



# Fisheries, Long Term Monitoring Program Sampling Protocol

Rocky Reef Fish: (2010 onwards)  
Section 1

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**Acknowledgments:**

This sampling protocol has been developed by Stephen Wesche, Jonathan Staunton-Smith, Olivia Whybird, Ross Quinn and with contributions from the LTMP (south) Assessment and Monitoring team.

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## Section 1

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## Section 2 - Operational Protocols

Section 2 of this sampling protocol can be obtained by contacting the Fisheries Data Coordinator:  
Telephone +61 7 3224 2175, Fax +61 7 3224 2805 or Email [FishDataCoordinator@dpi.qld.gov.au](mailto:FishDataCoordinator@dpi.qld.gov.au)

## Acronyms

ALK	age-length key
CFISH	Commercial Fisheries Information System, Fisheries Queensland part of DEEDI
DEEDI	Department of Employment, Economic Development and Innovation, Queensland
LTMP	Long Term Monitoring Program, Fisheries Queensland part of DEEDI
RFISH	Recreational Fishery Information System, Fisheries Queensland part of DEEDI

## Rationale

In Queensland, rocky reef fish species are primarily fished south of latitude 24°30'S (the southern boundary of the Great Barrier Reef Marine Park), although significant commercial catches of Snapper and Pearl Perch have been reported from the Capricorn Bunker Group, the southern Swain Reefs and as far north as Proserpine. The fishery is restricted primarily to coastal rocky reef habitat in depths between 10–100 m; however catches have been reported in over 150 m.

The most frequently landed Queensland rocky reef fish species for commercial fishers is Snapper (*Pagrus auratus*), followed by Pearl Perch (*Glaucosoma scapulare*). In recent years other species such as Amberjack (*Seriola dumerilii*), Cobia (*Rachycentron canadum*), and Yellowtail Kingfish (*Seriola lalandi*) have also contributed significantly to the commercial catch (see Table 1).

**Table 1. Historical total harvest (in tonnes) of rocky reef finfish species caught on an L1-L3 endorsement as recorded in the Annual Status Report 2010 Rocky Reef Finfish Fishery (Fisheries Queensland 2010).**

Species	Year		
	2007	2008	2009
Snapper	139	119	93.5
Pearl Perch	49.7	40.3	42.9
Teraglin	10.4	12.1	15.2
Cobia	27.6	35.8	26.8
Amberjack	13.6	16	12
Yellowtail Kingfish	7.5	11	9
Mahi Mahi	1.2	3	1.6
Samsonfish	1.6	<1	<1
Grass Sweetlip	7.5	17.2	23
Frypan Bream	0.1	0.5	0.5

Snapper is also one of the more popularly targeted recreational fish species with the 2005 recreational catch of snapper estimated at 550 t (Fisheries Queensland 2010).

In the late 1990's and early 2000's concerns were expressed by fishery managers, researchers, and the charter and recreational sectors, for the long-term sustainability of rocky reef fish stocks, in particular Snapper. This concern prompted management changes for a number of rocky reef fish species. In 2002 legal size limits were increased from 30 to 35 cm for Snapper and Pearl Perch. The minimum size was reduced from 45 to 38 cm for Teraglin to address the issue of high post-release mortality for this species. Recreational possession limits were also changed to five fish for each of these species.

In 2006 a monitoring program was implemented for the rocky reef fish fishery collecting length, age and sex data representative of the commercial, recreational and charter sectors. In 2008 data collected by the program were combined with a range of other biological and fishery related data to carry out an assessment of the status of Queensland's Snapper stock. The results of the stock assessment suggested the Snapper population was being harvested at or in excess of maximum sustainable levels (Campbell *et al.* 2009) and a reduction in effort was required to allow stock rebuilding. The authors highlighted the uncertainties in their assessment and the need to continue fishery-dependent monitoring of size and age frequencies.

Since it started in 2006, the sampling program has been reviewed leading to changes in the methodology. The latest methodology used by Fisheries Queensland, a service of the Department of Employment Economic Development and Innovation, for the routine collection of biological information on rocky reef fish focuses on Snapper and Pearl Perch and is described in this document.

## Objectives

The objective of the rocky reef fish Long Term Monitoring Program (LTMP) is to use fishery-dependent sampling to collect length, age and sex data representative of the commercial, recreational and charter boat catches in south east Queensland.

