

8 Effort Management

8.1 Review of Effort Management Tools under the Fisheries (East Coast Trawl) Management Plan 1999

8.1.1 Purpose

This section of the Effort Review reports on the mechanisms currently in place to manage effort in the East Coast Trawl Fishery, and outlines the performance of the fishery in achieving the effort reductions outlined in various agreements made between the Queensland Government, Industry and the Commonwealth Government. Effort management forms the basis of the Plan and probably constitutes the largest single reform that the trawl fishery has undergone. Fishing effort is measured and discussed in several contexts as described below.

8.1.2 Measures of Effort

Fishing Days

Fishing days have historically been used to measure and record fishing effort in the QECTF (and most fisheries). In the past, a fishing day has simply been a day in which a particular vessel or vessels fished. However, this is not the case anymore.

During the effort allocation process, days fished were counted from individual logbooks in the QECTF. These days formed the basis of the decisions regarding the allocation of effort. As a result of this process, each licence was allocated a certain number of "fishing days". Fishing days are the simplest measure of effort, however, other measures have been chosen for specific circumstances because they allow greater accuracy.

Steaming Days

Four steaming days are allocated to operators on an annual basis. These days are issued to compensate for circumstances where the Vessel Monitoring System records an individual as having fished (and therefore deducts a fishing day from the licence) and the fisher disputes the use of the day however is not able to provide sufficient evidence to convince the decision-maker that fishing did not occur.

Note: It is legal for operators to fish on a steaming day.

Over Quota Days

As discussed above, each operator is allocated a certain number of fishing days and is allowed to supplement these days with steaming days. If an individual continues to fish once all of their fishing and steaming days are used, each subsequent day is recorded as an over quota day. There are very few over quota days recorded each year.

Active Days

An active day is any day on which trawling occurs. Active days are therefore a summation of fishing days, steaming days and over quota days. Active days are usually used when discussing effort in conjunction with catch (such as CPUE), as active days are in effect what the logbook system records. Active days used to be referred to as "fishing days" or "days fished" prior to the implementation of the Plan.

Hull Units

Hull Units are a measure of the size of each vessel. In short, Hull Units are a measure of the underdeck volume of the boat.

Effort Units

Effort Units (EUs) form the basis of the Effort Management System (EMS) under the Plan. Once the number of fishing days that each operator was entitled to had been calculated, these days were converted to EUs based upon the size of each individual vessel (measured in Hull Units). Therefore a EU is a standardised measure of fishing effort; hence a large vessel requires more EUs than a smaller vessel to make one fishing day.

EUs were introduced into the QECTF to account for the fact that a small vessel is not likely to exert the same amount of “fishing power” in one active day as a larger boat. The EMS is based upon an inter-tradeable system, it was important that some commensurate measure of effort was introduced that could be traded between licences. An EU is a standardised measure of fishing effort, regardless of the vessel it is used by a large vessel requires more EUs to make one fishing day than a small vessel. In this way effort creep, whereby whole fishing days are transferred from small vessels to large ones, is countered.

EUs only pertain to fishing days. That is, the EUs were converted from fishing days to allow trading. The steaming days are issued to each individual on a yearly basis and are not tradable. There is therefore no general need to discuss steaming days in terms of EUs (with the following exception).

Notional Effort Units

As part of the agreement between the State and Commonwealth Governments regarding the Plan, a specific cap on the use of effort in the GBRWHA was agreed upon. This cap was to be measured in EUs (as they are the most appropriate measure of absolute fishing effort). The Great Barrier Reef Marine Park Authority raised concerns that fishing could occur on steaming days without contributing to the cap. This was particularly a concern at the time as each operator was issued 14 steaming days per year (as opposed to the current 4).

Notional effort units therefore include fishing days, steaming days and over quota days and were introduced specifically, and only for measuring effort in the GBRWHA in terms of the effort cap. In this regard, the Clients Licensing System (a DPI&F data base linked to VMS) converts all active days to notional EUs.

