



Marine Stewardship Council fisheries assessments

Western Australia Peel Harvey Estuarine Fishery

Announcement Comment Draft Report

Conformity Assessment Body (CAB)	bio.inspecta (mandated by q.inspecta)
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Fishery client	Western Australia Fishing Industry Council on behalf of the Mandurah Licensed Fishermen's Association and Recfishwest
Assessment type	First Reassessment
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2 Glossary

ACDR	Announcement Comment Draft Report
BMSY	Biomass for maximum sustainable yield
CI	Confidence Interval
CPUE	Catch Per Unit (fishing) Effort
CSA	Consequence Spatial Analysis (a risk assessment method)
CW	Carapace width
DDG	Deputy Director General of DPIRD
DoF	Department of Fisheries (Western Australia)
DPIRD	Department of Primary Industries and Regional Development
ERA	Environmental Risk Assessment
EEZ	Exclusive economic zone
ETP	Endangered, Threatened and Protected species
EBFM	Ecosystem-based Fisheries Management
EPBC	Environmental Protection and Biodiversity Conservation (Act)
HCR	Harvest Control Rules, using contained with the Harvest Strategy
IFM	Integrated Fisheries Management
FRDC	Fisheries Research and Development Corporation
FRMA	Fish Resources Management Act 1994
FRMA	Fish Resources Management Regulation 1995
GLM	Generalised linear model
HCR	Harvest control rule
MLFA	Mandurah Licensed Fishermen's Association
OCF	Operational Compliance Plan
OCS	Offshore Constitutional Settlement 1995
PHE	Peel-Harvey Estuary
PI	Performance Indicator
PRI	Point of Recruitment Impairment
RECFISHWEST	Peak body for recreational fishing in Western Australia
RP	Reference Point
SAT	Western Australian State Administrative Tribunal
SEG	Stakeholder Engagement Strategy
SICA	Scale Intensity Consequence Analysis (a risk assessment method)
SLA	Service Level Agreement
SG	Scoring Guidepost
UoA	Unit of Assessment
UoC	Unit of Certification
VFAS	Voluntary fishery adjustment scheme
WA	Western Australia
WAFIC	WA Fishing Industry Council, peak body for commercial fishing in WA
WCEMF	West Coast Estuarine Managed Fishery

3 Executive summary

Draft determination to be completed at Public Comment Draft Report stage

This report is the Announcement Comment Draft Report (ACDR) which outlines the MSC assessment process for the Western Australia Peel Harvey Estuarine Fishery. The assessment team consists of Dr Sabine Daume (Team Leader), Dr Klaas Hartmann (Principle 1), Dr Johanna Pierre (Principle 2) and Jo-Anne McCrea (Principle 3).

This report does not present a final scoring outcome or a certification decision. The final scoring and certification decision will take place after the assessment team has conducted a site visit when possible and has had the opportunity to review additional information and the views of stakeholders about this fishery.

The scoring presented in this report has not been reviewed by stakeholders, or peer reviewers. These steps will all take place from here onwards. Stakeholders are encouraged to review the scoring presented in this assessment. If you have any comments you must use the '[MSC Template for Stakeholder Input into Fishery Assessments](#)' to provide evidence to the team of where changes to scoring need to be considered.

All stakeholder comments will be published ahead of the site visit. Stakeholders can speak with the assessment team during the site visit which is scheduled for 10-11 May 2021 in Perth (remote if needed and following variation request under the MSC's Covid-19 September 2020 derogation).

bio.inspecta confirms that this fishery is "within scope" and eligible for MSC certification. The default assessment tree of MSC Fisheries Standard version 2.01 and the MSC Fisheries Certification Process version 2.2 is being used for this assessment.

Fishery strengths

- For both species there is a prolonged history of stable catches and catch rates indicating that management arrangements are meeting their objectives.
- The exploitation rate for sea mullet is likely to be extremely low resulting in a very robust fishery.
- The initial sea mullet modelling is showing promising results that conform with other available information.
- The size limit for blue swimmer crab provides a minimum level of protection for egg production per recruit.
- The blue swimmer crab fishery independent surveys are providing promising indices to use in conjunction with the CPUE index.
- The substantial information base available on the Estuary ecosystem and its components and elements
- The clear management approach documented in harvest strategy documents.
- The datasets on retained catch from commercial fishing activities.

Fishery weaknesses

- The sea mullet harvest strategy relies on a biomass indicator that is only updated every five years.
- Recreational catch estimates are infrequent and not comprehensive across gear types, consequently there is potential for unmonitored growth in this sector.

- The reduction in the commercial sector will reduce the reliability of CPUE indices.
- The response of the harvest control rules to indicators falling below threshold levels is not well defined.
- The limited information, including lack of recent catch information, available for the recreational fishery UoAs
- The lack of discard recording by commercial UoAs
- Indeterminate timeframes for the implementation of management actions to reduce risks, after harvest strategy triggers are breached.

The key issues that require further investigation for **Principle 1** are:

- Information on estimates of mortality of unwanted catch for all UoCs will be requested at the onsite meeting.
- For sea mullet, clarification will be requested, if existing indices remain a formal component of the HCR, if they will be examined on an annual basis and whether action would be taken if they fell below the previous thresholds in years between biomass assessments.

Key issues relevant to **Principle 2**, for further investigation include:

- Progress on developing new management measures for reducing the risk of disturbance to threatened migratory shorebirds.
- Any new stock status and management information specifically for yelloweye mullet, estuary cobbler, yellowfin whiting and Perth herring.
- Information available from the trial of permitted southern eagle ray catch.
- Any new information available on the recreational UoAs, including bait use and fishing locations of drop net fishers.
- Key points of difference from the haul net fishery in terms of fishing locations in the Estuary and fishery risks to Principle 2 components and elements
- Timeframes for implementing management actions when the need for these is identified through applying the harvest strategies.

The key issues to discuss further for **Principle 3** are:

- Further exploration of the consultation and participatory mechanisms employed in the fishery. In particular, understanding of how the Stakeholder Guidelines have been operationalised with regards to this fishery; and the means for non-industry stakeholders have been able and encouraged to participate in operational or strategic level management.
- The extent of information about the fishery's performance and management actions made available to interested stakeholders; including how the management system has responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
- The system of management plan review in Western Australian fisheries.
- Gain a clear understanding of revised strategic review and evaluation process for WA fisheries, following the transition to DPIRD.
- Compliance response to recreational fishing non-compliance, in particular in the blue swimmer crab fishery.

4 Report details

4.1 Authorship and peer review details

Peer reviewer information to be completed at Public Comment Draft Report stage

Together the team meets all competency requirements laid out in FCP v2.2 Section(s) 7.6, 7.14, Annex PC Table PC3.

Team Leader: Dr Sabine Daume

Dr Daume is the Managing Director of bio.inspecta Pty Ltd, Centre for Seafood Certification based in Melbourne Australia which covers MSC, ASC and Fisheries Improvement programs. Since 2009, Dr Daume has led numerous MSC evaluation audits including several large and controversial assessments, and many assessments in Australia.

Dr Daume led the WA rock lobster and Heard Island and McDonald Islands (HIMI) icefish annual surveillance and re-assessments as well as the HIMI and Macquarie Island toothfish full assessment in Australia, and numerous audits in USA, Canada, Mexico and Japan. Dr. Daume led five new full assessments in Western Australia between 2015 and 2018 (Peel Harvey Estuarine Fishery, West Coast Deep Sea Crab Fishery, Australian Silver-lipped Pearl Fishery, Western Australian Abalone Fishery, Western Australian Octopus Fishery). She has been trained by the MSC to use the Risk Based Framework (RBF) and the most recent MSC Certification Requirements (v2.0 Oct. 2015). She is a certified lead auditor under the ISO 9001:2008 standard.

She holds a PhD in marine biology from La Trobe University in Victoria, Australia and an MSc in Marine Biology and Marine Chemistry from Kiel University in Germany. Dr Daume has expertise in the biology and ecology of exploited marine resources. Dr Daume has over 25 years' experience working with the fishing and aquaculture industry in Australia and worked as a Senior Research Scientist at the Research Division of the Department of Fisheries in Western Australia.

Team Member and Principle 1 Expert: Dr Klaas Hartmann

Dr Hartmann is a Senior Research Fellow and Mathematician at the Institute for Marine and Antarctic Studies (IMAS) University of Tasmania whose research involves bio-economic modelling across a broad range of fisheries. Throughout his career he has worked on resource and conservation management from a mathematical ecology and ecological economics perspective. After working in fisheries at CSIRO for two years, Klaas focused on prioritising resources for biodiversity conservation, particularly using phylogenetic information.

Since commencing work at IMAS in 2009, Klaas has returned to his initial interest in fisheries modelling. At IMAS Dr Hartmann works on bio-economic models and developing/evaluating novel management strategies in collaboration with fisheries managers and industry. This work has helped support large changes in several fisheries that have substantially increased their profitability whilst improving environmental outcomes. Klaas has been responsible for conducting or overseeing Southern Rock Lobster and Giant Crab assessments in Tasmania for over ten years and Victoria for five years. Klaas was responsible for producing the Tasmanian Scalefish assessment for three years and has overseen and/or advised the assessment process for a further five years. Klaas is a committee member of the Tasmanian Crustacean Fisheries Advisory Committee and the Status of Key Australian Fish Stocks Advisory Committee. Dr Hartmann has been the P1 expert on several confidential pre-assessments and the recent annual surveillance audits of WA fisheries including the Peel Harvey Estuarine Fishery.

Team Member and Principle 2 Expert: Dr Johanna Pierre

Dr Johanna Pierre has more than 15 years' experience working on commercial and recreational fishing, in marine and freshwater environments. Her work includes fisheries management, policy, regulation and monitoring. She also conducts sustainability assessments, audits and evaluations of fishery and environmental performance. Johanna has worked for government, academia, non-profit organisations and industry. She has a Ph.D. in environmental biology and ecology (University of Alberta, Canada), and a B.Sc. (Hons) (University of Canterbury, New Zealand) and completed post-doctoral studies at the University of Tokyo (Japan). Johanna has extensive experience working on fisheries and other fields of science in Canada, Japan, China, South Korea, Australia and New Zealand.

Johanna is a certified MSC fishery team member, Chain of Custody auditor, and member of the MSC Peer Review College and Technical Consultants Register. She is trained in the use of the MSC Risk Based Framework. Johanna's experience covers MSC peer reviews (P1, P2, P3), surveillance audits (P1, P2, P3, including as team leader (TL)), fishery assessments (P2, P3), and fishery pre-assessments (P1, P2, P3, and TL). Recent work includes longline, pole and line, trawl, purse seine and small-scale fisheries, both in fisheries under national jurisdiction and those managed by multilateral bodies (such as Regional Fisheries Management Organisations).

Team Member and Principle 3 Expert: Jo-anne McCrea

Jo-anne (Jo) is a marine scientist with 25 years of experience in the area of sustainable fisheries and aquaculture management across the private, government and environmental non-government sectors. Jo worked in the Government fisheries and aquaculture regulatory sector for over a decade, specialising in environmental management of seafood industries; and as an independent consultant for 6 years, advising Government, non-government and academic sectors. During this time Jo developed and implemented marine protection policies such as bycatch action plans for commercial fisheries, protected species management measures, resource allocation, vulnerable habitat protection. Jo also led the Aquaculture and Pearling program of Western Australia where she was responsible for the development of policies to guide the development and sustainable management of these activities.

Most recently, Jo worked for the World Wildlife Fund for over 8 years, managing its Sustainable Seafood Program for the last 5 years. In this role, Jo was responsible for reviewing the environmental risk associated with the seafood supply chains of Australia's largest seafood companies, with the use of her deep understanding of sustainable harvesting and management of seafood. Jo also led the fisheries legislative and policy engagement work for WWF Australia. This included involvement in the development of commonwealth level fisheries policies and management approaches, including the Harvest Strategy Policy, Bycatch Policy, Climate Change Adaptation Tools and Australia Fisheries Standards. Over this period, she also represented the conservation sector on numerous fisheries and jurisdiction specific advisory groups, as well as national level committees.

4.2 Version details

Table 1 – Fisheries program documents versions	
Document	Version number
MSC Fisheries Certification Process	Version 2.2
MSC Fisheries Standard	Version 2.01
MSC General Certification Requirements	Version 2.4.1
MSC Reporting Template	Version 1.2

5 Unit(s) of Assessment and Unit(s) of Certification and results overview

5.1 Unit(s) of Assessment and Unit(s) of Certification

5.1.1 Unit(s) of Assessment

Table 2 – Unit(s) of Assessment (UoA)	
UoA 1	Description
Species	Blue Swimmer Crab (<i>Portunus armatus</i>)
Stock	South Western Australia Blue Swimmer Crab stock between Penguin Island and Cape Naturaliste, including the ADCREstuary, together with the Murray, Serpentine, Harvey and Dandalup Rivers, Western Australia, Indian Ocean, within Australian EEZ
Fishing gear type(s) and, if relevant, vessel type(s)	Crab pots
Client group	Mandurah Licensed Fishermen's Association and Recfishwest
Other eligible fishers	There are no other eligible fishers. All fishers are included in the Unit of Certification.
Geographical area	Peel-Harvey Estuary, together with the Murray, Serpentine, Harvey and Dandalup Rivers, Western Australia, Indian Ocean, within Australian EEZ
UoA 2	Description
Species	Blue Swimmer Crab (<i>Portunus armatus</i>)
Stock	South Western Australia Blue Swimmer Crab stock between Penguin Island and Cape Naturaliste, including the Peel-Harvey Estuary, together with the Murray,

	Serpentine, Harvey and Dandalup Rivers, Western Australia, Indian Ocean, within Australian EEZ
Fishing gear type(s) and, if relevant, vessel type(s)	Drop nets
Client group	Mandurah Licensed Fishermen's Association and Recfishwest
Other eligible fishers	There are no other eligible fishers. All fishers are included in the Unit of Certification.
Geographical area	Peel-Harvey Estuary, together with the Murray, Serpentine, Harvey and Dandalup Rivers, Western Australia, Indian Ocean, within Australian EEZ
UoA 3	Description
Species	Blue Swimmer Crab (<i>Portunus armatus</i>)
Stock	South Western Australia Blue Swimmer Crab stock between Penguin Island and Cape Naturaliste, including the Peel-Harvey Estuary, together with the Murray, Serpentine, Harvey and Dandalup Rivers, Western Australia, Indian Ocean, within Australian EEZ.
Fishing gear type(s) and, if relevant, vessel type(s)	Scoop nets
Client group	Mandurah Licensed Fishermen's Association and Recfishwest
Other eligible fishers	There are no other eligible fishers. All fishers are included in the Unit of Certification.
Geographical area	Peel-Harvey Estuary, together with the Murray, Serpentine, Harvey and Dandalup Rivers, Western Australia, Indian Ocean, within Australian EEZ
UoA 4	Description
Species	Sea Mullet (<i>Mugil cephalus</i>)
Stock	South Western Australia sea mullet stock extending North to Shark Bay Western Australia, Indian Ocean, within Australian EEZ.
Fishing gear type(s) and, if relevant, vessel type(s)	Haul nets
Client group	Mandurah Licensed Fishermen's Association and Recfishwest
Other eligible fishers	There are no other eligible fishers. All fishers are included in the Unit of Certification.
Geographical area	Peel-Harvey Estuary, together with the Murray, Serpentine, Harvey and Dandalup Rivers, Western Australia, Indian Ocean, within Australian EEZ
UoA 5	Description

Species	Sea Mullet (<i>Mugil cephalus</i>)
Stock	South Western Australia sea mullet stock extending North to Shark Bay Western Australia, Indian Ocean, within Australian EEZ.
Fishing gear type(s) and, if relevant, vessel type(s)	Gill nets
Client group	Mandurah Licensed Fishermen's Association and Recfishwest
Other eligible fishers	There are no other eligible fishers. All fishers are included in the Unit of Certification.
Geographical area	Peel-Harvey Estuary, together with the Murray, Serpentine, Harvey and Dandalup Rivers, Western Australia, Indian Ocean, within Australian EEZ

5.1.2 Unit(s) of Certification

Table 3 – Unit(s) of Certification (UoC)

UoC 1	Description
Species	Blue Swimmer Crab (<i>Portunus armatus</i>)
Stock	South Western Australia Blue Swimmer Crab stock between Penguin Island and Cape Naturaliste, including the Peel-Harvey Estuary, together with the Murray, Serpentine, Harvey and Dandalup Rivers, Western Australia, Indian Ocean, within Australian EEZ.
Fishing gear type(s) and, if relevant, vessel type(s)	Crab pots
Client group	Mandurah Licensed Fishermen's Association and Recfishwest
Geographical area	Peel-Harvey Estuary, together with the Murray, Serpentine, Harvey and Dandalup Rivers, Western Australia, Indian Ocean, within Australian EEZ
UoC 2	Description
Species	Blue Swimmer Crab (<i>Portunus armatus</i>)
Stock	South Western Australia Blue Swimmer Crab stock between Penguin Island and Cape Naturaliste, including the Peel-Harvey Estuary, together with the Murray, Serpentine, Harvey and Dandalup Rivers, Western Australia, Indian Ocean, within Australian EEZ.
Fishing gear type(s) and, if relevant, vessel type(s)	Drop nets
Client group	Mandurah Licensed Fishermen's Association and Recfishwest

Geographical area	Peel-Harvey Estuary, together with the Murray, Serpentine, Harvey and Dandalup Rivers, Western Australia, Indian Ocean, within Australian EEZ
UoC 3	Description
Species	Blue Swimmer Crab (<i>Portunus armatus</i>)
Stock	Blue Swimmer Crab within the Indian Ocean
Fishing gear type(s) and, if relevant, vessel type(s)	Scoop nets
Client group	Mandurah Licensed Fishermen's Association and Recfishwest
Geographical area	Peel-Harvey Estuary, together with the Murray, Serpentine, Harvey and Dandalup Rivers, Western Australia, Indian Ocean, within Australian EEZ
UoC 4	Description
Species	Sea Mullet (<i>Mugil cephalus</i>)
Stock	South Western Australia sea mullet stock extending North to Shark Bay Western Australia, Indian Ocean, within Australian EEZ.
Fishing gear type(s) and, if relevant, vessel type(s)	Haul nets
Client group	Mandurah Licensed Fishermen's Association and Recfishwest
Geographical area	Peel-Harvey Estuary, together with the Murray, Serpentine, Harvey and Dandalup Rivers, Western Australia, Indian Ocean, within Australian EEZ
UoC 5	Description
Species	Sea Mullet (<i>Mugil cephalus</i>)
Stock	South Western Australia sea mullet stock extending North to Shark Bay Western Australia, Indian Ocean, within Australian EEZ.
Fishing gear type(s) and, if relevant, vessel type(s)	Gill nets
Client group	Mandurah Licensed Fishermen's Association and Recfishwest
Geographical area	Peel-Harvey Estuary, together with the Murray, Serpentine, Harvey and Dandalup Rivers, Western Australia, Indian Ocean, within Australian EEZ

5.2 Assessment results overview

5.2.1 Determination, formal conclusion and agreement

To be drafted at Public Comment Draft Report stage

The CAB shall include in the report a formal statement as to the certification determination recommendation reached by the assessment team on whether the fishery should be certified.

The CAB shall include in the report a formal statement as to the certification action taken by the CAB's official decision-maker in response to the determination recommendation.

Reference(s): FCP v2.2, 7.20.3.h and Section 7.21

5.2.2 Principle level scores

To be drafted at Client and Peer Review Draft Report stage

The CAB shall include in the report the scores for each of the three MSC principles in the table below.

Reference(s): FCP v2.2 Section 7.17

Table 4 - Principle level scores					
Principle	UoA 1	UoA 2	UoA 3	UoA 4	UoA 5
Principle 1 – Target species					
Principle 2 – Ecosystem impacts					
Principle 3 – Management system					

5.2.3 Summary of conditions

To be drafted at Client and Peer Review Draft Report stage

The CAB shall include in the report a table summarising conditions raised in this assessment. Details of the conditions shall be provided in the appendices. If no conditions are required, the CAB shall include in the report a statement confirming this.

Reference(s): FCP v2.2 Section 7.18

Table 5 – Summary of conditions						
Condition number	Condition	Performance Indicator (PI)	Deadline	Exceptional circumstances?	Carried over from previous certificate?	Related to previous condition?
				Yes / No	Yes / No / NA	Yes / No / NA
				Yes / No	Yes / No / NA	Yes / No / NA

				Yes / No	Yes / No / NA	Yes / No / NA
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5.2.4 Recommendations

To be drafted at Client and Peer Review Draft Report stage

If the CAB or assessment team wishes to include any recommendations to the client or notes for future assessments, these may be included in this section.

6 Traceability and eligibility

6.1 Eligibility date

The target eligibility date for product from the fishery to bear the MSC label is 22 December 2021 which is the anticipated re-certification date.

6.2 Traceability within the fishery

This section is written for the commercial fishery sector only because only product from that sector can bear the MSC logo, in the event that the fishery is re-certified. The client representative for the recreational sector, Andrew Rowland from Recfishwest, confirmed that none of the species taken in the recreational fishery are intended for commercial sale and therefore cannot carry the MSC logo.

Within the commercial fishery, all landings are recorded and reported via mandatory catch and disposal records (CDRs), where the amount of catch and the fishing area are recorded for each fishing trip.

Table 6 – Traceability within the fishery	
Factor	Description
<p>Will the fishery use gears that are not part of the Unit of Certification (UoC)?</p> <p>If Yes, please describe:</p> <ul style="list-style-type: none"> - If this may occur on the same trip, on the same vessels, or during the same season; - How any risks are mitigated. 	<p><i>No, only baited pots are permitted in the commercial fishery and no other gears are used.</i></p>
<p>Will vessels in the UoC also fish outside the UoC geographic area?</p> <p>If Yes, please describe:</p> <ul style="list-style-type: none"> - If this may occur on the same trip; - How any risks are mitigated. 	<p><i>The risk of vessels fishing and landing catch from outside the permitted fishing area is low due to compliance checks. All product landed by individual license holders is transported in owner-operated and owned vehicles to local markets where it is sold, or it is sold to local wholesalers.</i></p>
<p>Do the fishery client members ever handle certified and non-certified products during any of the activities covered by the fishery certificate? This refers to both at-sea activities and on-land activities.</p> <ul style="list-style-type: none"> - Transport - Storage - Processing - Landing - Auction 	<p><i>No, all licence holders are included in the fishery. All product is landed at Fisheries approved landing ports. Product transported in owner-operated and owned vehicles. Therefore, there is minimal opportunity for substitution of certified with non-certified fish.</i></p>

If Yes, please describe how any risks are mitigated.	
Does transshipment occur within the fishery? If Yes, please describe: <ul style="list-style-type: none"> - If transshipment takes place at-sea, in port, or both; - If the transshipment vessel may handle product from outside the UoC; - How any risks are mitigated. 	<i>There is no transshipment in the fishery</i>
Are there any other risks of mixing or substitution between certified and non-certified fish? If Yes, please describe how any risks are mitigated.	<i>There is no other risks of mixing certified and non-certified product.</i>

6.3 Eligibility to enter further chains of custody

To be drafted at Client and Peer Review Draft Report stage

The CAB shall include in the report a determination of whether the seafood product will be eligible to enter certified chains of custody, and whether the seafood product is eligible to be sold as MSC certified or carry the MSC ecolabel.

The CAB shall include in the report a list of parties, or category of parties, eligible to use the fishery certificate, and sell product as MSC certified.

The CAB shall include in the report the point of intended change of ownership of product, a list of eligible landing points, and the point from which subsequent Chain of Custody certification is required.

If the CAB makes a negative determination under FCP v2.2 Section 7.9, the CAB shall state that fish and fish products from the fishery are not eligible to be sold as MSC certified or carry the MSC ecolabel. If the client group includes other entities such as agents, unloaders, or other parties involved with landing or sale of certified fish, this needs to be clearly stated in the report including the point from which Chain of Custody is required.

Reference(s): FCP v2.2 Section 7.9

7 Scoring

7.1 Summary of Performance Indicator level scores

Indicative scoring ranges at this stage of the assessment are presented below.

Component		Performance Indicator (PI)		UoA 1	UoA 2	UoA 3	UoA 4	UoA 5
One	Outcome	1.1.1	Stock status	≥80	≥80	≥80	≥80	≥80
		1.2.1	Harvest strategy	60-79	60-79	60-79	60-79	60-79
	Management	1.2.2	Harvest control rules & tools	≥80	≥80	≥80	≥80	≥80
		1.2.3	Information & monitoring	60-79	60-79	60-79	≥80	≥80
		1.2.4	Assessment of stock status	≥80	≥80	≥80	≥80	≥80
Two	Primary species	2.1.1	Outcome	≥80	≥80	≥80	≥80	≥80
		2.1.2	Management strategy	≥80	≥80	≥80	≥80	≥80
		2.1.3	Information/Monitoring	≥80	≥80	≥80	≥80	≥80
	Secondary species	2.2.1	Outcome	≥80	≥80	≥80	60-79	60-79
		2.2.2	Management strategy	60-79	≥80	≥80	60-79	60-79
		2.2.3	Information/Monitoring	≥80	≥80	≥80	60-79	60-79
	ETP species	2.3.1	Outcome	≥80	60-79	60-79	≥80	≥80
		2.3.2	Management strategy	≥80	≥80	60-79	≥80	≥80
		2.3.3	Information/Monitoring	≥80	60-79	≥80	60-79	60-79
	Habitats	2.4.1	Outcome	≥80	≥80	≥80	≥80	≥80
		2.4.2	Management strategy	≥80	≥80	≥80	≥80	≥80
		2.4.3	Information	≥80	60-79	60-79	≥80	≥80
	Ecosystem	2.5.1	Outcome	≥80	≥80	≥80	≥80	≥80
		2.5.2	Management	≥80	≥80	≥80	≥80	≥80
		2.5.3	Information	≥80	60-79	60-79	60-79	60-79
Three	Governance and policy	3.1.1	Legal & customary framework	≥80	≥80	≥80	≥80	≥80
		3.1.2	Consultation, roles responsibilities	≥80	≥80	≥80	≥80	≥80
		3.1.3	Long term objectives	≥80	≥80	≥80	≥80	≥80
	Fishery specific management system	3.2.1	Fishery specific objectives	≥80	≥80	≥80	≥80	≥80
		3.2.2	Decision making processes	≥80	≥80	≥80	≥80	≥80
		3.2.3	Compliance & enforcement	≥80	≥80	≥80	≥80	≥80
		3.2.4	Management performance	≥80	≥80	≥80	≥80	≥80

7.2 Principle 1

7.2.1 Principle 1 background

This section is largely based on DPIRD 2020a, DPIRD 2020b, DPIRD 2020c, DPIRD 2020d, DPIRD 2020e and Johnston et. al. 2015. As with the initial assessment report, in some sections the Principle 1 background draws directly on text from Johnston et. al. 2015.

7.2.2 Fishing activities

The commercial fishery

The commercial finfish net fishery in the PHE was first established in the mid-1800s. 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. Blue swimmer crab were initially largely ignored as there was no demand for them with sea mullet and yelloweye mullet dominating catches.

The commercial crab fishery began in the late 1950s with fishers targeting blue swimmer crabs with the same gillnets they were using for finfish species. During the 1970s and early 1980s a number of changes to the PHE were introduced including limited entry and gear restrictions on net length and mesh size. These changes resulted in a decline in fishing effort, with further declines in sea mullet catch in the late 1980s due to reduced demand (Figure 7). A voluntary fishery adjustment scheme (VFAS) resulted in an initial reduction in the number of commercial licenses to 11 in 2015 and through a second phase to 7 licenses in 2020. Fishers are restricted to operating from vessels less than 6.5m in length.

Trials of commercial crab traps were allowed in the mid 1990s, resulting in higher efficiency, bycatch reduction and reduction in environmental impact. By 2000 the majority of blue swimmer crabs were caught by crab traps. Haul netting has become the most common method for targeting finfish species.

The commercial fishing sector operating in the PHE is managed as part of the West Coast Estuarine Managed Fishery (WCEMF; Figure 1). The fishery is split into three management areas:

- Area 1 encompasses the Swan-Canning Estuary in the Perth metropolitan area;
- Area 2 encompasses the PHE; and
- Area 3 encompasses the waters of the Hardy Inlet.

Blue swimmer crab is predominantly caught with purpose designed 'hourglass' crab traps with defined dimensional limitations (Figure 2). The nets used to construct the traps vary between fisher and are subject to innovation (Johnston et. al. 2015). Since 2000 the traps have included escape gaps, however this measure is voluntary (DPIRD 2020e). License holders can operate up to 42 traps and these can be pulled once every 24 hours. As part of the resource sharing arrangement commercial fishing is prohibited on weekends (DPIRD 2020d).

Contemporary commercial finfish fishing for sea mullet in the PHE is primarily conducted using haul nets. Fishing is conducted by visually identifying a school of fish of the desired size composition and species. This school is then encircled with the haul net. As the net is pulled in any undesired catch can be quickly returned to the water and if needed the other end can be detached letting the bulk of the encircled school free.

Gillnets are typically set overnight and left unattended in areas where fish are likely to be caught. Gillnets tend to be used primarily during the winter months owing to the lower abundance of blue swimmer crabs in the estuary during this time. This method is typically used to capture more demersal species, such as cobbler and whiting (MLFA 2008).

The recreational fishery

The recreational fishery is highly popular due to the proximity to the large population centres of Mandurah and Perth. The majority of fishing is conducted from boats or overhanging structures using

baited drop nets (Figure 3). A smaller proportion of fishing takes place from the shore and uses both drop nets and scoop nets (Figure 3). A maximum of ten drop nets can be used per vessel or person.

The most recent catch estimate for the boat based PHE recreational sector was conducted in 2017/18 and determined a catch of 36t (Ryan et al. 2019). Previous studies have found that the majority (~70%) of the recreational catch is typically boat based (Johnston et. al. 2015).

There is limited interest by the recreational sector in catching sea mullet and the most recent catch estimate (2015/16) indicated a catch of <1t.

Input controls affecting both sectors.

Both sectors are prohibited from catching blue swimmer crabs below 127mm carapace width and are not permitted to retain berried females. There are a number of spatial closures in place as well as seasonal closures.

7.2.3 Blue Swimmer Crab

Distribution

Blue swimmer crab (*Portunus armatus*) have a broad distribution throughout the Indo-West Pacific region ranging from East Africa to New Zealand. The distribution is temperature limited along the Southern Australian coast with some populations in warmer gulfs (Kailola et al. 1993).

In Western Australia blue swimmer crabs are broadly distributed along the coast-line primarily from Dunsborough to Port Hedland. Blue swimmer crabs are likely to form multiple overlapping stocks with ocean currents playing a strong role in connectivity (Sezmiş 2004). Genetic studies have shown that the Peel Harvey Estuary population and other south-west populations are genetically distinct from the more northerly populations in Cockburn sound and the Swan-Canning estuary (Chaplin and Sezmiş 2008). The UoA is at the Southern limit of the species environmental and temperature range and is likely to be susceptible to effects of climate change (DPIRD 2020d).

Biological characteristics

The PHE is towards the southern limit of this species temperature tolerance, consequently reproduction is limited to warmer months (Kangas 2000; de Lestang et al. 2010). Mature males moult some weeks before the maturing females, and each male carries a female clasped beneath him for 4 – 10 days until she moults and mating occurs. This happens in late summer. Female crabs store the sperm for a number of months until eggs are fertilised and spawned (Penn 1977; Smith 1982). Incubation takes 10 to 18 days, depending upon water temperature, and the larval phase extends for up to six weeks (Kangas 2000). Females produce between 180,000 and two million eggs. In crab stocks exposed to the open ocean, larvae can drift as far as 60 km out to sea, before returning to settle inshore (Kangas 2000). At approximately 10 months they reach a size of ~ 95 mm carapace width (CW) (late spring) and as growth increases over summer, they reach a legal size of ~ 130 mm CW by early autumn. Maturity is reached within one year at between 80 and 100 mm CW and coincides with copulation. Females retain sperm over the winter months until they spawn in the following spring. Individuals attain commercial size at around 12 – 15 months of age, with the minimum legal size (127 mm CW) set sufficiently above the mean size at maturity allowing females to spawn at least once before being available for retention. Blue swimmer crab may live for 3 years but most animals will have died through natural or fishing mortality by 20 months of age in WA.

The diet of crabs includes small bivalves, gammarid amphipods and polychaetes but varies with shell size and state. Blue swimmer crab is not a low-trophic level species as defined by the MSC.

Stock Assessment Approach

The primary indicator used for assessing blue swimmer crab is the standardised CPUE index which is calculated using data obtained from the commercial fishing fleet (Figure 4). Factors included in the

standardisation include fishing season, month and vessel. Correcting data for spatial shifts is not possible due to the limited spatial resolution of the reported data.

A fishery independent trapping survey has been conducted since 2007 across 15 sites. The key use of this data has been the development of a November legal size index which provides a good prediction of the following season's commercial catch (Figure 6).

A fishery independent trawl survey has been conducted since 2016 across 10 sites. This provides a recruitment index which appears promising but has been in place for too few years to understand its reliability and utility.

The annual commercial catch is monitored against a tolerance range based on a reference period of 2000/01 – 2016/17. This tolerance level has been proportionately reduced to take into account the reduction of vessels under the VFAS.

Stock Status

Over 90% of the commercial blue swimmer crab catch taken in the WCEMF is from the PHE fishery (DPIRD 2020d). Catches have been consistently in or close to the target range for 20 years (Figure 7). During this same period the commercial catch rate has fluctuated within its target range.

The lower bound of the CPUE target range is referred to as the threshold level and is considered a proxy for B_{MSY} . The accuracy of this as a B_{MSY} proxy remains uncertain as this low level of CPUE has only been observed once in twenty years and there is no evidence that MSY catches could be obtained from a stock in this state. Nevertheless, given the stability of CPUE and catches, the target range of CPUE in which the stock has been oscillating is likely to correspond to a level at or above B_{MSY} .

There is potential for the standardised CPUE index to be biased through time due to several factors including spatial shifts of fishing and changing environmental factors. These are addressed through the fishery independent surveys and consideration of environmental indices as part of the weight of evidence approach required in the harvest strategy.

Harvest Control Rule

The harvest control rule is based on a comparison of the standardised CPUE against threshold and limit reference points derived from a reference period. The threshold reference point is the lowest CPUE observed during the reference period and is considered a proxy for B_{MSY} whilst the limit threshold RP is 70% of this and is considered the point at which recruitment may be impaired.

If CPUE falls below the threshold RP, it is considered to be approaching the limit RP and a review is triggered which must develop a management response within three months to reduce catch by up to 50%. If CPUE falls below the limit RP a review with the same timeframe is triggered but this must develop a management response that reduces catch by 50-100%. The process by which the required catch reduction is determined and how it is implemented remains undefined.

7.2.4 Sea Mullet

Distribution

Sea mullet have a worldwide tropical distribution and occur almost entirely between the latitudes of ~ 42 °N and 42 °S (Thomson 1963; Rossi et al. 1998). In Australia, this species appears to be most abundant from approximately 25 °S to 35 °S along the eastern and western coastlines. Sea mullet occur in marine, estuarine and fresh waters, tolerating salinities of 0 – 80 ppt (Thomson 1963).

Sea mullet stocks are broad due to dispersal of eggs and larvae by currents and adult pre-spawning migrations. For the UoA stock, from an analysis of length-frequency data and observed migrations it is understood that juvenile sea mullet inhabit the PHE before migrating northwards to spawn; an increase in the proportion of older fish is observed in samples from oceanic waters further north (DPIRD

2020a). The south-west WA stock is considered to extend to Shark Bay (DPIRD 2020e) and the homogeneity of this stock is supported by genetic evidence (Johnston et. al. 2015).

Biological characteristics

Sea mullet have been well studied and a broad range of information is available. Sea mullet is not a low-trophic level species as defined by the MSC.

Sea mullet grows to a maximum size of ~ 600 mm total length (TL) and attain a maximum age of 12 years (Gaughan et al. 2006). When sea mullet reach sexual maturity at approximately 3 – 4 years of age (Chubb et al. 1981; Virgona et al. 1998), they typically undergo a migration from estuaries to open waters to spawn during late summer and autumn. At 20 – 30 mm TL, juveniles typically enter estuaries where they remain until the onset of maturity.

Juvenile sea mullet typically inhabit estuaries, where they associate with shallow weed beds and bare substrate, while adults are found in estuaries, shallow coastal waters and marine embayments (Chubb et al. 1981; Harrison & Senou 1999; Smith 2006). Due to the tolerance of this species to a wide range of salinities, sea mullet can occur in the upper reaches of estuaries (Chubb et al. 1981).

Stock Assessment Approach

A new stock assessment modelling approach has been developed on the basis of an improved understanding of stock structure and movement (DPIRD 2020b). The new approach recognises that the PHE mostly contains juveniles and a pre-spawning migration occurs northwards to Shark Bay. Consequently, standardised CPUE in Shark Bay is used as an abundance index and standardised CPUE in the PHE is considered an index of recruitment. Three modelling approaches were initially trialled consisting of a Catch-MSY model and two Schaefer production models (DPIRD 2020c).

As this is the first application of assessment models to this fishery, substantial scope remains for a more comprehensive investigation of modelling approaches and sensitivity analyses.

Stock Status

The CPUE indicator for the PHE remains above the threshold level (Figure 5) indicating ongoing high levels of recruitment.

The model based biomass estimates produced consistently high stock states. This is consistent with the fishery having reduced from much higher historic levels of catch (Figure 8) due to management changes and demand as opposed to a reduction in abundance. The Bayesian Schaefer model estimated B/B_{MSY} at 1.72 and the Schaefer model at 1.79. These models were applied to data up to 2018. However, the model outputs are consistent with the expected stock state given the low exploitation rate and the healthy recruitment index.

Harvest Control Rule

The HCR detailed in the harvest strategy (DPIRD 2020e) uses the model-based biomass estimate on a five yearly basis and compares this against threshold and limit reference points (RPs). The threshold RP is B_{MSY} whilst the limit threshold RP is 50% of this and is considered the point at which recruitment may be impaired.

If the biomass estimates fall below the threshold RP, it is considered to be approaching the limit RP and a review is triggered which must develop a management response within three months to reduce catch by up to 50%. If the biomass estimates fall below the limit RP a review with the same timeframe is triggered but this must develop a management response that reduces catch by 50-100%. This meets the requirement at both SG 60 and SG 80 for the exploitation rate to be reduced as the limit RP is approached. As the threshold RP is considered a MSY proxy the HCR is expected to main the stock at a target level above MSY.

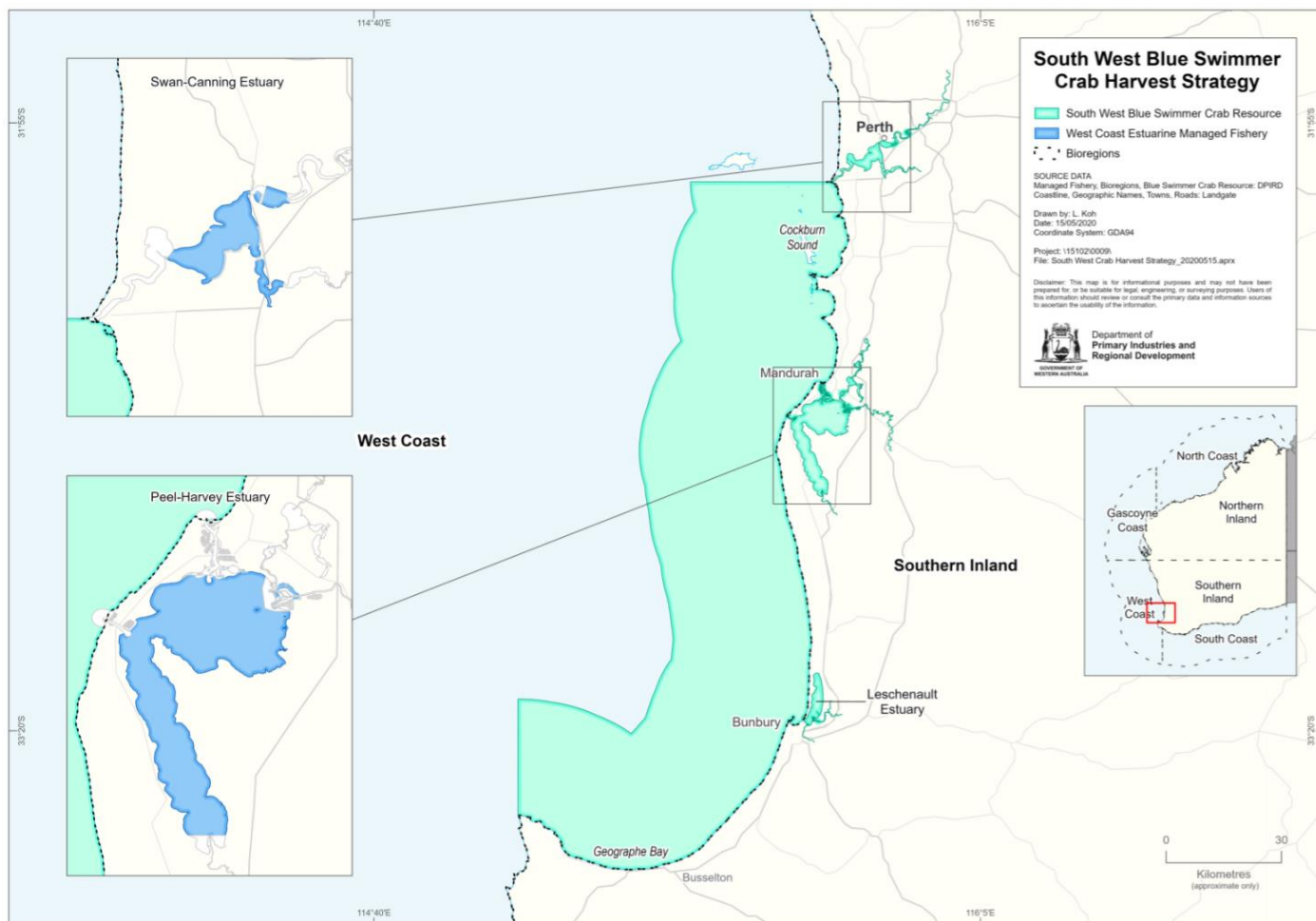


Figure 1: Extent of the Blue Swimmer Crab Resource of South West WA. Note that the harvest strategy considers the Swan-Canning Estuary and the Peel-Harvey Estuary stocks as separate. From DPIRD (2020d).



