

# Performance Measurement System

Queensland Marine Aquarium Fish Fishery



Version 1  
April 2009

Queensland Primary Industries and Fisheries, part of the Department of Employment, Economic Development and Innovation (DEEDI), seeks to maximise the economic potential of Queensland's primary industries on a sustainable basis.

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## ***Introduction***

This document provides the framework for a performance measurement system (PMS) for the Marine Aquarium Fish Fishery (MAFF). It formalises the objectives, performance indicators, performance measures and management responses that have been developed by Queensland Primary Industries and Fisheries (QPIF) with input from stakeholders.

The Marine Aquarium Fish Fishery (MAFF) is a wild-harvest fishery mainly involved with hand collection of fish and invertebrates from a diverse range of species. The fishery has been operating since the 1970's and supports 49 collection licences (in 2007), and occurs within a vast area along the east coast of Queensland within the bounds of the Australian Fishing Zone (AFZ). The MAFF is a predominantly commercial fishery with most collection occurring in coastal and reef waters off Cairns and in South East Queensland. Product from the commercial harvest is sold on export and domestic markets.

The total annual number of fish and invertebrate specimens collected in the MAFF is around 200 000 individuals (since 2000). Trade levels in the MAFF are small compared to the global aquarium trade which ranges from 20–24 million individuals annually (Wabnitz et al. 2003).

The MAFF operates under an 'A1' or an 'A2' fishery symbol. Fishers endorsed with an A2 fishery symbol have possession limits of 10 fish comprising not more than two fish of the same species. Introduced in September 2003, the fishery symbols and associated regulations addressed latent effort for the fishery and issues of localised concentration of effort and its potential effects on ecological sustainability.

There are five special management areas (SMA) in the MAFF (Cairns, Whitsundays, Keppel, Sunshine Coast and Moreton Bay). SMAs represent areas with historically high concentrations of fishing effort.

Marine aquarium fish and invertebrates are also collected by recreational fishers for personal home aquaria. Recreational fishers are limited by all existing in-possession and size limits and apparatus restrictions for fisheries, as outlined in the Queensland *Fisheries Regulation 2008*. Recreational fishers are not permitted to sell their catch.

Queensland Primary Industries & Fisheries is responsible for the management of the MAFF. A variety of input and output controls are used to manage harvest in the MAFF (Ryan & Clarke 2005), including the following:

- Commercial fishing controls — limited entry, limits on the number of operators under an authority, gear restrictions (type and dimensions), in-possession limits (for A2 symbol holders) and size limits for particular species, Special Management Areas, and spatial and seasonal closures.
- Recreational fishing controls — gear restrictions (type and dimensions), in-possession and size limits for certain species, and spatial and seasonal closures.

The fishery is considered well-managed, based on the suite of management measures outlined above, spatial closures within the Great Barrier Reef Marine Park (GBRMP) and the highly selective harvesting methods used.

The set of operational objectives, performance indicators and measures, and management responses contained in this PMS were developed by PI&F in consultation with stakeholders in May 2008. The PMS builds on the outputs of a MAFF Ecological Risk Assessment workshop conducted in August 2007 which identified nine species at risk from the fishery.

The PMS was developed to allow QPIF to assess the effectiveness of its management arrangements and to meet a Commonwealth recommendation under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) which states that the QPIF are 'to develop fishery specific objectives linked to performance indicators and performance

*measures for target stocks, protected species and impacts on the ecosystem. DPI&F will develop precautionary harvest limits for CITES<sup>1</sup> and EPBC Act species within 12 months.'*

Performance measures developed for the MAFF will be reported on in the Annual Status Report (ASR) for the fishery. QPIF have adopted a standard approach to harvest fisheries should an indicator be shown to have been triggered during the review. Within three months of becoming aware of a review event being triggered, QPIF will undertake a review of likely causes, and implications for sustainable management of the fishery. Pending the outcome of that review QPIF will finalise a timetable for the implementation of appropriate management responses.

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<sup>1</sup> CITES = Convention on International Trade in Endangered Species of Wild Fauna and Flora

	<b>Objective</b>	<b>Performance indicator</b> (quantitative info used to measure, e.g. CPUE)	<b>Performance measure</b> (e.g. defined changes, trends, reference pts)	<b>Management response</b>
<b>Target species</b>	Ensure MAFF resources are harvested in an ecologically sustainable manner	Total annual catch (numbers) of all species combined as reported in logbooks.	30% increase or decrease in total annual catch compared with the average annual catch over the previous 3 years	QPIF will report on the PMS annually in the Annual Status Report following the availability of all relevant data. Within three months of becoming aware that a review has been triggered, PI&F will review catch data at species level to identify drivers of change (e.g. market forces etc) in consultation with industry. Subsequent management action will depend on the outcomes of this assessment and relate specifically to the key driving forces identified.
	Ensure species identified as at risk in the MAFF ERA are harvested in an ecological sustainable manner	Annual catch (numbers) per Special Management Area (SMA)	> 50% change in annual catch (of a species in the list below) per SMA compared with previous year  <b>Medium risk</b> Personifer Angelfish ( <i>Chaetodontoplus meredithi</i> ) Scribbled Angelfish ( <i>Chaetodontoplus duboulayi</i> )  <b>Low risk</b> Tomato Anemonefish ( <i>Amphiprion melanopus</i> ) White banded Anemonefish ( <i>Amphiprion latezonatus</i> ) Ocellaris Anemonefish ( <i>Amphiprion ocellaris</i> ) Percula Anemonefish ( <i>Amphiprion percula</i> ) Harlequin Tuskfish ( <i>Choerodon fasciatus</i> ) Blue Tang ( <i>Paracanthurus hepatus</i> ) Pineapplefish ( <i>Cleidopus gloriamaris</i> )	As above
	Insure MAFF against unsustainable effects of localised concentration of effort in SMAs	Total number of effort days in SMAs	> 20% increase in annual fishing days in a SMA compared with the average annual number of fishing days over the previous 3 years in that SMA since 1 Jan 2004	QPIF will report on the PMS annually in the Annual Status Report following the availability of all relevant data. Within three months of becoming aware that a review has been triggered, QPIF will review effort data to identify drivers of change (e.g. market forces, weather etc) in consultation with industry. Subsequent management action will depend on key driving forces identified.