8.1.3 Relationship between Boat Length and Fishing Power

While there is general agreement that there is a relationship between the size of a boat and its fishing ability, researchers, managers and industry have struggled to reach agreement on the nature of the relationship. In April 2000, the Department contracted the Commonwealth Scientific and Industrial Research Organisation (CSIRO) to develop a model that quantified the relationship. CSIRO completed this task by comparing the catch rates of given vessels with their attributes. The CSIRO model formed the basis of the “Effort Unit Conversion Factors” (EUCFs) that are now included in the Plan.

As stated above, a single EU constitutes the same amount of fishing power regardless of which licence uses it. As a large boat requires more EUs to make a fishing day than a small boat the EUCF is used to define the number of EUs required by a given sized boat to make each fishing day. Table 8.1 summarises the EUCF (or number of effort units per fishing day) for each size-class of boat.

Table 8.1. Effort Unit Conversion Factors (Schedule 5 of the *Fisheries (East Coast Trawl) Management Plan 1999*).

Hull Units	EUCF	Hull Units	EUCF	Hull Units	EUCF
1	3	26	29	51	49
2	5	27	30	52	49
3	6	28	31	53	50
4	7	29	32	54	51
5	9	30	33	55	51
6	10	31	33	56	52
7	11	32	34	57	53
8	12	33	35	58	54
9	13	34	36	59	54
10	14	35	37	60	55
11	15	36	37	61	56
12	16	37	38	62	56
13	17	38	39	63	57
14	18	39	40	64	58
15	19	40	40	65	58
16	20	41	41	66	59
17	21	42	42	67	60
18	22	43	43	68	60
19	23	44	43	69	61
20	24	45	44	70	62
21	25	46	45		
22	26	47	46		
23	27	48	46		
24	28	49	47		
25	28	50	48		

The application of EUCFs accounts for the majority of effort creep that occurs through size increase when a small boat is replaced with a large one. It does not, however account for effort creep as a result of technological improvement, engine size change etc.

8.1.4 Effort Unit Reduction Targets

During the development of the Fisheries (East Coast Trawl) Management Plan 1999 (Plan) in general and the effort management component specifically, there were considerable negotiations about the need to reduce fishing effort in the fishery. The magnitude of the required reductions and the mechanisms needed to achieve them were particular points of discussion.

Between 1999 and 2000, this topic was discussed in many forums, including a task force of the Great Barrier Reef Ministerial Council (GBRMC), the GBRMC itself, and a stakeholder working group set up by the Premier of Queensland. The outcomes from such forums were used in negotiations between the parties.

The final agreements reached between industry representatives, the Queensland and Commonwealth Governments are based upon the outcomes of the Premiers Stakeholder Working Group (PSWG) and are largely reflected in the Plan.

In short, the agreement that was reached as far as effort management in the wider trawl fishery was as follows:

- Use the 1996 levels of fishing effort as a starting point (108,356 days);
- Immediate reduction of 5% of fishing days as the industry contribution to a structural adjustment scheme (reduced to 1996 level to 102,929 days);

- Government funded “buy-back” to target removal of a further 10% of effort units;
- Inclusion of surrender provisions to annually reduce the number of effort units in the fishery to compensate for increases in fishing effort due to boat replacement, technology uptake and other factors (effort creep); and
- A mandatory review of fishing effort in the fishery after three effort years (the GER).

This agreement differed from early deliberations by the GBRMC and its task force, which advocated an effort cap based on 1996 levels, followed by a reduction of 15% over the first three effort years, followed by a review. If that review demonstrated that effort was not yet sustainable, a further 10% reduction (5% per year) in effort would be required in 2004 and 2005. It was determined that this regime would have a significant negative impact the economic viability of individuals in the fishery and was not accepted by the Queensland Government.

