FINFISH RESOURCES OF
THE PEEL-HARVEY ESTUARY

HARVEST STRATEGY

2015 – 2020

Version 1.0

WEST COAST ESTUARINE MANAGED FISHERY (AREA 2)

FISHERIES MANAGEMENT PAPER NO. 274

Published by
Department of Fisheries
168 St Georges Terrace
Perth WA 6000

May 2015

ISSN 0819-4327
Finfish Resources of the Peel-Harvey Estuary Harvest Strategy 2015 - 2020
Version 1.0
West Coast Estuarine Managed Fishery (Area 2)

May 2015

Fisheries Management Paper No. 274

ISSN 0819-4327
# TABLE OF CONTENTS

1 INTRODUCTION ............................................................................................................. 1  
1.1 Review Process ........................................................................................................ 1  
2 SCOPE .......................................................................................................................... 1  
2.1 Environmental Context ............................................................................................ 3  
2.2 Target Species — Sea Mullet .................................................................................. 4  
2.3 Fishing Activities ...................................................................................................... 4  
   2.3.1 Governance ....................................................................................................... 4  
   2.3.2 Commercial Fishing ......................................................................................... 5  
   2.3.3 Recreational Fishing ....................................................................................... 6  
   2.3.4 Customary Fishing ......................................................................................... 6  
2.4 Catch-Share Allocations ......................................................................................... 7  
3 HARVEST STRATEGY .................................................................................................... 7  
3.1 Harvesting and Management Approaches .............................................................. 7  
3.2 Long-Term Objectives ............................................................................................. 7  
   3.2.1 Ecological Sustainability ............................................................................. 8  
   3.2.2 Social and Economic Objective .................................................................... 8  
3.3 Operational Objectives ........................................................................................... 8  
3.4 Performance Indicators, Reference Points and Control Rules ................................. 8  
   3.4.1 Identifying Performance Indicators and Reference Levels ............................... 9  
3.5 Monitoring and Assessment Procedures .................................................................. 21  
   3.5.1 Information and Monitoring ......................................................................... 21  
   3.5.2 Assessing Fishery Impacts ............................................................................ 22  
4 MANAGEMENT MEASURES AND IMPLEMENTATION .............................................. 23  
4.1 Management Measures ........................................................................................... 23  
4.2 Implementing Changes to the Management Arrangements ..................................... 24  
   4.2.1 Consultation .................................................................................................... 25  
4.3 Compliance and Enforcement ................................................................................. 26  
   4.3.1 Operational Compliance Plan ...................................................................... 26  
5 REFERENCES ............................................................................................................... 27
1 INTRODUCTION

Harvest strategies for aquatic resources managed by the Western Australian Department of Fisheries (the Department) are formal documents prepared to support the decision-making processes required to ensure the management of these resources are consistent with the principles of Ecologically Sustainable Development (ESD). The objectives of ESD are reflected in the objects of the Fish Resources Management Act 1994 (FRMA), Section 3, and the draft Aquatic Resources Management Bill 2013 (ARMB), Clause 9, which will replace the FRMA once enacted.

The publication of these strategies is intended to make the decision-making considerations and processes for the management of specified aquatic resources publicly transparent and provide a basis for informed dialogue on management actions with resource users and other stakeholders.

These strategies provide guidance for decision-makers, but do not derogate from or limit the exercise of discretion required for independent decision-making under the FRMA by either the Minister for Fisheries, the Chief Executive Officer of the Department of Fisheries or other delegated decision-makers in order to meet the objects of the FRMA.

Harvest strategies make explicit the objectives, performance indicators, reference levels, and harvest control rules for each defined ecological asset taken into consideration by the Department when preparing advice for the Minister for Fisheries. They also indicate the scope of management actions required in relation to the status of each resource in order to meet the specific long- and short-term management objectives for the resource and the broader goals of the ESD strategy.

1.1 Review Process

It is recognised that fisheries change over time and that a review period should be built into each harvest strategy to ensure that it remains relevant. This harvest strategy will remain in place for a period of five (5) years, after which time it will be fully reviewed; however, given that this is the first harvest strategy for this resource, this document may be subject to further review and amended as appropriate within the five year period.

2 SCOPE

This harvest strategy relates to the finfish resources of the Peel-Harvey Estuary, Western Australia, together with the Murray, Serpentine, Harvey and Dandalup Rivers and all their tributaries (Figure 1) and the fishing activities that impact these resources. Within the Peel-Harvey Estuary, finfish are targeted primarily by the commercial West Coast Estuarine Managed Fishery (WCEMF) Area 2, with a smaller amount of catches landed by the recreational fishing sector.
Figure 1. Key regions of the Peel-Harvey Estuary and boundaries of the West Coast Estuarine Managed Fishery: Area 2
This strategy has been developed in line with the Department’s over-arching Harvest Strategy Policy for Aquatic Resources (Department of Fisheries in press) and relevant national policies / strategies (ESD Steering Committee 1992) and guidelines (e.g. Sloan et al. 2014). In addition to considering fishing impacts on the main target species (i.e. sea mullet), it also considers other retained species, bycatch\(^1\), endangered, threatened and protected (ETP) species, habitats and other ecological components to ensure the risks to these elements are managed effectively.

This strategy also sets out and summarises matters relevant to independent third-party certification assessment against the Marine Stewardship Council (MSC) sustainability standard and should be read in conjunction with the MSC full assessment documentation for these resources.

This document has been developed via a consultative process with industry members and has been approved by the Director General of the Department of Fisheries and the Minister for Fisheries.

2.1 Environmental Context

The Peel-Harvey Estuarine system is located 80 km south of Perth, in the south-west region of Western Australia. The estuarine system is comprised of the Peel Inlet and Harvey Estuary, which are joined together by a narrow channel through the Point Grey Sill. The system is joined to the Indian Ocean via a natural entrance channel, the Mandurah Channel, in the northern Peel Inlet and an artificial entrance channel, the Dawesville Channel, which is located in the northern part of the Harvey Estuary (see Figure 1). The shallow waters of the Peel-Harvey Estuary support extensive stands of macroalgae and seagrass. These plants, in combination with high phytoplankton productivity, support large populations of small invertebrate animals, which in turn form the basis of a food chain that supports a number of fish, other invertebrates, birds and mammals.

The estuary environment has changed dramatically over the past few decades. Increasing inputs of nutrients from surrounding agricultural land in the 1980s led to a substantial increase in algal biomass in the estuary, which resulted in the opening of an artificial entrance channel (the Dawesville Channel) in 1994. This channel has increased water exchange throughout the estuary, resulting in improved water quality; however, it has also markedly altered the ecology of the estuary, with more marine conditions favouring marine over estuarine species. In contrast with outside oceanic waters, the estuary has relatively high salinity and nutrient levels.

The estuary was listed as a Ramsar Wetland of International Importance in 1990, as part of the larger Peel-Yalgorup Wetland System, and is considered to be an internationally-significant habitat for waterbirds.