	Insure against unsustainable effects of harvesting following severe impacts on critical coral habitat	Bleaching detected (GBRMPA Bleachwatch monitoring program) as defined in QPIF Coral Stress Response Plan	Bleaching severity & interaction with fishery is greater than Level 2 as defined in QPIF Coral Stress Response Plan	QPIF will adhere to the response timetable in the Coral Stress Response Plan which has been set dependent on the severity of the stress event.
<b>Species of Conservation Interest</b>	To ensure that the harvest of CITES and EPBC Act listed species is managed in an ecologically sustainable way	Total harvest (number of individuals) of CITES and EPBC Act listed species, specifically syngnathids, freshwater sawfish ( <i>Pristis microdon</i> ) and Maori wrasse	(i) Total harvest of syngnathids exceeds 25 in any calendar year (ii) Total harvest of Maori wrasse taken under the General Fisheries Permit issued to an operator in the MAFF exceeds 30 during the period 11/5/2007 to 11/5/2012 (iii) Total harvest of the sawfish <i>Pristis microdon</i> taken under the General Fisheries Permit issued to an operator in the MAFF exceeds 75 during the period 11/5/2007 to 11/5/2012.	Performance measures developed for the MAFF will be reported on in the Annual Status Report (ASR) for the fishery. QPIF have adopted a standard approach to harvest fisheries should an indicator be shown to have been triggered during the review. Within three months of becoming aware of a review event being triggered, QPIF will undertake a review of likely causes, and implications for sustainable management of the fishery. Pending the outcome of that review a timetable will then be finalised for the implementation of appropriate management responses.
<b>Social</b>	Ensuring community confidence in management arrangements	Number of DPIF Ministerial Letters referring to fishery sustainability concerns	> 5 Ministerial Letters are prepared per calendar year.	QPIF will report on the PMS annually in the Annual Status Report following the availability of all relevant data. Within three months of becoming aware that a review has been triggered, QPIF will review the circumstances relevant to each Ministerial Letter to determine whether further actions/changes to the MAFF management arrangements may be required.
	Ensuring adequate compliance with management arrangements for the fishery	Compliance activity reports	>10% of the active vessels in the fleet are used to commit an offence under the <i>Fisheries Regulation 2008</i> .	QPIF will report on the PMS annually in the Annual Status Report following the availability of all relevant data. Within three months of becoming aware that a review has been triggered, QPIF in collaboration with Harvest MAC to finalise a clear timetable for implementation of appropriate management responses. This would involve consultation with stakeholders.

<b>Economic</b>	Reducing impediments to economic efficiency and/or development of industry	Number of active licences in fishery	20% decrease in the number of active licences compared to the previous year.	QPIF will report on the PMS annually in the Annual Status Report following the availability of all relevant data. Within three months of becoming aware that a review has been triggered, QPIF in collaboration with Harvest MAC to finalise a clear timetable for implementation of appropriate management responses. This would involve consultation with stakeholders.
<b>Ecosystem</b>	Ensure MAFF resources are harvested in an ecologically sustainable manner	Proportion of industry adopting identified best practice protocols*  *Measure is dependent on formalisation of protocols within the industry developed Code of Conduct	< 80% of active operators have adopted best practice protocols.	QPIF will report on the PMS annually in the Annual Status Report following the availability of all relevant data. Within three months of becoming aware that a review has been triggered, QPIF in collaboration with Harvest MAC to finalise a clear timetable for implementation of appropriate management responses. This would involve consultation with stakeholders.

## ***Proposed review procedures***

Performance measures will be reported on annually in the Marine Aquarium Fish Fishery Annual Status Report.

The PMS is designed to be a working document and may be reviewed and updated to reflect available data and to address any issues that may have been highlighted by the data analysis process. Analysis will occur annually associated with monitoring the performance measures.

## ***References***

Fletcher, W, Cheeson, J, Sainsbury, K, Fisher, M, Hundloe, T and Whitworth, B 2002, *National ESD Reporting Framework: The "How To Guide" for wild capture fisheries*. FRDC 2000/145, Canberra, Australia ([www.fisheries-esd.com](http://www.fisheries-esd.com)).

Roelofs, A 2008, *Ecological Risk Assessment of the Queensland Marine Aquarium Fish Fishery*, Department of Primary Industries & Fisheries, Brisbane.

Roelofs, A and Silcock, R 2008, *A sustainability assessment of marine fish species collected in the Queensland marine aquarium trade*, Department of Primary Industries & Fisheries, Brisbane.

Ryan, S and Clarke, K 2005, *Ecological assessment of the Queensland Marine Aquarium Fish Fishery. A report to the Australian Government Department of Environment and Heritage on the ecologically sustainable management of the Queensland marine aquarium harvest fishery*, Department of Primary Industries and Fisheries, Brisbane, Australia, 78 pp.

Wabnitz, C, Taylor, M, Green, E and Razak, T 2003, *From Ocean to Aquarium. The global trade in marine ornamental species*, UNEP-WCMC, Cambridge, United Kingdom: 65p.

