

**Application for Declaration as an Approved Wildlife  
Trade Operation under the *Environment Protection and  
Biodiversity Conservation Act 1999***

**Export of Marine Aquarium Fish  
from Tasmanian Waters**



**May 2005**



DEPARTMENT of  
PRIMARY INDUSTRIES,  
WATER and ENVIRONMENT

**Tasmania**

# Contents

---

<b>EXECUTIVE SUMMARY</b>	<b>3</b>
<b>A. INTRODUCTION</b>	<b>4</b>
A.1 History of the fishery	4
A.2 Context of current management regime	7
A.3 Description of management regime	8
A.3.1 Availability of documented management arrangements	8
A.3.2 Consultative process for developing management regime	8
A.3.3 Expertise and community involvement in management of the fishery	8
A.3.4 Objectives of the management regime	9
A.3.5 Controls on level of harvest in the fishery	11
A.3.6 Enforcement of management arrangements	11
A.3.7 Provision for periodic review of the fishery	12
A.3.8 Assessment of any adverse impacts of the fishery on the marine ecosystem	13
A.3.9 Compliance with abatement and recovery plans and bycatch action strategies	13
<b>B. ESD ASSESSMENT</b>	<b>15</b>
<b>B.1 - PRINCIPLE 1.</b>	<b>15</b>
B.1.1 Objective 1.	15
B.1.1.1 Information requirements	15
B.1.1.2-5 Assessment	16
B.1.1.6-9 Management responses	19
B.1.2 Objective 2.	20
B.1.2.1-2 Management responses	20
<b>B.2 - PRINCIPLE 2.</b>	<b>21</b>
B.2.1 Objective 1.	21
B.2.1.1 Information requirements	21
B.2.1.2 Assessments	22
B.2.1.3-6 Management responses	22
B.2.2 Objective 2.	23
B.2.3 Objective 3.	23
B.2.3.1 Information requirements	23
B.2.3 Assessment	24
B.2.3.3-5 Management responses	27
<b>C. REFERENCES</b>	<b>27</b>
<b>D. GLOSSARY OF ABBREVIATIONS</b>	<b>27</b>
<b>E. ATTACHMENTS</b>	<b>27</b>

## EXECUTIVE SUMMARY

The collection of marine aquarium fish from Tasmanian State waters is assessed against the Commonwealth *Guidelines for the Ecologically Sustainable Management of Fisheries* as required under Part 13A of the *Environment Protection and Biodiversity Conservation Act 1999*.

Marine aquarium fish have been hand collected under the authority of permits since 1997. Holders of a commercial dive licence also have access to marine aquarium species, but this licence only authorises the taking of fish by hand, not the use of specialised gear. The commercial dive management arrangements are presently being reviewed, including whether the taking of aquarium species should require a commercial dive licence. In the interim, a limited number of permits were issued to interested fishers to assess the developmental potential of the aquarium fishery.

Species primarily targeted include small ornamental reef fish, hydroids, anenomes, decorative crabs and shrimps, starfish and crinoids. Areas mainly fished include the East Coast, D'Entrecasteaux Channel area and the Tamar estuary. At present, one permit holder collects marine aquarium specimens by diving and by hand for sale locally and overseas and for display in national and international aquaria.

Management of this fishery is by issue of a permit under the *Living Marine Resources Management Act 1995*. The commercial dive fishery is managed by the *Fisheries (Commercial Dive) Rules 1999*. Controls imposed on the fishery are precautionary in nature and executed by permit condition. The long term viability of the fishery is still being assessed, based on catch data, and any available scientific research and marketing information.

The fishery's low impact collection methods result in a minimum of impact occurring on the complex habitat of aquarium species and the wider ecosystem generally. The level of bycatch occurring in the fishery is insignificant.

## **A INTRODUCTION**

### **A.1 History of the fishery**

In Tasmania, fisheries and other living marine resources are managed under the provisions of the *Living Marine Resources Management Act 1995* (the Act). The Minister administering the Act is the Minister for Primary Industries and Water, and the responsible Department is the Department for Primary Industries, Water and the Environment (DPIWE).

