

Implementation and continued improvement of Queensland's harvest strategy for sharks

Wildlife Trade Operation Condition 9

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Purpose of this report

On 27 February 2009 the East Coast Inshore Fin Fish Fishery (ECIFFF) was declared an approved Wildlife Trade Operation under the *Environment Protection and Biodiversity Conservation Act 1999*. Condition 9 of this accreditation required that:

‘By 1 December 2010, Fisheries Queensland to report to Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) on the implementation and continued improvement of the harvest strategy for sharks, including progress towards species-based management.’

This report¹ provides an overview of the on-going work to date (August 2011) to ensure the sustainable harvest of shark in Queensland.

New management arrangements for the harvest of shark—2009

Fisheries Queensland commenced the review of management arrangements for the harvest of shark in 2006. A suite of new or refined management arrangements were implemented on 1 July 2009. These included:

- The allocation of a limited number (154 in total) of ‘S’ fishery symbols to constrain the number of operations authorised to take of sharks and rays above defined incidental catch limits.
- A Total Allowable Commercial Catch (TACC) of 600 tonnes (t) to constrain total catch to significantly less than recently reported annual catch levels.
- A maximum size limit² (150 cm total length) to protect breeding females.
- Protection or restricted take of high risk species.
- Increased fisher logbook reporting requirements to enable a better understanding of the species composition of the shark and ray catch.
- Restrictions on the form in which sharks can be landed to enable species identification and to prevent illegal finning.
- Reduction in the number of offshore net fishing operations that traditionally harvest sharks and grey mackerel.
- Other indirect measures including restricting total net length, mesh size restrictions and rigid requirements for attendance by fishers at nets.
- Condition of licence attached to S symbols to allow a Fisheries Observer from time to time to observe operations at sea, in port and during unloading, at times agreed to by both the licence holder and the Fisheries Observer.

The TACC is a key element of the harvest strategy for shark. The 600 t TACC was set lower than the highest reported total annual catch as a precautionary measure in light of limited species-specific information.

¹ A report was originally provided to the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) prior to 1 December 2010 to meet this condition.

² The maximum size limit does not apply to net licences with an S symbol. The net mesh size regulations are designed to select for sharks less than 150 cm.

Since 2008, Fisheries Queensland has partnered with other management agencies and research institutes to implement a comprehensive program of management, information collection, assessment and research initiatives that aim to provide for continued improvement of harvest strategies³ for sharks (Table 1). It is expected that by the end of 2013, Fisheries Queensland will have developed a sustainable and comprehensive harvest strategy for sharks. Highlights of these initiatives include:

Management coordination

- Fisheries Queensland established the East Coast Inshore Fin Fish Fishery (ECIFFF) Shark Panel in 2009 to specifically address and meet the conditions and recommendations relating to sharks. This group recognised that three years of species-specific data is required to enable appropriate assessments.
- Fisheries Queensland developed a Plan for Assessment of Queensland East Coast Shark Resources 2009–12 which sets out the key species on which future assessment will focus, the data to be collected through daily commercial fisher logbooks, the statewide recreational fisher survey, observer trips and further research as a prerequisite to future quantitative stock assessments. This draft plan was reviewed and supported by the Shark Panel in November 2009 and is being progressively implemented by Fisheries Queensland.
- Shark Assessment Working Group established to oversee the implementation of the resource assessment process for priority shark species and to ensure rapid progress in development and communication of the harvest strategy for sharks.