Figure 2: Commercial blue swimmer crab trap. From Johnston et. al. 2015



Figure 3: Recreational blue swimmer crab fishing equipment, Left: drop net, Right: Scoop net. From Johnston et. al. 2015.

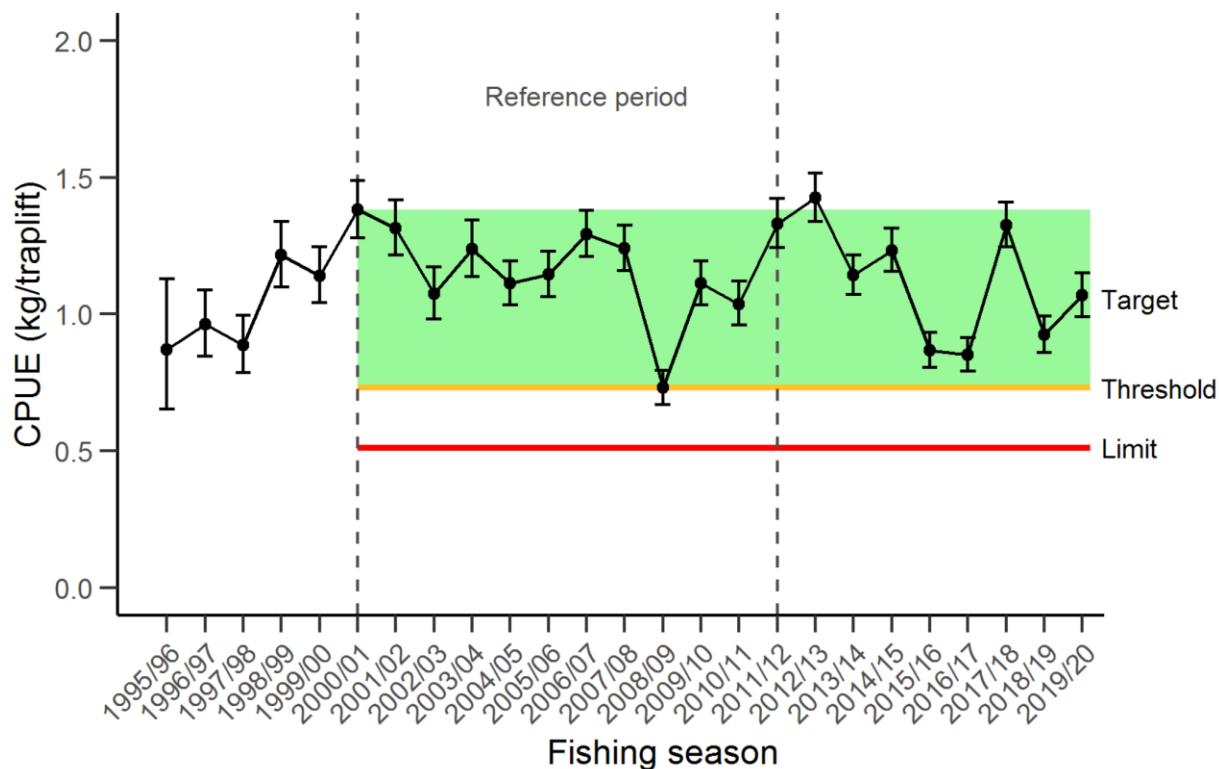


Figure 4: Annual standardised commercial catch rate (kg/traplift, $\pm 95\%$ CIs) of blue swimmer crabs in the Peel-Harvey Estuary fishery relative to target (green range), threshold (orange line) and limit (red line) reference levels. From: DPIRD 2020b

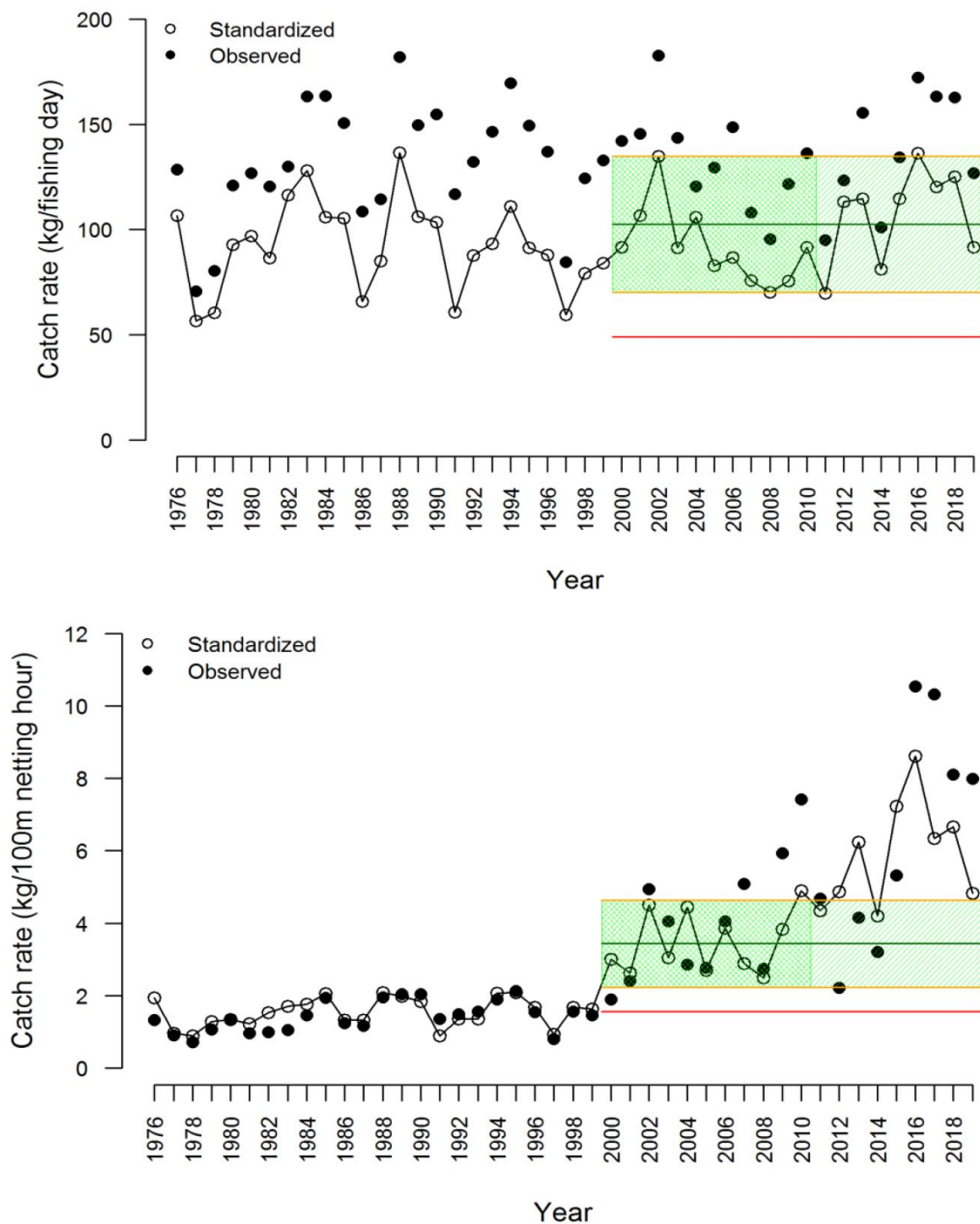


Figure 5: Time series of annual standardised commercial catch rate (top: kg/fishing day; bottom: kg/100 m netting hour) for sea mullet in the Peel-Harvey Estuary net fishery, relative to the target (green range), threshold (orange line) and limit (red line) reference levels. Due to changing fishing practices the top indicator is now considered the more reliable index. From: DPIRD 2020b

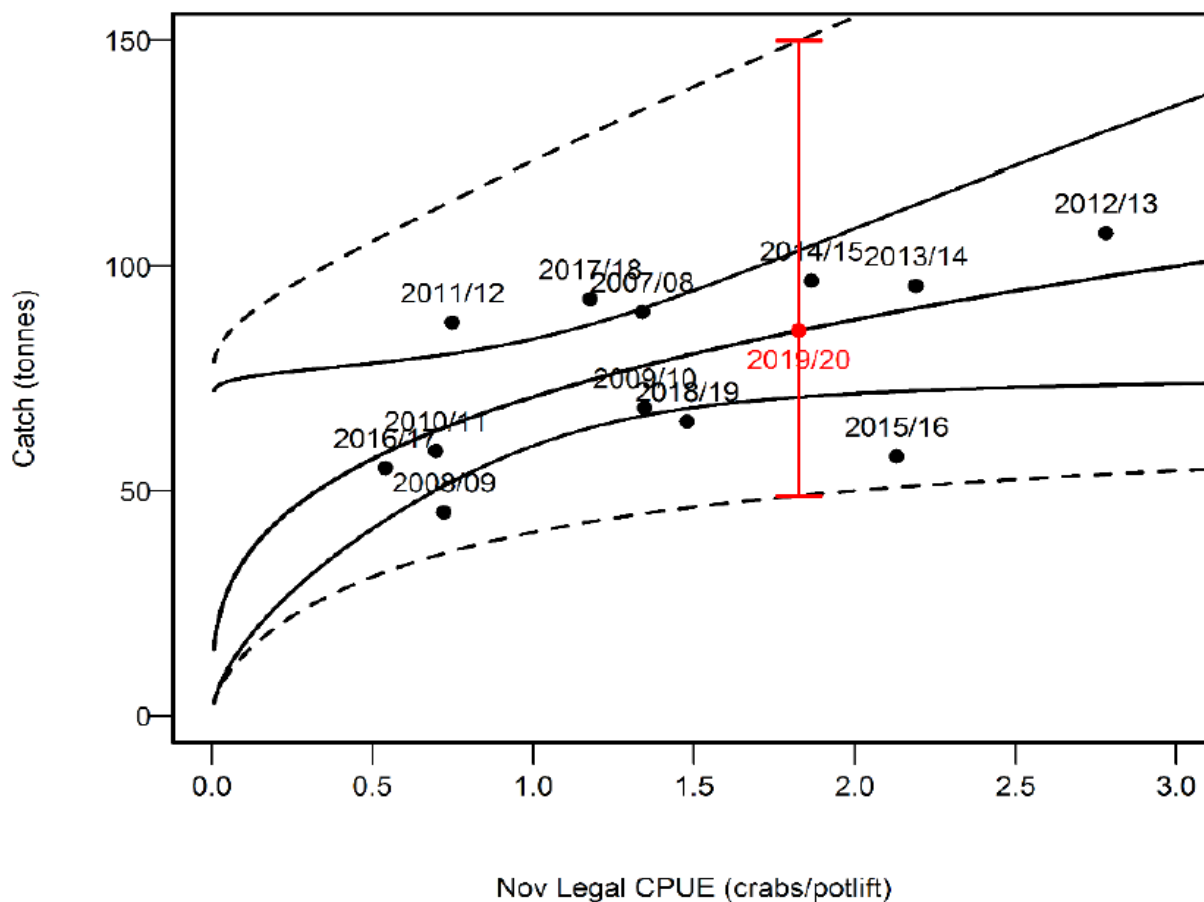


Figure 6: Relationship between the fishery independent trapping based CPUE index and the commercial catch in the subsequent season. From: DPIRD 2020b.

7.2.5 Catch profiles

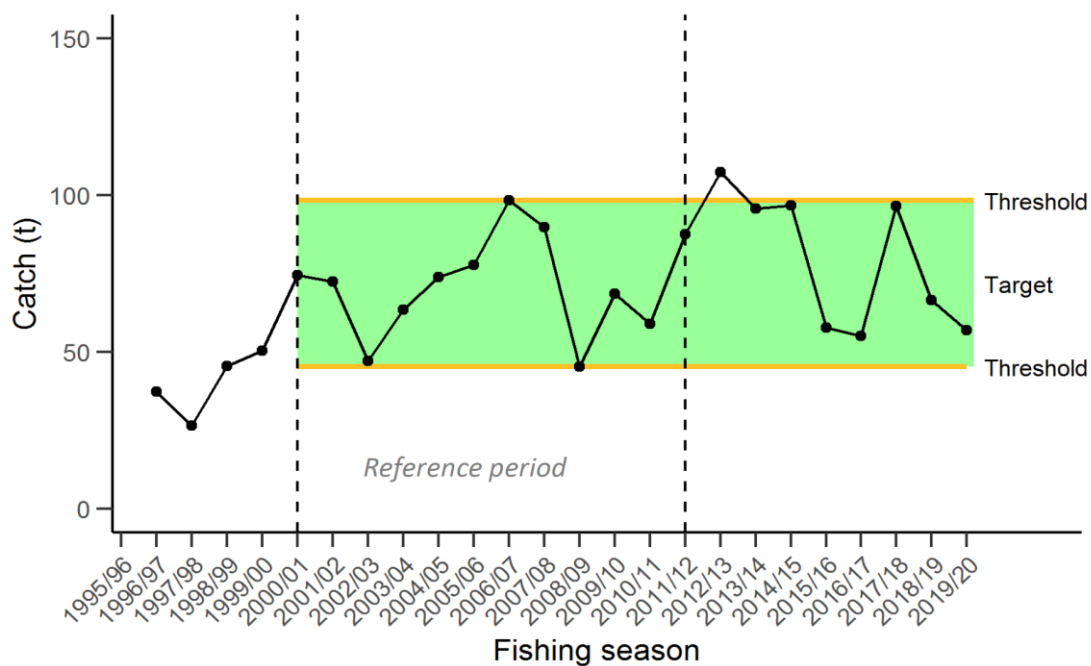


Figure 7: Commercial blue swimmer crab catches in the PHE. From: DPIRD 2020b

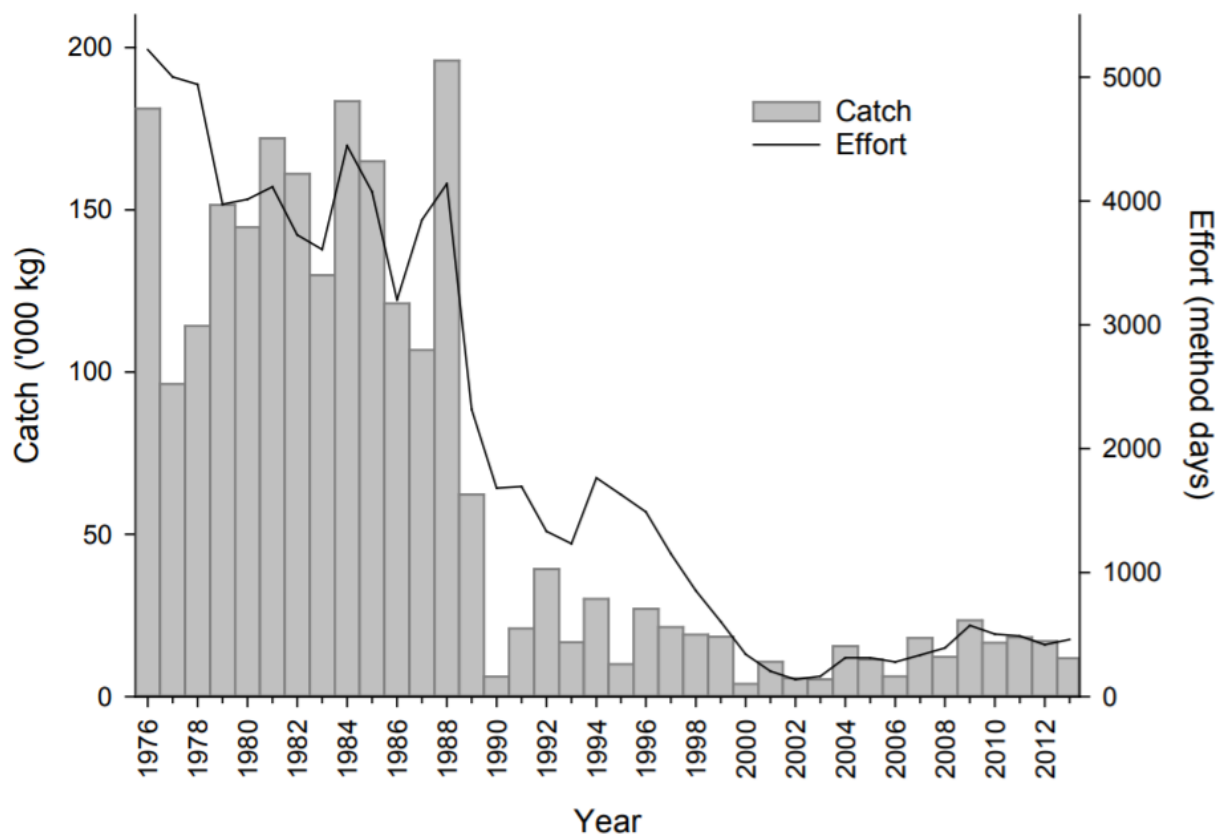


Figure 8: Long term time series of annual commercial catch (t) of sea mullet in the WCEMF Area 2. From Johnston et. al. 2015.

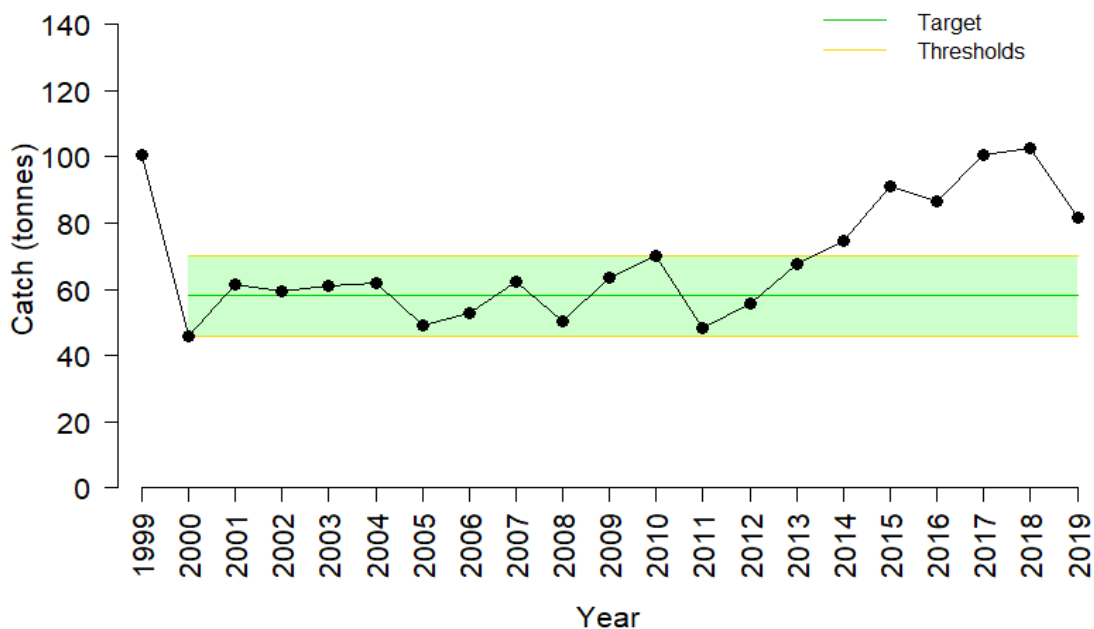


Figure 9: Annual commercial catch (tonnes) of sea mullet in the Peel-Harvey Estuary haul and gillnet fishery relative to the target (green range) and threshold (orange lines) reference levels. From: DPIRD 2020b

7.2.6 Total Allowable Catch (TAC) and catch data

Blue Swimmer Crab – commercial

Table 7 – Total Allowable Catch (TAC) and catch data				
TAC	Year		Amount	NA
UoA share of TAC	Year		Amount	NA
Total green weight catch by UoC	Year (most recent)	2019/20	Amount	57t
Total green weight catch by UoC	Year (second most recent)	2018/19	Amount	66.5t

Blue Swimmer Crab – recreational

Table 8 – Total Allowable Catch (TAC) and catch data				
TAC	Year		Amount	N/A
UoA share of TAC	Year		Amount	N/A
Total green weight catch by UoC	Year (most recent)	2019/20	Amount	Not estimated
Total green weight catch by UoC	Year (second most recent)	2018/19	Amount	Not estimated
Total green weight catch by UoC	Year (most recent estimate)	2017/18	Amount	36t (95% CI 30-42t)*

* Boat-based catch from whole Metropolitan zone of West Coast bioregion for 2017/18 (derived from Ryan et al. 2019)

Sea Mullet – commercial

Table 9 – Total Allowable Catch (TAC) and catch data				
TAC	Year		Amount	N/A
UoA share of TAC	Year		Amount	N/A
UoA share of total TAC	Year		Amount	N/A
Total green weight catch by UoC	Year (most recent)	2019	Amount	81.5t (PHE)
Total green weight catch by UoC	Year (second most recent)	2018	Amount	103t (PHE) 141t*

* Total catch from whole West Coast bioregion of which ~60% are taken in the Peel-Harvey Estuary.

Sea Mullet – recreational

Table 10 – Total Allowable Catch (TAC) and catch data				
TAC	Year		Amount	N/A
UoA share of TAC	Year		Amount	N/A
Total green weight catch by UoC	Year (most recent)	2019	Amount	Not estimated
Total green weight catch by UoC	Year (second most recent)	2018	Amount	Not estimated
Total green weight catch by UoC	Year (most recent estimate)	2015/16		0.7 t*

* Boat-based catch from whole Metropolitan zone of West Coast bioregion for 2015/16 (derived from Ryan et al. 2017)

7.2.7 Principle 1 Performance Indicator scores and rationales

PI 1.1.1 – Stock status

Blue Swimmer Crab (UoA 1,2 & 3)

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment			
	Guide post	It is likely that the stock is above the point where recruitment would be impaired (PRI).	It is highly likely that the stock is above the PRI.	There is a high degree of certainty that the stock is above the PRI.
	Met?	Yes	Yes	Yes
Rationale				

The primary indicator used to assess the state of the blue swimmer crab stock is the standardised catch rate (CPUE) using fisheries dependent logbook data from the commercial trap fishery (DPIRD 2020d). Standardised CPUE has continuously remained above the threshold level which the harvest strategy considers “a proxy for the stock level at which Maximum Sustainable Yield (MSY) can be achieved” (Figure 4). The ongoing fluctuation of the stock within this conservative target range is a good indicator that recruitment has not been impaired during this period.

The species is short-lived, consequently there is a high reliance on annual recruitment and there would be minimal lag between a period of reduced recruitment and the subsequent impact on the stock. Hence current high CPUE is a good indicator that recent recruitment has not been impaired.

Undersize abundance indices are also calculated based on the fishery independent trawl survey and trap survey. There are no associated reference points, however both indices show similar trends with a notable rise in recruitment in 2020 (trap) and 2018-2019 (trawl) (DPIRD (2020b)).

The ongoing stability of CPUE and undersize abundance coupled with a recent rise in the undersize abundance indices provides a high degree of certainty that the stock is above the PRI, meeting the requirements of SG100.

Stock status in relation to achievement of Maximum Sustainable Yield (MSY)				
b	Guide post		The stock is at or fluctuating around a level consistent with MSY.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
	Met?		Yes	No
Rationale				

Standardised CPUE has been above the threshold level since 1995/96 (the year in which the CPUE index commences). The harvest strategy considers the threshold level a proxy for MSY, however there is limited evidence to confirm the suitability of this assumption. Given the stability of the stock with consistently high catches we consider it highly likely that the target range in which CPUE has been fluctuating corresponds to a level consistent with or higher than MSY. Consequently, the requirement of SG80 is met.

It appears likely that the stock has been fluctuating at a level exceeding MSY. However, the lack of clear evidence linking the threshold level to MSY means that the high degree of certainty required by SG100 is lacking and therefore SG100 is not met.

References

DPIRD (2020b). Peel Harvey Crab Fishery: Research Update November 2020. Presentation pp. 38.

DPIRD (2020d). Blue Swimmer Crab Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Fisheries Management Paper No. 304. DPIRD November 2020, pp. 35.
http://www.fish.wa.gov.au/Documents/management_papers/fmp304.pdf

Sezmiş, E. (2004). The population genetic structure of Portunus pelagicus in Australian waters. PhD thesis. Murdoch University, Western Australia.

Stock status relative to reference points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (SIa)	B _{PRI} proxy, based on standardised CPUE during the reference period	0.49 kg / trawlift	1.07 kg / trawlift (2019/20)
Reference point used in scoring stock relative to MSY (SIb)	B _{MSY} proxy, based on standardised CPUE during the reference period	0.7kg / trawlift	1.07 kg / trawlift (2019/20)
Draft scoring range		≥80	
Information gap indicator		Information sufficient to score PI	

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.1.2 – Stock rebuilding- NA

PI 1.1.2		Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue		SG 60	SG 80	SG 100
a	Rebuilding timeframes			
	Guide post	A rebuilding timeframe is specified for the stock that is the shorter of 20 years or 2 times its generation time . For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the stock.
	Met?	Yes / No		Yes / No
Rationale				

The CAB shall insert sufficient rationale to support the team's conclusion for each Scoring Guidepost (SG).

Rebuilding evaluation				
b	Guide post	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is evidence that the rebuilding strategies are rebuilding stocks, or it is likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe .	There is strong evidence that the rebuilding strategies are rebuilding stocks, or it is highly likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe .
	Met?	Yes / No	Yes / No	Yes / No
Rationale				

The CAB shall insert sufficient rationale to support the team's conclusion for each Scoring Guidepost (SG).

References

The CAB shall list any references here, including hyperlinks to publicly-available documents.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage

Draft scoring range	<60 / 60-79 / ≥80
Information gap indicator	More information sought / Information sufficient to score PI <i>If more information is sought, include a description of what the information gap is and what information is sought</i>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.2.1 – Harvest strategy

Blue Swimmer Crab (UoA 1,2 & 3)

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Harvest strategy design			
	Guide post	The harvest strategy is expected to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	Yes	Yes	No
Rationale				

The objectives in the harvest strategy (DPIRD 2020d) related to P1 are to:

- maintain the biomass of the target species “at a level where the main factor affecting recruitment is the environment”
- “provide commercial fisheries with reasonable opportunities to maximise their livelihood”, and
- “provide fishing participants with reasonable opportunities to maximise cultural, recreational and lifestyle benefits of fishing”.

This is operationalised by a requirement to maintain the resource above the threshold level (MSY proxy). As such the objectives of the harvest strategy aim to maintain the stock at a higher level of abundance than required by PI 1.1.1 SG80.

The harvest control rule is based on standardised CPUE and is expected to keep the biomass above MSY (see PI 1.2.2.a). For a short lived species like blue swimmer crab a constant effort strategy is highly appropriate and ensures that the catch is responsive to the state of the stock. The tools that are used to implement the effort and catch required by the HCR are effective as demonstrated by a long history of stability.

The harvest strategy aims to meet the stock management objectives in PI 1.1.1 SG80 and the HCR and the management measures used to implement it are expected to work. This meets the requirements of SG60.

The harvest strategy supports the HCR through a number of mechanisms, including strict limitations on fishing equipment and reduced turn-over in vessels (due to limited entry) to maintain a consistent CPUE time series. Coupled with reporting requirements and compliance processes these elements of the harvest strategy aim to ensure that CPUE data is reliably, and accurately reported and sufficient information is available to conduct a standardisation.

The harvest strategy also articulates size limits which ensure females can spawn at least once before reaching the size limit. Measures that limit the handling time for undersize catch support the size limit through reducing post release mortality.

The above demonstrates that the harvest strategy has numerous elements that work together and are responsive to the state of the stock, thus meeting the requirements of SG80.

Individual elements of the harvest strategy such as size limits, the HCR, gear regulations and spatial restrictions have not been designed and considered collectively. Consequently, SG100 is not met.

Harvest strategy evaluation				
b	Guide post	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Yes	Yes	No
Rationale				

Whilst the harvest strategy was updated in 2020 (DPIRD 2020d), this represents a refinement of the previous harvest strategy (DoF 2015a) and we thus consider data from the intervening period evidence of the harvest strategy's performance. Furthermore, many of the elements of the harvest strategy have been in place for an extended period of time, consequently performance of the fishery in earlier years also provides some indication of the effectiveness of key elements of the harvest strategy.

The fishery has a long history of stability with CPUE in the target range for the last twenty years. The ongoing active recreational and commercial fisheries provide some evidence that the harvest strategy is meeting its objectives for these sectors.

Overall, we consider that available evidence indicates that the harvest strategy is clearly achieving its objectives, thus meeting SG80.

The performance of the harvest strategy has not been fully evaluated. In particular, the loosely defined process for reducing catches from sectors has not been triggered and consequently requires evaluation to ensure that if triggered it will be effective and be able to maintain the fishery at target levels. As a result of this the requirements for SG100 are not met.

Harvest strategy monitoring				
c	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Yes		

Rationale

The key indicator that the HCR uses is standardised CPUE which is reliably collected. The harvest strategy aims to maintain this indicator within its corresponding target range, hence this data is suitable for determining whether the HCR component of the harvest strategy is working.

Commercial catches are evaluated annually against catch tolerance levels to ensure that the other elements of the harvest strategy are working to control commercial catch. The same process is applied for boat based recreational catches on a triennial basis.

Fishery independent surveys are conducted, in part to provide independent indices of stock abundance and recruitment which can be used to ascertain whether the harvest strategy is working. At present these indicators are used annually as ancillary evidence, however they may be formally incorporated in a future harvest strategy. These elements satisfy the requirement of SG60.

Harvest strategy review

d	Guide post	The harvest strategy is periodically reviewed and improved as necessary.		
	Met?			Yes

Rationale

The harvest strategy is reviewed regularly with each version covering a five-year period (DoF 2015a, DPIRD 2020d). This meets the requirements of SG100.

Shark finning

e	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NA	NA	NA

Rationale

Scoring Issue is NA as sharks are not a target species.

Review of alternative measures

f	Guide post	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	Yes	No	No

Rationale

UoA related mortality of unwanted catch of the stock has been considered through time and through the management regulations and fishing practices that have evolved is now assessed as being

negligible. Catch of unwanted catch (almost exclusively undersize crabs) is reduced through the use of escape gaps on commercial pots. Recreational gear limitations and prevailing fishing practices help ensure reduced catches of undersize and reduced handling time. There are additional gear limitations to minimise gear induced injury including restrictions on hoop net size and requirements to use mesh that will prevent crab entanglement.

These measures have been developed through a range of reviews over time and meet the requirements of SG60.

The implemented measures are likely to have reduced mortality of unwanted catch considerably. However, whether this is in fact negligible remains unclear. Discard rates are not well quantified in either sector and post-release mortality rates including potential changes through time have not been studied.

A regular review as required by SG80 would provide the opportunity to review alternative measures to reduce unwanted mortality and consider whether they are effective and practical (which they may not be if unwanted mortality can be quantified and is negligible).

Due to a lack of regular reviews, SG80 is not met.

References

DoF (2015a) Blue Swimmer Crab Resource of the Peel-Harvey Estuary Harvest Strategy 2015 – 2020 Version 1.0 West Coast Estuarine Managed Fishery (Area 2) and the Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Fishery Management Paper No. 273. Department of Fisheries, Perth.

DPIRD (2020d). Blue Swimmer Crab Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Fisheries Management Paper No. 304. DPIRD November 2020, pp. 35. http://www.fish.wa.gov.au/Documents/management_papers/fmp304.pdf

Draft scoring range	60-79
Information gap indicator	More information sought Information on estimates of mortality of unwanted catch for both sectors will be requested at the onsite meeting (scoring issue f)

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.2.2 – Harvest control rules and tools

Blue Swimmer Crab (UoA 1,2 & 3)

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a	HCRs design and application			
	Guide post	Generally understood HCRs are in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	Well defined HCRs are in place that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock fluctuating at or above a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, most of the time.
	Met?	Yes	Yes	No
Rationale				

The HCR detailed in the harvest strategy uses the standardized commercial catch rate (CPUE) as its primary indicator and compares this on an annual basis against threshold and limit reference points (RPs).

The threshold RP is considered a proxy for B_{MSY} whilst the limit threshold RP is 70% of this and is considered the point at which recruitment may be impaired.

If CPUE falls below the threshold RP, it is considered to be approaching the limit RP and a review is triggered which must develop a management response within three months to reduce catch by up to 50%. If CPUE falls below the limit RP a review with the same timeframe is triggered but this must develop a management response that reduces catch by 50-100%. This meets the requirement at both SG 60 and SG 80 for the exploitation rate to be reduced as the limit RP is approached. As the threshold RP is considered a MSY proxy the HCR is expected to main the stock at a target level above MSY.

For the commercial sector, the catch reduction is relative to the last three years of catch. The recreational sector lacks regular reliable catch estimates; hence a revision of input controls likely to achieve the required percentage reduction will be implemented.

In parallel to the CPUE component of the HCR, the annual catches for both sectors are evaluated against a specified range to ensure that the input controls are still appropriate at achieving the desired catch.

The HCR has well defined thresholds, indicates the broad range of required catch reduction and the likely management instruments that will be used to implement the catch reduction. The HCR does not provide an indication of the review or the review process that will be used if CPUE falls below the RP, however it does specify the timeframe within which the management response will need to recover the stock to the target range. The HCR also does not provide guidance on the proportion of the catch reduction that each sector will have to implement.

Despite these aspects the detail provided in the harvest strategy is sufficient to consider the HCR strategy well defined as required for SG 80.

The above evidence shows that the HCR meets the requirements of both SG60 and SG80.

Due to uncertainty in the appropriateness of the threshold RP for an MSY proxy, it is possible that the CPUE corresponding to MSY may be somewhat higher. Despite this possibility the long-term stability of the fishery indicates that the target range meets the SG80 requirement for the stock to fluctuate around a target level consistent with MSY. However, the uncertainty in the MSY proxy choice means that it cannot be said that the target range ensures that the stock remains above a level consistent with MSY most of the time. Consequently, the requirements for SG100 are not met.

HCRs robustness to uncertainty				
b	Guide post		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a wide range of uncertainties including the ecological role of the stock, and there is evidence that the HCRs are robust to the main uncertainties.
	Met?		Yes	Yes
Rationale				

The HCR depends on standardised CPUE providing a reliable indicator of biomass. Comparisons between the CPUE index and the fishery independent surveys show a strong relationship between CPUE and biomass.

Long term changes in fishery activity and efficiency are of concern for any HCR that is reliant on CPUE. This is addressed through the CPUE standardisation process. Furthermore, due to the simplicity of the fishing operation, the limited spatial scope and the regulation of gear type there is limited capacity for changes in fisher efficiency that are not already captured in the CPUE standardisation process.

Uncertainty in the human response to management controls and changes in both commercial and recreational fleets results in uncertainty regarding the response of the catch / exploitation rate to the management controls. This is dealt with through a catch tolerance system which is assessed annually, to ensure that the implemented management controls are producing the catch required by the HCR.

The above evidence demonstrates that by design the HCR is likely to be robust to the main uncertainties, satisfying SG80.

Blue swimmer crab are susceptible to environmental conditions and climate change, particularly as this fishery is at the southern end of the species' geographic and temperature range. This is taken into account by examining rainfall and temperature annually to provide additional insight to changes in the primary CPUE indicator (e.g. DPIRD 2020b).

The fishery independent surveys provide additional data sources that are taken into consideration to account for any other possible factors impacting recruitment and ensure that the CPUE index remains a reliable indicator.

The stable operation of the fishery since the development of the initial HCR in 2015, the consistent advice provided by the HCR and the fishery independent validation of the CPUE index provides evidence that the HCR is robust to the main uncertainties.

The breadth of the uncertainties considered by the HCR and the evidence that it is robust meet the requirements of SG100.

c HCRs evaluation

	Guide post	There is some evidence that tools used or available to implement HCRs are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the HCRs.
	Met?	Yes	Yes	No
Rationale				

A comprehensive set of measures are used to regulate the exploitation level as defined in DPIRD 2020d. For the commercial blue swimmer crab fishery these tools include:

- Limited entry
- Gear restrictions
- Limited pot numbers
- Temporal closures
- Size limits

For the recreational fishery these measures include:

- Gear restrictions
- Size limits
- Bag limits
- Temporal closures

These measures have been largely in place for an extended period predating the first harvest strategy in 2015. From a long-term perspective, the fact that the blue swimmer crab remains in a healthy state after 60 years of targeted fishing provides some evidence that these measure have effectively controlled exploitation. There is further evidence of the appropriateness and effectiveness of these tools from examples of their application to other fisheries under the control of DPIRD.

In more recent years commercial exploitation has been actively monitored and compared against the commercial catch required by the HCR. This is implemented through an initial prediction of the expected commercial catch for the season based on the fishery independent trap survey. This allows variations in annual commercial catch to be examined in the context of fluctuating biomass (which is expected for a short lived species that is sensitive to environmental conditions). Formally the HCR also evaluates changes in commercial catch as outlined in 1.2.2.b.

The above evidence indicates that these tools are appropriate and are effectively achieving the exploitation rates required under the HCR, meeting the requirements of SG60 and SG80.

Due to the changing nature of both sectors (including VFAS and changing recreational participation) and the inherent difficulty of controlling a complex fishery with input controls it cannot be said that evidence clearly shows that the tools are effective in achieving the exploitation rates required under the HCR. Particularly for the as yet untested situation where a substantial catch reduction would be required by the HCR. Consequently, SG100 is not met.

References

DPIRD (2020b). Peel Harvey Crab Fishery: Research Update November 2020. Presentation pp. 38.

DPIRD (2020d). Blue Swimmer Crab Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Fisheries Management Paper No. 304. DPIRD November 2020, pp. 35.
http://www.fish.wa.gov.au/Documents/management_papers/fmp304.pdf

Draft scoring range

≥80

Information gap indicator

Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score

Condition number (if relevant)

PI 1.2.3 – Information and monitoring

Blue Swimmer Crab (UoA 1,2 & 3)

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guide post	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Yes	Yes	No
Rationale				

As described in the background information a broad range of data is available on the stock structure, stock productivity and other biological parameters. The commercial fleet is well characterised and the gear well understood. The recreational fleet and the range of gear types used are also well understood. Consequently, the requirements of SG60 and SG80 are met.

The environmental impacts on blue swimmer crab productivity and CPUE have begun to be examined (Johnston et. al. 2020) but are not comprehensively understood. The recreational fleet is diverse and some aspects including less common practices such as hand collection are not fully understood. Therefore, SG100 is not met.

Monitoring				
b				
	Guide post	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule , and one or more indicators are available and monitored with sufficient frequency to	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of

			support the harvest control rule.	assessment and management to this uncertainty.
	Met?	Yes	Yes	No
Rationale				

The harvest strategy requires annual catch levels from the commercial sector and triennial estimates from the recreational boat sector. Commercial removals are monitored with a high level of accuracy. Recreational surveys are based on a sample of fishing activity (as is widely the case for recreational fishing estimates) and the harvest strategy is designed around the level of accuracy inherent in those estimates (DPIRD 2020d).

The harvest control rule requires i) an annual CPUE index to determine if the fishery is within target range and ii) catch estimates as detailed above to ensure that the implemented measures are effectively restraining catch. This indicators are collected and available as required. Furthermore, the fishery independent surveys provided additional indicators that are used for cross-checking purposes.

