Annual status report 2008

East Coast Trawl Fishery

Queensland Government
Department of **Primary Industries and Fisheries**

The Department of Primary Industries and Fisheries (DPI&F) seeks to maximise the economic potential of Queensland's primary industries on a sustainable basis.

Introduction

The Queensland East Coast Otter Trawl Fishery (ECOTF)[1] targets prawns, scallops, bugs and squid. Various by-product species are also retained by the fleet. The ECOTF is the largest fishery in Queensland, both in terms of the volume of product caught and economic value of the product.

The Queensland Fisheries (East Coast Trawl) Management Plan 1999 (Qld) (the Trawl Plan) was introduced in 1999 and amended in 2000. During the transition period for management arrangements, significant changes occurred to fishing operations, 2001 is therefore considered to be the first typical effort year in the post-Trawl Plan period. It is also the historical limit for comparative analysis between years in this report. Data for the years prior to introduction of the Trawl Plan can be found in previous fisheries Annual Status Reports.[2]

This report covers the status of the ECOTF during the 2007 calendar year.

Fishery profile 2007

Total harvest from commercial sectors: 6553 t (trawl caught species)

Principal species otter trawl harvest: 5587 t (4192 t prawns, 920 t scallops, 417 t bugs, and 58 t squid)

Permitted species otter trawl harvest: 276 t (111 t Balmain bugs, 61 t blue swimmer crabs, 18 t red spot crabs, 25 t cuttlefish, 10 t octopus, 18 t barking crayfish, 5 t pinkies, 2 t mantis shrimp, 0.35 t pipefish)

Principal species beam trawl harvest: 366 t (364 t prawn, 2 t squid and bug)

Permitted species beam trawl harvest: <1 t blue swimmer crab and cuttlefish

Commercial non-trawl harvest: 690 t blue swimmer crab, 9 t red spot crab, 6 t banana prawn, 6 t squid

Recreational harvest 2005 (non-trawl): 200 t of banana prawns, 140 t of blue swimmer crabs and 50 t of squid

Indigenous harvest (non-trawl): uncertain but considered negligible[3]

Charter harvest (non-trawl): nil

Commercial Gross Value of Production (GVP): approximately $76 million

Number of otter trawl licences: 481 as at June 2007 (38 restricted to Moreton Bay)

Commercial boats accessing ECOTF: 373 boats in 2007 (77 boats in Moreton Bay)

Effort in the fishery: 39 811 otter trawl nights in 2007 (5363 nights in Moreton Bay)

Fishery season: 1 January–31 December

*Harvest tonnages are the best available estimate based on fisher logbooks

[1] For the purpose of this report, references to the ECOTF include the Moreton Bay Trawl Fishery (MBTF).
[2] Available online at: www.dpi.qld.gov.au/fishweb
[3] Statewide indigenous harvest estimates are not available for species harvested by beam trawl.

Description of the fishery

Fishing methods

East Coast Otter Trawl Fishery

Demersal otter trawling is used to harvest prawns, scallops, bugs, squid, and several by-product species in the ECTF. Variations to the standard prawn trawl are allowed under the Trawl Plan. For example, heavier net and ground gear is permitted when targeting scallops to reduce shell cuts; and to account for the larger size of scallops compared to prawns.

Triple and quad net arrangements (three or four towed nets) (Figure 1) are frequently used in the fishery depending on the species targeted, fishing conditions and length of the net allowed under the Trawl Plan. Headrope height varies according to target species, as does the detailed configuration of nets.

Queensland east cost otter trawlers have traditionally used flat, rectangular 'otter' boards to spread their nets, but there is an increasing tendency to use more streamlined and smaller boards. While holders of 'T1' licences[4] are also able to use a beam trawl, no 'T1' licence holder has reported using a beam trawl as their main fishing gear.[5]

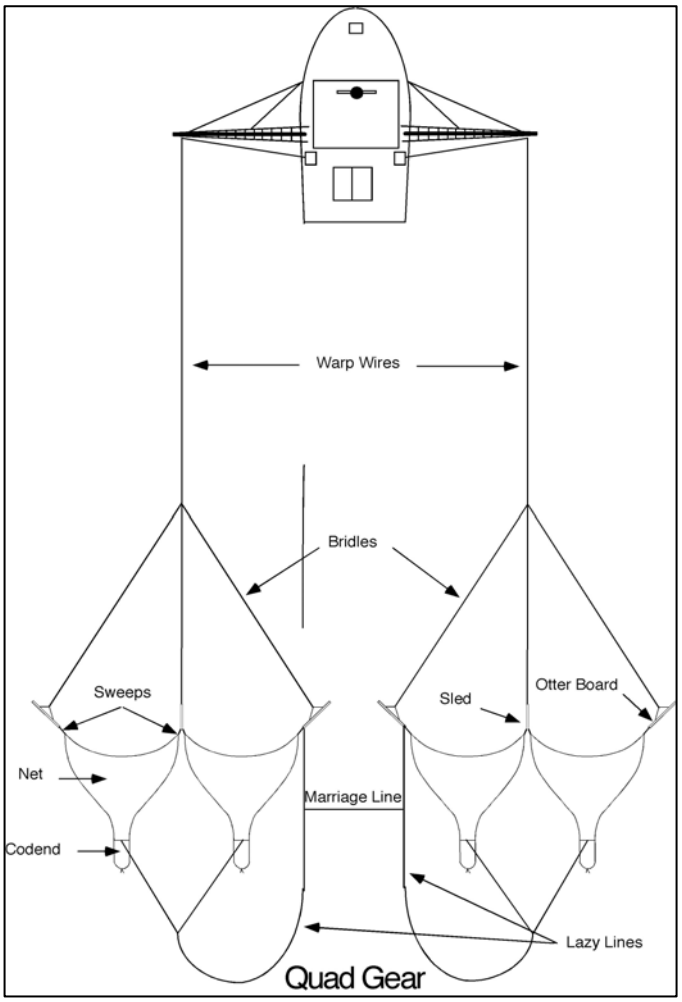


Figure 1: Quad otter trawl gear used in the ECOTF.

Fishing area

The ECOTF covers all tidal waters (excluding estuaries) east of longitude 142°31.89'E out to the East Coast Offshore Constitutional Settlement (OCS) Boundary[6] between Cape York and the Queensland/New South Wales (NSW) border (Figure 2).

The type of fishery symbol attached to a commercial fishing licence dictates the area that can be fished:

- Licence holders with a 'T1' fishery symbol can operate in the whole area excluding closed waters, estuaries and Moreton Bay.
- Licence holders with a 'T2' fishery symbol are only permitted to operate south of the Great Barrier Reef World Heritage Area (GBRWHA).

[4] 'T1' licences allow trawling in areas open to trawling along the whole east coast excluding Moreton Bay; 'T2' licences allow otter trawling south of the GBRWHA; 'M1' licences allow otter trawling in the 'T1' area and in Moreton Bay; 'M2' licences allow otter trawling in Moreton Bay only.

[5] The small 'try-net' used to locate commercial quantities of product is commonly a beam trawl.

[6] The OCS agreement between the Commonwealth and Queensland governments extends management of fisheries resources under Queensland legislation seaward of state waters to the 400 m isobath.

- Licence holders with a 'M1' fishery symbol are permitted to otter trawl in the 'T1' area and in Moreton Bay during weekdays provided the vessel is not greater than 14 m in length.
- Licence holders with a 'M2' fishery symbol are permitted to otter trawl only in Moreton Bay during weekdays provided their vessel is not greater than 14 m in length. Licence holders are not limited by the number of nights they can fish, as is the case with the other fishery symbols.

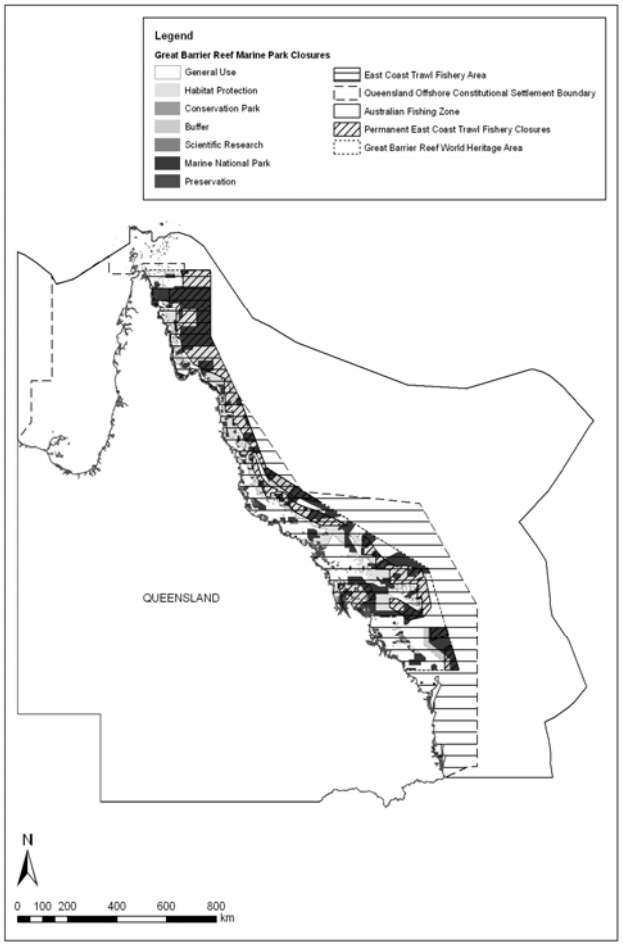


Figure 2: Fishing area of the ECOTF. Note: 66% of the GBRMP is closed to trawling.

Main management methods used

The Trawl Plan

The Trawl Plan provides the management regime for the ECTF.

The Trawl Plan lists principal species that may be targeted using trawl fishing gear and by-product (permitted) species that are captured incidentally during trawling. Permitted species may be retained subject to in-possession limits based on size, quantity, gender and other criteria depending on the species.

Management Methods

The fishery is managed by a range of input (effort) and output (harvest) controls directed at ensuring the ecologically sustainable harvest of target and by-product species whilst minimising the impacts on bycatch and the environment. These include:

- Limited entry: restrictions in the number and size of boats which can operate in the fishery.
- Quota management: Licence holders are allocated only a certain number of nights they can fish each year in the form of tradeable effort units.
- Effort capped at the 1996 level less 5%.
- Gear restrictions: vessel length, net head rope length and mesh restrictions apply depending on the areas of operation.
- Numerous and extensive permanent area closures apply to the fishery, particularly in waters of the GBRWHA, Woongarra, Hervey Bay and Moreton Bay Marine Parks.
- Seasonal closures: in place during summer and autumn north of 22°S latitude and during spring and summer south of this latitude.
- Daytime and weekend closures: apply to trawling in estuaries and some inshore areas (e.g. Moreton Bay) to reduce any interactions with recreational users.
- Mandatory use of turtle exclusion devices (TEDs) and bycatch reduction devices (BRDs).[7]
- A range of by-product harvesting protection arrangements (Table 1).

[7] TED and Square Mesh Cod End definitions under the Trawl Plan are under review

- Logbooks, surveillance by fisheries enforcement officers (the Queensland Boating and Fishing Patrol) and remote tracking of otter trawl vessel movements are used to monitor effort and compliance of fishing operations.

Table 1: Output controls on permitted species harvested in the East Coast Trawl Fishery.