\(^1\) Bycatch is described as the part of the catch which is returned to the sea (usually referred to as non-retained or discarded) either because it has no commercial value or because legislative requirements preclude it being retained.
2.2 Target Species — Sea Mullet

Sea mullet (*Mugil cephalus*) have a worldwide tropical distribution and, in Australia, occur in marine, estuarine and freshwater environments from approximately 25 °S to 35 °S along the eastern and western coastlines. Juveniles typically inhabit rivers and estuaries, where they associate with shallow weed beds and bare substrate. Upon reaching maturity at 3 – 4 years of age, they migrate out of these areas into open coastal waters to spawn (Hutchins and Swainston 1999).

Due to the broad dispersal of eggs and larvae by ocean currents, combined with adult pre-spawning migrations, sea mullet along the lower west and south coasts of Western Australia are considered to represent a genetically homogeneous stock. Taking a precautionary management approach, however, sea mullet in the West Coast Bioregion, which includes the Peel-Harvey Estuary, is managed as a separate stock from populations in the neighbouring Gascoyne Coast and South Coast Bioregions. Although the overall stock size of sea mullet is unknown, in the Peel-Harvey Estuary, where there have never been any sustainability concerns, the annual commercial catch of this species has averaged 107 tonnes for the past four decades, with catches of over 150 tonnes in many years.

2.3 Fishing Activities

2.3.1 Governance

Finfish in the Peel-Harvey Estuary are targeted by commercial, recreational and customary fishing sectors. These fishing sectors are managed by the Department under the following legislation:

- FRMA (will be replaced by ARMB once enacted);
- *Fish Resources Management Regulations 1995* (FRMR);
- FRMA Part 6 – *West Coast Estuarine Managed Fishery Management Plan 2014*; and

Fishers must also comply with the requirements of:

- The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- *Western Australian Marine Act 1982*; and
- Western Australian *Wildlife Conservation Act 1950*. 
2.3.2 Commercial Fishing

The commercial fishing sector operating in the Peel-Harvey Estuary is currently managed as Area 2 of the WCEMF.

The net fishery in the Peel-Harvey Estuary was first established in the mid-1800s (Bradby 1997). This fishery is one of the oldest in Australia, with up to 150 fishers historically operating in family-based fishing units to supply fresh fish to the local Perth and Fremantle markets (Mandurah Licenced Fishermen’s Association [MLFA] 2008).

Although originally operating as a finfish fishery, commercial fishers in the Peel-Harvey Estuary began targeting blue swimmer crabs (*Portunus armatus*) in the late-1950s using the same gillnets that were used to capture finfish species. In the mid-1990s, fishers started trialling crab traps to target blue swimmer crabs and by 2000/01 the majority of blue swimmer crab catch was landed using this method. A substantial proportion of the current total fishing effort in the WCEMF Area 2 is now directed towards blue swimmer crabs.

There are currently 11 licensed fishers operating in the WCEMF Area 2 who target a mix of temperate estuarine finfish species; historically sea mullet and yelloweye mullet (*Aldrichetta forsteri*) to supply the bait market have dominated the catch. The majority of catch is taken using haul nets to visually target schools of fish, employing different net lengths and mesh sizes to catch fish of different species or sizes throughout the estuary. Some fishers also set gillnets overnight, particularly when targeting species such as cobbler (*Cnidoglanis macrocephalus*). In more recent years there has been a strong shift to catching fish for human consumption rather than bait, with concomitant improvements in handling and processing, and increases in unit value of the product. Consequently, catches of mullet have declined at times in preference to other, more valuable species. The average annual commercial catch of sea mullet declined from 136 tonnes between 1976 and 1999 to 58 tonnes between 2000 and 2013.

Since the conversion of fishers to using traps for targeting blue swimmer crabs in 2000/01, the effort spent targeting finfish in the Peel-Harvey Estuary has been stable, with total annual haul and gillnet catches of finfish ranging from ~ 100 to 130 tonnes. The majority of the catch is edible-quality finfish, which is delivered daily to local retailers. A smaller portion of the catch is used as bait by those fishers in the WCEMF Area 2 who are also licenced to catch blue swimmer crabs in the estuary. The remainder is delivered to metropolitan bait wholesalers, who in turn package this product for use by other fisheries (MLFA 2008).

The mesh sizes used in the fishery (typically 50 – 100 mm, depending on net type and species / size targeted) allow for the escape of smaller individuals, thus virtually all captured fish are retained. Sea mullet generally comprises ~ 50 % of the total annual finfish catch in the fishery, with other retained species, including yelloweye mullet, cobbler, yellowfin whiting (*Sillago schomburgkii*) and Australian herring (*Arripsis georgianus*), comprising ~ 40 % of the total annual catch. Other finfish and invertebrate species are sometimes

---

2 Please refer to the Blue Swimmer Crab Resource of the Peel-Harvey Estuary Harvest Strategy for further information on this resource and related fishing activities.
captured in the nets, of which the majority are retained opportunistically in very small amounts. Fishers are not permitted to retain blue swimmer crabs caught using netting methods and captured individuals are returned alive to the water as quickly as possible.

Commercial fishing activities have the potential to interact with a number of ETP species throughout the estuary, most notably the high numbers of birds that use the Ramsar Wetland area. While using haul nets, fishers remain in constant contact with their fishing gear, and all ETP species are avoided as much as possible. Very few interactions with protected bird species have been reported in this fishery, and no interactions have been reported since 2007.

Fourteen per cent of the estuary is closed to commercial fishing activities (see Figure 1). Nets are used throughout the remainder of the estuary and are deployed in various depths and habitats depending on the species targeted. Sea mullet are primarily found in shallow areas (< 1 m depth) of patchy macroalgae and sand. Habitat impacts from netting activities are considered to be minor due to the limited effort that occurs within the fishery, the relatively low-impact nature of the methods used and the naturally-dynamic nature of the benthic habitats throughout the estuary.

2.3.3 Recreational Fishing

Most finfish caught recreationally in West Coast Bioregion estuaries and nearshore waters are taken by shore- or boat-based line fishing (angling). The most commonly targeted finfish by recreational anglers in the Peel-Harvey Estuary include Australian herring, whiting (Sillago spp.), tailor (Pomatomus saltatrix), silver trevally (Pseudocaranx georgianus), King George whiting (Sillaginodes punctata) and black bream (Acanthopagrus butcheri) (Malseed and Sumner 2001). Although there are no recent estimates of recreational finfish catches in the Peel-Harvey Estuary, the combined recreational angling catch of these six species/groups was estimated to be less than 10 tonnes in 1998/99 (Malseed and Sumner 2001). In recent years a notable change in the recreational line fishery has been an apparent significant increase (albeit unquantified) in the targeting of yellowfin whiting which has accompanied increases in population, access to the estuary and media coverage of lure fishing for this species.