Information collection systems

- Detailed species level logbook reporting for all 'S' endorsed licenses in the net and line fisheries were introduced for shark catch on 1 July 2009. Improved identification of the catch by fishers is a fundamental requirement for future species-level stock assessments. Fisheries Queensland facilitated shark identification workshops at several regional centres with commercial fishers using the shark identification guide in 2009 and in early 2010 with Queensland Boating and Fisheries Patrol field officers. Fisheries Queensland will continue to investigate the accuracy in shark reporting in the future using information collected from fishery observers and undertake the necessary remedial actions to improve logbook reporting.
- As part of a comprehensive fishery observer program detailed information is being collected on species composition of both the retained and discarded catch, primarily from the net and line fishers operating under an S symbol but also for all elasmobranchs caught incidentally in other fisheries where observers are active (e.g. trawl, line fisheries, crab fisheries). Length frequency information by gender and vertebrae for age determination are also being collected with tissue samples provided to the Molecular Fisheries Laboratory in Brisbane for genetic confirmation of species identity where necessary and population structure studies.

³ Fisheries Queensland interprets a 'harvest strategy for sharks' as referring to the full suite of management arrangements that specifically relate to these species.

- Basic life history and demographic characteristics of important shark species in the ECIFFF to support assessment work has been compiled in the form of a matrix and continues to be updated by Fisheries Queensland as the results of new research become available. This consolidates the outputs from a variety sources and identifies gaps in our knowledge relating to shark biology and ecology to inform future assessments, improve management arrangements and ensure sustainable harvest.

Assessment tools

Performance Measurement System

- Fisheries Queensland implemented a Performance Measurement System (PMS) for the ECIFFF on 1 July 2009. It contains a suite of specific indicators (reference points) developed to measure the performance of the fishery in meeting the management objective of ensuring shark harvest remains at precautionary and sustainable levels. The harvest indicators are monitored and reported through the [Annual Status Report](#) for the ECIFFF beginning in 2010.

Stock status assessment

- In November 2009 Fisheries Queensland initiated a process to assess and report on the exploitation status (stock status) of Queensland's key fish stocks. The aim of this process was to provide a transparent, consistent and simple to understand statement about the status of our key stocks. Stock status is determined in a workshop where an expert panel of scientists and managers review available biological and fishery information and assign an appropriate exploitation category for a given species guided by a set of exploitation criteria.
- With knowledge of our key shark stocks still in the information collection phase, Fisheries Queensland considers it premature to assess their status through this process. It is expected that an assessment of shark stocks beyond their current 'undefined' level will occur post 2012. The future assessment will consider the outcomes of the quantitative stock assessments planned after this date. Shark harvest levels will continue to be monitored annually through the PMS.

Shark specific research

Risk assessment

- Using new life history biology data collected by the Marine and Tropical Sciences Research Facility James Cook University (JCU)/DEEDI/CSIRO Inshore Fishery project and best available data on current net / line fishery pressure on shark resources from commercial logbook data, a risk assessment of major inshore shark and fin fish species was completed in 2010. The project provides an indication of relative risks of overfishing to elasmobranch species in the Great Barrier Reef region posed by current levels of inshore fishing effort. The report notes that species considered at ecological risk by this process are not necessarily overfished or at reduced population levels. The report is yet to be finalised.

Stock assessment

- Improved understanding of shark species population structure is critical for future assessments. A Fisheries Research and Development Corporation (FRDC) funded

JCU/Fisheries Queensland project was completed in 2011 that directly addresses this research need for three key harvested taxa from Queensland's inshore net fishery: blacktip sharks (*Carcharinus tilstoni* and *C limbatus*), the scalloped hammerhead shark (*Sphyrna lewini*) and the milk shark (*Rhizoprionodon acutus*). The report was released in 2011.

- Direct assessment of exploitation rate (= fishing mortality F) through tagging studies is underway through a FRDC project funded at JCU. It is anticipated that the project will provide initial estimates of fishing mortality from areas of known high effort by mid-2013.

Management of a sustainable fishery for commercially important shark species represents an ongoing challenge for Fisheries Queensland. The initiatives outlined above will provide improvements to the already precautionary suite of management arrangements in place and help ensure that maximum economic and social benefit from the fishery is achieved while minimizing impacts on the ecosystem. Fisheries Queensland continues to seek advice from Shark Panel meetings held biannually and support the work of the Shark Assessment Working Group to ensure rapid progress in development and communication of the harvest strategy for sharks. Fisheries Queensland aim to keep stakeholders informed of this progress through the Annual Status Report for the ECIFFF and the Progress against Conditions and Recommendations Report available on the website.