Effort Reduction Targets in the Plan

According to Schedule 2 of the Plan, in order to meet the objective of “ensuring fisheries resources are taken in an ecologically sustainable way”, the number of EUs must decrease by:

- 13% or more in the first effort year; and
- 1% or more in each subsequent effort year; and
- 2% or more during every 2-effort years for any licence.

Schedule 2 also states that to meet the objective of “providing an economically viable, but ecologically sustainable, trawl fishery”, the number of EUs must not decrease by:

- 4% or more in each of 3 consecutive effort years; or
- 5% or more in each of 2 consecutive effort years; or
- 6% or more in an effort year after the second effort year.

Therefore, the minimum effort unit reduction under the Plan is 1% per year and the maximum is 6%. If this range is not adhered to, a “review” is to be initiated. Obviously, the GER is far more significant than a review based on these targets would be, but seeks to achieve the same goal: ensuring the ecological sustainability of fishing effort.

Effort Reductions to account for Effort Creep

The current effort management system requires surrenders on transfer of licences, transfers of effort units and vessel replacements. The PSWG stated in it’s report: “Concern was expressed about the potential for trawl fishing effort to continue to increase through the adoption of technology and by boat replacement...To compensate for this eventuality, it has been agreed vessel replacement and trading in effort units will incur a penalty.”

The surrender provisions that have been included in the Plan (discussed below) were expected to meet an annual reduction of 3%. This reflects the best estimate of effort creep that was available at the time (in 2000). This was primarily based on extrapolation of data from the Northern Prawn Fishery (Gulf of Carpentaria). As discussed in Section 3.1.5, the Department of Primary Industries and Fisheries has now conducted an in-depth analysis of the factors that contribute to effort creep in the trawl fishery. This analysis indicated that for the period 1989 to 1999 effort creep varied from 0.226 and 1.591 per year depending on fishing sector. On a whole of fishery basis, this equates to an annual increase of approximately 1% per year.

It is recommended by the Review that the figure of 1% annual increase in fishing power be used in assessing effort reductions in the Fishery.

Effort Reductions Required by 31 December 2003

Table 8.2 outlines the required effort unit reductions according to the agreement reached prior to the introduction of the Effort Management System.

Table 8.2. Required effort unit reductions.

	Based on 1% Effort Creep per year		Based on 3% Effort Creep per year	
	Annual Reduction	Cumulative Reduction	Annual Reduction	Cumulative Reduction
Starting amount	100.00%		100.00%	
SAS	15.00%		15.00%	
Remaining	85.00%	15.00%	85.00%	15.00%
2001 Surrenders	1.00%		3.00%	
Remaining	84.15%	15.85%	82.45%	17.55%
2002 Surrenders	1.00%		3.00%	
Remaining	83.31%	16.69%	79.98%	20.02%
2003 Surrenders	1.00%		3.00%	
Remaining	82.48%	17.52%	77.58%	22.42%

On the basis that effort creep occurs at a rate of 1% per year, the 1996 level of effort should have been reduced by a total of 17.52% during the first three effort years via the Structural Adjustment Scheme and the surrender provisions in the Plan (Table 8.2). If an effort creep rate of 3% per year were applied, the cumulative reduction target would be 22.42%.

8.1.5 Effort Reduction Strategies

There are three effort reduction strategies contained in the Plan that reflect the outcomes of the PSWG. These are primarily market based and seek to remove EUs from individuals in the fishery when they engage in certain activities. These are often referred to as “penalties”, which is not an accurate description. The concept of a penalty is to discourage certain activities, whereas these activities are vital in order for the fishery to meet the desired EU reduction.

The three EU surrender requirements are:

Licence Transfers: When a licence changes ownership, a total of 5% of the total number of EUs held on the licence must be surrendered to the chief executive. This surrender provision is detailed in section 117 of the Plan;

Effort Unit Trading: As described above, EUs are a tradeable quota unit. However, when packages of EUs are transferred from one trawl licence to another, a total of 10% of the number being transferred must be surrendered to the chief executive. This surrender provision is detailed in section 118 of the Plan; and

Boat Replacement: When a licence holder wishes to place their trawl licence on a new boat (or make significant modifications to the existing boat), they are required to surrender a certain number of EUs. The magnitude of the surrender is dependant on the size of the new boat that is to be attached to the licence and varies from as little as 67 EUs to as high as 2,931. The requirement for this surrender is detailed in section 132 of the Plan and the number of EUs to be surrendered (for each size-class of boat) is in Schedule 5.