Some shore-based recreational net fishing also occurs in the Peel-Harvey Estuary, with fishers primarily using gillnets to target sea mullet. No estimates of recreational net catches of finfish in the Peel-Harvey Estuary are currently available; however, they are considered to be minor compared to the annual finfish catch landed by the commercial fishing sector.

2.3.4 Customary Fishing

The finfish resources of the Peel-Harvey Estuary have provided sustenance to the native Noongar Peoples of south-western Australia for thousands of years. Historically, the wider Noongar community would gather in this area each year around March to trap schools of sea mullet moving up the Serpentine River (Gibbs 2011).
There are no data on the current level of customary fishing in the estuary; however, anecdotal information suggests it is relatively low.

2.4 Catch-Share Allocations

The finfish resources of the Peel-Harvey Estuary are fished by commercial, recreational and customary sectors without any explicit catch share allocation between sectors. A formal sectoral allocation process (designated as Integrated Fisheries Management, IFM, in Western Australia) to define and assign long-term sectoral shares of the permitted catch of the finfish resources of the Peel-Harvey Estuary has not yet been undertaken.

3 HARVEST STRATEGY

3.1 Harvesting and Management Approaches

The finfish resources of the Peel-Harvey Estuary are harvested using a constant proportion approach, where the annual catch taken varies in proportion to variations in the stock abundance of each species.

In line with this harvesting approach, the WCEMF Area 2 is managed using a range of controls. Effort in the fishery is constrained by a cap on the number of licences / vessels (limited entry) and restrictions on fishing gear (net length and mesh sizes). Spatial and temporal closures within the fishery further limit the effective fishing effort. Fishers must also abide by the minimum legal size limits in place for some of the captured species as prescribed in the FRMR.

The recreational (finfish) fishing sector is managed through a range of adaptive regulatory controls. These include spatial and seasonal closures, temporal restrictions, gear controls (e.g. net specifications and mesh sizes), and daily bag limits and minimum size limits in place for some species.

Recreational fishers operating from a boat are required to hold a current Recreational Fishing from Boat Licence (RFBL). Unlicensed fishers on boats can fish if at least one other person on board has an RFBL, provided the total catch of everyone on board stays within the bag limits of the licenced fisher(s). Additionally, a Recreational Net Fishing Licence (RNFL) is required for all recreational net fishing using set (gill) nets, haul nets or throw nets.

3.2 Long-Term Objectives

In addition to ensuring the biological sustainability of all captured aquatic resources, this harvest strategy includes broader ecological objectives for each ecosystem component, as well as a social and economic objective for the fishery as a whole. It is important to note that the social and economic objective is applied within the context of ESD.
3.2.1 Ecological Sustainability

1) To maintain spawning stock biomass of the target species (i.e. sea mullet) at a level where the main factor affecting recruitment is the environment;

2) To maintain spawning stock biomass of each other retained species at a level where the main factor affecting recruitment is the environment;

3) To ensure fishing impacts do not result in serious or irreversible harm\(^3\) to bycatch species populations;

4) To ensure fishing impacts do not result in serious or irreversible harm to ETP species populations;

5) To ensure the effects of fishing do not result in serious or irreversible harm to habitat structure and function; and

6) To ensure the effects of fishing do not result in long-term serious or irreversible harm to ecological processes.

3.2.2 Social and Economic Objective

1) To provide commercial fisheries with reasonable opportunities to maximise their livelihood in supplying seafood to the community, within the constraints of ecological sustainability; and

2) To provide fishing participants with reasonable opportunities to maximise cultural, recreational and lifestyle benefits of fishing, within the constraints of ecological sustainability.

3.3 Operational Objectives

Long-term management objectives are typically operationalised as short-term (e.g. annual), fishery-specific objectives through one or more performance indicators that can be measured and assessed against pre-defined reference levels so as to ascertain actual performance. Thus, within the context of the long-term objectives provided above, each fishery (commercial and recreational) has operational objectives to maintain each resource / component above the threshold level (and, where relevant, close to the target level), or rebuild the resource if it has fallen below the threshold or the limit levels (see below).

3.4 Performance Indicators, Reference Points and Control Rules

Suitable indicators have been selected to describe performance of the fishery in relation to each management objective, with a set of reference levels established to define acceptable and unacceptable performance. Where relevant, these levels include:

---

\(^3\) Serious or irreversible harm relates to a change caused by the fishery that fundamentally alters the capacity of the component to maintain its function or to recover from the impact.
• A target level (i.e. where you want the indicator to be);
• A threshold level (i.e. where you review your position); and
• A limit level (i.e. where you do not want the indicator to be).

The associated control rules define what management actions should occur in relation to the value of each indicator compared to the reference levels. The extent of management actions taken (e.g. to reduce catches) will be determined by the extent to which a performance indicator has breached a threshold or limit reference point. A summary of the management objectives, performance indicators, reference levels and control rules for the resources is provided in Table 1. The ability, and timeframe, to implement management changes depends on the legal instrument under which the management measure occurs, and further information on the management measures in place for this fishery is provided in Section 4.

3.4.1 Identifying Performance Indicators and Reference Levels

3.4.1.1 Reference Period

The reference period used for setting the reference levels for the assessment of the sea mullet resource and other associated ecological assets is between 2000 and 2011. This was a period of relative stability in the commercial fishing operations in WCEMF Area 2.

3.4.1.2 Sea Mullet

The primary performance indicator used to evaluate the status of the sea mullet resource in the Peel-Harvey Estuary is the annual standardised catch rate of sea mullet in the WCEMF Area 2 (haul and gillnet), with a secondary performance indicator of the annual commercial catch. In the absence of direct estimates of total biomass for sea mullet, and due to the lack of regular information on total recreational effort and catch of this species in the Peel-Harvey Estuary, commercial data alone are used as an indicator of stock abundance.

Reference levels for sea mullet have been calculated from commercial catch rates and catches observed during the reference period. For each of the two indicators, the target range extends between the minimum and maximum values recorded during the reference period, which in turn represent the lower and upper threshold levels, respectively. The catch rate limit reference level is calculated as 70% of the lower threshold value.

3.4.1.3 Other Retained Species

There are various performance indicators used for other retained finfish species in the Peel-Harvey Estuary, with species-specific reference levels and control rules in place for those species that comprise a significant proportion of the total annual commercial catch (i.e. yelloweye mullet, yellowfin whiting, Australian herring and tailor) and/or have life history characteristics that make them inherently vulnerable to fishing impacts (i.e. cobbler and Perth herring, Nematalosa vlaminghi). Risk-based reference levels have also been set to differentiate acceptable fishery impacts from unacceptable fishery impacts on all retained species and other ecological assets (see Section 3.4.1.4).
3.4.1.3.1 Yelloweye Mullet, Yellowfin Whiting, Australian Herring and Tailor

Both of the mullet species, yellowfin whiting, Australian herring and tailor are estuarine opportunists, taking advantage of the higher productivity in estuaries to feed as juveniles and / or adults but are not reliant on estuaries as part of their life cycle. Thus, while some of these species may “prefer” the benefits to growth provided by estuaries, there is no obligatory physiological requirement to utilise estuaries so each is able to complete its lifecycle in marine waters outside of estuaries. The annual catches of yelloweye mullet, yellowfin whiting, Australian herring and tailor in the WCEMF Area 2 (haul and gillnets) are used, together with risk levels, as the performance indicators for these resources. The reference levels for each of these species are set such that a review will be triggered if the annual catch of any species exceeds the maximum catch for that species observed during the reference period (see Table 1).