In the past, marine aquarium fish have been taken at a low level as a bycatch of either the commercial dive or scalefish fisheries, and also recreationally. Whilst able to take many aquarium species, neither of these sectors specifically target marine aquarium fish as their licences do not allow specialised gear necessary to take them. To date, it has not been feasible to progress the development of this fishery beyond a scientific permit stage until a management plan for the commercial dive fishery has been put in place, due to the overlap of species taken.

Until such time as commercial dive management arrangements are finalised in the next 8 –12 months, commercial divers continue to have access to most aquarium species. Around 55 non-transferable commercial dive licences presently exist and monitoring of their catch returns shows no aquarium species are taken. The expected direction for restructuring the commercial dive fishery is to only allow licence holders to take species prescribed on their licence (most likely these will include species predominately targeted by commercial divers - urchins, periwinkles and whelks). Other species may be added to licences by individual endorsements or species may be authorised by permit.

Since 2001, there has been renewed commercial interest in developing a dedicated fishery for Tasmania's unique marine species as a result of increased demand from large national aquariums and aquarium suppliers. In September of that year, the Minister approved the issue of a limited number of exploratory scientific permits for taking aquarium species using specialised gear. The permit holders can not be required to hold a commercial dive licence until such time as that fishery is restructured, as licences are presently non-transferable, although it is DPIWE's intention that they do eventually obtain this licence. Two parties who

had demonstrated a long standing interest in this fishery were granted permits after providing submissions on their proposed operations including details of specialised collection and holding techniques and facilities.

Recognising the need to take a precautionary approach to this fishery, the management regime for aquarium fish allows the collection of some common species, restricts the numbers of less common species and does not allow the collection of species which were rare or highly localised, except by the issue of special permit to allow public display at large aquariums for educational purposes. The permits have strict reporting requirements aimed at collecting detailed information on species collected, abundances and actual collection sites. The list of permitted species is at Attachment 1.

The Minister approved that not more than a total of 4 – 5 permits may be issued for taking aquarium species and that applicants must demonstrate a significant interest in assisting research into this fishery. Scientific research permits were then developed for two stakeholders defining which species could be collected and sold, and detailing gear restrictions and annual and block limits on take. These permits were reissued with minor variations, at first three monthly, then six monthly and now annually (to only one permit holder since November 2004). Based on scientific advice, the variations were made to refine which species could be taken and to limit fishing areas.

Some species, particularly invertebrates, were removed because of doubts about their ability to survive in an aquarium environment. Permit holders were asked to apply for separate one-off permits for scientific research purposes to take these species. One-off permits have also been issued to experienced collectors or to large public aquariums for specific collections of notably rare or protected species for educational and community awareness purposes.

The fishery targets a diverse range of more than 130 different species of fish, although numbers taken are extremely low in volume and require specialised handling. Popular specimens are small ornamental reef fish, hydroids, anenomes, decorative crabs and shrimps, starfish and crinoids. Access is to all State waters, excluding protected areas, research areas and shark refuge areas. At this stage in the development of the fishery, the areas popular with divers have included the D'Entrecasteaux Channel, sections of the east coast including

Bicheno and St Helens and the Tamar River. The fishery is managed primarily by catch limits and gear controls.

The viability of the aquarium fishery is still being assessed and until such time as commercial dive arrangements are finalised, access will be by permit. To date, only one permit holder has shown continued interest in developing a dedicated aquarium fishery. If the fishery demonstrates potential to be commercially viable, the management of the fishery would then move to a more structured fisheries development phase. Access would be by permits issued for fisheries development purposes following extensive consultation with industry. It is envisaged that the fishery would spend at least 18 – 24 months as a developmental fishery. Progression to formal management arrangements would only occur if warranted and would be in accordance with the management planning processes provided for in the Act.

An absence of historical catch and effort data means only very limited assessment of catches of targeted marine aquarium species has occurred. Little information on the distribution and abundance is available, particularly for invertebrates. Should catch rates for the fishery increase, the Department will assess the feasibility of gathering further information about some targeted aquarium species.

A variety of research has been done on the biology and ecology of different species of Tasmanian marine fish and invertebrates. The information is, however, very limited and the range of species included in this fishery varied. The University of Tasmania, Australian Maritime College, Commonwealth Scientific and Industrial Research Organisation, Tasmanian Museum and Art Gallery, and Tasmania Aquaculture and Fisheries Institute (TAFI) have shown interest in further research, particularly into species of commercial interest, subject to funding being available.

