

# State-wide



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**Fisheries 286**

## FISHERIES

### Marine Aquarium Fish Managed Fishery Status Report

S.J. Newman and M. Cliff

Management input from S. Brand-Gardner

#### Fishery Description

The Marine Aquarium Fish Managed Fishery (MAF) targets more than 250 species of fish under its management plan. By way of endorsement, fishers also take coral, algae, live rock, live sand and invertebrates. It is primarily a dive-based fishery that uses hand-held nets to capture the desired target species from boats up to 8 m in length.

While the MAF operates throughout all Western Australian waters, catches are relatively low in volume, due to the special handling requirements of live fish. Fishing operations are heavily weather-dependent, owing to the small vessels used and the potentially hazardous conditions (e.g. waves and swell) encountered. In addition, human constraints (i.e. the physiological effects of decompression) limit the amount of effort exerted in the fishery, the depth of water and the extent offshore to where collections can occur.

#### Governing legislation/fishing authority

##### Commercial

Marine Aquarium Fish Management Plan 1995  
Marine Aquarium Fish Managed Fishery Licence  
Commonwealth Government *Environment Protection and Biodiversity Conservation Act 1999* (Wildlife Trade Operation (WTO))

##### Recreational

*Fish Resources Management Act 1994*  
*Fish Resources Management Regulations 1995* and subsidiary legislation

#### Consultation process

##### Commercial

Meetings between the Department of Fisheries and industry

##### Recreational

Recreational Fishing Advisory Committee (RFAC)

#### Boundaries

The MAF operates in Western Australia's state waters, spanning the coastline from the Northern Territory border in the north to the South Australian border in the south. The effort is spread over a total gazetted area of 20,781 km.

During the past 3 years the fishery has been active in waters from Esperance to Broome, with popular areas being around Dampier, Exmouth, Perth and Albany.

#### Management arrangements

This fishery is managed primarily through input controls, in the form of limited entry to the fishery, and permanent closed areas.

There are 13 licences in the fishery and in most years all licences are used. In 2006, 11 licences were operated in the fishery.

Licensees are not permitted to operate within any waters closed to fishing (e.g. Rowley Shoals, Reef Protected Areas, sanctuary zones). The fishery is permitted to operate in general-purpose zones of marine parks for the collection of fish and some invertebrates (usually excluding coral and live rock). Fishing is also prohibited on Cleaverville Reef (to exclude the take of coral and associated organisms).

Fish caught in this fishery may not be used for food purposes, and operators are not permitted to take species covered by other specific commercial management arrangements or management plans.

The MAF is permitted to take most species from the syngnathid family (seahorses and pipefish), which are listed under the *Environment Protection and Biodiversity Conservation Act 1999*. However, there is a total ban on the take of leafy seadragons (*Phycodurus eques*).

#### Research summary

Information provided by the fishery in the form of statutory monthly catch and effort returns is used as the basis to provide research advice for fisheries management. Statutory catch and effort reporting at the fine spatial scale of 10 minutes of latitude and longitude commenced in September 2004.

#### Retained Species

**Commercial landings (season 2006):** 28,203 fish

Collectors in this ornamental fishery can earn a high return from the capture of very small quantities of individuals. Therefore, the catches are small in comparison to the more common, food-fish fisheries.

Fishers report the level of catch (kg or numbers) by species or species group. A summary of the 2006 levels of catch is provided in Marine Aquarium Fish Table 1. The reported landings of aquarium fish for 2006 are similar to those reported in 2005.

#### Recreational catch:

**Not assessed**

There is no documented recreational fishery. If members of the public wish to collect specimens for their own private aquariums they are permitted to do so, but are restricted to normal recreational bag limits and, for some species, size limits. There is a complete ban on the recreational take of coral, live rock and totally protected fish such as leafy seadragons.