LTMP primary target species include:

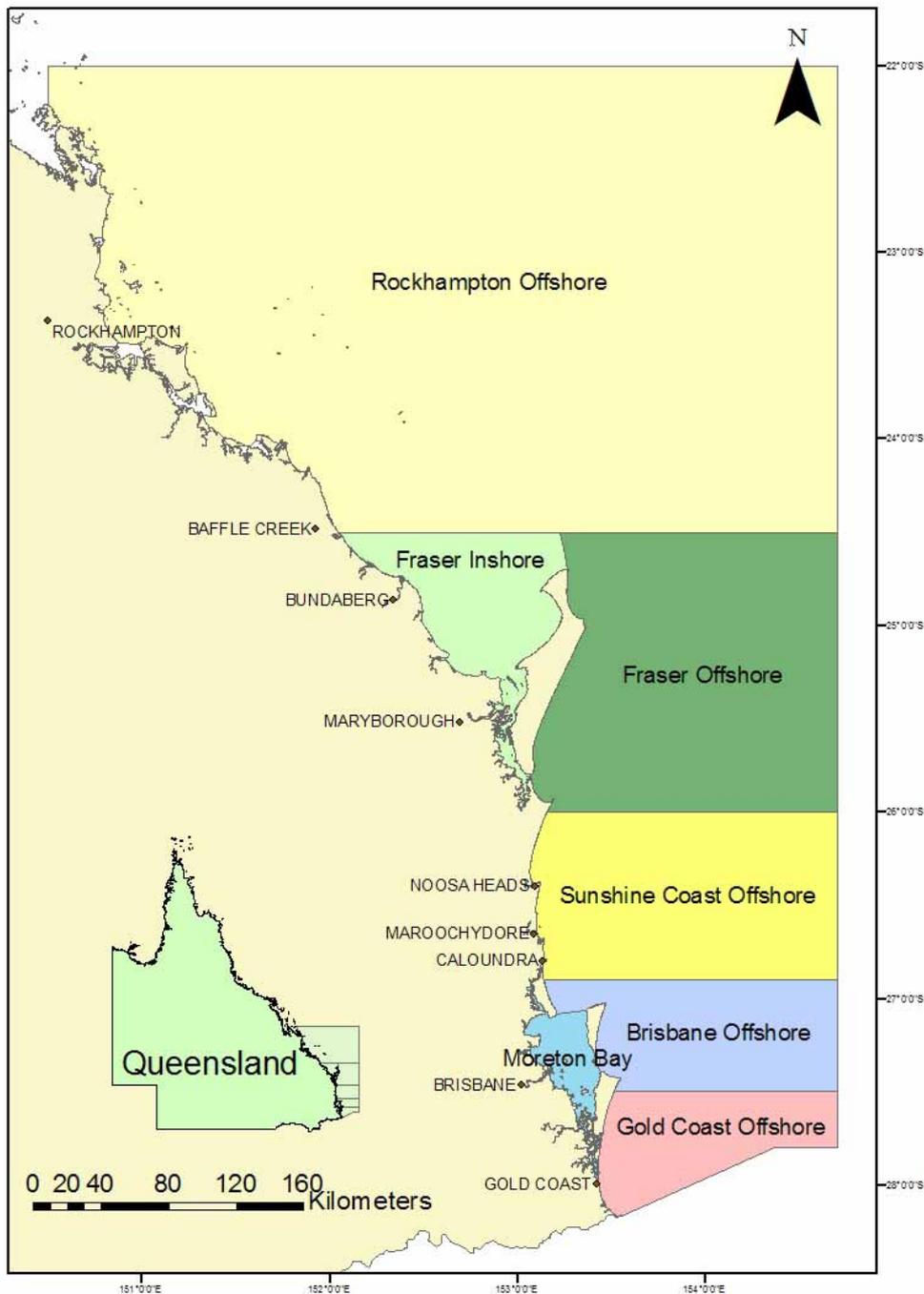
- Snapper (*Pagrus auratus*)
- Pearl Perch (*Glaucosoma scapulare*)

Data are to be collected opportunistically for the following species:

- Teraglin (*Atractoscion aequidens*)
- Amberjack (*Seriola dumeril*)
- Highfin Amberjack (*Seriola rivoliana*)
- Blackbanded Amberjack (*Seriolina nigrofasciata*)
- Cobia (*Rachycentron canadum*)
- Yellowtail Kingfish (*Seriola lalandi*)
- Samsonfish (*Seriola hippos*)

## Sites

The study area for the LTMP Rocky reef fish monitoring program is bounded by the latitude 22°00'S in the north and the Queensland – New South Wales border in the south. The study area is broken down into seven regions to stratify sample collection for Snapper and Pearl Perch from the commercial sector (Figure 1).



**Figure 1. Long Term Monitoring Program rocky reef fish study area including regions used to stratify sample collection for the commercial fishery.**

## Times

Rocky reef fish are monitored all year round with new sampling seasons starting in January. Much of the sampling effort for rocky reef fish is nonspecific in that data and samples are also collected for a range of other species at the same time. However, sample collection from commercial fishers for Snapper and Pearl Perch is stratified by region and quarter.

## Monitoring procedure

The monitoring program for rocky reef fish is fishery-dependent i.e. Fisheries Queensland staff sample catches from the commercial, recreational and charter sectors of the existing fishery. The sampling program can be considered to consist of two concurrent activities; collecting length data to estimate representative length-structure for each sector, and collecting samples from which to obtain length, sex and age data.

Length data are collected from all sectors of the fishery throughout the study area all year round. Emphasis is on line-caught fish with length data collected opportunistically from net-caught fish. Only when all fish in an individual catch (or a random subsample) have been measured are they considered representative length data. The length data are used to estimate the length-structure of retained catches for each sector.

