

# Annual status report 2008

## East Coast Bêche-de-mer Fishery



## Introduction

The Queensland East Coast Bêche-de-mer<sup>1</sup> fishery (ECBDM) is one of the oldest fisheries in the state, with commercial harvesting beginning in the early 1800s. Fishers can harvest all species of sea cucumber found in Queensland waters. However, the fishery has a history of focusing effort on the most commercially valuable species, such as black teatfish<sup>2</sup>, sandfish, white teatfish, and more recently, burrowing blackfish. Product harvested in the ECBDM is entirely exported, predominantly to China and other Asian nations for consumption and use in traditional Chinese medicines.

Through industry innovation and initiatives, the ECBDM fishery has grown to become one of the limited number of sustainably managed sea cucumber fisheries in the world.

This report covers the July 2007 to June 2008 financial year.

### Fishery profile 2007–08

**Commercial harvest:** approximately 317 t

**Recreational harvest:** no estimate but considered negligible

**Indigenous harvest:** no estimate but considered negligible

**Charter harvest:** nil

**Commercial Gross Value of Production (GVP):** approximately \$4.1 million<sup>3</sup>

**Number of licences:** 18 licences held by 3 operators

**Commercial fishing boats accessing the fishery:** seven

**Fishery season:** sea cucumber may be caught all year round

Source: Accessed DPI&F CFISH database 18 December 2008

## Description of the fishery

### Fishing methods

Commercial sea cucumber fishers are permitted to harvest by hand, using free-diving methods or with the aid of hookah apparatus or Self Contained Underwater Breathing Apparatus (SCUBA). Recreational fishers are permitted only to harvest by hand, without the aid of hookah apparatus or SCUBA.

### Fishing area

Commercial fishing under the B1 fishery symbol is authorised from Tin Can Bay (26°S) to Cape York (10°41'S) (Figure 1). Historically, effort has been focused on reef areas in northern Queensland between Townsville (19°30'S) and Cape York (10°41'S). Harvesting occurs to depths of about 30 m (a safe working depth for occupational diving), leaving much of the deeper Great

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<sup>1</sup> Bêche-de-mer (or trepang) is the term referring to the commercial product produced by processing (gutting, boiling and drying) the body of sea cucumbers or holothurians.

<sup>2</sup> The commercial Total Allowable Catch (TAC) for black teatfish remains at 0 t whilst stock sustainability remains a concern.

<sup>3</sup> GVP in 2007–08 was calculated using beach price. In previous reports it was calculated using the price of value-added product and therefore appear to be higher (\$6.5 million reported in 2006–07).

Barrier Reef (GBR) lagoon free of commercial harvesting. The ECBDM fishery is adjacent to the Commonwealth-managed Torres Strait Bêche-de-mer and Coral Sea Fisheries.

## Main management methods used

A series of input and output controls are used to manage the ECBDM fishery, including:

- Commercial Total Allowable Catch (TAC) of 380 tonnes (t) gutted wet weight. In 2007–08, the commercial TAC comprised 0 t of black teat fish, 64 t of white teat fish (divided into 51 t north of 19°S (Zone 1) and 13 t south of 19°S (Zone 2)) and 297 t of other species.
- Limited entry: 18 transferable licences.
- Species-specific minimum size limits<sup>4</sup> (sandfish 20 cm; white teatfish 40 cm; black teatfish 30 cm; prickly redfish 50 cm; blackfish 20 cm; deepwater redfish 20 cm; surf redfish 25 cm; lolly fish 20 cm; green fish 20 cm; curryfish 35 cm; elephant trunkfish 40 cm; brown sandfish 25 cm; leopard fish 35 cm; amberfish 50 cm; all other species 15 cm).
- Gear limitations: hand harvest only with a maximum of four<sup>5</sup> divers in the water fishing at any one time. Boat and dory limits also apply.
- Area closures: Great Barrier Reef Marine Park (GBRMP) implemented by Great Barrier Reef Marine Park Authority (GBRMPA) and Queensland State Marine Parks (GBR Coast Marine Park and Great Sandy Marine Park).<sup>6</sup>
- Rotational zoning scheme (RZS): Fishery is divided into 154 zones of approximately 100 to 150 square nautical miles (nm) that can be fished for a maximum of 15 days in any one year. Each area is allocated for fishing only one year in every three.<sup>7</sup>
- Recreational bag limit: no more than five in total (all species combined, other than black teatfish).<sup>8</sup>



Figure 1: Boundary of the Queensland East Coast Bêche-de-mer Fishery.