Table 1: Planned initiatives and activities to improve Queensland's harvest strategy for sharks in the ECIFF.

Initiatives	Activities	Outputs					
		2008	2009	2010	2011	2012	2013
Management coordination	Fisheries Queensland Independent Shark Panel	Shark Panel established—2 meetings held per year to review progress and advise on Wildlife Trade Operation (WTO) Conditions and Recommendations related to sharks.	Early 2009: Terms of Reference developed and first meeting held. Late 2009: Initial compilation of new shark logbook (CFISH) data presented to second Panel meeting.	2 meetings held—latest CFISH and Fisheries Observer Program data compiled and reviewed.	Ongoing—2 meetings held each year.	Ongoing—2 meetings held each year.	Ongoing—2 meetings held each year.
	<i>Plan for Assessment of Queensland East Coast Shark Resources 2009–12</i>		Draft <i>Plan</i> developed by working group, reviewed and endorsed by Shark Panel.	Implementation of <i>Plan</i> – data collection and assessment model review phase.	Ongoing implementation of <i>Plan</i> .	Preliminary assessment results for major target shark species. Revision of priority specie subject to Panel endorsement in light of catch and effort data available and research results	Commence full assessments.
	Regional Management (FRDC Project— <i>Whose fish is it anyway?</i>)		Project commenced—meetings held in Port Douglas, Hinchinbrook and the Burdekin region.	Project continues—follow up meetings.	Late 2011: Project completion.	Review findings and management implications.	

Initiatives	Activities	Outputs					
		2008	2009	2010	2011	2012	2013
Information collection systems	CFISH logbooks		<p>Species-specific logbook reporting was introduced for shark on 1 July 2009</p> <p>Shark identification workshops provided to fishers and QBFP compliance officers.</p> <p>Provide aggregated commercial catch and effort data to MTSRF research project for inclusion in risk assessment.</p> <p>Ongoing education of fishers in accurate completion of logbooks.</p>	<p>Late 2010: Logbook catch and effort information for 2009–10 presented to Shark Panel for review.</p> <p>Improvements to logbooks identified.</p>	<p>Early 2011: Latest shark information summarised in Annual Status Report</p> <p>Late 2011: First 2 years of data analysed and reviewed – improvements to logbooks identified and remedial action taken.</p>	<p>Early 2011: Annual Status Report</p> <p>Late 2012: Analysis of 3 years of data— data to be incorporated in preliminary resource assessments and PMS measure development/ review</p> <p>Improvements identified and remedial action taken.</p>	<p>Early 2011: Annual Status Report.</p>

Initiatives	Activities	Outputs					
		2008	2009	2010	2011	2012	2013
	Fisheries Observer Program (FOP)		<p>Begin stratified, statistically robust observation of commercial shark fishing on boats targeting sharks (focus on 'S' symbol holders).</p> <p>Provide observer data to MTSRF research project for inclusion in risk assessment.</p>	<p>Present summary of 1st year observation data to Shark Panel Review survey design. Implement improvements in observer program design while maintaining statistical robustness.</p> <p>Observations in trawl fishery complement focussed shark observer work.</p>	<p>Report on FOP in the ECIFFF (for reassessment submission), detailing highlights and key outcomes in first 2 years of observation.</p> <p>Apply findings to assessment of CFISH logbook data.</p> <p>Observations of line fisheries to provide complementary data on shark harvest.</p>	<p>Continue observation of shark fishery with focus on quantifying interaction with Species of Conservation Interest (SOI) .</p>	<p>Utilise full analyses in refining performance measures related to individual shark species and SOCI interactions with the fishery.</p>
	State Wide Recreational Fishing Survey		Methodology developed for next state wide survey.	Participation survey completed and catch and effort survey commenced.	October 2011 : Catch and effort survey completed.	Survey results and analysis complete.	Input survey outputs into Resource assessment, Stock Status assessment program and PMS review.
Assessment tools	Stock Status assessment program		Methodology developed and Framework released.	First assessment of shark species deferred to incorporate Ecological Risk Assessment outputs and Shark Panel assessment of catch data.	Data collection phase continues.	Data collection phase continues.	<p>Revise assessment with consideration of outcomes of quantitative stock assessments of priority species if available.</p> <p>Release of annual Stock Status Assessment report.</p>

