

## FIG Research Priorities List – 2005/06

### Definitions

- “Fisheries” refers to all fisheries that occur within the GBR Marine Park, including commercial, recreational, charter and indigenous fisheries.
- “Exploited fisheries resources” refers to target, byproduct and bycatch species taken in fisheries.

### Preamble

The GBRMPA views stock assessment and the monitoring of fisheries and fisheries-related activities as the core business of any fisheries managing agency.

In determining the priority of fisheries-related research in the GBR Marine Park, consideration is given to:

- the recommendations and conditions imposed by the Department of Environment and Heritage in accrediting export fisheries under Part 13 of the *Environment Protection and Biodiversity Conservation Act 1999*;
- the impact of the fisheries and fisheries-related activities on the natural systems and processes of the GBR Marine Park;
- known level of sustainability of the exploited species and ecosystems and the risk of this level being exceeded;
- level of knowledge about the exploited species based on past and current research; and
- the benefits derived from the research in terms of building on the existing knowledge base.

Special attention is given to:

- species and ecological communities of conservation concern or on which fisheries resources depend; and
- fisheries that have or are expected to have high environmental impacts.

The following are the key areas of fisheries-related research from a GBRMPA perspective.

### 1. Fishery Assessment

- 1.1 Conduct research on the biological parameters and life cycles of exploited fisheries resources in the GBR Marine Park, including:
  - 1.1.1 identification of critical sites (such as spawning sites) and critical times (such as spawning events);

- 1.1.2 determination of age, growth characteristics, fecundity and frequency of spawning; and
  - 1.1.3 assessment of fishing mortality of exploited species, including the discard mortality of species caught but not retained.
- 1.2 Assessment of temporal and spatial distribution of fishing activities in the GBR Marine Park, with respect to:
- 1.2.1 quantification of species taken by different fishing sectors;
  - 1.2.2 degree of regional depletion of fisheries resources; and
  - 1.2.3 incidental take of non-target (i.e. byproduct and bycatch) species in fisheries.
- 1.3 Validation of the fisheries information used for fishery assessment, including:
- 1.3.1 at-sea observer programs; and
  - 1.3.2 fishery-independent surveys.
- 1.4 Drawing on the above information (1.1, 1.2 and 1.3), conduct fishery assessments and develop assessment models on the ecological sustainability of exploited fisheries resources in the GBR Marine Park. Fishery assessments should include:
- 1.4.1 assessment methodology based on the best available fisheries information;
  - 1.4.2 best-practice standards for fishery assessment and population modelling;
  - 1.4.3 consideration of the accuracy of the data used in fishery assessments;
  - 1.4.4 information on the temporal and spatial distribution of fisheries; and
  - 1.4.5 evaluation of effort creep resulting from new technologies, methods and techniques in fisheries within the GBR Marine Park.

## **2. Management Strategy Evaluation**

- 2.1 Identification of appropriate performance indicators for fisheries in the GBR Marine Park, which include:
- 2.1.1 the development of performance measures which accurately assess the status of fisheries resources; and
  - 2.1.2 the development of limit reference points for species, species assemblages and ecosystems, which indicate if sustainability is being exceeded.
- 2.2 Based on the most current fishery assessments, evaluation of the effectiveness of the management options used in the fisheries of the GBR Marine Park, including:
- 2.2.1 evaluation of the effectiveness of temporal and spatial closures to fishing within the GBR Marine Park;
  - 2.2.2 evaluation of specific management measures such as quota systems, gear unitisation, gear and vessel restrictions, size limits, trip limits and sex restrictions; and

- 2.2.3 identification of alternative management options, which address uncertainty and adopt, under the precautionary principle, a low risk management approach.
- 2.3. Socio-economic analysis of management arrangements in fisheries, including:
  - 2.3.1 evaluation of comparative management arrangements; and
  - 2.3.2 assessment of the impact of marine protected areas.

### **3. Environmental Impacts**

- 3.1. Identification and risk assessment of bycatch species impacted by fishing activity in the GBR Marine Park, including:
  - 3.1.1 species of conservation concern (specifically dugong, turtles, dolphins, sea snakes and syngnathids); and
  - 3.1.2 species highly vulnerable to fishing activity and/or slow to recover from such impacts.
- 3.2. Assessment of the environmental impacts of fishing and fisheries-related activities on the ecology of communities and systems in the GBR Marine Park, including:
  - 3.2.1 determination of the ecological role of species or species assemblages within the GBR ecosystem; and
  - 3.2.2 determination of the rate of recovery of species or species assemblages impacted by fishing activity within the GBR ecosystem.
- 3.3. Development and assessment of technologies, which reduce bycatch and the impact of fishing, including:
  - 3.3.1 the development and assessment of bycatch mitigation devices (e.g. hoppers, BRDs, TEDs and pingers); and
  - 3.3.2 development of fishing practices/methods that minimise the environmental impacts of fishing (e.g. prawn traps).
- 3.4. Identification and evaluation of the impact of extrinsic factors on fisheries and fisheries-related activities within the GBR Marine Park, including:
  - 3.4.1 the impact of climatic events (such as rainfall and global warming) on fisheries; and
  - 3.4.2 the impact of man-induced changes (such as water quality, wetland destruction and degradation) on fisheries.

