STATEWIDE

ECOSYSTEM BASED FISHERIES MANAGEMENT

Identification of Statewide Ecological Assets using the EBFM framework

While the bioregional scale of management has been adopted by the Department through the implementation of an Ecosystem Based Fisheries Management (EBFM) framework (see How to Use section for more details), due to their life histories or broader impacts, a small number of ecological assets cannot realistically be managed at a single bioregional level but need to be considered at either a statewide or at a multiple bioregional level.

Risk Assessment of Statewide Ecological Assets and External Drivers

The EBFM process identifies the ecological assets in a hierarchical manner such that the assets outlined in Statewide Ecosystem Management Figure 1 are often made up of individual components at species or stock level. The risks to each of the individual stock or lower level components are mostly detailed in the individual fishery reports presented in this document. The following table (Statewide Ecosystem Management Table 1) provides an overview and cumulative assessment of the current risks to those ecological assets that function at a Statewide level and provides a mechanism for reporting on their status and the fisheries management arrangements that are being applied. These level risks are now used by the Department as a key input into the Department's Risk Register which, combined with an assessment of the economic and social values and risks associated with these assets, is integral for use in the annual planning cycle for assigning priorities for activities across all Divisions for Statewide issues.

Summary of Monitoring and Assessment of Statewide Assets

The Department is working closely with the Commonwealth Government and other jurisdictions to develop and implement the National System for the Prevention and Management of Marine Pest Incursions that will minimise the biosecurity risks associated with increased shipping in all parts of the State. Within WA, this is currently being achieved through the Fish Resources Management Act 1994 and the Biosecurity and Agriculture Management Act 2007. Work has also been undertaken to develop monitoring designs for introduced marine species for the high risk ports in WA. These designs have been approved by the Invasive Marine Pests Program within DAFF (Department of Agriculture, Fisheries and Forestry). This work contributes toward the management of introduced aquatic organism incursions and fish kill incident response programs already in place.

The Department of Fisheries' Research Division's Biodiversity and Biosecurity Branch works collaboratively with the Department of Parks and Wildlife (DPaW) in monitoring the condition of the state's fish resources, particularly within Marine Parks across the State. Development of Collaborative Operational Plans between the Department and DPaW ensure efficient and cost effective delivery of research and monitoring activities where jurisdictions overlap. The Department has also developed a statewide strategy for its research and monitoring activities within Marine Protected Areas, to detail the implementation of the Department's risk based prioritised research and monitoring program (under its EBFM framework) in conjunction with marine park management plans.

STATEWIDE ECOSYSTEM MANAGEMENT TABLE 1 - RISK LEVELS FOR EACH ASSET.

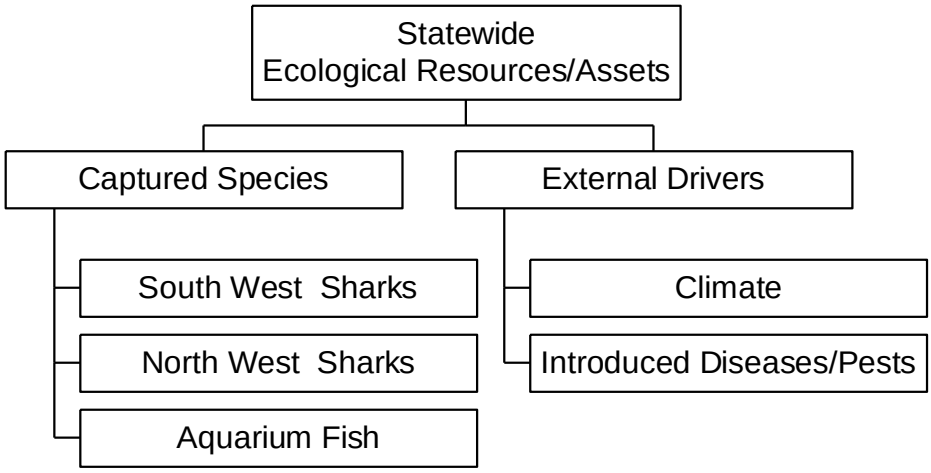
Low and Medium values are both considered to be acceptable levels of risk. High and Significant risks indicate that the asset is no longer in a condition that is considered appropriate and additional management actions are required.

Captured fish species

Fish species	Aquatic zone	Risk	Status and Current Activities
Sharks	South and lower west	MODERATE	The stock levels of most sharks in these regions are now either at acceptable levels or are deemed to be recovery at acceptable rates following management intervention.
	Mid West – North	MODERATE	The stocks levels of some sharks in these regions are now considered to be recovering. The State based fisheries for this asset is currently being reviewed and no catches by these fisheries were recorded during the past season.
Aquarium Fish	Marine	LOW	The level of capture is low and the management restrictions are such that that these species are not at risk.

