7. Management Arrangements in the East Coast Trawl Fishery

The Commonwealth "**Guidelines for the Ecologically Sustainable Management of Fisheries**" require that:

1. in order to ensure and assess the adequacy of management responses with respect to target and by-product species, that:

- *"there are reference points (target and/or limit), that trigger management actions including a biological bottom line and/or catch or effort upper limit beyond which stock should not be taken"* **[Guideline 1.1.6]**;

- "*there are management strategies in place capable of controlling the level of take"* **[Guideline 1.1.7]**;

- *"fishing is conducted in a manner that does not threaten stocks of by-product species"* **[Guideline 1.1.8]***; and*

- *"the management responses, considering uncertainties in the assessment and precautionary management actions, has* [sic] *a high chance of achieving the (Commonwealth Guideline) objective"* **[Guideline 1.1.9]**;

2. in order to assess and ensure the adequacy of management responses with respect to the impact of the fishery on the environment, bycatch species and ecologically related communities, that:

- *"measures are in place to avoid capture and mortality of bycatch species unless it is determined that the level of catch is sustainable (except in relation to endangered, threatened or protected species). Steps must be taken to develop suitable technology if none is available"* **[Guideline 2.1.3];**

- *"an indicator group of bycatch species is monitored"* **[Guideline 2.1.4]** and *"there are decision rules that trigger additional management measures when there are significant perturbations in the indicator species numbers"* **[Guideline 2.1.5];**

- "*the management response, considering uncertainties in the assessment and precautionary management actions, has a high chance of achieving Objective1 of Principle 2"* **[Guideline 2.1.6].**

3. in order to address overfishing of stocks below ecologically viable levels, that:

- *"a precautionary recovery strategy is in place specifying management actions, or staged management responses, which are linked to reference points. The recovery strategy should apply until the stock recovers, and should aim for recovery within a specific time period appropriate to the biology of the stock";* **[Guideline 1.2.1];** and

- *"if the stock is estimated as being at or below the biological and / or effort bottom line, management responses such as a zero targeted catch, temporary fishery closure or a 'whole of fishery' effort or quota reduction are implemented"* **[Guideline 1.2.2]**.

4. in order to conduct the fishery in a manner which is consistent with Objectives 2 and 3 of Principle 2, that:

- *"the management response, considering uncertainties in the assessment and precautionary management actions, has a high chance of achieving the objective";* **[Guideline 2.2.6];**

- *"management actions are in place to ensure significant damage to ecosystems does not arise from the impacts described in 2.3.1";* **[Guideline 2.3.4];** and

- *"there are decision rules that trigger further management responses when monitoring detects impacts on selected ecosystem indicators beyond a predetermined level, or where action is indicated by application of the precautionary approach";* **[Guideline 2.3.5].**

Following amendment to the Trawl Plan in late 2000 and the removal of nearly 16% of effort through a structural adjustment scheme and an across-the-board industry effort reduction, management arrangements in the ECTF improved significantly[50]. The reduction of fishing effort and the introduction of effort units has capped effort in the fishery, at least nominally. The implementation of a VMS has enabled closer monitoring of the fleet's activity, which has major compliance benefits and may assist with stock assessment in the longer term through better temporal and spatial analysis of catch and effort data. An additional 96,000 square kilometres of the GBRMP, where trawling had not occurred previously, were closed to trawling under the revised Trawl Plan.

The ECTF essentially is managed under an input control regime, which means that the amount of fishing effort (rather than the catch) is limited on an annual basis. This management approach is common in prawn fisheries world-wide, because it is difficult to predict the strength of annual recruitment (and hence the likely abundance of trawlable adults) with any degree of accuracy[51]. Also, the ECTF is a multi-species fishery. Catch restrictions applicable to one species are unlikely to be appropriate for other species. Under an input-controlled management system, high grading and discarding of commercial by-product is not as big a problem as in many multi-species quota fisheries, because operators generally retain their lesser-value catch.