Species	Harvest Regulations[8]	Desired Outcomes
Blue swimmer (BS) & red spot (RS) crabs	1. Total ban on damage or separation of carapace from the body 2. Minimum legal carapace width (BS– 11.5 cm; RS–10 cm) 3. Total ban on taking female BS crabs and egg-bearing RS crabs 4. In possession limit (BS– Moreton Bay– 100; 500 for each seven continuous fishing day period in waters outside Moreton Bay)	1. Protect undersized bugs 2. Protect spawners 3. Enhance egg production 4. Limits total harvest and targeting 5. Industry viability
Barking crayfish	Total ban on harvesting egg bearing females.	Enhance egg production
Mantis shrimp	In possession limit (max. 0.0153m^3 if frozen, 15 l if not frozen) in Moreton Bay	Limits total harvest
Balmain bugs	1. Total ban on damage or separation of carapace from the body 2. Total ban possession of bug-meat 3. Minimum legal carapace width (10 cm)[9] 4. Total ban on harvesting egg bearing females 5. Total ban on removal of eggs from berried females	1. Protect undersized bugs 2. Protect spawners 3. Enhance egg production
Octopus	In possession limits (max. 0.0612 m^3 if frozen, 66 l if not frozen) for each seven continuous fishing day period in waters outside Moreton Bay	1. Limits harvest & targeting 2. Industry viability
Slipper lobster	1. Total ban on harvesting egg bearing females 2. In possession limit (Max. 20) for each seven continuous fishing day period in waters outside Moreton Bay	Industry viability
Pipefish	Trip limit of 50 individuals in total	Limits harvest & targeting

Approximate allocation between sectors

The ECOTF is a commercial fishery. The majority of species are taken most effectively with trawl gear. Trawl species which are caught commercially using alternative fishing methods include: blue swimmer crabs, red spot crabs, squid and. banana prawns. The estimated take of these species by non-trawl commercial fisheries in 2007 was 690 t, 9 t, 6 t and 6 t respectively, which corresponds to 1100%, 50%, 10% and 2% of the commercial take by otter trawlers.

[8] Harvest regulations for blue swimmer crabs, Balmain bugs and octopus have been amended under Schedule 2 of the Fisheries Regulation 2008.

[9] Minimum Legal Sizes for Balmain bug species are under review.

Recreational fishers also harvest banana prawns, blue swimmer crabs and squid using gear other than trawl gear. The estimated take of these species by recreational fishers in 2005 (the most recent recreational survey) was 200 t, 140 t, and 50 t respectively, which corresponds to about 82%, 230% and 86% of the commercial take by otter trawlers in 2007.

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

The ECOTF was granted a Wildlife Trade Operation (WTO) approval on 18 November 2004 under Part 13A of the EPBC Act. The approval expired on 1 December 2007 and new approvals for this fishery are in place until 29 November 2010. This approval acknowledges that the ECOTF is being managed in an ecologically sustainable manner and allows the export of the catch. The WTO approval covers the following operations:

- Harvesting specimens of species other than those species listed under Part 13A of the EPBC Act taken in the ECOTF, as defined in the management regime for the fishery made under the Fisheries Regulation 2008 (Qld) and the Trawl Plan in force under the *Fisheries Act 1994* (Qld)
- For the incidental harvesting of pipefish (*Solegnathus hardwickii and Solegnathus dunckeri*) taken in the ECOTF, as defined in the management regime for the fishery.

Catch statistics

Otter trawling

Principal species

Annual catch statistics for the principal species harvested by otter trawlers in the ECTF are reported in Table 2.

Table 2: Annual catch (tonnes) of principal fish species (otter trawl).

	2001	2002	2003	2004	2005	2006	2007
Prawns	6153	7017	7402	7392	6129	5666	4192
Scallops	992	560	436	673	735	530	920
Bugs	317	476	476	486	467	474	417
Squid	117	126	139	157	186	90	58

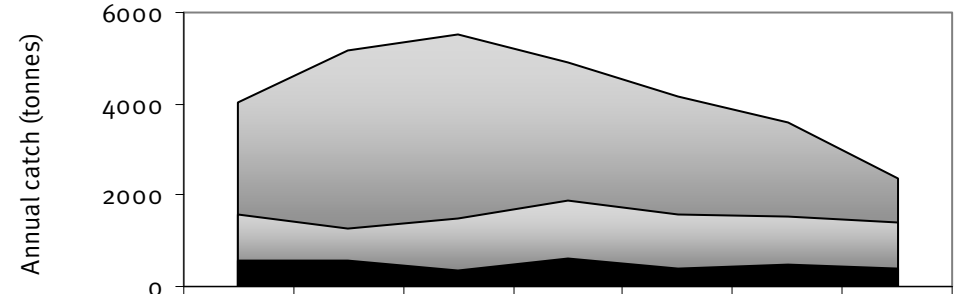
Following introduction of the Trawl Plan in 1999 and its amendments in 2000, annual prawn catches increased until 2003. Since 2004, prawn catches have declined by 43% (Table 2). This is likely to be a result of effort reduction due to the Department of the Environment, Water, Heritage and the Arts (DEWHA) buy-back under the Structural Adjustment Package, increased fuel prices, competition with lower priced imported prawns and additional trawl closures through the Great Barrier Reef Marine Park (GBRMP) Representative Areas Program (RAP) rezoning process.

From 2001 to 2006 the annual harvest of scallops varied but in 2007 returned to levels comparable to 2001. From 2002 to 2006 the annual harvest of bugs remained relatively stable but in 2007 was 86% of the 2006 harvest. Squid harvest, increased steadily from 2001 to 2005, before in 2006 declining by half the 2005 catch. The 2007 squid harvest declined further to 64% of the 2006 harvest. Since 2005 squid landings have declined by 70%.

Prawns

Total prawn landings comprise approximately 35% eastern kings, 25% tigers, 15% endeavours, and 10% each of red spot kings, banana and bay prawns. Five percent of prawn landings are reported under other catch categories.[10]

Annual regional prawn catches have decreased in the GBRMP but vary between years in Moreton Bay in since 2001 (Figure 3). Following an increase in catch by 25% between 2003 and 2004, the annual catches on the East Coast outside Moreton Bay and south of the GBRMP (i.e. between the GBRMP and the Queensland—New South Wales border) have returned to near 2003 levels.

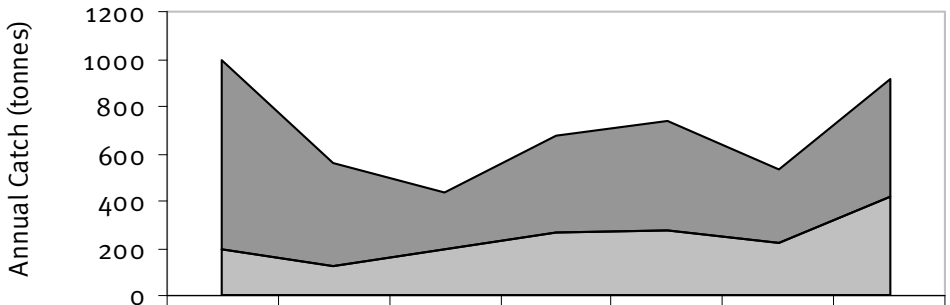


	2001	2002	2003	2004	2005	2006	2007
GBRMP	4016	5172	5534	4899	4180	3612	2379
East Coast	1578	1275	1503	1879	1575	1552	1421
Moreton Bay	560	570	365	614	375	502	392

Figure 3: Annual reported catch of all prawns by region 2001–07 (Source: QPIF CFISH database, 10 November 2008).

Scallops

During 2001–07, annual scallop catches decreased in the GBRMP but have increased in the east coast fishing area (Figure 4). Scallop catches in Moreton Bay were negligible over this period.



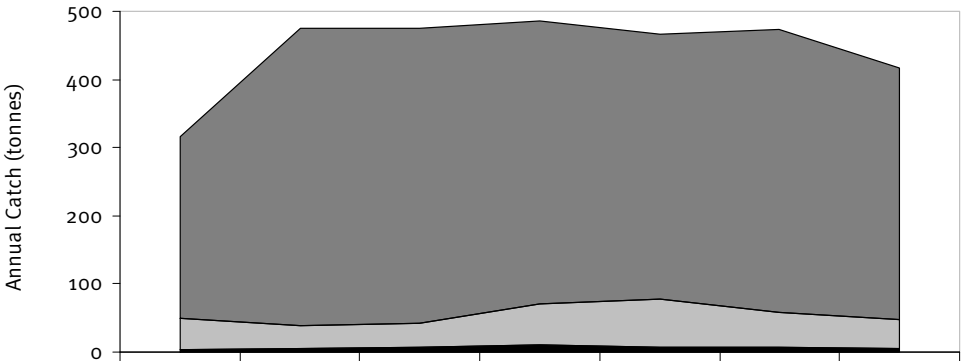
	2001	2002	2003	2004	2005	2006	2007
GBRMP	795	434	244	402	455	304	504
EC	197	126	192	271	277	223	413
MB	0		0	0	3	3	3

Figure 4: Annual reported catch of scallops by region 2001–07 (Source: QPIF CFISH database, 10 November 2008).

[10] Department of Primary Industries and Fisheries, 2003, Coastal Habitat Resources Information System (CHRIS), available: www.chrisweb.dpi.qld.gov.au/chris.

Moreton Bay Bugs

The majority of Moreton Bay bug (*Thenus*) catches are reported from within the GBRMP where annual catches have remained steady from 2002-06, before declining slightly in 2007 (Figure 5). Annual bug catches in the east coast fishing area are variable. Bug catches in Moreton Bay have been maintained at a low level during 2001–07.

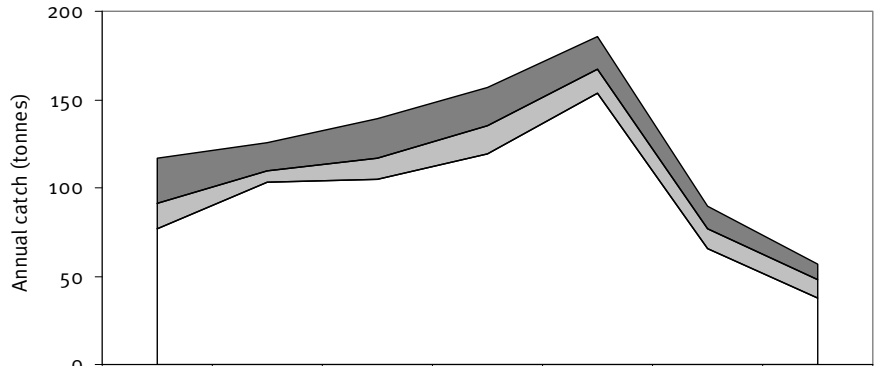


	2001	2002	2003	2004	2005	2006	2007
GBRMP	268	438	433	415	390	415	369
EC	46	33	36	60	70	52	43
MB	3	5	7	11	7	7	5

Figure 5: Annual reported catch of bugs by region 2001–07 (Source: QPIF CFISH database, 10 November 2008).

Squid

Squid catches are predominantly reported from within Moreton Bay. Moreton Bay catches increased steadily from 2001 to 2005, but declined to less than half the 2005 catch in 2006. In 2007 the Moreton Bay squid catch declined further to 60% of the 2006 catch. During 2001–07 the GBRMP squid catches declined by 65%, while the east coast squid catch has been variable (Figure 6).



	2001	2002	2003	2004	2005	2006	2007
GBRMP	26	16	22	22	19	13	9
EC	14	7	12	16	13	11	10
MB	77	103	105	119	154	66	38

Figure 6: Annual reported catch of squid by region 2001–07 (Source: QPIF CFISH database, 10 November 2008).

Annual changes in catch per unit effort[11] (CPUE)

Since 2003 otter trawl CPUE for prawns has varied only slightly between years., Scallop CPUE has also varied sightly between years until 2007 when CPUE increased above the 2006 CPUE by 80%.CPUE for bugs continues a steady increase while squid CPUE has declined since 2005 (Figure 7).