<sup>4</sup> Minimum size limits are at least 15% greater than the current best estimates of size at first maturity for each species.

<sup>5</sup> Whilst legislation states up to 10 divers may be fishing at any given time, a Memorandum of Understanding (MOU) drawn up by industry has further limited divers to four.

<sup>6</sup> Approximately 37% of commercially diveable sea cucumber habitat in the Great Barrier Reef Marine Park (GBRMP) is closed to fishing (Roelofs 2004).

<sup>7</sup> As per the MOU between sea cucumber industry operators.

<sup>8</sup> The recreational take of black teatfish is prohibited.

## Approximate allocation between sectors

The ECBDM fishery is predominantly a commercial fishery. The recreational take of sea cucumber is currently limited to an in-possession limit of five specimens (excluding black teatfish) from Queensland waters north of 20°S latitude and east of 143°E longitude. Recreational take of sea cucumber to the south and west of this defined area is prohibited.

There is no information available for recreational fishing levels of sea cucumber in Queensland. However, it is assumed to be negligible. No catches of sea cucumber have been reported through charter logbooks. There is also no estimate of the harvest of sea cucumber by Indigenous fishers for cultural purposes within the area of the fishery.

The take of sea cucumber by the recreational, charter and Indigenous sectors is considered to be negligible and will not be reported on further within this status report.

## Fishery accreditation under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

The ECBDMF was granted a second three-year Wildlife Trade Operation (WTO) approval under Part 13A of the EPBC Act on 19 December 2007. This accreditation acknowledges for the second time that the fishery is being managed in an ecologically sustainable manner and allows the export of sea cucumber caught on the east coast of Queensland. The approval expires on 20 December 2010.

## Catch statistics

### Commercial

The 2007–08 financial year is the fourth year of operation in this fishery following the introduction of the RZS.

The total fishery harvest (kg) for the 2007–08 financial year was approximately 12% higher than in 2006–07 (Figure 2). Burrowing blackfish represented the majority of the total catch weight (approximately 66%), followed by white teatfish (approximately 19%) and blackfish (approximately 6%) (Figure 3). These patterns in reported species composition of commercial catch mirror those reported for 2006–07.

The Department of Primary Industries and Fisheries (DPI&F) and the sea cucumber industry are monitoring the harvest of burrowing blackfish through the introduction of improved reporting for the species in logbooks and prior reports.

Approximately 33% more white teatfish individuals were caught in the 2007–08 quota year compared with the 2006–07 quota year. Despite variability in catch over the past four years, the annual catch per unit effort (CPUE)<sup>9</sup> for white teatfish has remained relatively stable. This trend

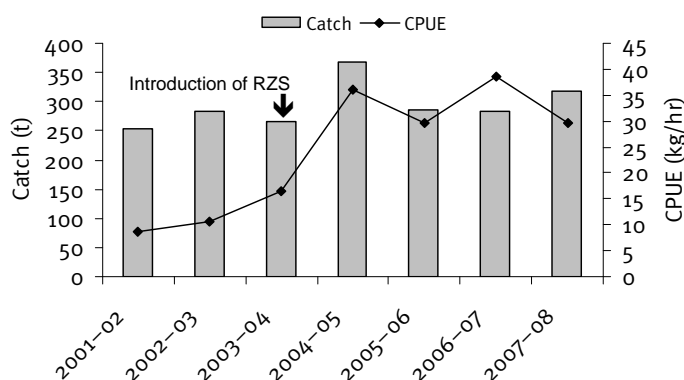


Figure 2: Total catch (kg) and CPUE (kg/hour) for the ECBDM fishery from 2001–02 to 2007–08 financial years (Source: DPI&F CFISH database 18 December 2008).

<sup>9</sup> Where fisher hours were not reported, an average of previous fishing hours by licence was calculated.

suggests that there is no evidence to warrant sustainability concerns for white teatfish (Figure 4).

In the 2007–08 quota year there was a significant decrease (approximately 99%) in reported sandfish catch (Figure 5)<sup>10</sup>. The decrease is likely to have resulted from increases in reported brown sandfish and golden sandfish catch (Figure 5).

Between 2006–07 and 2007–08, reported brown sandfish harvest increased from no harvest to 7.8 t. During this period reported golden sandfish harvest also increased from 6 t to approximately 7 t. These apparent increases in reported harvest are likely to be a result of improved species resolution.