Commercial catches across the remainder of the stock are well monitored and reported. Recreational catches are estimated using the same approach as in the PHE.

The above evidence is sufficient to meet the requirements of SG60 and SG80.

Recreational catches are only estimated on a triennial basis and do not have a high degree of certainty associated with them. The smaller shore based recreational catches are not regularly assessed (note that this is not required by the HCR). Consequently, SG100 is not met.

Comprehensiveness of information				
C	Guide post		There is good information on all other fishery removals from the stock.	
	Met?		No	
Rationale				

Shore based recreational catches have not been estimated since 2007/08. Consequently, SG80 is not met.

References

DPIRD (2020d). Blue Swimmer Crab Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Fisheries Management Paper No. 304. DPIRD November 2020, pp. 35. http://www.fish.wa.gov.au/Documents/management_papers/fmp304.pdf

Johnston, D., Yeoh, D., Harris, D. 2020. Environmental drivers of commercial blue swimmer crab (*Portunus armatus*) catch rates in Western Australian fisheries, Fisheries Research 235:105827, <https://doi.org/10.1016/j.fishres.2020.105827>

Draft scoring range	60-79
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.2.4 – Assessment of stock status

Blue Swimmer Crab (UoA 1,2 & 3)

PI	1.2.4	There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration			
	Guide post	The assessment is appropriate for the stock and for the harvest control rule.		The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		Yes	Yes
Rationale				

The assessment relies on the calculation of an annual standardised CPUE index. The harvest control rule has been explicitly developed to utilise this indicator. This assessment method is appropriate for a stock of this nature which exhibits a high degree of correlation between biomass density and CPUE. Thereby meeting the requirement of SG80.

Environmental conditions (water temperature and rainfall) are regularly examined to aid in understanding stock variations. There is good agreement between the CPUE based assessment and both the legal and undersized indices calculated from the fishery independent surveys. Furthermore the catch prediction derived from the fishery independent survey has performed well in predicting commercial catches (DPIRD 2020b).

On the basis of the broad data collection program and the integrated view across the different indices and environmental parameters we consider that the requirements of SG100 are met.

Assessment approach				
b	Guide post	The assessment estimates stock status relative to generic reference points appropriate to the species category.		The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.
	Met?	Yes	Yes	
Rationale				

Reference points have been derived from a historical reference period. The choice of these reference points is appropriate for this stock and is a conservative management decision. As the reference points are based on the primary indicator the stock status relative to these reference points can be readily calculated. This meets the requirements of the SG60 and SG80 level.

c Uncertainty in the assessment

	Guide post	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account .	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Yes	Yes	No
Rationale				

The CPUE standardisation approach used by the assessment explicitly takes into account major uncertainties including temporal changes in fishing and changes in operator. Other uncertainties in this dataset are minimised by design through a well-defined logbook data collection system and restriction of fishing to operators using gear that is consistent and well understood.

All indicators considered in the assessment (CPUE, trawl based juvenile index, trap based juvenile and legal-size index) are presented with confidence intervals. Whilst these correspond to variability across samples in each season, with the exception of CPUE they do not indicate the potential uncertainty from changes unrelated to biomass through time (e.g. changes in fisher).

The above methods have identified the major sources of uncertainty (meeting the requirement of SG60) and have taken this uncertainty into account, thereby meeting SG80.

The assessment presents confidence intervals for yearly CPUE estimates. However, the current point estimate of CPUE is simply compared against the point estimate of CPUE for the reference year. This evaluation is not probabilistic and does not take into account the uncertainty in the most recent estimate (which may vary from one assessment to the next). Consequently, SG100 is not met.

Evaluation of assessment				
d	Guide post	The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.		
	Met?			No
Rationale				

Alternative hypotheses are being explored through the use of the fishery independent indices and examination of environmental drivers (Johnston et. al. 2020). The complementary perspectives provided by the fishery independent indices support the current assessment approach, however the time series are still considered too short to incorporate into the harvest strategy (DPIRD 2020d).

Despite the promising work that continues to be undertaken we consider that this has not yet met the requirement of SG100 for rigorous exploration of alternative assessment approaches.

Peer review of assessment				
e	Guide post	The assessment of stock status is subject to peer review.		
	Met?		Yes	No

Rationale

The assessment is regularly internally peer reviewed through the annual production of the DPIRD "State of the Fisheries and Aquatic Resources Report" (Gaughan et. al. 2020). It is also currently under internal review as part of the production of a resource assessment report. These reviews meet the requirements of SG80.

Some elements of the assessment report have been externally reviewed, including a recent review of environmental drivers of CPUE (Johnston et. al. 2020). However, an external review of the whole assessment has not been undertaken, consequently SG100 is not met.

References

DPIRD (2020b). Peel Harvey Crab Fishery: Research Update November 2020. Presentation pp. 38.

DPIRD (2020d). Blue Swimmer Crab Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Fisheries Management Paper No. 304. DPIRD November 2020, pp. 35. http://www.fish.wa.gov.au/Documents/management_papers/fmp304.pdf

Gaughan, D.J. and Santoro, K. (eds). 2020. Status Reports of the Fisheries and Aquatic Resources of Western Australia 2018/19: The State of the Fisheries. Department of Primary Industries and Regional Development, Western Australia.

Johnston, D., Yeoh, D., Harris, D. 2020. Environmental drivers of commercial blue swimmer crab (*Portunus armatus*) catch rates in Western Australian fisheries, Fisheries Research 235:105827, <https://doi.org/10.1016/j.fishres.2020.105827>

Draft scoring range

≥80

Information gap indicator

Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score

Condition number (if relevant)

PI 1.1.1 – Stock status

Sea Mullet (UoA 4 & 5)

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment			
	Guide post	It is likely that the stock is above the point where recruitment would be impaired (PRI).	It is highly likely that the stock is above the PRI.	There is a high degree of certainty that the stock is above the PRI.
	Met?	Yes	Yes	No
Rationale				

Standardised CPUE was the primary indicator in the 2015-2020 sea mullet harvest strategy (DoF 2015b). In response to changing fishing characteristics, the CPUE indicator method was revised to consider kg per day instead of kg per netting hour. Both indices were monitored in 2019 and were well above their lower threshold values. (Figure 5).

Breaches of the upper catch and catch rate threshold levels have triggered further investigation of the risk to the sustainability of the broader sea mullet stock. Representative samples of the age structure of sea mullet stock in the West Coast Bioregion and Shark Bay have been collected to enable a Level 3 (catch curve and per-recruit) assessment (DPIRD 2020c). This found mostly juvenile fish were caught in the WCB Peel-Harvey Estuary, with an increase in the proportion of older fish in samples from oceanic waters further north. This is in agreement with other reports that sea mullet undergo a northward migration to spawn (DPIRD 2020a). Consequently, the conclusion was reached that CPUE in northern areas provides a better indication of stock abundance, whilst PHE CPUE is an index of recruitment.

The current modelling approach used (DPIRD 2020a; DPIRD 2020b; DPIRD 2020c) uses combined catch data from across the stock and CPUE data from Shark Bay. Three independent modelling approaches were applied to this data consisting of catch-MSY (applied to catch only) and two implementations of a Schaefer production model.

CPUE in the PHE and WCB is considered an indicator of recruitment and remains well above the respective established MSY proxies. The three models indicate high levels of biomass well above B_{MSY} . Recent catches are well below those previously supported. Based on these lines of evidence it is highly likely that the stock is above the PRI, meeting the requirements of SG60 and SG80.

Due to the new understanding of stock structure, the assessment approaches used remain under development. Consequently, there is insufficient certainty to satisfy the requirements of SG100.

Stock status in relation to achievement of Maximum Sustainable Yield (MSY)				
b	Guide post		The stock is at or fluctuating around a level consistent with MSY.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
	Met?		Yes	No

Rationale

As outlined in 1.1.1.a, the CPUE indicators are above their MSY proxies and the modelling indicates a level of biomass well above B_{MSY} . This meets the requirements of SG80.

Due to the new assessment approaches which remain under development, SG100 is not met.

References

DoF (2015b.) Finfish Resources of the Peel-Harvey Estuary Harvest Strategy 2015 – 2020 Version 1.0 West Coast Estuarine Managed Fishery (Area 2. Fishery Management Paper No. 274. Department of Fisheries, Perth.

DPIRD (2020a). Western Australian Marine Stewardship Council Report Series West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery Addendum 4 November 2020.

DPIRD (2020b). Peel Harvey Crab Fishery: Research Update November 2020. Presentation pp. 38.

DPIRD (2020c). Preliminary sea mullet modelling and associated diagnostics. pp. 10.

Stock status relative to reference points

	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (SIa)	B_{LIM}	$0.5 B_{MSY}$	Schaefer: $1.80 B_{MSY}$ BSM: $1.72 B_{MSY}$
Reference point used in scoring stock relative to MSY (SIb)	B_{MSY}	Schaefer: 1979t BSM: 2026t	Schaefer: 3552t BSM: 3485t
Draft scoring range		≥ 80	
Information gap indicator		Information sufficient to score PI	

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.2.1 – Harvest strategy

Sea Mullet (UoA 4 & 5)

PI 1.2.1 There is a robust and precautionary harvest strategy in place				
Scoring Issue		SG 60	SG 80	SG 100
a	Harvest strategy design			
	Guide post	The harvest strategy is expected to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	Yes	Yes	No
Rationale				

The notable change from the previous harvest strategy (DoF 2015b) is that due to an improved understanding of the stock structure is that the Shark Bay CPUE is monitored as an index of overall abundance and the PHE CPUE provides an estimate of recruitment. A model based biomass estimate using the Shark Bay CPUE data provides the primary indicator for the harvest strategy. The reference points for the biomass estimate have been explicitly chosen to maintain the fishery above BMSY. Coupled with management measures that have been effectively limiting effort and thus catch it is expected that the harvest strategy will achieve the objectives reflected in PI 1.1.1 SG 80. This meets the requirements of SG 60.

The model-based biomass indicator for the harvest control rule is only expected to be updated every five years (Table 1 DPIRD 2020e). Given the low exploitation rate, history of stability and the moderate age of the species, this frequency of responsiveness may be appropriate. In this situation, changes in the commercial or recreational sector that might change the exploitation rate are potentially of greater concern and these are monitored through the annual assessment of commercial catch levels against the commercial catch tolerance range. Consequently the SG 80 level is met.

The elements of the harvest strategy have not been collectively designed to meet the management objectives, consequently SG100 is not met.

Harvest strategy evaluation				
b	Guide post	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Yes	No	No
Rationale				

The harvest strategy utilises widely used assessment methods that are well understood and suitable for this species. The assessment methods are supported by appropriate data collection and consideration of other sources of information in a weight of evidence approach. The limitations put in

place on both sectors are appropriate and ensure that the required exploitation rates are maintained. These factors indicate that the harvest strategy is likely to work, thus meeting SG60.

Elements of the harvest strategy have been in place for an extended period, including the previous harvest strategy (DoF 2015b). A prolonged period of stability in this fishery provides evidence that the elements that have been in place have worked. The new harvest strategy (DPIRD 2020e) changes the HCR to use more comprehensive biomass estimates on a much less frequent basis (5 yearly). This change has not been tested and as it has only just been implemented there is no evidence available that it will work. Furthermore, the loosely defined process for reducing catches has not been triggered and consequently requires evaluation to ensure that if triggered it will be effective and be able to maintain the fishery at target levels. Consequently the requirements of SG80 are not met.

Harvest strategy monitoring			
c	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.	
	Met?	Yes	
Rationale			

The indices and model-based biomass estimates discussed in 1.2.1.a are used to assess whether the harvest strategy is working and are considered reliable for this species and fishery. Consequently SG60 is met.

Harvest strategy review			
d	Guide post	The harvest strategy is periodically reviewed and improved as necessary.	
	Met?		Yes
Rationale			

The harvest strategy is reviewed regularly with each version covering a five-year period (DoF 2015b, DPIRD 2020e). This meets the requirements of SG100.

Shark finning				
e	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NA	NA	NA
Rationale				

Scoring Issue is NA as sharks are not a target species.

f	Review of alternative measures
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	Guide post	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	Yes	No	No
Rationale				

UoA related mortality of unwanted catch of the stock has been considered and assessed as being negligible. Almost all catch is retained, and net mesh sizes have been regulated in part to reduce catch of less desirable sizes. The handling time of haul net is minimal to ensure high rates of post release survival. This meets the requirement of SG60.

A regular review has is not conducted, hence SG80 and SG100 are not met.

References

DoF (2015b.) Finfish Resources of the Peel-Harvey Estuary Harvest Strategy 2015 – 2020 Version 1.0 West Coast Estuarine Managed Fishery (Area 2. Fishery Management Paper No. 274. Department of Fisheries, Perth.

DPIRD (2020e). Estuarine and Nearshore Finfish Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Fisheries Management Paper No. 303. DPIRD November 2020, pp. 33. http://www.fish.wa.gov.au/Documents/management_papers/fmp303.pdf

Draft scoring range	60-79
Information gap indicator	More information sought <ul style="list-style-type: none"> Clarification if existing indices remain a formal component of the HCR and if they fall below the previous thresholds would trigger a catch reduction (scoring issue b) Further information regarding mortality of unwanted catch (scoring issue f)

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.2.2 – Harvest control rules and tools

Sea Mullet (UoA 4 & 5)

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a	HCRs design and application			
	Guide post	Generally understood HCRs are in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	Well defined HCRs are in place that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock fluctuating at or above a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, most of the time.
	Met?	Yes	Yes	No
Rationale				

The HCR detailed in the harvest strategy (DPIRD 2020e) uses a model based biomass estimate on a five yearly basis and compares this against threshold and limit reference points (RPs). The threshold RP is B_{MSY} whilst the limit threshold RP is 50% of this and is considered the point at which recruitment may be impaired.

If the biomass estimates fall below the threshold RP, it is considered to be approaching the limit RP and a review is triggered which must develop a management response within three months to reduce catch by up to 50%. If the biomass estimates fall below the limit RP a review with the same timeframe is triggered but this must develop a management response that reduces catch by 50-100%. This meets the requirement at both SG 60 and SG 80 for the exploitation rate to be reduced as the limit RP is approached. As the threshold RP is considered a MSY proxy the HCR is expected to main the stock at a target level above MSY.

For the commercial sector, the catch reduction is relative to the last three years of catch. The recreational sector lacks regular reliable catch estimates; hence a revision of input controls likely to achieve the required percentage reduction will be implemented.

The annual catch of the commercial sector is evaluated against a specified range to ensure that the input controls are still appropriate at achieving the desired catch.

The HCR has well defined thresholds, indicates the broad range of required catch reduction and the likely management instruments that will be used to implement the catch reduction. The HCR does not provide an indication of the review or the review process that will be used if CPUE falls below the RP, however it does specify the timeframe within which the management response will need to recover the stock to the target range. The HCR also does not provide guidance on the proportion of the catch reduction that each sector will have to implement.

Overall we consider the detail provided in the harvest strategy is sufficient to consider the HCR strategy well defined and expected to keep the stock well above MSY. Thus meeting the requirements for SG 80.

The HCR utilises an indicator which is likely to be available only every five years. With the current low level of exploitation this likely to be adequate and keep the stock fluctuating at a level well above MSY. However higher exploitation rates are permitted under the HCR. In this circumstance, whether the HCR with its slow rate of responsiveness would be sufficient to ensure the stock remains at its target level most of the time remains unclear. Consequently, the requirements for SG100 are not met.

HCRs robustness to uncertainty				
b	Guide post	The HCRs are likely to be robust to the main uncertainties.		The HCRs take account of a wide range of uncertainties including the ecological role of the stock, and there is evidence that the HCRs are robust to the main uncertainties.
	Met?		Yes	No
Rationale				

The primary indicator utilised by the HCR is a model based biomass estimate. The exact nature of this estimate is not defined, however as discussed in 1.2.4.b and 1.2.4.c the most recent model estimates of biomass took into account a broad range of uncertainties and were found to produce consistent biomass estimates.

The harvest strategy recognises the fluctuating nature of the resource and the inherent uncertainty in biomass estimates and their associated reference points. Consequently, to ensure the HCR is robust precautionary reference points have been chosen with B_{MSY} used as a threshold reference point. Through the use of robust assessment approaches and a cautionary reference points the HCR is likely to be robust to the main uncertainties, thereby meeting SG80.

The HCR in the new harvest strategy is a substantial change from the previous HCR, consequently evidence is not yet available that the HCR is robust to the main uncertainties. Furthermore the process by which the HCR has to reduce catches if the threshold is breached is not well described and this has not been tested under the previous version of the harvest strategy. Consequently SG100 is not met.

HCRs evaluation				
c	Guide post	There is some evidence that tools used or available to implement HCRs are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the HCRs.
	Met?	Yes	Yes	Yes
Rationale				

A comprehensive set of measures are used to regulate the exploitation level as defined in DPIRD 2020e. For the commercial sea mullet fishery these tools include:

- Limited entry
- Gear restrictions
- Temporal closures

For the recreational fishery these measures include:

- Gear restrictions

- Bag limits

These measures have been largely in place for an extended period predating the first harvest strategy in 2015. From a long term perspective, the fact that the sea mullet has remained at a high biomass for an extended period of time provides some evidence that these measure have effectively controlled exploitation. There is further evidence of the appropriateness and effectiveness of these tools from examples of their application to other fisheries under the control of DPIRD.

Commercial catches are monitored annually through comparison with a catch tolerance range to ensure that the measures in place are achieving the desired exploitation rates.

The above evidence indicates that these tools are appropriate and are effectively achieving the exploitation rates required under the HCR, meeting the requirements of SG60 and SG80.

Due to the changing nature of both sectors and the inherent difficulty of controlling a complex fishery with input controls, it cannot be said that evidence clearly shows that the tools are effective in achieving the exploitation rates required under the HCR. Particularly for the as yet untested situation where a substantial catch reduction would be required by the HCR. Consequently, SG100 is not met.

References

DPIRD (2020e). Estuarine and Nearshore Finfish Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Fisheries Management Paper No. 303. DPIRD November 2020, pp. 33. http://www.fish.wa.gov.au/Documents/management_papers/fmp303.pdf

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.2.3 – Information and monitoring

Sea Mullet (UoA 4 & 5)

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guide post	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Yes	Yes	No
Rationale				

As described in the background information a broad range of data is available on the stock structure, stock productivity and other biological parameters. The commercial fleet is well characterised and the gear well understood. The recreational fleet and the range of gear types used are also well understood. Consequently, the requirements of SG60 and SG80 are met.

New hypotheses have recently arisen on stock structure of the sea mullet fishery (DPIRD 2020b). This aspect is critical to management but not comprehensively understood. Therefore, SG100 is not met.

Monitoring				
b	Guide post	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule , and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	Yes	Yes	No
Rationale				

Commercial catch removals are well defined with sufficient accuracy to support the HCR in monitoring of the catch tolerance levels and for supporting the catch reduction analysis (if required). Removals from the recreational fishery are monitored less frequently and with less accuracy, however the HCR acknowledges this and describes a process for taking this into account if catch reductions are required. The biomass estimate is only produced every five years; however, this is the frequency stipulated by

the HCR. The other CPUE indicators are not formally part of the HCR but provide additional information on the fishery's performance in intervening years (DPIRD 2020e). This meets the requirements of SG60 and SG80.

The key indicator for the HCR is the biomass estimate which is only updated every five years, which cannot be considered a high frequency. Consequently, SG100 is not met.

Comprehensiveness of information			
C	Guide post	There is good information on all other fishery removals from the stock.	
	Met?	Yes	
Rationale			

Commercial catches from other bioregions are well reported. Recreational catches in other regions are reported with a similar level of accuracy and frequency through the same statewide recreational fishing survey. This meets the requirements of SG80.

References

DPIRD (2020b). Peel Harvey Crab Fishery: Research Update November 2020. Presentation pp. 38.

DPIRD (2020e). Estuarine and Nearshore Finfish Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Fisheries Management Paper No. 303. DPIRD November 2020, pp. 33. http://www.fish.wa.gov.au/Documents/management_papers/fmp303.pdf

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 1.2.4 – Assessment of stock status

Sea Mullet (UoA 4 & 5)

PI	1.2.4	There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration			
	Guide post	The assessment is appropriate for the stock and for the harvest control rule.		The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?	Yes		No

Rationale

The assessment consists of a Schaefer production model applied to a standardised CPUE time series and a time series of catch (DPIRD 2020d). This assessment is standard and appropriate for this stock and the HCR is designed around the assessment. Consequently, SG80 is met.

The new assessment process has only been conducted once and is still in development. Some aspects require further refinement such as improving the understanding of stock structure and appropriate choice for recruitment and adult biomass indices. Given separate indices are available for different age classes an aged based model could also be considered.

However, the assessment takes into account the current understanding of movement patterns of sea mullet. It draws on an index of dult abundance and uses modelling approaches that are suitable to the biology of the species. Consequently, we consider that the assessment takes into account the major features relevant to the biology of the species and SG100 is met.

Assessment approach

b	Guide post	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	Yes	Yes	

Rationale

The reference points are based on B_{MSY} which the model estimates and which are completely appropriate for the stock. Hence SG60 and SG80 are met.

Uncertainty in the assessment

c	Guide post	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account .	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Yes	Yes	Yes

Rationale

The assessment modelling to produce the biomass estimates required by the HCR is newly developed with three model approaches trialled including a Catch-MSY model and two Schaefer production models.

The production models take into account uncertainty in the input CPUE time series through a standardisation approach that considers increasing fisher efficiency. Structural model uncertainty is examined through the parallel implementation/application all three models which demonstrated good agreement. Model based biomass estimates include 95% confidence limits. This meets the requirements of SG60 and SG80.

The model-based estimates of biomass relative to the B_{MSY} reference point are reported with confidence limits. Consequently, SG100 is met.

d Evaluation of assessment

	Guide post			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			No
Rationale				

Whilst different model structures have been compared (see 1.2.4.c) this cannot be considered a rigorous exploration. Sensitivity analyses of the broad range of parameters have not been conducted. Model structures that are substantially different such as age or size based models have not been applied. Consequently SG100 is not met.

Peer review of assessment				
e	Guide post		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Yes	No
Rationale				

The assessment is regularly internally peer reviewed through the annual production of the DPIRD "State of the Fisheries and Aquatic Resources Report" (Gaughan et. al. 2020). This meets the requirements of SG80.

The assessment is not externally reviewed hence SG100 is not met.

References

DPIRD (2020c). Preliminary sea mullet modelling and associated diagnostics. pp. 10.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

7.3 Principle 2

7.3.1 Principle 2 background

The aquatic ecosystem

The Peel-Harvey Estuary is a natural inland water body near Perth, in the southwest of Western Australia. It is one of four significant estuarine systems in the West Coast Bioregion. It is approximately 136 km² in area with a mean depth of around 0.9 m and maximum depths of around 2 m in parts of both Peel Inlet and Harvey Estuary. The Estuary drains the Serpentine, Murray and Harvey Rivers. Point Grey Sill connects the Peel Inlet and the Harvey Estuary, and two channels provide connectivity between the Estuary and the Indian Ocean: the Mandurah Channel (a natural feature located in the northern Peel Inlet) and the Dawesville Channel (anthropogenic, located in the northern Harvey Estuary). The Dawesville Channel was opened in 1994 to improve water exchange in the estuary. These two channels are dredged regularly (Johnston et al. 2015).

Nutrient inputs to the Estuary are strongly affected by surrounding land use (which includes agriculture), and the Dawesville Channel was created to ameliorate the negative impacts of high nutrient loads (such as blooms of toxic algae). The salinity of estuarine waters varies due to tidal and riverine inputs (the latter affected in turn by rainfall in catchments upstream, which is reported to have decreased during the last decade) (Fisher et al. 2020 and references therein). Fish-kill events have been reported from the Estuary, e.g. following a rainfall event in 2017, which delivered a high organic load and poor quality brackish water into the Estuary and depleted oxygen levels (Thomson 2019). Runoff and climate change remain significant risks to the ecosystem.

Over time, an extensive dataset on water quality of the Estuary has been accumulated (e.g. through a programme of monthly monitoring of salinity, temperature, dissolved oxygen, pH, turbidity, water clarity, nitrogen and phosphorus concentrations, chlorophyll a, phytoplankton densities and taxa (Thomson 2019)). A hydrological-biogeochemical model has been developed to explore the effects of the Dawesville Channel and climate change on the Estuary. Development of a catchment model to study catchment flows and nutrient inputs. More details will be added once the final report is available.

The habitats surrounding the Peel-Harvey Estuary comprise shallow intertidal flats, samphire flats and marshes. In the shallow estuarine waters, macroalgae, seagrass and phytoplankton proliferate, and the high levels of primary production support large populations of invertebrates, finfish, birds and mammals. Macroalgae and seagrass have an important role in nutrient and carbon cycling. The Estuary (which is part of the Peel-Yalgorup Wetland System) was Ramsar-listed in 1990 as a wetland of international importance. More than 26,000 hectares is covered by the Ramsar designation (Johnston et al. 2015; Fisher et al. 2020).

Seventy-one species of fish have been recorded in the Peel-Harvey system. Many of these are marine species that are estuarine opportunists as juveniles (Johnston et al. 2015, and references therein). Located on the East Asian-Australasian flyway, the Estuary also provides important habitat for migrant and resident shorebirds (Graff 2019). Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) also occur in the Estuary (Fisher et al. 2020).

Overall, the main ecosystem impacts of the UoAs are considered to result from harvesting the target species, including accessing fishing sites. Ecosystem modelling (conducted to investigate the ecosystem impacts of the creation of the Dawesville Channel) explored the impacts of increasing and decreasing fishing effort on functional groups. Few negative impacts of increasing fishing effort were

identified, and most functional groups were predicted to increase in biomass (Fretzer 2013). The legal-size requirement on landed blue swimmer crab catch facilitates the retention of juveniles in the population and ecosystem. Similarly, the legal requirement to return berried females to the water is expected to contribute to stock maintenance and therefore mitigate ecosystem impacts of target species removal. Fishing mortality of blue swimmer crabs is considered a small proportion of the total biomass in the south-west region (Johnston et al. 2015). For sea mullet, a tolerance level for the commercial fishery has been set based on catch in periods the fishery is considered to have operated sustainably (i.e. catch below MSY) (DPIRD 2020a). Disturbance due to foot and boat traffic has been considered specifically with respect to habitat and ETP impacts (see below). A simplified Estuary food web is shown in Figure 10.

There is a closed season for commercial crab pot fishing, which was extended from two to three months in 2019 after a management review and is now set for 1 September – 31 November. Fishing using this method is prohibited at weekends, and there are spatial closures encompassing the Dawesville Channel, Mandurah Entrance Channel, and rivers that enter the Estuary, as well as in adjacent marine areas. Closures to all commercial fishing cover 14% of the Estuary (Fisher et al. 2020).

At a system level, the impacts of climate change are apparent, for example, in terms of rainfall inputs, weather events resulting in fish kills, and distributions of some fish stocks (Thomson 2019; Fisher et al. 2020).

An ecological risk assessment has been prepared by DPIRD, and this provides a framework to consider impacts of the fishery on the ecosystem, its components, and elements. Risk in that context is defined as the “*uncertainty associated with achieving a specific management objective or outcome*” (Fisher et al. 2020). The risk assessment followed a likelihood – consequence analysis and considers fishing methods (as reflected in the assessment UoAs) separately. For the management agency, Medium or lower risks are considered acceptable. High risks are deemed not desirable, requiring further strong management actions, and likely invoking increased management. Severe risks would be unacceptable and would require increased management as a matter of urgency. Reporting and monitoring actions are also linked to the level of risk identified (Fisher et al. 2020).

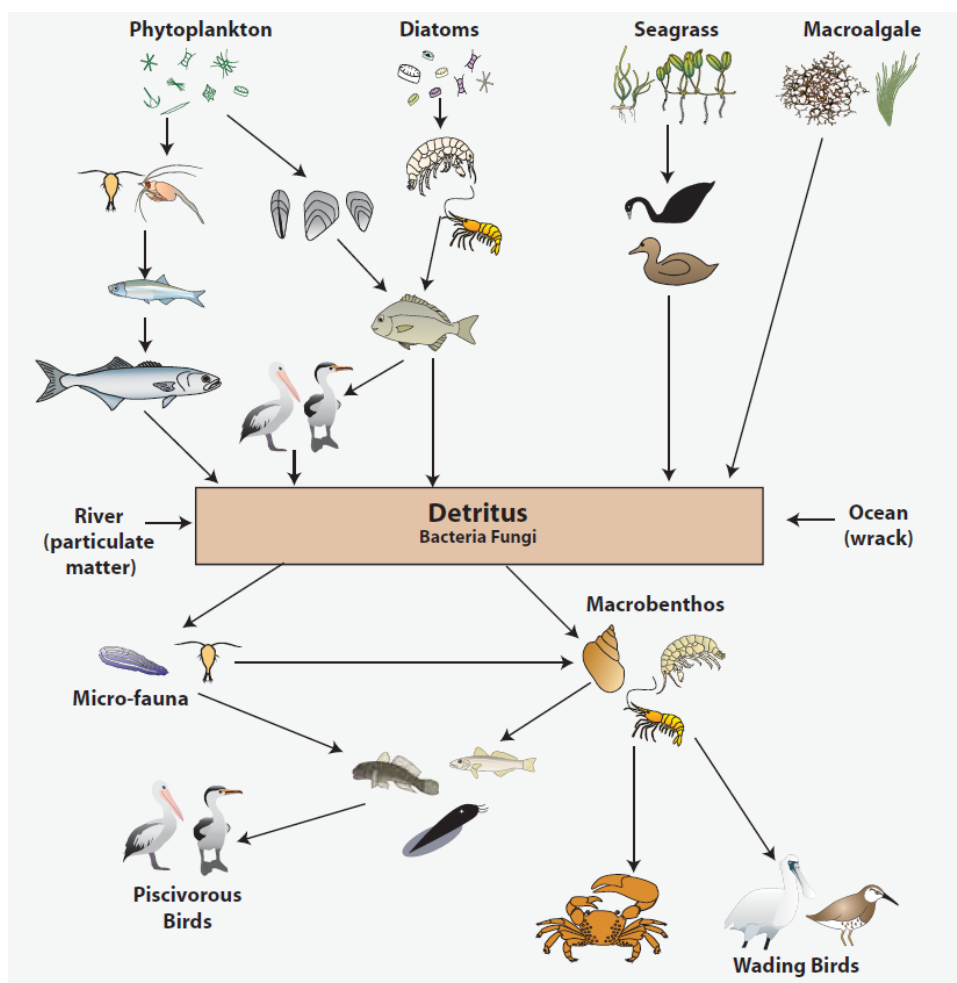


Figure 10. A simplified food web of the Peel-Harvey Estuary (Source: Hale and Butcher 2007).

Ecosystem-level risks considered by the 2020 risk assessment covered trophic interactions (removal of retained species and discarding and provisioning), translocation of pests and diseases, and ghost fishing by lost/abandoned gear. These risks were found to be Low or Negligible (Fisher et al. 2020). Key considerations when evaluating these risks included (Fisher et al. 2020):

- Removal of retained species and discarding of unwanted catch and bait have the potential to affect the ecosystem and its components (e.g. trophic dynamics).
- Alternate prey are available in the Estuary for predators of the target species. (Fishery-independent surveys have shown small crabs are abundant).
- Post-release survival of blue swimmer crabs (the most frequently discarded species) is considered likely to be high.
- Commercial pot fishers use only locally caught bait. Commercial net and scoop net fishers do not use bait.
- Commercial fishers are not permitted to use their vessels or gear outside the Estuary.
- Recreational drop net fishers may use bait from other areas, and can use vessels state-wide, which carry risks.
- It is considered unlikely that gear would be lost in the Estuary, given water depth and the frequency with which gear (e.g. drop nets) are pulled.

Broader risks to the Ecosystem and environment considered by the risk assessment included garbage. Problems with recreational fishers leaving their garbage behind after fishing were identified and considered to be Low risk. Commercial fishers undertake short trips and the bait used is not packaged.

Table 11. Catch composition across the five Units of Assessment (UoA) considered for this assessment. Target species considered under Principle 1 are highlighted orange, 'main' species are shown in blue, and primary species are in bold. 'B' denotes species used as bait (for which quantitative information on the weight used is limited). Catch information comprises: UoA 1 – commercial catch landing reports 2014 – 2019, estimated bait usage, and discard records from monthly monitoring trips conducted by Department of Primary Industries and Regional Development (DPIRD) May 2014 – May 2019; UoA 2 – Surveys of recreational fishers (2007, 2008); UoA 3 – Surveys of recreational fishers (2007, 2008); UoAs 4 and 5 – commercial reports of landed catch 2015 – 2019, fisher reports and observer monitoring of discards May 2017 – April 2018. Species that may be caught and/or used as bait are marked with *. For more detailed information on bait and for each UoA, see Tables Table 12 - Table 20. (Data from Fisher et al. 2020).

Common name	Scientific name	UoA 1		UoA 2	UoA 3	UoA 4		UoA 5		UoA 4 & 5
		Mean % retained catch + bait weight	% discarded catch items	% retained + discarded catch items	Mean % retained + discarded catch items	Mean % retained catch weight	% discarded catch items	Mean % retained catch weight	% discarded catch items	% catch items observed discarded
Blue swimmer crab	<i>Portunus armatus</i>	79.91	99.96	99.29	96.92		49		13	38
Sea mullet*	<i>Mugil cephalus</i>	B (20.02% with yelloweye mullet)		B		70		55		
Silver bream	<i>Rhabdosargus sarba</i>						31		38	34
Common blowfish	<i>Torquigener pleurogramma</i>		<0.01	0.05	1.31		7		33	21
Yelloweye mullet*	<i>Aldrichetta forsteri</i>	B (20.02% with sea mullet)				7	6	11	54	17
Leatherjackets	<i>Monacathidae</i>					<0.01	3		13	7
Common silverbiddy	<i>Gerres subfasciatus</i>					0.02	1			7
King George whiting	<i>Sillaginodes punctata</i>			0.02		1	1		4	7
Tailor	<i>Pomatomus saltatrix</i>			0.26 B	0.04	2	1	3	4	7
West Australian salmon	<i>Arripis truttaceus</i>						1			3
Black bream	<i>Acanthopagrus butcheri</i>						1			

Yellowtail grunter	<i>Amniataba caudavittata</i>						0.4			3
Australian herring	<i>Arripis georgianus</i>			0.24	1.73	3	0.2	4		7
Western striped trumpeter	<i>Pelates octolineatus</i>		<0.01				0.2			7
Smooth ray	<i>Dasyatis sp.</i>						0.2			
Estuary cobbler	<i>Cnidogobius macrocephalus</i>		<0.01			0.2		12	4	3
Mulloway	<i>Argyrosomus japonicus</i>								4	3
Western rock octopus	<i>Octopus djinda</i>	0.06								
Four-lobed swimming crab	<i>Thalamita sima</i>		0.03							
Green mud crab	<i>Scylla serrata</i>		<0.01							
Whittings/sand whiting*	<i>-/Sillago ciliata</i>			0.03 B		0.5				
Yellowfin whiting	<i>Sillago schomburgkii</i>					13		10		
Rough leatherjacket	<i>Scobinichthys granulatus</i>			0.01						
Pufferfish, toadfish and tobies				0.02						
Wrasses/groper				0.02						
Western rock lobster	<i>Panulirus cygnus</i>			0.02						
Striped trumpeter	<i>Latris lineata</i>			<0.01						
Trumpeter*				B						
Southern school/silver whiting	<i>Sillago bassensis</i>			<0.01						
Silver trevally*	<i>Pseudocaranx georgianus</i>			<0.01 B		0.01				

Stingray	<i>Myliobatoidei</i>			<0.01						
Perth herring	<i>Nematalosa vlaminghi</i>					2		5		
Trevallies						0.4		0.01		
Australian sardine	<i>Sardinops sagax</i>					0.04				
Flatheads						0.01		0.03		
Black bream	<i>Acanthopagrus butcheri</i>					0.01		0.1		
Southern garfish	<i>Hyporhamphus melanochir</i>					<0.01				
Squid						<0.01				
Flounders						<0.01		0.01		
Tuna spp.*				B						
Bream*				B						
West Australian dhufish*	<i>Glaucosoma hebraicum</i>			B						
Crab*				B						
Unidentified fish						<0.01				

Both considerations were expected to reduce the risk resulting from commercial operations, which was assessed as Negligible.

Risk assessment findings for specific components are discussed under the relevant headings below.

Primary and secondary species

An overview of species caught across UoAs, and primary species classifications as main or minor, is provided in Table 1. Species for which significant relevant information is available are considered first below, followed by UoA-specific information including catch composition and management.

Primary main species:

- Sea mullet (*Mugil cephalus*)

Background on stock status and management for this species is provided in section 7.2.1.

Primary minor species:

- Blue swimmer crab (*Portunus armatus*)

Background on stock status and management for this species is provided in section 7.2.1.

- Western rock octopus (*Octopus djinda*, formerly *O. aff. tetricus*)

Western rock octopus is subject to a harvest strategy; the species is targeted by the Octopus Interim Managed Fishery (Hart et al. 2018, 2019). This fishery is MSC-certified, with most licence holders included in the Unit of Certification since 2019¹. The harvest strategy uses standardised CPUE as the primary performance indicator, with soak time, distance between traps set, and month among six standardised factors. The harvest strategy also utilises the biomass index at the beginning of the trigger trap fishery, and the target (B40), threshold (B30), and limit (B20) biomass-based reference levels as key parameters. Actions are specified for when threshold and limit reference points are reached (Hart et al. 2019). The weight-of-evidence assessment conducted in 2018 concluded that there was a low risk of unacceptable stock depletion (Hart et al. 2018). The harvest strategy applying to the stock is under review. The stock is considered to be Low risk from the Peel-Harvey Estuary fishery (Fisher et al. 2020). Fishery independent depletion experiments suggest that a small proportion of octopus habitat is fished (<10%) (Hart et al. 2019).

- Western rock lobster (*Panulirus cygnus*)

This species supports a managed fishery, which is MSC-certified and the stock is sustainably fished (Daume et al. 2017; Daume and Morison 2020). Management arrangements include total allowable commercial and recreational catches. Most of the lobster's range is not recreationally fished. A harvest strategy supported management 2014-2019 and has been under review. The primary objective of this strategy was:

To ensure that the egg production in Breeding Stock Management Areas of the Fishery remains above its threshold value for the next five years with a probability greater than 75%.

Stock status is evaluated using a weight of evidence approach based on empirical and modelled estimates of a range of indices, including catches, catch rates, recruitment, egg production and harvest

¹ <https://fisheries.msc.org/en/fisheries/western-australian-octopus-fishery/@assessments> [Accessed 5 March 2021]

rate². Limits and thresholds are clearly specified in relation to stock biomass in defined reference periods (de Lestang et al. 2016). For recreational fishers (such as those active in UoA 2), a daily bag and boat limit apply (Johnston et al. 2015).

- Australian herring (*Arripis georgianus*)

Johnston et al. (2015) reported state-wide declining catch rates for this species, which were attributed to environmental factors and overfishing. Management measures designed to introduce the commercial and recreational catch were introduced as a result and the stock is identified as Recovering (Gaughan and Santoro 2020). Landings from the Peel-Harvey Estuary were estimated at approximately 1% of state-wide landings. In the Estuary, the reference level for this species is an annual commercial catch of <9 t and catch in 2019 was below this. The assessed risk of the fishery was Negligible (Fisher et al. 2020).

For Western Australia, the stock is considered to be above the limit reference point (20% unfished biomass), and the current level of fishing is expected to not result in depletion to the point of recruitment impairment. CMSY analysis at the national level predicted an increase in biomass at current catch levels (albeit with high levels of uncertainty)³.

A combined finfish bag limit of 30 fish per fisher applies to Australian herring, whiting (excluding King George whiting) and garfish.

- West Australian dhufish

This stock is classified as "Recovering" and High Risk in the West Coast bioregion (Gaughan and Santoro 2020). Reference points are described in terms of fishing and natural mortality (F and M, respectively), as Limit ($F = 1.5M$), threshold ($F = M$) and Target ($F = 2/3M$) (DoF 2013). The stock was considered likely to recover if retained catches continued to be below benchmark levels set and post-release mortality is not significant. In the 2017 assessment, annual fishing mortality (0.21) was found to be above the limit reference point (0.165) and spawning potential ratio (0.15) was below the limit set (0.2), and it was concluded that the stock is depleted, and recruitment is likely to be impaired. However, fishing mortality among year classes emerging after management changes were initiated in 2008 was lower (at $F=0.13$)⁴, suggesting recovery. Post-release mortality may impair stock recovery (Gaughan and Santoro 2020).

Management measures are in place for commercial, recreational and indigenous fishers, such as effort, boat, bag and size limits, gear restrictions, spatial and temporal restrictions⁴.