#### Fishing effort/access level

Effort in the fishery has been relatively stable over the past 3 years at an average of 806 days fished, with nearly all licensees reporting some level of activity. Effort in the fishery is concentrated in discrete areas adjacent to the limited number of boat landing sites along the Western Australian coastline.

Given that the specimens are collected for a live market, licensees are restricted in terms of the quantities that they can safely handle and transport (for example, by boat to shore, by vehicle to

the holding facility and then on to the retailer) without impacting on the quality of the product.

The size of the holding facility and access to regular freight and infrastructure services (such as airports, particularly in the remote northern parts of WA) restricts the levels of effort that can be expended in the fishery at any given time.

## Stock Assessment

**Assessment complete:** Preliminary

**Breeding stock levels:** Adequate

The operating extent of the fishery is low relative to the widespread distribution of the plethora of species targeted. No other fisheries exploit these species and therefore there is virtually no potential for impact on breeding stocks.

## Non-Retained Species

**Bycatch species impact:** Negligible

Divers in the MAF use hand-held nets to capture the desired target species. As a result of these highly selective fishing methods, there is no bycatch in this fishery.

**Protected species interaction:** Negligible

The MAF is permitted to take syngnathids (excluding leafy seadragons) and has retained at least 14 species of syngnathids, although only 5 are generally targeted: the Western Australian seahorse (*Hippocampus elongatus*), the western spiny seahorse (*Hippocampus angustus*), common or weedy seadragon (*Phyllopteryx taeniolatus*), knobby seahorse (*Hippocampus tuberculatus*) and spotted pipefish (*Stigmatopora argus*).

These species are widely distributed in Western Australian waters and occur in both shallow and deep waters in both urban and remote locations. It is estimated that 80% of populations occur in areas that receive little to no impact from fishing.

While, in general, some species of syngnathids may be vulnerable to overfishing because they reproduce relatively slowly, have low rates of dispersal and are highly habitat-dependent, there is no evidence of decline for any syngnathid species retained by the MAF (Pogonowski *et al.* 2002).

### MARINE AQUARIUM FISH TABLE 1

Summary of the reported catch landed from the Marine Aquarium Managed Fishery and associated endorsements in 2006.

Common Name	Quantity (numbers)	Weight (kg)
Fish	28,203	
Syngnathidae	1,116	
Hermit crabs	160,774	
Invertebrates	136,331	
Algae		722
Hard coral		4,552
Soft coral		2,289
Living rock, living sand, sponge, other		13,243

## Ecosystem Effects

**Food chain effects:** Negligible

**Habitat effects:** Negligible

## Social Effects

Under clauses 9 and 10 of the Marine Aquarium Fish Management Plan 1995, a licensee (or their nominated operator) may fish with 2 nominated divers, thus permitting up to 3 persons to fish on each licence at any one time. A recent survey has indicated that at least 69 people are directly employed in the fishery.

Another aspect to the social effects of this fishery is the increased awareness of marine ecosystems through the provision of specimens for public and private aquariums.

## Economic Effects

**Estimated annual value (to fishers) for year 2006:** Not assessed

## Fishery Governance

**Target catch (or effort) range:** Not assessed

**Current fishing (or effort) level:** Acceptable

The current effort level in the fishery is constant from year-to-year and the operating extent of the fishery is low relative to the widespread distribution of the plethora of species targeted. Therefore, the current level of fishing activity is considered acceptable.

### New management initiatives (2006/07)

The management arrangements for the MAF are currently under review. Among the changes under consideration is more equitable access for all licensees to collect coral and 'live rock'.

The Australian Government Department of Environment and Water Resources has recently approved the MAF as environmentally sustainable under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* and therefore declared the fishery as an approved Wildlife Trade Operation (WTO) for 3 years.

## Specimen Shell Managed Fishery Status Report

A. Hart and M. Cliff

Management input from S. Brand-Gardner

### Fishery Description

The Specimen Shell Managed Fishery (SSF) is based on the collection of individual shells for the purposes of display, collection, cataloguing, classification and sale.