Some successful work has been done on the culture of a variety of species, particularly those that command premium prices, such as members of the Syngnathidae family. In particular, big-bellied seahorses have been successfully cultured for commercial purposes since 1999.

To date, the fishery has been conducted at an extremely low level in terms of numbers of fish taken and the method of fishing is highly selective. This has minimised any adverse impact

of the fishing operations on the sensitive marine ecosystems inhabited by popular marine aquarium species.

## **A.2 Context of current management regime**

The permits that allow the taking and possession of marine aquarium fish are issued under Section 14 of the *Living Marine Resources Management Act 1995*. Permits can be issued for specific purposes, in this case, for exploratory scientific research purposes, and are issued by the Minister or his delegate subject to certain conditions, for not longer than 12 months.

The Act sets out the objectives for the sustainable management of living marine resources in Tasmania and provides the framework for developing and implementing management arrangements for each of the State's fisheries. The objectives of the legislation are provided in Section 7 and Schedule 1 of the Act and are consistent with the objectives of the resource management planning system of Tasmania.

- 7(1) *The purpose of this Act is to achieve sustainable development of living marine resources having regard to the need to -*
- (a) increase the community's understanding of the integrity of the ecosystem upon which fisheries depend; and*
  - (b) provide and maintain sustainability of living marine resources; and*
  - (ba) take account of a corresponding law; and*
  - (c) take account of the community's needs in respect of living marine resources; and*
  - (d) take account of the community's interests in living marine resources.*
- 7(2) *A person must perform any function or exercise any power under this Act in a manner which furthers the objective of resource management.*

### **SCHEDULE 1 - OBJECTIVES OF THE RESOURCE MANAGEMENT AND PLANNING SYSTEM OF TASMANIA**

1. *The objectives of the resource management and planning system of Tasmania are -*
- (a) to promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity; and*

- (b) to provide for the fair, orderly and sustainable use and development of air, land and water; and*
  - (c) to encourage public involvement in resource management and planning; and*
  - (d) to facilitate economic development in accordance with the objectives set out in paragraphs a, b and (c); and*
  - (e) to promote the sharing of responsibility for resource management and planning between the different spheres of Government, the community and industry in the State.*
2. *In clause 1a, "sustainable development" means managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural well-being and for their health and safety while -*
- (a) sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations; and*
  - (b) safeguarding the life-supporting capacity of air, water, soil and ecosystems; and*
  - (c) avoiding, remedying or mitigating any adverse effects of activities on the environment.*

### **A.3 Description of current management regime**

The taking of marine aquarium fish is managed under permit including controls such as monthly and annual limits on numbers of fish collected, limits on fishing apparatus used, number of participants and area restrictions (see attachments). Holders of a fishing licence (commercial dive) can take aquarium fish by hand by diving (usually using scuba or hookah techniques) only, however none currently target these species. Aquarium fish permit holders are limited to using hand nets, slurp guns, barrier nets (not more than 10m in length and 2 metres in drop and which are used within 50m of the permit holder).

One permit is issued on an annual basis to allow the taking of limited numbers of 49 species of fish and 50 species of invertebrates from estuarine, inshore and coastal waters (see Attachment 1). Present policy is that no more than five permits will be issued. Each permit holder is allocated a block limit for each species corresponding to blocks applying to the commercial dive fishery of approximately 6 x 6 nautical miles in area, ensuring that total catch numbers are dispersed over a wide area, minimising any likelihood of localised

depletions, particularly for invertebrates. Permit holders are not allocated separate blocks but fish in the same areas (block limits are calculated to accommodate this). Commercial divers also have access to these areas.

To collect marine aquarium fish, fishers must hold a fishing licence (personal), must do so by diving using scuba or hookah, wading or by hand using hand nets, slurp-gun, barrier nets and bait traps only. The Department cannot require them to hold a commercial dive licence as these are presently non-transferable. Marine aquarium fish are not to be collected from within marine nature reserves, national parks, research areas or marine resources protected areas and no fish are to be released back into State waters once collected. Marine Police must be notified at least 24 hours prior to any collection activities. Permit holders must complete the species and site specific aquarium fishery logbook for each dive collection and submit a copy to the Director of Marine Resources within 48 hours. The Director is to be notified in writing of the location of the primary holding facilities and accurate records are to be kept regarding any progeny produced by specimens held in captivity. Fish can be sold domestically and for export, but are not to be sold for human consumption.

