

## 1. Executive Summary

- ◆ In October 1999, the Great Barrier Reef (GBR) Ministerial Council requested that the Great Barrier Reef Marine Park Authority (GBRMPA) conduct an annual audit on the progress of the East Coast Trawl Fishery (ECTF) in achieving the objectives of its Management Plan. The findings of the audit are contained in this report, hereafter referred to as the “Audit Report”.
- ◆ The amended *Fisheries (East Coast Trawl) Management Plan 1999*, hereafter referred to as the “Trawl Plan”, was introduced in December 2000, with most of the new provisions coming into effect on or after 1 January 2001. Since that time the fishery has undergone a major restructure with the removal of nearly 250 vessels.
- ◆ The Australian National Audit Office (ANAO), in its 1998 performance audit of the GBRMPA, listed amongst its key findings that “*the Authority (i.e. GBRMPA) does not have adequate data to determine whether it is achieving its primary objective of protecting, conserving and allowing for reasonable use of the Great Barrier Reef Marine Park*”. The Audit Report on the performance of the ECTF addresses this shortcoming for this fishery by identifying the data sources available for the management of the ECTF and examining the quality of these.
- ◆ Major improvements have been achieved in the fishery through the introduction of revised management arrangements over the past two years. There has been a significant reduction of fishing effort and the introduction of effort units has (at least nominally) capped fishing effort in the fishery. The implementation of a satellite-based Vessel Monitoring System (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 GBR Marine Park, where trawling had not occurred previously, were closed to trawling under the revised Trawl Plan.
- ◆ The Audit Report appraises the revised management arrangements under the Trawl Plan and identifies issues that need to be addressed if there is to be confidence that the fishery is managed in an ecologically sustainable manner. Short-term and medium-term management actions are recommended to ensure the ecological sustainability of the fishery and that of the impacted ecosystems.
- ◆ In preparing this report, account has been taken of the GBRMPA’s obligations under the *Great Barrier Reef Marine Park (GBRMP) Act 1975* and the “*Guidelines for the Ecologically Sustainable Management of Fisheries*” developed by Environment Australia (EA), hereafter referred to as the “Commonwealth ESM Guidelines”. The latter ensures consistency with nationally adopted benchmarks in fisheries assessment. The audit by GBRMPA is a separate process from the fishery assessment of the ECTF by EA under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*. However, there has been close co-ordination between the GBRMPA and EA to ensure a consistent approach.
- ◆ The Audit Report has adopted a broad interpretation in its assessment of the fishery’s performance against the objectives of the Trawl Plan. It examined how well the prescribed achievements, performance measures and review events of the Trawl Plan were met since the introduction of the revised management arrangements. The Audit Report also examined the current administrative and management processes to determine whether they are appropriate for ensuring the ecological sustainability of the fishery.

- ◆ The GBR Ministerial Council requested that the audit be done on an annual basis. Since the Council did not meet in 2001, the Audit Report has commented on the performance of the fishery over the last two years. This was considered to be a more useful approach in this instance because several of the initiatives that were commenced in 2001 were not completed until 2002. Also, several public reports on the status of the ECTF were released by the QFS during 2002 and the findings of these reports have been taken into account in the preparation of the Audit Report.
- ◆ The performance of the fishery is examined only with respect to its occurrence in the GBR Marine Park and not the fishery in its entirety (as is the case with the EA process). Accordingly, some sectors of the fishery, which lie outside the Marine Park, are not considered by the audit. While reference is made to the “ECTF” throughout this report, technically it refers only to the East Coast Otter Trawl Fishery (ECOTF), because inshore beam trawling has been omitted.
- ◆ Given the occurrence of the majority of the ECTF in the GBR Marine Park, the ecological sensitivity of the region and the high conservation status of the Great Barrier Reef, the Audit Report sets a high assessment standard and advocates the adoption of the precautionary principle in managing the region’s resources and the impacts of the fishery.
- ◆ The Trawl Plan specifies “ecological sustainability of the trawl fishery” and “sustainability of the fishery’s ecological systems” as key management objectives. Without wishing to diminish the achievements of the revised Trawl Plan, the Audit Report highlights shortcomings in certain key areas of monitoring and research, fishery assessment, environmental impact and management, which detract from achieving these objectives.
- ◆ The Audit Report acknowledges that several management issues identified in this report have been identified already by the Queensland Department of Primary Industries (QDPI) through the Queensland Fisheries Service (QFS), which manages the fishery. In some instances, processes have been set in place to address the situation. Where appropriate, the audit endorses these processes through its recommendations.
- ◆ Given the diverse nature of the ECTF and hence the complexity of its management arrangements, the 40 recommendations of Audit Report deal with some fairly technical and specific issues.

## **Monitoring and Research in the ECTF**

- ◆ Significant improvements have been made to the information base underpinning the management of the ECTF. Sequential enhancements to the trawl logbook and the introduction of fishery-independent monitoring and research have improved knowledge about the principal (i.e. target) species over time. Previous information shortfalls (such as the recording of trawl interactions with species of conservation interest and byproduct) gradually are being addressed. However, given management’s reliance on monitoring and research data for fishery assessment, the Audit Report has identified several areas where further improvements to the information systems would be beneficial.
- ◆ Long-term security of funding for monitoring and research activities is a key issue. Much of the current funding is derived from external sources such as the Fisheries Research and Development Corporation (FRDC). This includes core activities in the management of the fishery. It is of concern that, given the current competitive funding environment, “routine monitoring and research” underpinning stock assessment is not funded as readily as new, groundbreaking research.

### *Recommendation 1*

- *That the QFS identifies the “true” management costs for the ECTF in terms of the monitoring and research costs and continues to pursue adequate funding for its fisheries as a matter of priority.*

- ◆ Although no precise figures were available for the audit, monitoring and research expenditure for the ECTF appears to be well below the accepted benchmark of 5 –10% of the average gross value of production of the fishery. With a growing demand to demonstrate the ecological sustainability of fisheries and a general tightening of external funding sources, it is unclear how the QDPI will manage to undertake the necessary monitoring and research in the future.

### *Recommendation 2*

- *That the QFS, via Trawl MAC, identifies the core monitoring and research activities for the ECTF and considers strategies through which these can be met on a continued basis.*

- ◆ The Audit Report advocates greater transparency in the research process through a formal peer review of the monitoring and research results. The regular and timely publication of research results in the scientific literature would ensure that this work is of the high standard required for public confidence.

### *Recommendation 3*

- *That a formalised process of regular peer review of monitoring and research results be developed for the ECTF through Trawl MAC.*

- ◆ The Audit Report recommends that a strategic Research and Development (R&D) Plan be developed for the ECTF to ensure that the monitoring and research programs remain focused on priority areas and address identified information gaps. This will assist in obtaining external funding for important research.