External Drivers (NON FISHING)

External Drivers	Risk	Status and Current Activities
Introduced Pests and Diseases	HIGH	There is a high risk that some exotic species will be introduced into the state through the increasing levels of international shipping that is occurring at ports around the country. Many of these pest species are capable of invading beyond a single bioregion. Marine pest monitoring programs are being implemented at high risk port locations throughout the State.
Climate	MODERATE in short term HIGH in Medium term	The predictions for impacts of climate change affecting the Statewide ecosystems and process are moderate in the short term. The risk escalates to a higher level in the medium term.



STATEWIDE ECOSYSTEM MANAGEMENT FIGURE 1
Component tree showing the Statewide ecological assets and external drivers identified and separately assessed.

FISHERIES

Marine Aquarium Fish Managed Fishery Report: Statistics Only

S.J. Newman, C. Bruce, C. Syers and K. Green

Fishery Description

Commercial

The Marine Aquarium Fish Managed Fishery (MAF) has the capacity to target more than 950 species of marine aquarium fish under the *Marine Aquarium Fish Management Plan 1995* (this includes sharks and rays (Chondrichthyes), syngnathids, moral eels, and higher taxonomic groups at the Order, Family or Genus level in cases where the species cannot be specifically identified and also includes unquantified aquarium species). However, the number of marine aquarium fish species targeted and/or landed by the fishery varies from year to year (e.g. in the period from 2005 to 2013 the number of marine aquarium fish species landed ranged from 183 to 288; 223 marine aquarium fish species were recorded in 2013). Operators in the MAF are also permitted to take coral, live rock, algae, seagrass and invertebrates under the *Prohibition on Fishing (Coral, 'Live Rock' and Algae) Order 2007* and by way of Ministerial Exemption. In 2013, a total of over 383 species or species groups were reported in the landed catch of the MAF. The reported catch includes groups that were reported at the level of Order, Family, Genus or species. The MAF is primarily a dive-based fishery that uses hand-held nets to capture the desired target species that operates 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 also heavily weather-dependent due to the small vessels used and the potentially hazardous conditions (e.g. waves, swell) encountered. In addition, human

constraints (i.e. physiological effects of decompression) limit the amount of effort exerted in the fishery, the depth of water and the offshore extent where collections can occur.

Recreational

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 listed fish such as leafy and weedy seadragons.

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^2. During the past three years the fishery has been active in waters from Esperance to Broome with popular areas being around the Capes region, Perth, Geraldton, Exmouth and Dampier.

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 12 licences in the fishery; however, only six licences are permitted to take all hard corals and most soft corals (all 12 licences are permitted to take coral like anemone groups such as corallimorphs and zoanthids in the Class Anthozoa). In 2013, 10 licences 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 in order 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 non-finfish 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*). If the current ESD trigger value of 2,000 individual syngnathids is reached across the State, a review will be initiated, and the results used to determine whether further management action is required.

Landings and Effort

Data for assessing the status of the MAF are derived from the catch and effort returns provided by industry. These data are compiled annually and used as the basis for this assessment.

A total of 19,302 fish (excluding syngnathids) were landed in 2013. 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 as either - kg, numbers or litres depending upon the species or species group involved (Marine Aquarium Fish Table 1). The reported landings of aquarium fish for 2013 were lower than those reported in 2012 (22,780), 2011 (19,776) and in 2010 (25,708), but were higher than that reported in 2009 (18,575). Although all catches in these years are somewhat similar.

The main fish (excluding syngnathids) species landed in 2013 were damselfish of the *Chromis* genus and the scribbled angelfish (*Chaetodontoplus duboulayi*) (Marine Aquarium Fish Table 2). Likewise, the main coral species landed in 2013 were the coral like anemones of the *Corallimorphus* genus (Marine Aquarium Fish Table 3). The numbers of fish species and the weight of coral species landed vary from year to year depending on market demand.

The syngnathid catch was low and stable between 2009 and 2010 (i.e. 340 and 338 respectively). However, the syngnathid catches in 2013 (1,635) are slightly higher in comparison and are similar to the catch levels reported in 2012 (1,232), 2011 (1,138) and 2008 (1,218).

In 2013, 10 licences reported some level of activity (effort). Effort in the fishery has decreased from 981 fishing days (2007) to 494 fishing days in 2013, with 61 fishing days of this total effort being exclusively for land hermit crabs only. Effort in the fishery is concentrated in a number of discrete areas adjacent to the limited number of boat landing sites along the Western Australian coastline.