7.1 General Comments about the Legislated Management Objectives of the Trawl Plan

The management objectives for the ECTF are subject to the overarching fisheries management objectives contained in the *Queensland Fisheries Act 1994*, which aim for the ecologically sustainable use of fisheries resources, optimum community, economic and other benefits from these resources and fair resource access. The specific objectives for the fishery, which expand on the objectives of the Act, are detailed in Part 2 and Schedule 2 of the Trawl Plan (see Appendix 3).

This section provides a brief consideration of the legislated management objectives of the Trawl Plan, the processes to achieve these objectives, measurements of how well they have been achieved, and review events, which are triggered if certain points are reached. Table 2 accompanying the Executive Summary lists the Schedule 2 provisions and comments on how well the Trawl Plan has performed against each provision. Section 7.2 provides specific comments about these objectives. In particular, it examines the adequacy of the biological, environmental and fishery performance indicators and the review events currently listed in the Trawl Plan.

[50] Details of the Trawl Plan negotiations and key events in the recent history of the ECTF are provided in Appendix 4.

[51] For some prawn fisheries which show distinct periods of spawning, pre-recruit surveys can give an indication of the strength of the cohort about to enter the fishery.

There needs to be a broader approach with respect to ensuring that the ecological sustainability of the ECTF is maintained in its entirety. Furthermore, a single-species approach fails to take account of the interactions between species (including by-product and bycatch).

It is noted that commercial catches may decline for a range of reasons, including overfishing, fewer operators in the fishery since the restructure, strong inter-annual variability or changes in targeting behaviour by the fleet. Only the first reason is of resource concern.

As pointed out in Section 5.2, there are major concerns with relying solely on CPUE data as an indicator of resource abundance. There are also too many environmental variables and uncertainties in the data to determine CPUE trends with confidence.

With respect to abundance, it is noted that assessments predicting available biomass (using either appropriate biomass or surplus production models) for any of the principle species are not available publicly. Once the assessment process reaches a point where such estimates can be made, it would be useful to have "abundance" defined (such as the level of recruitment or the biomass of adult spawners).

7.2.2 Ecological Review Events and Performance Indicators

Objective (c) in Schedule 2 of the Trawl Plan specifically relates to the "sustainability of the fishery's ecological systems". It contains performance indicators with respect to the impact of trawling on benthos, bycatch, turtles and bottom habitat.

7.2.2.1 Review Event and Performance Indicator for Benthic Impact

A review event is triggered under the Trawl Plan if there is not a 25% reduction in the amount of benthos taken in the ECTF by 1 January 2005. This has to be documented through a scientific study, showing "*levels accepted by the chief executive*". The starting date for the review period is some unspecified time "*before the notification day*" of the Trawl Plan (i.e. 19 November 1999)[58].

The plan gives no guidance on how this reduction is defined or calculated. As indicated in the Section 6, there has been no comprehensive study on habitat types and associated seabed life throughout the entire fishery. Apart from the "Effects of Prawn Trawling Study" in the Far North Section of the GBRMP (Poiner *et al.*, 1999), benthic impact data generally have been collected on an opportunistic basis. Furthermore, historical information on the spatial distribution of the fishery was reported at a broad scale (30'x30' grids) until early 2000.

Undoubtedly, the reduction of fleet activity (brought about by the industry restructure and reduction in the number of fishing platforms) would have had an impact on the amount of benthos taken. However, without comprehensive and spatially structured "before and after" data, it is impossible to quantify this reduction with any degree of certainty. Some major assumptions would need to be made about the areas fished, the gear used, the amount of time trawled and the biophysical habitat impacted.

Currently, a working group established by the QFS is reviewing the ecological performance indicators and review events. It is expected that the group will recommend a broad methodology for the calculation of the reduction in the amount of benthos taken in the ECTF and, more importantly, recommend improved benthic performance indicators for future incorporation in the Trawl Plan.

[58] The notification day refers to the date when the Trawl Plan was first gazetted (as opposed to any subsequent dates when amendments were gazetted).