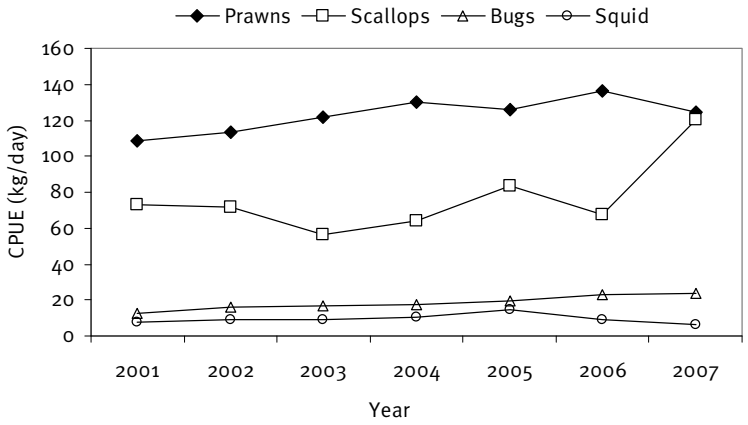


Figure 7: Average annual CPUE trends 2001–07 (Source: QPIF CFISH database, 10 November 2008).

Permitted species

Any trends in catches of permitted species are difficult to interpret since the introduction of in-possession limits which were introduced in 2000.

Reported Balmain bug catches increased from 2001 to 2006 before declining by 20% in 2007 (Table 3). The blue swimmer crab catch is steady at the 2006 level. The commercial pot catch also remains steady at about 700 t. The most recent recreational catch estimate was 140 t ± 20 t in 2005 (McInnes, 2008).

The red spot crab catch is declining, but remains within the range of catch levels for this species since 2001 (Table 3). Cuttlefish catches have stabilised at lower levels since 2005, while octopus catches are their lowest in the post-Trawl Plan period. Barking crayfish catches are twice the 2006 catch. Since 2001 the annual catch of pinkies (threadfin bream) and mantis shrimp have been maintained at low levels while the syngnathid catch declined in 2006 and again in 2007.

Table 3: Annual reported catch (tonnes) of permitted species (otter trawl) 2001–06 (Source: QPIF CFISH database, 10 November 2008).

Species Group	2001	2002	2003	2004	2005	2006	2007
Balmain bugs	63	56	94	116	119	140	111
Blue swimmer crabs	145	95	87	107	76	59	61
Red spot crabs	17	29	22	38	27	22	18
Cuttlefish	62	33	37	32	26	21	25
Species	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Octopus	29	22	13	13	14	15	10

[11] For the purposes of this report, otter trawl effort was calculated including only days when catch was reported for each target species.

Barking crayfish	50	15	30	37	10	9	18
Pinkies	12	8	10	6	10	8	5
Mantis shrimp	3	3	2	2	2	2	2
Syngnathids*	8310	5863	10551	8189	8678	7296	5634

* Syngnathids (pipehorses) are reported as number of individuals retained.

Fishing Effort

Historical annual fishing effort statistics for otter trawling in the ECOTF are reported in Figure 8. Since the Trawl Plan was implemented in 1999, actual fishing effort has reduced by 40%. The number of licences active in the fishery has decreased by 35% over the same period.

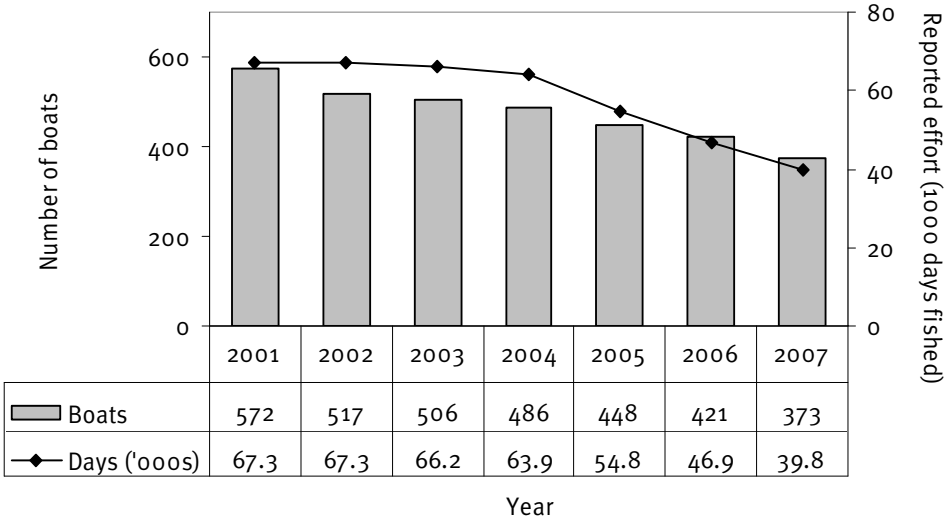


Figure 8: Annual number of reported otter trawl days fished and number of reporting licences in the ECOTF 2001–07 (Source: QPIF CFISH database, 10 November 2008).

Effort in 2007 was the lowest on record and continues a trend in declining effort in the ECOTF and a 40% reduction in the number effort units used since adjusted effort unit allocation in the fishery prior to 2004 (Figure 9). The number of licences also continues to decrease. Since 2001, there has been a 28% decline in the number of licences in the ECOTF. As of 30 June 2007, there were 480 licences active (Table 4).[12]

[12] Thirty-eight of these were Moreton Bay only ('M2') otter trawlers

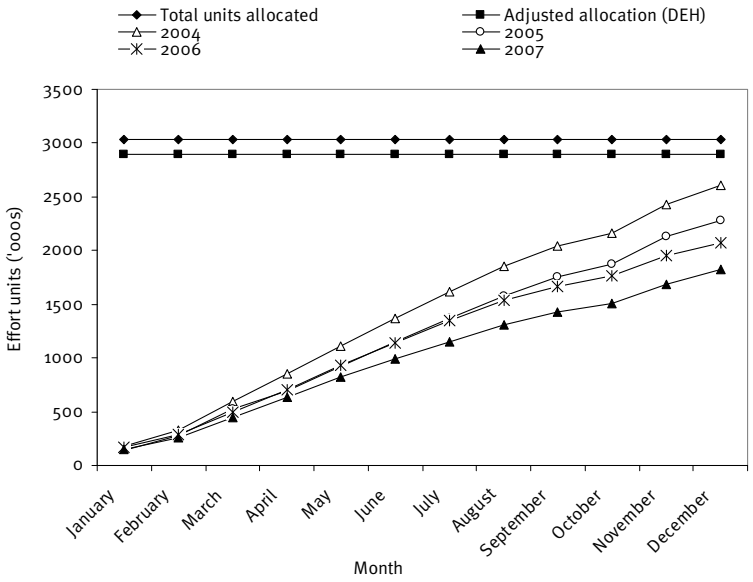


Figure 9: Cumulative monthly use of fishing effort units in the ECOTF 2004–07 (Source: QPIF CFISH database, 3 August 2009).

Table 4: Number of otter trawl licences (T1/T2/M1/M2) (Source: QPIF CFISH database, 30 June 2007).

Year	2001	2002	2003	2004	2005	2006	2007
Licences	665	578	535	511	501	498	480

From 2002 to 2006, trawling effort in the GBRWHA declined significantly (Figure 10). The trigger point for effort in the GBRWHA has been adjusted downward following the allocation of effort units in 2001 and was held at 2003 levels in view of the continuing steady decline in effort.

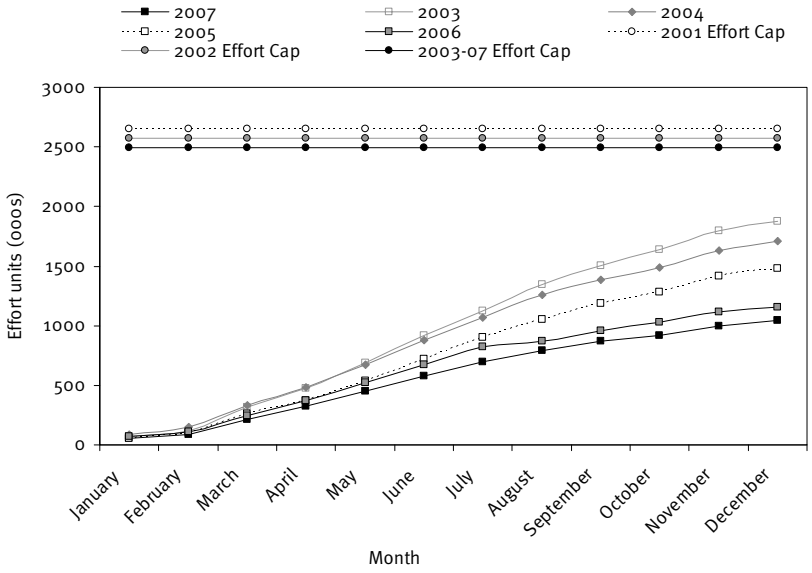


Figure 10: Cumulative monthly use of fishing effort units in the GBRWHA 2002–07 (Source: QPIF CFISH database, 3 August 2009).

Effort in the GBRWHA was 58% below the effort cap (Table 5). This was consistent with overall low effort unit usage observed for the ECOTF, and continues a five-year trend in declining effort. The current GBRWHA effort cap of 2 492 303 effort units will be revised downward with a progressive lowering of the effort cap proposed for 2009-11. From 2009 an annually reducing effort cap will be introduced through legislative amendment.

Table 5: Percentage of effort below the GBRWHA effort cap (Source: QPIF CFISH database, 3 August 2009).

2001	2002	2003	2004	2005	2006	2007
28	22	25	31	40	54	58

Spatial issues / trends

The GBRMP Authority (GBRMPA) introduced a new zoning plan for the Great Barrier Reef on 1 July 2004 following the RAP, which increased the extent of closures to all forms of commercial fishing from 4% to 33% (Fernandez *et al.* 2005). This has effectively displaced only a minor part of the effort from areas that were closed under rezoning into areas that remain open to trawling (Coles *et al.* 2008). The majority of the higher effort areas open to trawling are highly productive in terms of retained species (e.g. prawns, scallops and bugs). Maintaining access to these areas will be critical to the continued viability of the fishery into the future.

Socio-economic characteristics and trends

The Gross Value of Production (GVP) for the 2007 fishing season declined a further 15% from 2006 [13]and continues the recent trend of setting new lowest annual GVP records for the ECOTF (Figure 11). The observed reduction in GVP can be attributed to a number of factors, firstly to a large reduction in the amount of effort in the fishery over the last ten years. Operational costs of fishing have increased (i.e. high fuel prices and equipment), particularly since 2004, and the high availability of prawns on the international market as a result of aquaculture production has depressed the price of wild harvested prawns on domestic and international markets.

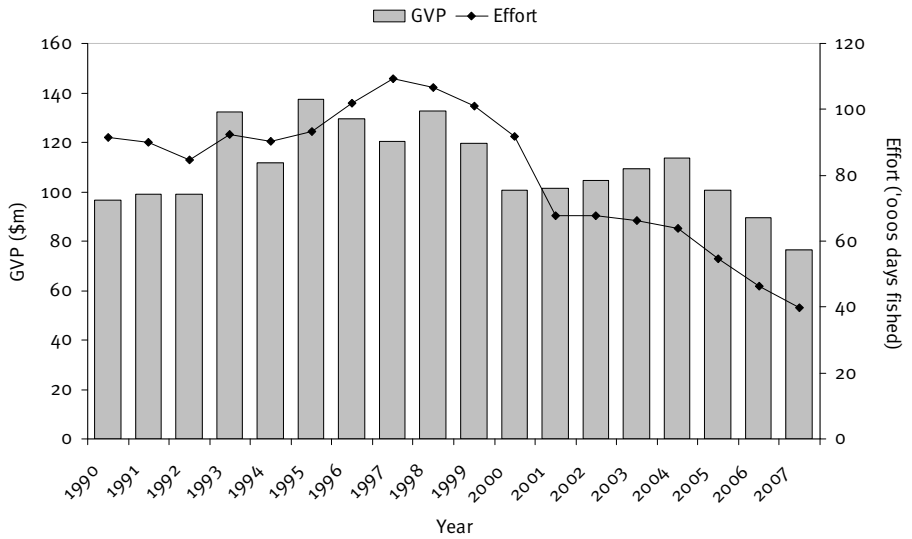


Figure 11: Annual GVP 1990–2007 (Source: QPIF CFISH database, 19 February 2009).