The level of effort in the MAF includes effort of both MAF licensees and also those fishers that hold an exemption authorisation to collect land hermit crabs, *Coenobita variabilis*. In 2013, of the 5 land hermit crab exemption holders, 4 collectors reported some level of activity.

Given that the specimens are collected for a live market, licences 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 locations of Western Australia) restricts the levels of effort that can be expended in the fishery at any given time.

There was one reported listed species interaction for the fishery in 2013.This interaction was with a turtle and it was released alive.

The performance measures for the fishery relate to the catch of the syngnathids. The MAF is permitted to take species from the Family Syngnathidae (seahorses and pipefish), which are listed under the Environment Protection and Biodiversity Conservation Act 1999, from state waters only (within 3nm). In 2013, the catch of syngnathids from all species and areas was 1,635 below the target commercial catch range level of 2,000 individuals per year. The catch level of syngnathids has increased from those reported in 2012 (1,232), 2011 (1,138) and in 2008 (1,218). Note, that there is a prohibition on the take of leafy seadragons (Phycodurus eques) in the MAF.

Fishery Governance

Target commercial catch range:

2000 Syngnathids

Current Fishing (or Effort) Level: Acceptable

The current effort level in the fishery is relatively constant from year to year and the operating extent of the fishery is very low relative to the widespread distribution of the numerous species targeted. No other fisheries exploit these species and therefore there is extremely limited potential for any impact on breeding stocks. Therefore the current level of fishing activity is considered acceptable.

New management initiatives (2014/15)

The Marine Aquarium Fish Fishery is currently under review with changes to the management arrangements expected to be introduced in early 2015. Among the changes under consideration is to consolidate existing legislative instruments for the fishery into a new Management Plan that will provide for the take of finfish, invertebrates, hard and soft coral, live rock, algae and seagrass.

In December 2012 an application for reassessment of the MAF as ecologically sustainable under the provisions of the EPBC Act 1999 was submitted to the Department of the Environment (DotE), the then Department of Sustainability, Environment, Water, Population and Communities. This application was successful and Wildlife Trade Operation (WTO) approval was granted till December 2013. In November 2013 a subsequent application was submitted to DotE for further WTO approval, this application was successful and WTO approval was granted till October 2016.

MARINE AQUARIUM FISH TABLE 1

Summary of the reported catch landed from the Marine Aquarium Managed Fishery and associated endorsements in 2013.

Common Name	Quantity (numbers)	Weight (kg)	Volume (litres)
Fish	19,302		
Syngnathidae (not included in Fish)	1,635		
Hermit crabs (land hermit crabs only - *Coenobita variabilis*)[1]	88,443		
Invertebrates (not including Hermit crabs or Corals)	49,643		
Hard coral		3,773.826	
Soft coral[2]		6,099.20	
Living rock		14,013.50	
Sponges	3,632		
Algae/Seagrasses			218
Live Feed (mainly shrimps/prawns)			1

1 This total includes both MAF licensees and also those fishers that hold an exemption authorisation to collect land hermit crabs - *Coenobita variabilis*.

2 The soft coral category includes 5,389 kg of coral like anemone groups such as corallimorphs and zoanthids in the Class Anthozoa. These are harvested under an invertebrate Ministerial Exemption and are not part of the annual coral TAC.

MARINE AQUARIUM FISH TABLE 2

Summary of the reported catch of the main fish (excluding Syngnathids) species landed from the Marine Aquarium Managed Fishery for 2013, with catch for the previous six years. Note the species reported in this table vary from year to year.

Species	Common Name	Year					
		2008	2009	2010	2011	2012	2013
Chromis spp.	*Chromis* damselfish	0	2849	2650	2320	400	2039
Chaetodontoplus duboulayi	Scribbled Angelfish	590	492	1333	2275	2527	1938
Chelmon marginalis	Margined Coralfish	542	682	1266	1506	1048	1429
Chromis atripectoralis	Black-axil *Chromis*	3065	50	1350	1550	1010	1200
Istiblennius meleagris	Spotted Blenny	1730	2846	1040	2081	1468	1075
Chromis cinerascens	Green *Chromis*	873	790	2998	1941	2203	1052
Plotosus lineatus	Striped Catfish	4	416	607	1142	0	900
Gobiidae	Gobies	445	447	580	979	967	749
Valenciennea puellaris	Orange-dashed Goby	100	26	440	1559	1250	562
Apogonidae/Dinolestidae Undifferentiated	Cardinalfishes	3451	1766	94	54	0	500
Salarias fasciatus	Banded Blenny	102	51	45	2	0	472
Trachinops brauni	Blue-lined Hulafish	150	300	992	2019	531	455
Siganidae	Rabbitfishes	7	25	183	125	543	383
Blenniidae	Blennies	400	38	75	82	128	282
Amphiprion clarkii	Clark's Anemonefish	846	573	935	452	326	280

MARINE AQUARIUM FISH TABLE 3

Summary of the reported catch of the main coral species landed from the Marine Aquarium Managed Fishery for 2013, with catch for the previous six years.