All other sea cucumber species were incidentally collected in the reporting year and are considered to be by-product in this fishery.

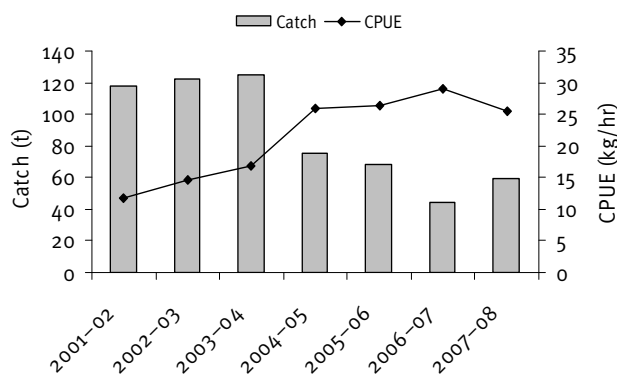


Figure 4: Total catch (kg) and CPUE (kg/hr) of white teatfish in the ECBDM fishery from 2001–02 to 2007–08 financial years (Source: DPI&F CFISH database 18 December 2008).

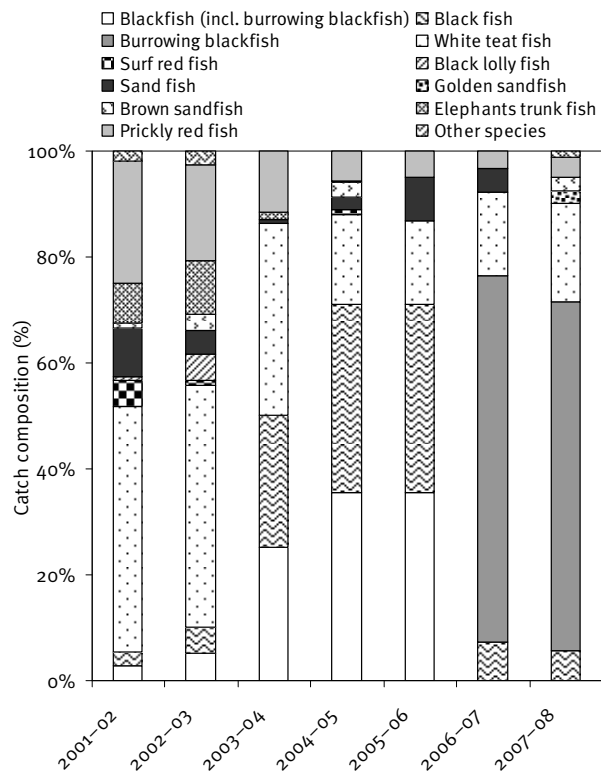


Figure 3: Species contribution to total catch weight for the ECBDM fishery from 2001–02 to 2007–08 financial years (Source: DPI&F CFISH database 18 December 2008).

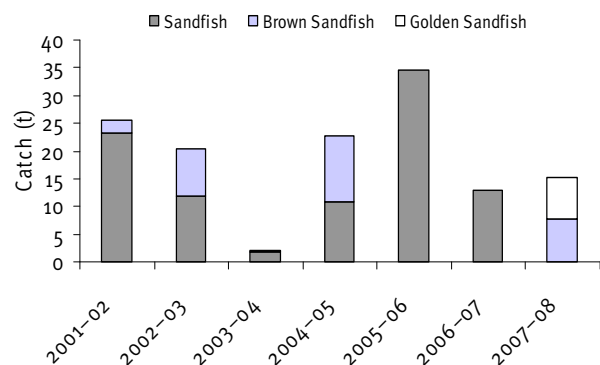


Figure 5: Total catch (kg) of sandfish species in the ECBDM fishery from 2001–02 to 2007–08 financial years (Source: DPI&F CFISH database 18 December 2008).

<sup>10</sup> Historical sandfish figures reported in previous annual status reports have over-estimated harvest in 2002–03 to 2005–06 financial years due to problems with extraction of data from DPI&F databases. DPI&F have now addressed the issue. Corrected historical estimates of sandfish catch have been reported in this annual status report. Total BDM catch has been correctly reported in all previous annual status reports.

## Spatial issues/trends

DPI&F are investigating the use of finer-scale spatial information to ensure that the status and performance of the fishery can be adequately reviewed (e.g. assessing the effectiveness of the RZS fishing strategy at minimising local-scale depletions).