Figure 12 shows the income distribution for the ECOTF fleet in 2006 and 2007. Income in the ECOTF is sourced mostly from prawn catches. In 2007, there has been a slight increase in the percentage of boats with an income of less than $80 000 a year compared to 2006 and fewer boats producing incomes of between $80 000 and $250 000 a year. There is no clear shift in the percentage of boats producing incomes of between $250 000 a year and $800 000 a year.

[13] GVP declined by 12% from 2004-05 & 11% from 2005-06

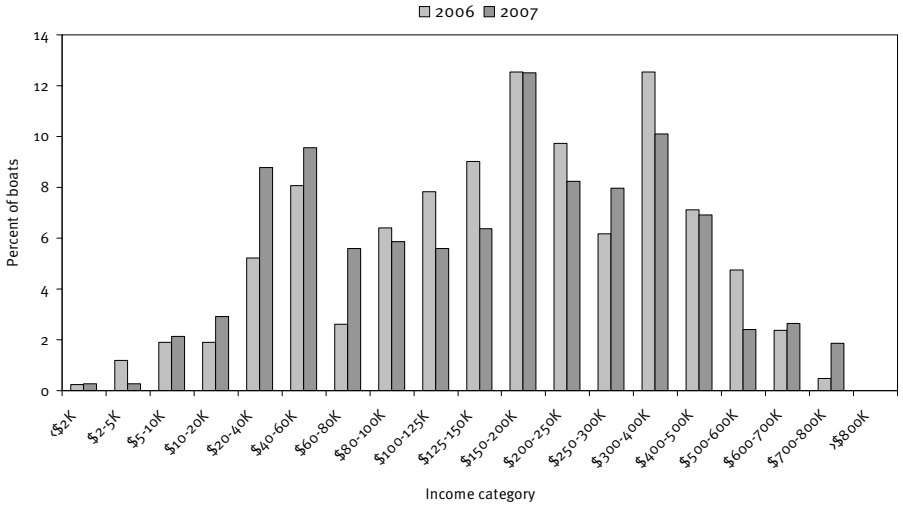


Figure 12: Income distribution in the trawl fishery for 2006 and 2007 (Source: QPIF CFISH database, 24 September 2009).

Fishery performance

Appraisal of fishery in regard to sustainability

The ECOTF fleet has undergone major changes since the introduction of the Trawl Plan and the closure to fishing of additional areas in the GBRMP in 2004. Reductions in effort, catch rates and overall harvest in the fishery are directly related to the fishery adjusting to such changes. In 2006 and 2007, the ECOTF experienced the lowest fishing effort years recorded, with associated reductions in catch and GVP. In addition to management changes, increasing fuel prices and high availability of low cost imported prawns on the local market continue to impact upon the fishery.

In 2007, a review event[14] was triggered for bay prawns (see Performance Measurement). Lower than usual bay prawn catches in February of 2006 and again in 2007 are likely to have been influenced by drought conditions. The CPUE for bugs held above the CPUE limit reference level for the entire year for the first time since bug CPUE performance measurement began in 2001.

Stock assessments undertaken on principal species over recent years suggest that stocks are being fished at sustainable levels. The continuation of the Fisheries Observer Program (FOP), Compulsory daily commercial fisher logbooks, Vessel Monitoring System (VMS), and biological data collection will add to data and information available to fishery managers to ensure that the ECOTF continues to be managed in a sustainable manner.

QPIF's progress against the recommendations attached to the initial ECOTF Wildlife Trade Operation approval (which expired 1 December 2007) is detailed in Table 6. The ECOTF fishery was reassessed in November 2007 and a set of revised recommendations were attached to the new three year WTO approval. The number of recommendations reduced from 18 to eight, indicating that QPIF has substantially improved the management regime for this fishery to achieve long-term sustainable outcomes. Reporting progress on further requirements of the current WTO approval will occur in the 2008 Annual Status Report.

[14] Review events are defined under the Trawl Plan (see Performance Measurement).

Table 6: Progress in implementing the Department of the Environment, Water, Heritage and the Arts (DEWHA) recommendations for the Queensland East Coast Otter Trawl Fishery, 2004-07.

Recommendation	Progress	Improvements to management regime
QPIF to inform DEWHA of any intended amendments to the management arrangements that may affect sustainability of the target species or negatively impact on by-product, bycatch, protected species or the ecosystem.	*Ongoing* No changes to management arrangements occurred in the 2007 fishery season.	N/A
QPIF to monitor the status of the fishery in relation to the performance measures (review events and/or reference points) specified in the Trawl Plan. Within three months of becoming aware that a performance measure has not been met, QPIF to finalise a clear timetable to the implementation of appropriate management responses.	*Ongoing* QPIF reports annually on review events currently in the Trawl Plan (see Management Performance).	Annual monitoring of performance measures specified in the Trawl Plan provide an early alert of potential problems with sustainable harvesting of the main species retained by the fishery and interactions with protected species (turtles), bycatch and benthic species. A review of relevant management arrangements is the outcome of monitoring where a performance measure has not been met. Since the mandatory introduction of TEDs and BRDs in 2003, the performance measures for sea turtles and other non-retained bycatch and benthic species are no longer considered appropriate for sustainability and will be replaced by alternate performance measures in the 2008 effort year annual status report.
From 2005, QPIF to report publicly on the status of the fishery on an annual basis, including explicit reporting against each performance measure specified in the Trawl Plan.	*Ongoing* This annual status report represents the third to be completed under the current WTO approval.	Public reporting on the status of Queensland's fisheries is an important aspect of managing fisheries on behalf of the community. These reports provide an important catalogue of historical information on the status of the fisheries, links to ecological assessments demonstrating to the Australian Government that fisheries meet sustainability guidelines, and the most up-to-date information on Queensland's fisheries.
By end of 2005, QPIF to review the adequacy of the current Long Term	*Completed* CSIRO Marine Research reviewed the survey design and value of data for	The outcomes from this review are being considered by an implementation team and recommendations progressively

Monitoring Program (LTMP) for the ECOTF in terms of survey design and the value of the survey data for fishery assessment purposes. QPIF to implement changes to the LTMP based on the results of this review and within available resources.	fishery assessment purposes for the LTMP northern prawn, and scallop surveys in early 2006. The proposed recruitment survey design for eastern king prawns (EKP) developed by QPIF in 2002 (Courtney *et al.* 2002) was also reviewed by CSIRO.	introduced where appropriate and as resources are available. Findings of the review have already resulted in the implementation of LTMP surveys of EKP recruitment from 2007 which will assist in providing additional information for use in stock assessments. The main findings of the review are included in the Research and Monitoring section of this report.
By the end of 2006, QPIF to develop and implement a robust system to validate catch logbook and Species of Conservation Interest (SOCI) logbook data.	*Completed* QPIF's logbook validation strategy encompasses a range of activities that may be undertaken across different fisheries. Validation of trawl logbook data and computer records held on the CFISH database against VMS data for 2001 to 2005 was completed in September 2006. Results of the logbook validation exercise demonstrated that discrepancies between QPIF's CFISH and VMS data sources are negligible. The percentage of total errors in misreporting the location of a day of fishing effort and reporting fishing as non-fishing activity collectively averaged around 2% (much less than 5% as expected). In 2006, the FOP began operating in the fishery. Validation of fisher reports of SOCI interactions against the small number of observer records indicated some discrepancies in fisher reports of SOCI interactions. Discussions have been held with industry to identify ways to improve fisher compliance with SOCI interaction reporting.	The high level of agreement between logbook and VMS data sources indicates that location and fishing/non-fishing reporting errors in the logbook data are few and that logbook effort data can be relied upon as accurate in the vast majority of instances. QPIF has confidence in the veracity of analytical outputs using these data to the extent that the data are used appropriately. In response to the noted SOCI data discrepancies, consultation has been undertaken with industry to maximise reporting of SOCI interactions, including the publication of an article in the June 2007 edition of the *Queensland Fisherman* magazine raising industry awareness of legal responsibilities for reporting SOCI interactions when they occur.
QPIF to develop, and make publicly available, a strategic research plan within one year. The research plan will identify information gaps in the knowledge required to manage the fishery sustainably, priorities for future research, and consider strategies through	*Completed* A Five Year Research Plan (2006–11) has been developed for the ECTF. The research plan is available to the public through the QPIF internet website.[15]	The research plan provides information to the public and research organisations on the QPIF research priorities for the 2006 to 2011 period in the ECTF.

[15] Available online at: www.dpi.qld.gov.au/fishweb

which research needs can be met on a continued basis.		
QPIF to develop a robust and regular fishery assessment process that provides a basis for management decisions, which are precautionary and recognise the uncertainty and level of risk. The assessment process will examine the ecological sustainability of the principal and permitted species and bycatch, within three years, using stock or risk assessments. Appropriate management responses will be developed to reduce risks to the high-risk species or groups.	*Ongoing* In 2004–05, stock assessment of the main target stocks in the fishery indicated that EKP, saucer scallops and tiger-endeavour prawns were being fished to the limit of maximum sustainable yield. Assessments of EKP and saucer scallops were subject to uncertainties in the spawner-recruitment relationships, estimates of annual increases in fishing power and accuracy of logbook catch data (O'Neill *et al.* 2005). The monitoring of recruitment in EKP through the QPIF LTMP is expected to provide data to reduce the uncertainty in future assessments for that species. Results from the 2004 stock assessment of the northern tiger prawn and northern endeavour prawn stocks indicated that both stocks were fully exploited but that the data lacked contrast i.e. catch and effort for the whole 1988 to 2003 time series was centred on the top of the yield curve. Since 2005, QPIF has had an ongoing commitment to undertake regular stock assessments for the principal species harvested in the fishery and risk assessments for permitted and bycatch species. Stock assessments of each of the principal species are planned to occur annually. A stock assessment for banana prawns has recently been completed (Tanimoto *et al.* 2006). Results of the age-structured model showed that the current exploitable biomass levels (biomass in 2004) were about 50 to 70% of B_0 (virgin biomass). The biomass trends were relatively stable in the Tully, Mackay and the Fitzroy areas, but significant declines were observed during the late 1990s in the Townsville and Moreton areas, falling below 40% of B_0.	QPIF has responded with improved and updated estimates for incremental increases in fishing power and identified the major sources of error in catch and effort logbook data. In addition, fishery independent survey data collected in the period from 1997 are available to test stock assessment model assumptions based on fishery logbook data. For example, annual pre-recruit species abundance (tiger /endeavour prawn species) and standardised survey catch rate (scallops). More accurate and robust reference points by which to guide future sustainable management of the trawl target species may also be developed using these data (O'Neill *et al.* 2005). Quantification of changes to fishing power in the period 1988 to 2003 set against long-term changes in catch rates (O'Neill & Leigh 2006) have alerted management to priority stock assessment needs. Stock assessments for EKP, tiger and endeavour prawns, red spot king prawns and saucer scallops are proposed for completion by end of 2008. The banana prawn stock assessment recommended that standardised catch rates be monitored annually and that the biologically-based limit reference point of B_{MSY} (biomass at maximum sustainable yield) be adopted as a precaution against overfishing. This and other sustainability reference points developed for the other east coast trawl fishery target species have been integrated into a draft Performance Measurement System (PMS) that sets out the requirements for regular assessment, monitoring and reporting of the status of these stocks (see below). A situation report based on existing information on the sustainability risk from current effort levels to retained and non-retained species in the fishery is pending, expected to be completed by early 2008.