There are a number of exemptions to these surrender conditions: Section 65C of the Fisheries Act 1994 places an onus on the chief executive to waive any fee or surrender

requirement when a licence holder transfers or amends a licence to give effect to the following:

- To give effect to—
- A settlement between spouses or former spouses; or
- Bankruptcy; or
- Winding up or administration under the Corporations Act; or
- Section 70C(3); or
- To administer a deceased estate; or
- Because of the loss, at sea, of the boat being used in relation to the authority, through storm, capsized, collision or fire.

The Plan also contains a provision that allows for reduced effort unit surrender in the event that a person replaces a trawl vessel due to a sinking or similar event. This provision would only be used in the event that ‘the event’ did meet section 65C described above.

A “top-up” provision that allows a person who has replaced their boat to transfer a certain number of EUs onto the licence without the usual surrender of 10% has also been included in the Plan.

8.1.6 Effort Reductions to Date

Assessing the achievement of effort reductions is complicated for several reasons. Firstly, as discussed above, the 5% industry contribution to the SAS was removed as fishing days. Secondly, although the effort agreed upon for the allocation of EUs was the equivalent to 102,929 fishing days, only 96,000 fishing days were initially allocated. The remaining 6,929 fishing days were set aside for use as supplementary and appeal days. It has therefore been necessary to use aggregate factors to determine the number of EUs that would have been in the fishery if all 108,346 fishing days were allocated, as this is the agreed “bench mark”.

There were 758 licences in the fishery when the EMS was introduced in 2001. The original allocation formula (which resulted in the allocation of 96,000 days) was manipulated and applied to each licence to result in an allocation of the 108,346 days to the fleet (agreed “bench mark”).

A total number of 3,859,155 EUs for the 758 licences that were in force at the commencement of the allocation process has therefore been used as a starting point for the assessment of effort reductions to date.

Table 8.3. Effort Reductions in the East Coast Trawl Fishery.

	Days	EU
Benchmark		
1996	108,346	3,859,155
Total Allocation	102,929	3,666,186
Initial Allocation	96,000	3,419,802
Buyback	11,431	369,847
Usable Effort for Allocation	91,498	3,296,339
Dec 2003 Allocated	77,097	3,108,893
2003 Used	64,738	2,616,605
Reductions		
1996 to Total	5,417	192,969

	5%	5%
	31,249	750,262
1996 to 2003 Allocated	28.8%	19.4%
	43,608	1,242,550
1996 to 2003 Used	40.2%	32.2%
	14,401	187,446
Usable to 2003 Allocated	15.7%	5.7%
Targets		Achieved
3% Effort Creep	22.42%	NO
1% Effort Creep	17.52%	YES
Review Events (3% first year, 1% after)	19.19%	YES
GBRMC (days)	15%	YES

The Plan has achieved a total reduction of 19.4% of EUs when the end of 2003 is compared to the 1996 benchmark (Table 8.3).

In applying an annual reduction of 1% to account for effort creep, the required cumulative reduction from 1996 to 2003 as recommended by the PSWG would be 17.52% of EUs. Table 8.3 clearly shows that the agreed effort reduction target has been achieved.

The review events in the Plan require a minimum cumulative reduction of 19.2% (i.e. 15% from the SAS, 3% in 2001 and 1% in each of 2002 and 2003). This cumulative requirement has been exceeded, but only because the SAS removed slightly more than 15% and surrenders in 2001 were slightly higher than the required 3%. In both 2002 and 2003, the minimum of 1% was not reached.