## Appendix 1

### Target species

Rationale for inclusion of issue	<p>The main purpose of the <i>Fisheries Act 1994</i> (the Act) includes applying and balancing the principles of ecologically sustainable development (ESD). Among the principles of ESD, as defined in the Act are:</p> <ul style="list-style-type: none"> <li>• “protecting biological diversity, ecological processes and life-support systems”</li> <li>• “the precautionary principle”, which is defined in the Act as “the principle that , if there is a threat of serious or irreversible environmental damage, lack of scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation, because of the threat”.</li> </ul> <p>The MAFF fishery collects from a very diverse array of species (600+). Historically the bulk of the harvest (approx. 70% by number) is comprised of damselfish (Family Pomacentridae), angelfish (Family Pomacanthidae), wrasses (Family Labridae), catfish (Family Ariidae), invertebrates and butterflyfish (Chaetodontidae). This precautionary indicator will identify coarse changes in the overall catches as an early warning of possible unsustainable harvest.</p>															
<b>Operational objective</b>	<b>Ensure MAFF resources are harvested in an ecologically sustainable manner</b>															
<b>Indicator</b>	<b>Total annual catch (No.s) of all species combined as reported in logbooks.</b>															
<b>Performance measure</b>	<b>30% increase or decrease in total annual catch compared with the average annual catch over the previous 3 years</b>															
Justification	The MAFF has been collecting an average 190 000 specimens since 2000. Ecological assessments of the MAFF have been based on this total combined level of take which was deemed to not pose a significant risk to the taxa that the fishery relies on in the mid to long term. Significant deviations from the average catch levels may indicate sustainability issues and require closer scrutiny. This performance measure provides an early warning of possible unsustainable harvest.															
Data requirements/availability	Commercial logbook data – total catch for combined species															
Monitoring and assessment of PMS	Logbook data will be monitored annually and reported on in context of the performance measures in the Annual Status Report for the fishery. QPIF will review catch data at species level to identify drivers of change (e.g. market forces etc) in consultation with industry. Subsequent management action will depend on the key driving forces identified.															
Evaluation of current fishery performance	<p>Indicator has not been triggered</p> <p>Table 1. Changes in total annual harvest (all species combined) for the MAFF from 2003 to 2006</p> <table border="1"> <thead> <tr> <th>Year</th> <th>No. of specimens</th> <th>% change since previous 3 year average</th> </tr> </thead> <tbody> <tr> <td>2003</td> <td>202122</td> <td>1</td> </tr> <tr> <td>2004</td> <td>224946</td> <td>13</td> </tr> <tr> <td>2005</td> <td>210891</td> <td>1</td> </tr> <tr> <td>2006</td> <td>171641</td> <td>-19</td> </tr> </tbody> </table>	Year	No. of specimens	% change since previous 3 year average	2003	202122	1	2004	224946	13	2005	210891	1	2006	171641	-19
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<p><b>Robustness</b>  <u>Levels (from Fletcher <i>et al.</i> 2002)</u>  <u>High</u> – The indicator is a direct measure of the objective, or if indirect, is known to closely reflect changes in the area of interest.  <u>Medium</u> – The indicator is suspected to be reasonably accurate measure against the objective, or if the known error is in the conservative direction  <u>Low</u> – The degree to which the indicator measures against the objective is largely unknown, or known to be low.</p>	<p><b>Medium</b></p> <ul style="list-style-type: none"> <li>The indicator is based on the evaluation of Queensland logbook data that provides compulsory reporting of daily fishing activities and harvest in the MAFF. While there are accuracy and compliance issues with any logbook program, QPIF considers that the information provides a valuable monitoring tool.</li> </ul>
<p>Current and future management</p>	<p>Current – limited entry, gear and vessel restrictions—harvesting restricted to hand collection, spatial management measures (e.g. SMAs, marine protected areas).  Future – Current system is comprehensive and adequate for managing the fishery.</p>
<p>Actions if performance measure is triggered</p>	<p>QPIF will report on the PMS annually in the Annual Status Report following the availability of all relevant data. Within three months of becoming aware that a review has been triggered, QPIF will review catch data at species level to identify drivers of change (e.g. market forces etc) in consultation with industry. Subsequent management action will depend on the makeup of the influencing forces.</p>
<p>Comments and action</p>	<p>Nil</p>
<p>External drivers</p>	<ul style="list-style-type: none"> <li>The MAFF fishery collects from a very diverse array of species (600+) and targeting activity is influenced heavily by market forces. Assessments of sustainability risks if Review Reference Points (RRPs) are triggered will need to take market drivers into account.</li> </ul>
<p>Other issues</p>	<p>Nil</p>

## Target species - at risk species

Rationale for inclusion of issue	<p>The main purpose of the <i>Fisheries Act 1994</i> (the Act) includes applying and balancing the principles of ecologically sustainable development (ESD). Among the principles of ESD, as defined in the Act are:</p> <ul style="list-style-type: none"> <li>“protecting biological diversity, ecological processes and life-support systems”</li> <li>“the precautionary principle”, which is defined in the Act as “the principle that , if there is a threat of serious or irreversible environmental damage, lack of scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation, because of the threat”.</li> </ul> <p>The MAFF fishery underwent an Ecological Risk Assessment (ERA) to determine taxa at ecological risk from the activities of the fishery. The assessment determined only two species from the 600+ collected were at moderate ecological risk and only five species at low risk. No high risk species were identified. It is appropriate that a measure was developed to monitor the harvest of these species closely given their higher risk category.</p>
Operational objective	<b>Ensure species identified as at risk in the MAFF ERA are harvested in an ecological sustainable manner</b>
Indicator	<b>Annual catch (No.s) per Special Management Area (SMA)</b>
Performance measure	<p><b>&gt; 50% change in annual catch (of a species in the list below) per SMA compared with previous year</b></p> <p><b>Medium risk</b>            Personifer Angelfish (<i>Chaetodontoplus meredithi</i>)            Scribbled Angelfish (<i>Chaetodontoplus duboulayi</i>)</p> <p><b>Low risk</b>            Tomato Anemonefish (<i>Amphiprion melanopus</i>)            White banded Anemonefish (<i>Amphiprion latezonatus</i>)            Ocellaris Anemonefish (<i>Amphiprion ocellaris</i>)            Percula Anemonefish (<i>Amphiprion percula</i>)            Harlequin Tuskfish (<i>Choerodon fasciatus</i>)            Blue Tang (<i>Paracanthurus hepatus</i>)            Pineapplefish (<i>Cleidopus gloriamaris</i>)</p>
Justification	Species to be monitored by this indicator were identified by an ERA of the fishery in 2007. A $\pm 50\%$ change (where the change was greater than 100 individuals) was deemed appropriate given that those species where data are available are not collected in high numbers. Those species without data are expected to also be collected in small numbers and will be monitored using the same measure. The indicator will be measured per SMA to enable early detection of potential unsustainable harvest in areas with high concentrations of commercial collection effort.
Data requirements/availability	Commercial logbook data – total catch for combined species