3.4.1.3.2 Cobbler and Perth Herring

Estuarine cobbler stocks and Perth herring are both considered to be estuarine-dependent and have an obligatory reliance on estuarine habitats for spawning, feeding and / or nursery areas. The primary performance indicator used to evaluate the status of the cobbler resource in the Peel-Harvey Estuary is the annual catch rate of cobbler between July and September (the key capture period for this species) in the WCEMF Area 2 (gillnets only). The annual commercial catch of cobbler (haul and gillnet) is also used as a secondary performance indicator for this species.

The catch rate-based reference levels for cobbler are based on the minimum catch rate value observed during the reference period, excluding two years (2006 and 2007) in which the catch rates were lower than average. The catch-based reference levels for this species are based on the annual commercial catches observed during the reference period, with the threshold level set at the maximum catch of cobbler observed during this time. As the catch of this species can fluctuate between years as a result of variable targeting, the limit reference levels reflect a breach of either threshold level for two consecutive years (see Table 1).

The status of the Perth herring resource in the Peel-Harvey Estuary is evaluated using the annual catch of this species in the WCEMF Area 2 (by haul and gillnet). Reference levels have been set based on the annual catches of Perth herring observed during the reference period, with the threshold reference level set at the maximum catch reported during this time. The limit reference level has been calculated as 130 % of the threshold value (see Table 1).

3.4.1.3.3 All Other Retained Species

The remainder of the species retained in the WCEMF Area 2 are generally caught in very small amounts.

The threshold levels for these species have been set to identify a significant change in fishing operations or stock abundance in the estuary, e.g. fishers actively targeting different species or positive impacts of environmental change. This is evaluated based on the proportion of
each such species in the total commercial catch retained by the fishery each year, with a management review triggered when a species is found to comprise more than 5% of the total annual catch.

3.4.1.4 Other Ecological Assets

For ecological assets for which reliable quantitative information is lacking (bycatch, ETP species, habitats and ecosystem), reference levels have been set to differentiate acceptable fishery impacts from unacceptable fishery impacts according to the risk levels defined in Fletcher (2014). Risk assessment outcomes are also used in a weight-of-evidence approach to support each of the assets considered within this harvest strategy.

3.4.1.5 Social and Economic Objective

In line with the draft Harvest Strategy Policy and the principles of ESD, this harvest strategy also includes social and economic objectives and performance indicators for the commercial and recreational fishing sectors. These objectives relate to the provision of opportunities to ensure (1) commercial fishers can maintain / enhance their livelihood and (2) that all fishers can maximise cultural, recreational and / or lifestyle benefits of fishing. It is important to note that management actions relating to these objectives are applied within the constraints of ecological sustainability.

The social and economic objectives for this fishery do not have explicit performance measures within the harvest strategy. Rather, it is through the formal consultation process that regulatory impediments to maintaining social and economic returns, or opportunities for enhancing these, are discussed. Where possible, and in due consideration of ecological sustainability, fisheries management arrangements can be adjusted or reformed to help meet these objectives.

It is important to note that fisheries managers cannot always address the causes of constraints on access to fishing activities, as these may be due to environmental or other factors, or may compromise ecological sustainability.
### Table 1. Summary of the harvest strategy for the Peel-Harvey Estuary finfish resources and associated assets that may be impacted by fishing activities undertaken by commercial and recreational fishing sectors while targeting finfish within the Peel-Harvey Estuary

<table>
<thead>
<tr>
<th>Component</th>
<th>Management objectives</th>
<th>Resource / Asset</th>
<th>Performance Indicators</th>
<th>Reference Levels</th>
<th>Control Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ecological</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Target species</strong></td>
<td>To maintain spawning stock biomass at a level where the main factor affecting recruitment is the environment.</td>
<td>Sea mullet</td>
<td>1. Annual standardised commercial (haul and gillnet) catch rate (kilograms / 100 m netting hour) of sea mullet in the Peel-Harvey Estuary.</td>
<td><strong>Target:</strong> Annual standardised catch rate is 2.2 – 4.6 kilograms / 100 m netting hour; and Annual commercial catch is 46 – 70 tonnes&lt;sup&gt;4&lt;/sup&gt;.</td>
<td>No management action required.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Annual commercial (haul and gillnet) catch (tonnes) of sea mullet in the Peel-Harvey Estuary.</td>
<td><strong>Threshold:</strong> Annual standardised catch rate is &lt; 2.2 kilograms / 100 m netting hour or &gt; 4.6 kilograms / 100 m netting hour; or Annual commercial catch is &lt; 46 tonnes or &gt; 70 tonnes.</td>
<td>A review is triggered to investigate the reasons for the variation. If sustainability is considered to be at risk, appropriate management action will be taken to reduce the total catch by up to 50 %.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Limit:</strong> Annual standardised catch rate is &lt; 1.6 kilograms / 100 m netting hour.</td>
<td>Management strategies to further protect the breeding stock will be implemented if sustainability is considered to be at risk (50 – 100 % reduction of total catch).</td>
</tr>
<tr>
<td><strong>Other retained species</strong></td>
<td>To maintain spawning stock biomass at a level where the main factor affecting recruitment is the environment.</td>
<td>Yelloweye mullet</td>
<td>1. Annual commercial (haul and gillnet) catch (tonnes) of yelloweye mullet in the Peel-Harvey Estuary.</td>
<td><strong>Target:</strong> Annual commercial catch is &lt; 46 tonnes; and Fishing impacts are considered to generate an acceptable level of risk to yelloweye mullet stocks, i.e. moderate risk or lower.</td>
<td>No management action required.</td>
</tr>
</tbody>
</table>