Data presented in the ECOTF Status Report 2001 suggest that a review probably was triggered in 2001, when 58 convictions were recorded (Table 27). This is twice the trigger point identified in the Trawl Plan. The Status Report notes that "*data is* [sic] *not readily available to confirm whether multiple convictions were recorded for individual vessels*". This lack of data on such an important issue is of concern. Information on prosecutions involving fishing boats is a matter of public record and should be available readily. It seems *ultra vires* to ignore the legal provisions of the plan by not providing information on the performance against this objective, particularly when there is evidence that performance has been inadequate to the point of triggering a review under the Trawl Plan's provisions.

As with some of the other review events in the plan, there is some ambiguity in the wording of this trigger. Clarification is required as to whether the 5% refers to the total number of offences or the number of vessels used in an offence. For example, a situation could arise where less than 5% of the boats have committed offences, but together these boats have amassed more than a 5% level of non-compliance. Clearly the 5% figure should refer to the number of offences (i.e. the frequency of non-compliance), irrespective of the number of boats involved.

Another difficulty in reporting against this review event becomes apparent from the compliance data presented by the QFS. According to the Management Plan, the review event is triggered if 5% of the boats are used "to commit" an offence. Table 27 provides a breakdown of "convictions" in 2001. Given the delays inherent in the judicial process, many offences committed in one year will be heard before a court during the following year. To avoid delays in obtaining and acting on information crucial to the plan, the review events should be defined more clearly as the number of operators found guilty of an offence in a year (regardless of when the offence was committed). Inevitably, this will include some offences committed in the previous calendar year, but these will be balanced by other incidents yet to go to court.

Furthermore, the number of operators "found guilty of an offence" is a more appropriate performance indicator than the "number of convictions". It must be recognised that, in many cases, no conviction is recorded when someone is found guilty of an offence. Such a judgement is sought increasingly by persons found guilty in order to avoid the "Serious Fisheries Offences" provisions. The aim of the review event is to measure the level of non-compliance. Whether or not a conviction is recorded in such cases is irrelevant.

Notwithstanding the limitations of the "number of convictions" as a useful performance indicator to trigger a review event, such information is still of interest as a compliance statistic. It reflects the views of the judiciary and community on fisheries offences and, to a degree, the success rate of bringing fisheries cases to trial.

Other enforcement and compliance information may be useful indicators of the level of compliance in the ECTF. This may include patrol and inspection reports (e.g. number of nets inspected and proportions found to be compliant) or the number of VMS "switch-offs". One of the traditional difficulties of using detection and prosecutions as compliance indicators is their interpretation. For example, a declining number of prosecutions may indicate an improved compliance, that offenders are getting smarter or that fewer cases make it to the legal proceedings stage. Consequently, performance indicators should not be viewed in isolation, but in conjunction with other information.

7.2.4 Fisheries Performance Review Events and Performance Indicators

Several fishery performance-based indicators have been included in Schedule 2 of the Trawl Plan, which relate to the economic performance of the fishery and the achievement of effort reductions.

annual basis to accommodate changes in efficiency and is less unsettling for industry than major once-off effort reductions.

It is noted that in many fisheries, input-based management is adopted because there is insufficient knowledge about the status of stocks to set an optimal TAC (i.e. one that allows for the maximisation of economic yield without jeopardising the sustainability of the resources). However, under a stringent effort control system, a similar demand for resource knowledge exists. In other words, if the TAE is set too low, industry will forfeit valuable fishing days. Conversely, if the TAE is set too high, the fishing effort may exceed the capacity of the resource to recover and this may impact on the sustainability of the resource. During the stock assessment process, the basis for calculating a proposed TAE should be specified. As with a TAC, the basis for calculating a TAE will come under close scrutiny by industry if it limits their activity.

The effort control system adopted in the ECTF is essentially a TAE system, but without the annual stock assessment and effort adjustments underlying the WA model. How effective the current effort limitations are and the Trawl Plan's ability to reduce effort is discussed in the next section. However, it is noted that neither the basis for the initial allocation of fishing days in the ECTF nor any subsequent effort reduction targets have been justified with respect to the available biomass of the fisheries resources. Instead, the scientific justification underlying the ECTF's TAE level is that historic levels of fishing effort have not resulted in any significant resource declines and that, therefore, a lower level of effort than those in 1996 and 1997 must be sustainable.