QPIF to implement an effort cap in the Great Barrier Reef World Heritage Area (GBRWHA), which changes periodically in line with the most current estimates of effort creep. QPIF to implement appropriate management arrangements to account for effort creep across the fishery.	*Ongoing* QPIF research estimates of annual effort creep have been established. Proposals to implement a new system for reducing the GBRWHA cap in effort are being prepared for public comment and legislative amendment.	The Queensland Government recognises a need to ensure that effort levels in the GBRWHA remain at sustainable levels to preserve the unique values of the area.
QPIF to manage effort in the ECOTF at ecologically sustainable levels. QPIF to identify appropriate management issues and options flowing from the General Effort Review (GER), make the findings publicly available, and implement any necessary management changes before the end of 2005.	*Completed* The GER Final Report - a comprehensive analysis of spatial and temporal changes in effort in the ECTF -was released to the public in September 2004. It reported that from 1996 to 2003, significant reductions in effort were achieved in terms of fishing days (40%) and effort units (32%). The number of otter trawlers in the fishery declined by 45% between 1990 and 2003, while the number of beam trawlers declined by 30% between 1996 and 2003.	The majority of stakeholder responses received to the GER (87%) confirmed there was community support that effort in the fishery was being sustainably managed (Gaddes and Zeller 2005). The GER Final Report found that recent changes in management of the fishery introduced through the Trawl Plan have been beneficial to ecological sustainability in the fishery. A preliminary analysis of bycatch mitigation measures put in place under the Trawl Plan was also conducted in the GER, indicating that impacts on bycatch in the fishery were sustainable. Results from two major QPIF / FRDC research projects recently completed (see Recent Research and Implications) and an assessment of the adequacy of closures for protection of species and benthic habitats within the GBRWHA support this finding.
QPIF to investigate the feasibility of implementing finer scale spatial management in the ECOTF.	*Proposed* QPIF will be considering finer scale spatial management options for target stocks prior to the remaking of the Trawl Plan.	QPIF currently has limited mechanisms by which to reduce total effort or to partition effort across the different sectors of the fishery if required for ecological sustainability purposes. These will be reviewed in the General Review of the Trawl Plan.
As part of the Review of the Trawl Plan (to be completed and changes implemented before November 2006), QPIF to revise current review events and develop appropriate limit and target reference points for principal and permitted	*In progress* In December 2006, the Scientific Advisory Group (SAG) to Trawl Management Advisory Committee (Trawl MAC) endorsed a draft Performance Measurement System (PMS) for the ECTF. When finalised, approval by the Chief Executive QPIF will be sought for the PMS to be the formal instrument for measuring	During 2008, the proposed limit and target reference levels for principal and permitted species harvest in the draft PMS will be finalised and integrated into the management regime for the fishery. Performance will be monitored against the reference points reported in the 2008 Annual Status Report. Current review events will be repealed from the legislation

species by the end of 2005.	performance against sustainability targets in the fishery.	subsequent to the proposed Review of the Trawl Plan.
QPIF to continue to cooperate with other relevant jurisdictions to pursue complementary management and research of shared stocks for all principal and permitted species, which may be affected by cross-jurisdictional issues. In particular, QPIF will cooperate with AFMA, WA and NT fisheries management agencies in relation to squid and with NSW in relation to eastern king prawn.	*Ongoing* Processes are in place, such as the Northern Australian Fisheries Managers Forum (NAFM), the Australian Fisheries Managers Forum (AFMF) and the Protected Zone Joint Authority (PZJA), that allow discussion of complementary management arrangements for shared stocks (e.g. tiger and endeavour prawns).	EKP catch data have been obtained from NSW and utilised in formal assessments of the shared stock in the past. It is proposed to continue to collaborate with NSW DPI in future eastern king prawn assessments. Annual fishery manager meetings between Queensland and NSW are proposed to continue.
By the end of 2006, QPIF to develop and implement a system sufficient to identify changes in the composition and quantity of bycatch in the ECOTF over time.	*Completed* In early 2006 the QPIF FOP began monitoring bycatch taken onboard trawlers. Observers record total bycatch weight and species composition data, including numbers of protected species caught. QPIF is developing a three-year rolling program for bycatch monitoring in the fishery. The program seeks to document the composition and quantity of bycatch characteristic of high and low effort areas in each of the trawl sectors that make up the fishery on a triennial basis. A draft version of the ECTF Bycatch Monitoring Strategy was developed during 2006 and finalised in early 2007. The strategy sets out the protocols for sampling, selection of sampling sites and reporting procedures for bycatch monitoring in the fishery.	Since 2006, the QPIF FOP has embarked upon a long-term monitoring program for bycatch in the fishery. The ECTF Bycatch Monitoring Strategy identifies and consolidates current best practice to meet objectives of the program with limited resources. Review procedures have been included in the strategy to ensure the program continues to meet data requirements for sustainable outcomes.
QPIF to continue to pursue a reduction in the amount of bycatch taken in the ECOTF through the refinement of bycatch mitigation technology and to support the investigation of methods for increasing the	*In progress* QPIF is encouraging industry to investigate alternative, more effective BRDs and has recently received proposals from industry members. QPIF is undertaking research into the impact of the fishery and effectiveness of specific BRD designs on sea snakes (including	QPIF will continue to monitor trends in the exclusion of bycatch species and the BRD types in use in the fishery validated through the FOP. As part of a research project, QPIF is developing options to mitigate risk associated with sea snake bycatch.

survivability of bycatch species. Any effective and appropriate methods identified should be implemented in the Trawl Plan within 18 months.	assessment of survivability) (see Recent research and implications). The project is expected to be completed by mid-2008.	
QPIF to develop sustainability risk indicators for bycatch based on the Seabed Biodiversity Mapping Project (FRDC Project number 2003/201). In the interim, QPIF to, by the end of 2005, implement precautionary performance measures related to bycatch.	*In progress* In late 2005, the Trawl SAG developed precautionary bycatch performance measures for bycatch. The interim performance measure for bycatch is that non-compliance with BRD and TED regulations should not exceed 5%. Between 2005 and 2007, QPIF has collaborated with researchers on development of sustainability risk indicators for bycatch based on the joint FRDC / CRC Reef Great Barrier Reef Seabed Biodiversity Mapping Project. It is expected that final project outputs will be available to guide development of other ecosystem performance measures in 2008.	A PMS to ensure the fishery management regime minimises risk to the sustainability of ecosystem components within the fishery area is under development using recent information from the joint FRDC / CRC Reef Great Barrier Reef Seabed Biodiversity Project. It is expected that the project final report will provide estimates of percentage area of distribution of benthic habitats, assemblages, species groups and numerous individual species and estimates of biomass of each species group and individual species inhabiting the inter-reefal habitats of the GBRWHA. QPIF is currently developing risk profiles (i.e. ranking risk to the sustainability) of inter-reefal benthic community assemblages and associated higher risk species subject to trawling in the GBRWHA. When completed, this will establish benchmarks for monitoring future changes in the trawling risk exposure of these ecosystem components with changing patterns of trawl effort.
QPIF to promote research into the impact of the fishery on protected species including syngnathids and sea snakes, and to take all responsible steps to reduce protected species interactions. Each year, the QPIF to report publicly on interactions with protected species, incorporating the latest research findings.	*In progress* *Pipehorses* QPIF assessed the biology, distribution and abundance of pipehorses in southeast Queensland trawl grounds. This report found little correlation between abundance as assessed by research surveys and commercial catch data. Indeed, higher catches of pipehorses were found in areas subjected to only light trawl effort. *Seasnakes* QPIF is currently investigating the distribution, abundance and vulnerability of seasnakes to trawling. Survivability of seasnakes to various trawl durations is also being assessed. This project commenced in early 2005 and is due for	*Pipehorses* The 2005 LTMP pipehorse assessment report (Dodt, 2005) noted that further work was required to investigate the relationships between syngnathid distribution and abundance and benthic habitat and species assemblage characteristics. Too few pipehorses were recorded from research samples in the GBR Seabed Biodiversity Mapping Project to make this possible inside the GBRMP. It would therefore appear unlikely that this would be possible in the near future outside the GBRMP. When they become available, data collected in the proposed seabed biodiversity mapping project of the Tweed-Moreton bioregion will be assessed for the

	completion by mid-2008 (see Recent research and implications section).	level of risk to the sustainability of a range of species - including syngnathids - that are caught incidentally in the fishery. *Seasnakes* QPIF are considering management options to reduce sea snake bycatch and maintain acceptable sea snake catch and release reporting compliance in the fishery.
Within 12 months, QPIF to amend the definition of "recognised Turtles Exclusion Devices" (TEDs) in the Trawl Plan to ensure that TEDs used in the ECOTF allow the effective escape of those turtle species caught in the fishery. QPIF to undertake sufficient and effective enforcement activities, including at-sea and in-port inspections, to monitor the compliance with the TED provisions of the Trawl Plan.	*In progress* It is intended that legislative amendment for the definition of TEDs will be progressed as a proposed amendment to subordinate legislation in the near future. Operators are being encouraged to adopt revised TED requirements that have been endorsed by Trawl MAC prior to them being included in legislation. A Compliance Risk Assessment was completed for the Queensland east coast trawl fisheries in 2005 and compliance with effective TEDs was assessed to be a high risk issue for the sustainability of marine turtles. Compliance with legislative requirements for TEDs is addressed through Queensland Boating and Fisheries Patrol (QBFP) operational planning processes.	Measurable performance criteria have been developed for the fishery through the PMS and are in place to monitor TED compliance starting 2008.
QPIF to, within three years, initiate a review and provide a preliminary report on the adequacy of protection provided to species and benthic habitats in the ECOTF by the current system of closures within and outside the Great Barrier Reef Marine Park (GBRMP), and whether additional closures are required outside GBRMP.	*In progress* *Within the GBRMP* QPIF is investigating this issue incorporating the findings of the 2004 QPIF General Effort Review Permitted Species Risk Assessment, GBR Seabed Biodiversity Mapping and trawl bycatch composition projects. *Outside the GBRMP* Following discussions between QPIF, CSIRO and regional NRM bodies a project commenced in 2007 to extend investigations of marine biodiversity south of the GBR and into southern Qld and northern NSW shelf waters. QPIF is leading stage 1 of the project that will extend over the 2007-08 period and includes collation and synthesis of current information on marine benthic	A preliminary assessment of the adequacy of protection provided by trawl closures to benthic habitats, protected species and higher risk species as determined by the GBR Seabed Biodiversity Mapping Project is under way and will be completed in 2008. While 33% of the GBRWHA is permanently closed to trawling, trawl closures in southern Queensland cover only a small part of the fishery area. It is intended that research under way as part of a proposed SEQ Seabed Biodiversity Mapping Project will improve management in the fishery through reduced environmental impacts (reduced time that trawl gear needs to be on the seafloor, reduced spatial extent of trawling, improved avoidance of sensitive areas).

	habitats and biodiversity for southern Queensland and northern New South Wales and preparation of field methodologies. The methods will be refined and applied to obtain new data in Stage 2 of the project from 2009 to 2011 (subject to funding).	It is intended that outcomes of the project will enhance the potential for spatial management by: • identification of most appropriate areas for protection; • allocation and design of marine protected areas; and • increased information available to fishers and managers to guide ecologically sustainable fishing practices.

Performance measurement

Assessment of the 2007 data against the review events described in Schedule 2, parts 2, 3 and 4 of the Trawl Plan[16] are reported below. Only one review event has been triggered for bay prawns – a principal species listed in the Trawl Plan (Table 7). Details of QPIF's interpretation of fishery performance with respect to the review events are also provided.

Review events Schedule 2, Part 2 of the Trawl Plan

Principal species CPUE

Otter trawl catch and otter trawl effort have been considered for the purposes of monitoring the principal species review events in the Trawl Plan, based on a CPUE performance measurement index. A review event is triggered if the CPUE of a species drops below 70% of the average CPUE baseline for that species taken over the 1988–97 period. The CPUE for each principal species is calculated on a monthly basis for the whole year. Specific reference periods during the year are recognised as important for each principal species and these are critical times at which CPUE must meet the performance criteria. Where this is not the case, a review of the management arrangements applicable to that species would be considered.

Monthly changes in CPUE

Increased fishing power estimates adjusting for vessel gear and technology specifics and regional data have been used in this analysis. Extrapolation from an annual fishing power estimate time series developed by O'Neill & Leigh (2006) is used to monitor standardised CPUE for the principal species performance measure/ review events currently in the Trawl Plan.