<sup>4</sup> Note that this catch range is well below the long-term average annual commercial catch of 107 tonnes.
<table>
<thead>
<tr>
<th>Component</th>
<th>Management objectives</th>
<th>Resource / Asset</th>
<th>Performance Indicators</th>
<th>Reference Levels</th>
<th>Control Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellowfin whiting</td>
<td></td>
<td>1. Annual commercial (haul and gillnet) catch (tonnes) of yellowfin whiting in the Peel-Harvey Estuary.</td>
<td>2. Periodic risk assessments: • Management measures in place; and • Annual fishing effort.</td>
<td><strong>Threshold:</strong> Annual commercial catch is ≥ 15 % above the target; or Fishing impacts are considered to generate an undesirable level of risk to yelloweye mullet stocks, i.e. high risk. <strong>Limit:</strong> Fishing impacts are considered to generate an unacceptable level of risk to yelloweye mullet stocks, i.e. severe risk. No management action required.</td>
<td>An investigation is triggered to determine the reasons for the variation. If sustainability is considered to be at risk options for restricting catch will be considered and implemented. Implement appropriate management strategies to reduce the risk to an acceptable level.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Threshold:</strong> Annual commercial catch is &lt; 12 tonnes; and Fishing impacts are considered to generate an acceptable level of risk to yellowfin whiting stocks, i.e. moderate risk or lower. <strong>Limit:</strong> Fishing impacts are considered to generate an unacceptable level of risk to yellowfin whiting stocks, i.e. severe risk.</td>
<td></td>
</tr>
</tbody>
</table>

**Threshold:** Annual commercial catch is ≥ 15 % above the target; or Fishing impacts are considered to generate an undesirable level of risk to yelloweye mullet stocks, i.e. high risk. **Limit:** Fishing impacts are considered to generate an unacceptable level of risk to yelloweye mullet stocks, i.e. severe risk. An investigation is triggered to determine the reasons for the variation. If sustainability is considered to be at risk options for restricting catch will be considered and implemented. Implement appropriate management strategies to reduce the risk.
<table>
<thead>
<tr>
<th>Component</th>
<th>Management objectives</th>
<th>Resource / Asset</th>
<th>Performance Indicators</th>
<th>Reference Levels</th>
<th>Control Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian herring</td>
<td>Resource performance</td>
<td>Australian herring</td>
<td>1. Annual commercial (haul and gillnet) catch (tonnes) of Australian herring in the Peel-Harvey Estuary.</td>
<td><strong>Target:</strong> Annual commercial catch is &lt; 9 tonnes; and Fishing impacts are considered to generate an acceptable level of risk to Australian herring stocks, i.e. moderate risk or lower.</td>
<td>No management action required.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Periodic risk assessments:</td>
<td><strong>Threshold:</strong> Annual commercial catch is ≥ 15% above the target; or Fishing impacts are considered to generate an undesirable level of risk to Australian herring stocks, i.e. high risk.</td>
<td>Due to the current poor status of this stock there will be no tolerance for exceeding the target catch level. An investigation is triggered to determine the reasons for the variation with immediate management action to restrict catch.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Management measures in place; and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Annual fishing effort.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Limit:</strong> Fishing impacts are considered to generate an unacceptable level of risk to Australian herring stocks, i.e. severe risk. Implement appropriate management strategies to reduce the risk to an acceptable level.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tailor</td>
<td>Resource performance</td>
<td>Tailor</td>
<td>1. Annual commercial (haul and gillnet) catch (tonnes) of tailor in the Peel-Harvey Estuary.</td>
<td><strong>Target:</strong> Annual commercial catch &lt; 9 tonnes; and Fishing impacts are considered to generate an acceptable level of risk to tailor stocks, i.e. moderate risk or lower.</td>
<td>No management action required.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Periodic risk assessments:</td>
<td><strong>Threshold:</strong> Annual commercial catch is ≥ 15% above the target; or Fishing impacts are considered to generate an undesirable level of risk to tailor stocks, i.e. high risk.</td>
<td>An investigation is triggered to determine the reasons for the variation. If sustainability is considered to be at risk options for restricting catch will be considered and implemented.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Management measures in place; and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Annual fishing effort.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Component</td>
<td>Management objectives</td>
<td>Resource / Asset</td>
<td>Performance Indicators</td>
<td>Reference Levels</td>
<td>Control Rules</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------</td>
<td>------------------</td>
<td>------------------------</td>
<td>------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Cobbler</td>
<td></td>
<td></td>
<td></td>
<td>Limit: Fishing impacts are considered to generate an unacceptable level of risk to tailor stocks, i.e. severe risk.</td>
<td>Implement appropriate management strategies to reduce the risk to an acceptable level.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Target: Annual catch rate of cobbler is &gt; 6 kilograms / fishing day; and Annual commercial catch of cobbler is &lt; 9 tonnes; and Fishing impacts are considered to generate an acceptable level of risk to cobbler stocks, i.e. moderate risk or lower.</td>
<td>No management action required.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Threshold: Annual catch rate of cobbler is ≤ 6 kilograms / fishing day; Annual commercial catch of cobbler is ≥ 9 tonnes; or Fishing impacts are considered to generate an undesirable level of risk to cobbler stocks, i.e. high risk.</td>
<td>A review is triggered to investigate the reasons for the variation or increased risk. Appropriate management action will be taken if sustainability is considered to be at risk.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Annual commercial gillnet catch rate (kilograms / fishing day) of cobbler in the Peel-Harvey Estuary (July – September).
2. Annual commercial (haul and gillnet) catch (tonnes) of cobbler in the Peel-Harvey Estuary.
3. Periodic risk assessments:
   • Management measures in place; and
   • Annual fishing effort.
<table>
<thead>
<tr>
<th>Component</th>
<th>Management objectives</th>
<th>Resource / Asset</th>
<th>Performance Indicators</th>
<th>Reference Levels</th>
<th>Control Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Limit:</strong> Annual catch rate of cobbler is ≤ 6 kilograms / fishing day for two consecutive years;</td>
<td>If any indicator breaches a limit, management strategies to further protect the breeding stock will be implemented if sustainability is considered to be at risk.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Annual commercial catch of cobbler is ≥ 9 tonnes for two consecutive years; or</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fishing impacts are considered to generate an unacceptable level of risk to cobbler stocks, i.e. severe risk.</td>
<td></td>
</tr>
<tr>
<td>Perth herring</td>
<td>1. Annual commercial (haul and gillnet) catch (tonnes) of Perth herring in the Peel-Harvey Estuary.</td>
<td></td>
<td></td>
<td><strong>Target:</strong> Annual commercial catch of Perth herring is &lt; 2.7 tonnes; and</td>
<td>No management action required.</td>
</tr>
<tr>
<td></td>
<td>2. Periodic risk assessments:</td>
<td></td>
<td></td>
<td>Fishing impacts are considered to generate an acceptable level of risk to Perth herring stocks, i.e. moderate risk or lower.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Management measures in place; and</td>
<td></td>
<td></td>
<td><strong>Threshold:</strong> Annual commercial catch of Perth herring is ≥ 2.7 and &lt; 3.5 tonnes; or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Annual fishing effort.</td>
<td></td>
<td></td>
<td>Fishing impacts are considered to generate an undesirable level of risk to Perth herring stocks, i.e. high risk.</td>
<td></td>
</tr>
</tbody>
</table>