### *Recommendation 4*

- *That a strategic R&D Plan, which identifies and prioritises the information gaps for monitoring and research in the ECTF and which provides input into external R&D processes, be developed through Trawl MAC.*

- ◆ The Audit Report has examined the information systems in place for the ECTF. The importance of the VMS in providing real-time, high-resolution, spatial information is recognised. More improvements are expected as researchers develop techniques to analyse trawl tracks for fishery assessment purposes. The Audit Report advocates that the feasibility of introducing gear monitors to supplement the VMS be investigated further.

### *Recommendation 5*

- *That the development of gear monitors in the ECTF be pursued to a prototype stage and that a cost-benefit analysis be undertaken on the use of this system as a fisheries management and monitoring tool.*

- ◆ Commercial ECTF logbooks are a key information source for fishery assessment and they have improved significantly since early 2001. Whilst relatively “cheap” and readily available, such fishery-dependent data have limitations. They provide information only on those parts of the fishery where there is commercial activity (generally on a broad geographical scale). Given the multi-species nature of the ECTF, catch composition often is recorded inaccurately and there is no reliable information on targeting. Logbooks only

record target and by-product species. The uncertainty over the accuracy of these data is of concern. The Audit Report advocates the implementation of fishery-wide monitoring programs as a secondary and independent source of fishery information to overcome these limitations.

#### *Recommendation 6*

➤ *That the QFS determines and implements specific and statistically well-designed fishery-wide monitoring programs, which supplement the existing programs and provide essential fishery assessment information currently not provided through the trawl logbook.*

- ◆ In early 2003, the requirement to record interactions with species of conservation interest was introduced. Whilst the onus is on the licence holders to report to EA any interaction with environmentally listed wildlife, the QFS is now in a position to assess the impact of the fishery on species of conservation concern.

#### *Recommendation 7*

➤ *That the interaction of trawl operations with species of conservation interest (as listed under the EPBC Act) be reported annually in the Status Report for the ECTF.*

- ◆ The Audit Report recommends the integration of VMS and logbook data, once the interpretation of VMS tracks has been resolved. This would allow for a fine-scale spatial analysis of the fishing activity recorded in logbooks.

#### *Recommendation 8*

➤ *That, as the results of the VMS interpretation study become available, a fine-scale analysis of VMS data be integrated with the logbook data analysis in the fishery assessment process.*

- ◆ The Audit Report anticipates further (and possibly significant) effort creep in the fishery, following the structural adjustment of early 2001. Gear information has been collected by the logbooks since their introduction. The report advocates that this information be used as a baseline to investigate effort creep in the fishery post-2001.

#### *Recommendation 9*

➤ *That the information provided on the logbook gear sheets be reviewed annually as part of the fishery assessment process and that this information be used in the planning of on-going assessments of effort creep.*

- ◆ A key issue in using logbook data for fishery assessment purposes relates to the accuracy of reported information. The Audit Report cites examples where the veracity of logbook information is questioned. It is recommended that the logbook data be validated independently, such as through at-sea observer programs or the auditing of processor records of landed catch.

#### *Recommendation 10*

➤ *That the QFS determines and implements an at-sea observer program, which validates the information provided in the trawl logbooks.*

- ◆ The Audit Report recognises the potential benefits of the electronic catch effort recording system (ECERS) in terms of its ability to monitor fishing activity on a real-time basis. The report argues that in an input-managed fishery such a tool is essential to ensure that effort limitations are not exceeded.

### ***Recommendation 11***

➤ *That a feasibility study be undertaken on the introduction of an ECERS throughout the ECTF, specifically with a view to monitoring the level of fishing activity in the GBR World Heritage Area on a real-time basis.*

- ◆ The continuation of annual, fishery-independent, long term monitoring programs (LTMPs), such as are conducted in the scallop and tiger/endeavour prawn fishery in North Queensland, is supported. The LTMPs address information gaps in the logbook data. However, a limitation is that these surveys are conducted only in areas of major commercial fishing activity. A review of the LTMPs is recommended to ensure that maximum benefit is derived from this costly (but essential) research. The review should consider the information demands now and in the future.

### ***Recommendation 12***

➤ *That a peer review be conducted on the design of the current ECTF LTMPs, with a view to:*

- (a) identifying the bias in sampling established trawl grounds;*
- (b) assessing the use of the data in current and future stock assessments; and*
- (c) extending the spatial coverage of the surveys.*

- ◆ The Audit Report notes that ECTF-associated researchers have adopted (through necessity) an “opportunistic” approach, making use of a range of research providers and funding sources. However, there is a danger that research may become “interest driven”. A more structured approach to meeting the information gaps in the fishery is advocated.

### **Fishery Assessment in the ECTF**

- ◆ The Audit Report acknowledges that stock assessment in the ECTF is a challenging and resource intensive task, given the wide geographical range of the fishery and its extensive species mix. Most target species are short lived (1 to 2 years) and there are high inter-annual and seasonal variations in catches and catch rates. Notwithstanding these constraints, the methodology used in the ECTF assessment process has several limitations.
- ◆ To date, assessments for the fishery have been based primarily on Catch per Unit Effort (CPUE) analysis. Stock assessment has been confined to some principal (target) species. Permitted species generally have not been addressed. The QFS has concluded in several status reports on the ECTF that while many of the key species appear to be “fully exploited”, their CPUE has remained relatively stable.
- ◆ The predominant use of fishery-dependant data in the stock assessment process may have introduced a bias about species distribution and abundance, which is difficult to quantify. Furthermore, historical data (where available) lack resolution in terms of species composition and fine-scale spatial effort patterns. This situation, together with concerns about the accuracy of unvalidated logbook data, raises concern over the reliability of the information used in the stock assessment process.
- ◆ Logbook data in the ECTF have been collected only since 1988. There is some historical information available from early processor records, voluntary logbooks and other studies, but it is incomplete and unchecked at this stage. The Audit Report stresses the need to conduct assessments over the life of the fishery in order to obtain the necessary contrast in the data to show the impact of the fishery on virgin biomass and to determine the relationship between equilibrium yield and fishing effort or stock size.