The voluntary RZS is part of an industry Memorandum of Understanding designed to distribute effort across the fishery area in order to mitigate the risk of localised depletion which is commonly associated with hand collection fisheries. The RZS is an innovative industry led initiative that demonstrates the commitment of operators to the long-term sustainability of the fishery.

Of the 154 available RZS zones, four were nominated for blackfish harvest and 52 were nominated for the harvest of other species in the 2007–08 quota year. Figure 6 demonstrates the locations of the nominated zones along the Queensland coast. For species other than blackfish, operators were limited to 15 days in any one nominated zone, whereas there were no limits on effort in the blackfish zones.

## Socio-economic characteristics and trends

The GVP of the ECBDM fishery has risen from approximately \$3.4 million in 2006–07, to approximately \$4.1 million in 2007–08. It should be noted that in previous annual status reports the GVP was calculated using prices paid for value-added product and therefore appeared higher. However in this and future reports GVP calculations will be based on price paid to fishers at the first point of sale (i.e. “beach price”)<sup>11</sup>.

The prices for sea cucumber products (per processed kg) were slightly higher in the 2007–08 financial year with burrowing blackfish at approximately \$10–12.50/kg

(cooked frozen), sandfish varying between \$12–\$16/kg (wet salted), and white teatfish at \$20–\$25/kg (wet salted). The price paid depended on size and quality of handling. The increase in beach price was attributed mostly to a weakening of the Australian dollar relative to the US dollar prices paid by overseas importers.

On 1 July 2007, the Australian Quarantine and Inspection Service (AQIS) introduced an ‘Approved Arrangements System’ for sea cucumber fishers. The AQIS system allows for the accountability and traceability of all harvested sea cucumbers, including tracking of product form and operator identification. This allows the tracking of product back to the original

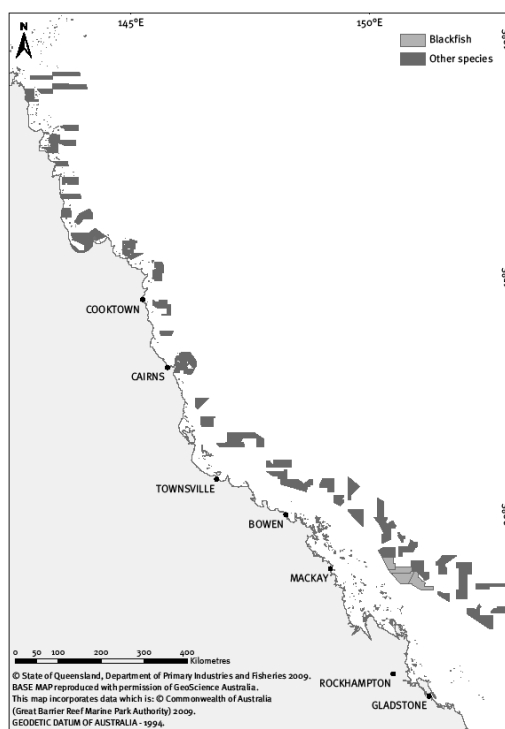


Figure 6: RZS zones nominated by industry for harvest of blackfish and ‘other species’ in 2007–08.

<sup>11</sup> The GVP 2006–07 and 2007–08 using the previous method would be approximately \$6.8 million and \$8.2 million respectively.

suppliers. The system is a formal arrangement, meaning that all stages of the supply chain from harvest through to export are auditable by the government.

## Fishery performance

### Appraisal of fishery in regard to sustainability

Commercial logbook data suggests that the harvest of sea cucumber is sustainable at current levels. Significant changes to the way the sea cucumber resources are harvested in the fishery following the introduction of the RZS in 2004 have greatly reduced the likelihood of localised and serial depletions occurring (Lowden 2005; Roelofs 2004). The range of input and output controls currently implemented (commercial TAC, size limits, closures) are precautionary approaches to management that have the capacity to protect the fishery from increases in effort. The fishery is regarded as being managed in a precautionary and sustainable manner by the Australian Government Department of the Environment, Water, Heritage and the Arts (DEWHA), as evidenced by the recent renewal of the fishery's WTO accreditation.