Monitoring and assessment of PMS	<p>Logbook data will be monitored annually and reported on in context of the performance measures in the Annual Status Report for the fishery.</p> <p>QPIF will review catch data at species level to identify drivers of change (e.g. market forces etc) in consultation with industry. Subsequent management action will depend on the magnitude of the change and the key driving forces identified.</p>																																																																																																				
Evaluation of current fishery performance	<p>Indicators were triggered in 2006 for anemonefish (all species combined) in the Keppel SMA (-53%) and outside the SMAs (-53%) (Table 2). Scribbled Angelfish was also triggered in the Keppel SMA (+64%)</p> <p>Table 2. Changes in harvest numbers for species identified as at risk in the MAFF. Numbers indicate the net change since the previous year. Numbers in parentheses represent the percentage change since the previous year. Highlighted numbers indicate changes greater than ±50% where the difference is greater than 100.</p> <table border="1" data-bbox="663 475 2145 1066"> <thead> <tr> <th>Year</th> <th>Logbook Name</th> <th>Cairns</th> <th>Keppel</th> <th>Moreton</th> <th>Other</th> <th>Sunshine Coast</th> <th>Whitsundays</th> </tr> </thead> <tbody> <tr> <td rowspan="5">2003-2004</td> <td>ANEMONEFISH - ALL</td> <td>-1223 (-20%)</td> <td></td> <td>205 (30%)</td> <td>478 (37%)</td> <td rowspan="5">-112 (-14%)</td> <td rowspan="5"></td> </tr> <tr> <td>ANGEL FISH - PERSONIFER</td> <td></td> <td></td> <td>-148 (-64%)</td> <td>-157 (-20%)</td> </tr> <tr> <td>ANGEL FISH - SCRIBBLED</td> <td>-129 (-97%)</td> <td>-232 (-20%)</td> <td></td> <td>-647 (-13%)</td> </tr> <tr> <td>PINEAPPLE FISH</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>TUSK FISH - HARLEQUIN</td> <td>339 (6%)</td> <td></td> <td></td> <td>-268 (-32%)</td> </tr> <tr> <td rowspan="5">2004-2005</td> <td>ANEMONEFISH - ALL</td> <td>-1156 (-24%)</td> <td></td> <td>688 (78%)</td> <td>510 (29%)</td> <td>246 (36%)</td> <td rowspan="5"></td> </tr> <tr> <td>ANGEL FISH - PERSONIFER</td> <td></td> <td></td> <td>159 (194%)</td> <td>795 (124%)</td> <td>285 (14%)</td> </tr> <tr> <td>ANGEL FISH - SCRIBBLED</td> <td></td> <td>-188 (-20%)</td> <td></td> <td>4925 (113%)</td> <td></td> </tr> <tr> <td>PINEAPPLE FISH</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>TUSK FISH - HARLEQUIN</td> <td>-2928 (-47%)</td> <td></td> <td></td> <td>265 (47%)</td> <td></td> </tr> <tr> <td rowspan="5">2005-2006</td> <td>ANEMONEFISH - ALL</td> <td>-746 (-20%)</td> <td>-164 (-53%)</td> <td>-449 (-29%)</td> <td>-1195 (-53%)</td> <td>136 (15%)</td> <td rowspan="5"></td> </tr> <tr> <td>ANGEL FISH - PERSONIFER</td> <td></td> <td>109 (13%)</td> <td>114 (47%)</td> <td>252 (18%)</td> <td>102 (4%)</td> </tr> <tr> <td>ANGEL FISH - SCRIBBLED</td> <td></td> <td>468 (64%)</td> <td></td> <td>-1874 (-20%)</td> <td></td> </tr> <tr> <td>PINEAPPLE FISH</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>TUSK FISH - HARLEQUIN</td> <td>-740 (-22%)</td> <td></td> <td></td> <td>129 (16%)</td> <td></td> </tr> </tbody> </table>	Year	Logbook Name	Cairns	Keppel	Moreton	Other	Sunshine Coast	Whitsundays	2003-2004	ANEMONEFISH - ALL	-1223 (-20%)		205 (30%)	478 (37%)	-112 (-14%)		ANGEL FISH - PERSONIFER			-148 (-64%)	-157 (-20%)	ANGEL FISH - SCRIBBLED	-129 (-97%)	-232 (-20%)		-647 (-13%)	PINEAPPLE FISH					TUSK FISH - HARLEQUIN	339 (6%)			-268 (-32%)	2004-2005	ANEMONEFISH - ALL	-1156 (-24%)		688 (78%)	510 (29%)	246 (36%)		ANGEL FISH - PERSONIFER			159 (194%)	795 (124%)	285 (14%)	ANGEL FISH - SCRIBBLED		-188 (-20%)		4925 (113%)		PINEAPPLE FISH						TUSK FISH - HARLEQUIN	-2928 (-47%)			265 (47%)		2005-2006	ANEMONEFISH - ALL	-746 (-20%)	-164 (-53%)	-449 (-29%)	-1195 (-53%)	136 (15%)		ANGEL FISH - PERSONIFER		109 (13%)	114 (47%)	252 (18%)	102 (4%)	ANGEL FISH - SCRIBBLED		468 (64%)		-1874 (-20%)		PINEAPPLE FISH						TUSK FISH - HARLEQUIN	-740 (-22%)			129 (16%)	
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Current and future management	<p>Current – limited entry, gear and vessel restrictions—harvesting restricted to hand collection, spatial management measures (e.g. SMAs, marine protected areas).</p> <p>Future – Fishery operators’ reporting requirements will be expanded to provide catch information for each of the Anemonefish species at risk.</p>																																																																																																				

Actions if performance measure is triggered	QPIF will report on the PMS annually in the Annual Status Report following the availability of all relevant data. Within three months of becoming aware that a review has been triggered, QPIF will review catch data at species level to identify drivers of change (e.g. market forces etc) in consultation with industry. Subsequent management action will depend on the makeup of the influencing forces.
Comments and action	Anemonefish data are grouped. Changes to logbook reporting so that catch information for each anemonefish species is recorded is a priority for implementation.
External drivers	<ul style="list-style-type: none"> <li>The MAFF collects from a very diverse array of species (600+) and targeting activity is influenced heavily by market forces. Assessments of sustainability risks if RRP's are triggered will need to take market drivers into account.</li> </ul>
Other issues	Nil

