fisheries Management Authority (AFMA) chartered the F&F team to investigate the extent and availability of catch and effort data from the line fishery in Eastern Torres Strait. For non-islanders fishing commercially in the Torres Strait, compulsory logbooks that were supplied to the Queensland Fisheries Service (QFS) provide the best information of catch and effort. For Islander fishers, however, the information is more difficult to assess.

indigenous commercial fishing



Gavin Begg



Cameron Murchie

Islander fishers have fished commercially and sold their catch of reef fish (as well as other commercial species) to community freezer processing operations on the various Islands throughout the Eastern Torres Strait. Records of sales of fish to these freezer facilities by Islanders is the best source of catch and effort data for this sector of the fishery. However, it was found that different freezer operators record the information in different forms, and at various levels of detail.

F&F researchers have recently returned from a trip to Eastern Torres Strait Islands, visiting island freezer operations on Murray (Mer), Darnley (Erub) and Yorke (Masig) Islands collecting valuable freezer records of sales of reef fish (and other marine species) from Islanders. Over 4000 pages of records were collected representing a significant amount of information. Researchers are now in the process of entering all of this information into a database in preparation for analysis and assessment of current and historical commercial fishing practices of Torres Strait Islander fishers.

The information collected on catch and effort in the commercial Islander reef fishery will allow all stakeholders, particularly Torres Strait Islanders to approach future management decisions from a more informed basis. The project will build on a previous AFMA funded review of the ETS reef line fishery conducted by the F&F team and will feed directly into another F&F project on the assessment of the fishery funded by the new CRC Torres Strait research project.

F&F researchers would like to thank all those who have helped with the collection of this data, and in particular the staff from the island freezers for their co-operation and patience. Thanks to all who have provided comments and thoughts on this research.



!MOVERS & SHAKERS

!Farewell Bruce Mapstone

It is with much sadness that the F&F team bids farewell to the team's founder and long time campaigner, Bruce Mapstone.

Bruce's vision saw the need for dedicated research to investigate the direct effects of line fishing on the reef environment on the GBR many years ago and he was instrumental in the development of the world class Effects of Line Fishing (ELF) Experiment from conceptual beginnings in 1988. He has since championed the ELF cause to lead the project to the standing it has today, where it is viewed as the bench mark to which other similar research is compared. The results from this long term research are now viewed by managers and stakeholders alike as judicious and relevant in this time of review of two plans of management that effect the reef line fishery in Queensland.

Without Bruce's continued dedication, determination and hard work, the ELF Experiment would not have been possible and its outstanding achievement is largely due to his leadership.

Bruce leaves us to take up a position as CEO of the Antarctic Climate and Ecosystems CRC in Hobart. He will be sadly missed by the F&F team as well as the many stakeholder groups, managers, advisory committees and fishers that he has met over the years. We wish Bruce success and best wishes in his future enterprise.



& Andrew Tobin

The F&F team is also losing another of our energetic younger scientists, Andrew Tobin. Andrew has completed an extremely relevant and timely research project with F&F and QDPI investigating the catch characteristics of Spanish mackerel on the east coast of Queensland.

His expertise in this area has been in high demand recently with the review of the Spanish mackerel fishery in Queensland. His work has seen him out meeting with many fishers throughout Queensland and his thorough knowledge of the Queensland reef line and mackerel fishery has been an enormous asset to the F&F team. We wish Andrew all the best for his future endeavours.



From Page 1

Age structure of catches

Spanish mackerel collected for the research project ranged in age from one to 17 years, however, there were differences in the average ages of fish caught by the different fishing sectors. Almost half of the recreational catch of Spanish mackerel consisted of one year old fish that were particularly prevalent on inshore fishing grounds during 2002. The same age group of mackerel contributed only about 30% of the commercial catch. Commercial catch tended to be dominated by fish 2 - 4 years old. Interestingly, a relatively high number of one year old fish found in both recreational and commercial catch could indicate that the spawning event from which they were born (in Spring 2000) may have been a particularly successful one with high rates of survivorship of the young. To confirm this, however, catch from other years would be needed to compare these results. As Geoff McPherson's work shows, Spanish mackerel do not mature until two years of age. It is essential for healthy fisheries that sufficient numbers of spawning fish are maintained, hence, large harvest of one year old Spanish mackerel may be harmful to the sustainability of the fishery as they have not had a chance to reproduce prior to being caught.