Up to 550 different shellfish species are collected by hand by a small group of divers operating from small boats in shallow coastal waters. While the fishery covers the entire Western Australian coastline, there is some concentration of effort in areas adjacent to population centres such as metropolitan Perth, Bunbury, Albany and Port Hedland.

### Governing legislation/fishing authority

Specimen Shell Management Plan 1995

Specimen Shell Managed Fishery Licence

Commonwealth Government *Environment Protection and Biodiversity Conservation Act 1999* (Export Exemption)

### Consultation process

Meetings between the Department of Fisheries and industry

### Boundaries

The fishing area includes all Western Australian waters between the high water mark and the 200 m isobath.

### Management arrangements

This fishery is managed through input controls in the form of limited entry, gear restrictions and permanent closed areas. The primary controls in the fishery are natural – depth, time and tide.

There are 32 licences in the fishery, though some of these are completely inactive and many more are fished only rarely. A maximum of 2 divers is allowed in the water per license at any one time and specimens may only be collected by hand.

There are a number of closed areas where the SSF is not permitted to operate, for example within various marine parks and aquatic reserves and other closed waters such as Reef Observation Areas and Fish Habitat Protection Areas. Much of the west side of North West Cape and the Ningaloo Marine Park are prohibited areas for the fishery. The exclusion of Marmion Marine Park in the Perth metropolitan area is also important because of its populations of 2 cowrie species.

Some molluscs – such as abalone, mussels, scallops and pearl oysters – form the basis of other commercial fisheries and are subject to separate management plans. The SSF is not permitted to take any species for which separate management arrangements exist.

A comprehensive Ecologically Sustainable Development assessment of this fishery has been undertaken to identify any potential

sustainability risks requiring direct management. The only issue identified through this process related to the breeding stock levels of specimen shell species. Boxed text in this status report provides the annual assessment of performance for this issue.

Some minor-scale collection of dead shells is also undertaken above the high water mark by collectors operating under the authority of a commercial fishing licence, mainly for sale into the souvenir, pet supply and hobby craft markets. However, this does not form part of the Specimen Shell Managed Fishery.

### Research summary

Current fishery-dependent data collection systems monitor the catch (species-specific), effort and catch rates for the fishery. Fishers within the SSF provide monthly returns under the statutory catch and effort system (CAES). These returns contain information on catch (species, numbers and spatial area), and days and hours fished by month and year.

In August 2004, fishers commenced reporting using 10 x 10 nautical mile (nm) grids rather than 60 x 60 nm grids, providing a finer spatial scale to the data collected. At the same time, they began collecting additional information on sightings of the 8 mollusc species identified as potentially ‘vulnerable.’ These data are used as the basis to provide research advice for fisheries management.

## Retained Species

**Commercial landings (season 2006): 19,074 shells**

### Landings

In 2006, the total number of specimen shells collected was 19,074, distributed over a wide range of species. In the past 5 years, more than 535 separate species of molluscs have been collected, with an average of more than 200 species per year – the majority in very low numbers.

There is some focus of effort on mollusc families most popular with shell collectors, such as cowries, cones, murexes and volutes. For example, *Cypraea venusta*, *C. marginata* and *C. friendii* make up approximately 15% of all shells collected in 2005 and 2006. Cypraeidae or cowries are noted for their localised variations in both shape and colour, making them attractive to collectors.

(Note that reported total landings exclude *Trochus hanleyanus* taken for other purposes.)

### Fishing effort/access level

Although there are 32 licences in the fishery, only 6 of these are regularly active. Effort has been stable over the past 5 years, at an average of around 1,200 days fished. In 2006, 1,027 days were fished.

### Recreational catch:

**Not assessed**

Shell collecting is a popular recreational pastime, and members of the public are permitted to collect shells for their private collections. The recreational catch, while unknown, is considered

to be declining, as evidenced by declining membership in shell collecting associations.