Species	Common Name	Year					
		2008	2009	2010	2011	2012	2013
Corallimorphus	*Corallimorphus* anemones	0	0	0	45	72.5	1869
Zoanthidae Undifferentiated	Zoanthid anemones	238.5	2184	1606	799	527.5	1712
Corallimorpharia Undifferentiated	Coral-like anemones	1377.6	1899	2233	2932	3725	1009
Lobophyllia	*Lobophyllia* brain coral	261.2	462.8	430.2	438.5	293.2	555.9
Zoanthidea Undifferentiated	Anemones & Corals	180	56	105	35	736.6	404
Zoanthus	*Zoanthus* colony polyps	811.5	744	669	558	513	395
Euphyllia ancora	Anchor coral	370.5	414.8	605.6	599.7	491.8	344.8
Duncanopsammia axifuga	Duncan coral	439.2	548	877.4	407.3	456.4	326.5
Sarcophyton	Toadstool coral	300.9	166.2	174.1	203.4	118.8	314.6
Euphyllia paraancora	Branching hammer coral	0	0	0	0	29	269
Euphyllia glabrescens	Torch coral	198.7	149.8	374.1	402	504.6	246.6
Alcyonacea	Soft coral & Sea fans - undifferentiated	13.6	6	0.4	0.6	10.8	243
Goniopora	Goniopora	265	102.5	68.4	156.1	145.1	235.9
Trachyphyllia geoffroyi	*Trachyphyllia* brain coral	396.9	503.5	640.4	470.9	266.3	230
Scleractinia Undifferentiated	Hard corals	18.6	16	4	16.4	18.15	222.4
Acanthastrea	*Acanthastrea* large polyp stony corals	122.8	100.3	72.4	102.2	129.5	174.5
Turbinaria	*Turbinaria* cup corals	204.6	165.3	271.3	169	94.2	149.1
Favia	*Favia* brain corals	296.1	481	267.1	243.8	140.6	136.4
Echinophyllia	*Echinophyllia* chalice corals	162.5	511	293	222.4	197.3	109.3
Acropora	*Acropora* corals	336.6	333.3	193.5	285.6	186.2	98.4
Symphyllia	Symphyllia	23.4	169.4	289.8	225.6	189.9	74.8
Dendronephthya	Flower soft coral	113.6	106.4	29.9	43.3	41.3	72
Plerogyra sinuosa	Green bubble coral	10.8	0	22	380	30	60
Moseleya latistellata	Giant star coral	110	188.6	294.1	79.3	11.4	57.3
Fungia	*Fungia* disc coral	77	139.6	67	105.2	57.8	56.5

Specimen Shell Managed Fishery Status Report

A. Hart, C. Bruce, C. Syers and K. Green

Main Features

Status		Current Landings	
Stock level	Adequate	Specimen Shell Catch Total	
Fishing level	Acceptable	Shell numbers	8,896 shells

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.

Just over 200 (218) different Specimen Shell species were collected in 2013, using a variety of methods. The main methods are by hand by a small group of divers operating from small boats in shallow coastal waters or by wading along coastal beaches below the high water mark. A current exemption method being employed by the fishery is using a remote controlled underwater vehicle at depths between 60 and 300 m and a new exemption method using baited habitat structures at depths is being trialled While the fishery covers the entire Western Australian coastline, there is some concentration of effort in areas adjacent to population centres such as Broome, Karratha, Shark Bay, metropolitan Perth, Mandurah, the Capes area and Albany.

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

The Department undertakes consultation directly with licensees on operational issues. Industry Annual General Meetings are convened by the Western Australian Fishing Industry Council (WAFIC), who are also responsible for statutory management plan consultation under a Service Level Agreement with the Department.

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 operational limitations – depth, time and tide.

This is a limited entry fishery with 32 licences in the fishery, with 18 of the licences being active. Furthermore, a maximum of 2 divers are 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. This includes 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 rare cowrie species.