Samples (fish frames) from which to obtain sex and age data are collected opportunistically from any sector, time or location within the study area. The age data are used to establish annual relationships between length and age to allow the transformation of length-structures into age-structures (i.e. relative abundance of age groups). An important assumption that is made is that the age distribution within individual length classes is not significantly different between sectors within each sampling season. This means that the same age data are used to transform length-structures, of all sectors.

## Sampling Strategies

The Long Term Monitoring Program uses a suite of sampling strategies to collect fishery-dependent data and samples for a large number of species. Those that apply to rocky reef fish include:

Commercial catch sampling (Fisheries Queensland 2009a)

- measuring fish before they are sold by fishers to seafood wholesalers
- measuring fish and/or collecting fish frames at seafood wholesalers

Recreational catch sampling

- measuring fish and/or collecting fish frames at popular boat ramps (DPI&F 2007a)
- asking anglers to keep fish frames (Fisheries Queensland In Prep. a)

Charter catch sampling (DPI&F 2007b)

- asking charter operators to measure fish and/or keep fish frames
- Fisheries Queensland staff measuring charter catches

## **Target numbers**

Sample collection of line-caught Snapper and Pearl Perch from the commercial sector is stratified by setting target numbers of catches to sample (measure). Target numbers are set at the start of each sampling season to assist project planning and the representative sampling of the commercial sector. The total target number for the sampling season (e.g. 80) is stratified by region and quarter according to weight of commercial catch calculated from the Fisheries Queensland Commercial Fisheries Information System (CFISH) historical data (e.g. 2006 – 2008). However, these targets are used as a guide (rather than a rule) for sampling, allowing for flexibility to adapt sampling when patterns in the catch are vastly different to the averaged historical catches.

The collection of otoliths is stratified by fish length; while many rocky reef fish frames are collected per season, the number of otoliths collected from these is capped at 15 per 10 mm length class.

## **Laboratory procedures**

Samples of rocky reef fish consist of bags of frames accompanied by labels containing all the necessary site and sample details (e.g. date and location of capture, fishing method and the percentage of the total catch that was sampled). All frames in each sample are processed in the laboratory. Fish are measured (fork length) to the nearest 10 mm and sex is determined by macroscopic examination of the gonads (Fisheries Queensland In Prep. b, In Prep. c). Where sex cannot be determined it is recorded as unknown. When required for ageing, otoliths (sagittae) are removed and stored in labelled vials. Macrostructure of otoliths is interpreted by viewing otolith sections with a microscope, and age is estimated according to general and species-specific protocols (DPI&F 2008; Fisheries Queensland In Prep. b).

## Permits and approvals

### Permits and Permission

This project does not require permits or animal ethics approval to catch samples as they are taken by recreational or commercial fishers as part of normal fishing practice and provided to Fisheries Queensland for the project. A General Fisheries Permit (*Fisheries Act 1994*) is required to possess fish outside legislated possession or size limits.

Survey staff familiarise themselves with and follow all permit conditions and have a copy with them during each survey.

### Notifications

Notifications are required for several of the fishery-dependent sampling strategies utilised by the LTMP to monitor rocky reef fish. For example, Queensland Boating and Fisheries Patrol offices are notified prior to carrying out surveys at boat ramps, popular shore-based fishing locations, competitions and seafood wholesalers. Notifications are detailed in the sampling protocols for each strategy (DPI&F 2007a, 2007b; Fisheries Queensland 2009a, 2009b, In Prep. a).

Stakeholders and the general public are kept informed of the survey through a variety of media resources including press releases, pamphlets, reports and web site information, as required in the Assessment and Monitoring Communication Strategies.

## Data access

All use of assessment and monitoring data is subject to a data agreement between the Department and the party requesting the data. The data agreement covers how data must be acknowledged in publications and other restrictions that may be placed on data use. If the publication is based substantially on LTMP data and on LTMP survey design then co-authorship may be requested or advised. All documents that utilise LTMP data must be sent to the Fisheries Data Coordinator as drafts for perusal before they are published. Copies of final documents utilising LTMP data must be provided to the Fisheries Data Coordinator free of charge for lodgement in the departmental library.

The Fisheries Data Coordinator is to be contacted for all applications:  
Telephone +61 7 3224 2175, Fax +61 7 3224 2805 or  
Email [FishDataCoordinator@dpi.qld.gov.au](mailto:FishDataCoordinator@dpi.qld.gov.au)

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- Fisheries Queensland (In Prep. b). Fisheries Long Term Monitoring Program Sampling Protocol – Rocky Reef Fish: (2010 onwards) Section 2. Department of Primary Industries and Fisheries, Brisbane, Australia.<sup>i</sup>
- Fisheries Queensland (In Prep. c). Fisheries Long Term Monitoring Program – Data Protocol Department of Employment, Economic Development and Innovation, Brisbane, Australia.

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<sup>i</sup> Section 2 of LTMP Sampling protocols can be obtained by contacting the Fisheries Data Coordinator: Telephone +61 7 3405 6822, Fax +61 7 3224 2805 or Email [FishDataCoordinator@dpi.qld.gov.au](mailto:FishDataCoordinator@dpi.qld.gov.au)