A summary of the principal species review events triggered / not triggered under the Trawl Plan is provided in Table 7 and details of QPIF's proposed response to the triggered review events provided in the text. Performance measures relating to distribution of hull units and average engine power of the fleet became redundant with standardization of catch-per-unit-effort adjusting for effort creep that included upgrades to larger vessels with more powerful engines in the fishery over time.

Review events

Summary results for review events are provided in Table 7 below and further explanation of the review events for some principal species, impacts on ecosystems, benthos and bycatch are provided in the text.

[16] Available online at: www.legislation.qld.gov.au.

Table 7: Summary results of Schedule 2 of the Trawl Plan review event monitoring for 2007.

Review event	Measured	Performance
Bay prawns CPUE from 1 November to the end of February, is less than 70% of the average CPUE for the species from 1988 – 97	*Triggered*	CPUE was below the limit reference level in February 2006 and again in February 2007. QPIF will continue to monitor bay prawn CPUE as an indicator of the sustainability status of the stocks. However lower rainfall than in recent years was received over Moreton Bay stream catchments during 2006-07. This may have been a factor limiting the availability of bay prawns to the fishery in February. However catch rates rebounded strongly in November at the start of a sharp increase in rainfall over Moreton Bay catchments during 2007-08 (South East Queensland Healthy Waterways Partnership 2008).
Eastern king prawns CPUE from 1 November to the end of February and 1 May to 31 August, is less than 70% of the average CPUE for the species from 1988 – 97.	*Not Triggered*	As in previous years, CPUE for eastern king prawns was again above the CPUE limit reference level for the entire year.
Moreton Bay bugs CPUE from 1 November to the end of February and 1 May to 31 October is less than 70% of the average CPUE for the species from 1988 – 97.	*Not Triggered*	In most years, lower CPUE is expected in October because the annual southern closure (20 September to 1 November) tends to restrict access to bug stocks - this is evident in the 2004-07 data). The continuing increase in bug catch rate from 2001-07 is holding the 2007 bug CPUE above the CPUE limit reference level for the entire year for the first time.
Red spot king prawns CPUE from 1 June to 30 September, is less than 70% of the average CPUE for the species from 1988 – 97.	*Not Triggered*	As for 2005 and 2006, CPUE in 2007 has been held at an acceptable level in relation to the limit reference level and a review event was not triggered. In December CPUE declined to below the limit reference level but this is not unexpected for as in most years, a decrease in fishing effort occurs during the annual northern closure (15 December to the end of February).
Scallops CPUE from 1 November to end February, is less than 70% of the average CPUE for the species from 1988 – 97.	*Not Triggered*	CPUE held above the limit reference level throughout 2007 except for October where similar to Oct 2006, CPUE fell below the limit reference level but rebounded quickly to be above it during the peak November – December catching period. Scallop CPUE performance during the 2007 Nov – Feb reference period was acceptable. The 2006 change made to the minimum legal size appears to have increased scallop CPUE in 2007.[17]

[17] See 'Changes to management arrangements in the reporting year' section of the report

Northern tiger prawns[18] CPUE between 1 March to 30 June and 1 September to 31 December, is less than 70% of the average CPUE for the species from 1988 – 97.	*Not Triggered*	In 2007 CPUE was held well above the limit reference level and did not trigger a review event. As in previous years CPUE was zero in January & February during the annual northern closure (15 December to the end of February).
Southern tiger prawns CPUE between 1 March to 30 June and 1 September to 31 December, is less than 70% of the average CPUE for the species from 1988 – 97.	*Not Triggered*	As in 2006 CPUE in 2007 did not trigger a review event. CPUE was below the reference level only in January & February during the annual northern closure (15 December to the end of February).
Northern endeavour prawns CPUE from 1 March to 30 June and 1 September to 31 December is less than 70% of the average CPUE for tiger prawns from 1988 – 97.	*Not Triggered*	As in 2006 CPUE in 2007 did not trigger a review event. CPUE was below the reference level only in January & February during the annual northern closure (15 December to the end of February).
Compliance More than 5% of boats in the ECTF are used to commit an offence	*Not Triggered*	In 2007 there were 373 otter trawlers operating in the ECOTF. Seven boats were used to commit offences under the *Fisheries (East Coast Trawl) Management Plan 1999* during 2007, resulting in the issue of FINs or successful prosecutions. As at 11 November 2008, prosecutions pending for alleged offences during 2007 involved an additional five boats. If these prosecutions are all successful, a total of 12 boats will have been used to commit an offence under the *Fisheries (East Coast Trawl) Management Plan 1999* during 2007, corresponding to 3.2% of the number of boats in the ECOTF and fewer than the number required to trigger a review event.
Effort units (EUs) The number of EUs has not decreased by: i. 13% or more in the first effort year of the Trawl Plan (i.e. 2000) ii. 1% or more in any subsequent effort year iii. 2% or more during 2 consecutive effort years	i. N/A ii. N/A iii. *N/A*	The review events in Schedule 2, Section 8 (e) (i) and (ii) of the Trawl Plan were made redundant following regulatory amendment of the ECTF management and licensing regime removed the effort unit surrender provision from the Trawl Plan on 1 July 2006. This was in recognition that the surrender provisions placed on the trawl fleet were no longer necessary given the significant reduction in effort since the Trawl Plan's introduction.[19] In 2007, the number of effort units applied to the fishery was 12% less than in 2006. A review event in Schedule 2, section 8(e) (iii) of the Trawl Plan may have been triggered, but a review of effort management in the fishery will not be necessary given that actual effort in the fishery since 2004 has declined by 40%. A decline of this magnitude is a more robust measure of the effectiveness of effort

[18] Tiger and endeavour prawns have been split into northern and southern sections, based on fishing grid location. The northern section is defined as the waters north of 16°S and southern is defined as waters at or south of 16°S (the split falls between Cairns and Cooktown).

[19] See Figures 9 and 10

		management in the fishery than is the two percent reduction over 2 consecutive years for any licence performance measure stipulated by the review event.
Boat hull units There is a significant change in the relative distribution of boat hull units in the fishery	*Not Measured*[20]	No review event has been triggered under Schedule 2, Section 8 (f) (i) of the Trawl Plan, as no significant change in the relative distribution of boat hull units has occurred over the 2006 season.
Engine power Average engine power for boats in the ECTF is increasing	*Not Measured*[21]	No review event has been triggered under Schedule 2, Section 8 (f) (ii) of the Trawl Plan. There is no significant difference in the average engine power of the trawl fleet between 2006 and 2007 (p›0.05).
Ecosystem By 1 January 2005:		No review events have been triggered under Schedule 2, Section 12 of the Trawl Plan. In order to meet the ecosystem performance measures in the Trawl Plan, a range of mitigations have been put in place, including BRDs, TEDs, permanent and temporal closures, and effort reductions, all of which have contributed to a significant reduction in overall quantities of benthos, bycatch & protected species interacting with the fishery.
i. benthos is not reduced by 25 %	*Not Triggered*	Reduction in the take of benthos by 25% since the implementation of the Trawl Plan has been achieved[23]. Reduction in the take of bycatch by 40% since the implementation of the Trawl Plan has been achieved.
ii. the amount of fish taken other than principal fish (bycatch) is not reduced by 40%	*Not Triggered*	Only 6 turtle interactions were recorded in 2007—all live releases, At this level captures were much less than the 5% of 1991–92 turtle catch reference level (295 turtles) specified by the Robins report.
iii. turtle capture or mortality for any turtle species is more than 5% of the average level of turtle capture of mortality as reported in Robins 1995[22]	*Not Triggered*	In addition, no review event has been triggered for any individual turtle species, indicating that TEDs are effective at ensuring that the vast majority of turtles are able to successfully escape from a trawl.

[20] This performance measure became redundant when monitoring standardized catch-per-unit-effort began.

[21] This performance measure became redundant when monitoring standardized catch-per-unit-effort began.

[22] JB Robins 1995, estimated catch and mortality of sea turtles from the East Coast Otter Trawl Fishery of Queensland, Australia. *Biological Conservation*, **74**, 157-67.

[23] W Norris, (Draft) *Estimating total bycatch reduction in the east coast trawl fishery using limited data sets,* Department of Primary Industries & Fisheries, Queensland Australia, 2004.

Effort in Moreton Bay A study shows that a total of more than 15 000 fishing days under 'M1' and 'M2' licences have been used in the review year.	*Not Triggered*	The fishing effort for Moreton Bay in 2007 was 5220 fishing days, a 16% decrease on the effort in 2006. The level of effort in Moreton Bay has decreased since the Trawl Plan was introduced and is considerably less than the 15 000 days reference level in the Trawl Plan, therefore no review event has been triggered.

Saucer scallops

A quantitative stock assessment of saucer scallop stocks harvested in the ECOTF is currently underway. Results from the assessment are pending. QPIF will review the results to determine whether the management regime for this species needs modification.

Benthos

Under Schedule 2, Section 12 of the Trawl Plan, the level of benthos taken must have been reduced by 25% as of 1 January 2005. An analysis of data by QPIF indicated that a 25% reduction of the take of benthos (seabed associated plants and animals) by the fishery since the implementation of the Trawl Plan had been achieved[24]. The conclusion was based on reductions in swept area (hectares), nominal effort and the effects of BRDs and TEDs on bycatch rates. Continued enforcement of the use of BRDs and TEDs and seasonal and permanent closures will further reduce the take of benthos from the ECTF. Results from the recently completed Great Barrier Reef Seabed Biodiversity Project undertaken by CSIRO Marine and Atmospheric Research (see Recent research and implications) are being assessed to determine current risks associated with fishing activities on benthos in the GBRMP. Indicators and methods for monitoring risk to the sustainability of benthos have been developed for the ECTF Performance Measurement System using data from this project.

Bycatch

Species caught incidentally by trawl nets are discarded either because they hold low market value, are not permitted to be retained, or are outside the legal or market size requirements[25].

Bycatch consists mainly of small fish, crabs, other penaeid prawns and numerous other bottom dwelling invertebrate species including sponges, sea stars and gastropod shellfish. Larger vertebrate species which may enter otter trawl nets include turtles, sea snakes, sharks and rays can usually exit through specially designed excluder or escape devices built into the body of the net (see Interaction with protected species section).

Most species (>70%) are uncommon in the catch[26]. High zero counts in trawl samples for most species present monitoring problems, that is, low numbers of many bycatch species mean there is low statistical power to detect change in catch rates for these species through monitoring programs.

QPIF research results indicate that each of the trawl sectors are distinct in terms of bycatch species composition making it necessary to tailor use of specific BRD types that are the most effective in each trawl sector .[26] Introduction to the fishery of QPIF-designed square mesh cod ends as the most effective BRD type for use in the scallop sector is under consideration as a proposed amendment to the Trawl Plan in 2009.

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[24] W Norris, (Draft) *Estimating total bycatch reduction in the east coast trawl fishery using limited data sets,* Department of Primary Industries & Fisheries, Queensland Australia, 2004.

[25] D Huber, *Audit of the Management of the Queensland ECTF in the Great Barrier Reef Marine Park*, Great Barrier Reef Marine Park Authority, Queensland, Australia, 2003.

[26] AJ Courtney, M Tonks, M Campbell, D Roy, S Gaddes & MF O'Neill, *Quantifying the effects of bycatch reduction devices (BRD) in Queensland's shallow water eastern king prawn (*Penaeus plebejus*) trawl fishery,* Department of Primary Industries & Fisheries, Southern Fisheries Centre, Deception Bay, Australia, 2005.

QPIF proposes to evaluate the ECTF bycatch monitoring strategy. The strategy currently focuses on data collection through fishery observers for quantification of levels and composition of bycatch in the ECTF. Terms of reference for the evaluation will be determined according to the performance of this activity to date and the future priority use of observers in the ECTF.