Generally, input-based management is not species specific. For example, if there was a decline in grooved tiger prawn stocks (as has occurred in the NPF), possible management action could include extended spatial and temporal closures to protect grooved tiger prawn recruitment. However, in addition to grooved tiger prawns, the northern ECTF yields blue endeavour prawns, red endeavour prawns and brown tiger prawns. Any measures designed to reduce fishing effort on one species will have flow-on effects to the other three species. This has major economic implications for industry and any management initiatives to reduce effort are likely to be challenged.

Another problem in a multi-species fishery, in which exploitation is regulated through input controls, is the ability of fishers to refocus effort on different species. This can lead to the sequential depletion of species or species groups and this depletion may not be detected readily during stock assessment. Such changes in targeting need to be identified during stock assessment and factored into any TAE calculations, if effort controls are to remain effective.

In summary, input-based management is the most appropriate regime for the ECTF, but care needs to be taken in assessing the effective effort applied in the fishery. Input controls generally work on the principle of reducing fishing effort through gear and vessel restrictions, which in turn decreases the efficiency of fishing operations. As has been shown repeatedly in many fisheries, industry (in its attempt to maximise profitability), will generally find ways to overcome or compensate for these restrictions. For example, in the NPF, all major initiatives to reduce effort have been gradually compensated for by an accompanying increase in effective effort. A properly functioning TAE system needs to recognise these underlying forces.

7.3.2 Effort Limitations and Reductions

Under the revised Trawl Plan for the ECTF, effort units were allocated based on the product of an individual licence's historical participation in the fishery (i.e. allocated fishing days) and the standardised hull units of the vessel (i.e. hull units x conversion factor). About 3.5 million effort units were allocated at the beginning of 2001.

In addition to the overall effort cap in the fishery, a secondary effort limitation relates to the GBR World Heritage Area. The Commonwealth contributed $10 million to the ECTF structural adjustment scheme in late 2000 in return for an assurance from Queensland that effort would not increase in the World Heritage Area. Subsequently, fishing effort in the region was capped at about 2.4 million effort

A contentious issue from the GBRMPA's perspective was the allocation of 14 steaming days in 2001, in addition to the fishing days already allocated on the basis of past participation. Initially, steaming days had been proposed by the Premier's Working Group to compensate operators for any days lost steaming to the grounds and searching for fish[60]. However, prior to 1 January 2001, the QFS agreed to a proposal by industry that vessels would be deemed not to be trawling if, on the basis of VMS polls, they were estimated to be moving at a speed greater than 5.5 knots.

Subsequently, this provision was implemented under the Management Plan.[61] It meant that operators effectively had been allocated an additional 14 days above their allocated fishing days. Furthermore, operators could apply to have their fishing day(s) reinstated if they could demonstrate to the QFS that they had not been fishing. As a result of these arrangements, few operators lost fishing days when they were steaming.

The GBRMPA was opposed to this allocation of steaming days. Its submission to the "Review on Steaming Days" stated that the "14 additional days equates to about 10% of the average number of effort days allocated for ECTF operators and this could result in an overall increase of effort of up to 8% across the fleet. Clearly this would undermine the achievements of past effort reductions under the ECTF Structural Adjustment Scheme and jeopardise the effectiveness of the 1996 effort cap." Following the review, the QFS reduced the number of steaming days to four. In the view of the GBRMPA, this still is an over-allocation of steaming days. Given the amended speed provisions, the QFS's own data have shown an average annual steaming day requirement of less than one day per operator.

As shown in Table 29, the amount of fishing in 2001 was considerably less than the allocated effort. Only 83% of the total effort units allocated for the fishery were used for fishing, leaving 17% unused.[62] In the case of the effort unit allocation for the GBR World Heritage Area only 78.5% of the available effort units were used. In an appropriately allocated and well-functioning effort quota system, it would be expected that the fleet would come close to using all available effort units each year.