### **Explanation of the attached tables:**

The attached tables indicate the research needs, relative priority and time frame for each of the commercial/ charter fisheries that operate in the Great Barrier Reef Marine Park.

In interpreting these tables, please note the following:

- Priority Rating:            H = High        M= Medium        H = High
- For the QLD Reef Line Fishery, the research needs for the fishery's environmental impact is rated as L/H. The general impact of the fishery is rated "low" with respect to most bycatch species. However, large (unknown) amounts sharks are taken as bycatch and the impact of this warrants a high priority rating.
- The **yellow highlighted cells** indicate that this research activity is currently being undertaken;
- Research activities remain a high priority until the research has been completed. However, funding support and new research projects will not be sought in areas where research is currently being conducted.
- Some research activities have been given a priority rating of medium or low. This is particularly the case with management strategy evaluation needs. However, this does not diminish the importance of the work required. Rather, it is a reflection of the inadequacy of the data required for such an analysis. In many cases, the basic stock assessment work needs to be done first before the management strategy can be evaluated.
- Time frame indicates the number of years in which it would be desirable to see the research area addressed. Time frame reflects the urgency of the research need.

<b>Old East Coast Trawl Fishery</b>									
<b>Species / Species Group</b>	<b>Fishery Assessment</b>			<b>Management Strategy Evaluation</b>			<b>Environmental Impacts</b>		
	<b>Priority</b>	<b>Research Area</b>	<b>Time Frame</b>	<b>Priority</b>	<b>Research Area</b>	<b>Time Frame</b>	<b>Priority</b>	<b>Research Area</b>	<b>Time Frame</b>
<b>Target Species (14 sp.)</b>									
Tiger Prawns	M	1.3, 1.4	3 yrs	H	2.1, 2.2; 2.3	3 yrs	H	3.1, 3.2, 3.3	3 yrs
Endeavour Prawns	M	1.3, 1.4	3 yrs	H	2.1, 2.2; 2.3	3 yrs	H	3.1, 3.2, 3.3	3 yrs
Northern King Prawns	M	1.3, 1.4	3 yrs	H	2.1, 2.2; 2.3	3 yrs	H	3.1, 3.2, 3.3	3 yrs
Banana Prawns	L	1.3	-	L	2.1, 2.2;	-	L	3.1, 3.2, 3.3. 3.4.1	-
Scallops	H	1.3, 1.4	3 yrs	H	2.1, 2.2; 2.3	3 yrs	H	3.1, 3.2, 3.3; 3.4.1	3 yrs
Bugs	H	1.2, 1.3, 1.4	3 yrs	H	2.1, 2.2	3 yrs	H	3.1, 3.2, 3.3	3 yrs
Squid	M	1.1, 1.3, 1.4	5 yrs	M	2.1, 2.2	5 yrs	M	3.1, 3.2, 3.3	5 yrs
<b>Byproduct Species (~50 sp.)</b>									
Blue Swimmer Crab	M	1.2, 1.3, 1.4		M			M		
Pipefish / Seahorses	H	1.1, 1.3, 1.4	1 yr	H	2.1, 2.2	1 yr	H		
Balmain Bugs	M	1.2, 1.3, 1.4		M			M		
Barking Crayfish	L	1.1, 1.2, 1.3, 1.4		L	2.1, 2.2		L		
Cuttlefish	M	1.1, 1.2, 1.3, 1.4		M			M		
Octopus	M	1.1, 1.2, 1.3, 1.4		M			M		
Pinkies	L	1.1,1.2, 1.3, 1.4		L			L		
Red Spot Crab	M	1.2, 1.3, 1.4		M			M		

<b>Qld Reef Line Fishery</b>									
	<b>Fishery Assessment</b>			<b>Management Strategy Evaluation</b>			<b>Environmental Impacts</b>		
<b>Species / Species Group</b>	<b>Priority</b>	<b>Research Area</b>	<b>Time Frame</b>	<b>Priority</b>	<b>Research Area</b>	<b>Time Frame</b>	<b>Priority</b>	<b>Research Area</b>	<b>Time Frame</b>
Coral Trout	H	1.1, 1.2, 1.3, 1.4	3 yrs	H	2.1, 2.2	3 yrs	L/H	3.2, 3.3	3 yrs
Red Throat Emperor	H	1.1, 1.2, 1.3, 1.4	3 yrs	H	2.1, 2.2	3 yrs	L/H	3.1, 3.2, 3.3, 3.4	3 yrs
Red Fish (incl. Red Emperor & Nannygai)	H	1.1, 1.2, 1.3, 1.4	5 yrs	H	2.1, 2.2	5 yrs	L/H	3.1, 3.2, 3.3, 3.4	3 yrs
Spanish Mackerel	H	1.1, 1.2, 1.3, 1.4	5 yrs	H	2.1, 2.2	3 yrs	L/H	3.2, 3.4	3 yrs
Cods	H	1.1, 1.2, 1.3, 1.4	5 yrs	H	2.1, 2.2	5 yrs	L/H	3.1, 3.2, 3.3	3 yrs
Sharks (spp.) taken as bycatch	H	1.1; 1.2; 1.3; 1.4	3 yrs	L	2.1; 2.2	5 yrs	H	3.1; 3.2; 3.3	3 yrs