The frames of West Australian dhufish are used as bait, not other fish parts. At the site visit, this will be investigated further. If frames comprise waste resulting from other fishing activities (i.e. the frames are not landed specifically for bait use), this species does not require assessment⁵.

- Tuna

It is unknown which species of tuna the bait used comprises.

² <https://fish.gov.au/report/176-Western-Rock-Lobster-2018> [Accessed 20 February 2021]

³ <https://fish.gov.au/report/220-Australian-Herring-2018> [Accessed 17 February 2021]

⁴ <https://fish.gov.au/report/209-West-Australian-Dhufish-2018> [Accessed 17 February 2021]

⁵ <https://mscportal.force.com/interpret/s/article/Assigning-bait-category-in-FCR-v2-0-plus-RBF-and-cumulative-considerations-FCR-v2-0-SA-3-1-7-SA-3-4-2-GSA-3-4-2-1527262006141> [Accessed 27 March 2021]

Secondary main species:

- Yelloweye mullet (*Aldrichetta forsteri*)

Over the five years to 2018, this species' biomass was considered to be between the limit (20% unfished biomass) and target (40% unfished biomass) reference points⁶. The CMSY method is used to evaluate stock status. A time series of catch information is used to provide annual estimated of biomass and harvest rate. The harvest rate is considered to have been below the level commensurate with MSY for at least 10 years. Current catch is below the estimated MSY level of 24 t (Fisher et al. 2020 and references therein).

The target catch for yelloweye mullet has been identified as annual commercial catch of < 46 t (DPIRD 2020b). The relationship between this target level and the more recently estimated MSY level will be investigated further at the site visit.

The stock is considered at Low risk of Estuary fishery impacts (Fisher et al. 2020).

- Estuary cobbler (*Cnidogobius macrocephalus*)

Peel-Harvey Estuary cobbler form a discrete stock. Fishing and benthic habitat degradation are thought to have resulted in a historic stock decline. The CMSY method is used to derive estimates of relative biomass in relation to MSY and harvest rate for cobbler. Currently, the stock is estimated to be above the limit biomass (20% unfished biomass) and below the target biomass (40% unfished biomass). Catch rate and amount are the stock performance indicators with target values of annual commercial catch rate >6 kg/day and annual commercial catch <9 t (Johnston et al. 2015). In 2018 and 2019, both indicators were within the target range. The stock appears stable in the Peel-Harvey Estuary, though historical declines occurred in all west coast estuaries as a result of overexploitation and environmental degradation (Fisher et al. 2020 and references therein).

The commercial catch of this species has declined in the past 20 years, because of reductions in gill net fishing effort. Some unlawful recreational fishing has been reported.

This species is evaluated as being stable (at a lower than historic level) and at Medium risk from commercial net fishing, and the Estuary fishery overall. Other fishing methods are assigned negligible risk (Fisher et al. 2020).

- Perth herring (*Nematalosa vlaminghi*)

This species is anadromous, spawning in rivers then returning to the sea. Commercially harvested fish are on their pre-spawning migration. The species' anadromous life history contributes to its vulnerability to fishing pressure. Environmental degradation has affected spawning and nursery areas. Total mortality of the Peel-Harvey Estuary stock has been estimated at three times the unexploited stock occurring in the Swan-Canning Estuary, using age structure data.

The target catch for this species is < 2.7 t, and this target was met in 2019 (DPIRD 2020b). The risks associated with the cumulative impact of the Estuary fishery, and the impact of commercial net fishing, are assessed as High for this stock. Measures to reduce this risk are considered necessary by DPIRD. Risks from other fishing methods are considered Negligible (Fisher et al. 2020 and references therein).

⁶ <https://fish.gov.au/report/240-Yelloweye-Mullet-2018> [Accessed 17 February 2021]

The stock is classified as main while comprising 2% of the retained catch weight for UoA 4, due to its inherent vulnerability.

- Yellowfin whiting (*Sillago schomburgkii*) -

The stock is caught by commercial and recreational fishers and expected to increase in abundance under a warming climate. It occurs in coastal and estuarine habitats and spawns in the ocean. The stock is discrete, having limited connectivity with others of the same species (Fisher et al. 2020 and references within).

Above average yellowfin whiting catches were recorded in 2014 and 2015, as a result of strong recruitment. Catch declined in 2018 but 2019 catch of 15.8 t exceeded the threshold level (set at 13.8 t). An age-based assessment of the stock was undertaken. Its key finding was that yellowfin whiting abundance in the Estuary fluctuates due to variable recruitment between years (Daume and Hartmann 2020). A "soft trigger" of 10 t was set in 2020, and 12 t was identified as the catch tolerance level. The harvest strategy states that DPIRD will meet with stakeholders in-season if the trigger is reached, to explore the appropriateness of the 12 t tolerance level for that season (considering fishing and environmental factors) (DPIRD 2020a). If catch in excess of a tolerance level occurs without being accounted for (e.g. by environmental impacts or arrangements between fishing sectors), fishery performance is deemed unacceptable. A review of management arrangements is triggered and the need for a review of stock status, HCR, and/or tolerance levels (DPIRD 2020a).

Current fishing pressure is considered to be sustainable, based on evidence including a catch curve and per-recruit assessment of 2015 and 2016 age composition data. Management includes limited entry and gear restrictions for commercial fishers, and bag limits for recreational fishers⁷.

The Estuary fishery risk to this species was assessed as Medium (Fisher et al. 2020).

Secondary minor species:

- Tailor (*Pomatomus saltatrix*)

The target catch level for this species is <9 t. Catches in 2019 were well below this (DPIRD 2020b).

In response to a decrease in size and catch rate before 2000, bag and size limits were introduced to reduce the recreational harvest of this species⁸. Now, a size limit, an individual daily bag limit (four fish) and a mixed species daily bag limit (16 fish per fisher) apply (Johnston et al. 2015; Fisher et al. 2020). Recruitment appears to have been stable over time.

The species is managed, but management targets and limits do not appear to be linked to biological reference points currently. Therefore, it is classified as a secondary species.

- Australian sardine (*Sardinops sagax*)

The exploitation rate of stocks occurring off Western Australia has been estimated at <5% of the estimated spawning biomass. Climatic influences are thought to be causing a southward contraction in the species range (Gaughan and Santoro 2020). State and Commonwealth management is in place,

⁷ <https://fish.gov.au/report/213-Yellowfin-Whiting-2018> [Accessed 17 February 2021]

⁸ <https://fish.gov.au/report/215-Tailor-2018> [Accessed 17 February 2021]

which includes limited entry and gear restrictions in the commercial fishery, and bag and possession limits in the recreational fishery⁹.

- Silver bream (*Rhabdosargus sarba*)

A size limit is in place, below which catch cannot be retained (Fisher et al. 2020).

Catch, bait use and management in the Units of Assessment:

• UoA 1

Non-target catch is occasional only. Western rock octopus (a minor primary species) are occasionally caught in crab traps, with catches ranging from 5 – 129 kg in the five-year period 2014/15 – 2018/19 (Table 12).

Five species have been recorded from DPIRD's monthly trap monitoring conducted during the period May 2014 – May 2019 (Table 13). Among these, only the four-lobed swimming crab (*Thalamita sima*) was represented in more than one trap-lift. This species has a broad distribution well outside the Estuary, and stock-wide impacts are considered likely to be undetectable (Fisher et al. 2020).

The findings of monthly monitoring conducted by DPIRD staff shows that other than for the target species blue swimmer crab, the number of unwanted catch items is extremely small in this trap fishery. For example, the discarded four-lobed swimming crab comprises 0.03% of the total number of catch items (Table 13). Excluding blue swimmer crab and four-lobed swimming crab, catch items in Table 13 were only recorded from a single trap lift (Fisher et al. 2020). Monthly monitoring by DPIRD staff on commercial crabbing vessels has occurred since 2007.

Entrance gaps incorporated into the design of traps are reported to enable the escape of fish that enter traps (Fisher et al. 2020). All fishers are reported by DPIRD to have incorporated escape gaps into their gear, after the trial period 2006 – 2010.

Sea mullet and yelloweye mullet are main species as bait used in this UoA, and locally sourced (Table 14; Fisher et al. 2020). Unwanted catch of yelloweye mullet has been recorded in net fisheries (Table 20).

Table 12. Catch retained in the Peel-Harvey Estuary crab trap fishery (UoA 1), 2014/15 – 2018/19. (Source: Fisher et al. 2020).

Species	Retained catch (tonnes)						% of total retained
	2014/15	2015/16	2016/17	2017/18	2018/19	Average	
Blue swimmer crab	96.8	57.7	55.1	96.6	65.4	74.5	99.92%
Octopus	0.005	0.023	0.032	0.103	0.129	0.058	0.08%

⁹ <https://fish.gov.au/report/186-Australian-Sardine-2018> [Accessed 17 February 2021]

Table 13. Catch items counted in commercial traps set for blue swimmer crabs in the Peel-Harvey Estuary (UoA 1). Data collected from 4,596 trap lifts, during monthly monitoring trips conducted by Department of Primary Industries and Regional Development, May 2014 – May 2019. (Source: Fisher et al. 2020)

Species	Retained catch	Discarded catch	Total catch
Blue swimmer crab (<i>Portunus armatus</i>)	30,156	14,382	44,538
Four-lobed swimming crab (<i>Thalamita sima</i>)	0	12	12
Green mud crab (<i>Scylla serrata</i>)	0	1	1
Common blowfish (<i>Torquigener pleurogramma</i>)	0	1	1
Western striped trumpeter (<i>Pelates octolineatus</i>)	0	1	1
Estuary cobbler (<i>Cnidoglanis microcephalus</i>)	0	1	1
Total	30,156	14,398	44,554

Table 14. Estimated amount of bait used in the Peel-Harvey Estuary commercial crab trap fishery (UoA 1). (Source: Fisher et al. 2020)

Year	No. of traplifts	Bait type	Amount used per trap (kg)	Total bait used (kg)
2014/15	69,888	Sea mullet Yelloweye mullet	0.3	20,966
2015/16	56,746	Sea mullet Yelloweye mullet	0.3	17,024
2016/17	52,874	Sea mullet Yelloweye mullet	0.3	15,862
2017/18	62,400	Sea mullet Yelloweye mullet	0.3	18,720
2018/19	58,044	Sea mullet Yelloweye mullet	0.3	17,413

• UoA 2

Non-target species caught in recreational drop nets have not been quantified recently, though information available from 2007/2008 and earlier includes low levels of primary and secondary species captures, e.g. Australian herring, western rock lobster, common blowfish (*Torquigener pleurogramma*), King George whiting (*Sillaginodes punctata*) (Table 11; Table 15). Johnston et al. (2015) noted that these data have not been independently validated and may not be representative of the fishery bycatch.

At the time of the first assessment of this fishery (Morison et al. 2016), bait used by this UoA was reported to comprise mostly sea mullet, chicken or lamb, based on 19 survey responses collected in December 2014 (Table 16). Bait was reported to be sourced from a store (sea mullet, tuna), or caught

by the fisher in the Estuary or at another location (Johnston et al. 2015). Surveillance audits since the first assessment have not reported any new information regarding bait use by drop netters.

While catch and bait usage information do not allow direct calculation of the proportions of total catch that comprise bait, the gear type is similar to the commercial trap fishery, and it appears reasonable that similar amounts of bait would be used. On a precautionary basis, sea mullet is considered a main species, as bait used in this UoA. Tailor and other in-scope species are also used as bait, in minor quantities (Table 16). The frames of West Australian dhufish are used as bait. At the site visit, this will be investigated further. If frames comprise waste resulting from other fishing activities (i.e. the frames are not landed specifically for bait use), this species would not require assessment.

Recent usage, bait sources, and classification of bait species for this UoA will be explored further at the site visit.

Table 15. Retained and discarded catch composition (as number of catch items), compiled from surveys of recreational drop net fishers. (Source: Johnston et al. 2015)

Species	Retained catch		Discarded catch		Total catch	% of total
	1998/99	2007/08	1998/99	2007/08		
Blue swimmer crab	21,142	8,646	25,762	12,093	67,643	99.49%
Australian herring	70	49	14	2	135	0.20%
Tailor	10	18	5	37	70	0.10%
Mussels	48	0	0	0	48	0.07%
Common blowfish	12	0	10	11	33	0.05%
General/sand whiting	11	1	0	5	17	0.03%
King George whiting	6	4	0	0	10	0.01%
Western school whiting	1	0	7	0	8	0.01%
Rough leatherjacket	0	0	2	3	5	0.01%
Pufferfish, toadfish and tobies	0	0	0	5	5	0.01%
Wrasses/groper	0	0	0	5	5	0.01%
Western rock lobster	0	4	0	0	4	0.01%
Striped trumpeter	0	2	0	0	2	<0.01%
Trumpeters/grunters	2	0	0	0	2	<0.01%
Southern school/silver whiting	0	1	0	0	1	<0.01%
Silver trevally	0	1	0	0	1	<0.01%
Western buffalo bream	1	0	0	0	1	<0.01%
Octopus	1	0	0	0	1	<0.01%
Brown-spotted wrasse	1	0	0	0	1	<0.01%
Stingray	0	0	0	1	1	<0.01%
Total	21,305	8,726	25,800	12,162	67,993	

Table 16. Bait usage reported by recreational drop net fishers participating in a survey conducted in the Peel-Harvey Estuary in December 2014. (Source: Johnston et al. 2015)

Species	Number recorded	% of total*
Sea mullet	45	34%
Chicken	32	24%
Lamb	21	16%
Tailor	15	11%
Tuna	6	5%
Bream	4	3%
West Australian dhufish	4	3%
Silver trevally	3	2%
Trumpeter	2	2%
Crab	1	1%
Sand whiting	U	-
Spleen	U	-
Total	133*	

*Does not include records of sand whiting and spleen

- **UoA 3:**

Scoop netters are known to land very few non-target species, though information is limited to past surveys and has become dated (Table 17). Johnston et al. (2015) noted that survey data were not independently validated, and may not be representative of bycatch in the fishery. Australian herring and blowfish dominated non-target species catch (Table 1; Table 17).

Bait is not used in this UoA.

Table 17. Numbers of retained and discarded catch items compiled from survey information reported by recreational scoop net fishers. (Source: Johnston et al. 2015)

Species Name	Number Retained				Number Discarded				% Total Catch
	1998	1999	2007	2008	1998	1999	2007	2008	
Blue swimmer crab	304	696	24	959	371	627	290	1243	97.3
Australian herring	0	26	0	45	0	0	0	0	1.5
Mussels	18	0	0	0	0	0	0	0	0.4
Tailor	0	0	1	0	0	0	0	0	0.0
Common blowfish	0	0	0	0	0	0	0	34	0.7

- **UoAs 4 and 5**

A wider range of non-target species is caught in these UoAs (Table 1). Commercial catch records document retained catch (Table 18; Table 19). Three species occurred in catch volumes sufficient to be classified as main in the haul net fishery (yelloweye mullet, yellowfin whiting, and Perth herring). One additional main species was identified from the gill net fishery catch records (estuary cobbler) (Table 1).

The nature and extent of unwanted catch have also been explored in these UoAs. From the beginning of May 2017 to the end of April 2018, a voluntary monitoring programme was implemented, which all active licence-holders in the net fishery participated in. The programme covered 538 net shots, comprising 96% haul net shots and 4% from gill net shots (Table 20). This method split represents the use of net methods reported, suggesting the information obtained can also be considered representative. Government observers conducted bimonthly monitoring to validate the information collected, covering 29 shots (Fisher et al. 2020). It is intended that this monitoring of the commercial fishery will occur every five years (DPIRD 2020a).

On average, fewer than 4 discards were recorded per haul net shot, compared to 12 discards per gill net shot. Discard weight was not recorded, but the proportion of shots from which discarded catch items were released was determined. The reasons catch was unwanted, and therefore discarded, included that retention was prohibited (blue swimmer crabs which can only legally be retained following trap capture; species caught below legal size, such as silver bream, tailor), the quality of catch items was poor (due to predation while catch remained in the net), or the species had no commercial value (e.g. blowfish). Post-capture survival was not estimated. Haul net discards were considered more likely to survive than unwanted catch extracted from gill nets (Fisher et al. 2020).

Mesh sizes in the fishery (reported as typically 50 – 100 mm) enable some escape of small-sized fish. Unwanted catch from nets is returned to the water during hauling or after landing. Nets can also be dropped into the water prior to landing catch, if fishers want to release fish (e.g. if a net's catch comprises largely unwanted species) (Fisher et al. 2020).

If the weight per discarded item is very roughly estimated at 0.25 kg, the estimated weight of unwanted catch is reported to comprise 0.6% of the haul net fishery and 1.5% of the gill net fishery (Fisher et al. 2020).

Bait is not used in these UoAs. Gill net effort is reported to have declined to very low levels in recent years (Fisher et al. 2020).

Table 18. Retained catches (tonnes), 2015 – 2019, in the Peel-Harvey Estuary haul net fishery. (Source: Fisher et al. 2020)

Species	Retained catch (tonnes)						% of total retained
	2015	2016	2017	2018	2019	Average	
Sea Mullet	79.9	84.6	95.4	100.4	80.7	88.2	70%
Yellowfin Whiting	26.4	19.0	12.2	11.6	15.7	17.0	13%
Yelloweye Mullet	4.9	11.1	10.7	10.4	9.6	9.3	7%
Australian Herring	2.6	3.1	3.8	5.4	6.3	4.2	3%
Tailor	6.2	1.3	1.1	2.6	2.3	2.7	2%
Perth Herring	2.5	2.8	3.3	2.5	1.9	2.6	2%
King George Whiting	0.4	0.8	0.1	1.6	1.8	0.9	1%
Whittings, other	0.1	0.8	0.4	0.3	1.4	0.6	0.5%
Trevallies	1.1	0.8	0.4	0.3	0.2	0.5	0.4%
Estuary Cobbler	0.4	0.3	0.1	0.5	0.2	0.3	0.2%
Australian Sardine	0.2	0.1	0	0	0	0.1	0.04%
Common Silverbiddy	0.02	0.1	0.002	0.01	0.04	0.03	0.02%
Silver Trevally	0.08	0	0	0	0	0.02	0.01%
Flatheads	0.01	0.01	0.02	0.01	0.02	0.01	0.01%
Black Bream	0	0.02	0.003	0.02	0	0.008	0.01%
Southern Garfish	0.005	0	0	0	0.002	0.001	<0.01%
Squid	0	0	0	0	0.01	0.001	<0.01%
General Fish	0	0	0.005	0	0	0.001	<0.01%
Leatherjackets	0	0	0	0	0.005	0.001	<0.01%
Flounders	0	0	0	0	0.003	0.001	<0.01%
Total	124.7	124.8	127.4	135.6	120.2	126.5	

Table 19. Retained catches (tonnes), 2015 – 2019, in the Peel-Harvey Estuary gill net fishery. (Source: Fisher et al. 2020)

Species	Retained catch (tonnes)						% of total retained
	2015	2016	2017	2018	2019	Average	
Sea Mullet	11.1	1.8	5.2	2.4	0.8	4.2	55%
Estuary Cobbler	0.9	0.9	1.8	1.2	0.01	0.9	12%
Yelloweye Mullet	0.9	0.3	2.0	0.8	0.0	0.8	11%
Yellowfin Whiting	3.2	0	0.5	0.1	0.1	0.8	10%
Perth Herring	0.0	0	1.1	1.0	0	0.4	5%
Australian Herring	0.1	0	0.4	0.7	0.2	0.3	4%
Tailor	0.1	0	0.04	0.8	0.02	0.2	3%
Black Bream	0.01	0	0.03	0	0	0.1	0.1%
Flatheads	0	0	0.01	0	0	0.002	0.03%
King George Whiting	0.01	0	0.005	0	0	0.002	0.03%
Trevallies	0.01	0	0	0	0	0.001	0.01%
Flounders	0	0	0	0.002	0	0.0004	0.01%
Total	16.3	3.0	11.1	6.9	1.1	7.7	

Table 20. Occurrence of unwanted catch that was discarded from haul and gill nets set by commercial fishers, between May 2017 and April 2018, in the Peel-Harvey Estuary. Fisher reporting was voluntary, and observers from the Department of Primary Industries and Regional Development monitored some shots. n = number of net shots included. (Source: Fisher et al. 2020)

Species	Reported by fishers		Observed
	Haul nets (n = 514)	Gill nets (n = 24)	Haul and Gill nets (n = 29)
Blue swimmer crab (<i>Portunus armatus</i>)	49%	13%	38%
Silver bream (<i>Rhabdosargus sarba</i>)	31%	38%	34%
Common blowfish (<i>Torquigener pleurogramma</i>)	7%	33%	21%
Yelloweye mullet (<i>Aldrichetta forsteri</i>)	6%	54%	17%
Leatherjacket (Monacathidae)	3%	13%	7%
Common silverbiddy (<i>Gerres subfasciatus</i>)	1%		7%
King George whiting (<i>Sillaginodes punctata</i>)	1%	4%	7%
Tailor (<i>Pomatomus saltatrix</i>)	1%	4%	7%
West Australian salmon (<i>Arripis truttaceus</i>)	1%		3%
Black bream (<i>Acanthopagrus butcheri</i>)	1%		
Yellowtail grunter (<i>Amniataba caudavittata</i>)	0.4%		3%
Australian herring (<i>Arripis georgianus</i>)	0.2%		7%
Western striped trumpeter (<i>Pelates octolineatus</i>)	0.2%		7%
Smooth ray (<i>Dasyatis</i> sp.)	0.2%		
Estuary cobbler (<i>Cnidogobius macrocephalus</i>)		4%	3%
Mulloway (<i>Argyrosomus japonicus</i>)		4%	3%

Endangered, Threatened and Protected (ETP) Species

ETP are identified and managed through international agreements (including those identified by the MSC FS as defining ETP (SA3.1.5.2)), and Australian national legislation and state legislation (Western Australia), as follows:

- The Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds in Danger of Extinction and their Environment 1974
- The Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment 1986
- The Agreement between the Government of Australia and the Government of the Republic of Korea on the Protection of Migratory Birds 2007
- Environment Protection and Biodiversity Conservation Act 1999
- Fish Resources Management Act 1994
- Western Australian Wildlife Conservation Act 1950

Requirements include reporting ETP interactions from commercial fisheries, and protection and management requirements for migratory birds (e.g. relating to preventing damage to birds' environments and preserving habitats). Sharks and rays are commercially protected in Western Australia and are only permitted to be retained by a specific number of commercial fisheries. Smooth stingray (*Dasyatis brevicaudata*) and black stingray (*Dasyatis thetidis*) are recreationally protected.

ETP occurring in the Estuary include at least 84 bird species (residents and migrants) (Appendix A in Fisher et al. 2020, and references therein), rays, syngnathids (*Hippocampus* spp.), and Indo-Pacific bottlenose dolphins (*Tursiops aduncus*). Commercial fishers are required by law to report ETP interactions in their statutory monthly catch and effort returns. These returns are checked by DPIRD research staff, and possible errors detected are checked with skippers or fishing licensees. ETP interactions with recreational fisheries may be detected if reported to the Department of Biodiversity, Conservation and Attractions Wildcare Helpline, and are otherwise unreported.

While interactions are considered possible with dolphins and seahorses, none are known to have occurred (Fisher et al. 2020). Therefore, these taxa are not scored in the assessment.

- **UoA 1**

One cormorant (*Phalacrocorax* spp.) was recovered from a crab trap during DPIRD monitoring of the fishery. The three month period when the Estuary is closed to crab trap fishing coincides with the arrival of migrant shorebirds (Fisher et al. 2020).

- **UoA 2**

No information is available about drop net interactions with ETP. Broad similarities with the crab trap design enables some comparison, and it has been concluded that impacts are likely to be low (Fisher et al. 2020).

- **UoA 3**

Crabs are targeted individually by fishers using this method. Fishers wade through the water to scoop net. Much of the Estuary is accessible to users of this method due to the shallow water depths, while there are some especially popular spots (e.g. Coodanup and Novara, in the Peel Inlet). Disturbance of ETP (specifically birds) appears to be the main risk, which is addressed below. No other interactions are known.

- **UoAs 4 – 5**

The potential for net interactions with ETP including dolphins, birds and syngnathids has been identified. None have been reported since 2007 and none were observed by the DPIRD monitoring conducted in 2017/18 (Johnston et al. 2015; Fisher et al. 2020). In 2006 and 2007, interactions with cormorants were reported (five and two interactions respectively).

Affecting the spatial overlap with ETP and therefore the risk of interactions, haul net fishing generally occurs in shallower waters < 1 m in depth and nets are not set in place unattended, while gill nets are set (e.g. overnight) in deeper areas where fish movements are thought to occur. Net activity is focused away from densely vegetated areas, as macrophytes increase the weight of nets, making them harder to haul by hand (Fisher et al. 2020).

ETP impacts that do not result directly from fishing gear:

Aside from the impacts of the gear *per se*, ETP may be affected by the anthropogenic disturbance associated with recreational activities including fishing, boating and other watersports. In the initial MSC assessment of the Peel-Harvey Estuary fishery, aquatic birds and shorebirds were identified as at risk in this regard (Morison et al. 2016). Resident aquatic birds occur year-round in the Estuary, with more than 10 species recorded breeding there. Migrant shorebirds (including some that are classified

as threatened) arrive from September onwards to spend the non-breeding season. From March, these migrants return to their northern hemisphere breeding sites. Replenishing their depleted reserves after migration and building up sufficient body weight to survive the return to their breeding sites is critical for the survival of these birds. Systematic shorebird monitoring has occurred in the Estuary since 2008, with counts being conducted from fixed sites in summer (Graff 2019; Fisher et al. 2020 and references within).

Disturbance of birds at their foraging and/or roosting sites resulting in the reduction of effective foraging time due to disturbance responses, wasted energy flying to evade disturbance, and utilisation of suboptimal areas for foraging have all been raised as issues at the Estuary (Graff 2019; Fisher et al. 2020). Fishing (defined as line-fishing, crabbing) and boating were identified as the main causes of shorebird disturbance by Graff (2019). Disturbance was higher on weekends and public holidays than weekdays, and lower during the seasonal closure to crabbing. The level of disturbance also varied among sites. There was a negative relationship between shorebird abundance and disturbance, and birds often left areas when disturbed (Graff 2019).

Data on the abundance and distribution of birds at the Estuary, and disturbance, contributed to the risk assessment conducted in 2020 (Fisher et al. 2020). The risk assessment categorised birds as migratory threatened species, migratory non-threatened species, non-migratory shorebirds (specifically considering the fairy tern and hooded plover, as well as other species) and other waterbirds (e.g. waterfowl).

Overall, a high risk of cumulative impact from the fishery was identified on migratory, threatened species. Disturbance from shore-based scoop net fishing activity on these birds was considered especially problematic (risk identified as high). These species are present at the Estuary October – March, and feed and roost in the same habitats used by scoop netters. Birds and fishers are also active day and night, and the findings reported by Graaf (2019) suggest that birds avoid popular scooping areas once the crabbing season opens, while using these areas in the closed season. For threatened species, it was considered possible that disturbance in Estuary habitats could impact recovery (Fisher et al. 2020). In contrast, boat-based commercial and recreational fishers were considered to have negligible effects by Fisher et al. (2020) because of the water depths activity occurs in (i.e., vessels are not as close to birds as wading fishers).

For migratory non-threatened shorebirds, the risks of cumulative impact of the Estuary fishery, and the impact of scoop netting were considered Medium, while risks of other methods were considered negligible (Fisher et al. 2020). The difference between the High (threatened) and Medium (non-threatened) was related to the stability of the shorebird populations, rather than a difference in fishing impacts at the Estuary. Impacts on resident shorebirds were scored similarly (Medium, for cumulative impact and scoop-netting). Vessel-based fishers were considered to have negligible impacts for these ETP, as above. For other resident waterbirds, the cumulative impact and scoop netting impacts were considered to present a Low risk, with other methods having Negligible risk (Fisher et al. 2020).

The need for new management measures to address disturbance of shorebirds has been identified (DPIRD 2020b), and DPIRD plans to develop shorebird management measures in consultation with the relevant conservation groups, i.e. Birdlife WA and Peel-Harvey Catchment Council. This will be explored further at the site visit.

Habitats

While some seasonal changes in habitats occur, 17 significantly different nearshore habitat types have been distinguished in the Estuary, using cluster analysis based on enduring and non-enduring habitat

characteristics. Enduring characteristics were grouped into three categories: site location with respect to marine and riverine water sources, exposure to wave activity, and substrate and submerged vegetation types. Non-enduring characteristics were the physico-chemical attributes of estuarine waters, such as salinity, dissolved oxygen concentration and water temperature. Significant correlations were found between enduring and non-enduring habitat characteristics. Differences among habitats in fish and invertebrate assemblages were also correlated with differences in enduring characteristics. Habitats are somewhat dynamic, e.g. given seasonal changes (Valensini et al. 2009).

Macroalgae and seagrass are the main components of the Estuary's macrophyte biomass, occurring in large beds (Johnston et al. 2015). From the late 1970s through 2018, a general decrease in Chlorophyta was documented (especially in the eastern Peel Inlet), and a concomitant increase in seagrass biomass was recorded (especially in the western Peel Inlet and northern Harvey Estuary). Elevated salinity levels resulting from reduced river flows into the Estuary have contributed to the expansion of seagrass beds and the colonisation of the southern Harvey Estuary by seagrass in 2017/18 (Fisher et al. 2020 and references therein).

The dominant seagrass in 2009 was *Zostera* spp., followed by *Ruppia* sp., and *Halophila* sp. (Johnston et al. 2015). Since then, *Ruppia* sp. has become dominant, with changes in the macrophyte community correlating with reduced nitrogen concentrations in parts of the Estuary that are furthest from river inflows. Accumulations of chlorophyta (*Willeella brachyclados*) occur around river mouths where higher nutrient loads prevail.

CSA and SICA risk assessments of seagrass habitats considered the impacts of the haul and gill-net fisheries to be Medium and Low (using the CSA and SICA methods, respectively), while the pot, drop net and scoop net fisheries were assessed as Low risk to seagrass habitats. For trap fisheries, the risk of habitat impacts was related to the size and weight of traps, hauling depth and haul speed (Johnston et al. 2015). The impacts of scoop netter activity on habitats (i.e. impacts of fisher movements) are affected by the accessibility of fishing sites, crab distribution and fisher preferences (Fisher et al. 2020). Overlaying the scoop net fishery footprint with habitat information shows that Chlorophyta biomass has increased in an area in which scooping effort occurs in the southern Harvey Estuary. In the Peel Inlet, key scoop netting areas have experienced an increase in seagrass cover and biomass relative to historical levels (Krumholz 2019).

The first full MSC assessment of the UoAs considered here identified the following scoring elements for Habitat PIs: Macroalgae, seagrass, rocky and unconsolidated sediment habitat features. A condition was placed on recreational scoop net fishery (UoC3), requiring evidence that this UoC is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm, and considering overlap with habitat for bird species (especially threatened species) (Morison et al. 2016). That condition was closed in the fourth surveillance audit (Daume and Hartmann 2021).

In the risk assessment conducted by Fisher et al. (2020), habitats are divided into sand and mud, macroalgae, and seagrasses. Fishery risks of unacceptable cumulative UoA impacts on sand and mud habitats, and seagrass habitats, were considered low to negligible. For macroalgae, this risk was assessed as negligible.

For sand and mud habitats, key considerations were (Fisher et al. 2020):

- Substrate impacts of wading fishers, and fishing gear.
- Drag of commercial gill and haul nets over the substrate (and benthos), noting that crab traps do not drag.
- Crab trap and drop net mesh is large enough to enable the escape of any macrobenthos that may be captured.

- Drop nets do not drag, but the number of them increases the potential for impacts.
- The large number of scoop netters wading in the Estuary shallows and margins in the summer months.

For macroalgae, the following considerations were highlighted (Fisher et al. 2020):

- Commercial haul and gill net fishers actively avoid these habitats because macroalgae loads make nets harder to haul
- Macroalgae are dynamic, and not necessarily anchored to the substrate
- Crab traps are not dragged across the substrate and these fishers can only operate on weekdays.

The risk of unacceptable impacts on seagrass was assessed as being higher than for macroalgae (while still low overall) because seagrasses are anchored to the substrate. This sessile habit was considered to increase susceptibility to trampling and net dragging. Further, crab traps occasionally bring up small amounts of seagrass (Fisher et al. 2020).

The closed season when crabbing is not permitted provides a 3-month period for recovery from any habitat impacts resulting from fishing activity.

Updated habitat information has been collected as part of a Murdoch University research programme.

For the purposes of this assessment, seagrass beds were identified as VMEs and are therefore assessed as such (MSC FS GSA3.13.3.2).

Table 21 – Scoring elements

Component	Scoring elements	Designation	Data-deficient
P1	Blue swimmer crab	Target species	No
P1, Primary	Sea mullet	Target species, Main	No
Primary	Australian herring	Minor	No
Primary	Western rock octopus	Minor	No
Primary	Western rock lobster	Minor	No
Primary	Tuna spp.	Minor	No (though species unknown)
Primary	West Australian dhufish	Minor	No
Secondary	Yelloweye mullet	Main	No
Secondary	Estuary cobbler	Main	No
Secondary	Yellowfin whiting	Main	Yes
Secondary	Perth herring	Main	Yes

Secondary	Silver bream	Minor	Yes
Secondary	Common blowfish	Minor	Yes
Secondary	Rough leatherjacket	Minor	Yes
Secondary	Leatherjackets	Minor	Yes
Secondary	Common silverbiddy	Minor	Yes
Secondary	King George whiting	Minor	Yes
Secondary	Tailor	Minor	Yes
Secondary	West Australian salmon	Minor	No
Secondary	Black bream	Minor	Yes
Secondary	Yellowtail grunter	Minor	Yes
Secondary	Western striped trumpeter	Minor	Yes
Secondary	Striped trumpeter	Minor	Yes
Secondary	Smooth ray	Minor	Yes
Secondary	Mulloway	Minor	Yes
Secondary	Four-lobed swimming crab	Minor	Yes
Secondary	Green mud crab	Minor	Yes
Secondary	Whittings/sand whiting	Minor	Yes
Secondary	Pufferfish, toadfish and tobies	Minor	Yes
Secondary	Wrasses/groper	Minor	Yes
Secondary	Southern school/silver whiting	Minor	Yes
Secondary	Silver trevally	Minor	Yes
Secondary	Stingray	Minor	Yes
Secondary	Trevallies	Minor	Yes
Secondary	Australian sardine	Minor	Yes

Secondary	Flatheads	Minor	Yes
Secondary	Southern garfish	Minor	Yes
Secondary	Squid	Minor	Yes
Secondary	Flounders	Minor	Yes
ETP	Birds (including cormorants, shorebirds and aquatic birds)		No
Habitats	Sand and mud	Commonly encountered, Main	No
	Macroalgae	Commonly encountered, Main	No
	Estuary water column	Commonly encountered, Main	No
	Seagrass	VME, Main	No
Ecosystem			No

Cumulative impacts

Requirements for cumulative impacts were considered (e.g. with other Western Australian fisheries such as the Shark Bay Prawn Managed Fishery¹⁰). Such impacts did not require evaluation for the UoAs included in this assessment, as part of Principle 2.

7.3.2 Principle 2 Performance Indicator scores and rationales

PI 2.1.1 – Primary species outcome: Blue swimmer crab, crab pots

PI 2.1.1		The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI		
Scoring Issue		SG 60	SG 80	SG 100
a	Main primary species stock status			
	Guide post	<p>Main primary species are likely to be above the PRI.</p> <p>OR</p> <p>If the species is below the PRI, the UoA has measures in place that are expected to ensure that the UoA does not</p>	<p>Main primary species are highly likely to be above the PRI.</p> <p>OR</p> <p>If the species is below the PRI, there is either evidence of recovery or a demonstrably effective strategy in place between all MSC UoAs</p>	<p>There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY.</p>

¹⁰ <https://fisheries.msc.org/en/fisheries/shark-bay-prawn/@@view> [Accessed 20 February 2021]

		hinder recovery and rebuilding.	which categorise this species as main , to ensure that they collectively do not hinder recovery and rebuilding.	
	Met?	Yes	Yes	Yes
Rationale				

There is one primary main species in this UoA, which is used as bait.

Sea mullet: Stock status has been assessed by considering the area from the South Coast Bioregion to the Gascoyne Coast Bioregion of Western Australia. Commercial catch data (1941 – 2018 and catch rate information from Shark Bay 1956 – 2018) has been used to fit a Schaefer biomass dynamic model. Preliminary outputs (recognising some issues with fit in recent years, when model-estimated CPUE values were larger than observed values) suggest that catch levels are currently below the estimated MSY level (566 t, 95% CI: 543 – 589 t). The stock is considered to be close to its unfished level. The stock is highly likely to be above PRI. SG60 and SG80 are met.

95% confidence limits show the biomass to be well above the reference level associated with MSY. SG100 is met.

Minor primary species stock status				
b	Guide post	Minor primary species are highly likely to be above the PRI.		
		OR		
		If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species.		
	Met?			Yes
Rationale				

There is one primary minor species in this UoA.

Western rock octopus: This species is managed through a stock-wide harvest strategy. A weight-of-evidence assessment conducted in 2018 concluded that there was a low risk of unacceptable stock depletion. The assessment did, however, indicate that further work to investigate the efficiency of the fishing gear and spatial extent of the stock will be needed to provide a more accurate estimation of stock biomass. It has been estimated through depletion experiments that less than 10% of the octopus habitat is actively fished.

The UoA catches a very small amount of this stock, which would not hinder its recovery or rebuilding. SG100 is met.

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Hart, A.M., Murphy, D.M., Harry, A.V. and Fisher, E.A. 2018. Western Australian Marine Stewardship Council Report Series No. 14: Resource Assessment Report Western Australian Octopus Resource. Department of Primary Industries and Regional Development, Western Australia.

Hart, A.M., Murphy, D., Hesp, S.A., Leporati, S. 2019. Biomass estimates and harvest strategies for the Western Australian *Octopus* aff. *tetricus* fishery. ICES Journal of Marine Science 76(7): 2205–2217. doi:10.1093/icesjms/fsz146

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.1.1 – Primary species outcome: Blue swimmer crab, drop nets

PI 2.1.1		The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI		
Scoring Issue		SG 60	SG 80	SG 100
a	Main primary species stock status			
	Guide post	Main primary species are likely to be above the PRI.	Main primary species are highly likely to be above the PRI.	There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY.
		OR If the species is below the PRI, the UoA has measures in place that are expected to ensure that the UoA does not hinder recovery and rebuilding.	OR If the species is below the PRI, there is either evidence of recovery or a demonstrably effective strategy in place between all MSC UoAs which categorise this species as main , to ensure that they collectively do not hinder recovery and rebuilding.	
	Met?	Yes	Yes	Yes
Rationale				

There is one primary main species in this UoA, which is used as bait.

Sea mullet: Stock status has been assessed by considering the area from the South Coast Bioregion to the Gascoyne Coast Bioregion of WA. Commercial catch data (1941 – 2018 and catch rate information from Shark Bay 1956 – 2018) has been used to fit a Schaefer biomass dynamic model. Preliminary outputs (recognising some issues with fit in recent years, when model-estimated CPUE values were larger than observed values) suggest that catch levels are currently below the estimated stock MSY (566 t, 95% CI: 543 – 589 t). The stock is considered to be close to its unfished level. The stock is highly likely to be above PRI. SG60 and SG80 are met.

95% confidence limits show the biomass to be well above the reference level associated with MSY. SG100 is met.

Minor primary species stock status				
b	Guide post			
		Minor primary species are highly likely to be above the PRI.		
		OR		
		If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species.		
	Met?			Yes – Western rock lobster, Australian herring, tuna No – WA dhufish
Rationale				

Western rock lobster: This species supports a managed fishery, which is MSC-certified and the stock is sustainably fished. The stock status is evaluated using a weight of evidence approach updated in 2020. The stock was considered to be in a very healthy state. SG100 is met.

Australian herring: For Western Australia, the stock is considered to be above the limit reference point (20% unfished biomass), and the current level of fishing is expected to not result in depletion to the point of recruitment impairment. CMSY analysis at the national level predicted an increase in biomass at current catch levels (with high levels of uncertainty). Landings from the Peel-Harvey Estuary were estimated at approximately 1% of state-wide landings. The stock is considered to be above the PRI, and landings in the Estuary are at a level that the UoA would not hinder the recovery and rebuilding of the stock. SG100 is met.

Tuna (unknown species):

It is unknown what species of tuna is used, and the quantity. However, given the extent of the known use of this bait by the UoA and the size and status of tuna stocks, recovery and rebuilding would not be hindered even if the bait source was a tuna stock below PRI (which is considered unlikely). SG100 is met.

West Australian dhufish:

The dhufish stock is recovering and is below PRI. There is a lack of evidence regarding the quantity of these baits used. Based on currently available information, SG100 is not met. However, it is noted that bait comprises frames only. Depending on the source of the frames, this bait species may not require assessment. This will be investigated further at the site visit.