*Fisheries Management Paper 274*
<table>
<thead>
<tr>
<th>Component</th>
<th>Management objectives</th>
<th>Resource / Asset</th>
<th>Performance Indicators</th>
<th>Reference Levels</th>
<th>Control Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>All other retained species</td>
<td>Limit: Annual commercial catch of Perth herring is $\geq 3.5$ tonnes; or Fishing impacts are considered to generate an unacceptable level of risk to Perth herring stocks, i.e. severe risk.</td>
<td>1. Annual commercial (haul and gillnet) catch (tonnes) of each retained species in the Peel-Harvey Estuary.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Periodic risk assessments:&lt;br&gt;• Management measures in place; and&lt;br&gt;• Annual fishing effort.</td>
<td></td>
<td></td>
<td>If either indicator breaches a limit, management strategies to further protect the breeding stock will be implemented if sustainability is considered to be at risk.</td>
</tr>
<tr>
<td></td>
<td>Target: Annual commercial catch of each other retained species is $&lt; 5%$ of the total retained catch; and Fishing impacts are considered to generate an acceptable level of risk to all other retained species' stocks, i.e. moderate risk or lower.</td>
<td></td>
<td></td>
<td>No management action required.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Threshold: Annual commercial catch of any other retained species comprises $\geq 5%$ of the total retained catch; or Fishing impacts are considered to generate an undesirable level of risk to any other retained species' stocks, i.e. high risk.</td>
<td></td>
<td></td>
<td>A review is triggered to investigate the reasons for the variation or increased risk. Appropriate management action will be taken if sustainability is considered to be at risk.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Limit: Fishing impacts are considered to generate an unacceptable level of risk to any other retained species' stocks, i.e. severe risk.</td>
<td></td>
<td></td>
<td>Implement appropriate management strategies to reduce the risk to an acceptable level.</td>
<td></td>
</tr>
<tr>
<td>Component</td>
<td>Management objectives</td>
<td>Resource / Asset</td>
<td>Performance Indicators</td>
<td>Reference Levels</td>
<td>Control Rules</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------</td>
<td>------------------</td>
<td>------------------------</td>
<td>------------------</td>
<td>---------------</td>
</tr>
<tr>
<td><strong>Bycatch (non-ETP) species</strong></td>
<td>To ensure fishing impacts do not result in serious or irreversible harm to bycatch species populations.</td>
<td>All (non-ETP) bycatch species</td>
<td>1. Periodic risk assessments: • Management measures in place; and • Annual fishing effort.</td>
<td><strong>Target:</strong> Fishing impacts are considered to generate an acceptable level of risk to all bycatch species’ populations, i.e. moderate risk or lower. <strong>Threshold:</strong> Fishing impacts are considered to generate an undesirable level of risk to any bycatch species’ populations, i.e. high risk. <strong>Limit:</strong> Fishing impacts are considered to generate an unacceptable level of risk to any bycatch species’ populations, i.e. severe risk.</td>
<td>No management action required. A review is triggered to investigate the reason for the increased risk. Appropriate management action will be taken if sustainability is considered to be at risk. Implement appropriate management strategies to reduce the risk to an acceptable level.</td>
</tr>
<tr>
<td><strong>Endangered, threatened and protected (ETP) species</strong></td>
<td>To ensure fishing impacts do not result in serious or irreversible harm to endangered, threatened and protected (ETP) species populations.</td>
<td>All ETP species</td>
<td>1. Periodic risk assessments: • Management measures in place; • Fishing effort; and • Annual number of reported interactions in commercial fishery from statutory reporting.</td>
<td><strong>Target:</strong> Fishing impacts are considered to generate an acceptable level of risk to all ETP species’ populations, i.e. moderate risk or lower. <strong>Threshold:</strong> Fishing impacts are considered to generate an undesirable level of risk to any ETP species’ populations, i.e. high risk. <strong>Limit:</strong> Fishing impacts are considered to generate an unacceptable level of risk to any ETP species’ populations, i.e. severe risk.</td>
<td>No management action required. A review is triggered to investigate the reason for the increased risk. Appropriate management action will be taken if sustainability is considered to be at risk. Implement appropriate management strategies to reduce the risk to an acceptable level.</td>
</tr>
<tr>
<td>Component</td>
<td>Management objectives</td>
<td>Resource / Asset</td>
<td>Performance Indicators</td>
<td>Reference Levels</td>
<td>Control Rules</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------------</td>
<td>------------------</td>
<td>-------------------------</td>
<td>------------------</td>
<td>---------------</td>
</tr>
</tbody>
</table>
| **Habitats** | To ensure the effects of fishing do not result in serious or irreversible harm to habitat structure and function | Benthic habitats | 1. Periodic risk assessments:  
- Management measures in place; and  
- Annual fishing effort. | **Target**: Fishing impacts are considered to generate an acceptable level of risk to benthic habitats, i.e. moderate risk or lower.  
**Threshold**: Fishing impacts are considered to generate an undesirable level of risk to any benthic habitats, i.e. high risk.  
**Limit**: Fishing impacts are considered to generate an unacceptable level of risk to any benthic habitats, i.e. severe risk. | No management action required.  
A review is triggered to investigate the reason for the increased risk.  
Appropriate management action will be taken if sustainability is considered to be at risk.  
Implement appropriate management strategies to reduce the risk to an acceptable level. |
| **Ecosystem** | To ensure the effects of fishing do not result in serious or irreversible harm to ecological processes | All species and habitats in the Peel-Harvey Estuary | 1. Periodic risk assessments:  
- Management measures in place;  
- Annual fishing effort; and  
- Annual catch of all retained species. | **Target**: Fishing impacts are considered to generate an acceptable level of risk to ecological processes within the estuary, i.e. moderate risk or lower; and Fishing impacts on each ecological resource / asset impacts are considered to generate an acceptable level of risk, i.e. moderate risk or lower.  
**Threshold**: Fishing impacts are considered to generate an undesirable level of risk to any ecological processes within the estuary, i.e. high risk. | No management action required.  
A review is triggered to investigate the reason for the increased risk.  
Appropriate management action will be taken if sustainability is considered to be at risk. |
<table>
<thead>
<tr>
<th>Component</th>
<th>Management objectives</th>
<th>Resource / Asset</th>
<th>Performance Indicators</th>
<th>Reference Levels</th>
<th>Control Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Implement appropriate management strategies to reduce the risk to an acceptable level.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Limit:</strong> Fishing impacts are considered to generate an unacceptable level of risk to any ecological processes within the estuary, i.e. severe risk; or</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fishing impacts are considered to generate an unacceptable level of risk, i.e. severe risk, to the majority of ecological resources / assets within the estuary.</td>
<td></td>
</tr>
<tr>
<td>Social and Economic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Commercial Sector</strong></td>
<td>To provide commercial fisheries with reasonable opportunities to maximise their livelihood in supplying seafood to the community, within the constraints of ecological sustainability(^5).</td>
<td>All retained species</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td><strong>All Fishing Sectors</strong></td>
<td>To provide fishing participants with reasonable opportunities to maximise cultural, recreational and lifestyle benefits of fishing, within the constraints of ecological sustainability(^5).</td>
<td>All retained species</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

\(^5\) Note that these objective do not have explicit performance measures within the harvest strategy and are rather discussed through the formal consultation process for the fishery (see Section 3.4.1.5)
3.5 Monitoring and Assessment Procedures

3.5.1 Information and Monitoring

3.5.1.1 Commercial Fishing Information

3.5.1.1.1 Commercial Catch and Effort Reporting

Commercial fishers are required to report all retained species catches (kg), effort (e.g. days fished, net length) and any ETP species interactions in statutory monthly catch and effort (CAES) returns, which have been used in the fishery since 1975. These forms provide data on catch and catch rates used to inform the assessments of the finfish resources.