## Target species - unsustainable harvest through localised concentrations of fishing effort

Rationale for inclusion of issue	<p>The main purpose of the <i>Fisheries Act 1994</i> (the Act) includes applying and balancing the principles of ecologically sustainable development (ESD). Among the principles of ESD, as defined in the Act are:</p> <ul style="list-style-type: none"> <li>• “protecting biological diversity, ecological processes and life-support systems”</li> <li>• “the precautionary principle”, which is defined in the Act as “the principle that , if there is a threat of serious or irreversible environmental damage, lack of scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation, because of the threat”.</li> </ul> <p>There are five special management areas (SMA) in the MAFF (Cairns, Whitsundays, Keppel, Sunshine Coast and Moreton Bay). SMAs represent areas with historically high concentrations of fishing effort. As a management measure to control excessive effort, the number of licences that can access these areas was capped in 2003. SMAs are monitored annually for indications of unsustainable harvest levels brought about by localised concentration of effort.</p>												
<b>Operational objective</b>	<b>Insure MAFF against unsustainable effects of localised concentration of effort in Special Management Areas (SMAs)</b>												
<b>Indicator</b>	<b>Total number of effort days in SMAs</b>												
<b>Performance measure</b>	<b>&gt; 20% increase in annual fishing days in a SMA compared with the average annual catch over the previous 3 years in that SMA since 1 Jan 2004</b>												
Justification	There is potential for the designated high use areas (termed SMAs) to undergo significant collection pressure. QPIF aim to ensure that the amount of fishing pressure in these areas is closely monitored. A greater than 20% increase in the total number of fishing days is considered sufficiently precautionary to indicate a detrimental change in fisher targeting behaviour. The 1 January 2004 start date for data comparisons reflects the first full year of fishing under the SMA arrangement.												
Data requirements/availability	Commercial logbook data – total catch and effort for individual SMAs.												
Monitoring and assessment of PMS	Logbook data will be monitored annually and reported on in context of the performance measures in the Annual Status Report for the fishery. QPIF will review catch data at species level to identify drivers of change (e.g. market forces etc) in consultation with industry. Subsequent management action will depend on the makeup of the influencing forces.												
Evaluation of current fishery performance	<p>Indicators have not been measured. These will be measured and reported in the Annual Status Report for the 2007 calendar year.</p> <p>Table 3. Average annual number of effort days in each SMA from 2004-06.</p> <table border="1"> <thead> <tr> <th>Cairns</th> <th>Keppel</th> <th>Moreton</th> <th>Sunshine Coast</th> <th>Whitsundays</th> <th>Outside</th> </tr> </thead> <tbody> <tr> <td>438</td> <td>89</td> <td>194</td> <td>303</td> <td>41</td> <td>782</td> </tr> </tbody> </table>	Cairns	Keppel	Moreton	Sunshine Coast	Whitsundays	Outside	438	89	194	303	41	782
Cairns	Keppel	Moreton	Sunshine Coast	Whitsundays	Outside								
438	89	194	303	41	782								

Robustness <u>Levels (from Fletcher <i>et al.</i> 2002 – refer to first indicator for level definitions)</u>	<b>Medium</b> <ul style="list-style-type: none"> <li>The indicator is based on the evaluation of Queensland logbook data that provides compulsory reporting of daily fishing activities and harvest in the MAFF. While there are accuracy and compliance issues with any logbook program, QPIF considers that the information provides a valuable monitoring tool.</li> </ul>
Current and future management	Current – limited entry, gear and vessel restrictions—harvesting restricted to hand collection, spatial management measures (e.g. SMAs, marine protected areas). Future – Current system is comprehensive and adequate for managing the fishery.
Actions if performance measure is triggered	QPIF will report on the PMS annually in the Annual Status Report following the availability of all relevant data. Within three months of becoming aware that a review has been triggered, QPIF will review effort data to identify drivers of change (e.g. market forces, weather etc) in consultation with industry. Subsequent management action will depend on the makeup of the influencing forces.
Comments and action	Nil
External drivers	<ul style="list-style-type: none"> <li>High fuel costs may significantly influence the economics of fishing in the MAFF (e.g. reducing the distance travelled for collection trips). The SMAs were originally selected partly based on their close proximity to transport hubs such as airports. SMAs may come under increased pressure as fuel costs increase.</li> <li>The MAFF fishery collects from a very diverse array of species (600+) and targeting activity is influenced heavily by market forces. Assessments of sustainability risks if RRP are triggered will need to take market drivers into account.</li> </ul>
Other issues	Nil

## Target species – mitigating fishery flow on effects from impacts on critical coral habitat

Rationale for inclusion of issue	<p>The main purpose of the <i>Fisheries Act 1994</i> (the Act) includes applying and balancing the principles of ecologically sustainable development (ESD). Among the principles of ESD, as defined in the Act are:</p> <ul style="list-style-type: none"> <li>• “protecting biological diversity, ecological processes and life-support systems”</li> <li>• “the precautionary principle”, which is defined in the Act as “the principle that , if there is a threat of serious or irreversible environmental damage, lack of scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation, because of the threat”.</li> </ul> <p>Many fish and invertebrate species collected in the MAFF are closely associated for some part of the life history with coral communities. These are critical ecosystem interactions that are underpinned by healthy, productive coral structures. The loss of or damage to these structures through natural or anthropogenic impacts (e.g. coral bleaching, cyclones, freshwater runoff etc.) has been shown to have flow-on impacts to fish and invertebrate communities closely associated with this habitat. QPIF need to ensure that fishery activity in the MAFF does not exacerbate these impacts by establishing mechanisms to modify fishing activity in the event of an impact, and that the modification to fishing is commensurate with the level or severity of the impact.</p>
<b>Operational objective</b>	<b>Insure against unsustainable effects of harvesting following severe impacts on critical coral habitat</b>
<b>Indicator</b>	<b>Bleaching detected (GBRMPA Bleachwatch monitoring program) as defined in QPIF Coral Stress Response Plan</b>
<b>Performance measure</b>	<b>Bleaching severity &amp; interaction with fishery is &gt; Level 2 as defined in QPIF Coral Stress Response Plan</b>
Justification	<p>The aim of the performance measure is to mitigate the potential exacerbating impacts of fishing activity on damaged coral ecosystems to provide sufficient time for a system to return to a relatively healthy state. The key objectives of the Coral Stress Response Plan are to:</p> <ul style="list-style-type: none"> <li>• ensure that fishing activities do not compromise the resilience of coral reefs that are subject to stress events</li> <li>• maintain open communication with all stakeholders to achieve balanced and appropriate fishery-based responses when coral reefs exhibit signs of stress (i.e. bleaching)</li> <li>• improve stakeholders’ understanding of the interactions between coral bleaching events (most apparent indicator of stress) and the Queensland Coral Fishery and MAFF.</li> </ul>
Data requirements/availability	<p>Access to Bleachwatch data reports. BleachWatch is a program that collates observation data on coral condition that has been collected and reported by community members/reef users.</p> <p>Commercial logbook data – total catch and effort for combined species.</p>
Monitoring and assessment of PMS	<p>The monitoring process is outlined in the QPIF Coral Stress Response Plan. Bleachwatch reports will be monitored. If reports of early signs of bleaching are received from BleachWatch participants in January, site inspections are conducted by GBRMPA in late January or early February. If substantial bleaching is observed, full ecological surveys are undertaken by GBRMPA in March (Pers. comm., Johanna Johnson, 2007).</p> <p>QPIF will review catch data at species level to identify levels of fishery activity in stressed coral areas and assess whether subsequent action is required.</p>
Evaluation of current fishery performance	Not assessed