References

Daume, S. and Morison, A. 2020. The Australian Western Rock Lobster Fishery. Surveillance report: Third surveillance. Bio.inspecta.

Daume, S., Morison, A., Leporati, S. and Trott, P. 2017. Australian western rock lobster fishery: MSC Full Assessment report. SCS Global Services.

DoF. 2013. Key findings of the 2013 West Coast Demersal Scalefish Resource Stock Assessment. Fisheries Management Paper No. 262. Department of Fisheries, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

<https://fish.gov.au/report/220-Australian-Herring-2018> [Accessed 17 February 2021]

<https://fish.gov.au/report/209-West-Australian-Dhufish-2018> [Accessed 17 February 2021]

<https://fish.gov.au/report/176-Western-Rock-Lobster-2018> [Accessed 20 February 2021]

Draft scoring range	≥80
Information gap indicator	More information sought <i>Source of WA dhufish used as bait (this species may not require assessment if frames used as bait are waste from other fishing activity).</i>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.1.1 – Primary species outcome: Blue swimmer crab, scoop nets

PI 2.1.1		The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI		
Scoring Issue		SG 60	SG 80	SG 100
a	Main primary species stock status			
	Guide post	<p>Main primary species are likely to be above the PRI.</p> <p>OR</p> <p>If the species is below the PRI, the UoA has measures in place that are expected to ensure that the UoA does not hinder recovery and rebuilding.</p>	<p>Main primary species are highly likely to be above the PRI.</p> <p>OR</p> <p>If the species is below the PRI, there is either evidence of recovery or a demonstrably effective strategy in place between all MSC UoAs which categorise this species as main, to ensure that they collectively do not hinder recovery and rebuilding.</p>	<p>There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY.</p>

Met?	NA	NA	NA
Rationale			

There are no main primary species. This scoring issue is not scored.

Minor primary species stock status			
b	Guide post		<p>Minor primary species are highly likely to be above the PRI.</p> <p>OR</p> <p>If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species.</p>
	Met?		Yes
Rationale			

Australian herring: For Western Australia, the stock is considered to be above the limit reference point (20% unfished biomass), and the current level of fishing is expected to not result in depletion to the point of recruitment impairment. CMSY analysis at the national level predicted an increase in biomass at current catch levels (with high levels of uncertainty). Landings from the Peel-Harvey Estuary were estimated at approximately 1% of state-wide landings. The stock is considered to be above the PRI, and landings in the Estuary are at a level that the UoA would not hinder the recovery and rebuilding of the stock. SG100 is met.

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

<https://fish.gov.au/report/220-Australian-Herring-2018> [Accessed 17 February 2021]

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.1.1 – Primary species outcome: Sea mullet, haul nets

PI 2.1.1	The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI
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Scoring Issue		SG 60	SG 80	SG 100
a	Main primary species stock status			
	Guide post	Main primary species are likely to be above the PRI.	Main primary species are highly likely to be above the PRI.	There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY.
		OR If the species is below the PRI, the UoA has measures in place that are expected to ensure that the UoA does not hinder recovery and rebuilding.	OR If the species is below the PRI, there is either evidence of recovery or a demonstrably effective strategy in place between all MSC UoAs which categorise this species as main , to ensure that they collectively do not hinder recovery and rebuilding.	
	Met?	NA	NA	NA
Rationale				

There are no main primary species caught in this UoA. This scoring issue is not scored.

b	Minor primary species stock status			
	Guide post			Minor primary species are highly likely to be above the PRI.
				OR
	Met?			If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species.
				Yes
Rationale				

Blue swimmer crab: This species is a component of discarded catch for the UoA. The primary indicator of stock status is standardised CPUE (kg/traplift). In 2019/20, this was well above the threshold level (1.07 kg/traplift, for a threshold of 0.7 kg/traplift). While some variability in catch levels has occurred, catch remained within the target range. Fishing effort remained at a level that was not affecting stock recruitment. SG100 is met.

Australian herring: For Western Australia, the stock is considered to be above the limit reference point (20% unfished biomass), and the current level of fishing is expected to not result in depletion to the point of recruitment impairment. CMSY analysis at the national level predicted an increase in biomass at current catch levels (with high levels of uncertainty). Landings from the Peel-Harvey Estuary were estimated at approximately 1% of state-wide landings. The stock is considered to be above the PRI, and landings in the Estuary are at a level that the UoA would not hinder the recovery and rebuilding of the stock. SG100 is met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

<https://fish.gov.au/report/220-Australian-Herring-2018> [Accessed 17 February 2021]

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.1.1 – Primary species outcome: Sea mullet, gill nets

PI 2.1.1		The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI		
Scoring Issue		SG 60	SG 80	SG 100
a	Main primary species stock status			
	Guide post	Main primary species are likely to be above the PRI.	Main primary species are highly likely to be above the PRI.	There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY.
		OR If the species is below the PRI, the UoA has measures in place that are expected to ensure that the UoA does not hinder recovery and rebuilding.	OR If the species is below the PRI, there is either evidence of recovery or a demonstrably effective strategy in place between all MSC UoAs which categorise this species as main , to ensure that they collectively do not hinder recovery and rebuilding.	
	Met?	NA	NA	NA
Rationale				

There are no main primary species caught in this UoA. This scoring issue is not scored.

Minor primary species stock status				
b	Guide post	<p>Minor primary species are highly likely to be above the PRI.</p> <p>OR</p> <p>If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species.</p>		
	Met?			Yes
Rationale				

Blue swimmer crab: This species is an important component of discarded catch for the UoA. The primary indicator of stock status is standardised CPUE (kg/traplift). In 2019/20, this was well above the threshold level (1.07 kg/traplift, for a threshold of 0.7 kg/traplift). While some variability in catch levels has occurred, catch remained within the target range set. Fishing effort remained at a level that was not affecting stock recruitment. SG100 is met.

Australian herring: For Western Australia, the stock is considered to be above the limit reference point (20% unfished biomass), and the current level of fishing is expected to not result in depletion to the point of recruitment impairment. CMSY analysis at the national level predicted an increase in biomass at current catch levels (with high levels of uncertainty). Landings from the Peel-Harvey Estuary were estimated at approximately 1% of state-wide landings. The stock is considered to be above the PRI, and landings in the Estuary are at a level that the UoA would not hinder the recovery and rebuilding of the stock. SG100 is met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

<https://fish.gov.au/report/220-Australian-Herring-2018> [Accessed 17 February 2021]

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.1.2 – Primary species management strategy: Blue swimmer crab, crab pots

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the PRI.	There is a partial strategy in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the PRI.	There is a strategy in place for the UoA for managing main and minor primary species.
	Met?	Yes	Yes	Yes
Rationale				

Sea mullet: This stock, used as bait fish by the UoA, is managed under the estuarine and nearshore finfish harvest strategy (see references), which uses a constant exploitation approach i.e. assuming that catches vary proportionally with varying stock abundance. Management is based on monitoring landed catch against specified reference levels. When the threshold reference level (designed to be equivalent to B_{MSY}) is breached, a review is completed to develop a management response within 3 months. Catch would then be reduced across relevant sectors, up to 50% of the current harvest level, to enable stock recovery to the target level ($>B_{MSY}$). If the limit ($0.5B_{MSY}$) level is breached, catch would be reduced among relevant sectors as soon as practicable, by at least 50% of the current catch. The review would determine the management actions required to rebuild the stock to the target level in 2 generation times. This could include 100% catch reduction.

Management measures for commercial fishing identified in the harvest strategy for stocks targeted in the Estuary include limited entry for commercial fishers, effort restrictions, gear restrictions, spatial and temporal closures. Retained catch must be reported. Some monitoring of discarded catch occurs. There is a strategy in place, which the UoA operates within, for managing this main species. SG60, SG80 and SG100 are met.

Western rock octopus: The strategy for managing UoA impacts is risk-based and set out as part of the blue swimmer crab harvest strategy. The risk of the UoA to octopus was considered Low in the 2020 risk assessment. The target reference level for retained species (including western rock octopus) is for fishing impacts to generate an acceptable (i.e. medium for lower) risk level. At that level, existing management continues. If a potentially material change to risk level is identified, or, fishing impacts are considered to generate a high risk to species populations, a review would be completed within 3 months, and a management response implemented to reduce the risk level to Medium or lower as soon as practicable. An immediate management response is triggered if the limit reference level is reached, that is, fishing impacts are considered to generate an unacceptable (severe) level of risk. Beyond the UoA, the species is managed through a stock-wide harvest strategy. The key performance indicator used in the stock-wide harvest strategy is annual standardised commercial catch rate in two designated areas. Target, threshold and limit catch rates are specified.

There is a strategy in place for the UoA for managing main and minor primary species. SG100 is met.

Management strategy evaluation				
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Yes	Yes	No – Sea mullet Yes – Western rock octopus
Rationale				

The 2015 – 2020 harvest strategy for sea mullet set out reference levels in terms of commercial annual standardised catch rate and volume. The control rules specified were broadly similar to those in the new harvest strategy applying 2020 – 2025, i.e., triggering a review and management actions to reduce catch when a threshold or limit reference level is breached. In 2015 - 2018, catches of sea mullet were above threshold, which triggered an investigation of sustainability risk to the stock. However, by 2019, management responses had not been defined. The 2020 – 2025 harvest strategy for finfish now states a timeframe in which a review must occur. For sea mullet (as a target stock), the harvest strategy specifies that a “*recovery strategy will be developed and implemented to ensure that the resource can rebuild at an acceptable rate (i.e. within two generation times)*”, if the stock declines below the limit reference level. There is some objective basis for confidence that the measures/partial strategy will work for this stock, based on some information directly about the fishery and/or species involved. SG60 and SG80 are met.

Testing of the partial strategy/strategy does not appear to have taken place. Therefore, it cannot support high confidence that the strategy will work for main species, based on information directly about the fishery and/or species involved. SG100 is not met.

For minor species at a stock-wide level, testing has occurred and supports high confidence that the partial strategy/strategy will work, based on information directly about the species involved. SG100 is met.

Management strategy implementation				
c	Guide post		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a) .
	Met?		Yes	No – Sea mullet Yes – Western rock octopus
Rationale				

There is some evidence that the measures/partial strategy is being implemented successfully. For sea mullet, catch levels are evaluated as below the level commensurate with MSY, and the stock is considered to be close to its unfished state. There have been delays in implementing management actions following threshold breaches in previous years. This issue has been addressed in the updated harvest strategy, with clear timeframes for the implementation of management responses for target species now stated.

Overall, there is some evidence that the measures/partial strategy is being implemented successfully. However, there is not clear evidence. SG80 is met. As yet, SG100 is not met given the finfish harvest strategy changes were made recently and evidence of successful implementation is not yet available.

For western rock octopus, a weight-of-evidence assessment conducted in 2018 concluded that the risk of unacceptable stock depletion was low. Similarly, the risk from the UoA was low. There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a). SG100 is met.

Shark finning				
d	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NA	NA	NA
Rationale				

Sharks are not primary species for this UoA.

Review of alternative measures				
e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	NA	NA	NA
Rationale				

There is no unwanted catch of primary species reported. Therefore, this scoring issue is not scored.

References

- Daume, S. and Hartmann, K. 2020. Western Australia Peel Harvey Estuarine Fishery Surveillance Report (Fourth Surveillance). Bio.inspecta.
- Daume, S. and Morison, A. 2017. Peel Harvey Estuarine Fishery: 2017 MSC Surveillance Audit Report. SCS Global Services.
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Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.1.2 – Primary species management strategy: Blue swimmer crab, drop nets

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the PRI.	There is a partial strategy in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the PRI.	There is a strategy in place for the UoA for managing main and minor primary species.
	Met?	Yes	Yes	Yes – Sea mullet, Western rock lobster, Australian herring No – Tuna, WA dhufish
Rationale				

Sea mullet: This stock, used as bait fish by the UoA, is managed under the estuarine and nearshore finfish harvest strategy (see references), which uses a constant exploitation approach i.e. assuming that catches vary proportionally with varying stock abundance. Management is based on monitoring landed catch against specified target and threshold levels. When the threshold (designed to be equivalent to B_{MSY}) is breached, a review is completed to develop a management response within 3

months. Catch would then be reduced across relevant sectors, up to 50% of the current harvest level, to enable stock recovery to the target level ($>B_{MSY}$). If the limit ($0.5B_{MSY}$) level is breached, catch would be reduced among relevant sectors as soon as practicable, by at least 50% of the current catch. The review would determine the management actions required to rebuild the stock to the target level in 2 generation times. This could include 100% catch reduction.

Management measures for commercial fishing identified in the harvest strategy for stocks targeted in the Estuary include limited entry for commercial fishers, effort restrictions, gear restrictions, spatial and temporal closures. Retained catch must be reported. Some monitoring of discarded catch occurs. (This stock is not landed recreationally in the Estuary). There is a strategy in place, which the UoA operates within, for managing this main species. SG60, SG80 and SG100 are met.

Western rock lobster, Australian herring: The strategy for managing UoA impacts is risk-based, and set out as part of the blue swimmer crab harvest strategy. The target reference level for retained species is for fishing impacts to generate an acceptable (i.e. medium for lower) risk level. At that level, existing management continues. If a potentially material change to risk level is identified, or, fishing impacts are considered to generate a high risk to species populations, a review would be completed within 3 months, and a management response implemented to reduce the risk level to Medium or lower as soon as practicable. An immediate management response is triggered if the limit reference level is reached, that is, fishing impacts are considered to generate an unacceptable (severe) level of risk. Further, the Western rock lobster is subject to a stock-specific harvest strategy. There is a strategy in place and SG100 is met.

West Australian dhufish, tuna: These species are not covered by the harvest strategy and SG100 is not met. However, the frames of West Australian dhufish are used as bait, not other fish parts. If frames comprise waste resulting from other fishing activities (i.e. the frames are not landed specifically for bait use), this species does not require assessment. This will be investigated further at the site visit.

Management strategy evaluation				
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Yes	Yes	No – Sea mullet, Australian herring Yes – Western rock lobster
Rationale				

The 2015 – 2020 harvest strategy for sea mullet set out reference levels in terms of commercial annual standardised catch rate and volume. The control rules specified were broadly similar to those in the new harvest strategy applying 2020 – 2025, i.e., triggering a review and management actions to reduce catch when a threshold or limit reference level is breached. In 2015 - 2018, catches of sea mullet were above threshold, which triggered an investigation of sustainability risk to the stock. However, by 2019, management responses had not been defined. The 2020 – 2025 harvest strategy for finfish now states a timeframe in which a review must occur. For sea mullet (as a target stock), the harvest strategy specifies that a “*recovery strategy will be developed and implemented to ensure that the resource can rebuild at an acceptable rate (i.e. within two generation times)*”, if the stock declines below the limit reference level. There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved. SG60 and SG80 are met.

Main and minor species are considered at SG100. Testing does not appear to have been conducted for the Australian herring, to support high confidence that the strategy will work, based on information directly about the fishery and/or species involved. SG100 is not met.

For western rock lobster, the stock specific harvest strategy is under review. Performance of the previous strategy is sufficient to comprise testing to support high confidence that the partial strategy/strategy will work, based on information directly about the species involved. SG100 is met.

Management strategy implementation			
C	Guide post	There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a) .
	Met?	Yes	No – Sea mullet Yes – Australian herring, Western rock lobster
Rationale			

There is some evidence that the measures/partial strategy is being implemented successfully. For sea mullet, catch levels are evaluated as below the level commensurate with MSY, and the stock is considered to be close to its unfished state. There have been delays in implementing management actions following threshold breaches in previous years. This issue has been addressed in the updated harvest strategy for this target species. Overall, there is some evidence that the measures/partial strategy is being implemented successfully. However, there is not clear evidence. SG80 is met, while SG100 is not.

For Australian herring, the stock is considered to be above the PRI, and landings in the Estuary are at a level that the UoA would not hinder the recovery and rebuilding of the stock (approximately 1% of state-wide landings). There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a). SG100 is met.

For western rock lobster, there is clear evidence that the previous harvest strategy (now under review) was implemented successfully and achieved its overall objective. SG100 is met.

Shark finning			
d	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.
	Met?	NA	NA
Rationale			

Sharks are not primary species for this UoA.

Review of alternative measures			
e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to	There is a regular review of the potential effectiveness and practicality of alternative
			There is a biennial review of the potential effectiveness and practicality of alternative

		minimise UoA-related mortality of unwanted catch of main primary species.	measures to minimise UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	measures to minimise UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	NA	NA	NA
Rationale				

The main primary species is sea mullet, caught in UoAs 4 and 5. There has been no unwanted catch of sea mullet recorded in discard monitoring undertaken.

Unwanted catch of minor species is negligible, based on the information available.

This scoring issue is not scored.

References

Daume, S. and Hartmann, K. 2020. Western Australia Peel Harvey Estuarine Fishery Surveillance Report (Fourth Surveillance). Bio.inspecta.

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Hart, A.M., Murphy, D., Hesp, S.A., Leporati, S. 2019. Biomass estimates and harvest strategies for the Western Australian *Octopus* aff. *tetricus* fishery. ICES Journal of Marine Science 76(7): 2205–2217. doi:10.1093/icesjms/fsz146

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.1.2 – Primary species management strategy: Blue swimmer crab, scoop nets

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the PRI.	There is a partial strategy in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the PRI.	There is a strategy in place for the UoA for managing main and minor primary species.
	Met?	Yes	Yes	Yes
Rationale				

There are no main primary species. SG60 and SG80 are met by default.

Australian herring: The strategy for managing UoA impacts is risk-based, and set out as part of the blue swimmer crab harvest strategy. The target reference level for retained species is for fishing impacts to generate an acceptable (i.e. medium for lower) risk level. At that level, existing management continues. If a potentially material change to risk level is identified, or fishing impacts are considered to generate a high risk to species populations, a review would be completed within 3 months, and a management response implemented to reduce the risk level to Medium or lower as soon as practicable. An immediate management response is triggered if the limit reference level is reached, that is, fishing impacts are considered to generate an unacceptable (severe) level of risk. There is a strategy in place and SG100 is met.

Management strategy evaluation				
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Yes	Yes	No
Rationale				

There are no main primary species. SG60 and SG80 are met by default.

The strategy for minor species is considered at SG100. At this point, testing has not been undertaken to support high confidence that the strategy will work, based on information directly about the fishery and/or species involved. SG100 is not met.

Management strategy implementation				
C	Guide post		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a) .
	Met?		Yes	No
Rationale				

There are no main primary species. SG80 is met by default.

For minor primary species (the Australian herring), there is not recent clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a). SG100 is not met.

Shark finning				
d	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NA	NA	NA
Rationale				

Sharks are not primary species for this UoA.

Review of alternative measures				
e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	NA	NA	NA
Rationale				

There are no main primary species. The most recent information available shows negligible discarding of minor primary species. Therefore, this scoring issue is not scored.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

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Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.1.2 – Primary species management strategy: Sea mullet, haul nets

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the PRI.	There is a partial strategy in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the PRI.	There is a strategy in place for the UoA for managing main and minor primary species.
	Met?	Yes	Yes	Yes
Rationale				

There are no main primary species. SG60 and SG80 are met by default.

The finfish harvest strategy describes the UoA management approach to minor primary species. This is risk based, with target (fishing impacts generate an acceptable, i.e. medium for lower risk level), threshold (a potentially material change to risk level is identified, or, fishing impacts are considered to generate a high risk to species populations) and limit reference levels (fishing impacts are considered to generate an unacceptable (severe) level of risk). At or in excess of threshold reference levels, a review would be completed within 3 months, and a management response implemented to reduce the risk level to Medium or lower as soon as practicable. On reaching a limit reference level, an immediate management response is triggered with actions to reduce the risk as soon as practicable.

The blue swimmer crab is also subject to a specific harvest strategy, developed for the targeted crab fishery. The harvest strategy includes various objectives, thresholds and performance indicators, for managing the stock.

There is a strategy in place for the UoA for managing minor primary species. SG100 is met.

Management strategy evaluation				
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Yes	Yes	Yes – Blue swimmer crab No – Australian herring
Rationale				

There are no main primary species. Therefore, SG60 and SG80 are met by default.

Testing does not appear to have been conducted for the Australian herring, to support high confidence that the strategy will work, based on information directly about the fishery and/or species involved. SG100 is not met.

For the blue swimmer crab, performance of the stock-specific harvest strategy is sufficient to comprise testing to support high confidence that the partial strategy/strategy will work, based on information directly about the species involved. SG100 is met.

Management strategy implementation				
c	Guide post		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a) .
	Met?		Yes	Yes
Rationale				

There are no main primary species. Therefore, SG80 is met by default.

For blue swimmer crabs, annual catches have remained within the acceptable range set out by the harvest strategy through the past five seasons. There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a). SG100 is met.

For Australian herring, the stock is considered to be above the PRI, and landings in the Estuary are at a level that the UoA would not hinder the recovery and rebuilding of the stock (approximately 1% of state-wide landings). There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a). SG100 is met.

d Shark finning

	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NA	NA	NA

Rationale

Sharks are not primary species for this UoA.

Review of alternative measures				
e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	NA	NA	NA

Rationale

By weight, unwanted catch discarded in UoA 4 comprised an estimated 0.6% of total catch, in catch monitoring undertaken in 2017/2018.

Australian herring discards comprised 0.2% of discarded items. Blue swimmer crab comprised 49% of discards among the 0.6% of total catch that is unwanted; crabs cannot legally be retained by net fishers.

Overall, this unwanted catch is considered negligible and the scoring issue is not scored.

References

Daume, S. and Hartmann, K. 2020. Western Australia Peel Harvey Estuarine Fishery Surveillance Report (Fourth Surveillance). Bio.inspecta.

Daume, S. and Morison, A. 2017. Peel Harvey Estuarine Fishery: 2017 MSC Surveillance Audit Report. SCS Global Services.

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Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.1.2 – Primary species management strategy: Sea mullet, gill nets

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the PRI.	There is a partial strategy in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the PRI.	There is a strategy in place for the UoA for managing main and minor primary species.
	Met?	Yes	Yes	Yes
Rationale				

There are no main primary species. SG60 and SG80 are met by default.

The finfish harvest strategy describes the UoA management approach to minor primary species. This is risk based, with target (fishing impacts generate an acceptable, i.e. medium for lower risk level), threshold (a potentially material change to risk level is identified, or, fishing impacts are considered to generate a high risk to species populations) and limit reference levels (fishing impacts are considered to generate an unacceptable (severe) level of risk). At or in excess of threshold reference levels, a review would be completed within 3 months, and a management response implemented to reduce the risk level to Medium or lower as soon as practicable. On reaching a limit reference level, an immediate management response is triggered with actions to reduce the risk as soon as practicable.

The blue swimmer crab is also subject to a specific harvest strategy, developed for the targeted crab fishery. The harvest strategy includes various objectives, thresholds and performance indicators, for managing the stock.

There is a strategy in place for the UoA for managing main and minor primary species. SG60, SG80 and SG100 are met.

b	Management strategy evaluation			
	Guide post	The measures are considered likely to work,	There is some objective basis for confidence	Testing supports high confidence that the

		based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Yes	Yes	Yes – Blue swimmer crab No – Australian herring
Rationale				

There are no main primary species. Therefore, SG60 and SG80 are met by default.

Testing does not appear to have been conducted for the Australian herring, to support high confidence that the strategy will work, based on information directly about the fishery and/or species involved. SG100 is not met.

For the blue swimmer crab, performance of the stock-specific harvest strategy is sufficient to comprise testing to support high confidence that the partial strategy/strategy will work, based on information directly about the species involved. SG100 is met.

Management strategy implementation				
C	Guide post		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a) .
	Met?		Yes	Yes
Rationale				

There are no main primary species. Therefore, SG80 is met by default.

For blue swimmer crabs, annual catches have remained within the acceptable range set out by the harvest strategy through the past five seasons. There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a). SG100 is met.

For Australian herring, the stock is considered to be above the PRI, and landings in the Estuary are at a level that the UoA would not hinder the recovery and rebuilding of the stock (approximately 1% of state-wide landings). There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a). SG100 is met.

Shark finning				
d	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NA	NA	NA
Rationale				

Sharks are not primary species for this UoA.

Review of alternative measures				
e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	NA	NA	NA
Rationale				

There are no main primary species. There is no unwanted catch reported of the Australian herring. Unwanted catch is considered negligible for blue swimmer crab in this UoA, and the scoring issue is not scored.

References

- Daume, S. and Hartmann, K. 2020. Western Australia Peel Harvey Estuarine Fishery Surveillance Report (Fourth Surveillance). Bio.inspecta.
- Daume, S. and Morison, A. 2017. Peel Harvey Estuarine Fishery: 2017 MSC Surveillance Audit Report. SCS Global Services.
- DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.
- DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.
- DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.
- Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.1.3 – Primary species information – Blue swimmer crab, crab pots

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impact on main primary species			
	Guide post	Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status.
	Met?	Yes	Yes	No
Rationale				

Sea mullet: Quantitative information to assess the impact of the UoA includes catch rate and catch volume information, and age composition data (from different parts of the stock range). A Schaefer production model has recently been used as a basis to preliminarily conclude that catch is well below MSY-level, and that the stock is close to its unfished level. The model fit is not good in recent years, when model-estimated catch rates were larger than the observed values. It was considered that this may be due to relatively lower fishing effort in recent years. Further work is planned.

Results from modelling are informative, while preliminary. Information is sufficient to show biomass is well above B_{MSY} . Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status. SG60 and SG80 are met.

There is some information on bait volumes used by the UoA in combination with yelloweye mullet. However, the usage of each species is unknown. Therefore, quantitative information is not adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status. SG100 is not met.

b	Information adequacy for assessment of impact on minor primary species			
	Guide post	Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.		
	Met?			Yes
Rationale				

Some quantitative information is available on minor primary species (western rock octopus) and this is adequate to estimate the impact of the UoA with respect to status. SG100 is met.

Information adequacy for management strategy				
C	Guide post	Information is adequate to support measures to manage main primary species.	Information is adequate to support a partial strategy to manage main primary species.	Information is adequate to support a strategy to manage all primary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Yes	Yes	No – Sea mullet Yes – Western rock octopus
Rationale				

Information is adequate to support a strategy to manage main primary species (sea mullet), including fishery-dependent data and information on the species biology and life history. SG60 and SG80 are met.

Information is not adequate currently to evaluate, for all primary species, with a high degree of certainty, that the strategy is achieving its objective. SG100 is not met for sea mullet, where the extent of bait use of this species and yelloweye mullet could usefully be clarified. SG100 is met for western rock octopus, for which catch (and other) information and a UoA-specific and effective stock-wide harvest strategy are in place.

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Hart, A.M., Murphy, D.M., Harry, A.V. and Fisher, E.A. 2018. Western Australian Marine Stewardship Council Report Series No. 14: Resource Assessment Report Western Australian Octopus Resource. Department of Primary Industries and Regional Development, Western Australia.

Hart, A.M., Murphy, D., Hesp, S.A., Leporati, S. 2019. Biomass estimates and harvest strategies for the Western Australian *Octopus* aff. *tetricus* fishery. ICES Journal of Marine Science 76(7): 2205–2217. doi:10.1093/icesjms/fsz146

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
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Condition number (if relevant)

PI 2.1.3 – Primary species information – Blue swimmer crab, drop nets

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impact on main primary species			
	Guide post	Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status.
	Met?	Yes	Yes	No
Rationale				

Sea mullet: Quantitative information to assess the impact of the UoA includes catch rate and catch volume information, and age composition data (from different parts of the stock range). A Schaefer production model has recently been used as a basis to preliminarily conclude that catch is well below MSY-level, and that the stock is close to its unfished level. The model fit is not good in recent years, when model-estimated catch rates were larger than the observed values. It was considered that this may be due to relatively lower fishing effort in recent years. Further work is planned. Results from modelling are informative, while preliminary. Information is sufficient to show biomass is well above B_{MSY}. SG60 and SG80 are met.

The extent of bait use by the UoA is not known by volume or from information recently collected that is known to be representative of the fishery. Therefore, quantitative information is not available or adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status. SG100 is not met.

		Information adequacy for assessment of impact on minor primary species		
b	Guide post	Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.		
	Met?			No

Rationale

Some quantitative information is available on minor primary species that comprise landed and discarded catch, and bait. Bait information is reported from 2014, while the available catch information was collected over 10 years ago. While it may be that the fishery has changed little in that time, the information available is not considered adequate to estimate the impact of the UoA on minor primary species with respect to status. SG100 is not met.

Information adequacy for management strategy				
C	Guide post	Information is adequate to support measures to manage main primary species.	Information is adequate to support a partial strategy to manage main primary species.	Information is adequate to support a strategy to manage all primary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Yes	Yes	Yes – Sea mullet, Western rock lobster No – Australian herring, West Australian dhufish, Tuna spp.

Rationale

Information is adequate to support a strategy to manage the main primary species, including fishery-dependent data and information on the species biology and life history. SG60 and SG80 are met. Information is sufficient to allow stock status of sea mullet to be evaluated, which can provide a basis to evaluate whether the strategy is working. Information is adequate to support a strategy to manage all primary species and evaluate with a high degree of certainty whether the strategy is achieving its objective. SG100 is met for this main species.

For western rock lobster, the performance of the stock-wide harvest strategy and stock status demonstrate that information is adequate to support a strategy to manage the species and evaluate with a high degree of certainty whether the strategy is achieving its objective. SG100 is met.

Information is not adequate currently to support a strategy to manage other minor primary species and evaluate with a high degree of certainty that the strategy is achieving its objective. Bait use information is dated, and may not represent the current state of the fishery. SG100 is not met. (Note that West Australian dhufish frames are used as bait. Depending on the source of the frames, this bait species may not require assessment. This will be investigated further at the site visit).

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.1.3 – Primary species information – Blue swimmer crab, scoop nets

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impact on main primary species			
	Guide post	Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status.
	Met?	NA	NA	NA
Rationale				

There are no main primary species. This scoring issue is not scored.

b	Information adequacy for assessment of impact on minor primary species			
	Guide post	Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.		
	Met?			No

Rationale

Some quantitative information is available on minor primary species that comprise landed and discarded catch. The available information has become dated, having been collected more than 10 years ago. While it may be that the fishery has changed little in that time, the information available is not considered adequate to estimate the impact of the UoA on minor primary species with respect to status. SG100 is not met.

Information adequacy for management strategy				
C	Guide post	Information is adequate to support measures to manage main primary species.	Information is adequate to support a partial strategy to manage main primary species.	Information is adequate to support a strategy to manage all primary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Yes	Yes	No
Rationale				

There are no main primary species, therefore SG60 and SG80 are met by default.

Information is not adequate currently to support a strategy to manage Australian herring, the only primary species, and evaluate with a high degree of certainty that the strategy is achieving its objective. SG100 is not met.

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

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Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.1.3 – Primary species information – Sea mullet, haul nets

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impact on main primary species			
	Guide post	Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status.
	Met?	NA	NA	NA
Rationale				

There are no main primary species, therefore this scoring issue is not scored.

Information adequacy for assessment of impact on minor primary species				
b	Guide post	Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.		
	Met?			Yes
Rationale				

Some quantitative information is available on the two minor primary species that comprise landed and discarded catch, and stock status has been evaluated using available data. Some information on species life histories and biology is also available to inform an assessment of UoA impacts.

Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status. SG100 is met.

c Information adequacy for management strategy				
	Guide post	Information is adequate to support measures to manage main primary species.	Information is adequate to support a partial strategy to manage main primary species.	Information is adequate to support a strategy to manage all primary species and evaluate with

				a high degree of certainty whether the strategy is achieving its objective.
	Met?	Yes	Yes	Yes – Blue swimmer crab No – Australian herring
Rationale				

There are no main primary species. Therefore, SG60 and SG80 are met by default.

For blue swimmer crab, stock status indicators are monitored for the stock-specific harvest strategy. Catch landing information and stock status monitoring demonstrates that information is adequate to support a strategy to this primary species and evaluate with a high degree of certainty whether the strategy is achieving its objective. SG100 is met.

Information is not adequate currently to evaluate with a high degree of certainty, that the strategy for Australian herring is achieving its objective. SG100 is not met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

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<https://fish.gov.au/report/220-Australian-Herring-2018> [Accessed 17 February 2021]

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.1.3 – Primary species information – Sea mullet, gill nets

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impact on main primary species			
	Guide post	Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status.
	Met?	NA	NA	NA
Rationale				

There are no main primary species, therefore this scoring issue is not scored.

Information adequacy for assessment of impact on minor primary species				
b	Guide post	Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.		
	Met?			Yes
Rationale				

Some quantitative information is available on minor primary species that comprise landed and discarded catch, and stock status has been evaluated using available data. Some information on species life histories and biology is also available to inform an assessment of UoA impacts.

Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status. SG100 is met.

c Information adequacy for management strategy				
	Guide post	Information is adequate to support measures to manage main primary species.	Information is adequate to support a partial strategy to manage main primary species.	Information is adequate to support a strategy to manage all primary species, and evaluate with

				a high degree of certainty whether the strategy is achieving its objective.
	Met?	Yes	Yes	Yes – Blue swimmer crab No – Australian herring
Rationale				

There are no main primary species. Therefore, SG60 and SG80 are met by default.

For blue swimmer crab, stock status indicators are monitored for the stock-specific harvest strategy. Catch landing information and stock status monitoring demonstrates that information is adequate to support a strategy to this primary species and evaluate with a high degree of certainty whether the strategy is achieving its objective. SG100 is met.

Information is not adequate currently to evaluate with a high degree of certainty, that the strategy for Australian herring is achieving its objective. SG100 is not met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

<https://fish.gov.au/report/220-Australian-Herring-2018> [Accessed 17 February 2021]

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.2.1 – Secondary species outcome – Blue swimmer crab, crab pots

PI 2.2.1	The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit		
Scoring Issue	SG 60	SG 80	SG 100

Main secondary species stock status				
a	Guide post	Main secondary species are likely to be above biologically based limits.	Main secondary species are highly likely to be above biologically based limits.	There is a high degree of certainty that main secondary species are above biologically based limits.
		OR	OR	
		If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.	If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding. AND Where catches of a main secondary species outside of biological limits are considerable , there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that have considerable catches of the species , to ensure that they collectively do not hinder recovery and rebuilding.	
	Met?	Yes	Yes	No
Rationale				

There is one main secondary species, used as bait in this UoA.

Yelloweye mullet: The CMSY method is used to evaluate the status of this stock, based on a time series of catch information. Harvest rate is reported to have been below the level commensurate with MSY for at least 10 years. Over the five years to 2018, this species' biomass was considered to be between the limit (20% unfished biomass) and target (40% unfished biomass) reference points. SG60 and SG80 are met.

As yet, the results of the CMSY analysis have been reported in summary form, but not published in detail. Therefore, it cannot be concluded that there is a high degree of certainty that main secondary species are above biologically based limits. SG100 is not met. This will be explored further at the site visit.

Minor secondary species stock status		
b	Guide post	Minor secondary species are highly likely to be above biologically based limits.
		OR
		If below biologically based limits', there is evidence that the UoA does not hinder the recovery and

			rebuilding of secondary species
Met?			Yes
Rationale			

Estuary cobbler: The CMSY method is used to derive estimates of relative biomass in relation to MSY and harvest rate for cobbler. Currently, the stock is estimated to be above the limit biomass (20% unfished biomass) and below the target biomass (40% unfished biomass). The CMSY evaluation has not been published, and only summary findings are reported. However, the small amount of catch reported from this UoA provides further evidence that the UoA would not hinder recovery and rebuilding. SG100 is met.

Stock status of other minor secondary species in relation to biological limits is unknown. However, given low level of catch in the UoA and the widespread nature of these stocks relative the Estuary fishery, the UoA would not hinder recovery and rebuilding. SG100 is met.

References

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

<https://fish.gov.au/report/187-Estuary-Cobbler-2018> [Accessed 17 February 2021]

<https://fish.gov.au/report/240-Yelloweye-Mullet-2018> [Accessed 17 February 2021]

Draft scoring range	≥80
Information gap indicator	More information sought <i>Detailed results of evaluations of stock status for yelloweye mullet and estuary cobbler.</i>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.2.1 – Secondary species outcome – Blue swimmer crab, drop net

PI 2.2.1		The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit		
Scoring Issue		SG 60	SG 80	SG 100
a	Main secondary species stock status			
	Guide post	Main secondary species are likely to be above biologically based limits.	Main secondary species are highly likely to be above biologically based limits.	There is a high degree of certainty that main secondary species are above biologically based limits.
		OR If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.	OR If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding. AND Where catches of a main secondary species outside of biological limits are considerable , there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that have considerable catches of the species , to ensure that they collectively do not hinder recovery and rebuilding.	
	Met?	NA	NA	NA
Rationale				

There are no main secondary species, so this scoring issue is not applicable.

		Minor secondary species stock status		
b	Guide post	Minor secondary species are highly likely to be above biologically based limits.		
		OR If below biologically based limits', there is evidence that the UoA does not hinder the recovery and		

			rebuilding of secondary species
	Met?		Yes
Rationale			

Stock status of minor secondary species in relation to biological limits is unknown. However, given low level of catch in the UoA and the broad distribution of stocks relative to the UoA, the UoA would not hinder recovery and rebuilding. SG100 is met.

References

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.2.1 – Secondary species outcome – Blue swimmer crab, scoop nets

PI 2.2.1		The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit		
Scoring Issue		SG 60	SG 80	SG 100
a	Main secondary species stock status			
	Guide post	<p>Main secondary species are likely to be above biologically based limits.</p> <p>OR</p> <p>If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.</p>	<p>Main secondary species are highly likely to be above biologically based limits.</p> <p>OR</p> <p>If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding.</p> <p>AND</p> <p>Where catches of a main secondary species outside</p>	<p>There is a high degree of certainty that main secondary species are above biologically based limits.</p>

		of biological limits are considerable , there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that have considerable catches of the species , to ensure that they collectively do not hinder recovery and rebuilding.		
	Met?	NA	NA	NA
Rationale				

There are no main secondary species, so this scoring issue is not applicable.

Minor secondary species stock status				
b	Guide post	Minor secondary species are highly likely to be above biologically based limits.		
		OR		
		If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species		
	Met?			Yes
Rationale				

Stock status of minor secondary species in relation to biological limits is unknown. However, given low level of catch in the UoA and the widespread nature of these stocks relative to the UoA, the UoA would not hinder recovery and rebuilding. SG100 is met.

References

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report stage	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.2.1 – Secondary species outcome – Sea mullet, haul nets

PI 2.2.1		The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit		
Scoring Issue		SG 60	SG 80	SG 100
a	Main secondary species stock status			
	Guide post	<p>Main secondary species are likely to be above biologically based limits.</p> <p>OR</p> <p>If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.</p>	<p>Main secondary species are highly likely to be above biologically based limits.</p> <p>OR</p> <p>If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding.</p> <p>AND</p> <p>Where catches of a main secondary species outside of biological limits are considerable, there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding.</p>	<p>There is a high degree of certainty that main secondary species are above biologically based limits.</p>
		Met?	Yes – All main species	Yes – Yelloweye mullet No – Yellowfin whiting, Perth herring
Rationale				

Yelloweye mullet: The CMSY method is used to evaluate the status of this stock, based on a time series of catch information. As yet, the results of the CMSY analysis have been reported in summary form, but not published in detail. Over the five years to 2018, this species' biomass was considered to be between the limit (20% unfished biomass) and target (40% unfished biomass) reference points. Harvest rate is reported to have been below the level commensurate with MSY for at least 10 years. SG60 and SG80 are met. With currently available information, SG100 is not met. However, this will be explored further at the site visit.

Yellowfin whiting: Above average yellowfin whiting catches were recorded in 2014 and 2015, as a result of strong recruitment. Catch declined in 2018 but 2019 catch of 15.8 t exceeded the threshold level (set at 13.8 t). An age-based assessment of the stock was undertaken. Its key finding was that yellowfin whiting abundance in the Estuary fluctuates due to variable recruitment between years. A

"soft trigger" of 10 t was set in 2020, and 12 t was identified as the catch tolerance level. Current fishing pressure is considered to be sustainable, based on evidence including a catch curve and per-recruit assessment of 2015 and 2016 age composition data. SG60 is met. Based on currently available information it is unclear whether SG80 is met, and this will be explored further at the site visit. (It is noted that reporting on the age-based assessment undertaken was in progress at the fourth surveillance audit of the previous certificate). SG100 is not met.

Perth herring: This species is anadromous, spawning in rivers then returning to the sea. Commercially harvested fish are on their pre-spawning migration. The species' anadromous life history contributes to its vulnerability to fishing pressure. Environmental degradation has affected spawning and nursery areas. Total mortality of the Peel-Harvey Estuary stock has been estimated at three times the unexploited stock occurring in the Swan-Canning Estuary, using age structure data.