At present, no other permits have been issued allowing marine aquarium fish to be collected in the State. Permit holders and public aquarium owners can be issued with separate permits on a one-off basis to take limited amounts of aquarium fish for education and community awareness purposes. Collection of aquarium fish by recreational fishers for home aquariums is minimal with no catch and effort information available about this activity.

### **A.3.1 Availability of documented management arrangements**

Permits are publicly available documents as is generally the practice for release of details of access and licensing arrangements for community owned natural resources such as wild fisheries. Information and copies of the permits can be obtained from the fishery manager, the Marine Resources Division of the Department of Primary Industry and Fisheries on 6233 2044. The *Living Marine Resources Management Act 1995* can be viewed at [www.thelaw.tas.gov.au](http://www.thelaw.tas.gov.au).

Information about management arrangements for the taking of aquarium species for recreational aquarists is provided in the Tasmanian Recreational Sea Fishing Guide.

### **A.3.2 Consultative process for developing management regime**

The Act describes the consultative process that must be undertaken if the Minister intends issuing a permit for scientific research purposes. Prior to issuing a permit for taking marine aquarium fish for this purpose, the Act requires that the Minister must consult with the relevant fishing body if he considers that granting the permit is likely to have a significant effect on that fishing body. As the fishery is still in an exploratory research stage, formal consultation has not been undertaken with the relevant fishing bodies, although the Tasmanian Fishing Industry Council (TFIC) is aware of the aquarium permits. Permit requirements for the fishery are developed by the fishery manager in consultation with industry participants. In particular, any changes to permit conditions are discussed with the fishers prior to implementation.

### **A.3.3 Expertise and community involvement in management of the fishery**

The work of Tasmanian Aquaculture and Fisheries Institute (TAFI) scientists provides background species abundance and distribution data for some finfish species<sup>1</sup>. Additionally, a small scientific advisory committee comprising representatives from CSIRO, University of Tasmania and the Tasmanian Museum and Art Gallery advise on catch rates, area restrictions and requests for species to be added or removed from permit schedule list. Meetings are not held on a regular basis, however advice is sometimes sought individually from these experts with regard to information about the handling of certain species and their survivability in aquarium environments. The Marine Police are consulted about reporting and enforcement provisions of the permits.

Management of the marine aquarium fishery is the responsibility of the Marine Resources Group of DPIWE in consultation with local community representatives where appropriate, including other divers, recreational fisheries managers, and other non-extractive users of State waters.

---

<sup>1</sup> Jordan, A R, Mills, D M, Ewing, G, and Lyle, J M, (1998), *Assessment of inshore habitat around Tasmania for life-history stages of commercial finfish species*. FRDC project no. 94/037. Marine Research Laboratories - Tasmanian Aquaculture and Fisheries Institute, University of Tasmania. Tasmania, Australia.

### **A.3.4 Objectives of the management regime**

As the marine aquarium fishery is still classified as a developing fishery, the Minister, where appropriate, takes account of the precautionary principle during the development of this fishery. Restricting permit numbers in the early stages of development is particularly important until sufficient biological information is available. This approach is intended to avert any possibility that pressure to over-exploit the fishery could lead to overfishing or habitat degradation. Further research will be undertaken only if total catches increase in volume or some other issue arises to justify it.

#### **Policy objectives and management strategies for the aquarium fish resource**

Below are the objectives of fisheries management for the aquarium fish fishery and strategies to attain these objectives. The objectives are complementary to the stated resource management and planning objectives described in Schedule 1 of the *Living Marine Resources Management Act 1995*.

##### *1. Maintaining fish biomass and recruitment*

- Limiting number of participants in fishery by restricting permit issue (currently one permit).
- Limit total specimens catch by permit condition (see Attachment 1).
- Restrict fishing methods and gear to be used in marine aquarium fish collection.
- Monitor marine aquarium fishery primarily through catch in sufficient detail to recommend alteration to management methods if necessary.
- Protect juvenile fish by imposition of size limit.

##### *2. Managing environmental interactions*

- Minimise any environmental impact of marine aquarium fishing methods by specifying non-mechanical fishing methods.
- Minimise bycatch of non-target species.