Interactions with protected species

During the period 1991–96, the average turtle catch was estimated at approximately 6000/year[27]. Since the introduction of TEDs in 2001, a dramatic reduction in turtle captures has been observed in the fishery. In the period 2001–06 the average turtle interaction reported through the trawl fishing logbooks has been 14 per year. Fisher awareness of reporting requirements for interactions with turtles and other protected species is being enhanced through education by QPIF onboard observers.

In 2007 the ECOTF reported six turtle interactions (Table 8). Of these, all were released alive. The very low numbers of turtles caught in the fishery indicate that TEDs are very effective in allowing turtles to escape a trawl net and that when on the rare occasions they are caught these turtles are probably captured toward the end of the trawl shot and so have been in the net for a relatively short time compared to the time actually spent fishing. Turtles that do not have enough time to escape through the TED before the net is removed from the water are typically released alive and in good condition.

SOCI

In January 2003, the Species of Conservation Interest Logbook (SOCI01) was introduced to the fishery. Fishers have since been required to report all interactions with protected species in a separate logbook to the general logbook used for recording retained catch. Any capture of marine species protected under Queensland and Australian Government laws such as sea snakes, turtles, sea birds, dolphins, grey nurse and great white sharks, and dugongs must be recorded in the SOCI01 logbook. Protected species catch and release data for otter trawl in 2007 are given in Table 8.

Table 8: Reported otter trawl interactions with species of conservation interest in 2007 (Source: QPIF CFISH database, 21 February 2008).

Species	Numbers		
	Caught	Released Alive	Released Dead
Sea snake	1574	1424	150
Flatback turtle	6	6	0
Seahorse unspecified	7	7	0
Sawfish—narrow	1	1	0
Sawfish—dwarf	1	1	0
Tern—unspecified	1	0	1
Total	**1590**	**1439**	**151**

[27] JB Robins & DG Mayer, *Monitoring the impact of trawling on sea turtle populations of the Queensland east coast*, Department of Primary Industries & Fisheries, Brisbane, Australia, 1998.

Trawl fishers also reported 1526 interactions with sea snakes in 2006 (Table 8). SOCI01 logbook data indicate that in 2007, live releases resulted from 90% of seasnake interactions. Very low numbers of interactions with other protected species were reported in 2007.

Fishery impacts on the ecosystem

The extent of impact from trawling on benthos is dependent on several factors, which includes the type of trawl gear being used, the spatial patterning of the trawl gear, the habitat the gear is being utilised in and the frequency of use.

Studies have found that trawling has the capacity to reduce biomass and abundance of benthic organisms and lead to long-term shifts in benthic species composition (Drabsch *et al.* 2001). Trawling activity in the ECOTF is heavily focussed on areas of soft seabed (sand, silt, and mud)—the preferred habitat for several major harvestable species. Repeated trawling over the same ground in areas supporting attached sedentary animals may be cause for the depletion of the animals at a local level.

The *Great Barrier Reef Marine Park Act 1975* places restrictions on the ECOTF through closures to fishing. Under GBRMP legislation, trawling can not occur in: Habitat Protection, Conservation Park, Marine National Park, Buffer, and Scientific Research and Preservation zones. The total area of these zones has increased to approximately 66% of the GBRMP with the introduction of the revised GBRMP Zoning Plan from 1 July 2004, which allows for a minimum of 20% of the area of each of the 70 bioregions to be protected from fishing.[28]

Other ecosystem impacts

Nil

Research and monitoring

Recent research and implications

Fisheries Research and Development Corporation, Project No. 2000/170: "Bycatch weight, composition and preliminary estimates of the impact of bycatch reduction devices in Queensland's trawl fishery."

This project was completed in May 2007. It assessed catch rates for some 1300 species (mainly bycatch) taken in the eastern king prawn, tiger-endeavour prawn and saucer scallop otter trawl sectors of the ECTF. It also reports on assessments of the effectiveness of BRD types when used in combination with recognised TEDs in the fishery and makes findings and recommendations that will provide better information and sustainable management of a number of by-product species taken in the fishery.

Based on recommendations from this project, QPIF is developing proposals to introduce the BRD type that is best suited to the bycatch species composition and that has the greatest effect with regard to maximising bycatch reduction in the scallop sector. Recommendations for minimum legal sizes for barking crayfish and Balmain bugs based on their biology have also been considered. Together, these proposals have been scheduled for 2008 as legislative amendments to the Trawl Plan.

FRDC Project 2003/021: "Mapping bycatch & seabed benthos assemblages in the GBR region for environmental risk assessment & sustainable management of the East Coast Trawl Fishery."

This project was completed in July 2007. The overall objective of the project was to address key issues identified by GBRMPA, QPIF and the Queensland Seafood Industry Association (QSIA) in relation to biodiversity

[28] Great Barrier Reef Maine Park Authority 2003, *Why is biodiversity in the Great Barrier Reef Park important?* [Online], available: www.gbrmpa.gov.au/corp_site/management/zoning/rap/rap/pdf/FAQs_3Dec2003.pdf [Accessed 10 July 2006].

assessment and provision of information for future Marine Park planning needs, and environmental sustainability assessments of the ECTF. It focussed specifically on the development of sustainability indicators and assessment methods and a risk assessment of the effects of trawling on the sustainability of bycatch, benthic species and assemblages and seabed habitat within the GBRMP.

Key findings indicated that:

- trawl effort had a significant (both positive and negative) effect on the biomass of a very small percentage (6.5%) of the 850 species mapped;
- about 70% of the 850 species mapped had low or very low exposure to trawl effort;
- ›800 species had low or very low estimates of proportion caught annually;
- only 33 species had relatively high exposure to trawl effort—only about 15% of these species had high catchability by trawling, the other 85% were assessed to have somewhat lower catchability by trawling;
- Indicators based on qualitative recovery ranks showed that about 15 species were possibly at higher relative risk with respect to trawling with considerable uncertainty about the parameters used to quantitatively assess risk in the majority of these species against an experimental biological limit reference point (analogous to maximum sustainable yield); and
- Evaluations of the environmental performance of several recent management interventions showed that generalised depletion trends up until the late 1990s have all been arrested and reversed—the 2001 buyback of fishing licences and subsequent penalties made the biggest positive contributions with the 2004 rezoning of the marine park making a small positive contribution for some species.

The project has enhanced information available on habitats and biodiversity distribution and risks that managers need to address to ensure human activities within the GBRMP are conducted sustainably. QPIF is currently considering the project findings and their implications for sustainable management in the ECOTF.

FRDC Project 2005/053: "Reducing the impact of trawl fisheries on protected sea snakes"

Depending on location, there is an occasional to likely occurrence of sea snakes in the ECTF bycatch. Anecdotal evidence from this fishery suggests thousands of sea snakes are caught annually. Research from the Northern Prawn Fishery in the Gulf of Carpentaria suggests up to 50% of these snakes could die as a result of their contact with trawl gear.

In July 2005, the QPIF commenced work on a three-year research project intended to quantify catch and mortality rates of sea snakes and investigate the effects of existing BRDs on sea snake catch rates in the ECTF. The project is funded by the FRDC and has three objectives:

1. Implement a crew-based data collection program to collect information on sea snake catch rates, species composition and distribution.
2. Quantify post-trawling mortality rates of sea snakes by undertaking survival trials at sea on commercial vessels.
3. Test the effect of existing BRDs on sea snake catch rates.

As at July 2007 preliminary results of the project indicate that:

A crew-member observer program (CMO) has sea snake catch and mortality data from 72 vessels and 100 fishing trips across the following sectors of the ECTF:

- scallop
- eastern king prawn
- tiger and endeavour prawn
- banana prawn
- deepwater king prawn
- brood-stock collection fishery (*Penaeus monodon*)
- bay prawn (Moreton Bay)

- river and estuarine prawn (Beam Trawl).

Sea snake catch rate per hectare estimates of trawl swept area for each sector of the ECTF are highest in the black tiger prawn broodstock and banana prawn fisheries (0.57 and 0.38 snakes per hectare respectively) and lowest in the scallop and deepwater king prawn fisheries (0.0004 and 0.0001 snakes per hectare respectively).

The number of dead snakes recorded by the CMO program is low for most sectors and much less than the 0.01 snake per hectare mortality rate observed in the red spot king prawn fishery. No dead snakes have been reported in the black tiger prawn, banana or Moreton Bay trawl fisheries as trawl times are relatively short in these sectors.

Testing the effect of existing BRDs used in the ECTF on sea snake catch rates under commercial conditions indicates that significant reductions in sea snake catch rates are being achieved by commercial fishers with various BRD/TED/distance from the codend drawstring configurations. However recent experimental fisheye and popeye fishbox BRD testing in the ECTF and in the Northern Prawn Fishery indicate higher sea snake catch rate reductions are achievable without significant loss of prawns. The data collected from this project will be used to:

1. Identify sea snake species or populations that are most at risk from trawling.
2. Encourage the use of existing BRDs and practices that help minimise sea snake catch and mortality rates.
3. Provide advice to all interested stakeholders on the sustainability of sea snake populations.

The field component of this research was completed in late 2007. Preliminary project findings will be communicated to stakeholders in early 2008. Results of a risk assessment of sea snake species will be made available by the end of the project in 2009.[29]

Monitoring programs and results

Long term monitoring program (LTMP)

LTMP trawl review implementation

QPIF has considered the recommendations of the independent evaluation of the LTMP trawl fishery resource surveys undertaken by CSIRO Marine and Atmospheric Research in early 2006.

The CSIRO evaluation highlighted that the scallop survey as undertaken since 2001 to assess the performance of the rotational harvest strategy using scallop replenishment areas was not able to provide a reliable abundance index for use in stock assessment because of the limited area of the fishery currently surveyed. LTMP scallop monitoring was discontinued at the end of the 2006. However, the review did highlight the value of the data collected to refining knowledge of the scallop stock recruitment relationship. In 2007 QPIF reprioritized LTMP resources for the fishery to tiger, endeavour and eastern king prawns.

The review found that the annual tiger and endeavour prawn surveys provided reliable abundance indices for these species, recommended that this information should be incorporated into future stock assessments and that consideration be given to conducting future model-based analysis of both the time series of abundance indices and the recruitment indices. These recommendations are being considered by QPIF stock assessment scientists for future assessments of these resources. The report also recommended that if funding allowed, the

[29] A Courtney (Queensland Primary Industries & Fisheries) pers. comm., August 2007.

number of sites surveyed should be increased. Monitoring related activities carried out in 2007 are summarized below.

Taking into account the positive review of the sampling design proposed in a 2002 FRDC report by QPIF officers, an additional survey of pre-recruit eastern king prawns based on this design was initiated from late 2006 as part of the LTMP to provide an annual abundance index. Monitoring related activities carried out in 2007 are summarized below.

Monitoring northern prawns (LTMP)

In multi-species fisheries, such as the northern section of the ECOTF, information on the individual commercial prawn species is not captured in daily commercial fishery logbook data. To assess the stocks of the individual species, fishery independent data is needed on the distribution of these species geographically and over time. The annual tiger prawn LTMP surveys provide this information.

Survey catch rates of tiger prawns in far north Queensland, both as numbers per trawl and weight per trawl indicate that 1998, 1999 and 2005 were years of higher than average tiger prawn recruitment while 2000 was a year of lower than average recruitment. Tiger prawn survey catch rates during 2001-04 and 2006-07 were average indicating years of average recruitment.

Survey catch rates of endeavour prawns in far north Queensland since 2005 have been stable at about the average for the whole time series of data (1998-07). Survey catch rates were lowest in 2000 indicating a year of low endeavour prawn recruitment. Endeavour prawn survey catch rates were also below average in 2004 and to a lesser extent in 1998.

The catch rates provided by the surveys compare well with trends in the commercial harvest data, especially for tiger prawns which are considered more susceptible to overfishing. The LTMP prawn surveys provide an important time-series of fishery independent data that complements the analysis of the commercial fishery catch and effort data in quantitative stock assessment for tiger and endeavour prawn species.