### ***Recommendation 13***

➤ *That, notwithstanding data quality and compatibility issues, an attempt be made to analyse historical (i.e. pre-1988) ECTF data and to assess the level of catch and effort since the fishery's inception.*

- ◆ In input-managed fisheries, changes in the effective fishing power of the fleet need to be monitored closely. This phenomenon, known as “effort creep”, has the potential to undermine any effort reductions imposed by management. If such changes are not factored into the assessment process, catch rates may appear to be steady when in fact they are declining. Interim results show that changes in fishing power in the ECTF are variable and fishery specific. In the scallop fishery it was calculated at 0.2% per year, whereas in the shallow-water eastern king prawn fishery it was calculated to be 1.6% per year. The Audit Report notes that these results refer only to the 1989-1999 period. They do not capture the technological changes in the fishery's early history, nor any recent changes since the 2001 restructure.

### ***Recommendation 14***

➤ *That there be a review of the estimated changes in fishing power in the ECTF from the fishery's inception in the 1960s till today, using both historical (pre-1988) and recent (1988 – today) data.*

- ◆ There is considerable spatial variability amongst the ECTF species, including a latitudinal trend in catch composition, aggregating behaviour, habitat preference and lifecycle-dependent distribution. Also, fishing effort is highly aggregated, with less than 31% of the available area in the GBR Marine Park being trawled in 2001. Without fishery-wide, independent surveys, it is difficult to assess species abundance in areas outside trawl grounds. Spatial variability complicates the interpretation of commercial CPUE data, because it is unknown if observed trends are a reflection of species abundance or fleet behaviour.

### ***Recommendation 15***

➤ *That, as part of the fishery assessment process, there be a fine-scale spatial analysis of the fishery in terms of species abundance and fishing effort over time, and that appropriate stratifications be applied to the CPUE data to account for the fishery's spatial variability.*

- ◆ Temporal variability can be high in tropical penaeid prawn fisheries. Species that depend on environmental conditions (such as rainfall in the case of banana prawns) may show highly variable catches and catch rates from year to year. Species with succinct spawning and recruitment events may show strong seasonal abundance. Lunar periodicity is common in most ECTF prawn species. The Audit Report stresses the need to recognise these patterns and to account for them in the assessment process.

### ***Recommendation 16***

➤ *That, as part of the fishery assessment process, there be a temporal analysis of the fishery in terms of known species abundance and fishing effort over time and that appropriate stratifications be applied to the CPUE data to account for the fishery's temporal variability.*

- ◆ The multi-species nature of the ECTF introduces a further level of complexity in the assessment process. Certain species are taken as by-product either regularly or occasionally. It cannot be assumed that CPUE is a good indicator of stock abundance for species not targeted specifically. For example, Moreton Bay bugs are listed as a principal species under the Trawl Plan. Except for areas off Townsville and Gladstone, where they

appear to be abundant, generally they are taken as by-product only. In assessing the long-term CPUE trends for Moreton Bay bugs, scientists have compared catch rates from these regions rather than the whole fishery.

#### **Recommendation 17**

➤ *That, based on all available data (i.e. logbook, LTMPs and research data), there be an assessment of the spatial distribution of commercial by-product species in the ECTF.*

- ◆ In light of the data uncertainties identified in the fishery assessment process and the limitations in the use of CPUE as a performance indicator, it is of concern that sole reliance on nominal CPUE trends may fail to warn of overfishing in the ECTF in a timely manner.

#### **Recommendation 18**

➤ *That there be a peer review of the use and limitations of using CPUE as an indicator of abundance for all principal and permitted ECTF species.*

- ◆ Assessment models are being developed for the major commercial species (scallops, tiger prawns, endeavour prawns and bugs). The Audit Report supports the development of alternative assessment techniques, but acknowledges that this may take time as relevant population parameters are tested and sensitivity analyses are conducted to determine the impact of data uncertainty on the assessments.

#### **Recommendation 19**

➤ *That the development of assessment models for the principal ECTF species be progressed as a matter of priority and that they be used in the recommended annual fishery assessment process as the input data become available.*

- ◆ The Audit Report provides an appraisal of the stock assessment findings of each of the principal species, as reported in various fishery status reports (Table 1).

**Table 1:** Key findings of the Audit Report on the assessment status of the principal ECTF species.

Species Grouping	Commercial Value	Reported CPUE Trend	CPUE as Performance Indicator	Alternative Assessment Methods	Population Status	Estimated Sustainable Catch	Life Cycle & Biology Knowledge
<b>Tiger Prawns *</b>	High	Slightly decreasing	Adequate	Surplus Production Model	Fully exploited	1,227-1,400 t/yr for FNQ	Good - Adequate
<b>Endeavour Prawns</b>	High	Slightly decreasing	Adequate	Surplus Production Model	Fully exploited	1,053 t/yr.	Good - Adequate
<b>Northern King Prawns *</b>	Medium	Decreasing	Adequate - Poor	Nil	Possibly over-exploited	Unknown	Adequate
<b>Banana Prawns</b>	Low	Decreasing	Poor	Nil	Unknown but likely to be sustainable	Unknown	Adequate - Poor
<b>Eastern King Prawns *</b>	High (outside Marine Park)	Decreasing	Adequate - Poor	Age structured model	Possibly over-exploited	Unknown	Good - Adequate
<b>Scallops *</b>	High	Decreasing	Poor	Age	Heavily	Unknown	Good -



Species Grouping	Commercial Value	Reported CPUE Trend	CPUE as Performance Indicator	Alternative Assessment Methods	Population Status	Estimated Sustainable Catch	Life Cycle & Biology Knowledge
				structured model	exploited		Adequate
Bugs *	Low	Decreasing	Poor	Nil	Possibly fully exploited	Unknown	Adequate - Poor
Squid	Low	Decreasing	Poor	Nil	Unknown	Unknown	Poor

**Note: 1.** \* denotes there are demonstrated cases of overfishing for these species within Australia.  
**2.** FNQ refers to Far North Queensland.

- ◆ The Audit Report recommends the formalisation of the ECTF assessment process. It is suggested that there be an expertise-based, annual research review and fishery assessment process, with appropriate information feedback to management, researchers, Trawl MAC and external funding bodies. Publication and dissemination of results should occur so that the most current fishery assessment information can be considered in the formulation of fisheries policy. This would focus and optimise the monitoring, research and fishery assessment work.