Robustness <u>Levels (from Fletcher <i>et al.</i> 2002 – refer to first indicator for level definitions)</u>	<b>Medium</b>
Current and future management	Current—limited entry, gear and vessel restrictions—harvesting restricted to hand collection, spatial management measures (e.g. SMAs, marine protected areas). Future—Industry/government partnership agreements (e.g. Memorandum of Understanding – MOUs) and Industry Codes of Conduct.
Actions if performance measure is triggered	QPIF will adhere to the response timetable in the Stress Response Plan which has been set dependent on the severity of the stress event.
Comments and action	Nil
External drivers	<ul style="list-style-type: none"> <li>This PMS measure is tied to the Coral Stress Response Plan. Climate change is predicted to increase the level of coral bleaching. Greater political pressures to protect coral communities for future generations may influence the response gradient currently in place in the Coral Stress Response Plan.</li> </ul>
Other issues	Nil

## Species of Conservation Interest – harvest of CITES and EPBC Act listed species

Rationale for inclusion of issue	<p>The main purpose of the <i>Fisheries Act 1994</i> (the Act) includes applying and balancing the principles of ecologically sustainable development (ESD). Among the principles of ESD, as defined in the Act are:</p> <ul style="list-style-type: none"> <li>• “enhancing individual and community wellbeing through economic development that safeguards the wellbeing of future generations”;</li> <li>• “protecting biological diversity, ecological processes and life-support systems”</li> <li>• “the precautionary principle”, which is defined in the Act as “the principle that , if there is a threat of serious or irreversible environmental damage, lack of scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation, because of the threat”.</li> </ul> <p>The marine aquarium fish fishery (MAFF) was accredited by the DEWHA on 27 November 2005. The fishery was not accredited under Part 13 of the EPBC Act, which relates to the targeted harvest of CITES and EPBC Act listed species from Commonwealth waters.</p> <p>Under Queensland legislation, operators are permitted to harvest syngnathids from Queensland state waters. In addition, the QPIF has issued one General Fisheries Permit for an operator in the MAFF to take Maori wrasse and sawfish for the purpose of public display and/or public education. Conditions on this permit are considered precautionary in nature. One of the recommendations attached to the DEWHA accreditation is: “Within 3 years Department of Primary Industries and Fisheries to develop fishery specific objectives linked to performance indicators and performance measures for target stocks, protected species and impacts on the ecosystem. Department of Primary Industries and Fisheries will develop precautionary harvest limits for CITES and EPBC Act listed species within 12 months.” DEH have confirmed that they are seeking the Primary Industries and Fisheries to develop precautionary performance measures and indicators for CITES and EPBC Act listed species within 12 months, in recognition that these species are a priority under the EPBC Act and therefore require a shorter timeframe than the 3 years given to develop a full performance measurement system for the fishery.</p>
<b>Operational objective</b>	<b>To ensure that the harvest of CITES and EPBC Act listed species is managed in an ecologically sustainable way</b>
<b>Indicator</b>	<b>Total harvest (number of individuals) of CITES and EPBC Act listed species, specifically syngnathids, sawfish (<i>Pristis microdon</i>) and Maori wrasse</b>
<b>Performance measure/s</b>	<p><b>(i) Total harvest of syngnathids exceeds 25 in any calendar year</b>  <b>(ii) Total harvest of Maori wrasse taken under the General Fisheries Permit issued to an operator in the MAFF exceeds 30 during the period 11/5/2007 to 11/5/2012</b>  <b>(iii) Total harvest of the sawfish <i>Pristis microdon</i> taken under the General Fisheries Permit issued to an operator in the MAFF exceeds 75 during the period 11/5/2007 to 11/5/2012</b></p>

Justification / Interpretation	<p>There are no recognized sustainability reasons for the listing of syngnathids and Maori wrasse in a Queensland fisheries context. The listing of syngnathids and Maori wrasse relates more to the iconic value placed on those species. Sawfish, however, are of sustainability concern.</p> <p>The limit reference point for syngnathids has been set at below the 25 year average catch from the fishery from outside of Commonwealth waters (2001–05 average catch: 26).</p> <p>Only one species of sawfish, <i>Pristis microdon</i>, has a CITES listing allowing the international trade of limited numbers for aquarium purposes.</p> <p>The development of permit conditions in relation to the take of Maori wrasse sets the catch limit at a precautionary level.</p>
Data requirements/availability	<ul style="list-style-type: none"> <li>• MAFF operators were recently (Feb 2007) directed to keep additional information relating to targeted harvest of syngnathids as part of logbook requirements. Fishers are asked to provide data relating to both catch and effort (including details on location of harvest).</li> <li>• General fisheries permits, authorising the collection of Maori wrasse and sawfish by MAFF operators include, as a condition of permit: "The holder must submit an annual written report to the chief executive, QPIF, of the activities undertaken under this permit outlining the number of fish taken, location where the fish were taken and date, apparatus used and days fished."</li> </ul>
Monitoring and assessment of PMS	Commercial logbook data and data provided by the holders of general fisheries permits will be monitored annually and reported on in context of the performance measures in the Annual Status Report for the fishery.
Evaluation of current fishery performance	No assessment has been conducted of the current performance of the fishery against the proposed measure. New logbooks introduced in 2007 did not include provisions to record the take of syngnathids. A directive to record the take of syngnathids in unused species categories on the logsheet was sent to operators in late February 2007.
Robustness <u>Levels (from Fletcher <i>et al.</i> 2002 – refer to first indicator for level definitions)</u>	<b>High</b>
Current and future management	<p>Current –</p> <ul style="list-style-type: none"> <li>• Limited entry</li> <li>• Regulated fish provisions for Maori wrasse – no take species</li> <li>• In possession limits for holders of A2 licences</li> <li>• Gear restrictions</li> <li>• Spawning season closures (Maori wrasse)</li> <li>• Special management areas to control effort in high use areas.</li> </ul> <p>Future –</p> <ul style="list-style-type: none"> <li>• Current system is comprehensive and adequate for managing the fishery. Should the situation change then QPIF will make an appropriate and timely management response.</li> </ul>
Actions if performance measure is triggered	Performance measures developed for the MAFF will be reported on in the Annual Status Report (ASR) for the fishery. QPIF have adopted a standard approach to harvest fisheries should an indicator be shown to have been triggered during the review. Within three months of becoming aware of a review event being triggered, QPIF will undertake a review of likely causes, and implications for sustainable management of the fishery. Pending the outcome of that review QPIF will finalise a timetable for the implementation of appropriate management responses.