The SSF is not permitted to take any mollusc species for which separate management arrangements exist – such as abalone, mussels, scallops and pearl oysters.

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 activity 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 method by month and year.

A new specific Specimen Shell logbook was formally introduced in August 2013 (which built on the logbook being trialled in the fishery) to aid the reporting of the number sighted and number taken alive and/or dead of the 8 mollusc species identified as potentially ‘vulnerable’ and the reporting of the finer spatial scale, 10 x 10 nautical mile (nm) grid blocks.

This data is used as the basis to provide research advice for fisheries management.

Retained Species

Commercial landings (season 2013): 8,896 shells

Recreational catch estimate (season 2013):

Unknown

Commercial Landings

In 2013, the total number of specimen shells collected was 8,896 distributed over a wide range of species. This is based on 100% of submitted catch returns. In the past 5 years, more than 487 separate species of molluscs have been collected, with an average of more than 200 species per year – the majority in 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* (including identified sub-species) make up approximately 18% of those collected in 2008, 31% of those collected in 2009, 16% of those collected in both 2010 and 2011, 14% in 2012 and 19% in 2013. Cypraeidae or cowries are noted for their localised variations in both shape and colour, making them attractive to collectors.

Fishing effort/access level

Although there are 32 licences in the fishery, about 11 of these are regularly active. Effort has decreased from 1,057 fishing days in 2009 to 745 fishing days in 2013. Over the past 5 years, there was an average of around 873 days fished, with 901 days fished in 2010, 932 days fished in 2011 and 729 days fished in 2012.

Recreational component: 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 2013 season the catch rate was approximately 12 shells per day.

Ponder and Grayson (1998) 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 of 6 cowries (*Cypraea (Austrocypraea) reevei, Cypraea (Zoila) friendii vercoi, Cypraea (Zoila) marginata (albanyensis), Cypraea (Zoila*) *marginata (consueta*), *Cypraea (Zoila) rosselli* and *Cypraea (Zoila) venusta*) and 2 volutes (*Amoria damoni (keatsiana*) and *Amoria damoni (reevei*)).

'Shell sighting' is a new abundance category. 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 51 % of the shells sighted were not harvested in 2013. The measure of the number of shells sighted is reported correctly in about 98 % of the cases where one of the vulnerable species is reported**.** The figures for 'sighted' versus 'taken' of vulnerable shells is continually improving by licensees, which is demonstrated by the increase in the percentage of the number of vulnerable shells sighted from 30% in 2009 to 98 % in 2013. It is anticipated that current sightings are an under estimate of the available populations.

This improvement in reporting of the vulnerable (indicator) species, in terms of species identification and the number sighted and number taken alive and/or dead can be contributed to the new return form.

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. Again, the 2013 season has seen ll licensees report the smaller spatial resolution grid blocks rather than reporting the 60 x 60 nm blocks. This was the same for the 2011 and 2012 season.

For convenience for fishers, 10 x 10 nm block generic maps were added to the front of the new Specimen Shell logbooks (which built on the logbook being trialled in the fishery) and therefore has helped the fishers with the requirement of reporting the smaller spatial resolution grid blocks.

All species collected in Western Australia, including the 8 indicator 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 for logistical and safety reasons be collected. However, with the introduction of the remote controlled underwater vehicles these depth restrictions are starting to be overcome.

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 having an unacceptable impact 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 2013, the catch level of approximately 8,896 shells is just under the range set , i.e. 10,000 – 25,000 shells and the catch rate of 12 shells/day is within the range set ,i.e. 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.

Listed species interaction: **Negligible**

The fishery reported no interactions with listed species during 2013. Reports of interactions with listed species are required to be recorded on monthly catch and effort returns.

Ecosystem Effects

Food chain effects: **Negligible**

Habitat effects: **Negligible**

Social Effects

In 2013 there were 32 authorisation holders in this fishery with around 11 licences recording consistent activity, the number of people employed regularly in the fishery (licensees plus crew/ dive buddies) is likely to be around 19 . There were also around 8 people (licensees plus crew/dive buddies) that operated occasionally in this fishery. With many of the licences there might be the additional employment of people to prepare the shells for collection, pack and distribute the shells and also, some licensees might have shop fronts, therefore, employing shop assistants. The number employed in this area is unknown.

Economic Effects

Estimated annual value (to fishers) for 2013:

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 (2014/15)

The Specimen Shell Managed Fishery is currently under review with changes to the management arrangements expected to be introduced in 2015. Among the changes under consideration is to consolidate existing management arrangements for the fishery into a new Management Plan that will provide for additional permitted methods of collection in the Fishery such as remotely operated underwater vehicles.