#### **Recommendation 20**

- *That a formalised fishery assessment process be developed for the ECTF, through Trawl MAC, which involves an expertise-based team reviewing research results and conducting the fishery and stock assessment process.*

#### **Recommendation 21**

- *That the proposed assessment process be extended to include consideration of by-product and bycatch species taken in the ECTF.*

#### **Recommendation 22**

- *That, where there are stocks of species with distributions which extend outside Queensland, the ECTF assessment process take account of the research and stock assessment work done by other jurisdictions and that there be collaboration in the stock assessment.*

### **Environmental Impact of the ECTF**

- ◆ Research has shown that benthic prawn trawling can have a significant environmental impact on the benthos and benthic communities. Bottom trawling is an indiscriminate method of capture, as indicated by high bycatch to catch ratios. Tropical prawn fisheries in particular are marked by high species diversity, the majority of which are bycatch.
- ◆ Monitoring and research work on the environmental impact of trawling in the ECTF has been, by necessity, opportunistic and *ad hoc*. Several studies have yielded detailed information on specific aspects of the fishery, but there has not been a systematic approach across the entire fishery. Until recently, only limited information had been collected on the bycatch composition of the various sectors of the ECTF.

#### **Recommendation 23**

- *That the proposed at-sea observer program collects detailed information on the composition, size and the condition of the bycatch taken in the ECTF and that this*



*information be analysed regularly as part of the proposed annual fishery assessment process.*

- ◆ Much of the ECTF bycatch in the GBR Marine Park appears to be made up of highly fecund, short-lived species, which are believed to be at a lower risk from overfishing than longer-lived species. However, trawling also has an impact on a range of species of conservation concern, including marine turtles, sea snakes, seahorses and pipefish and many shark species.

#### *Recommendation 24*

- *That there be further monitoring and research on the incidental bycatch of sea snakes in the ECTF.*

#### *Recommendation 25*

- *That there be further monitoring and research on the incidental bycatch of syngnathids and solenostomids in the ECTF, specifically with respect to their distribution within the area of the fishery.*
- ◆ The Audit Report notes the findings of the five-year study into the benthic impact of trawling in the Far Northern Section of the GBR Marine Park. A richness of biodiversity was demonstrated in the lagoonal and inter-reefal seabed and five biophysical zones were identified across the continental shelf according to their sediment type and benthic communities. The study found that trawling had a major impact on the seabed, if the fishing effort was intensive and repeated. The ability of the seabed community to recover from the impact of trawling depended on the resilience of the fauna to recover from the trawl impact and the amount of fishing effort that had been applied. The study concluded that in areas of heavy trawl activity the habitat was likely to have been modified extensively.
- ◆ Various bycatch mitigation devices are deployed in the ECTF. Turtle excluder devices (TEDs) mainly exclude marine turtles and other large bycatch such as sharks, rays and big sponges. As a result of changes to the Trawl Plan in late 2002, these devices must be used in all sectors of the ECTF and must comply with certain technical design standards. Bycatch reduction devices (BRDs) are installed primarily to exclude smaller bycatch. As there are over 1,000 bycatch species, with different swimming and behavioural characteristics, there is no common design standard that can be used for all. The Audit Report reviews the various BRDs used in the ECTF and presents preliminary data on their relative effectiveness in excluding bycatch without major product loss.

#### *Recommendation 26*

- *That the further development of BRD technology be encouraged and that performance standards, which can be applied in the performance assessment of BRDs, be developed by a group of technical experts.*
- ◆ Other measures to reduce bycatch mortality and enhance bycatch survival include the use of hoppers, which are used extensively throughout the Northern Prawn Fishery (NPF). This technology is yet to be adopted in the ECTF for smaller trawlers. Also, gear restrictions and a voluntary code of conduct on trawl times and net sizes in inshore waters off Cairns have lead to the reduction of bycatch and benthic impacts.

#### *Recommendation 27*

- *That the development and adoption of hopper technology be encouraged.*

- ◆ The Audit Report recommends that a risk assessment be undertaken in the ECTF on bycatch vulnerability to trawling. While there are several models to choose from, a quantitative approach that is based on estimated vulnerability of the bycatch species, the percentage of the population exposed to trawling and the intensity of the trawl effort, is recommended.

#### *Recommendation 28*

- *With a view to developing a risk-assessment for ECTF bycatch species, that there be an expertise-based review of those species and, that based on currently available information:*
  - (a) the species (or species groupings) taken in the ECTF be identified; and*
  - (b) their vulnerability to trawling be assessed, taking into account their known distribution and the amount of fishing effort applied.*

### **Management Arrangements in the ECTF**

- ◆ The ECTF is a complex, multi-species fishery and, for these reasons, it is difficult to monitor, assess and manage. The Audit Report acknowledges that input-based management is the most appropriate regime for the ECTF. Fisheries management needs to balance the economics of the fishery against its ecological sustainability. A precautionary approach dictates the adoption of a risk-averse management strategy, especially when dealing with uncertain fisheries data.
- ◆ Typically, fisheries management in Australia has been focussed on target species. This approach fails to encompass the wider ecosystem impacts of the fishery. The ECTF assessment and management regimes must encompass a more holistic approach as information about the ecosystem interactions in this fishery becomes available.
- ◆ If the ecological sustainability of the ECTF is threatened, recognition may come too late and management actions may be delayed. The QFS has indicated that the objectives of its fisheries legislation are to be reviewed. The Audit Report recommends a stronger focus on the objectives relating to ecological sustainability, a clear precedence of the ecological sustainability objectives over the economic objectives (if the fishery is not ecologically sustainable, it will not be economically sustainable) and the adoption of the precautionary principle.

#### *Recommendation 29*

- *That there be a review of the objectives of the Trawl Plan, with a view to ensuring the ecological sustainability of all ECTF species, maintaining biodiversity and incorporating the principles of ESD (including the adoption of the precautionary principle).*
- ◆ The lack of predetermined decision rules is of concern. Once there are signs of overfishing, an evaluation of possible management options will cause delays in taking remedial action. Such measures should be considered in advance, using a formal management strategy evaluation (MSE) approach based on simulation modelling.

#### *Recommendation 30*

- *That, as the fishery assessment process is improved, there be an expert-based review of the management measures that can be applied in situations where there is a decline in the ECTF's performance below prescribed levels and that the decision rules for such action be tested using a MSE approach.*

- ◆ The Audit Report is critical of the performance measures contained in the Trawl Plan. It is argued that these are not prescriptive enough in terms of how the assessments of the fishery's economic or ecological performances are to be conducted and the timeframe within which action must begin. The Audit Report points out that data must be available and of sufficient quality in order to be used in the prescribed surveys and studies.

### *Recommendation 31*

- *That, as the fishery assessment process is improved, there be an expert-based review of the performance measures specified in the Trawl Plan.*

- ◆ The Audit Report is critical of the Trawl Plan's performance indicators. A detailed appraisal is provided of the biological, ecological, enforcement and fisheries performance indicators and the events that would trigger some type of review. It is noted that review events have been triggered in the past without any action being taken. There is ambiguity in the wording of most of the performance indicators, which leaves scope for interpretation. The Audit Report supports the review processes for the performance indicators initiated by the QFS.