The target catch for this species is < 2.7 t, and this target was met in 2019. In 2017 and 2018, higher catches occurred, including catch exceeding the threshold level in 2017. The risks associated with the cumulative impact of the Estuary fishery, and the impact of commercial net fishing, are assessed as High for this stock. Additional measures to reduce this risk are considered necessary by DPIRD. Risks from other fishing methods are considered Negligible.

The stock status in relation to biologically-based limits is unknown. However, measures have been introduced to reduce catches (and additional measures are in development).

SG60 appears to be met based on currently available information, and this will be explored further during the site visit. SG80 and SG100 are not met.

The Risk Based Framework may be used to assess main secondary species.

Minor secondary species stock status			
b	Guide post		Minor secondary species are highly likely to be above biologically based limits. OR If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	Met?		Yes
Rationale			

For estuary cobbler, the CMSY method is used to derive estimates of relative biomass in relation to MSY and harvest rate. Currently, the stock is estimated to be above the limit biomass (20% unfished biomass) and below the target biomass (40% unfished biomass). The CMSY evaluation has not been published, and summary findings are reported.

Stock status of other minor secondary species in relation to biological limits is unknown. However, given low level of catch in the UoA of most secondary species, the UoA would not hinder recovery and rebuilding. For tailor, recruitment appears to have been stable for around 20 years. King George whiting appears not to have been assessed recently but occurs widely outside the Estuary. Overall, it appears that minor secondary species are highly likely to be above biologically based limits, and/or there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species. SG100 is met.

The Risk Based Framework may be used to assess minor secondary species, or, they may not be assessed (MSC FCP PF4.1.4).

References

Daume, S. and Hartmann, K. 2021. Western Australia Peel Harvey Estuarine Fishery Surveillance Report. Fourth surveillance. Bio.inspecta.

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Gaughan, D.J. and Santoro, K. (eds). 2020. Status Reports of the Fisheries and Aquatic Resources of Western Australia 2018/19: The State of the Fisheries. Department of Primary Industries and Regional Development, Western Australia.

<https://fish.gov.au/report/187-Estuary-Cobbler-2018> [Accessed 17 February 2021]

<https://fish.gov.au/report/215-Tailor-2018> [Accessed 17 February 2021]

<https://fish.gov.au/report/240-Yelloweye-Mullet-2018> [Accessed 17 February 2021]

Draft scoring range	60-79
Information gap indicator	More information sought <i>Additional information relevant to stock status of main secondary species (scoring issue (a)).</i>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.2.1 – Secondary species outcome – Sea mullet, gill nets

PI 2.2.1		The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit		
Scoring Issue		SG 60	SG 80	SG 100
a	Main secondary species stock status			
	Guide post	Main secondary species are likely to be above biologically based limits. OR If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.	Main secondary species are highly likely to be above biologically based limits. OR If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding. AND Where catches of a main secondary species outside of biological limits are considerable , there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that have considerable catches of the species , to ensure that they collectively do not hinder recovery and rebuilding.	There is a high degree of certainty that main secondary species are above biologically based limits.
		Met?	Yes – All main species	Yes – Yelloweye mullet, Estuary cobbler No – Yellowfin whiting, Perth herring
	Rationale			

Yelloweye mullet: The CMSY method is used to evaluate the status of this stock, based on a time series of catch information. As yet, the results of the CMSY analysis have been reported in summary form, but not published in detail. Over the five years to 2018, this species' biomass was considered to be between the limit (20% unfished biomass) and target (40% unfished biomass) reference points. Harvest rate is reported to have been below the level commensurate with MSY for at least 10 years. SG60 and SG80 are met. With currently available information, SG100 is not met. However, this will be explored further at the site visit.

Estuary cobbler: The CMSY method is used to derive estimates of relative biomass in relation to MSY and harvest rate for cobbler. Currently, the stock is estimated to be above the limit biomass (20% unfished biomass) and below the target biomass (40% unfished biomass). The CMSY evaluation has not been published, and summary findings are reported. Catch rate and amount are the stock performance indicators with target values of annual commercial catch rate >6 kg/day and annual commercial catch <9 t. In 2018 and 2019, both indicators were within the target range. The stock

appears stable in the Peel-Harvey Estuary, though historical declines occurred in all west coast estuaries as a result of overexploitation and environmental degradation. SG60 and SG80 are met. Based on currently available information, it is not possible to determine whether SG100 is not met.

Yellowfin whiting: Above average yellowfin whiting catches were recorded in 2014 and 2015, as a result of strong recruitment. Catch declined in 2018 but 2019 catch of 15.8 t exceeded the threshold level (set at 13.8 t). An age-based assessment of the stock was undertaken. Its key finding was that yellowfin whiting abundance in the Estuary fluctuates due to variable recruitment between years. A "soft trigger" of 10 t was set in 2020, and 12 t was identified as the catch tolerance level. Current fishing pressure is considered to be sustainable, based on evidence including a catch curve and per-recruit assessment of 2015 and 2016 age composition data. SG60 is met. Based on currently available information it is unclear whether SG80 is met, and this will be explored further at the site visit. (It is noted that reporting on the age-based assessment undertaken was in progress at the fourth surveillance audit of the previous certificate). SG100 is not met.

Perth herring: This species is anadromous, spawning in rivers then returning to the sea. Commercially harvested fish are on their pre-spawning migration. The species' anadromous life history contributes to its vulnerability to fishing pressure. Environmental degradation has affected spawning and nursery areas. Total mortality of the Peel-Harvey Estuary stock has been estimated at three times the unexploited stock occurring in the Swan-Canning Estuary, using age structure data.

The target catch for this species is < 2.7 t, and this target was met in 2019. In 2017 and 2018, higher catches occurred, including catch exceeding the threshold level in 2017. The risks associated with the cumulative impact of the Estuary fishery, and the impact of commercial net fishing, are assessed as High for this stock. Additional measures to reduce this risk are considered necessary by DPIRD. Risks from other fishing methods are considered Negligible.

The stock status in relation to biologically-based limits is unknown. However, measures have been introduced to reduce catches (and additional measures are in development). SG60 appears to be met based on currently available information, and this will be explored further during the site visit. SG80 and SG100 are not met.

The Risk Based Framework may be used to assess main secondary species.

Minor secondary species stock status			
b	Guide post		Minor secondary species are highly likely to be above biologically based limits. OR If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	Met?		Yes
Rationale			

Stock status of minor secondary species in relation to biological limits is unknown. However, given low level of catch in the UoA of most secondary species, the UoA would not hinder recovery and rebuilding. For tailor, recruitment appears to have been stable for around 20 years. Among discarded minor secondary species, silver bream and common blowfish contribute the most to catch (by number).

These species' range extends well beyond the Estuary. Other species comprise very small proportions of catch.

Overall, it appears that minor secondary species are highly likely to be above biologically based limits, and/or there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species. SG100 is met.

The Risk Based Framework may be used to assess minor secondary species, or, they may not be assessed (MSC FCP PF4.1.4).

References

Daume, S. and Hartmann, K. 2021. Western Australia Peel Harvey Estuarine Fishery Surveillance Report. Fourth surveillance. Bio.inspecta.

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Gaughan, D.J. and Santoro, K. (eds). 2020. Status Reports of the Fisheries and Aquatic Resources of Western Australia 2018/19: The State of the Fisheries. Department of Primary Industries and Regional Development, Western Australia.

<https://fish.gov.au/report/187-Estuary-Cobbler-2018> [Accessed 17 February 2021]

<https://fish.gov.au/report/215-Tailor-2018> [Accessed 17 February 2021]

<https://fish.gov.au/report/240-Yelloweye-Mullet-2018> [Accessed 17 February 2021]

Draft scoring range	60-79
Information gap indicator	More information sought <i>Additional information relevant to stock status of main secondary species (scoring issue (a)).</i>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.2.2 – Secondary species management strategy – Blue swimmer crab, crab pots

PI 2.2.2		There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a partial strategy in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a strategy in place for the UoA for managing main and minor secondary species.
	Met?	Yes	Yes	Yes
Rationale				

Main secondary species: A target catch has been identified for yelloweye mullet (used as bait by the UoA), and a level of catch commensurate with MSY. The harvest strategy is risk-based, with a target reference level commensurate with Medium or lower risk to species populations, a threshold of a potentially material change to risk level, or, a High risk to species populations, and a limit of severe risk. In turn, if the threshold is reached, a review would be completed within 3 months, and a management response implemented to reduce the risk level to Medium or lower as soon as practicable. An immediate management response is triggered if the limit reference level is reached. Management measures in place for sea mullet also act to restrain catch of this species. (The UoA does not implement the finfish harvest strategy designed for sea mullet target fishing, but operates within it). SG60, SG80 and SG100 are met.

Minor secondary species: The blue swimmer crab harvest strategy describes the UoA management approach to minor secondary species. This is risk based, with target (fishing impacts generate an acceptable, i.e. medium for lower risk level), threshold (a potentially material change to risk level is identified, or, fishing impacts are considered to generate a high risk to species populations) and limit reference levels (fishing impacts are considered to generate an unacceptable (severe) level of risk). At or in excess of threshold reference levels, a review would be completed within 3 months, and a management response implemented to reduce the risk level to Medium or lower as soon as practicable. On reaching a limit reference level, an immediate management response is triggered with actions to reduce the risk as soon as practicable. SG100 is met.

Management strategy evaluation			
b			
	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or	There is some objective basis for confidence that the measures/partial strategy will work, based on some information
			Testing supports high confidence that the partial strategy/strategy will work, based on information directly about

		comparison with similar UoAs/species).	directly about the UoA and/or species involved.	the UoA and/or species involved.
	Met?	Yes	No	No
Rationale				

For yelloweye mullet, the duration of the review period is specified in the 2020 – 2025 finfish harvest strategy. (This species is classified as a retained species under the finfish harvest strategy). However, the timeframe for implementing management responses is “*as soon as practicable*” for breaches of the threshold reference level. For breaches of the limit reference level, the control rule requires “*an immediate management response to reduce the risk to an acceptable level as soon as practicable*”. SG60 is met for this species, i.e. the measures are considered likely to work based on plausible argument. Given time lags evident in fishery management when thresholds were breached previously (for sea mullet), an objective basis for confidence that the measures/partial strategy will work is not evident, based on some information directly about the fishery and/or species involved. SG80 is not met.

For main and minor secondary species, testing has not occurred to support high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved. SG100 is not met.

Management strategy implementation				
C	Guide post		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) .
	Met?		Yes	No – Yelloweye mullet Yes – Minor species
Rationale				

For yelloweye mullet, the harvest rate is considered to have been below the level commensurate with MSY for at least 10 years. The assessed risk to this species of the Estuary fishery was considered Low in the 2020 assessment. The risk level meets the requirements of the finfish harvest strategy. There is some evidence that the measures/partial strategy is being implemented successfully. SG80 is met. Available information characterises the stock status as between the limit and target reference points. There is not clear evidence that the partial strategy/strategy is both being implemented successfully and is achieving its objective as set out in scoring issue (a). SG100 is not met.

The harvest strategy for blue swimmer crab was updated in 2020 and is set out to apply through 2025. Catches of minor secondary species are very low and monitoring occurred recently. It is concluded that for minor secondary species, there is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a). SG100 is met.

Shark finning				
d	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NA	NA	NA
Rationale				

There are no secondary species that are sharks.

Review of alternative measures to minimise mortality of unwanted catch				
e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all secondary species, and they are implemented, as appropriate.
	Met?	NA	NA	NA
Rationale				

Yelloweye mullet comprised 6% and 54% of discarded catch items (by number) in UoAs 4 and 5 respectively. For the haul net fishery (UoA4), this unwanted catch is considered negligible and not scored (6% of items among an estimated unwanted catch volume of 0.6% of total catch).

For the gill net fishery (UoA5), unwanted catch was higher (an estimated 1.5% of total catch volume) and less likely to be released alive. Overall however, the retained catch volume of the gill net fishery has declined substantially in the last decade, to 6.9 t in 2018 and 1.1 t in 2019. At that level of total catch, unwanted catch of secondary species is considered negligible, and this scoring issue is not scored.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

<https://fish.gov.au/report/240-Yelloweye-Mullet-2018> [Accessed 17 February 2021]

Draft scoring range	60-79
Information gap indicator	More information sought <i>Additional information on unwanted catch of yelloweye mullet in the gill net fishery, in relation to total catch and effort in that fishery (scoring issue (e)).</i>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.2.2 – Secondary species management strategy – Blue swimmer crab, drop nets

PI 2.2.2		There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a partial strategy in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a strategy in place for the UoA for managing main and minor secondary species.
	Met?	Yes	Yes	Yes
Rationale				

There are no main secondary species. Therefore, SG60 and SG80 are met by default.

The blue swimmer crab harvest strategy describes the UoA management approach to minor secondary species. This is risk based, with target (fishing impacts generate an acceptable, i.e. medium for lower risk level), threshold (a potentially material change to risk level is identified, or, fishing impacts are considered to generate a high risk to species populations) and limit reference levels (fishing impacts are considered to generate an unacceptable (severe) level of risk). At or in excess of threshold reference levels, a review would be completed within 3 months, and a management response implemented to reduce the risk level to Medium or lower as soon as practicable. On reaching a limit reference level, an immediate management response is triggered with actions to reduce the risk as soon as practicable. SG100 is met.

Management strategy evaluation				
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
	Met?	Yes	Yes	No
Rationale				

There are no main secondary species, therefore SG60 and SG80 are met by default.

For minor secondary species, testing has not occurred to support high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved. SG100 is not met.

Management strategy implementation				
C	Guide post		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) .
	Met?		Yes	No
Rationale				

There are no main secondary species, therefore SG80 is met by default.

The harvest strategy for blue swimmer crab was updated in 2020 and is set out to apply through 2025. Assessed risk levels for minor secondary species currently meet the requirements of the harvest strategy (i.e. all are medium or lower). However, it is unclear whether there was any new evidence available to be considered (e.g. UoA catch and bait use information) when the risk assessment was updated in 2020.

It is concluded that for minor secondary species, there is not clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a). SG100 is not met.

Shark finning				
d	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NA	NA	NA
Rationale				

There are no secondary species that are sharks.

Review of alternative measures to minimise mortality of unwanted catch				
e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all secondary species, and they are implemented, as appropriate.
	Met?	Yes	Yes	No
Rationale				

There are no main secondary species. SG60 and SG80 are met by default.

There has not been a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of minor secondary species. Most appear to be bycaught at negligible levels and would not be scored, with the possible exception of tailor (made on a precautionary basis, noting that a small amount of dated information is available on catch composition and bait use). SG100 is not met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Draft scoring range

≥80

Information gap indicator

Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score

Condition number (if relevant)

PI 2.2.2 – Secondary species management strategy – Blue swimmer crab, scoop nets

PI 2.2.2

There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch

Scoring Issue

SG 60

SG 80

SG 100

a Management strategy in place

Guide post

There are **measures** in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.

There is a **partial strategy** in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.

There is a **strategy** in place for the UoA for managing main and minor secondary species.

Met?

Yes

Yes

Yes

Rationale

There are no main secondary species. Therefore, SG60 and SG80 are met by default.

The blue swimmer crab harvest strategy describes the UoA management approach to minor secondary species. This is risk based, with target (fishing impacts generate an acceptable, i.e. medium for lower risk level), threshold (a potentially material change to risk level is identified, or, fishing impacts are considered to generate a high risk to species populations) and limit reference levels (fishing impacts are considered to generate an unacceptable (severe) level of risk). At or in excess of threshold reference levels, a review would be completed within 3 months, and a management response implemented to reduce the risk level to Medium or lower as soon as practicable. On reaching a limit reference level, an immediate management response is triggered with actions to reduce the risk as soon as practicable. SG100 is met.

Management strategy evaluation				
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
	Met?	Yes	Yes	No
Rationale				

There are no main secondary species, therefore SG60 and SG80 are met by default.

For minor secondary species, testing has not occurred to support high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved. SG100 is not met.

Management strategy implementation				
c	Guide post		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) .
	Met?		Yes	No
Rationale				

There are no main secondary species, therefore SG80 is met by default.

The harvest strategy for blue swimmer crab was updated in 2020 and is set out to apply through 2025. Assessed risk levels for minor secondary species currently meet the requirements of the harvest strategy (i.e. all are medium or lower). However, it is unclear whether there was any new evidence available to be considered (e.g. UoA catch and bait use information) when the risk assessment was updated in 2020. It is concluded that there is not clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a). SG100 is not met.

d Shark finning

	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NA	NA	NA

Rationale

There are no secondary species that are sharks.

Review of alternative measures to minimise mortality of unwanted catch

e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all secondary species, and they are implemented, as appropriate.
	Met?	Yes	Yes	No

Rationale

There are no main secondary species.

There has not been a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of minor secondary species. Based on the information available, tailor appear to be bycaught at negligible levels and would not be scored. However, scoring is conducted here on a precautionary basis for common blowfish, noting that a small amount of dated information is available on catch composition. SG100 is not met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Johnston, D.J., Smith, K.A., Brown, J.I., Travaille, K.L., Crowe, F., Oliver, R.K. and Fisher, E.A. 2015. Western Australian Marine Stewardship Council Report Series No. 3: West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Department of Fisheries, Western Australia.

Draft scoring range

≥80

Information gap indicator

Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score

Condition number (if relevant)

PI 2.2.2 – Secondary species management strategy – Sea mullet, haul nets

PI 2.2.2		There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a partial strategy in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a strategy in place for the UoA for managing main and minor secondary species.
	Met?	Yes	Yes	Yes
Rationale				

Main and minor secondary species are managed under the finfish harvest strategy is risk-based, with a target reference level commensurate with Medium or lower risk to species populations, a threshold of a potentially material change to risk level or a High risk to species populations, and a limit reference level of severe risk. If the threshold reference level is reached, a review would be completed within 3 months, and a management response implemented to reduce the risk level to Medium or lower as soon as practicable. An immediate management response is triggered if the limit reference level is reached and implemented as soon as practicable. Management measures in place (limited entry for commercial fishers, effort restrictions, gear restrictions, spatial and temporal closures) act to restrain catch of primary species, though measures are not designed specifically for them.

A target catch has been identified for yelloweye mullet (used as bait by the UoA), and a level of catch commensurate with MSY.

An age-based assessment of the stock of yellowfin whiting was undertaken after catches above threshold levels occurred (most recently in 2019). Its key finding was that yellowfin whiting abundance in the Estuary fluctuates due to variable recruitment between years. A "soft trigger" of 10 t was set in 2020, and 12 t was identified as the catch tolerance level. The harvest strategy states that DPIRD will meet with stakeholders in-season if the trigger is reached, to explore the appropriateness of the 12 t tolerance level for that season (considering fishing and environmental factors). If catch in excess of a tolerance level occurs without being accounted for (e.g. by environmental impacts or arrangements between fishing sectors), fishery performance is deemed unacceptable. A review of management arrangements is triggered and the need for a review of stock status, HCR, and/or tolerance levels is considered. There is a strategy in place for this main secondary species.

Perth herring also falls within the finish harvest strategy, as a retained species. The 2020 risk assessment concluded that the UoA risk to the Perth herring was High, noting also its inherent vulnerability due to life history characteristics and environmental degradation. This risk rating has therefore triggered a management review (completed within 3 months), and the implementation of an appropriate management response as soon as practicable.

For all main species, SG60, SG80 and SG100 are met.

Minor secondary species would be managed as retained or bycatch species under the finfish harvest strategy, following the risk-based management approach set out above. SG100 is met.

Management strategy evaluation				
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
	Met?	Yes	No	No
Rationale				

The 2020 – 2025 finfish harvest strategy specifies the duration of the review period, when a review is to be undertaken in response to the breach of threshold or limit reference level. However, the timeframe for implementing management responses is “*as soon as practicable*” for breaches of the threshold reference level. For breaches of the limit reference level, the control rule requires “*an immediate management response to reduce the risk to an acceptable level as soon as practicable*”. SG60 is met, i.e. the measures are considered likely to work based on plausible argument. However, given time lags evident in fishery management when thresholds were breached previously (for sea mullet), an objective basis for confidence that the measures/partial strategy will work is not evident, based on some information directly about the fishery and/or species involved. SG80 is not met.

Testing has not occurred to an extent that there is high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved. SG100 is not met.

Management strategy implementation				
c	Guide post		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) .
	Met?		Yes	No
Rationale				

While there have been time lags in implementing management actions (see scoring issue (b)), there are examples sufficient to provide some some evidence that the measures/partial strategy is being implemented successfully.

In response to catches of yellowfin herring in excess of the threshold, an age-based assessment of the stock was undertaken. A “soft trigger” of 10 t was set in 2020, and 12 t was identified as the catch tolerance level. The harvest strategy sets out provisions for in-season actions if the soft trigger is reached. Then, if catch in excess of a tolerance level (which is higher than a trigger) occurs without being accounted for, fishery performance is deemed unacceptable and another set of actions is rolled out.

Similarly, for Perth herring, recent developments show the management approach responding as stated in the strategy. A risk level of High in the 2020 risk assessment led to the requirement for additional management measures to reduce risk to the stock. Those measures must now be progressed in a timely manner.

There is some evidence that the measures/partial strategy is being implemented successfully. SG60 and SG80 are met.

As yet, there is not clear evidence that the strategy is being implemented successfully for all main and minor secondary species and is achieving its objective as set out in scoring issue (a). SG100 is not met.

Shark finning				
d	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NA	NA	NA
Rationale				

There are no secondary species that are sharks.

Review of alternative measures to minimise mortality of unwanted catch				
e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all secondary species, and they are implemented, as appropriate.
	Met?	NA	NA	NA
Rationale				

Unwanted catch of secondary species for this UoA is negligible. (Unwanted catch of all primary and secondary species comprised an estimated 0.6% of total catch). Therefore, this scoring issue is not scored.

References

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

<https://fish.gov.au/report/240-Yelloweye-Mullet-2018> [Accessed 17 February 2021]

Draft scoring range	60-79
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.2.2 – Secondary species management strategy – Sea mullet, gill nets

PI 2.2.2		There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a partial strategy in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a strategy in place for the UoA for managing main and minor secondary species.
	Met?	Yes	Yes	Yes
Rationale				

Main and minor secondary species are managed under the finfish harvest strategy is risk-based, with a target reference level commensurate with Medium or lower risk to species populations, a threshold of a potentially material change to risk level or a High risk to species populations, and a limit reference level of severe risk. If the threshold reference level is reached, a review would be completed within 3 months, and a management response implemented to reduce the risk level to Medium or lower as soon as practicable. An immediate management response is triggered if the limit reference level is reached, and implemented as soon as practicable. Management measures in place (limited entry for commercial fishers, effort restrictions, gear restrictions, spatial and temporal closures) act to restrain catch of primary species, though measures are not designed specifically for them.

A target catch has been identified for yelloweye mullet (used as bait by the UoA), and a level of catch commensurate with MSY.

The estuary cobbler stock is estimated to be above the limit biomass (20% unfished biomass) and below the target biomass (40% unfished biomass). Catch rate and amount are the stock performance indicators with target values of annual commercial catch rate >6 kg/day and annual commercial catch <9 t. In 2018 and 2019, both indicators were within the target range.

An age-based assessment of the stock of yellowfin whiting was undertaken after catches above threshold levels occurred (most recently in 2019). Its key finding was that yellowfin whiting abundance in the Estuary fluctuates due to variable recruitment between years. A "soft trigger" of 10 t was set in 2020, and 12 t was identified as the catch tolerance level. The harvest strategy states that DPIRD will meet with stakeholders in-season if the trigger is reached, to explore the appropriateness of the 12 t tolerance level for that season (considering fishing and environmental factors). If catch in excess of a tolerance level occurs without being accounted for (e.g. by environmental impacts or arrangements between fishing sectors), fishery performance is deemed unacceptable. A review of management arrangements is triggered and the need for a review of stock status, HCR, and/or tolerance levels is considered. There is a strategy in place for this main secondary species.

For Perth herring, the 2020 risk assessment concluded that the UoA risk was High, noting also the species' inherent vulnerability due to life history characteristics and environmental degradation. This risk rating has therefore triggered a management review (completed within 3 months), and the implementation of an appropriate management response as soon as practicable. Progress of the management review will be investigated at the site visit.

For all main species, SG60, SG80 and SG100 are met.

Minor secondary species would be managed as retained or bycatch species under the finfish harvest strategy, following the risk-based management approach set out above. SG100 is met.

Management strategy evaluation				
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
	Met?	Yes	No	No
Rationale				

The 2020 – 2025 finfish harvest strategy specifies the duration of the review period, when a review is to be undertaken in response to the breach of threshold or limit reference level. However, the timeframe for implementing management responses is "*as soon as practicable*" for breaches of the threshold reference level. For breaches of the limit reference level, the control rule requires "*an immediate management response to reduce the risk to an acceptable level as soon as practicable*". SG60 is met, i.e. the measures are considered likely to work based on plausible argument. However, given time lags evident in fishery management when thresholds were breached previously (for sea mullet), an objective basis for confidence that the measures/partial strategy will work is not evident, based on some information directly about the fishery and/or species involved. SG80 is not met.

Testing has not occurred to an extent that there is high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved. SG100 is not met.

Management strategy implementation		
c	Guide post	There is some evidence that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.
		There is clear evidence that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.

		strategy is being implemented successfully.	strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).
	Met?	Yes	No
Rationale			

While there have been time lags in implementing management actions (see scoring issue (b)), there are examples sufficient to provide some evidence that the measures/partial strategy is being implemented successfully.

In response to catches of yellowfin herring in excess of the threshold, an age-based assessment of the stock was undertaken. A "soft trigger" of 10 t was set in 2020, and 12 t was identified as the catch tolerance level. The harvest strategy sets out provisions for in-season actions if the soft trigger is reached. Then, if catch in excess of a tolerance level (which is higher than a trigger) occurs without being accounted for, fishery performance is deemed unacceptable and another set of actions is rolled out.

Similarly for Perth herring, recent developments show the management approach responding as stated in the strategy. A risk level of High in the 2020 risk assessment led to the requirement for additional management measures to reduce risk to the stock. Those measures must now be progressed in a timely manner.

There is some evidence that the measures/partial strategy is being implemented successfully. SG60 and SG80 are met.

As yet, there is not clear evidence that the strategy is being implemented successfully for all main and minor secondary species, and is achieving its objective as set out in scoring issue (a). SG100 is not met.

Shark finning				
d	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NA	NA	NA
Rationale				

There are no secondary species that are sharks.

Review of alternative measures to minimise mortality of unwanted catch				
e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all secondary species, and they are implemented, as appropriate.

Met?	NA	NA	NA
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Rationale

By weight, unwanted catch discarded in UoA 5 comprised an estimated 1.5% of total catch, in catch monitoring undertaken in 2017/2018. Yelloweye mullet (a main secondary species) comprised 54% discarded catch items (by number) in the UoA (i.e., 54% of items among an estimated unwanted catch volume of 1.5% of total catch). Among minor secondary species, silver bream and common blowfish comprised 38% and 33% (respectively) of discarded catch.

Overall however, the retained catch volume of the gill net fishery has declined substantially in the last decade, to 6.9 t in 2018 and 1.1 t in 2019. At that level of total catch, and the level of unwanted catch estimated for the fishery, unwanted catch of secondary species is considered negligible, and this scoring issue is not scored.

Unwanted catch in this UoA will be investigated further at the site visit, in the context of the reduced fishing effort in recent years.

References

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Draft scoring range	60-79
Information gap indicator	More information sought <i>Additional information on unwanted catch of yelloweye mullet in the gill net fishery, in relation to total catch and effort in that fishery (scoring issue (e)).</i>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.2.3 – Secondary species information – Blue swimmer crab, crab pots

PI 2.2.3	Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species		
Scoring Issue	SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts on main secondary species		

	Guide post	Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	Some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	Quantitative information is available and adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status.
	Met?	Yes	Yes	No
Rationale				

Yelloweye mullet: Commercial catch data and bait use information are the main quantitative information sources available to assess UoA impacts. Stock status can be estimated (via a data poor assessment method). Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status. SG60 and SG80 are met.

The extent of bait usage comprising this species is unknown (while the amount used in combination with sea mullet has been estimated). Therefore, quantitative information is not available to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status. Bait use by species would be informative in that regard. SG100 is not met.

Information adequacy for assessment of impacts on minor secondary species				
b	Guide post	Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.		
	Met?			Yes
Rationale				

For estuary cobbler, an assessment of stock status has been conducted, and information is available on UoA catch. Some quantitative information is adequate to estimate the impact of the UoA on this minor secondary species with respect to status. SG100 is met.

With the status of other minor secondary species stocks unknown in relation to reference points, fishery-dependent data, life history and biological information inform estimation of the impacts of the UoA. Secondary species are exclusively represented in discard data, with discarding of any species at <0.01% of the total discards (which are almost all the target species, addressed under Principle 1). The four-lobed swimming crab comprised 0.03% of discarded items. Information from the commercial fishery and DPIRD trap monitoring, together with species information is adequate to estimate the impact of the UoA on minor secondary species with respect to status. SG100 is met.

Information adequacy for management strategy				
C	Guide post	Information is adequate to support measures to manage main secondary species.	Information is adequate to support a partial strategy to manage main secondary species.	Information is adequate to support a strategy to manage all secondary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective .
	Met?	Yes	Yes	No
Rationale				

Information on yelloweye mullet, the main secondary species, is adequate to support a partial strategy. Available information includes an evaluation of stock status, commercial catch and some bait use information. SG60 and SG80 are met.

Information is not adequate currently to evaluate, with a high degree of certainty, that a strategy is achieving its objective for secondary species. SG100 is not met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

<https://fish.gov.au/report/187-Estuary-Cobbler-2018> [Accessed 17 February 2021]

<https://fish.gov.au/report/240-Yelloweye-Mullet-2018> [Accessed 17 February 2021]

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.2.3 – Secondary species information – Blue swimmer crab, drop nets

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts on main secondary species			
	Guide post	Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status.	Some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status.	Quantitative information is available and adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status.
		OR	OR	
		If RBF is used to score PI 2.2.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	If RBF is used to score PI 2.2.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	
	Met?	NA	NA	NA
Rationale				

There are no main secondary species. Therefore, this scoring issue is not scored.

Information adequacy for assessment of impacts on minor secondary species				
b	Guide post	Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.		
	Met?			No
Rationale				

The information on catch composition and bait use is dated and may not be representative of the fishery. Quantitative information is not adequate to estimate the impact of the UoA on minor secondary species with respect to status. SG100 is not met.

Information adequacy for management strategy				
c	Guide post	Information is adequate to support measures to manage main secondary species.	Information is adequate to support a partial strategy to manage main secondary species.	Information is adequate to support a strategy to manage all secondary species, and evaluate with a high degree of certainty whether the

		strategy is achieving its objective .		
	Met?	Yes	Yes	No
Rationale				

There are no main secondary species, therefore SG60 and SG80 are met by default.

Information is not adequate currently to evaluate, for minor secondary species, with a high degree of certainty, that the strategy is achieving its objective. SG100 is not met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.2.3 – Secondary species information – Blue swimmer crab, scoop nets

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts on main secondary species			
	Guide post	Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	Some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	Quantitative information is available and adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status.
	Met?	NA	NA	NA
	Rationale			

There are no main secondary species. Therefore, this scoring issue is not scored.

b	Information adequacy for assessment of impacts on minor secondary species			
	Guide post	Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.		
	Met?			No
Rationale				

The information on catch composition is dated and may not be representative of the fishery. Quantitative information is not adequate to estimate the impact of the UoA on minor secondary species with respect to status. SG100 is not met.

c	Information adequacy for management strategy			
	Guide post	Information is adequate to support measures to manage main secondary species.	Information is adequate to support a partial strategy to manage main secondary species.	Information is adequate to support a strategy to manage all secondary species, and evaluate with a high degree of

		certainty whether the strategy is achieving its objective .		
	Met?	Yes	Yes	No
Rationale				

There are no main secondary species, therefore SG60 and SG80 are met by default.

Information is not adequate currently to evaluate, for minor secondary species, with a high degree of certainty, that the strategy is achieving its objective. SG100 is not met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.2.3 – Secondary species information – Sea mullet, haul nets

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts on main secondary species			
	Guide post	Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status.	Some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status.	Quantitative information is available and adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status.
		OR	OR	
		If RBF is used to score PI 2.2.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	If RBF is used to score PI 2.2.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	
	Met?	Yes – All main species	Yes – Yelloweye mullet No – Yellowfin whiting, Perth herring	No
Rationale				

Commercial catch data is the main source of quantitative information available to assess UoA impacts on yelloweye mullet. This is used to assess stock status (via a data poor assessment method). Some quantitative information is available and is adequate to assess the impact of the UoA on this main secondary species with respect to status. SG60 and SG80 are met.

Some quantitative information is available on other secondary main species, though additional information is needed to adequately assess the impact of the UoA with respect to status. For yellowfin whiting, reporting in preparation at the time of the fourth surveillance audit under the previous certificate may provide such information. It is unclear whether such information is available for the Perth herring. SG60 is met, while SG80 is currently not met. This will be investigated at the site visit.

Available quantitative information is not adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status. SG100 is not met.

The Risk Based Framework may be used to assess main secondary species at PI 2.2.1.

b		Information adequacy for assessment of impacts on minor secondary species		
	Guide post	Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.		

Met?			Yes
Rationale			

With the status of minor secondary species stocks unknown in relation to reference points, fishery-dependent data, life history and biological information inform estimation of the impacts of the UoA. Information is adequate to estimate the impact of the UoA on minor secondary species with respect to status. SG100 is met.

Information adequacy for management strategy				
C	Guide post	Information is adequate to support measures to manage main secondary species.	Information is adequate to support a partial strategy to manage main secondary species.	Information is adequate to support a strategy to manage all secondary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective .
	Met?	Yes	Yes	No
Rationale				

A range of information is available on the UoA and main secondary species caught in it (e.g. fishery catch and effort, species life history and some status information, and a significant body of information on the Estuary itself). This is adequate to support a partial strategy to manage main secondary species. SG60 and SG80 are met.

Information is not adequate currently to evaluate with a high degree of certainty that the strategy is achieving its objective. SG100 is not met.

References

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

<https://fish.gov.au/report/187-Estuary-Cobbler-2018> [Accessed 17 February 2021]

<https://fish.gov.au/report/215-Tailor-2018> [Accessed 17 February 2021]

<https://fish.gov.au/report/240-Yelloweye-Mullet-2018> [Accessed 17 February 2021]

Draft scoring range	60-79
Information gap indicator	More information sought <i>Available quantitative information to assess the impact of the UoA on main secondary</i>

species with respect to status (see scoring issue (a)).

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score

Condition number (if relevant)

PI 2.2.3 – Secondary species information – Sea mullet, gill nets

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts on main secondary species			
	Guide post	Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status.	Some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status.	Quantitative information is available and adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status.
		OR	OR	
		If RBF is used to score PI 2.2.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	If RBF is used to score PI 2.2.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	
	Met?	Yes – All main species	Yes – Yelloweye mullet, Estuary cobbler No – Yellowfin whiting, Perth herring	No
Rationale				

Commercial catch data is the main source of quantitative information available to assess UoA impacts on yelloweye mullet and estuary cobbler. This is used to assess stock status (via a data poor assessment method). Some quantitative information is available and is adequate to assess the impact of the UoA on these main secondary species with respect to status. SG60 and SG80 are met.

Some quantitative information is available on other secondary main species, though additional information is needed to adequately assess the impact of the UoA with respect to status. For yellowfin whiting, reporting in preparation at the time of the fourth surveillance audit under the previous certificate may provide this information. It is unclear whether such information is available for the Perth herring. SG60 is met, while SG80 is currently not met. This will be investigated at the site visit.

Available quantitative information is not adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status. SG100 is not met.

The Risk Based Framework may be used to assess main secondary species at PI 2.2.1.

Information adequacy for assessment of impacts on minor secondary species				
b	Guide post			
	Met?			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status. Yes
Rationale				

With the status of minor secondary species stocks unknown in relation to reference points, fishery-dependent data, life history and biological information inform estimation of the impacts of the UoA. Information is adequate to estimate the impact of the UoA on minor secondary species with respect to status. SG100 is met.

Information adequacy for management strategy				
c	Guide post	Information is adequate to support measures to manage main secondary species.	Information is adequate to support a partial strategy to manage main secondary species.	Information is adequate to support a strategy to manage all secondary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective .
	Met?	Yes	Yes	No
Rationale				

A range of information is available on the UoA and main secondary species caught in it (e.g. fishery catch and effort, species life history and some status information, and a significant body of information on the Estuary itself). This is adequate to support a partial strategy to manage main secondary species. SG60 and SG80 are met.

Information is not adequate currently to evaluate with a high degree of certainty that the strategy is achieving its objective. SG100 is not met.

References

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

<https://fish.gov.au/report/187-Estuary-Cobbler-2018> [Accessed 17 February 2021]

<https://fish.gov.au/report/215-Tailor-2018> [Accessed 17 February 2021]

<https://fish.gov.au/report/240-Yelloweye-Mullet-2018> [Accessed 17 February 2021]

Draft scoring range

60-79

Information gap indicator

More information sought

Available quantitative information to assess the impact of the UoA on main secondary species with respect to status (see scoring issue (a)).

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score

Condition number (if relevant)

PI 2.3.1 – ETP species outcome – Blue swimmer crab, crap pots

PI 2.3.1		The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Effects of the UoA on population/stock within national or international limits, where applicable			
	Guide post	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/ stock are known and likely to be within these limits.	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs on the population /stock are known and highly likely to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits.
	Met?	NA	NA	NA
Rationale				

There are no applicable national or international limits. This scoring issue is not applicable.

b	Direct effects			
	Guide post	Known direct effects of the UoA are likely to not hinder recovery of ETP species.	Direct effects of the UoA are highly likely to not hinder recovery of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
	Met?	Yes	Yes	Yes
Rationale				

Commercial fishers are required to report ETP interactions by law. DPIRD monitoring has also occurred in this UoA. One cormorant has been recovered from a crab pot during DPIRD monitoring. No other ETP interactions are known. There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species. SG60, SG80 and SG100 are met.

Indirect effects				
C	Guide post		Indirect effects have been considered for the UoA and are thought to be highly likely to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the UoA on ETP species.
	Met?		Yes	Yes
Rationale				

Indirect effects of the UoA on ETP include effects of removal of fished species and reduced habitat suitability for ETP (including through altered availability of prey organisms). Sustainable management of target, primary and secondary species, and limited habitat impacts reduce the likelihood of such effects.

Disturbance of birds (especially threatened migratory shorebirds) has been identified as an issue in the Estuary. However, commercial trap fishers are boat-based, and commercial capacity is currently limited to six licences. Traps can only be pulled once every 24 h period and are removed during seasonal and weekend closures. Further, the relatively slower speeds that vessels are reported to travel at are considered likely to reduce disturbance to birds associated with this UoA. The 2020 risk assessment concluded that impacts of disturbance of this UoA were negligible.

There is a high degree of confidence that there are no significant detrimental indirect effects of the UoA on ETP species. SG80 and SG100 are met.

References

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Graff, J. 2019. Shorebird disturbance on the Peel-Harvey Estuary. BirdLife Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.3.1 – ETP species outcome – Blue swimmer crab, drop nets

PI 2.3.1		The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Effects of the UoA on population/stock within national or international limits, where applicable			
	Guide post	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/ stock are known and likely to be within these limits.	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs on the population /stock are known and highly likely to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits.
	Met?	NA	NA	NA
Rationale				

There are no applicable national or international limits. This scoring issue is not applicable.

Direct effects				
b	Guide post	Known direct effects of the UoA are likely to not hinder recovery of ETP species.	Direct effects of the UoA are highly likely to not hinder recovery of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
	Met?	Yes	Yes	No
Rationale				

There is no qualitative or quantitative information about drop net interactions with ETP species. However, given similarities in gear design, it is reasonable to assume similar modes of interaction as would occur with commercial crab pots. Information from the commercial pot fishery, together with the short time that drop nets are typically deployed underwater (10-15 minutes), and the findings of an ecological risk assessment, supports the conclusion that direct effects of the UoA are highly likely to not hinder recovery of ETP species. SG60 and SG80 are met. There is not a high degree of confidence, and SG100 is not met.

C	Indirect effects			
	Guide post		Indirect effects have been considered for the UoA and are thought to be highly likely to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the UoA on ETP species.
	Met?		No	No
Rationale				

Indirect effects of the UoA on ETP include any effects of the removal of fished species and reduced habitat suitability for ETP (including through altered availability of prey organisms). Sustainable management of target, primary and secondary species, and limited habitat impacts would reduce the likelihood of such effects.