### Progress in implementing the Department of the Environment, Water, Heritage and the Arts (DEWHA) recommendations

DEWHA made a range of recommendations to DPI&F during its first assessment of the ECBDM fishery in December 2004. Final progress against each of the recommendations can be found online in DEWHA's assessment report at [www.environment.gov.au/coasts/fisheries/qld/east-coast-beche-de-mer/report-deco7.html](http://www.environment.gov.au/coasts/fisheries/qld/east-coast-beche-de-mer/report-deco7.html)

DEWHA made a range of recommendations to DPI&F during its second assessment of the ECBDM fishery in December 2007 in order to address any perceived risks or uncertainties. Details of the progress DPI&F has made in implementing each of these recommendations are provided in Table 1.

Table 1: Progress against Round 2 DEWHA conditions and recommendations for the fishery.

Recommendation	Progress
1. DPI&F to review the effectiveness of the RZS and provide a report to DEWHA on the species composition of the RZS zones.	<i>Not started</i>
2. DPI&F to incorporate additional performance measures, relating to the outcomes of resource assessments for key target species, into the PMS, with priority given to burrowing blackfish.	<i>Complete</i> Limit reference points related to outcomes of spatially explicit resource assessments of available biomass estimates have been incorporated into the PMS. These reference points will be measured against in the 2009 Annual Status Report.
3. DPI&F to identify as a priority and support research into the basic biology and recruitment of key target species, including burrowing blackfish, and the ecological impact of sea cucumber harvest in the ECBDMF.	<i>In progress</i> The development of a five year research and development plan for all diver based hand harvest fisheries is underway.

### Performance against fishery objectives

The draft Performance Measurement System (PMS) was endorsed by DPI&F's Deputy Director General on November 27 2008. It is available to the public through DPI&F's website [www.dpi.qld.gov.au](http://www.dpi.qld.gov.au). Performance of the ECBDM fishery will be measured against the PMS in the 2009 Annual Status Report.

## Resource concerns

The commercial harvest of black teatfish was stopped in 1999 following concerns over sustainability of the stock. Research suggested that there had been little to no recovery by 2001 after conducting surveys to assess the recovery of over-fished black teatfish stocks on the Great Barrier Reef (Benzie and Uthicke 2003). The commercial TAC will remain at 0 t while there is no conclusive evidence that the resource has recovered to a sustainable level.

A performance measure has been developed that aims to recover stocks of sea cucumber species that are currently considered to be below sustainable levels, to a level where a sustainable harvest may be determined. The measure requires that a fishery independent assessment be conducted to determine the level of available biomass for each species that is considered to be below sustainable levels. The level will be used to determine whether the fishery for a species can re-open. Any survey designed to provide species-specific available biomass levels will require significant industry support or funding through external agencies.

## Ecosystem

### Non-retained species/bycatch

Harvest of sea cucumber in the ECBDM fishery is by hand collection, a highly selective method of fishing that only collects individuals specifically chosen for harvest. Bycatch is restricted to releasing undersize specimens of the target species immediately at the collection site.

The post-release mortality of discarded sea cucumbers has not been assessed, but is expected to be low. Minimum size limits and the preference of operators to select the most marketable-sized animals during collection suggest that minimal discarding would occur.

### Interactions with protected species

No interactions with protected species have been reported by fishers in the ECBDMF in 2007–08.

### Fishery impacts on the ecosystem

Hand collection methods employed in the ECBDMF have virtually no detrimental effect on the environment.

Limited available research suggests that sea cucumbers are an important component in the natural nutrient recycling pathways of benthic environments (Roelofs 2004). Preliminary findings of a joint project being undertaken by CSIRO/Institute for Biodiversity Research (Germany) have found that the removal of *Holothuria scabra* (sandfish) in Moreton Bay may have an effect on the ecology of shallow water, subtropical seagrass ecosystems. These results are preliminary and require ongoing repeated experiments before drawing any conclusions regarding the impact of harvesting sea cucumber species on seagrass and coral reef associated ecosystems (Wolkenhauer *et al.* 2005).

### Other ecosystem impacts

The ECBDMF operates within the boundaries of the Great Barrier Reef Marine Park which is managed by the Great Barrier Reef Marine Park Authority (GBRMPA). Water quality, marine fauna and flora, and the physical environment is closely monitored by the GBRMPA through its



involvement in a suite of local, state and Commonwealth community and scientific monitoring programs.