- Manage marine environmental concerns such as the introduction and translocation of disease in accordance with the relevant Departmental policies.

### 3. *Sustaining yield and reducing incidental fishing mortality*

- Sustaining yield by limiting collection of marine aquarium fish annually and in defined areas.
- To provide management measures including gear restrictions and imposition of annual and block limits, to minimise incidental fishing mortality as a result of collection operations.

### 4. *Access to marine aquarium resources by non-commercial and non-extractive users*

- Maintain and provide reasonable access to marine aquarium fish for recreational users.
- Limit the development of marine aquarium fisheries in areas of State waters that are of particular significance to recreational or Aboriginal cultural users.
- Minimise adverse interaction between commercial fishers and other users of the marine environment, including non-extractive users.

### 5. *Enforcement and monitoring*

- To prevent persons taking marine aquarium fish in excess of commercial or recreational catch limits under the *Living Marine Resources Management Act 1995*.
- To prevent any breach of marine aquarium fishery conditions by permit holders.
- To monitor the collection of marine aquarium fish annually to restrict or adjust management controls where necessary.

### 6. *Cost recovery and socio-economic return to the community*

- To equitably recover an economic return from permit holders to contribute to the costs of management, compliance and research for the marine aquarium fishery, sufficient to achieve cost recovery over time.
- To provide employment and business opportunities in coastal communities.

## *7. Marketing/processing sector*

- To achieve handling, storage and transporting practices which ensure the highest quality product.

### **A.3.5 Controls on level of harvest in the fishery**

Management controls in this developing fishery are controlled by permit condition (see Attachment 1). At present, permits are only issued for twelve-month periods with a fixed catch allocation for each species, allowing for frequent review. The Minister has the power to vary any condition of a permit by notice in writing served on the person who holds the permit. This allows for the swift introduction or alteration of management controls such as types or numbers of fish taken, size limits and area restrictions which is essential due to the exploratory nature of the fishery. The Minister can also revoke a permit by notice in writing to the permit holder at any time.

### **A.3.6 Enforcement of management arrangements**

Tasmania Police Marine and Rescue Division are responsible for enforcing management arrangements. This includes the requirement that fishers must carry a copy of the permit with them when collecting and count and record specimens accurately at catch site. Approved logbooks must be completed prior to any specimens being removed from the point of landing for transport. The completed daily marine aquarium fishery logbook must be forwarded to the fishery manager within 48 hours of collection.

Compliance checks are carried out by Tasmanian Marine police officers statewide as required including during fishing, at the landing sites and at the holding facility. These checks may be more frequent depending on the popularity of the dive site with other fishers. To date, there have not been any compliance issues with logbooks being provided to the Department and no recorded offences within the fishery.

### ***A.3.7 Provision for periodic review of the fishery***

Permits under the *Living Marine Resources Management Act 1995* for the development of fisheries can not be issued for a period longer than 12 months. Current permits have a duration of 12 months.

A review of the developmental fishery for marine aquarium fish is conducted upon the expiry of each permit and an appraisal is undertaken annually, usually prior to the expiry of the permits at the end of October). These include examination of the collection levels, impact on species populations or the environment, a review of management, research or compliance costs, market infiltration and success and, if necessary, additional consultation with other users of the resource. An overall evaluation of whether the fishery is likely to be commercially viable and suitable for further development is also appropriate at this stage.

The most recent review, undertaken after the expiry of the most recent 12 month permit in September 2004 included revision of catch levels, fishing block size, follow up with the advisory committee and review of available market and pricing information. Currently, the numbers of fish being taken are low and whether the fishery has the potential to move beyond developmental status will be further evaluated by DPIWE on an ongoing basis.

### ***A.3.8 Assessment of any adverse impacts of the fishery on marine ecosystem***

The current size of the fishery is such research into its impact on the marine ecosystem cannot be justified and that any adverse impact of the fishery on the marine ecosystem are minimal.

### ***A3.9 Compliance with abatement and recovery plans and bycatch action strategies***

Abatement and recovery measures appropriate to the scale of this developing fishery will be developed if required. Bycatch, due to the scale of the fishery and the method of fishing, is negligible. Any bycatch is limited to commensal organisms. No byproduct is collected - only species listed on the permit can be taken.