## Stock Assessment

**Assessment complete:** Yes

**Breeding stock levels:** Adequate

During the 2006 season the catch rate was approximately 19 shells per day (excluding *Trochus hanleyanus*).

Ponder and Grayson (1988) examined the specimen shell industry on a nationwide basis, rating vulnerability to over-exploitation on the basis of species biology, accessibility to collection, and rarity. Species collected in Western Australia which were identified by Ponder and Grayson as potentially vulnerable comprised 6 cowries and 2 volutes (*Amoria* spp.).

'Shell sighting' is a new abundance category reported on for the second time this year. It is a measure of the population of vulnerable shells that is observed but not taken, and provides evidence for the breeding stock being conserved each year. Of the 8 vulnerable species, an overall average of approximately 61% in 2005 and 71% in 2006 of the shells sighted were not harvested.

The figures for sighted versus taken vulnerable shells from 2005 have been reworked, however as these figures are not kept properly by all licencees it is anticipated that current averages are an overestimate.

The reporting of catch and effort on the finer spatial scale of 10 x 10 nm blocks from August 2004 is also providing more accurate information on the distribution of certain species.

All species collected in Western Australia, including the 8 prized species, occur over wide geographic ranges (hundreds or thousands of kilometres) and wide depth ranges (up to 200 m) where a substantial portion of the population cannot be collected.

Even in shallow waters, many localities cannot be fished because of the lack of access to the beach and the small boats used, and collecting is prohibited in many of the more easily reached areas which are now in marine parks and reserves. Additional protection is afforded by the fact that collectors will ignore any specimens with slight visual imperfections, but their reproductive potential in the population remains undiminished. In summary, it is considered that the fishery has very little likelihood of impacting on breeding stocks.

*The performance measures for the fishery relate to the maintenance of breeding stocks as indicated by catch levels and catch rates. In 2006, the catch level of approximately 19,000 shells and catch rate of 19 shells/day were both within the ranges set, i.e. 10,000 – 25,000 shells and 10 – 40 shells/day.*

## Non-Retained Species

**Bycatch species impact:** Negligible

There is no bycatch in this fishery owing to the highly selective fishing methods.

**Protected species interaction:** Negligible

The fishery had no reported interactions with protected species during 2006. Reports of interactions with protected species are required to be recorded on monthly catch and effort returns.

## Ecosystem Effects

**Food chain effects:** Negligible

**Habitat effects:** Negligible

## Social Effects

Over the past few years, around 30 divers have operated occasionally in this fishery. However, with only 5 or 6 licences recording consistent activity, the number of people employed regularly in the fishery (licensees plus dive buddies) is likely to be around 12.

## Economic Effects

**Estimated annual value (to fishers) for year 2006:** Not assessed

## Fishery Governance

**Target catch range:** 10,000 – 25,000 shells

A preliminary performance measure has been developed of a total annual catch range from 10,000 to 25,000 shells, which encompasses the range of catches taken from 2000 to 2003. This performance measure has been developed to ensure that any major change in the patterns of fishing is noticed and investigated. If it is triggered, this may not necessarily indicate any problem with the stocks, but rather fluctuations in the natural environment or market dynamics.

### New management initiatives (2006/07)

The management plan for the SSF is currently under review. To address safety concerns of the licensees, a Ministerial Exemption was granted on 25 September 2006, which permits the use of up to 2 fishing boats of any size (provided that the boats are not used simultaneously) and the use of up to 2 assistant fishers who are not nominated on the Managed Fishery Licence (provided no more than 2 people are in the water at any one time).

In May 2005, the Australian Government's Department of Environment and Heritage found the fishery to be managed in an ecologically sustainable way and therefore included specimen shells on the list of exempt native specimens which serves to exempt the fishery from the export controls of the *Environment Protection and Biodiversity Conservation Act 1999* for a period of 5 years before reassessment.