Disturbance of birds (especially threatened migratory shorebirds) has been identified as problematic in the Estuary. No crabbing is permitted 1 September – 30 November, which reduces disturbance during the arrival of migratory shorebirds at the estuary. Drop net fishing occurs from vessels in deeper parts of the estuary, or sometimes jetties and bridges. The 2020 risk assessment concluded that impacts of disturbance of this UoA were Negligible, based on vessels travelling slower in shallow waters and not approaching birds sufficiently close that disturbance occurs. However, boating is identified as the main source of disturbances to shorebirds in the Estuary (boating defined as “*use of powered or sailing vessels, generally where the purpose was transiting through the study area*” (Graff 2019)), and the risk assessment notes that drop net and scoop net fishers’ activities were documented creating disturbances affecting shorebirds. Further information is sought to clarify the potential disturbance to birds resulting from drop net fishing, including associated recreational fishing vessels (as a subset of the vessels on the Estuary). SG80 is not met based on current information.

There is not a high degree of confidence that there are no significant detrimental indirect effects of the UoA on ETP species. SG100 is not met.

References

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Graff, J. 2019. Shorebird disturbance on the Peel-Harvey Estuary. BirdLife Western Australia.

Draft scoring range	60-79
Information gap indicator	More information sought <i>Further information is sought to clarify the potential disturbance to birds resulting from recreational fishing vessels (as a subset of all vessels).</i>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.3.1 – ETP species outcome – Blue swimmer crab, scoop nets

PI 2.3.1		The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Effects of the UoA on population/stock within national or international limits, where applicable			
	Guide post	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/ stock are known and likely to be within these limits.	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs on the population /stock are known and highly likely to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits.
	Met?	NA	NA	NA
Rationale				

There are no applicable national or international limits. This scoring issue is not applicable.

Direct effects				
b	Guide post	Known direct effects of the UoA are likely to not hinder recovery of ETP species.	Direct effects of the UoA are highly likely to not hinder recovery of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
	Met?	Yes	Yes	Yes
Rationale				

Scoop nets are an active fishing method, highly targeted to catching crabs. Fishers deploy the nets by hand. Nets are made of hard materials, have an open top (i.e. a scoop shape) and they are not left unattended. The gear is considered extremely unlikely to interact with ETP directly. There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species. SG60, SG80 and SG100 are met.

Indirect effects				
c	Guide post	Indirect effects have been considered for the UoA and are thought to be highly likely to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the UoA on ETP species.	
	Met?		No	No
Rationale				

Indirect effects of the UoA on ETP include any effects of the removal of fished species and reduced habitat suitability for ETP. Sustainable management of target, primary and secondary species would

reduce the likelihood of such effects. Habitat impacts of scoop netting are considered below (under 2.4.1).

Disturbance of birds (especially threatened migratory shorebirds) has been identified as problematic in the Estuary. No crabbing is permitted 1 September – 30 November, which reduces disturbance during the arrival of migratory shorebirds at the estuary. However, outside that period, scoop net fishers may be active during day or night and can disturb shorebirds feeding and roosting in the shallows and adjacent areas. Migratory shorebirds remain present until the autumn, when they return to their northern hemisphere breeding grounds, and January-February is the peak season for this UoA. Scoop net fishers were documented as a key source of disturbance for migratory shorebirds. The 2020 risk assessment classified this UoA as a High risk for migratory threatened shorebirds. The need for additional management action was recognised (in accordance with the blue swimmer crab harvest strategy). For this group, indirect effects have been considered are not thought to be highly likely to not create unacceptable impacts. SG80 is not met.

There is not a high degree of confidence that there are no significant detrimental indirect effects of the UoA on ETP species. SG100 is not met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Graff, J. 2019. Shorebird disturbance on the Peel-Harvey Estuary. BirdLife Western Australia.

Draft scoring range	60-79
Information gap indicator	Information sufficient to score PI.

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.3.1 – ETP species outcome – Sea mullet, haul nets

PI 2.3.1		The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Effects of the UoA on population/stock within national or international limits, where applicable			
	Guide post	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/ stock are known and likely to be within these limits.	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs on the population /stock are known and highly likely to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits.
	Met?	NA	NA	NA
Rationale				

There are no applicable national or international limits. This scoring issue is not applicable.

Direct effects				
b	Guide post	Known direct effects of the UoA are likely to not hinder recovery of ETP species.	Direct effects of the UoA are highly likely to not hinder recovery of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
	Met?	Yes	Yes	Yes
Rationale				

Commercial fishers are required to report ETP interactions by law. DPIRD monitoring has also occurred in this UoA in 2017/18. In 2006 and 2007, interactions with cormorants were reported (five and two interactions respectively). No interactions have been reported since 2007 and none were observed by the DPIRD monitoring in 2017/18.

There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species. SG60, SG80 and SG100 are met.

Indirect effects				
c	Guide post	Indirect effects have been considered for the UoA and are thought to be highly likely to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the UoA on ETP species.	
	Met?		Yes	Yes
Rationale				

Indirect effects of the UoA on ETP could include effects of removal of fished species and reduced habitat suitability for ETP. Sustainable management of target, primary and secondary species, and limited habitat impacts reduces the likelihood of such effects.

Disturbance of birds (especially threatened migratory shorebirds) has been identified as an issue in the Estuary. However, commercial net fishers are boat-based, and capacity is currently limited to seven licenced fishers. There is a maximum legal boat length (6.5 m) and mechanised hauling systems are not permitted. Trips mostly comprise a single haul and a half-day of activity, mainly on calm, clear days. The scale of the fishery is considered unlikely to have significant detrimental indirect effects on shorebirds. The 2020 risk assessment concluded that impacts of disturbance of this UoA on ETP were negligible.

There is a high degree of confidence that there are no significant detrimental indirect effects of the UoA on ETP species. SG80 and SG100 are met.

References

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Graff, J. 2019. Shorebird disturbance on the Peel-Harvey Estuary. BirdLife Western Australia.

Draft scoring range

≥80

Information gap indicator

Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score

Condition number (if relevant)

PI 2.3.1 – ETP species outcome – Sea mullet, gill nets

PI 2.3.1		The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Effects of the UoA on population/stock within national or international limits, where applicable			
	Guide post	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/ stock are known and likely to be within these limits.	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs on the population /stock are known and highly likely to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits.
	Met?	NA	NA	NA
Rationale				

There are no applicable national or international limits. This scoring issue is not applicable.

Direct effects				
b	Guide post	Known direct effects of the UoA are likely to not hinder recovery of ETP species.	Direct effects of the UoA are highly likely to not hinder recovery of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
	Met?	Yes	Yes	Yes
Rationale				

Commercial fishers are required to report ETP interactions by law. DPIRD monitoring has also occurred in this UoA in 2017/18. No interactions have been reported with net fisheries since 2007 and none were observed by the DPIRD monitoring in 2017/18.

There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species. SG60, SG80 and SG100 are met.

Indirect effects				
c	Guide post		Indirect effects have been considered for the UoA and are thought to be highly likely to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the UoA on ETP species.
	Met?		Yes	Yes
Rationale				

Indirect effects of the UoA on ETP could include effects of removal of fished species and reduced habitat suitability for ETP. Sustainable management of target, primary and secondary species, and limited habitat impacts reduces the likelihood of such effects.

Disturbance of birds (especially threatened migratory shorebirds) has been identified as an issue in the Estuary. However, commercial net fishers are boat-based, and capacity is currently limited to seven licenced fishers. There is a maximum legal boat length (6.5 m) and mechanised hauling systems are not permitted. Gill net effort in recent years is reported to have declined significantly. The scale of the fishery is considered unlikely to have significant detrimental indirect effects on shorebirds. The 2020 risk assessment concluded that impacts of the UoA for ETP were negligible.

There is a high degree of confidence that there are no significant detrimental indirect effects of the UoA on ETP species. SG80 and SG100 are met.

References

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Graff, J. 2019. Shorebird disturbance on the Peel-Harvey Estuary. BirdLife Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.3.2 – ETP species management strategy – Blue swimmer crab, crab pots

PI 2.3.2		The UoA has in place precautionary management strategies designed to: <ul style="list-style-type: none"> - meet national and international requirements; - ensure the UoA does not hinder recovery of ETP species. Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place (national and international requirements)			
	Guide post	There are measures in place that minimise the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Yes	Yes	No
Rationale				

The selectivity of the fishing method comprises an operational measure that minimises the UoA-related mortality of ETP species. Fishers are required to report interactions with ETP and DPIRD monitoring also occurs. Extremely low rates of ETP capture are known to have occurred over time in crab traps. There are measures in place that minimise the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species. SG60 is met.

Available information is used to evaluate the fishery risk to ETP, with a risk level of "Medium" or lower set out as the management target reference level as part of the blue swimmer crab harvest strategy 2020 – 2025. Where a High risk or a change in risk level occurs, the reasons for this must be reviewed within 3 months and a management response implemented as soon as practicable. The limit reference level has been identified as when fishing impacts are considered to generate an unacceptable level of risk (i.e. a Severe risk). At that time, an immediate management response is initiated to reduce the risk to an acceptable level as soon as practicable. Currently, the risk that the UoA presents to ETP is considered to be Negligible, and no additional management action has been triggered.

There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species. SG80 is met.

A comprehensive strategy is not in place; SG100 is not met.

Management strategy in place (alternative)				
b	Guide post	There are measures in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species.
	Met?	NA	NA	NA
Rationale				

Scoring issue (a) is scored, therefore (b) is not.

Management strategy evaluation				
c	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved.	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Yes	Yes	No
Rationale				

The operational measure of fishing method is considered likely to work for managing direct UoA impacts on ETP. This is based on confirmation of the method's selectivity, demonstrated by the monitoring information collected by DPIRD over time, and with no ETP interactions reported by fishers. As described above in scoring issue (b), the risk that this UoA presents to ETP is considered to be Negligible, and no additional management action has been triggered through the 2020 risk assessment process.

Overall therefore, there is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved. SG60 and SG80 are met.

A quantitative analysis is not available to support high confidence that the strategy will work, and SG100 is not met.

Management strategy implementation				
d	Guide post	There is some evidence that the measures/strategy is		There is clear evidence that the strategy/comprehensive strategy is being

		being implemented successfully.	implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).
Met?		Yes	No

Rationale

Evidence for the selectivity of the fishing method is provided by the monitoring information collected by DPIRD over time. Further, a requirement to report ETP interactions is in place and no ETP interactions have been reported by UoA fishers. The harvest strategy for blue swimmer crabs 2020 – 2025 states that control measures are now required to reduce disturbance of migratory threatened shorebirds due to scoop netting, to reduce an identified High risk to an acceptable level (Medium or lower risk). This demonstrates key early steps of the risk evaluation and management process being followed. There is some evidence that the measures/strategy is being implemented successfully. SG80 is met.

As yet, there is not clear evidence that the strategy is being implemented successfully and achieving its objective. SG100 is not met.

Review of alternative measures to minimise mortality of ETP species

e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.
	Met?	NA	NA	NA

Rationale

Direct UoA-related mortality of ETP is negligible, with mortality of a single cormorant recorded by DPIRD and no fisher reports of ETP interactions occurring. Therefore, this scoring issue is not scored.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Graff, J. 2019. Shorebird disturbance on the Peel-Harvey Estuary. BirdLife Western Australia.

Draft scoring range

≥80

Information gap indicator

Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score

Condition number (if relevant)

PI 2.3.2 – ETP species management strategy – Blue swimmer crab, drop nets

PI 2.3.2		The UoA has in place precautionary management strategies designed to: <ul style="list-style-type: none"> - meet national and international requirements; - ensure the UoA does not hinder recovery of ETP species. Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place (national and international requirements)			
	Guide post	There are measures in place that minimise the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Yes	Yes	No
Rationale				

The selectivity of the fishing method comprises an operational measure that minimises the UoA-related mortality of ETP species.

Available information is used to evaluate the fishery risk to ETP, with a risk level of "Medium" or lower set out as the management target reference level as part of the blue swimmer crab harvest strategy 2020 – 2025. Where a High risk or a change in risk level occurs, the reasons for this must be reviewed within 3 months and a management response implemented as soon as practicable. The limit reference level has been identified as when fishing impacts are considered to generate an undesirable level of risk (i.e. a Severe risk). At that time, an immediate management response is initiated to reduce the risk to an acceptable level as soon as practicable. Currently, the risk that the UoA presents to ETP is considered to be Negligible, and no additional management action has been triggered.

There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species. SG80 is met.

A comprehensive strategy is not in place; SG100 is not met.

Management strategy in place (alternative)				
b	Guide post	There are measures in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species.
	Met?	NA	NA	NA
Rationale				

Scoring issue (a) is scored, therefore (b) is not.

Management strategy evaluation				
c	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved.	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Yes	Yes	No
Rationale				

The operational measure of fishing method is considered likely to work for managing direct UoA impacts on ETP, based on plausible argument.

While no information is available from recreational drop net fishing, the commercial crab pot fishery operates similar gear, and extremely low levels of ETP interactions are known from that fishery. Further, as described above in scoring issue (b), the risk that this UoA presents to ETP is considered to be Negligible, and no additional management action has been triggered through the 2020 risk assessment process. Overall therefore, there is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved. SG60 and SG80 are met.

A quantitative analysis is not available to support high confidence that the strategy will work, and SG100 is not met.

Management strategy implementation				
d	Guide post	There is some evidence that the measures/strategy is being implemented successfully.		There is clear evidence that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective as set out in

			scoring issue (a) or (b).
	Met?	Yes	No
Rationale			

Evidence for the selectivity of the crab pot fishing method, including extremely low levels of ETP interactions, is provided by the monitoring information collected by DPIRD over time from the commercial fishery. Further, the harvest strategy for blue swimmer crabs 2020 – 2025 states that control measures are now required to reduce disturbance of migratory threatened shorebirds due to scoop netting, to reduce an identified High risk to an acceptable level (Medium or lower risk). This demonstrates key early steps of the risk evaluation and management process being followed. There is some evidence that the measures/strategy is being implemented successfully. SG80 is met.

As yet, there is not clear evidence that the strategy is being implemented successfully and achieving its objective. SG100 is not met.

Review of alternative measures to minimise mortality of ETP species				
e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.
	Met?	NA	NA	NA
Rationale				

UoA-related mortality of ETP is negligible, therefore, this scoring issue is not scored.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Graff, J. 2019. Shorebird disturbance on the Peel-Harvey Estuary. BirdLife Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.3.2 – ETP species management strategy – Blue swimmer crab, scoop nets

PI 2.3.2		The UoA has in place precautionary management strategies designed to: <ul style="list-style-type: none"> - meet national and international requirements; - ensure the UoA does not hinder recovery of ETP species. Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place (national and international requirements)			
	Guide post	There are measures in place that minimise the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Yes	Yes	No
Rationale				

The selectivity of the fishing method comprises an operational measure that minimises the UoA-related mortality of ETP species.

Available information is used to evaluate the fishery risk to ETP, with a risk level of "Medium" or lower set out as the management target reference level as part of the blue swimmer crab harvest strategy 2020 – 2025. Where a High risk or a change in risk level occurs, the reasons for this must be reviewed within 3 months and a management response implemented as soon as practicable. The limit reference level has been identified as when fishing impacts are considered to generate an undesirable level of risk (i.e. a Severe risk). At that time, an immediate management response is initiated to reduce the risk to an acceptable level as soon as practicable. In 2020, the risk that the UoA presents to one group of ETP was identified as high, and the need for additional management actions has been recognised.

There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species. SG80 is met.

A comprehensive strategy is not in place; SG100 is not met.

b	Management strategy in place (alternative)			
	Guide post	There are measures in place that are expected to ensure the UoA does not	There is a strategy in place that is expected to ensure the UoA does not	There is a comprehensive strategy in place for

		hinder the recovery of ETP species.	hinder the recovery of ETP species.	managing ETP species, to ensure the UoA does not hinder the recovery of ETP species.
	Met?	NA	NA	NA
Rationale				

Scoring issue (a) is scored, therefore (b) is not.

Management strategy evaluation				
C	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved.	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Yes	No	No
Rationale				

The operational measure of fishing method is considered likely to work for managing direct UoA impacts on ETP, based on plausible argument.

The harvest strategy for blue swimmer crabs 2020 – 2025 states that control measures are now required to reduce disturbance of migratory threatened shorebirds due to scoop netting, to reduce an identified High risk to an acceptable level (Medium or lower risk). This demonstrates key early steps of the risk evaluation and management process being followed, while measures remain to be identified.

The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species). SG60 is met. As yet, there is not an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved. The identification of a high risk for threatened migratory shorebirds appears to be the first time an ETP risk has been considered undesirable through applying the harvest strategy. SG80 is not met.

A quantitative analysis is not available to support high confidence that the strategy will work, and SG100 is not met.

Management strategy implementation				
d	Guide post		There is some evidence that the measures/strategy is being implemented successfully.	There is clear evidence that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b) .
	Met?		Yes	No

Rationale

Though catch information for this UoA is limited and now dated, there is some evidence for the selectivity of the fishing method. There is also some evidence that the strategy is being implemented, with the initial steps of the process taken to manage the High risk associated with disturbance of threatened migratory shorebirds. The timely implementation of a management response is now needed, and this will be explored further at the site visit. SG80 is met.

As yet, there is not clear evidence that the strategy is being implemented successfully and achieving its objective. SG100 is not met.

Review of alternative measures to minimise mortality of ETP species

e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.
	Met?	Yes	Yes	No

Rationale

Direct UoA-related mortality of ETP is negligible, while disturbance risk may have cumulative effects that are extremely difficult to quantify. Nonetheless, a set of recommendations has been prepared to address disturbance issues at the Estuary, to manage the identified risk to threatened migratory shorebirds. The intent to review this (and other) UoA risks is set out in the blue swimmer crab harvest strategy. SG60 and SG80 are met. Biennial review appears not to be provided for, and SG100 is not met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Graff, J. 2019. Shorebird disturbance on the Peel-Harvey Estuary. BirdLife Western Australia.

Draft scoring range	60-79
Information gap indicator	More information sought <i>Information on the ETP management strategy to address disturbance of threatened migratory shorebirds (as per scoring issues (c, d)).</i>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.3.2 – ETP species management strategy – Sea mullet, haul nets

PI 2.3.2	The UoA has in place precautionary management strategies designed to: <ul style="list-style-type: none"> - meet national and international requirements; - ensure the UoA does not hinder recovery of ETP species. Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species			
	Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place (national and international requirements)			
	Guide post	There are measures in place that minimise the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Yes	Yes	No
Rationale				

Characteristics of the fishing operation minimises the UoA-related mortality of ETP species. For example, fishers do not leave gear unattended, there are capacity limits in place, and effort comprises generally one haul per vessel per day. Fishers are required to report interactions with ETP and DPIRD monitoring has occurred (and is planned to recur 5-yearly). Extremely low rates of ETP capture are known to have occurred over time, with interactions limited to one seabird taxon (cormorants). There are measures in place that minimise the UoA-related mortality of ETP species and are highly likely to achieve national and international requirements for the protection of ETP species. SG60 is met.

Available information is used to evaluate the fishery risk to ETP, with a risk level of "Medium" or lower set out as the management target reference level as part of the finfish harvest strategy 2020 – 2025. Where a High risk or a change in risk level occurs, the reasons for this must be reviewed within 3 months and a management response implemented as soon as practicable. The limit reference level has been identified as when fishing impacts are considered to generate an unacceptable level of risk (i.e. a Severe risk). At that time, an immediate management response is initiated to reduce the risk to an acceptable level as soon as practicable. Currently, the risk that the UoA presents to ETP is considered to be Negligible, and no additional management action has been triggered.

There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species. SG80 is met.

A comprehensive strategy is not in place; SG100 is not met.

Management strategy in place (alternative)				
b	Guide post	There are measures in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species.
	Met?	NA	NA	NA
Rationale				

Scoring issue (a) is scored, therefore (b) is not.

Management strategy evaluation				
c	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved.	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Yes	Yes	No
Rationale				

The operational measures characterising the fishing method are considered likely to work for managing direct UoA impacts on ETP. Further, an extremely low level of interactions have been detected in the fishery over time. As described above in scoring issue (a), the risk that this UoA presents to ETP is considered to be Negligible, and no additional management action has been triggered by the findings of 2020 risk assessment process. There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved. SG60 and SG80 are met.

A quantitative analysis is not available to support high confidence that the strategy will work, and SG100 is not met.

Management strategy implementation				
d	Guide post		There is some evidence that the measures/strategy is being implemented successfully.	There is clear evidence that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).
	Met?		Yes	No

Rationale

Evidence for the selectivity of the fishing method is provided by the extremely low levels of ETP interactions detected over time, through monitoring by DPIRD and fisher reporting of ETP interactions (a legal requirement). ETP risks were considered negligible for this UoA.

There is some evidence that the measures/strategy is being implemented successfully. SG80 is met.

As yet, there is not clear evidence that the strategy is being implemented successfully and achieving its objective. SG100 is not met.

Review of alternative measures to minimise mortality of ETP species

e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.
	Met?	NA	NA	NA

Rationale

Direct UoA-related mortality of ETP is negligible. Therefore, this scoring issue is not scored.

References

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

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Graff, J. 2019. Shorebird disturbance on the Peel-Harvey Estuary. BirdLife Western Australia.

Draft scoring range

≥80

Information gap indicator

Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score

Condition number (if relevant)

PI 2.3.2 – ETP species management strategy – Sea mullet, gill nets

PI 2.3.2		The UoA has in place precautionary management strategies designed to: <ul style="list-style-type: none"> - meet national and international requirements; - ensure the UoA does not hinder recovery of ETP species. Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place (national and international requirements)			
	Guide post	There are measures in place that minimise the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Yes	Yes	No
Rationale				

Fishers are required to report interactions with ETP and DPIRD monitoring has occurred (and is planned to recur 5-yearly). Extremely low rates of ETP capture are known to have occurred over time, with interactions limited to one seabird taxon (cormorants) in net fisheries. Indirectly, the nature of the fishing operation can be considered a measure, including that nets are set at night, capacity is limited, there is a decreasing level of effort with this fishing method. SG60 is met.

Available information is used to evaluate the fishery risk to ETP, with a risk level of "Medium" or lower set out as the management target reference level as part of the finfish harvest strategy 2020 – 2025. Where a High risk or a change in risk level occurs, the reasons for this must be reviewed within 3 months and a management response implemented as soon as practicable. The limit reference level has been identified as when fishing impacts are considered to generate an unacceptable level of risk (i.e. a Severe risk). At that time, an immediate management response is initiated to reduce the risk to an acceptable level as soon as practicable. Currently, the risk that the UoA presents to ETP is considered to be Negligible, and no additional management action has been triggered.

There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species. SG80 is met.

A comprehensive strategy is not in place; SG100 is not met.

Management strategy in place (alternative)				
b	Guide post	There are measures in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not

				hinder the recovery of ETP species.
	Met?	NA	NA	NA
Rationale				

Scoring issue (a) is scored, therefore (b) is not.

Management strategy evaluation				
C	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved.	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Yes	Yes	No
Rationale				

Some of the operational measures characterising the fishing method are considered likely to work for managing direct UoA impacts on ETP (e.g. the relatively low level of fishing capacity and effort). Further, an extremely low level of interactions have been detected in the fishery over time. In the 2020 ecological risk assessment conducted, the risk that this UoA presents to ETP was considered to be Negligible, and no additional management action has been triggered by that assessment's findings. There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved. SG60 and SG80 are met.

A quantitative analysis is not available to support high confidence that the strategy will work, and SG100 is not met.

Management strategy implementation				
d	Guide post		There is some evidence that the measures/strategy is being implemented successfully.	There is clear evidence that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).
	Met?		Yes	No
Rationale				

Evidence for the low level of ETP interactions with the fishing operation is provided by monitoring information collected by DPIRD and fisher reporting of ETP interactions (a legal requirement).

There is some evidence that the measures/strategy is being implemented successfully. SG80 is met.

As yet, there is not clear evidence that the strategy is being implemented successfully and achieving its objective. SG100 is not met.

Review of alternative measures to minimise mortality of ETP species				
e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.
	Met?	NA	NA	NA
Rationale				

Direct UoA-related mortality of ETP is negligible. Therefore, this scoring issue is not scored.

References

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

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Graff, J. 2019. Shorebird disturbance on the Peel-Harvey Estuary. BirdLife Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.3.3 – ETP species information – Blue swimmer crab, crab pots

PI 2.3.3		Relevant information is collected to support the management of UoA impacts on ETP species, including:		
		<ul style="list-style-type: none"> - Information for the development of the management strategy; - Information to assess the effectiveness of the management strategy; and - Information to determine the outcome status of ETP species 		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts			
	Guide post	Qualitative information is adequate to estimate the UoA related mortality on ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.	Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.	Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Yes	Yes	No
Rationale				

Quantitative information available to consider UoA impacts includes DPIRD monitoring, population status and life history information. In addition, fishers are required to report ETP interactions. Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. Therefore, SG60 and SG80 are met.

Quantitative information is not available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species. SG100 is not met.

Information adequacy for management strategy				
b	Guide post	Information is adequate to support measures to manage the impacts on ETP species.	Information is adequate to measure trends and support a strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimise mortality and injury of ETP species, and evaluate with a high degree of certainty whether a

				strategy is achieving its objectives.
Met?	Yes	Yes	No	
Rationale				

Information is adequate to support measures to manage the impacts on ETP species, for example, the demonstrated selectivity of the fishing method and the nature of potential indirect effects (e.g. disturbance and prey availability). Information is also adequate to measure trends and support a strategy to manage impacts on ETP species. SG60 and SG80 are met.

Information is not adequate to support a comprehensive strategy to manage impacts, minimise mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives. SG100 is not met.

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Graff, J. 2019. Shorebird disturbance on the Peel-Harvey Estuary. BirdLife Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.3.3 – ETP species information – Blue swimmer crab, drop nets

PI 2.3.3		Relevant information is collected to support the management of UoA impacts on ETP species, including:		
		<ul style="list-style-type: none"> - Information for the development of the management strategy; - Information to assess the effectiveness of the management strategy; and - Information to determine the outcome status of ETP species 		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts			
	Guide post	Qualitative information is adequate to estimate the UoA related mortality on ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.	Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.	Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Yes	Yes	No
Rationale				

There is no information on ETP interactions with drop nets. However, quantitative information available to consider impacts in the commercial crap pot fishery, which utilises similar gear, includes DPIRD monitoring, population status and life history information. (Commercial fishers are also required to report ETP interactions). Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. Therefore, SG60 and SG80 are met.

Quantitative information is not available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species. SG100 is not met.

Information adequacy for management strategy				
b				
	Guide post	Information is adequate to support measures to manage the impacts on ETP species.	Information is adequate to measure trends and support a strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimise mortality and injury of ETP species, and evaluate with a high degree of certainty whether a

				strategy is achieving its objectives.
	Met?	Yes	No	No
Rationale				

Information is adequate to support measures to manage the impacts on ETP species, for example, the demonstrated selectivity of the analogous crab pot fishing method used by commercial fishers (and extremely low levels of ETP captures detected over time), and the nature of potential indirect effects (e.g. disturbance). However, there is no information available to measure trends characterising the UoA as relevant to ETP interactions (e.g. in terms of fishing effort, intensity of use of fishing areas, UoA-specific information on captures/lack of captures, etc.). SG60 is met. SG80 is not.

Information is not adequate to support a comprehensive strategy to manage impacts, minimise mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives. SG100 is not met.

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Graff, J. 2019. Shorebird disturbance on the Peel-Harvey Estuary. BirdLife Western Australia.

Draft scoring range	60-79
Information gap indicator	More information sought <i>Information to measure trends relevant to a strategy for managing ETP impacts (scoring issue (b)).</i>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.3.3 – ETP species information – Blue swimmer crab, scoop nets

PI 2.3.3		Relevant information is collected to support the management of UoA impacts on ETP species, including:		
		<ul style="list-style-type: none"> - Information for the development of the management strategy; - Information to assess the effectiveness of the management strategy; and - Information to determine the outcome status of ETP species 		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts			
	Guide post	Qualitative information is adequate to estimate the UoA related mortality on ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.	Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.	Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Yes	Yes	No
Rationale				

There is no information on ETP interactions with scoop nets. However, the selectivity of the gear provides assurance that such interactions would be extremely rare if they ever occur. The gear is fished actively, does not work if unattended, and has a fixed hard “mesh” so is not entrapping. Information on the intensity of fisher use of sites around the Estuary, and shorebird monitoring data, are available to evaluate disturbance risks and impacts. Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. SG60 and SG80 are met.

Quantitative information is not available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species. SG100 is not met.

Information adequacy for management strategy				
b	Guide post	Information is adequate to support measures to manage the impacts on ETP species.	Information is adequate to measure trends and support a strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimise mortality and injury of ETP species, and evaluate with a high degree of

		certainty whether a strategy is achieving its objectives.		
	Met?	Yes	Yes	No
Rationale				

Information is adequate to support measures to manage the impacts on ETP species, for example, the demonstrated selectivity of the gear, and intensity of use of sites around the Estuary by fishers. Information relevant to measuring trends and supporting a strategy for managing ETP impacts is focused on fisher use of various areas and disturbance impacts. SG60 and SG80 are met.

Information is not adequate to support a comprehensive strategy to manage impacts, minimise mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives. SG100 is not met.

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Graff, J. 2019. Shorebird disturbance on the Peel-Harvey Estuary. BirdLife Western Australia.

Draft scoring range	≥80
Information gap indicator	Information adequate to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.3.3 – ETP species information – Sea mullet, haul nets

PI 2.3.3		Relevant information is collected to support the management of UoA impacts on ETP species, including:		
		<ul style="list-style-type: none"> - Information for the development of the management strategy; - Information to assess the effectiveness of the management strategy; and - Information to determine the outcome status of ETP species 		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts			
	Guide post	Qualitative information is adequate to estimate the UoA related mortality on ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.	Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.	Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Yes	Yes	No
Rationale				

There is some information relevant to ETP interactions with haul nets, from fisher reports and DPIRD monitoring conducted in 2017/18. However, the nature of the fishing method provides assurance that ETP interactions would be rare. The gear is fished actively, when schools are located. The number of fishers is small, and fishers operate from inside vessels. Disturbance from the UoA was risk-assessed as Negligible. Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. SG60 and SG80 are met.

Quantitative information is not available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species. SG100 is not met.

Information adequacy for management strategy				
b	Guide post	Information is adequate to support measures to manage the impacts on ETP species.	Information is adequate to measure trends and support a strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimise mortality and injury of ETP species, and evaluate with a high degree of

		certainty whether a strategy is achieving its objectives.		
	Met?	Yes	No	No
Rationale				

Information is adequate to support measures to manage the impacts on ETP species, for example, the operational measures that characterise the UoA, and low level of interactions (with cormorants) known over time. Continued collection of information relevant to measuring trends is required, and it is noted that DPIRD monitoring (focused on "bycatch" i.e. primary and secondary species, but also detecting any ETP interactions) was planned five-yearly. SG60 is met. SG80 is not currently met, however, the intent to collect relevant information is recognised.

Information is not adequate to support a comprehensive strategy to manage impacts, minimise mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives. SG100 is not met.

References

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Graff, J. 2019. Shorebird disturbance on the Peel-Harvey Estuary. BirdLife Western Australia.

Draft scoring range	60-79
Information gap indicator	Information adequate to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.3.3 – ETP species information – Sea mullet, gill nets

PI 2.3.3		Relevant information is collected to support the management of UoA impacts on ETP species, including: <ul style="list-style-type: none"> - Information for the development of the management strategy; - Information to assess the effectiveness of the management strategy; and - Information to determine the outcome status of ETP species 		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts			
	Guide post	Qualitative information is adequate to estimate the UoA related mortality on ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.	Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.	Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Yes	Yes	No
Rationale				

There is some information relevant to ETP interactions with gill nets, from fisher reports and DPIRD monitoring conducted in 2017/18. Disturbance from the UoA was risk-assessed as Negligible. The fishing effort in the UoA has declined in recent years, and the level of UoA interactions with ETP is extremely low, based on the information available. Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. SG60 and SG80 are met.

Quantitative information is not available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species. SG100 is not met.

Information adequacy for management strategy				
b	Guide post	Information is adequate to support measures to manage the impacts on ETP species.	Information is adequate to measure trends and support a strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimise mortality and injury of ETP species, and evaluate with a high degree of

		certainty whether a strategy is achieving its objectives.		
	Met?	Yes	No	No
Rationale				

Information is adequate to support measures to manage the impacts on ETP species, for example, the operational measures that characterise the UoA, and low level of interactions (with cormorants) known over time. Continued collection of information relevant to measuring trends is required, and it is noted that DPIRD monitoring (focused on "bycatch" i.e. primary and secondary species, but also detecting any ETP interactions) was planned five-yearly. SG60 is met. SG80 is not currently met, however, the intent to collect relevant information is recognised.

Information is not adequate to support a comprehensive strategy to manage impacts, minimise mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives. SG100 is not met.

References

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Graff, J. 2019. Shorebird disturbance on the Peel-Harvey Estuary. BirdLife Western Australia.

Draft scoring range	60-79
Information gap indicator	Information adequate to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.4.1 – Habitats outcome – Blue swimmer crab, crab pots

PI 2.4.1		The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates		
Scoring Issue		SG 60	SG 80	SG 100
a	Commonly encountered habitat status			
	Guide post	The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
	Met?	Yes – All habitats	Yes – All habitats	Yes – All habitats
Rationale				

Commonly Encountered habitats are sand, mud, macroalgae and the estuary water column. Fishing will only have transient effects on the water column. Traps do not retain benthos, which either pass through netting and/or are shaken off at the haul. Traps are light in weight, having a wire rim and a mesh frame. They are not weighted, and are considered unlikely to damage the substrate.

Overall, the footprint of the UoA has been estimated at 33 km². Crab traps sit on, but do not drag over benthic habitats. The distribution of fishing effort varies in the Estuary through the year, and there are closed periods and areas in place. The characteristics of the commonly encountered habitats, nature of the gear and its use, relatively small extent of the footprint, and dynamic nature of estuaries all limit the potential for significant habitat impacts.

Impacts of lost gear are considered negligible in the 2020 risk assessment. The extent of gear loss was previously reported as very low (in 2015), though specific information is not available. This will be explored further at the site visit, though habitat impacts are expected to be not significant.

Overall, there is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm. SG60, SG80 and SG100 are met.

VME habitat status				
b	Guide post	The UoA is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
	Met?	Yes	Yes	Yes
Rationale				

Environmental changes have contributed to the expansion of seagrass beds including the colonisation of the southern Harvey Estuary by seagrass in 2017/18. An increase in seagrass biomass was recorded (especially in the western Peel Inlet and northern Harvey Estuary) at the same time as a decline in

Chlorophyta. Over time, the Estuary's macrophyte community has become dominated by seagrass rather than macroalgae.

Crab traps occasionally bring up seagrass when hauled. Traps are not weighted, and are considered unlikely to significantly damage seagrass they sit atop of during fishing. The small footprint of the fishery further supports the conclusion that impacts on seagrass do not include serious or irreversible harm.

There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats (seagrass) to a point where there would be serious or irreversible harm. SG60, SG80 and SG100 are met.

Minor habitat status			
C	Guide post	There is evidence that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.	
	Met?		NA
Rationale			

No minor habitats are identified. This scoring issue is not scored.

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Johnston, D.J., Smith, K.A., Brown, J.I., Travaille, K.L., Crowe, F., Oliver, R.K. and Fisher, E.A. 2015. Western Australian Marine Stewardship Council Report Series No. 3: West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Department of Fisheries, Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.4.1 – Habitats outcome – Blue swimmer crab, drop nets

PI 2.4.1		The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates		
Scoring Issue		SG 60	SG 80	SG 100
a	Commonly encountered habitat status			
	Guide post	The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
	Met?	Yes – All habitats	Yes – All habitats	Yes – All habitats
Rationale				

Commonly Encountered habitats are sand, mud, macroalgae and the estuary water column. Fishing will only have transient effects on the water column. Drop nets do not retain benthos, which either pass through netting and/or are shaken off at the haul. Nets are lightweight gear, having a wire rim, a mesh frame and no top. They are not weighted, and are considered unlikely to damage the substrate, which they sit on top of. The characteristics of the commonly encountered habitats, nature of the gear and its use, and dynamic nature of estuary habitats all limit the potential for significant habitat impacts.

Impacts of lost gear are considered negligible in the 2020 risk assessment. Drop net fishers remain close to their gear and pull nets often. Consequently, they are considered unlikely to lose gear. Associated habitat impacts are expected to be not significant.

Overall, there is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm. SG60, SG80 and SG100 are met.

VME habitat status				
b	Guide post	The UoA is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
	Met?	Yes	Yes	Yes
Rationale				

Seagrass beds are identified as VMEs. Environmental changes have contributed to the expansion of seagrass beds in the Estuary, including the colonisation of the southern Harvey Estuary by seagrass in 2017/18. An increase in seagrass biomass was recorded (especially in the western Peel Inlet and northern Harvey Estuary) at the same time as a decline in Chlorophyta. Over time, the Estuary's macrophyte community has become dominated by seagrass rather than macroalgae.

Commercial crab traps occasionally bring up seagrass when hauled, and it is reasonable to assume drop nets would too. However, nets are not weighted, and are considered unlikely to damage seagrass they sit atop of during fishing to any more than a very minor extent.

There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats (seagrass) to a point where there would be serious or irreversible harm. SG60, SG80 and SG100 are met.

Minor habitat status			
C	Guide post	There is evidence that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.	
	Met?		NA
Rationale			

No minor habitats are identified. This scoring issue is not scored.

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.4.1 – Habitats outcome – Blue swimmer crab, scoop nets

PI 2.4.1		The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates		
Scoring Issue		SG 60	SG 80	SG 100
a	Commonly encountered habitat status			
	Guide post	The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
	Met?	Yes – All habitats	Yes – All habitats	Yes – All habitats
Rationale				

Commonly Encountered habitats are sand, mud, macroalgae and the estuary water column. Fishing will only have transient effects on the water column. Scoop nets may make contact with the substrate, but do not retain substrate material or benthos, which pass through the net as it is pulled up. Fishes wading at their fishing sites, and moving to their fishing sites are likely to cause some habitat impacts. However, these are expected to be temporary, not comprising serious or irreversible harm. Research on the distribution of Estuary macrophyte biomass over time has shown that macroalgae (Chlorophyta) biomass has increased in an area where scoop net fishing occurs, since the mid-1990s. The characteristics of the commonly encountered habitats, nature of the gear and its use, evidence of macroalgae biomass increase in scooping areas, and dynamic nature of estuary habitats all support the conclusion that habitat impacts are not serious or irreversible.

The 2020 risk assessment concluded that the risks of scoop net fishing to sand and mud, and macroalgae habitats were low and negligible respectively.

Impacts of lost gear are considered negligible in the 2020 risk assessment. Fishers must hold onto their gear to use it and are therefore considered unlikely to lose gear. Associated habitat impacts are expected to be not significant.

Overall, there is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm. SG60, SG80 and SG100 are met.

VME habitat status				
b	Guide post	The UoA is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
	Met?	Yes	Yes	Yes
Rationale				

Seagrass beds are identified as VMEs. Environmental changes have contributed to the expansion of seagrass beds in the Estuary, including the colonisation of the southern Harvey Estuary by seagrass in 2017/18. An increase in seagrass biomass was recorded (especially in the western Peel Inlet and northern Harvey Estuary) at the same time as a decline in Chlorophyta. Over time, the Estuary's macrophyte community has become dominated by seagrass rather than macroalgae. Scoop nets are manually deployed and may come into contact with the Estuary floor on occasion, as fishers try to catch crabs. However, such impacts are not considered to be of sufficient impact to cause serious or irreversible harm. Further, these impacts would not occur in the closed season. In the Peel Inlet, there are popular scoop netting areas where the biomass of seagrass, and extent of seagrass cover, have increased compared to historical levels.

The 2020 risk assessment concluded that the risks of scoop netting to seagrass habitats was Low, and the risk represented by lost gear was Negligible.

There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats (seagrass) to a point where there would be serious or irreversible harm. SG60, SG80 and SG100 are met.

Minor habitat status			
C	Guide post	There is evidence that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.	
	Met?		NA
Rationale			

No minor habitats are identified. This scoring issue is not scored.

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.4.1 – Habitats outcome – Sea mullet, haul nets

PI 2.4.1		The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates		
Scoring Issue		SG 60	SG 80	SG 100
a	Commonly encountered habitat status			
	Guide post	The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
	Met?	Yes – All habitats	Yes – All habitats	Yes – All habitats
Rationale				

Commonly Encountered habitats are sand, mud, macroalgae and the Estuary water column. Fishing will only have transient effects on the water column. Areas with prolific algae or seagrass are avoided, because these add weight to the net at hauling if entangled, and must be shaken off. Nets do not retain benthos or sediments, which either pass through netting and/or are shaken off at the haul. The characteristics of the commonly encountered habitats, nature of the gear and its use, and dynamic nature of estuaries all limit the potential for significant habitat impacts.

The 2020 risk assessment assessed the risks to commonly encountered habitats as Low (sand and mud) and Negligible (macroalgae). Impacts of lost gear are considered negligible in the 2020 risk assessment, though specific information is not available.