## **B ESD ASSESSMENT**

### **B.1 PRINCIPLE 1.**

**A fishery must be conducted in a manner that does not lead to over-fishing, or for those stocks that are over-fished, the fishery must be conducted such that there is a high degree of probability the stock(s) will recover.**

#### ***B.1.1 Objective 1.***

**The fishery shall be conducted at catch levels that maintain ecologically viable stock levels at an agreed point or range, with acceptable levels of probability.**

##### ***B.1.1.1 Information requirements***

***1.1.1 There is a reliable information collection system in place appropriate to the scale of the fishery. The level of data collection should be based upon an appropriate mix of fishery independent and dependent research and monitoring.***

Some limited fishery independent data such as distribution and abundance information for some finfish species has been compiled for other research purposes.<sup>2</sup>

Fishery dependent data is collected from the permit holders who complete a Marine Aquarium Fishery Logbook (see attachment) for each dive collection. This catch logbook must be completed within 48 hours of a dive collection and contain the following catch data:

- Permit number and date
- Dive start and finish time

---

<sup>2</sup> Jordan, A R, Mills, D M, Ewing, G, and Lyle, J M, (1998), *Assessment of inshore habitat around Tasmania for life-history stages of commercial finfish species*. FRDC project no. 94/037. Marine Research Laboratories - Tasmanian Aquaculture and Fisheries Institute, University of Tasmania. Tasmania, Australia.

- Name of dive site, block number and GPS coordinates
- Water temperature and bottom type
- Names of collectors and collection methods used
- Names of species collected (common and scientific)
- Numbers of each species collected (including separate notification of mortalities)
- Gear details (i.e. length of barrier net used)

The number of collectors is not limited, but a permit holder must be in attendance when fish are being taken under the permit. Usually, around 2- 3 divers collect the fish at one time.

The penalties for breaching a permit condition by not completing logbook information as required are a significant deterrent to overfishing or under declaring catch. They have never been imposed on any permit holder in the aquarium fishery.

Targeted fishery independent information is not currently being collected due to the developing nature of the aquarium fishery, its low economic value and the small number of participants. The allocation of resources for extensive scientific research can only be justified where the potential for a substantial industry can be demonstrated and where the financial return to the state from the fishery is likely to generate enough revenue to fund its ongoing management and research.

The funding and collection of more detailed fishery independent information about species has not been conducted because of low numbers of fish collected to date. Some fishery independent data in regard to abundance of invertebrates in the State's marine protected areas has been conducted over a number of years and is available as a baseline reference for these species. Habitat information for some areas is available via the Tasmanian Aquaculture and Fisheries Institute seamapping project.

#### ***B.1.1.2-5 Assessment***

***1.1.2*** *There is a robust assessment of the dynamics and status of the species/fishery and periodic review of the process and the data collected. Assessment should include a*

*process to identify any reduction in biological diversity and/or reproductive capacity.  
Review should take place at regular intervals but at least every three years.*

One permit holder participates in the fishery on a small scale under the authority of permits. These permits have annual species allocations to be taken from designated small-scale blocks. The permit is for a period of 12 months and the holder may be issued additional permits should requests for rare or highly localised specimens not included on the permit be requested by public aquaria.

Information on the effect on biodiversity from this small fishery is not readily available. As the fishery takes very small numbers of a diverse variety of species from a large expanse of coastline, it is expected that any effect to the biodiversity would be limited to sedentary invertebrates that may be fished beyond their recruitment capabilities within small localised areas. There is no evidence of any such depletions occurring in the current fishery and monitoring systems are in place to prevent this.

The complexity of the interrelationships between the various vertebrates, invertebrates and algae that inhabit the coastal marine ecosystems would require extensive survey and assessment to provide any significant information. It is difficult to justify expending the considerable resources this would require given the current size and value of this fishery.

*1.1.3 The distribution and spatial structure of the stock(s) has been established and factored into management responses.*

Fishers who have held past permits to take marine aquarium fish by diving have reported that collection has resulted in no discernible changes in the environment. There is some suggestion that this level of harvest may actually increase site productivity.

Catch per block is monitored in the fishery via catch returns. The pattern is that permit holders fish selectively over the all the designated block (Global Positioning System coordinates are provided). This means that CPUE provides a general indication of fishing effort but cannot be relied on as an accurate indicator of stock abundance.