All CAES returns are checked by Departmental research staff, and any possibly erroneous entries or gaps are verified directly with skippers or the relevant licensees.

3.5.1.2 Recreational Fishing Information

3.5.1.2.1 Recreational Fishing Surveys

Estimates of recreational catches of key finfish species in Western Australia are available from periodic fishing surveys undertaken by the Department. Some of the surveys have been undertaken specifically in the Peel-Harvey Estuary (Malseed and Sumner 2001; Lai et al. 2014), whilst others have provided broader-scale estimates of recreational fishing catch and effort in the whole bioregion (e.g. Ryan et al. 2013). A state-wide, voluntary recreational angler logbook program (the “Research Angler Program”) commenced in 2004 and collects opportunistic catch and effort information from recreational anglers.

There is currently no available estimate of shore-based recreational net catches of finfish in the Peel-Harvey Estuary; however, the RNFL provides a sampling frame on which to base any future surveys should these be considered necessary.

3.5.1.3 Fishery-Independent Information

In 1993, the Department commenced large-scale, annual fishery-independent surveys of 0+ juvenile finfish abundance at numerous coastal sites along the lower west and south coasts of Western Australia. These surveys aimed to monitor the annual recruitment of juveniles of various recreationally- and commercially-important species, in order to assess relative stock abundance and potentially predict fishery landings.

Preliminary analyses of the relationships between annual recruitment trends, fishery catch rates and environmental factors were conducted for a number of species (including Australian herring and sea mullet) after six years of recruitment monitoring by Gaughan et al. (2006). Fishery-independent recruitment indices for Australian herring were re-examined using additional data as part of a recent stock assessment of this species in south-western Australia (Smith et al. 2013); however, the suitability of this approach to determine the relative abundance of other species such as sea mullet is yet to be fully assessed.
3.5.2 Assessing Fishery Impacts

3.5.2.1 Sea Mullet

The sea mullet resource in the Peel-Harvey Estuary is assessed annually through monitoring of standardised commercial catch rates (primary performance indicator used as a proxy for abundance) and commercial catch (secondary indicator) relative to reference levels based on a reference period in which these indicators have been stable (see Section 3.4.1.1). Recognising that the stock also extends outside the Peel-Harvey Estuary, this assessment approach is considered appropriate as the commercial WCEMF Area 2 lands the majority of the sea mullet catches from the stock.

3.5.2.1.1 Standardised Commercial Catch Rates

Annual commercial catch rates for sea mullet (kg / 100 m netting hour) in the Peel-Harvey Estuary are calculated using the total haul and gillnet catch and effort in the WCEMF Area 2, as provided by commercial fishers in monthly CAES returns. The catch rates are standardised using a generalised linear modelling (GLM) approach to analysis of variance to account for effects of factors including year, month, method (haul and gillnet) and vessel. Months are paired together as a factor level to result in a ‘complete’ design so that an interaction between year and month can be included, i.e. not every month in every year has data.

With sea mullet representing one of several species targeted by net fishers in the Peel-Harvey Estuary, catch rates are calculated from effort data reported only in CAES records by vessels that have been identified at the time as targeting sea mullet. As catches from the Peel-Harvey Estuary are reported in a single CAES block, it is not possible to standardise catch rates for spatial shifts in effort distribution.

3.5.2.1.2 Commercial Catch

In addition to standardised catch rates, the status of sea mullet in the Peel-Harvey Estuary is also assessed annually through monitoring commercial sea mullet catch by haul and gillnets relative to specified reference levels.

3.5.2.2 Other Retained Species

Other retained finfish species in the Peel-Harvey Estuary are assessed primarily based on annual commercial haul and gillnet catches in the WCEMF Area 2 relative to reference levels. The only exception is cobbler, for which the mean gillnet catch rate (kg / fishing day) in the WCEMF Area 2 between July and September is used as a proxy for abundance of the Peel-Harvey Estuary stock.

3.5.2.3 Risk Assessments

The Department uses a risk-based Ecosystem Based Fisheries Management (EBFM) framework to assess the impacts of fishing on all parts of the marine environment, including the sustainability risks of target species, other retained species, bycatch, ETP species, habitats...
and the ecosystem. This framework has led the development of a periodic risk assessment process for the WCEMF Area 2, which is used to prioritise research, data collection, monitoring needs and management actions for these fisheries and to ensure that fishing activities in the Peel-Harvey Estuary are managed both sustainably and efficiently.

In 2014 and 2015, internal risk assessments were conducted for the WCEMF Area 2 on target, other retained, bycatch and ETP species, and habitat, using the Productivity Susceptibility Analysis (PSA) and Consequence Spatial Analysis (CSA) methodologies. Twenty-five species / groups were assessed, with two retained species assessed to be at medium risk, i.e. cobbler and Perth herring (Johnston et al. in prep.). Due to the higher susceptibility of these species to fishing impacts, species-specific reference levels and control rules have been developed as a precautionary measure. Fishery impacts from haul and gillnetting on benthic habitats in the Peel-Harvey Estuary were each assessed as a medium risk (Johnston et al. in prep.).

Risk assessments will be undertaken periodically (every 3 – 5 years) to reassess any current or new issues that may arise in the fishery; however, a risk assessment can also be triggered if there are significant changes identified in fishery operations or management activities or controls that may change current risk levels.

4 MANAGEMENT MEASURES AND IMPLEMENTATION

4.1 Management Measures

There are a number of management measures in place for the commercial and recreational fishing sector (Tables 2 and 3, respectively), which can be amended as needed to ensure this sector is achieving the resource objectives. These do not preclude the consideration of other options.