It is important to review effort reductions in light of the actual amount of effort that is being used in the fishery. Table 8.3 shows a reduction of 32.2% in the number of EUs used from 1996 to December 2003. This is a significant achievement. The analysis of actual effort as well as potential effort is appropriate given that there will always be numerous factors that will prevent 100% utilisation of effort. These include weather, refits, market dynamics and the fact that most licence holders are multi-endorsed.

The review events in the Plan require a minimum cumulative reduction of 19.2% (i.e. 15% from the SAS, 3% in 2001 and 1% in each of 2002 and 2003). This cumulative requirement has been exceeded, but only because the SAS removed slightly more than 15% and surrenders in 2001 were slightly higher than the required 3%. In both 2002 and 2003, the minimum of 1% was not reached. This must be a consideration when future management arrangements are being developed.

8.1.7 Specific Effort Reduction Mechanisms

As discussed above, while the agreed and legislated cumulative effort reduction targets have been exceeded to date, the surrender provisions in the Plan did not achieve a level of 1% per annum in 2002 or 2003.

Transfer of Effort Units

In 2001, there were 200 individual transactions where effort units were transferred, resulting in a total surrender of almost 35,000 effort units. In contrast, there were only 95 transactions in 2002, and 73 in 2003 resulting in the surrender of approximately 10,500 units and 9,700 units respectively. This is a reduction in the number of effort units surrendered of approximately 72% over the three seasons.

Transfer of Licences

License transfers are the only type of surrender that remained relatively constant over the three effort years. In 2001, there were 35 transfers, resulting in approximately 7,000 units, and in 2002 there were 36 transfers with a surrender of approximately 9,000 units. A further 33 transfers with a surrender of approximately 8,000 occurred in 2003.

Boat Replacement

Surrenders due to boat replacement varied significantly between the three years. Surrenders through boat replacement fell from 17,000 to 2,500 between the 2001 and 2002 but increased to approximately 9,000 units in 2003. Despite the variation, the boat replacement surrenders in all years were less than expected.

8.1.8 Issues with the Current EU Surrender Strategies

While it is recognised that the current surrender provisions were developed through extensive consultation, based on information available at the time, they may no longer be appropriate because:

- There is general uncertainty regarding their ability to effectively manage effort;
- They seek to obtain EU surrenders from a small proportion of the fleet to account for the effort creep of the fleet as a whole; and
- There is suggestion that they are counter-productive in that they discourage fishers from replacing boats or transferring licences and EUs.

Uncertainty

There is a high level of uncertainty in the management of effort using the current surrender provisions. That is, there is no conclusive method available to predict the number of EUs that will be surrendered in a given period, or the mechanisms that will contribute to these surrenders. As described above, the current provisions have not achieved the desired target of 3% per annum, or even the minimum legislative target of 1% per annum.

Models predicting the level of surrenders prior to the introduction of the EU system were based heavily on boat replacements contributing to the majority of surrenders. This modelling was conducted prior to the adjustment scheme of late 2000, which removed 99 licences from the fishery. It now seems apparent that a large proportion of the boats attached to those licences would have been due for replacement in the next few years. Surrenders of effort units due to boat replacement have therefore not been as high as originally predicted.

A further factor contributing to the uncertainty in overall surrenders is the restrictive nature of the surrender provisions themselves. This is particularly the case with EU transfers and boat replacements. Anecdotal advice from industry representatives is that these surrender provisions actively discourage licence holders from engaging in these activities, thereby compromising the ability of the fishery to meet its legislated and intended targets.

Lastly, the reductions that have been evident in the number of surrenders due to EU trading could be expected to continue. The data indicates that in the first effort year, there was a “flurry” of trading as fishers who wished to stay in the fishery increased their allocation and those who decided to leave sold their allocation. It is highly probable that from now on those fishers remaining in the fishery will identify and purchase the level of effort (number of effort units) they need to produce specific economic returns in the future. As a result it is likely that future EU trading (and subsequent surrenders) will be substantially reduced.