This project showed a persistence of one and four year old Spanish mackerel in the catches taken from all regions except Rockhampton. In combination, this age class represented more than 50% of the catch taken in all regions (except Rockhampton). This pattern



suggests that the relative success (measured in catches landed) of the east coast Spanish mackerel fishery is driven by good and bad

A commercial catch of Spanish mackerel dominated by mackerel between 4 and 10kg in weight.

years for survival of juvenile fish. This results may also indicate the presence of one stock of fish on the east coast rather than a number of discrete stocks such as has been suggested for the Western Australia and the Top End of Australia, however the evidence is inconclusive.

Regional differences

Analysis of QFS data demonstrated that in recent years, the majority of the commercial catch has been taken from the Townsville region during the spring spawning months while the majority of the recreational catch has been taken from south-east Queensland waters during summer months. Prior to this research project information on regional differences in catch characteristics of Spanish mackerel was scarce.

Results from this project also identified one year old Spanish mackerel in catches taken from southern Queensland locations including Noosa and Mooloolaba. Prior to this research it was believed that only mackerel greater than two years of age frequented the southern waters of the State during the summer months.

Conclusions

The project has demonstrated that there are differences between the catches of Spanish mackerel taken by commercial and recreational anglers. Recreational anglers tend to catch a wider size range of fish, including more smaller one year old fish, as well as the larger, 'trophy' fish. Commercial fishers tended to catch fish of a more limited size range due to market pressures. The size range of fish landed by the different sectors is probably influenced by the types of gears and fishing areas preferred by each. In addition there appears to be good and bad years for spawning and survival of young Spanish mackerel.

The information from this project will be used by scientists, managers and fishers in their future assessments of the status of the east coast Spanish mackerel fishery. Ongoing assessments of Spanish mackerel stocks in Queensland are essential to identify any changes in the status of the stocks of this important species to ensure a healthy fishery for both recreational and commercial fishers in future years.

COASTAL FISHERIES RESOURCE MONITORING IN THE GBRWHA

Focus on shark continues, mangrove jack and trawl bycatch concludes

by Stuart Hyland & Rod Garrett - QDPI

A series of articles on collaborative research conducted by the Queensland Department of Primary Industries concludes with the following article summarising the continuing work on shark resources in the Great Barrier Reef World Heritage Area (GBRWHA) and the investigation of the commercially and recreationally important mangrove jack, as well as, the identification of bycatch from prawn trawling. This work is an important component of the Coastal Fisheries Resource Monitoring Task being conducted at the QDPI's Northern Fisheries Centre in Cairns under the CRC Reef Research Centre.

Coastal shark investigations are an important component of the Task since there is considerable concern by Marine Park and fisheries managers over pressure on shark resources with increased market demand for shark products. An increase in pressure has also occurred as operators have moved to the shark fishery from the trawl fishery following its restructuring. This impact reflects the complexities of fisheries management where changes in management arrangements of one fishery have potential to impact other fisheries operating independently. The concern over the shark resource in the GBRWHA also relates to the impact that the removal of high order predators such as shark may have on the ecosystem. The concerns in the GBRWHA mirror global concerns over shark resources.

There is very little information currently available on the species composition of the catches in the shark fishery in Queensland since commercial landings have been mainly reported as trunks. The main aim of the Task was to identify the species composition of the shark landings from the GBRWHA through fisheries dependent monitoring. To date, onboard observations have identified 20 species of sharks and rays in landings from the shark fishery in the GBRWHA. Some 90% of the catch is composed of nine species with hammerheads (*Sphyrna* spp.) and spot tailed sharks (*Carcharhinus sorrah*) being among the most common (see fig. 1). Information collected through the Task has been used in a recent fishery report on sharks in the GBRWHA. Future investigations under this Task will focus on assessing the spatial and seasonal patterns in species composition of inshore shark populations in the GBRWHA through a series of fisheries independent inshore netting surveys. These surveys will complement fisheries dependent monitoring of offshore shark operations undertaken by DPI in an FRDC-funded study of the sustainability of sharks in northern Australia.