<b>Qld Inshore Finfish Fishery</b>									
	<b>Fishery Assessment</b>			<b>Management Strategy Evaluation</b>			<b>Environmental Impacts</b>		
<b>Species / Species Group</b>	<b>Priority</b>	<b>Research Area</b>	<b>Time Frame</b>	<b>Priority</b>	<b>Research Area</b>	<b>Time Frame</b>	<b>Priority</b>	<b>Research Area</b>	<b>Time Frame</b>
Small mackerels (3 spp.)	M	1.1; 1.2; 1.3; 1.4	3 yrs	L	2.1; 2.2	5 yrs	L	3.1; 3.2; 3.3; 3.4	5 yrs
Barramundi	M	1.1; 1.2; 1.3; 1.4	3 yrs	L	2.1; 2.2	5 yrs	L	3.1; 3.2; 3.3; 3.4	5 yrs
Grunter (2 spp.)	M	1.1; 1.2; 1.3; 1.4	3 yrs	L	2.1; 2.2	5 yrs	L	3.1; 3.2; 3.3; 3.4	5 yrs
Tropical Salmon (2 spp.)	M	1.1; 1.2; 1.3; 1.4	3 yrs	L	2.1; 2.2	5 yrs	L	3.1; 3.2; 3.3; 3.4	5 yrs
Sharks (spp.) taken as target sp.	H	1.1; 1.2; 1.3; 1.4	3 yrs	L	2.1; 2.2	5 yrs	H	3.1; 3.2; 3.3	3 yrs

<b>Qld Gamefish Fishery</b>									
	<b>Fishery Assessment</b>			<b>Management Strategy Evaluation</b>			<b>Environmental Impacts</b>		
<b>Species / Species Group</b>	<b>Priority</b>	<b>Research Area</b>	<b>Time Frame</b>	<b>Priority</b>	<b>Research Area</b>	<b>Time Frame</b>	<b>Priority</b>	<b>Research Area</b>	<b>Time Frame</b>
Marlins (3 spp.)	H	1.1, 1.2	3–5 yrs	L	2.1; 2.2	5 yrs	L	3.2	5 yrs
Broadbill swordfish	L	1.1, 1.2, 1.4	5 yrs	L	2.1; 2.2	5 yrs	L	3.2	5 yrs

<b>Qld Crab Fishery</b>									
	<b>Fishery Assessment</b>			<b>Management Strategy Evaluation</b>			<b>Environmental Impacts</b>		
<b>Species / Species Group</b>	<b>Priority</b>	<b>Research Area</b>	<b>Time Frame</b>	<b>Priority</b>	<b>Research Area</b>	<b>Time Frame</b>	<b>Priority</b>	<b>Research Area</b>	<b>Time Frame</b>
Blue Swimmer Crab	H	1.1, 1.2, 1.3, 1.4	3 yrs	L	2.1, 2.2	5 yrs	H	3.1.1; 3.4	3 yrs
Mud Crab	M	1.1, 1.2, 1.4	5 yrs	M	2.1, 2.2	5 yrs	H	3.1.1; 3.4	3 yrs
Spanner Crab	M	1.1, 1.2, 1.4	5 yrs	H	2.2	3 yrs	H	3.1.1; 3.3.2, 3.4	3 yrs

<b>Qld Dive-Based Fisheries</b>									
	<b>Fishery Assessment</b>			<b>Management Strategy Evaluation</b>			<b>Environmental Impacts</b>		
<b>Species / Species Group</b>	<b>Priority</b>	<b>Research Area</b>	<b>Time Frame</b>	<b>Priority</b>	<b>Research Area</b>	<b>Time Frame</b>	<b>Priority</b>	<b>Research Area</b>	<b>Time Frame</b>
Commercial sea cucumber (~10 spp. but 3 major sp.)	H	1.1; 1.2.2; 1.3; 1.4	3-5 yrs	L	2.1; 2.2	5 yrs	H	3.2; 3.3.2	3 yrs
Tropical Rock Lobster	L	1.1.3; 1.2.2; 1.3		M	2.1; 2.2	3 yrs			
Coral	M	1.1; 1.2.2; 1.3; 1.4	3-5 yrs	M	2.1; 2.2.2	5 yrs	M	3.4	5 yrs
Aquarium fish	M	1.1; 1.2.2; 1.3; 1.4	3-5 yrs	M	2.1; 2.2.1	5 yrs			
Trochus	L	1.2.2; 1.3; 1.4	5 yrs	L	2.1; 2.2.1, 2.2.2	5 yrs			