Appropriateness of targeted surrenders

As discussed above, the purpose of EU reductions is to account for effort creep throughout the fleet. Questions have been raised as to the appropriateness of obtaining those EUs from only a small proportion of the fleet.

If it could be definitely shown that those fishers who transfer EUs or whole licences are contributing to effort creep over and above those fishers who do not, such surrenders would be more justifiable. However, under the current management, a licence holder can purchase new nets and navigation equipment, thereby increasing their fishing power, without any surrender. Another fisher may sell some EUs and be required to surrender a potentially large number of EUs, without actually increasing the fishing power of their operation or the fleet in general.

In this regard, the surrenders for boat replacement are slightly more appropriate as they recognise that in most instances where EU surrenders apply, the fisher is replacing with a boat that has some quality making it more effective or desirable as a fishing boat. However, even in this case, the EUCF accounts for the difference in fishing power between boats of different sizes, so the boat replacement surrenders only account for non-size related changes in fishing power. Given the magnitude of the surrenders for boat replacement, it is highly likely that those fishers who replace boats are over-contributing to overall EU surrenders.

Temporary Transfers

The current situation effectively discourages any form of temporary transfer (such as quota leasing) because such transactions would incur EU surrenders. This removes flexibility from the system as it prevents the movement of EUs between licences on an informal basis to account for fishery and market dynamics.

8.1.9 Future Effort Reduction Targets and Strategies

As discussed above, the figure of 1% annual increase in fishing power should be used in assessing effort reductions in the Fishery. **This figure should be updated to reflect recent changes in the Fishery and the impact that those changes have had on fishing power.**

There is an urgent need to identify more appropriate effort reduction mechanisms. In particular, a system is required that provides certainty and flexibility to fishers while achieving a reduction appropriate for estimated effort creep.

8.1.10 Great Barrier Reef World Heritage Area Effort Cap

Another issue that is directly relevant to the management of effort in the fishery is the total allowable effort in the Great Barrier Reef World Heritage Area. As a condition of its contribution to the East Coast Trawl Adjustment Scheme in 2000, the Commonwealth Government insisted that mechanisms should be introduced to ensure that effort directed at the WHA was specifically managed.

Historically, approximately 70% of fishing effort in the trawl fishery was directed at stocks within the Marine Park. Concerns were raised by the Commonwealth that in the absence of specific management, effort traditionally directed elsewhere could migrate into the Park to account for that removed by the adjustment scheme.

To address these concerns, a cap on the total amount of notional effort units that could be used in the WHA was introduced. This cap was based on approximately 70% of the total number of effort units in the fishery. The Plan states that once this cap has been reached, the WHA becomes closed.

A need was also identified for the cap to be annually reduced to account for effort creep. As discussed above, the best available estimate of effort creep at that time was 3% per annum, and as such, the WHA cap reduced by 3% in 2002 and 2003. Written agreements between the State and Queensland only focussed on the first three effort years, and as such, only 2002 and 2003 were catered for under the Plan. In late 2003, the Plan was amended to carry the 2003 cap into 2004 (i.e.: no reduction) while the GER is being completed.

At this time, stock-based effort management is not available. Therefore the continuation of a WHA effort cap is deemed appropriate until a more effective management system can be developed and agreed upon that utilises the outputs of stock assessments. The cap was not reached during the first three effort years, but has been in the vicinity of 90% in each of the last two years. Ensuring that a disproportionate amount of total trawl effort is not used in the WHA remains a valid consideration.

Given that the overall effort in the fishery reduces by an annual percentage, it is reasonable to reduce the WHA Cap by the same proportion. As discussed above, an annual reduction of 1% per annum is proposed as appropriate to counter effort creep in the fishery, if this becomes the agreed level then it follows that **the WHA cap should also decrease by 1% per year.**

9 Future Directions

The long-term sustainability of demersal trawl fisheries is highly dependent on minimising negative impacts on discards, benthos and the overall ecosystem that the fisheries operate within. Queensland's ECTF has and continues to operate under significant scrutiny, which is amplified by the existence of approximately 70% of the fishery within the Great Barrier Reef World Heritage Area (GBRWHA).