### *Recommendation 32*

- *That the current review of performance indicators and review events be completed by the end of 2003 and that amendments be made to the Trawl Plan by early 2004 (incorporating the recommendations of the review) and that these revised performance indicators be used in assessing the status of the ECTF by the end of 2004.*

- ◆ The Audit Report supports the use of input-based management measures because this approach is the most pragmatic for highly variable prawn fisheries. However, this approach has several limitations, which need to be recognised. Input-based management measures are not species specific. A possible decline in any one of several species taken in the fishery cannot be addressed in isolation. The application of available management measures (such as extended temporal and spatial closures) would result in restrictions on the take of species not of assessment concern.
- ◆ The effort reductions achieved through the introduction of the revised Trawl Plan and the Structural Adjustment Scheme are acknowledged. However, the Audit Report views the allocation of an additional 14 steaming days per operator in 2001 as an allocation of additional effort (8%). The reduction of steaming days to four in late 2001 is seen as an improvement, but still is in excess of what the QFS' own analysis has indicated as being required by the fleet. In this context, the implementation of gear monitors is recommended for the ECTF.
- ◆ The issues of most concern with the current ECTF management arrangements are the potential for increase in real fishing effort and the Trawl Plan's inability to reduce fishing effort directly if this becomes necessary. Under the current effort unit system, reductions can be achieved only through the penalty provisions for vessel upgrades and the transfers of licences and effort units (to compensate for effort creep in the fishery), increased temporal and spatial closures and the emergency closure and banning powers of the QFS's Chief Executive. The Audit Report points out that, based on fisheries experiences world-wide, industry usually will develop ways to compensate for these effort reductions through increased efficiency.
- ◆ The Audit Report proposes the introduction of a proper "Total Allowable Effort" (TAE) system, which allows for the adjustment of effort on an annual basis in light of the latest assessment advice. A formal fishery assessment process (which considers allowable effort levels and changes in fishing power) is a requirement for a TAE system.

### *Recommendation 33*

- *That the QFS considers the feasibility of adopting a TAE system, in which the permitted effort level is reviewed and adjusted (if necessary) on an annual basis in light of fishery assessment advice, and which permits the across-the-board reduction of effort units if this is required for resource sustainability.*
- ◆ The Audit Report generally supports the suite of management measures contained in the Trawl Plan. The introduction of a VMS is seen as a positive step in obtaining real-time, high-resolution data on trawl activity that will have enforcement and fishery assessment benefits.
- ◆ The adequacy of the current possession and minimum size limits for principal and permitted species is addressed. The Audit Report questions both the scientific basis for setting some of these limits and their enforceability. It is suggested that greater emphasis should be placed on the management of by-product (i.e. permitted species).

### *Recommendation 34*

- *That there be a review of the current limits on by-product (i.e. permitted species) in light of new fishery assessment advice and adopting the principles developed for adding or removing species from the “permitted species” list.*
- ◆ The Audit Report supports the initiatives by the QFS to develop a more rigorous system for the determination of species classification (as principal, permitted or bycatch) based on the best available stock assessment advice.

### *Recommendation 35*

- *That a process be determined for adding species to and removing them from the categories of “principal species” and “permitted species” under the Trawl Plan, taking into account the status of information on the species and adopting a precautionary approach in light of any uncertainty.*
- ◆ The Audit Report is critical of the time it has taken to revise the TED and BRD provisions of the Trawl Plan in order for them to be enforceable. It is acknowledged that the technical specifications for TEDs finally were resolved in late 2002 and that now they are consistent with the standards in other prawn fisheries and the provisions of the Turtle Recovery Plan (still in draft). With respect to BRDs, there are improvements still to be made. The Audit Report acknowledges that the development of appropriate BRD technology is a lengthy, complex and resource-intensive issue. A rigorous system for developing and testing new devices is supported.

### *Recommendation 36*

- *That the Trawl Plan be amended, as a matter of priority, to tighten the current BRD provisions, taking into account the specifications recommended by the Technical Working Group of Trawl MAC.*

### *Recommendation 37*

- *That a process be determined for adding new or removing existing BRDs from the permitted devices listed under the Trawl Plan, taking account of proposed technical performance standards developed for such devices.*

#### *Recommendation 38*

- *That there be more stringent enforcement of the TED and (proposed revised) BRD provisions of the Trawl Plan and that annual statistics be provided on the level of compliance.*

- ◆ The level of compliance with the Trawl Plan's management arrangements is integral to the plan's performance. The adequacy of current enforcement and surveillance arrangements are discussed throughout the Audit Report. Penalties, which act as a disincentive for non-compliance, are important. Acknowledging the QFS' Chief Executive's discretionary powers in this regard, the Audit Report urges the adoption of more stringent administrative sanctions for "serious fisheries offences".

#### *Recommendation 39*

- *That there be a greater level of reporting on enforcement and compliance issues in the ECTF, including the types of offences committed, the number of inspections (where relevant) and the subsequent legal and administrative actions.*

#### *Recommendation 40*

- *That there be a review of the types of offences considered "Serious Fisheries Offences" under the Trawl Plan 1999, identifying the administrative actions (if any) taken by the QFS and the grounds on which action was taken or not taken.*

### **Summary**

- ◆ An appraisal of how well the objectives of the Trawl Plan have been met in the past two years since the introduction of the revised management arrangements is presented in Table 2. The rationale for these comments is contained in Sections 4, 5, 6 and 7 of the Audit Report.
- ◆ The Audit Report notes that the performance indicators of the Trawl Plan generally have been met, as per the reports on the "*Status of the Queensland East Coast Otter Trawl Fishery after the First Effort Year (2001)*" (QFS, 2002) and the "*Ecological Assessment of the Queensland East Coast Otter Trawl Fishery*" (Zeller, 2002). However, the adequacy of the Trawl Plan's performance measures, indicators and review events in detecting issues of concern is questioned. The Audit Report supports the review of these provisions of the plan so that appropriate changes can be made and more meaningful performance measures and indicators can be used in the assessment of the ECTF's ecological sustainability by the end of 2003.
- ◆ Clearly, changes to the revised Trawl Plan have progressed the ecological sustainability of the ECTF and assisted with the mitigation of the impact of the fishery on the environment. The Audit has indicated where further improvements are required if the fishery is to be managed according to public expectations of the management of the natural resources of the Great Barrier Reef Marine Park and in line with the requirements of the Commonwealth's environmental legislation. The recommendations of this report should be therefore viewed as constructive advice on how current arrangements may be improved.

**Table 2:** Provisions of the Trawl Plan regarding its management objectives, achievement measures, performance measures, review events and performance indicators, and the Audit Report's appraisal of each.