Two other components of the Task include monitoring of mangrove jack and trawl bycatch, both of which were completed in June 2003. The trawl bycatch component provided information on species composition of organisms susceptible to incidental capture in prawn trawls in the Cairns and central sections of the GBRWHA. This component complemented ongoing studies of trawl bycatch by DPI funded through the FRDC and operating in the Far Northern Section of the WHA. The trawl bycatch monitoring was undertaken from the DPI research trawler Gwendolyne-May and is fisheries independent. Samples were obtained from prawn trawl grounds using trawl gear fitted with Turtle Excluder Devices (TEDs) and Bycatch Reduction Devices (BRDs). Some 205 species representing 8 broad taxonomic groups have been identified. While these include 116 species from 46 families of fish and 37 species from 9 families of crustaceans, some 14 species made up 70% of the bycatch by abundance. Only one endangered species (an unidentified pipefish) was present as a single individual from 40 shot samples.

The mangrove jack component provided support for an FRDC funded research project by DPI and provided the CRC with access to a database of size, age and genetic information on more than 5000 tagged mangrove jack. Tag returns are coordinated by SUNTAG (the database for the ANSA Sportfish Tagging Program). Mangrove jack utilise estuarine and freshwater habitats as juveniles and move to offshore reef systems for spawning. Between February 2002 and June 2003, 48 tagged mangrove jacks were recaptured from the Johnstone River and adjacent localities. Most of these were recaptured within the release area but one specimen had moved offshore to the reef while two others had moved out of the estuary to adjacent foreshores.

The Coastal Fisheries Resource Monitoring Task is a multispecies fisheries investigation of key coastal fisheries species in the GBRWHA, and links with various projects including the QFS Long Term Fisheries Resources Monitoring Program and various FRDC funded projects. Thanks to the CRC Reef contribution, fishery managers and fishers in the GBRWHA, as well as Marine Park managers, can benefit from information on species composition, stock condition, and stock structure of these key coastal fisheries resources. The Task also provides an opportunity to develop and adapt methodologies appropriate for monitoring coastal fisheries resources in the GBRWHA. Such methods will be required for assessing conservation management strategies proposed for fisheries resources in the GBRWHA. The Task was recently reviewed by the CRC Task Review Committee. This review recommended that the Task continue with a greater focus on shark, barramundi and mud crab resources. The focus on shark has been supported by both QFS and GBRMPA managers and will investigate seasonal and spatial patterns in the species composition of inshore shark populations in the GBRWHA. The Task will also investigate the potential role of barramundi and mud crabs as indicators of ecosystem condition. The findings will be reported in future articles in this newsletter.

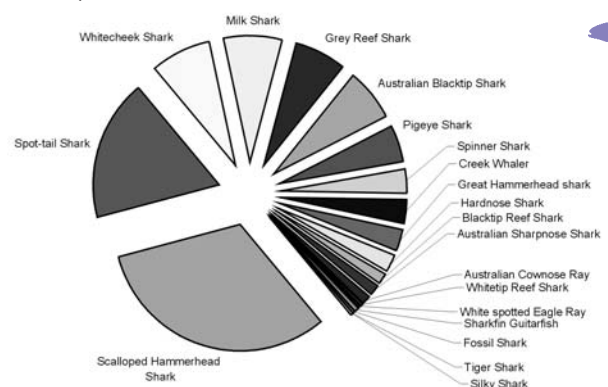


Fig 1: Species Composition of shark landings in the Queensland commercial shark fishery (% Abundance). Although a large number of shark species are captured in this fishery, nine species make up around 90% of the total catch. The remainder of the catch is made up of quite a few different species each in relatively small amounts. (Combined totals from Task B4.5 and FRDC Project 2001/077)