## Research and monitoring

### Recent research and implications

A recent study on the ecological role of the commercially important sea cucumber *Holothuria scabra* in Moreton Bay was completed in 2005. Results indicated that sandfish have a distinct diurnal burying and feeding cycle, with periods of burying increased with decreasing temperature. Knowing when and how long sandfish bury and are not visible is crucial for population surveys conducted for conservation and fishery research on this species (Wolkenhauer *et al.* 2005). Sandfish were also shown to play a role in recycling inorganic nutrients within sub-tropical seagrass beds (Wolkenhauer *et al.* submitted 2008).

This research will provide useful information on the biology and ecosystem functions of holothurians, as well as an increased knowledge of the environmental impacts associated with the removal of holothurians from associated food webs. Results from this research combined with previous CSIRO relative abundance studies will better inform managers of the potential ecosystem impacts of this fishery.

### Monitoring programs and results

The ECBDMF is monitored using catch and effort data collected through the DPI&F compulsory logbook program (see Catch statistics section). There have been no updates to monitoring programs or results since the 2007 annual status report.

### Collaborative research

The ECBDMF operates in waters adjacent to the Coral Sea and the Torres Strait Fisheries, both under AFMA management.<sup>12</sup> There are currently no collaborative research projects being undertaken in these fisheries. An annual biomass assessment is conducted by CSIRO in the Torres Strait and results may be useful in enhancing knowledge of stock dynamics for the same species in the ECBDMF. Regular dialogue occurs between all management and research agencies to discuss issues common to all sea cucumber fisheries.

## Fishery management

### Compliance report

Compliance and enforcement in the ECBDM fishery are the responsibility of the Queensland Boating and Fishery Patrol (QBFP). In the 2007–08 quota year, 12 inspections were conducted in the Queensland East Coast Bêche-de-mer fishery

Table 2: Offences recorded in the ECBDMF (2007–08).

Offence	FIN	Caution
Failed to produce a document required to be available for immediate inspection	1	-
Boat mark not placed as required	1	-
Contravened a condition of an authority (prior notice condition)	-	1
<b>TOTAL</b>	<b>2</b>	<b>1</b>

<sup>12</sup> The Torres Strait Fisheries are jointly managed by DPI&F and AFMA.

(11 commercial vessels, one marketer premise), with three offences detected (Table 2). The offences resulted in two Fisheries Infringement Notices (FINs) and one caution.

A compliance risk assessment was conducted for the ECBDM fishery in June 2005 in order to determine compliance priorities and allow the most effective use of QBFP resources. The risk assessment identified exceeding the annual quota; failure to comply with the VMS and manual reporting conditions; and failure to provide buyers return within the required period, as the highest priorities for enforcement and compliance in the Fishery. There were also a number of activities rated as having a moderate risk, which are also being addressed.

## **Changes to management arrangements in the reporting year**

DPI&F implemented an agreed change with industry that involved stating quota as weights in landed form (salted/frozen boiled) rather than wet gutted form. This resulted from an assessment of the relevance of a quota stated in wet gutted weight given the variability in the weight conversion during processing, both between species and between operators using different processing techniques. A quota stated in landed form was considered more appropriate and meaningful. License conditions were amended to reflect this change. As a result the Total Allowable Catch changed from 380 t to 361 t based on an agreed weight conversion.

License conditions were also amended to reduce the quota of white teatfish (both northern and southern zones) and reallocate that amount of quota to other species. Catches of other species are monitored against conservative catch review points for each species, which are applied under the industry MOU and now the DPI&F's performance measurement system. The sum of review points for all other species remains higher than the TAC for other species combined.

## **Consultation/communication/education**

Promotion of regulations applying to commercial, recreational and Indigenous fishers is an ongoing role of DPI&F. This is achieved through:

- recreational fishing brochures containing size and possession limit information
- distribution of the 'Fish' newsletter and the 'FishFlash' e-newsletter.

Consultation also occurs through Harvest MAC, with meetings generally held twice a year. Harvest MAC provides an opportunity for stakeholders to review and advise DPI&F on management measures for the ECBDMF.

A Bêche-de-mer Working Group and a Harvest Scientific Advisory Group (SAG) also review issues relating to the fishery. The Working Group and Harvest SAG provide advice to Harvest MAC members on management actions required to ensure the fishery continues to operate within sustainable levels.

## **Complementary management**

The ECBDM fishery is managed by DPI&F in consultation with GBRMPA (permits are issued by GBRMPA for this fishery).

## References

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### Information compiled by

Bronwyn Fargher

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### Front cover image

Sandfish (*Holothuria scabra*)