Comments and action	<p>There is only one general fisheries permit that includes the commercial take of Maori wrasse and one for sawfish issued for 2006/2007. Permits are assessed and issued on a case by case basis. Sustainability issues are a critical component of QPIF's assessment process.</p> <p>The CITES Appendix I and II listings for sawfish came into effect in 13 September 2007. Harvest in 2007 therefore is mostly unaffected by the new conservation listing.</p> <p>Additionally, green sawfish (<i>Pristis zijsron</i>) were listed as vulnerable under the EPBC Act on 1 March 2008. This listing will make it illegal to kill, harm or take green sawfish in Commonwealth waters.</p>
External drivers	Community perceptions regarding the harvest of these animals cannot be predicted but may place pressure to further control their collection.
Other issues	Nil

## Social – community confidence in management arrangements

Rationale for inclusion of issue	<p>The main purpose of the <i>Fisheries Act 1994</i> (the Act) includes applying and balancing the principles of ecologically sustainable development (ESD). Among the principles of ESD, as defined in the Act are:</p> <ul style="list-style-type: none"> <li>• “protecting biological diversity, ecological processes and life-support systems”</li> <li>• “the precautionary principle”.</li> </ul> <p>The suite of management arrangements currently in place for the MAFF ensure the principles of ESD are adhered to and provide community confidence that Queensland’s wild fisheries resources are being sustainably managed for the long term. The public have the right to question these arrangements. A common method for expressing community dissatisfaction is through letters to the Minister for Primary Industries &amp; Fisheries.</p>
<b>Operational objective</b>	<b>Ensuring community confidence in management arrangements</b>
<b>Indicator</b>	<b>Number of DPIF Ministerial Letters referring to fishery sustainability concerns</b>
<b>Performance measure</b>	<b>&gt; 5 Ministerial Letters are prepared per calendar year</b>
Justification	The measure of > 5 letters per annum may indicate significant community concern that the principles of ESD are not being adhered to.
Data requirements/availability	Ministerial letters
Monitoring and assessment of PMS	The content of each letter will be assessed to determine whether there is a significant concern that the conduct of the fishery is not supportive of sustainability.
Evaluation of current fishery performance	Not assessed. To be reviewed annually.
Robustness <u>Levels (from Fletcher <i>et al.</i> 2002 – refer to first indicator for level definitions)</u>	<p><b>Low</b></p> <ul style="list-style-type: none"> <li>• This measure is untested as to whether it will be sufficient to ensure the objective. Measuring of this indicator after the first year will provide an understanding of robustness.</li> </ul>
Current and future management	<p>Current—limited entry, gear and vessel restrictions—harvesting restricted to hand collection, spatial management measures (e.g. SMAs, marine protected areas).</p> <p>Future—Industry/government partnership agreements (e.g. MOU’s) and Industry Codes of Conduct.</p>
Actions if performance measure is triggered	QPIF will report on the PMS annually in the Annual Status Report following the availability of all relevant data. Within three months of becoming aware that a review has been triggered, QPIF will review the circumstances relevant to each Ministerial Letter to gauge whether further actions/changes to the MAFF management arrangements may be required.
Comments and action	Nil
External drivers	Nil
Other issues	Nil

## Social – compliance

Rationale for inclusion of issue	<p>The main purpose of the <i>Fisheries Act 1994</i> (the Act) includes applying and balancing the principles of ecologically sustainable development (ESD). Among the principles of ESD, as defined in the Act are:</p> <ul style="list-style-type: none"> <li>• “enhancing individual and community wellbeing through economic development that safeguards the wellbeing of future generations”</li> <li>• “protecting biological diversity, ecological processes and life-support systems”.</li> </ul> <p>MAFF management arrangements have been established to ensure sustainability of the target species and other ecosystem components. Ensuring adequate compliance with fishery regulations strengthens the protection to biological diversity, ecological processes and critical habitats provided by these management arrangements.</p>
<b>Operational objective</b>	<b>Ensuring adequate compliance with management arrangements for the fishery</b>
<b>Indicator</b>	<b>Compliance activity reports</b>
<b>Performance measure</b>	<b>&gt;10% of the active vessels in the fleet are used to commit an offence under the <i>Fisheries Regulation 2008</i></b>
Justification	<ul style="list-style-type: none"> <li>• The measure equates to approximately 3 out of 34 boats committing an offence – this level of non-compliance is deemed significant and warrants a management response.</li> <li>• The measure recognises that compliance rate (number of offences per inspection) is a poor indicator of compliance levels for small fleets.</li> </ul>
Data requirements/availability	Compliance activity reports in relation to the MAFF.
Monitoring and assessment of PMS	Compliance activity reports will assess compliance against the performance measure and be reported in the Annual Status Report.
Evaluation of current fishery performance	Indicator has not been triggered.
Robustness <u>Levels (from Fletcher <i>et al.</i> 2002 – refer to first indicator for level definitions)</u>	<b>Medium</b> Compliance Activity Reports have improved the QPIF ability to track compliance in the fishery. A compliance risk assessment for the MAFF has been conducted and a strategy is in place to deal with risks ranked as moderate or higher.
Current and future management	<p>Current—limited entry, gear and vessel restrictions—harvesting restricted to hand collection, spatial management measures (e.g. SMAs, marine protected areas).</p> <p>Future—Industry/government partnership agreements (e.g. MOU's) and Industry Codes of Conduct.</p>
Actions if performance measure is triggered	Performance measures developed for the MAFF will be reported on in the Annual Status Report (ASR) for the fishery. QPIF have adopted a standard approach to harvest fisheries should an indicator be shown to have been triggered during the review. Within three months of becoming aware of a review event being triggered, QPIF will undertake a review of likely causes, and implications for sustainable management of the fishery. Pending the outcome of that review QPIF will finalise a timetable for the implementation of appropriate management responses.
Comments and action	Compliance strategy incorporating the outcomes of the Compliance Risk Assessment workshop is to be developed and implemented
External drivers	QBFP capacity to survey this remote fishery
Other issues	Nil