Pre-recruit eastern king prawns (LTMP)

In November/December 2007 the LTMP completed the second year of the eastern king prawn pre-recruit beam trawl survey. The pilot survey in 2006 was a success and provided encouragement and direction for developing an ongoing monitoring program for eastern king prawns. Information gathered during the pilot survey was used to improve the survey design in 2007 although EPA rezoning may have significant impact on sampling locations in future years.

Catches from the main survey have shown the distribution of prawns in the survey area to be patchy with catches from 0.5nm trawl shots ranging in size from 0 prawns up to 200 prawns. The distribution of prawns is especially patchy in areas outside of Moreton Bay with sites around bar entrances the most productive. However, areas where prawns were caught in 2006 were also productive areas during 2007. This is encouraging especially if these trends continue in future years as it may enable further stratification of the survey design and hence improvement in the quality of the data provided.

The pre-survey sampling component of the eastern king prawn monitoring program conducted in Deception Bay proved useful in giving confidence in the data collected during the main survey. Catches of juvenile prawns remained high throughout the main survey period. As more years of data are collected as part of this component a link between catches in Deception Bay and the whole Moreton Bay strata may be able to be identified. This would enable considerable savings in the cost of monitoring the resource to be made if pre survey sampling data can be used as a proxy for data collected during the main survey.

The procedure for determining the annual index of juvenile abundance using the data collected during beam trawl surveys requires further investigation.

Monitoring protected species

The anticipated investigation of the spatial distribution of benthic habitats in the shallow water EKP grounds through a collaborative research project has not been granted funding. The expected outcome of the proposed project to provide a more detailed understanding of the extent of rocky habitats preferred by syngnathids and a quantitative measure of absolute risk regarding the effect of trawlers on the sustainability of syngnathid populations will not be achievable.

Fishery Observer Program (FOP)

The primary objectives of the Fisheries Observer Program in the ECTF are to collect fishery dependent information to:

- Validate the accuracy of catch and effort data detailed within logbooks
- Detail composition and fate of SOCI, and validate data supplied through SOCI logbooks
- Estimate bycatch amounts and determine composition of bycatch for the fishery.

These objectives are achieved by collecting information on:

- total catch retained (target and non-target species)
- catch per unit effort
- amounts of principle and permitted species discarded (estimated)
- total bycatch discarded (estimated)
- total species catch compositions (target, non-target and bycatch)
- vessel and gear information (number and sizes of nets, net mesh size, type of TED and BRDs used)
- interactions with SOCI.

During 2007, observers conducted a total of 74 sea days onboard vessels in the ECOTF and 15 days in the RIBTF. Observed fishing days onboard otter trawl vessels were spread among boats targeting banana / bay prawns, shallow water EKP, tiger and endeavour prawns, red-spot king prawns, and Moreton Bay. Observers recorded 89 days of logbook information which will be used for validation of fisher submitted (catch and effort) logbook data.

From each trawl shot observed, observers take a sub-sample of the catch that is divided into various components. Principal and permitted species are recorded as being retained or discarded. Discarded principal or permitted species include individuals that are under size, damaged, not important for the operator or otherwise non marketable. In addition, observers record information about selected bycatch species for the fishery, species of interest; mainly in respect to species that have other commercial or recreational fishing importance. From observed otter trawl shots in 2007, 19% was retained as target product, 11% was discarded as unwanted target product, 3% was discarded species of interest (main contributor was stout whiting from shallow water EKP sector) and 67% was discarded bycatch. For beam trawl observer surveys in 2007, 67% was retained as target product, 1% was discarded as unwanted target product, 1% was discarded species of interest and 31% was discarded bycatch.

Table 9: Observed retained catch percentages for 2007, by sector.

Trawl Sector	Catch retained
Moreton Bay	72%
Beam	67%
Tiger/Endeavour	19%
Banana/Bay	18%
EKP (SW)	16%
Red Spot	11%

The introduction of TEDs into the fishery dramatically reduced turtle bycatch, with no interactions recorded on any observed trip within the ECTF or RIBTF. All SOCI interactions observed in 2007 were from otter trawling. These interactions involved sea snakes and a single pipefish that was non-target. From 371 observed shots (283 ECOTF shots & 88 RIBTF shots), 222 sea snake interactions were observed, of which 88% were released alive. The FOP is likely to have had a positive effect on the release of sea snakes by educating fishers on better handling techniques.

The East Coast Trawl Fishery Bycatch Monitoring Strategy

In response to a need for more specific data needs for bycatch management in the east coast trawl fisheries, the strategy provides detailed information on the QPIF's approach to monitoring bycatch through the FOP in the ECTF.

The FOP conducts sampling and analysis to determine bycatch composition in line with this strategy. The fishery has been divided into sectors (tiger/endeavour prawn, red-spot king prawn, EKP, banana/bay prawn, scallop). During 2007, intensive onboard bycatch collection and laboratory species processing was directed to the tiger/endeavour and redspot king prawn sectors. For each sector, the aim was to collect ten replicate samples from each of nine high effort and three low effort (6 nm) sites.

In 2007, many of these chosen sites were not fished during observer surveys and thus no samples were obtained for those sites. For tiger/endeavour 20% of the samples were be obtained, and 28% for the redspot king prawn sector. The current bycatch monitoring strategy design will be reviewed at the first opportunity to determine the utility of the data collected as a measure of ecosystem health.

Collaborative research

QPIF collaborated with CSIRO, GBRMPA and Queensland Seafood Industry Association to identify key issues for biodiversity assessment and provision of information for future Marine Park planning needs. Research was undertaken into the effects of trawling on bycatch, benthic assemblages and seabed habitat, and to support ecologically-based management of the fishery (see 'Recent research and implications'). Preliminary risk indicators for important bycatch species were provided to QPIF in early 2007. Final results were reported in July 2007. Information from this project is being considered for incorporation into the ECOTF performance measurement system under development.

Fishery management

Compliance report

Compliance and enforcement in Queensland East Coast Otter Trawl Fishery are the responsibility of the QPIF, Queensland Boating and Fisheries Patrol (QBFP).

Table 10: Trawl Fishery Compliance 2007.

Fishery	Units Inspected	Offences	Units not compliant	Compliance Rate % (per unit)
East Coast Otter Trawl	417	43	38	91%
Moreton Bay Otter Trawl	23	4	4	83%

Note: Prosecutions data are from the QBFP prosecutions database as at 2 October 2008.

Of the units inspected, 376 were commercial vessel inspections. The majority of the remaining units inspected were marketer premises.

Offences

Offences are reported as either a Fisheries Infringement Notice (FIN); Caution (FIN Caution or official caution issued by QPIF Legal); or Prosecution (to proceed by complaint summons).

Table 11*:* Offences recorded in the Queensland East Coast Otter Trawl Fishery (2007).

OFFENCE	FIN	Prosecution	Caution
Fail to comply with a requirement to keep stated records, documents or other information in the approved form.	3		3
Fail to have a document required to be available for immediate inspection.	4		1
*Use or possess a boat identified in a licence with a T1/T2 licence in a scallop replenishment area.	5	1	
*Failed to comply with a regulated waters declaration (contravened a closed waters declaration)	1	1	1
Use a boat to take fish for trade or commerce with boat not marked as required.	1		
Take/possess/sell regulated fish.	5	4	1
Mutilate or disfigure a regulated fish with the intent to hide that it is a regulated fish.		2	
Possess a bug on board a commercial fishing boat, female bugs with the eggs removed.		1	
*Contravened a condition of an authority. TED use condition.		3	
*Contravened a condition of an authority. BRD use condition.		2	
Did an act only an authority holder can do, namely take fish for trade or commerce without a current commercial fishing licence.		2	1

The seller must give to the buyer, and the buyer must obtain from the seller, a docket for the sale		1	
TOTAL	**19**	**17**	**7**

Note: The majority of prosecutions for this period are still pending. * denotes offences prescribed under the *Fisheries (East*

Table 12: Offences recorded in the Moreton Bay Otter Trawl Fishery (2007).

OFFENCE	FIN	Prosecution	Caution
Fail to comply with a requirement to keep stated records, documents or other information in the approved form.	2		
Fail to produce a document required to be available for immediate inspection	1		
Take/possess/sell regulated fish	1		
TOTAL	**4**	**0**	**0**

Review event

A review event of the management arrangements is triggered if more than 5% of boats in the fishery are used to commit an offence under the *Fisheries (East Coast Trawl) Management Plan 1999* in a year.

The 2007 effort year

Of the offences recorded above in Tables B, C and D, those marked * pertain to offences prescribed under the *Fisheries (East Coast Trawl) Management Plan 1999*. The total number of recorded offences does not directly translate to the number of boats used to commit an offence as a single boat may be associated with more than one offence.

In 2007 there were 373 otter trawlers operating in the ECOTF. Seven boats were used to commit offences under the *Fisheries (East Coast Trawl) Management Plan 1999* during 2007, resulting in the issue of FINs or successful prosecutions. As at 11 November 2008, prosecutions pending for alleged offences during 2007 involved an additional five boats. If these prosecutions are all successful, a total of 12 boats will have been used to commit an offence under the *Fisheries (East Coast Trawl) Management Plan 1999* during 2007, corresponding to 3.2% of the number of boats in the ECOTF. A review event has therefore not been triggered in the fishery.

Compliance Risk Assessment

A compliance risk assessment was completed for Queensland's Trawl Fisheries in 2005. The risk assessment identified compliance with BRD provisions and closed water provisions as the highest priorities for enforcement and compliance for the trawl fisheries. There were also a number of activities rated as having a moderate risk, which are also being addressed. The risk assessment is currently being reviewed and the outcomes will be reported in the 2009 Annual Status Report.

Changes to management arrangements in the reporting year

As mentioned in the 2005 Annual Status Report, a marked decrease in scallop catches was observed after implementation of the Trawl Plan. A fishery-based trial of an alternative minimum legal size regime for saucer scallops was conducted in Nov–Dec 2004 and Nov–Dec 2005.

An amendment was made to the Trawl Plan in October 2006 based on increased scallop catch rates during November to December in the trial period, to make the minimum legal size 90mm from 1 November to 31 December each year. Noting the lower scallop catch reported in 2006, assessment of 2007 data reveals that scallop CPUE has increased as predicted (Table 7).

Bycatch Reduction Devices

BRDs are devices placed in the trawl net to allow the escape of incidentally caught non-target and undersized target species, while minimising the loss of target species.

Based on at-sea trials the Trawl Plan was amended in June 2006 to include two additional devices as recognised BRDs:

- the popeye fish excluder
- the v-cut and bell codend[30].

Although there are seven recognised BRD's in the Plan that can be used anywhere in the fishery, a proposal is under consideration to match specific BRDs to specific fishery areas to ensure that the most effective device is used in areas best suited to its use. To date compelling evidence for effective bycatch reduction only exists for adoption of the square mesh cod end BRD (SMCE) in the scallop fishery. Proposals under consideration may require the use of SMCEs in scallop gear in the near future. Meanwhile QPIF will continue to encourage the refinement of other BRD types and practical innovations to minimise bycatch.

Consultation/communication/education

Promotion of regulations applying to both commercial and recreational fishers, including those relating to the ECOTF, is an ongoing role for QPIF.

Consultation with stakeholders in the fishery mainly occurs through Trawl MAC, with meetings generally held twice a year. Trawl MAC provides to QPIF on management measures for fishery.

Complementary management

QPIF is committed to ongoing consultation with other jurisdictions to ensure sustainable management of shared fish stocks across their native range. QPIF meets annually on fisheries matters with NSW Fisheries and routinely participates in regional inter-jurisdictional management forums through the Commonwealth Northern Prawn Fishery Management Advisory Committee and the PZJA Torres Strait Prawn Management Advisory Committee.

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Image

Tiger prawn (*Penaeus esculentus*), banana prawn (*Penaeus merguiensis*) and saucer scallop (*Amusium japonicum balloti)*.