The ECTF has undergone significant structural adjustment over the last five years following the introduction of the Plan. The significant reductions in fishing effort that have resulted from this adjustment have been a major contributor to the sustainability of the fishery. Input controls, in the form of limits on net size, Bycatch Reduction Devices (BRDs), turtle excluder devices and permanent closures have significantly reduced the negative impacts of trawling on principal and permitted species and bycatch in the fishery.

The fishery now operates under a framework of continuous improvement and refining of management arrangements put in place by the trawl Plan to ensure that the sustainability of the fishery is maintained. The DPI&F is committed to delivering a profitable industry that is ecologically sustainable. This General Effort Review represents an assessment of the performance of the Plan in delivering an ecologically sustainable fishery. The review process and outcomes have identified a number of areas that need to be addressed in the near future in order to ensure the fishery remains economically viable and ecologically sustainable.

Current Effort Management System

The effort management system has been a key element of the trawl Plan. The surrender of effort units on transfers and boat replacements has hindered the continued self-restructuring of the fleet and the capacity of individual licence holders to refine business operations and optimise economic returns. The Effort Management System will be reviewed in 2005 and a new process developed that will provide for management of effort in relation to effort creep whilst allowing for vessel replacements and trading/leasing of effort units amongst licence holders.

The periodic reassessment of effort creep in the fishery will be essential for effective management. A process will be developed that will identify when future reviews are required. A 'checks and balances' process may be advocated that tracks annual changes in effort creep allowing for annual reductions or increases in effort units.

Great Barrier Reef World Heritage Area (GBRWHA) Cap in Effort

Total effort (number of effort units) in the ECTF is capped across the fleet (T1, T1/M1, T2 endorsed vessels). Noting the area restrictions relevant to each fishery symbol, vessels have the capacity to fish in any part of the fishery area outside of permanent and seasonal closures. Approximately 70% of the effort is applied to the fishery area within the GBRWHA. In line with Great Barrier Reef Marine Park Authority management objectives for the GBRWHA it would be inappropriate for the entire East Coast trawl fishery effort to be applied to the world heritage area. The GBRWHA cap was put in place to prevent any increase in the proportion of effort applied to the GBRWHA, i.e. prevent effort from exceeding $\approx 70\%$ of the entire effort of the East Coast trawl fishery. The annual reductions in the cap, until 2003, were based on extrapolated estimates of effort creep from another trawl fishery that were agreed by Queensland Government, Commonwealth Government and Industry at the time of the revision of the Plan in 2000. Effort creep was estimated to be 3% per year. A comprehensive analysis of effort creep in the fishery (from 1989 to 1999) has recently been completed that indicates that effort creep was actually in the order of 0.2 to 1.7% per year during that time. The DPI&F has recently completed a further revision of effort creep for the period 2000 to 2003 and results will be available in early 2005.

The on-going refinement and development of stock assessments for key principal species may provide a means or framework for refining the spatial scale at which effort is managed in the fishery. That is, the application of effort management to each stock or fishing region in such a way as to implement the results of stock assessment modelling is a definite possibility for the ECTF. Under such a regime, effort management would be based on a measure of sustainability (such as x% of the estimated effort that would result in Maximum Sustainable Yield) and may therefore make the GBRWHA cap a redundant provision.

The continued development of BRDs and gear technologies that increase the survival of bycatch (discards) and minimise the negative impacts of trawling on the ecosystem is a priority. The use of effective BRDs is critical to minimising the bycatch landed and will contribute significantly to the sustainability of the fishery.

Industry and management need to commit to progressing changes that improve the management and economic viability of the fishery. More effective and productive linkages between management and industry may be achieved in the future by developing partnerships that lead to the overall goal of co-management.

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