Table 29: Fishing effort used in the ECTF in 2001 and 2002
(Data Source: Logbook and VMS Data).

	2001	**2002**
Total Effort Units available (1 Jan)	3,162,946[1]	3,045,424[2]
Total Effort Units Used	2,625,737	2,672,564
% of Available Effort Units	**83%**	**88%**
GBRMP Cap (Notional Effort Units)	2,365,200	2,193,731
Notional Effort Units Used in GBRMP	1,855,534	1,984,662
% of Available Effort Units	**78.50%**	**90.47%**

Note: 1 The above information was reported in the "ECOTF Status Report – 2001".

2 The available effort units indicated as of 1 January may appear to be consistent with the figures cited in Table 1. However, the 2001 figure[1] has been adjusted for the effort units removed from the fishery and the 2002 figure[2] has been adjusted for additional units allocated through appeal.

[60] A fishing day was going to be deducted for every day that the VMS recorded the vessel as operating in the fishery.
[61] The 5.5 knot provision was amended to 5.0 knots in December 2001 following a review of the steaming provisions.
[62] The 83% does not include the 14 steaming days.

In particular, species such a barking crayfish and mantis shrimps[63] were taken in large numbers by a small number of operators, particularly in the southern parts of the fishery. Above average catches of by-product cannot by themselves be considered evidence of the targeting of permitted species. For such proof, statistical information would be required about the distribution of the catches of each of the by-product species, sufficient to allow an assessment of the probability associated with the unusually high catches. This information is not available.

A specific problem is the enforcement of the ban on the take of sharks by trawling. It is acknowledged that the introduction of the ban is a positive step in supporting the effective use of TEDs and recognises the vulnerability of shark stocks to over-fishing. Unfortunately, the intent of the regulation is undermined by practicality constraints associated with its enforcement. The prosecution of infringements requires proof that sharks or shark product was taken by trawling. Most ECTF operators hold a line-fishing endorsement. The crew on many trawlers take sharks by line, particularly when the sharks are feeding around the vessel during the discarding of bycatch. This fishing practice is legal provided an appropriate endorsement is held. However, it weakens significantly the trawl ban on shark. Regulations were introduced in late 2002 banning the finning of sharks. This makes a significant contribution to the sustainability of shark stocks since many operators primarily take shark for their fins.

While the by-product possession limits are necessary from a management perspective, they present enforcement problems in terms of the practicalities associated with the inspection and the counting of product, particularly when it is packaged and/or frozen. Also, there is a high risk of the product being damaged during such inspections. In other fisheries, limits on numbers, size and sex of fish product are supported by appropriate regulations on the format in which the product must be held in order to facilitate enforcement. Regulations on the labelling of packaged product could also be helpful in the ECTF.

7.3.6 Bycatch Mitigation Devices

With the introduction of the revised Trawl Plan on 1 January 2001, TEDs and BRDs became a legal requirement in most parts of the ECTF (including throughout the GBR Marine Park). However, temporary exemptions were provided for the scallop and deepwater trawl fisheries because industry had indicated that current devices were not suited (and in some cases dangerous) to their type of operation. In order to allow for further development, the plan specified an introduction date of 1 July 2001 for TEDs in all scallop nets and 31 December 2001 for TEDs in all deepwater nets. BRDs were required in all scallop and deepwater nets by 1 July 2002.

Despite the prolonged phase-in period for bycatch mitigation devices, there has been slow progress in their effective implementation (see Section 6.2.1 and Tables 20, 22 and 23). This is particularly the case with TEDs, where there is ample information from within Australia and overseas on minimum design standards for effective turtle exclusion. It is noted that TED adoption has been achieved industry-wide in some prawn trawl fisheries (like the NPF) within two seasons. In the ECTF, discussions about the need for such devices and their design have extended over several years.