Table 2. Management measures and instrument of implementation for the West Coast Estuarine Managed Fishery: Area 2

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
<th>Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited Entry</td>
<td>A limited number of Managed Fishery Licences (11) are permitted to operate in the Peel-Harvey Estuary.</td>
<td>WCEMF Management Plan</td>
</tr>
<tr>
<td>Effort Restrictions</td>
<td>The capacity of Area 2 of the WCEMF is 12 000 m of haul net and 12 000 m of set net. No more than 1 000 m (total combined length) of set nets and haul nets can be used in Area 2 of the fishery at any one time.</td>
<td>WCEMF Management Plan</td>
</tr>
<tr>
<td>Gear Controls</td>
<td>Restrictions on overall net size, mesh size and set depth for set and / or haul nets.</td>
<td>WCEMF Management Plan</td>
</tr>
</tbody>
</table>
Spatial Closures  Parts of Peel-Harvey Estuary are permanently closed to commercial fishing activities to preserve sensitive habitats that are important for bird species.  WCEMF Management Plan

Size Limits  Species-specific size limits are in place for some finfish species.  FRMR

Reporting  Fishers are required to report all retained species catches, effort, ETP species interactions and fishing location in statutory monthly logbooks.  FRMR

Table 3.  Management measures and instrument of implementation for the recreational finfish fishing sector in the Peel-Harvey Estuary

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
<th>Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effort Restrictions</td>
<td>Each recreational net fisher is only permitted to use one net at a time.</td>
<td>FRMR</td>
</tr>
<tr>
<td>Gear Controls</td>
<td>The only permitted recreational net fishing methods in the Peel-Harvey Estuary are set (gill) netting and throw (cast) netting.</td>
<td>Closed Waters Recreational Netting Restrictions (Rivers, Estuaries, Inlets and Lakes South of 23° South Latitude) Notice 1992</td>
</tr>
<tr>
<td></td>
<td>Restrictions on net size, mesh size and depth for nets, and rules relating to the setting, attending and cleaning of nets apply.</td>
<td>FRMR</td>
</tr>
<tr>
<td>Spatial Closures</td>
<td>Parts of Peel-Harvey Estuary are permanently closed to recreational netting activities. Recreational set netting is only permitted 800 m seaward of the low water mark.</td>
<td>Closed Waters Recreational Netting Restrictions (Rivers, Estuaries, Inlets and Lakes South of 23° South Latitude) Notice 1992</td>
</tr>
<tr>
<td>Seasonal Closures</td>
<td>Recreational set netting is only permitted in the Peel-Harvey Estuary between 1 November and 31 July, which is the main cobbler breeding season.</td>
<td>Closed Waters Recreational Netting Restrictions (Rivers, Estuaries, Inlets and Lakes South of 23° South Latitude) Notice 1992</td>
</tr>
<tr>
<td>Temporal Restrictions</td>
<td>Recreational set netting is only permitted in the Peel-Harvey Estuary on Wednesday nights from 16:30 hours until midnight.</td>
<td>FRMR</td>
</tr>
<tr>
<td>Size Limits</td>
<td>Species-specific size limits are in place for some finfish species.</td>
<td>FRMR</td>
</tr>
<tr>
<td>Bag Limits</td>
<td>Mixes species and individual species daily bag limits are in place for many estuarine finfish species.</td>
<td>FRMR</td>
</tr>
</tbody>
</table>

4.2 Implementing Changes to the Management Arrangements

Decision-making processes can be triggered following the identification of new or potential issues as part of an ecological risk assessment (generally reviewed every 3 – 5 years), results of research, management or compliance projects or investigations, monitoring or assessment
outcomes (including those assessed as part of the harvest strategy) and / or expert workshops and peer review of aspects of research and management.

There are two main processes for making decisions about the implementation of management measures and strategies for the Peel-Harvey blue swimmer crab resource:

- Annual decision-making processes that may result in measures to meet the short-term, operational fishery objectives (driven by the control rules); and
- Longer-term decision-making processes that result in new measures and / or strategies to achieve the long-term fishery objectives (i.e. changes to the management system).

However, if there is an urgent issue, stakeholder meetings may be called to discuss the issue and determine appropriate management action, as needed.

4.2.1 Consultation

Management changes are generally given effect through amendments to legislation, such as the commercial fishery management plan, regulations and orders. These changes generally require the approval of the Minister for Fisheries. In making decisions relevant to fisheries, the Minister for Fisheries may choose to receive advice from any source, but has indicated that:

1) The Department is the primary source of management advice; and

2) Peak Bodies (Western Australian Fishing Industry Council [WAFIC] and Recfishwest) are the primary source of commercial and recreational sector advice and representation, respectively.

The peak bodies are funded by Government under Service Level Agreements (SLAs) to undertake their representation / advisory and consultation roles.

4.2.1.1 Commercial Sector Consultation

Under its SLA with the Department, WAFIC has been funded to undertake statutory consultation functions related to fisheries management plans and the facilitation of annual management meetings (AMMs) for licensed fisheries.

The FRMA requires the Minister to consult with affected parties when changes to a Part 6 management plan are being considered. In the case of the WCEMF Area 2, this includes all licence holders. AMMs between the Department, WAFIC and licence holders are used as the main forum to consult with stakeholders and licence holders on the management of the fishery. During these meetings, current and future management issues that may have arisen during the previous fishing season, and any proposed changes to the management plan, are discussed. Follow-up meetings may be held as required.
4.2.1.2 Recreational Sector Consultation

Under the SLA with Recfishwest, the Department is required to consult with Recfishwest as the recognised peak body for recreational fishing in Western Australia. Recfishwest is required to engage and consult with recreational fishers as necessary in order to meet its obligations.

4.2.1.3 Consultation with Other Groups

Consultation with the public, other Government agencies, marine users, Native Title parties and NGOs is undertaken by the Department as needed.

4.3 Compliance and Enforcement

The primary objective of the Department regarding compliance is to encourage voluntary compliance through education, awareness and consultation activities.

4.3.1 Operational Compliance Plan

Management arrangements are enforced under the Operational Compliance Plan (OCP) for the WCEMF. The OCP is informed and underpinned by a compliance risk assessment conducted for the fishery. These OCP has the following objectives:

- To provide clear and un-ambiguous direction and guidance to Fisheries and Marine Officers for the annual delivery of compliance in this fishery;
- To protect the fisheries’ environmental values, whilst providing fair and sustainable access to the fisheries’ commercial and social values;
- To encourage voluntary compliance through education, awareness and consultation activities; and
- To provide processes which ensure that the fisheries are commercially viable in the international market yet environmentally sustainable in the local context.

These OCP is reviewed every two (2) years.

4.3.1.1 Compliance Strategies for the Commercial Sector

The following compliance strategies are utilised in the Peel-Harvey Estuary for the commercial sector’s compliance risk management:

- On-water patrols utilising Departmental vessels;
- Catch, licence and gear inspections; and
- Covert surveillance of gear / persons of interest for suspected illegal activity.
4.3.1.2 Compliance Strategies for the Recreational Sector

The following compliance strategies are utilised in the Peel-Harvey Estuary for the recreational sector’s compliance risk management:

- Land patrols;
- On-water patrols;
- Catch, licence and gear inspections;
- Covert surveillance of persons of interest under approved operations;
- Road-side checkpoints; and
- Wholesale / retail inspections.

5 REFERENCES


Department of Fisheries (in press). Harvest Strategy Policy for the Aquatic Resources of Western Australia. Fisheries Management Paper No. 271. Perth: Department of Fisheries, Western Australia.