Research staff at the TAFI have conducted fish species abundance and distribution as well as habitat mapping coastal waters, providing a baseline reference for some species.

*1.1.4 There are reliable estimates of all removals, including commercial (landings and discards), recreational and Aboriginal from the fished stock. These estimates have been factored into stock assessments and target species catch levels.*

There is no reliable information about collection prior to the current permit fishery. The overall level of harvest under Permit 4069 from October 2003 to September 2004 was 1219 specimens.

Fishers operating under a current permit must lodge catch returns within 48 hours of collection and are restricted to permit allocations. Any take of aquarium fish by holders of a commercial dive licence is negligible.

Recreational and Aboriginal fishing for aquarium species around the state is believed to be at a very low level and in the shallower areas than those fished by commercial permit holders. Aquarium species are not considered a popular recreational species. Recreational bag, size and possession limits apply for some scalefish species. These limits also apply to Aboriginal fishers, unless they wish to apply for a special permit for a particular cultural event but most species are not attractive as they are non-consumable items. No such permits have been issued under the *Living Marine Resources Management Act 1995*.

Indications from police prosecutions are that levels of illegal fishing for marine aquarium fish are negligible.

*1.1.5 There is a sound estimate of the potential productivity of the fished stock/s and the proportion that could be harvested.*

In the absence of any real data for many of the species targeted in this fishery, particularly invertebrates, catch levels have been set at very low levels for each species after consultation with relevant members of the advisory committee referred to in A 3.3. These catch levels are reviewed at least annually or may be reviewed during the collection year if necessary.

Increased market demand for a particular species is also a legitimate reason for review of catch levels.

#### ***B.1.1.6-9 Management responses***

*1.1.6 There are reference points (target and/or limit), that trigger management actions including a biological bottom line and/or a catch or effort upper limit beyond which the stock should not be taken.*

Due to its status as a developing fishery, formal trigger points for the aquarium fishery have not been developed. The response to escalating fishing effort in the fishery is to vary, or if necessary, not issue further permits. Other indicators in the fishery which may prompt management action include significant changes in density, indications of poor recruitment or high rates of natural mortality. Such changes may be indicated via information received from fishers.

The management responses to indications of changes in the fishery could be to authorise one or more of the following actions:

- Removal of species from list of species able to be fished.
- Further restrict catch limits, following consultation with advisory group and/or survey of fishing area.
- Introduce or change catch limits on a regional basis.
- Introduce area or seasonal closures.
- Other appropriate management measures.

These actions could be implemented quickly by varying permit conditions as provided for under the Act.

*1.1.7 There are management strategies in place capable of controlling the level of take.*

Management controls include a limit on the number of fishers participating in the fishery, their level of catch, type of fishing gear and areas where collection takes place. Commercial divers still have access to aquarium species but no significant catches have been reported in the history of the fishery, primarily because they do not have access to specialised fishing gear or handling facilities.

*1.1.8 Fishing is conducted in a manner that does not threaten stocks of by-product species.*

Marine aquarium fish are harvested by hand by a diver. Other species taken incidentally as bycatch are negligible, consisting primarily of minute quantities of invertebrate species attached to larger target species.

*1.1.9 The management response, considering uncertainties in the assessment and precautionary management actions, has a high chance of achieving the objective.*

At this early stage in the development of this minor fishery, the management controls appear to be effective to date in meeting the objectives set for the fishery. It is difficult to foresee any external factors that may have uncontrollable impact on this minor, inshore fishery. The ultimate protection, because the fishery is controlled by short term permit and fishers do not have the access rights conferred by a licence, is that fishing can cease absolutely at the end of each permit period, or be revoked by the Minister during the period of the permit. Long term access to fisheries granted by permit is not guaranteed. Should the fishery progress to becoming a viable commercial fishery, it is expected that trigger points will be established.

### **B.1.2 Objective 2.**

**Where the fished stock(s) are below a defined reference point, the fishery will be managed to promote recovery to ecologically viable stock levels within nominated timeframes.**

#### **B.1.2.1-2 Management responses**

*1.2.1 A precautionary recovery strategy is in place specifying management actions, or staged management responses, which are linked to reference points. The recovery*

*strategy should apply until the stock recovers, and should aim for recovery within a specific time period appropriate to the biology of the stock.*

Currently not applicable as reference points have not been established because the fishery is still in the development stage.