<b>Objective (a)</b> <b>“Manage the fishery in a way that gives optimal, but sustainable community benefit”</b>	
Management Plan Provisions	Audit Report's Comments
<p><b>How objective is to be achieved</b>  The objective is to be achieved by providing fair fishing opportunities for commercial and recreational fishers and Aborigines and Torres Strait Islanders.</p>	<p>➤ Access is granted to all stakeholders in the ECTF (including commercial, recreational and indigenous people). “Fair fishing opportunities” has not been defined and information is limited on the participation of non-commercial fishers. The Audit Report is therefore not in a position to comment on how well this objective has been achieved.</p>
<p><b>How achievement is to be measured</b>  Achievement of the objective may be measured only by–</p> <p>(a) surveys, accepted by the chief executive, of fishing for fisheries resources taken in the fishery by commercial and recreational fishers and Aborigines and Torres Strait Islanders; and</p> <p>(b) commercial fishing catch and effort data for the fishery received by the chief executive.</p>	<p>➤ Recreational fisheries data are collected through biennial recreational fishing surveys in Queensland. Information is presented on the state-wide recreational take of “prawns”. Information on the Indigenous take of ECTF species does not appear to be available. [See Section 4.3.6.]</p> <p>➤ Commercial fishing data are received by the QFS through ECTF logbooks. There are some concerns about the veracity and level of resolution of these data and, consequently, their impact on fishery assessment. [See Sections 4.3, 4.4, 5.2, 5.3, 5.5 and 7.1.]</p>
<p><b>Review events</b>  The review events for the achievement of the objective are–</p> <p>(a) a survey mentioned in (a) above shows a significant decline in the catch of principal fish; or</p> <p>(b) data mentioned in (b) above shows a significant decline in the commercial catch of principal fish;</p>	<p>➤ These review events relate to the economic performance of the ECTF.</p> <p>➤ “Significant” is not defined. Terms of Reference for the survey are not defined.</p> <p>➤ Catches may decline for reasons other than resource abundance (e.g. fewer operators, less effort, weather conditions, etc.). Stock assessment is required to determine the reasons behind declining catches of principal species. [See Sections 5.2, 5.3 and 5.5.]</p> <p>➤ The review events are target species-specific. A community cost is involved if the sustainability of by-product or bycatch species becomes threatened as a result of overfishing and/or the impact of trawling.</p>

<b>Objective (b)</b> <b>“Ensuring fisheries resources taken in the fishery are taken in an ecologically sustainable way”</b>	
Management Plan Provisions	Audit Report’s Comments
<p><b>How objective is to be achieved</b></p> <p>The objective is to be achieved by the following -</p> <ul style="list-style-type: none"> <li>(a) the provisions of this plan about effort units;</li> <li>(b) the closed waters declarations under this plan;</li> <li>(c) the regulated fish declarations under this plan;</li> <li>(d) limiting, under chapters 3 and 4, the commercial fishing apparatus that may be used under the plan;</li> <li>(e) the boat modification and replacement restrictions under chapter 3, part 8;</li> <li>(f) the main engine power restrictions under chapter 3, part 8, division 2 for boat modification or replacement.</li> </ul> <p><b>How achievement is to be measured</b></p> <p>Achievement of the objective may be measured only by the following -</p> <ul style="list-style-type: none"> <li>(a) the level of compliance with this plan;</li> <li>(b) catch and effort data received by the chief executive for principal fish;</li> <li>(c) the abundance of principal fish;</li> <li>(d) how many effort units are surrendered under sections 117, 118 and 132(2);</li> </ul>	<ul style="list-style-type: none"> <li>➤ Measures (a) to (f) are primarily input-control management tools with the potential to limit expanding fishing effort. As with most input controls, increased efficiency by the fleet (i.e. effort creep) generally overcome these effort limitations. [See Sections 5.2, 7.1, 7.3 and 7.5.]</li> <li>➤ With respect to (a), the number of effort units and the value of effort units cannot be altered under current Queensland fisheries legislation. [See Section 7.3.2.]</li> <li>➤ With respect to (b) and (c), restrictions on the available area of the fishery and target species may result in the redistribution of effort. [See Sections 7.3.4 and 7.3.5.]</li> <li>➤ With respect to (b) and (c), these restrictions partially limit the effort that may be applied in the fishery. However, other factors (not restricted) can lead to increases in effective effort by the fleet. [See Section 7.3.2.]</li> <li>➤ Insufficient compliance information has been provided by the QDPI to measure achievement. [See Sections 7.2.3 and 7.3.7.]</li> <li>➤ There are concerns over the unverified nature of ECTF logbook data and the appropriateness of nominal CPUE as a performance indicator for stock abundance. By the time significant declines are noticed in the nominal CPUE, the fishery may already be over-fished. [See Sections 5.2, 5.3. 5.5 and 7.1.]</li> <li>➤ The Audit Report notes that current ECTF stock assessments examine primarily nominal CPUE trends. Fishery-independent stock assessments and the development of assessment models are limited in the ECTF. Also, assessment of the sustainability of the ECTF resources is restricted to principal (i.e. target) species only. [See Sections 5.2 and 5.3.]</li> <li>➤ Information on effort unit holdings and transactions is monitored by the QFS. The Audit Report notes that if effort creep exceeds the effort reductions achieved through the surrender of effort units, there will be an increase in effective effort in the fishery. [See Sections 5.2.3, 7.2.4 and 7.3.2.]</li> </ul>