Part of the reason for the poor implementation record has been ambiguity in the relevant legislative provisions. Parts 3 and 4 of the Trawl Plan deal with the requirement for licence holders to use BRDs and TEDs in their nets, and minimum design standards are stipulated for each. Until the amendment to the TED provisions in late 2002, the Trawl Plan stated that the "*use condition is taken to have been complied with if … a recognised BRD/TED is used with the net*". At the time, there were five recognised BRDs and one recognised TED design permitted under the plan (see Appendix 7).

[63] Mantis shrimp are targeted in Moreton Bay, outside the GBR Marine Park.

In order to allow for technological development, the Trawl Plan made provisions for the use of "*another device with the net if the use achieves the purpose of a BRD/TED*". The plan provided even greater flexibility for the use of non-specified devices by granting the Chief Executive the power to "*make guidelines for devices other than recognised BRDs/TEDs, that may be used with a trawl net to achieve the purpose of a BRD/TED*".

Towards the end of 2001, the QFS and the GBRMPA discussed the size of the bar spacing in TED grids. In an attempt to tighten the existing TED provisions and remove the scope for operators to use devices other than rigid or semi-rigid grids, the QFS sought to amend the TED guidelines. However, it was proposed that the maximum bar spacing be set at 15cm. The GBRMPA did not support this position because it would have set a significantly lower standard than that adopted in other prawn fisheries[64]. Furthermore, the QFS's own scientific advice indicated that, with a 15cm bar spacing, there is a high risk of capturing up to 16% of flatback turtles and up to 10% of other turtles found off the east coast. These potential captures rates are higher than the targets agreed to by parties to the National Draft Turtle Recovery Plan and present an unacceptably high risk of the incidental capture of an endangered marine species.

In November 2001, following discussions over the bar spacing, the QFS received legal advice, which suggested that the proposed TED guidelines were invalid. It was argued that the guidelines were inconsistent with the procedures for amending a management plan set out in Section 39 of the *Fisheries Act 1994* and that the publication and notification provisions for the guidelines were inconsistent with Section 52 of the *Statutory Instruments Act 1992 (Qld)*[65]. The advice noted that the purpose of the TED, currently specified in Section 52 of the Trawl Plan (i.e. to allow turtles to escape immediately after being taken in the net) could not possibly be met because some turtle hatchlings would always pass through to the codend, even at a conservative bar spacing of 10 or 12cm. The advice also stated that the TED guidelines were "*so wide to be virtually meaningless*".

In light of this advice, the GBRMPA urged the QFS to rescind the invalid guidelines and inform industry of the urgent need to meet tighter minimum design standards. Trawl MAC supported this position in March 2002 and recommended that "*the implementation of rigid TEDs with a maximum of 120 mm bar spacing should become law by 1 January 2003*". The QFS has since revised the Trawl Plan to implement the tighter provisions[66]. No information is available yet on how well the new provisions have been adopted by industry.

Progress also has been slow in tightening the current BRD definitions to ensure the optimal deployment of these devices. Recognising the need to address this issue, the QFS embarked on a "BRD Amendment Program" through the Technical Working Group of Trawl MAC. The first stage involved the dissemination of a questionnaire and survey form. The responses were discussed in May 2002 at a workshop on the effectiveness of the current BRDs. The meeting identified modifications and new designs, which could enhance the effectiveness and performance of BRDs. In particular, suggestions were made about the maximum distance that escape holes should be positioned from the codend.

The proceedings of the workshop were considered by Trawl MAC in mid 2002 and recommendations about revised BRD specifications were made to QFS. To date, there appears to have been no progress in implementing these changes. The QFS has indicated that the revised BRD provisions will be addressed in a Regulatory Impact Statement to be released in mid-2003.

---

[64] In the Commonwealth-managed prawn fisheries, such as the TSPF and NPF the minimum bar spacing is 12 cm and, in the USA, the bar spacing is 10 cm.

[65] The logic of this argument also can be applied to the BRD guidelines, making them invalid under administrative law.

[66] The QFS released a Regulatory Impact Statement in late 2002, which (amongst other things) proposed the amendment of the TED provisions. The Trawl Plan was amended in December 2002.