To comply with the objectives of *the Living Marine Resource Management Act 1995*, the Minister must take appropriate action to ensure a fishery is managed sustainably. The Act provides powers to vary or revoke permits or to take emergency action to rectify threatening actions.

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

Currently not applicable.

## **B.2 PRINCIPLE 2.**

**Fishing operations should be managed to minimise their impact on the structure, productivity, function and biological diversity of the ecosystem.**

### ***B.2.1 Objective 1.***

**The fishery is conducted in a manner that does not threaten bycatch species.**

#### ***B.2.1.1 Information requirements***

*2.1.1 Reliable information, appropriate to the scale of the fishery, is collected on the composition and abundance of bycatch.*

No information is collected on bycatch species, which are negligible for the taking of aquarium fish. Incidental observations have been made by collectors on any commensal bycatch during normal fishing operations.

#### **B.2.1.2 Assessments**

*2.1.2 There is a risk analysis of the bycatch with respect to its vulnerability to fishing.*

There are no specific assessments or risk analysis on bycatch species as their take is infinitesimally small because the fishery method is highly selective. The collection sites occupy, proportionally, a very small area of coastal regions throughout the state where the incidental invertebrate bycatch species from this fishery also occur.

#### **B.2.1.3-6 Management responses**

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

Marine aquarium fish are specifically targeted by hand by a diver with the intent of avoiding the taking of bycatch species.

*2.1.4 An indicator group of bycatch species is monitored.*

Not currently applicable. None of the bycatch species are taken in sufficient numbers to warrant monitoring in this manner. At present, there is no intention to determine if any of the bycatch species are good indicator species.

*2.1.5 There are decision rules that trigger additional management measures when there are significant perturbations in the indicator species numbers.*

Not applicable at this stage.

*2.1.6 The management response, considering uncertainties in the assessment and precautionary management actions, has a high chance of achieving the objective.*

Not applicable at this stage. However, the Act provides for variations to permits and emergency responses that could be used to protect a species that was perceived to be under threat. In the absence of a continuous, targeted research program to monitor bycatch species, it is likely that in the first instance the Department would become aware of any concerns via anecdotal information from fishers or from catch data.

### **B.2.2 Objective 2.**

**The fishery is conducted in a manner that avoids mortality of, or injuries to, endangered, threatened or protected species and avoids or minimises impacts on threatened ecological communities.**

Not applicable as there is no interaction between this fishery and any known endangered, threatened or protected species at this stage. In Tasmanian waters, threatened species are protected by the *Threatened Species Protection Act 1995*, which also provides mechanisms for reporting sightings.

### **B.2.3 Objective 3.**

**The fishery is conducted, in a manner that minimises the impact of fishing operations on the ecosystem generally.**

#### **B.2.3.1 Information requirements**

*2.3.1 Information appropriate for the analysis in 2.3.2 is collated and/or collected covering the fisheries impact on the ecosystem and environment generally.*

The impact on the ecosystem and environment generally from the removal of marine aquarium fish is negligible. The scale of the fishery is such that information is not currently collected in regard to this.

### **B.2.3            *Assessment***

**2.3.2** *Information is collected and a risk analysis, appropriate to the scale of the fishery and its potential impacts, is conducted into the susceptibility of each of the following ecosystem components to the fishery.*

*1. Impacts on ecological communities*

- *Benthic communities*
- *Ecologically related, associated or dependent species*
- *Water column communities*

*2. Impacts on food chains*

- *Structure*
- *Productivity/flows*

*3. Impacts on the physical environment*

- *Physical habitat*
- *Water quality*

No information about the role of each species in the ecosystem or the effect of their removal has been gathered at this time due to the small scale of the fishery. The use of chemicals and explosives are not permitted in the management arrangements for this fishery.

### **B.2.3.3-5        *Management responses***

**2.3.3** *Management actions are in place to ensure significant damage to ecosystems does not arise from the impacts described in 2.3.1.*

Not applicable at present.

*2.3.4 There are decision rules that trigger further management responses when monitoring detects impacts on selected ecosystem indicators beyond a predetermined level, or where action is indicated by application of the precautionary approach.*

No management responses are required at this time.

*2.3.5 The management response, considering uncertainties in the assessment and precautionary management actions, has a high chance of achieving the objective.*

Not applicable at present.