<p>(e) studies or surveys accepted by the chief executive on the average size, or the main engine power, of boats in the fishery.</p> <p><b>Review events</b> Each of the following is a review event for the achievement of the objective-</p> <p>(a) CPUE for the following principal fish in the following periods is less than 70% of the average CPUE for principal fish from 1988 to 1997-</p> <p>(i) for bay prawns (greasy prawns) – 1 November to the end of February;</p> <p>(ii) for eastern king prawns – 1 November to the end of February and 1 May to 31 August;</p> <p>(iii) for bugs – 1 November to the end of February or 1 May to 31 October;</p> <p>(iv) for red spot king prawns – 1 June to 30 September;</p> <p>(v) for saucer scallops – 1 November to the end of February;</p> <p>(vi) for tiger prawns – 1 March to 30 June and 1 September to 31 December;</p> <p>(b) the chief executive accepts a study of catch and effort data that show a significant decline in a principal fish;</p> <p>(c) the chief executive accepts a scientific study that show a significant decline in the abundance of a principal fish species;</p>	<p>➤ Average boat size has increased in the ECTF following the licence buy-out in early 2001. Regular collation of these data is required to monitor the situation on a continual basis.</p> <p>➤ The Audit Report is concerned about the sole reliance on nominal CPUE as a performance indicator of stock abundance and notes that the 70% reference point is based on Western Australian stock assessment findings for tiger prawns. The wording of the review period is defined poorly, leaving ambiguity as to its interpretation. Some principal species and all bycatch species are not covered by the review event. The adequacy of the review periods is questioned for some species. The Audit Report notes that a review event has been triggered potentially (depending upon definition) for 4 of the 6 listed species. There has been on subsequent management action. [See Sections 7.1.4 and 7.2.1.]</p> <p>➤ Review period coincides with fishery season and recruitment period. Review event has been triggered potentially.</p> <p>➤ Review period coincides with fishery season and recruitment period.</p> <p>➤ Review period coincides with fishery season and spawning period. Review event has been triggered potentially.</p> <p>➤ Review period coincides with fishery season and spawning period. Review event has been triggered potentially.</p> <p>➤ Review period coincides with fishery season.</p> <p>➤ Review period coincides with fishery season, spawning and recruitment period. Review event has been triggered potentially.</p> <p>➤ By the time significant declines are noticed in nominal CPUE, the fishery may be over-fished already. “Significant” is also not defined. [See Sections 5.2, 7.1 and 7.2.]</p> <p>➤ With the exception of tiger and endeavour prawns, there are no published assessment reports on the maximum sustainable yield of the ECTF species. Nominal CPUE trends are generally used as an indicator of stock abundance. Only the key principal species are assessed regularly. [See Sections 5.2 and 5.3.]</p>
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<p>(d) more than 5% of boats in the fishery in 2000 or a subsequent year are used to commit an offence under the plan;</p> <p>(e) the number of effort units has not decreased by-</p> <ul style="list-style-type: none"> <li>(i) 13% or more in the first effort year;</li> <li>(ii) 1% or more in any subsequent effort year; or</li> <li>(iii) 2% or more during 2 consecutive effort years for any licence;</li> </ul> <p>(f) the chief executive accepts a study or survey that shows –</p> <ul style="list-style-type: none"> <li>(i) a significant change in the relative distribution of boat hull units in the fishery; or</li> <li>(ii) average main engine power for boats in the fishery is increasing.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Notwithstanding the ambiguity in the wording of this review event, the review event appears to have been triggered in 2001. [See Sections 7.2.3 and 7.3.7.]</li> <li>➤ Effort unit reductions through effort unit surrenders and penalties on transactions amounted to 3% in 2001 and accord with the outcome of the GBRMC28. The situation will need to be monitored closely and estimates of effort creep in the ECTF since 1 January 2001 are required. [See Sections 5.2.3 and 7.3.2.]</li> <li>➤ Average boat size has increased in the ECTF following the licence buy-out in early 2001. Regular collation of these data is required to monitor the situation on a continued basis.</li> <li>➤ Apart from the gear sheet information in the OT07 logbooks, this information is not collected routinely. The last comprehensive survey on fleet profile was conducted prior to the structural adjustment scheme and the introduction of revised management arrangements. Increases in hull size and engine power are likely to lead to effort creep in the ECTF under the new management arrangements. [See Sections 5.2.3 and 7.2.1.]</li> </ul>
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<b>Objective (c)</b> <b>“Ensuring the sustainability of the fishery’s ecological systems”</b>	
<b>Management Plan Provisions</b>	<b>Audit Report’s Comments</b>
<p><b>How objective is to be achieved</b> The objective is to be achieved by -</p> <p>(a) the closed waters declarations under this plan; and</p> <p>(b) limiting, under chapters 3 and 4, the commercial fishing apparatus that may be used under this plan; and</p> <p>(c) the requirements under this plan for using a BRD or TED</p> <p><b>How achievement is to be measured</b> Achievement of the objective may be measured only by surveys or studies, accepted by the chief executive, of commercial fishing for principal fish by trawling in the fishery.</p> <p><b>Review events</b> Each of the following is a review event for the achievement of the objective-</p> <p>(a) a scientific study, showing levels accepted by the chief executive, shows the amount for any of the following is not, by 1 January 2005, reduced by the following percentage compared with an amount reported in a scientific study showing the levels before the notification day-</p> <p>(i) benthos-25%;</p>	<p>➤ Seasonal closures to protect parts of the life cycle may assist certain susceptible bycatch species. Similarly, spatial closures may assist susceptible bycatch species that demonstrate a strong habitat preference. Closures also would limit the impact of trawling on fragile benthic habitats. However, little is known about the biology of most bycatch species and ecosystems to make such assessments. [See Section 6.1.3.]</p> <p>➤ Limitations on fishing apparatus may assist, but requires knowledge of how trawling impacts on bycatch species, benthic communities and habitat. [See Section 6.2.4.]</p> <p>➤ The requirement for minimum design standards for TEDs was revised under the Trawl Plan in December 2002, making the permitted TED designs more stringent to ensure effective deployment. The provisions for BRDs still are to be revised to maximise their effectiveness. Further research and development also is required into BRD designs. [See Sections 6.2.1 and 7.3.6.]</p> <p>➤ The health and sustainability of the fishery’s ecological systems cannot be measured by the population dynamics of the target species. There are no regular surveys or studies to assess the impact of trawling or changes in bycatch species composition. There is no formal ecological assessment process. [See Sections 4.3.4 , 6.3.3 and 6.3.5.]</p> <p>➤ In order to measure comparative reductions, knowledge is required of the “baseline“. There are no systematic surveys or studies, which quantify the benthic impact and bycatch for the entire ECTF prior to 1 January 2001. The Terms of Reference for a scientific study have not been specified. [See Section 7.2.2.]</p> <p>➤ The 25% figure is not justified in terms of ecological sustainability, nor is it specified how it will be calculated.</p>