Initiatives	Activities	Outputs					
		2008	2009	2010	2011	2012	2013
	Performance Measurement System (PMS)	FRDC / JCU/ DEEDI Baseline socioeconomic survey of Inshore finfish fishery commenced 2007.	PMS developed and implemented 1 July 2009. FRDC/JCU/DEEDI Baseline socioeconomic survey of Inshore finfish fishery underway.	Late 2010: preliminary assessment of fishery performance. FRDC/JCU/DEEDI Baseline socioeconomic survey of Inshore finfish fishery completed.	Report fishery performance in 2011 ASR. Major review and update of PMS to incorporate new findings on shark catch trends and include socio-economic objectives, measures and indicators.	Report fishery performance in 2012 ASR.	Review and update of PMS to adjust shark measures and indicators (if applicable). Report fishery performance in 2013 ASR.
Shark specific research projects	Shark Stock Discrimination		FRDC/DEEDI/NT/ NSW Fisheries Project commenced.		Mid 2011: Final report and release of findings.	Early 2012: Minor review and update of PMS to adjust shark measures and indicators (if applicable).	

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		2008	2009	2010	2011	2012	2013
	<p>Ecological Risk Assessments – various</p> <p>A) MTSRF/JCU/DEEDI/CSIRO</p> <p>B) GBRMPA</p>			<p>A) End 2010: Final report and release of findings of MTSRF JCU/QPIF/CSIRO Inshore Fishery project.</p> <p>B) GBRMPA Top predators report.</p>	<p>Early 2011: Review findings and fisheries management implications. Major review and update of PMS to incorporate new findings on sharks at risk into relevant measures and indicators if applicable.</p> <p>GBRMPA Biodiversity Strategy – key species Vulnerability Assessments.</p>		
	Stock assessments for key shark species in the fisheries		Data collection (CFISH, FOP, research projects)	Data collection (CFISH, FOP, research projects)	Data collection (CFISH, FOP, research projects)	<p>Preliminary outputs. Review findings and management implications (to include provision of standardised catch rates for shark related PMS measures and stock status assessment).</p>	<p>Commence assessments</p> <p>Data collection (CFISH, FOP, research projects)</p>

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		2008	2009	2010	2011	2012	2013
	National Environmental Research Program- GBR – TS hub projects (Answers to: How the fisheries of the GBR and adjacent areas can be best managed to maximize ecosystem health, ecosystem resilience and ecosystem goods and services)			Priority research question identified by SEWPaC/ GBRMPA and calls for research expressions of interest.	DEEDI co-investment – TBC Management Strategy Evaluation of inshore fisheries and other human coastal activities in the GBR.	DEEDI co-investment – TBC.	DEEDI co-investment – TBC.

Initiatives	Activities	Outputs					
		2008	2009	2010	2011	2012	2013
	Shark life history and ecological information			<p>Qld Shark Control Program research DEEDI / UQ /GU Reports on life history and movement information for spinner sharks, tiger sharks, hammerheads, off southern Queensland .</p> <p>JCU Fishing and fisheries research centre / MTSRF / GBRMPA – Reports on life history characteristics of scalloped hammerheads, great hammerheads, blacktip sharks, blacktip reef sharks, milk sharks, pigeye sharks, spot-tail sharks, creek whalers, white spotted guitarfish and giant shovelnose rays</p>	Early 2011: Review findings and incorporate into resource assessments, risk assessments, fisheries management implications.	Ongoing??	Ongoing??