## Economic

Rationale for inclusion of issue	The main purpose of the <i>Fisheries Act 1994</i> (the Act) includes applying and balancing the principles of ecologically sustainable development (ESD). Among the principles of ESD, as defined in the Act are: <ul style="list-style-type: none"> <li>“enhancing individual and community wellbeing through economic development that safeguards the wellbeing of future generations”</li> </ul>
<b>Operational objective</b>	<b>Reducing impediments to economic efficiency and/or development of industry</b>
<b>Indicator</b>	<b>Number of active licences in fishery</b>
<b>Performance measure</b>	<b>20% decrease in the number of active licences compared to the previous year</b>
Justification	A 20% reduction in the indicator equates to approximately 10 out of 49 licences currently active in the fishery. Licence activity reflects operator confidence in the fishery and that economic conditions favour profitability. QPIF is an economic development agency with primary aims of profitable primary industries and long-term sustainability of our natural resources. QPIF will use this measure to provide an early warning signal if business conditions are becoming less conducive to deriving profit for the marine aquarium fish industry on an ecological sustainable basis.
Data requirements/availability	Logbook records
Monitoring and assessment of PMS	QPIF will review logbook records annually to determine the number of active licences in the MAFF for the preceding year.
Evaluation of current fishery performance	Indicator has not been triggered. The number of active licences remained at 49 in 2005, 2006 and 2007.
Robustness <u>Levels (from Fletcher <i>et al.</i> 2002 – refer to first indicator for level definitions)</u>	<b>Medium</b> See Justification
Current and future management	Current—limited entry, gear and vessel restrictions—harvesting restricted to hand collection, spatial management measures (e.g. SMAs, marine protected areas).  Future—Industry/government partnership agreements (e.g. MOU's) and industry Codes of Conduct.
Actions if performance measure is triggered	QPIF will report on the PMS annually in the Annual Status Report following the availability of all relevant data. Within three months of becoming aware that a review has been triggered, QPIF in collaboration with Harvest MAC to finalise a clear timetable for implementation of appropriate management responses. This would involve consultation with stakeholders.
Comments and action	Nil
External drivers	High fuel costs may significantly influence the economics of fishing in the MAFF. In its role as an economic development agency, QPIF review management arrangements to provide for profitable primary industries in an ecological sustainable manner. External factors such as rising fuel costs are considered during management arrangement reviews.
Other issues	Nil

## Ecosystem

Rationale for inclusion of issue	<p>The main purpose of the <i>Fisheries Act 1994</i> (the Act) includes applying and balancing the principles of ecologically sustainable development (ESD). Among the principles of ESD, as defined in the Act are:</p> <ul style="list-style-type: none"> <li>• “protecting biological diversity, ecological processes and life-support systems”</li> <li>• “the precautionary principle”, which is defined in the Act as “the principle that , if there is a threat of serious or irreversible environmental damage, lack of scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation, because of the threat”.</li> </ul> <p>The MAFF collects from a very diverse array of species (600+). While the ERA of the fishery established that this fishery is having minimal impact on the species base it collects from, commercial operators recognise the industry has the potential to harm the ecosystem through indiscriminate collection practices. The industry peak representative body, ProVision Reef, have developed a Code of Conduct outlining best practice fish handling and collection techniques that are aimed at reducing the risk of ecosystem harm. While the Code of Conduct is not yet finalised (as at July 2008), education of members will be key to maintaining across the board non-harmful collection practices.</p>
<b>Operational objective</b>	<b>Ensure MAFF resources harvested in an ecologically sustainable manner</b>
<b>Indicator</b>	<b>Proportion of industry adopting identified best practice protocols*</b> *Measure is dependent on formalisation of protocols within the industry developed Code of Conduct to be implemented in May 2009
<b>Performance measure</b>	<b>&lt; 80% of active operators have adopted best practice protocols</b>
Justification	The measure is a proxy for ecosystem health and will indicate the level of commitment to best practice, non-harmful collection techniques by industry members.
Data requirements/availability	Membership levels in the peak representative body - ProVision Reef.
Monitoring and assessment of PMS	Membership data will be monitored annually and reported on in context of the performance measures in the Annual Status Report for the fishery.
Evaluation of current fishery performance	<p>This is an aspirational performance measure. Indicator has not been measured as the Code of Conduct has not been implemented formally. This is planned to occur in May 2009.</p> <p>Membership statistics indicate that the indicator will not been triggered in 2008–09 with the 90% of active licences members of Pro-vision Reef.</p>
Robustness <u>Levels (from Fletcher <i>et al.</i> 2002 – refer to first indicator for level definitions)</u>	<b>Low</b> Measure robustness is dependent on the best practice techniques outlined in the Code of Conduct once implemented.
Current and future management	<p>Current—limited entry, gear and vessel restrictions—harvesting restricted to hand collection, spatial management measures (e.g. SMAs, marine protected areas).</p> <p>Future—Current system is comprehensive and adequate for managing the fishery.</p>
Actions if performance measure is triggered	QPIF will report on the PMS annually in the Annual Status Report following the availability of all relevant data. Within three months of becoming aware that a review has been triggered, QPIF in collaboration with Harvest MAC to finalise a clear timetable for implementation of appropriate management responses. This would involve consultation with stakeholders.
Comments and action	Ecosystem objectives will need further development as more information on the ecosystem indicators is received.

External drivers	Climate change may influence regional ecosystems and result in change of collection practices
Other issues	Nil