<p>(ii) the amount of fish taken other than principal fish-40%;</p> <p>(b) more than 5% of boats in the fishery in 2000 or a subsequent year are used to commit an offence under the plan;</p> <p>(c) turtle capture or mortality for any of the following species is in any year more than 5% of the average level of turtle capture or mortality for species in the Robins report-</p> <ul style="list-style-type: none"> <li>(i) flatback turtle;</li> <li>(ii) green turtle;</li> <li>(iii) hawksbill turtle;</li> <li>(iv) leatherback turtle;</li> <li>(v) loggerhead turtle;</li> <li>(vi) olive ridley turtle;</li> </ul> <p>(d) the chief executive receives a logbook return for the fishery that shows trawling has happened in an area represented on a grid stated in the logbook where trawling has not previously been recorded in a logbook return;</p> <p>(e) the chief executive accepts a scientific study or survey that shows the level of winter whiting by-catch between 1 April and 1 June has not significantly declined in the area mentioned in schedule 3, section 72(1), before 2003.</p>	<ul style="list-style-type: none"> <li>➤ The 40% figure is not justified in terms of ecological sustainability, nor is it specified how it will be calculated.</li> <li>➤ Notwithstanding the ambiguity in the wording of this review event, the review event appears to have been triggered in 2001. [See Sections 7.2.3 and 7.3.7.]</li> <li>➤ With an amendment to the minimum TED design specifications in the Management Plan, the likelihood of turtle capture should have been significantly reduced. There is no independent verification of logbook reports of turtle interactions. [See Sections 6.1.2, 6.2.1. and 7.2.2.]</li> <li>➤ The Audit Report is unaware of any data to ascertain if the review event has been triggered. This review event presumably refers to fishery expansion rather than illegal fishing in closed zones. Onus should be on the regular monitoring of spatial fishery-wide trends (in terms of expansion and contraction) rather than on individual logbook records. [See Section 7.2.2.]</li> <li>➤ The Audit Report does not comment because winter whiting are taken outside the Great Barrier Reef Marine Park.</li> </ul>
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<b>Objective (d)</b> <b>“Providing an economically viable, but ecologically sustainable, trawl fishery”</b>	
<b>Management Plan Provisions</b>	<b>Audit Report’s Comments</b>
<p><b>How the objective is to be achieved</b></p> <p>The objective is to be achieved by -</p> <ul style="list-style-type: none"> <li>(a) providing commercial fishers with fair access to permitted fish in the fishery; and</li> <li>(b) minimising restrictions, on a sustainable basis, on trawling; and</li> <li>(c) the provisions of this plan about effort units.</li> </ul> <p><b>How achievement is to be measured</b></p> <p>Achievement of the objective may be measured only by -</p> <ul style="list-style-type: none"> <li>(a) studies or surveys accepted by the chief executive on economic aspects of the fishery, and</li> <li>(a) how many effort units are surrendered under sections 117, 118 and 132(2).</li> </ul> <p><b>Review events</b></p> <p>Each of the following is a review event for the achievement of the objective-</p> <ul style="list-style-type: none"> <li>(a) the chief executive’s acceptance of an economic study of the fishery that shows a significant decline in the fishery’s economic efficiency;</li> <li>(b) the number of effort units decreases by- <ul style="list-style-type: none"> <li>(i) 4% or more in each of 3 consecutive years; or</li> <li>(ii) 5% or more in each of 2 consecutive years; or</li> <li>(iii) 6% or more in an effort year after the second effort year;</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>➤ Following a Trawl Plan Review (August 2002), trip limits have been set for by-product species. These limits were based on the average take of permitted species by ECTF operators and not on estimates of stock sustainability. [See Section 7.3.5.]</li> <li>➤ Input controls by definition aim to restrict the operational efficiency of the fleet. [See Sections 7.3.1 and 7.3.2.]</li> <li>➤ The introduction of tradable effort units has led to an autonomous fishery restructure after the completion of the Structural Adjustment Scheme. [See Section 7.2.4.]</li> <li>➤ The Audit Report is unaware of any study or survey into the economic aspects of the fishery since 1 January 2001.</li> <li>➤ This information has been monitored and reported on by the QFS since 1 January 2001. [See Section 7.2.4.]</li> <li>➤ Information was not made available to determine if this review event has been triggered. However, given the achievements of the Structural Adjustment Scheme and subsequent effort reductions, it is unlikely that the economic efficiency of the ECTF would have decreased since 1 January 2001.</li> <li>➤ The GBRMC 28 outcome required an effort reduction of 3% per annum to compensate for effort creep in the fishery. This was achieved in 2001. [See Section 7.2.4.]</li> </ul>

<p>(c) the chief executive's acceptance of a study that shows effort units consistently can not be obtained by transfer;</p>	<p>➤ The Audit Report is unaware of any study into the trading of effort units. The ability to acquire effort units is subject to normal supply and demand considerations. The type of management intervention that might be triggered by this review event is questioned.</p>
<p>(d) the chief executive accepts a study or survey that shows a total of more than 15,000 fishing days under "M1" and "M2" licences in a year.</p>	<p>➤ The Audit Report does not address this review event as it refers to the fishery outside the Great Barrier Reef Marine Park.</p>

<b>Objective (e)</b> <b>“Ensuring fair access to fisheries resources on a sustainable basis”</b>	
<b>Management Plan Provisions</b>	<b>Audit Report’s Comments</b>
<p><b>How objective is to be achieved</b>  The objective is to be achieved by regulating commercial fishers to ensure fair access to and use of fisheries resources taken in the fishery by persons other than commercial fishers.</p> <p><b>How achievement is to be measured</b>  Achievement of the objective may be measured only by –</p> <p>(a) surveys, accepted by the chief executive, of fishing for fisheries resources taken in the fishery by commercial and recreational fishers and Aborigines and Torres Strait islanders; and</p> <p>(b) commercial fishing catch and effort data for the fishery received by the chief executive.</p> <p><b>Review events</b>  It is a review event for the achievement of the objective if-</p> <p>(a) a survey mentioned in (a) above shows a significant decline in the catch of principal fish; or</p> <p>(b) data mentioned in (b) above show a significant decline in the commercial catch of principal fish.</p>	<p>➤ This objective deals with resource allocation. According to the biennial recreational fishing survey, the usage of ECTF resources by non-commercial fishers appears to be low. [See Section 4.3.6.]</p> <p>➤ Recreational fisheries data are collected through biennial recreational fishing surveys in Queensland. Information is presented on the state-wide recreational take of “prawns”. Information on the Indigenous take of ECTF species does not appear to be available. [See Section 4.3.6.]</p> <p>➤ Commercial fishing data are received by the QFS through ECTF logbooks. There are some concerns about the veracity and level of resolution of these data and, consequently, their impact on fishery assessment. [See Sections 4.3, 4.4, 5.2, 5.3, 5.5 and 7.1.]</p> <p>➤ “Significant” is not defined. Terms of Reference for the survey are not defined.</p> <p>➤ Catches may decline for reasons other than resource abundance (e.g. fewer operators, less effort, weather conditions, etc.). Stock assessment is required to determine the reasons behind declining catches of principal species. [See Sections 5.2, 5.3 and 5.5.]</p> <p>➤ The review events are target species-specific. A community cost is involved if the sustainability of by-product or bycatch species becomes threatened as a result of overfishing and/or the impact of trawling.</p>