Overall, there is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm. SG60, SG80 and SG100 are met.

b	VME habitat status			
	Guide post	The UoA is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
	Met?	Yes	Yes	Yes
Rationale				

Environmental changes have contributed to the expansion of seagrass beds including the colonisation of the southern Harvey Estuary by seagrass in 2017/18. An increase in seagrass biomass was recorded (especially in the western Peel Inlet and northern Harvey Estuary) at the same time as a decline in Chlorophyta. Over time, the Estuary's macrophyte community has become dominated by seagrass rather than macroalgae.

Nets are unlikely to catch seagrass in large quantities (fishers prefer to fish over mud and sand), or to retain seagrass, which would be shaken off at the haul. The characteristics of the gear and its use, controlled amount of fishing effort in the UoA, and dynamic nature of estuaries all limit the potential for significant VME impacts.

There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats (seagrass) to a point where there would be serious or irreversible harm. SG60, SG80 and SG100 are met.

Minor habitat status			
C	Guide post	There is evidence that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.	
	Met?		NA
Rationale			

No minor habitats are identified. This scoring issue is not scored.

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.4.1 – Habitats outcome – Sea mullet, gill nets

PI 2.4.1		The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates		
Scoring Issue		SG 60	SG 80	SG 100
a	Commonly encountered habitat status			
	Guide post	The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
	Met?	Yes – All habitats	Yes – All habitats	Yes – All habitats
Rationale				

Commonly Encountered habitats are sand, mud, macroalgae and the Estuary water column. Fishing will only have transient effects on the water column. Areas with prolific algae or seagrass are avoided, because these add weight to the net at hauling if entangled and must be shaken off. Gill nets are generally set in deeper areas than haul nets, and where fish movement is thought to occur, such as channels (noting that the Estuary's entrance channels are closed to commercial fishing). Nets do not retain benthos or sediments, which either pass through netting and/or are shaken off at the haul. The characteristics of the commonly encountered habitats, nature of the gear and extent of its use, and dynamic nature of estuaries all limit the potential for significant habitat impacts.

The 2020 risk assessment assessed the risks to commonly encountered habitats as Low (sand and mud) and Negligible (macroalgae). Impacts of lost gear are considered negligible in the 2020 risk assessment, though specific information is not available.

Overall, there is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm. SG60, SG80 and SG100 are met.

VME habitat status				
b	Guide post	The UoA is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
	Met?	Yes	Yes	Yes
Rationale				

Environmental changes have contributed to the expansion of seagrass beds including the colonisation of the southern Harvey Estuary by seagrass in 2017/18. An increase in seagrass biomass was recorded (especially in the western Peel Inlet and northern Harvey Estuary) at the same time as a decline in Chlorophyta. Over time, the Estuary's macrophyte community has become dominated by seagrass rather than macroalgae.

Nets are unlikely to catch seagrass in large quantities (fishers prefer to fish over mud and sand), or to retain seagrass, which would be shaken off at the haul. The characteristics of the gear and its use, relatively small extent of fishing effort in the UoA in recent years, and dynamic nature of estuaries all limit the potential for significant VME impacts.

There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats (seagrass) to a point where there would be serious or irreversible harm. SG60, SG80 and SG100 are met.

Minor habitat status			
C	Guide post	There is evidence that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.	
	Met?		NA
Rationale			

No minor habitats are identified. This scoring issue is not scored.

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.4.2 – Habitats management strategy – Blue swimmer crab, crab pots

PI 2.4.2 There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats				
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
	Met?	Yes	Yes	No
Rationale				

Measures are in place that restrain habitat impacts, including trap design, fishing capacity limits, and spatial and temporal closures. There are measures in place that are expected to achieve the Habitat Outcome 80 level of performance. SG60 is met.

The 2020 – 2025 harvest strategy for blue swimmer crab sets out a risk-based approach to managing habitat impacts. The stated management objective in the strategy is “*To ensure the effects of fishing do not result in serious or irreversible harm to habitat structure and function*”. The risk-based approach considers the available information on the fishery, such as management arrangements, fishing effort, and footprint, together with any other research. Based on the available information, the risk of habitat impacts is assessed in relation to reference levels, with control rules applied at each level. Risk to benthic habitats is considered undesirable when High, which triggers a review within 3 months and a management response to reduce the risk as soon as practicable. There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above. SG80 is met.

There does not appear to be a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats. SG100 is not met.

Management strategy evaluation				
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or habitats involved.
	Met?	Yes	Yes	Yes
Rationale				

Fishing effort constraints, and gear specifications that limit habitat impacts, are considered likely to work based on plausible argument. Further, information collected on habitat changes in the Estuary over time supports this. Overall, there is an objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved. SG60 and SG80 are met.

The strategy appears not to have been formally tested. However, research on Estuary habitat changes over time has shown that the broader changes have been driven by nitrogen and salinity changes, rather than any fishing impacts. SG100 is met.

Management strategy implementation				
C	Guide post		There is some quantitative evidence that the measures/partial strategy is being implemented successfully.	There is clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
	Met?		Yes	Yes
Rationale				

Evidence that the measures are being implemented successfully include monitoring the extent of fishing effort, number of trap lifts, fishing location, and gear used by fishers, and compliance with closed areas and seasons. (Two offences were detected in the commercial fishery 2014 – 2019, and these were unrelated to habitat management). There is some quantitative evidence that the measures/partial strategy is being implemented successfully. SG80 and SG100 are met.

Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs				
d	Guide post	There is qualitative evidence that the UoA complies with its management requirements to protect VMEs.	There is some quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	There is clear quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
	Met?	Yes	Yes	No
Rationale				

Compliance with relevant management requirements to protect VMEs includes adhering to seasonal and area closures, gear specifications. Two offences were detected in the commercial fishery 2014 – 2019, and these were unrelated to habitat management. There is some quantitative evidence that the measures/partial strategy is being implemented successfully. SG60 and SG80 are met.

Information available on compliance did not comprise clear quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant. SG100 is not met.

References

Daume, S. and Hartmann, K. 2019. Western Australia Peel Harvest Estuarine Fishery Surveillance Report (Third Surveillance). Bio.inspecta.

Daume, S. and Hartmann, K. 2020. Western Australia Peel Harvest Estuarine Fishery Surveillance Report (Fourth Surveillance). Bio.inspecta.

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Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Johnston, D.J., Smith, K.A., Brown, J.I., Travaille, K.L., Crowe, F., Oliver, R.K. and Fisher, E.A. 2015. Western Australian Marine Stewardship Council Report Series No. 3: West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Department of Fisheries, Western Australia.

Morison, A., Daume, S., Gardner, C. and Lack, M. 2016. Western Australia Peel Harvey Estuarine Fishery MSC Full Assessment Public Certification Report. SCS Global Services.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.4.2 – Habitats management strategy – Blue swimmer crab, drop nets

PI 2.4.2		There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
	Met?	Yes	Yes	No
Rationale				

Measures in place that restrain habitat impacts including drop net design, and spatial and temporal closures. There are some gear limits (e.g. 10 nets per person, or 10 nets per boat), which may

indirectly restrain impacts to a degree. There are measures in place that are expected to achieve the Habitat Outcome 80 level of performance. SG60 is met.

The 2020 – 2025 harvest strategy for blue swimmer crab sets out a risk-based approach to managing habitat impacts. The stated management objective in the strategy is “*To ensure the effects of fishing do not result in serious or irreversible harm to habitat structure and function*”. The risk-based approach considers the available information on the fishery, such as management arrangements, fishing effort, and footprint, and any other relevant research available. Based on the available information, the risk of habitat impacts is assessed in relation to reference levels, with control rules applied at each level. Risk to benthic habitats is considered undesirable when High, which triggers a review within 3 months and a management response to reduce the risk as soon as practicable. There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above. SG80 is met.

There does not appear to be a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats. SG100 is not met.

Management strategy evaluation				
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or habitats involved.
	Met?	Yes	Yes	Yes
Rationale				

Temporal and spatial closures and gear designs that limit habitat impacts are considered likely to work based on plausible argument. Further, information collected on habitat changes in the Estuary over time supports this. Overall, there is an objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved. SG60 and SG80 are met.

The strategy appears not to have been formally tested. However, research on Estuary habitat changes over time has shown that the broader changes have been driven by nitrogen and salinity changes, rather than any fishing impacts. SG100 is met.

Management strategy implementation				
c	Guide post		There is some quantitative evidence that the measures/partial strategy is being implemented successfully.	There is clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
	Met?		Yes	No
Rationale				

Evidence that the measures are being implemented successfully include monitoring the extent of compliance with closed areas and seasons, and gear specifications. In general, non-compliance with closed seasons and gear appears relatively lower level, and significantly exceeded by offences relating

to excess and undersize catch. There is some quantitative evidence that the measures/partial strategy is being implemented successfully. SG80 is met.

There does not appear to be clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective. SG100 is not met.

Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs				
d	Guide post	There is qualitative evidence that the UoA complies with its management requirements to protect VMEs.	There is some quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	There is clear quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
		Met?	Yes	Yes
Rationale				

Compliance with relevant management requirements to protect VMEs includes adhering to seasonal and area closures, and gear specifications. As above, non-compliance with closed seasons and gear appears relatively low-level. There is some quantitative evidence that the measures/partial strategy is being implemented successfully. SG60 and SG80 are met.

Information available on compliance did not comprise clear quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant. SG100 is not met.

References

Daume, S. and Hartmann, K. 2019. Western Australia Peel Harvest Estuarine Fishery Surveillance Report (Third Surveillance). Bio.inspecta.

Daume, S. and Hartmann, K. 2020. Western Australia Peel Harvest Estuarine Fishery Surveillance Report (Fourth Surveillance). Bio.inspecta.

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Johnston, D.J., Smith, K.A., Brown, J.I., Travaille, K.L., Crowe, F., Oliver, R.K. and Fisher, E.A. 2015. Western Australian Marine Stewardship Council Report Series No. 3: West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Department of Fisheries, Western Australia.

Morison, A., Daume, S., Gardner, C. and Lack, M. 2016. Western Australia Peel Harvey Estuarine Fishery MSC Full Assessment Public Certification Report. SCS Global Services.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.4.2 – Habitats management strategy – Blue swimmer crab, scoop nets

PI	2.4.2	There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
	Met?	Yes	Yes	No
Rationale				

Measures in place that restrain habitat impacts including net use (i.e. nets can only be actively deployed by hand), and spatial and temporal closures. There are measures in place that are expected to achieve the Habitat Outcome 80 level of performance. SG60 is met.

The 2020 – 2025 harvest strategy for blue swimmer crab sets out a risk-based approach to managing habitat impacts. Based on the available information, the risk of habitat impacts is assessed in relation to reference levels, with control rules applied at each level. Risk to benthic habitats is considered undesirable when High, which triggers a review within 3 months and a management response to reduce the risk as soon as practicable. There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above. SG80 is met.

There does not appear to be a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats. SG100 is not met.

Management strategy evaluation				
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or	There is some objective basis for confidence that the measures/partial strategy will work, based on information directly	Testing supports high confidence that the partial strategy/strategy will work, based on information directly

		comparison with similar UoAs/habitats).	about the UoA and/or habitats involved.	about the UoA and/or habitats involved.
	Met?	Yes	Yes	No
Rationale				

Temporal and spatial closures and gear usage that limit habitat impacts are considered likely to work based on plausible argument. Further, in response to a condition on the previous certificate, spatial distribution of scoop netters in the peak season has been explored. Some confidence that the measures in place will work is provided by information available on habitats in areas where scoop netters are active (e.g. an increase in Chlorophyta in an area used by scoop net fishers).

Overall, there is an objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved. SG60 and SG80 are met.

The strategy appears not to have been tested. Therefore, SG100 is not met.

Management strategy implementation				
C	Guide post		There is some quantitative evidence that the measures/partial strategy is being implemented successfully.	There is clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
	Met?		Yes	No
Rationale				

Evidence that the measures are being implemented successfully include monitoring the extent of compliance with closed areas and seasons, and legal gear specifications. In general, non-compliance with closed seasons and gear appears relatively lower level, and significantly exceeded by offences relating to excess and undersize catch.

There is some quantitative evidence that the measures/partial strategy is being implemented successfully. SG80 is met.

There does not appear to be clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective. SG100 is not met.

Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs				
d	Guide post	There is qualitative evidence that the UoA complies with its management requirements to protect VMEs.	There is some quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	There is clear quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
	Met?	Yes	Yes	No
Rationale				

Compliance with relevant management requirements to protect VMEs includes adhering to seasonal and area closures, and gear specifications. As above, non-compliance with closed seasons and gear appears relatively lower-level. There is some quantitative evidence that the measures/partial strategy is being implemented successfully. SG60 and SG80 are met.

Information available on compliance did not comprise clear quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant. SG100 is not met.

References

Daume, S. and Hartmann, K. 2019. Western Australia Peel Harvest Estuarine Fishery Surveillance Report (Third Surveillance). Bio.inspecta.

Daume, S. and Hartmann, K. 2020. Western Australia Peel Harvest Estuarine Fishery Surveillance Report (Fourth Surveillance). Bio.inspecta.

Daume, S. and Morison, A. 2017. Peel Harvest Estuarine Fishery: 2017 MSC Surveillance Audit Report. SCS Global Services.

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Johnston, D.J., Smith, K.A., Brown, J.I., Travaille, K.L., Crowe, F., Oliver, R.K. and Fisher, E.A. 2015. Western Australian Marine Stewardship Council Report Series No. 3: West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Department of Fisheries, Western Australia.

Morison, A., Daume, S., Gardner, C. and Lack, M. 2016. Western Australia Peel Harvey Estuarine Fishery MSC Full Assessment Public Certification Report. SCS Global Services.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.4.2 – Habitats management strategy – Sea mullet, haul nets

PI 2.4.2 There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats				
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
	Met?	Yes	Yes	No
Rationale				

Measures are in place that restrain habitat impacts of the UoA, including methods of gear operation, commercial fishing capacity limits, and spatial closures. There are measures in place that are expected to achieve the Habitat Outcome 80 level of performance. SG60 is met.

The 2020 – 2025 harvest strategy for finfish sets out a risk-based approach to managing habitat impacts. The stated management objective in the strategy is “*To ensure the effects of fishing do not result in serious or irreversible harm to habitat structure and function*”. The risk-based management approach considers the available information on the fishery, such as management arrangements, fishing effort, and areas fished, together with any other research. Based on the available information, the risk of habitat impacts is assessed in relation to reference levels, with control rules applied at each level. Risk to benthic habitats is considered undesirable when High, which triggers a review within 3 months and a management response to reduce the risk as soon as practicable. There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above. SG80 is met.

There does not appear to be a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats. SG100 is not met.

Management strategy evaluation				
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or habitats involved.
	Met?	Yes	Yes	Yes
Rationale				

Fishing capacity limits, spatial closures and gear use that limits habitat impacts are considered likely to work based on plausible argument. Further, information collected on habitat changes in the Estuary over time supports this. Overall, there is an objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved. SG60 and SG80 are met.

The strategy appears not to have been formally tested. However, research on Estuary habitat changes over time has shown that the broader changes have been driven by nitrogen and salinity changes, rather than any fishing impacts. SG100 is met.

Management strategy implementation				
C	Guide post		There is some quantitative evidence that the measures/partial strategy is being implemented successfully.	There is clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
	Met?		Yes	No
Rationale				

Evidence that the measures are being implemented successfully includes compliance monitoring with closed areas and gear requirements and information on fishing locations. Findings of ecological risk assessments are also expected to reflect UoA risks to habitats, and consider pertinent information to draw conclusions. There is some quantitative evidence that the measures/partial strategy is being implemented successfully. SG80 is met.

There does not appear to be clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective. SG100 is not met.

Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs				
d	Guide post	There is qualitative evidence that the UoA complies with its management requirements to protect VMEs.	There is some quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	There is clear quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
	Met?	Yes	Yes	No
Rationale				

Compliance with relevant management requirements to protect VMEs includes adhering to spatial closures and gear specifications. A small number of netting offences were detected that related to closed areas and illegal gear among recreational net fishers. None were reported for commercial fishers. This will be investigated further at the site visit. Based on currently available information, there is some quantitative evidence that the measures/partial strategy is being implemented successfully. SG60 and SG80 are met.

Information available on compliance did not comprise clear quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant. SG100 is not met.

References

Daume, S. and Hartmann, K. 2019. Western Australia Peel Harvest Estuarine Fishery Surveillance Report (Third Surveillance). Bio.inspecta.

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Johnston, D.J., Smith, K.A., Brown, J.I., Travaille, K.L., Crowe, F., Oliver, R.K. and Fisher, E.A. 2015. Western Australian Marine Stewardship Council Report Series No. 3: West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Department of Fisheries, Western Australia.

Morison, A., Daume, S., Gardner, C. and Lack, M. 2016. Western Australia Peel Harvey Estuarine Fishery MSC Full Assessment Public Certification Report. SCS Global Services.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.4.2 – Habitats management strategy – Sea mullet, gill nets

PI 2.4.2 There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats				
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
	Met?	Yes	Yes	No
Rationale				

Measures are in place that restrain habitat impacts of the UoA, including commercial fishing capacity limits, gear design, and spatial closures. There are measures in place that are expected to achieve the Habitat Outcome 80 level of performance. SG60 is met.

The 2020 – 2025 harvest strategy for finfish sets out a risk-based approach to managing habitat impacts. The stated management objective in the strategy is “*To ensure the effects of fishing do not result in serious or irreversible harm to habitat structure and function*”. The risk-based management approach considers the available information on the fishery, such as management arrangements, fishing effort, and areas fished, together with any other research. Based on the available information, the risk of habitat impacts is assessed in relation to reference levels, with control rules applied at each level. Risk to benthic habitats is considered undesirable when High, which triggers a review within 3 months and a management response to reduce the risk as soon as practicable. There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above. SG80 is met.

There does not appear to be a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats. SG100 is not met.

Management strategy evaluation				
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or habitats involved.
	Met?	Yes	Yes	Yes
Rationale				

Fishing capacity limits, spatial closures and gear design that limits habitat impacts are considered likely to work based on plausible argument. Further, information collected on habitat changes in the Estuary over time supports this. Overall, there is an objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved. SG60 and SG80 are met.

The strategy appears not to have been formally tested. However, research on Estuary habitat changes over time has shown that the broader changes have been driven by nitrogen and salinity changes, rather than any fishing impacts. SG100 is met.

Management strategy implementation				
C	Guide post		There is some quantitative evidence that the measures/partial strategy is being implemented successfully.	There is clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
	Met?		Yes	No
Rationale				

Evidence that the measures are being implemented successfully includes compliance monitoring with closed areas and gear requirements and information on fishing locations. Findings of ecological risk assessments are also expected to reflect UoA risks to habitats, and consider pertinent information to draw conclusions. There is some quantitative evidence that the measures/partial strategy is being implemented successfully. SG80 is met.

There does not appear to be clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective. SG100 is not met.

Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs				
d	Guide post	There is qualitative evidence that the UoA complies with its management requirements to protect VMEs.	There is some quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	There is clear quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
	Met?	Yes	Yes	No
Rationale				

Compliance with relevant management requirements to protect VMEs includes adhering to spatial closures and gear specifications. A small number of netting offences were detected that related to closed areas and illegal gear among recreational net fishers. None were reported for commercial fishers. This will be investigated further at the site visit. Based on currently available information, there is some quantitative evidence that the measures/partial strategy is being implemented successfully. SG60 and SG80 are met.

Information available on compliance did not comprise clear quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant. SG100 is not met.

References

Daume, S. and Hartmann, K. 2019. Western Australia Peel Harvest Estuarine Fishery Surveillance Report (Third Surveillance). Bio.inspecta.

Daume, S. and Hartmann, K. 2020. Western Australia Peel Harvest Estuarine Fishery Surveillance Report (Fourth Surveillance). Bio.inspecta.

Daume, S. and Morison, A. 2017. Peel Harvest Estuarine Fishery: 2017 MSC Surveillance Audit Report. SCS Global Services.

Daume, S. and Morison, A. 2018. Peel Harvest Estuarine Fishery: 2018 MSC Surveillance Audit Report. SCS Global Services.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Johnston, D.J., Smith, K.A., Brown, J.I., Travaille, K.L., Crowe, F., Oliver, R.K. and Fisher, E.A. 2015. Western Australian Marine Stewardship Council Report Series No. 3: West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Department of Fisheries, Western Australia.

Morison, A., Daume, S., Gardner, C. and Lack, M. 2016. Western Australia Peel Harvey Estuarine Fishery MSC Full Assessment Public Certification Report. SCS Global Services.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.4.3 – Habitats information – Blue swimmer crab, crab pots

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	<p>The types and distribution of the main habitats are broadly understood.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the types and distribution of the main habitats.</p>	<p>The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.</p>	<p>The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.</p>
	Met?	Yes	Yes	Yes
Rationale				

A substantial body of information has been amassed on the types and distributions of habitats in the Estuary, including changes over time. Some of this information has been collected in contexts unrelated to the UoA (e.g. the creation of Dawesville Channel, investigation of environmental changes affecting macrophyte communities, and investigation of the Estuary's ecological character and environmental condition), but is nonetheless informative for managing and monitoring habitat impacts of the fishery.

The nature, distribution and vulnerability of the main habitats (i.e. commonly encountered habitats and VMEs) in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. SG60 and SG80 are met. The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats. SG100 is met.

Information adequacy for assessment of impacts				
b	Guide post	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear.	The physical impacts of the gear on all habitats have been quantified fully.
		OR	OR	
		If CSA is used to score PI 2.4.1 for the UoA:		

		Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	
	Met?	Yes	Yes	No
Rationale				

Fishers are required to report fishing location (start latitude and longitude per line of traps), mean depth, and soak time. Together with habitat distribution information, and the qualitative assessment of gear impacts, this body of information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear. SG60 and SG80 are met.

The physical impacts of the gear on all habitats have not been quantified fully. SG100 is not met.

Monitoring				
C	Guide post		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in all habitat distributions over time are measured.
	Met?		Yes	No
Rationale				

Information on fishing effort, location, and compliance with gear requirements continues to be collected. This is adequate to detect any increase in risk to the main habitats. SG80 is met.

While changes in some habitat distributions over time have been examined, it appears not all are, and that such work is not necessarily conducted on an ongoing and systematic basis. SG100 is not met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

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Krumholz, O. 2019. Macrophyte communities in the Peel-Harvey Estuary: Historical trends and current patterns in biomass and distribution. Honours Thesis, Murdoch University.

Valesini, F.J., Hourston, M., Wildsmith, M.D., Coen, N.J. and Potter, I.C. 2010. New quantitative approaches for classifying and predicting local-scale habitats in estuaries. Estuarine, Coastal and Shelf Science, 86(4): 645-664.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.4.3 – Habitats information – Blue swimmer crab, drop nets

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	<p>The types and distribution of the main habitats are broadly understood.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the types and distribution of the main habitats.</p>	<p>The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.</p>	<p>The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.</p>
	Met?	Yes	Yes	Yes
Rationale				

A substantial body of information has been amassed on the types and distributions of habitats in the Estuary, including changes over time. Some of this information has been collected in contexts unrelated to the fishery (e.g. the creation of Dawesville Channel, investigation of environmental changes affecting macrophyte communities, and investigation of the Estuary's ecological character and

environmental condition), but is nonetheless informative for managing and monitoring habitat impacts of the fishery.

The nature, distribution and vulnerability of the main habitats (i.e. commonly encountered habitats and VMEs) are known at a level of detail relevant to the scale and intensity of the UoA. SG60 and SG80 are met. The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats. SG100 is met.

Information adequacy for assessment of impacts				
b	Guide post	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear.	The physical impacts of the gear on all habitats have been quantified fully.
		OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	
	Met?	Yes	No	No
Rationale				

Habitat distribution information, the qualitative assessment of gear impacts, locations of closed areas, and knowledge of fishing activities in the Estuary is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear. SG60 is met.

It appears that there is not reliable information available from recent years on the spatial extent of interaction, and the timing and location of use of the fishing gear. SG80 is not met.

The physical impacts of the gear on all habitats have not been quantified fully. SG100 is not met.

Monitoring				
c	Guide post		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in all habitat distributions over time are measured.
	Met?		Yes	No
Rationale				

Compliance with gear requirements continues to be monitored in the UoA, and habitat-related research and monitoring have also occurred over time (at times unrelated to the Estuary fishery, but

nonetheless informative in terms of evaluating habitat risks). Risk assessments are reviewed regularly, and consider any new information available. Collectively, these actions are expected to be adequate to detect any increase in risk to the main habitats. SG80 is met.

While changes in some habitat distributions over time have been examined, it appears not all necessarily would be systematically on an ongoing basis. SG100 is not met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

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Valesini, F.J., Hourston, M., Wildsmith, M.D., Coen, N.J. and Potter, I.C. 2010. New quantitative approaches for classifying and predicting local-scale habitats in estuaries. Estuarine, Coastal and Shelf Science, 86(4): 645-664.

Draft scoring range	60-79
Information gap indicator	More information sought <i>Reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear (scoring issue (b)).</i>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.4.3 – Habitats information – Blue swimmer crab, scoop nets

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	<p>The types and distribution of the main habitats are broadly understood.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the types and distribution of the main habitats.</p>	<p>The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.</p>	<p>The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.</p>
	Met?	Yes	Yes	Yes
Rationale				

A substantial body of information has been amassed on the types and distributions of habitats in the Estuary, including changes over time. Some of this information has been collected in contexts unrelated to the fishery (e.g. the creation of Dawesville Channel, investigation of environmental changes affecting macrophyte communities, and investigation of the Estuary's ecological character and environmental condition), but is nonetheless informative for managing and monitoring habitat impacts of the fishery.

The nature, distribution and vulnerability of the main habitats (i.e. commonly encountered habitats and VMEs) are known at a level of detail relevant to the scale and intensity of the UoA. SG60 and SG80 are met. The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats. SG100 is met.

Information adequacy for assessment of impacts				
b	Guide post	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear.	The physical impacts of the gear on all habitats have been quantified fully.
		OR	OR	

		If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.		
		If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.		
	Met?	Yes	No	No
Rationale				

Habitat distribution information, the qualitative assessment of gear impacts, locations of closed areas, and knowledge of the distribution of scoop net fishing in the Estuary in the high season is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear. SG60 is met.

Information collected in high season is valuable for understanding the impacts of scoop net fishing on habitats. However, as yet, there does not appear to be reliable information for the rest of the year, on the spatial extent of interaction and on the timing and location of use of the fishing gear. This may be in preparation (the reference to Desfosses et al. in prep is noted in the 2020 risk assessment) and this will be explored further at the site visit. SG80 is not met based on currently available information.

The physical impacts of the gear on all habitats have not been quantified fully. SG100 is not met.

Monitoring				
C	Guide post		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in all habitat distributions over time are measured.
	Met?		Yes	No
Rationale				

Compliance with gear requirements continues to be monitored in the UoA, and habitat-related research and monitoring have also occurred over time (at times unrelated to the Estuary fishery, but nonetheless informative in terms of evaluating habitat risks). Risk assessments are reviewed regularly and consider any new information available. Collectively, these actions are expected to be adequate to detect any increase in risk to the main habitats. SG80 is met.

While changes in some habitat distributions over time have been examined, it appears not all necessarily would be systematically on an ongoing basis. SG100 is not met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

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Krumholz, O. 2019. Macrophyte communities in the Peel-Harvey Estuary: Historical trends and current patterns in biomass and distribution. Honours Thesis, Murdoch University.

Draft scoring range	60-79
Information gap indicator	More information sought <i>Reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear (outside the peak season summarised in Fisher et al. 2020) (scoring issue (b)).</i>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.4.3 – Habitats information – Sea mullet, haul nets

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	<p>The types and distribution of the main habitats are broadly understood.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the types and distribution of the main habitats.</p>	<p>The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the types and</p>	<p>The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.</p>

		distribution of the main habitats.		
	Met?	Yes	Yes	Yes
Rationale				

A substantial body of information has been amassed on the types and distributions of habitats in the Estuary, including changes over time. Some of this information has been collected in contexts unrelated to the UoA (e.g. the creation of Dawesville Channel, investigation of environmental changes affecting macrophyte communities, and investigation of the Estuary's ecological character and environmental condition), but is nonetheless informative for managing and monitoring habitat impacts of the fishery.

The nature, distribution and vulnerability of the main habitats (i.e. commonly encountered habitats and VMEs) in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. SG60 and SG80 are met. The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats. SG100 is met.

Information adequacy for assessment of impacts				
b	Guide post	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear.	The physical impacts of the gear on all habitats have been quantified fully.
		OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	
	Met?	Yes	Yes	No
Rationale				

In 2017/18, a 12-month programme was undertaken, during which net fishers reported shots from more than 60 sites in the Estuary. Around half of the effort reported in the Peel Inlet occurred in the southern parts around Boggy Bay and Roberts Bay. In the Harvey Estuary, the eastern and southern areas around Long Island were important for fishing. Fishing in the Peel Inlet took place throughout the year. In contrast, fishing was reported mostly in the southern parts of the Harvey during warmer months, and in the northern parts (around the Dawesville Channel) during the colder months. Together with habitat distribution information, and the qualitative assessment of gear impacts, this body of information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear. SG60 and SG80 are met.

The physical impacts of the gear on all habitats have not been quantified fully. SG100 is not met.

Monitoring				
C	Guide post		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in all habitat distributions over time are measured.
	Met?		Yes	No
Rationale				

Compliance with gear requirements continues to be monitored in the UoA, and habitat-related research and monitoring have also occurred over time (at times unrelated to the Estuary fishery, but nonetheless informative in terms of evaluating habitat risks). Risk assessments are reviewed regularly, and consider any new information available. Collectively, these actions are expected to be adequate to detect any increase in risk to the main habitats. SG80 is met.

While changes in some habitat distributions over time have been examined, it appears not all are, and that such work is not necessarily conducted on an ongoing and systematic basis. SG100 is not met.

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

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Krumholz, O. 2019. Macrophyte communities in the Peel-Harvey Estuary: Historical trends and current patterns in biomass and distribution. Honours Thesis, Murdoch University.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.4.3 – Habitats information – Sea mullet, gill nets

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	<p>The types and distribution of the main habitats are broadly understood.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the types and distribution of the main habitats.</p>	<p>The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.</p>	<p>The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.</p>
	Met?	Yes	Yes	Yes
Rationale				

A substantial body of information has been amassed on the types and distributions of habitats in the Estuary, including changes over time. Some of this information has been collected in contexts unrelated to the UoA (e.g. the creation of Dawesville Channel, investigation of environmental changes affecting macrophyte communities, and investigation of the Estuary's ecological character and environmental condition), but is nonetheless informative for managing and monitoring habitat impacts of the fishery.

The nature, distribution and vulnerability of the main habitats (i.e. commonly encountered habitats and VMEs) in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. SG60 and SG80 are met. The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats. SG100 is met.

Information adequacy for assessment of impacts				
b	Guide post	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear.	The physical impacts of the gear on all habitats have been quantified fully.
		OR	OR	
		If CSA is used to score PI 2.4.1 for the UoA:		

		Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	
	Met?	Yes	Yes	No
Rationale				

In 2017/18, a 12-month programme was undertaken, during which net fishers reported shots from more than 60 sites in the Estuary. Around half of the effort reported in the Peel Inlet occurred in the southern parts around Boggy Bay and Roberts Bay. In the Harvey Estuary, the eastern and southern areas around Long Island were important for fishing. Fishing in the Peel Inlet took place throughout the year. In contrast, fishing was reported mostly in the southern parts of the Harvey during warmer months, and in the northern parts (around the Dawesville Channel) during the colder months. Together with habitat distribution information, and the qualitative assessment of gear impacts, this body of information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear. SG60 and SG80 are met.

The physical impacts of the gear on all habitats have not been quantified fully. SG100 is not met.

Monitoring				
C	Guide post		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in all habitat distributions over time are measured.
	Met?		Yes	No
Rationale				

Compliance with gear requirements continues to be monitored in the UoA, and habitat-related research and monitoring have also occurred over time (at times unrelated to the Estuary fishery, but nonetheless informative in terms of evaluating habitat risks). Risk assessments are reviewed regularly and consider any new information available. Collectively, these actions are expected to be adequate to detect any increase in risk to the main habitats. SG80 is met.

While changes in some habitat distributions over time have been examined, it appears not all necessarily would be systematically on an ongoing basis. SG100 is not met.

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Hale, J. and Butcher, R. 2007. Ecological Character Description of the Peel-Yalgorup Ramsar Site, Report to the Department of Environment and Conservation and the Peel-Harvey Catchment Council, Perth.

Johnston, D.J., Smith, K.A., Brown, J.I., Travaille, K.L., Crowe, F., Oliver, R.K. and Fisher, E.A. 2015. Western Australian Marine Stewardship Council Report Series No. 3: West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Department of Fisheries, Western Australia.

Krumholz, O. 2019. Macrophyte communities in the Peel-Harvey Estuary: Historical trends and current patterns in biomass and distribution. Honours Thesis, Murdoch University.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.5.1 – Ecosystem outcome – Blue swimmer crab, crab pots

PI 2.5.1		The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Ecosystem status			
	Guide post	The UoA is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Yes	Yes	Yes
Rationale				

The key elements underlying ecosystem structure and function are physico-chemical characteristics of the estuarine waters, and drivers of those characteristics. Specifically, salinity, dissolved oxygen and water temperature are all affected by the riverine inputs to the estuary, rainfall and climate more broadly (including climate change). The UoA will not affect any of these, and its impact on the ecosystem would be driven by removal of target species biomass. The fish fauna of the estuary is diverse, and UoA removals are not considered likely to result in ecosystem disruption (including when explored through ecosystem modelling). Fishery-independent data shows high abundance of juvenile (sub-legal) blue swimmer crabs and the sea mullet stock is considered to be at a level close to its unfished biomass.

The Ecological Risk Assessment conducted in 2020 identified a low risk of the UoA to trophic interactions, and a negligible risk resulting from gear loss. Garbage was also considered a Negligible risk, with commercial fishers conducting day trips only, and not using packaged bait.

There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. SG60, SG80 and SG100 are met.

References

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Fretzer, S. 2013. Analysing the effects of anthropogenic activities on two aquatic ecosystems in Western Australia and identifying sustainable policies for ecosystem based management. Ph.D. Thesis, Murdoch University, Western Australia.

Hale, J. and Butcher, R. 2007. Ecological Character Description of the Peel-Yalgorup Ramsar Site, Report to the Department of Environment and Conservation and the Peel-Harvey Catchment Council, Perth.

Johnston, D.J., Smith, K.A., Brown, J.I., Travaille, K.L., Crowe, F., Oliver, R.K. and Fisher, E.A. 2015. Western Australian Marine Stewardship Council Report Series No. 3: West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Department of Fisheries, Western Australia.

Thomson, C.E. 2019. Regional Estuaries Initiative, Estuary condition report: Peel-Harvey 2016/17, Department of Water and Environmental Regulation, Western Australia.

Draft scoring range

≥80

Information gap indicator

Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score

Condition number (if relevant)

PI 2.5.1 – Ecosystem outcome – Blue swimmer crab, drop nets

PI 2.5.1 The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function				
Scoring Issue		SG 60	SG 80	SG 100
a	Ecosystem status			
	Guide post	The UoA is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Yes	Yes	Yes
Rationale				

The key elements underlying ecosystem structure and function are physico-chemical characteristics of the estuarine waters, and drivers of those characteristics. Specifically, salinity, dissolved oxygen and water temperature are all affected by the riverine inputs to the estuary, rainfall and climate more broadly (including climate change). The UoA will not affect any of these, and its impact on the ecosystem would be driven by removal of target species biomass. The fish fauna of the estuary is diverse, and UoA removals are not considered likely to result in ecosystem disruption (including when explored through ecosystem modelling). Fishery-independent data shows high abundance of juvenile (sub-legal) blue swimmer crabs and the sea mullet stock is considered to be at a level close to its unfished biomass. Unrelated to the UoA, the trophic linkages have increased since the Dawesville Channel opened.

The Ecological Risk Assessment conducted in 2020 identified a low risk of the UoA to trophic interactions, and a negligible risk resulting from gear loss. Garbage was considered a Low risk, with recreational fishers sometimes using packaged bait (the wrappings of which could be dumped onsite).

There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. SG60, SG80 and SG100 are met.

References

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Fretzer, S. 2013. Analysing the effects of anthropogenic activities on two aquatic ecosystems in Western Australia and identifying sustainable policies for ecosystem based management. Ph.D. Thesis, Murdoch University, Western Australia.

Hale, J. and Butcher, R. 2007. Ecological Character Description of the Peel-Yalgorup Ramsar Site, Report to the Department of Environment and Conservation and the Peel-Harvey Catchment Council, Perth.

Johnston, D.J., Smith, K.A., Brown, J.I., Travaille, K.L., Crowe, F., Oliver, R.K. and Fisher, E.A. 2015. Western Australian Marine Stewardship Council Report Series No. 3: West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational

Fishery. Department of Fisheries, Western Australia.

Thomson, C.E. 2019. Regional Estuaries Initiative, Estuary condition report: Peel-Harvey 2016/17, Department of Water and Environmental Regulation, Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.5.1 – Ecosystem outcome – Blue swimmer crab, scoop nets

PI 2.5.1		The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Ecosystem status			
	Guide post	The UoA is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Yes	Yes	Yes
Rationale				

The key elements underlying ecosystem structure and function are physico-chemical characteristics of the estuarine waters, and drivers of those characteristics. Specifically, salinity, dissolved oxygen and water temperature are all affected by the riverine inputs to the estuary, rainfall and climate more broadly (including climate change). The UoA will not affect any of these, and its impact on the ecosystem would be driven by removal of target species biomass. The fish fauna of the estuary is diverse, and UoA removals are not considered likely to result in ecosystem disruption (including when explored through ecosystem modelling). Fishery-independent data shows high abundance of juvenile (sub-legal) blue swimmer crabs and the sea mullet stock is considered to be at a level close to its unfished biomass. Unrelated to the UoA, the trophic linkages have increased since the Dawesville Channel opened.

The Ecological Risk Assessment conducted in 2020 identified a low risk of the UoA to trophic interactions, and a negligible risk resulting from gear loss. Garbage was considered a Low risk, with recreational fishers sometimes using packaged bait (the wrappings of which could be dumped onsite).

There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. SG60, SG80 and SG100 are met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Fretzer, S. 2013. Analysing the effects of anthropogenic activities on two aquatic ecosystems in Western Australia and identifying sustainable policies for ecosystem based management. Ph.D. Thesis, Murdoch University, Western Australia.

Hale, J. and Butcher, R. 2007. Ecological Character Description of the Peel-Yalgorup Ramsar Site, Report to the Department of Environment and Conservation and the Peel-Harvey Catchment Council, Perth.

Johnston, D.J., Smith, K.A., Brown, J.I., Travaille, K.L., Crowe, F., Oliver, R.K. and Fisher, E.A. 2015. Western Australian Marine Stewardship Council Report Series No. 3: West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Department of Fisheries, Western Australia.

Draft scoring range

≥80

Information gap indicator

Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score

Condition number (if relevant)

PI 2.5.1 – Ecosystem outcome – Sea mullet, haul nets

PI 2.5.1		The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Ecosystem status			
	Guide post	The UoA is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Yes	Yes	Yes
Rationale				

The key elements underlying ecosystem structure and function are physico-chemical characteristics of the estuarine waters, and drivers of those characteristics. Specifically, salinity, dissolved oxygen and water temperature are all affected by the riverine inputs to the estuary, rainfall and climate more broadly (including climate change). The UoA will not affect any of these, and its impact on the ecosystem would be driven by removal of target species biomass. The fish fauna of the estuary is diverse, and UoA removals are not considered likely to result in ecosystem disruption (including when explored through ecosystem modelling). The sea mullet stock is considered to be at a level close to its unfished biomass. Unrelated to the UoA, the trophic linkages have increased since the Dawesville Channel opened.

The Ecological Risk Assessment conducted in 2020 identified a low risk of the UoA to trophic interactions, and a negligible risk resulting from gear loss. Garbage was also considered a Negligible risk, with commercial fishers conducting day trips only, and not using packaged bait.

There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. SG60, SG80 and SG100 are met.

References

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Fretzer, S. 2013. Analysing the effects of anthropogenic activities on two aquatic ecosystems in Western Australia and identifying sustainable policies for ecosystem based management. Ph.D. Thesis, Murdoch University, Western Australia.

Hale, J. and Butcher, R. 2007. Ecological Character Description of the Peel-Yalgorup Ramsar Site, Report to the Department of Environment and Conservation and the Peel-Harvey Catchment Council, Perth.

Johnston, D.J., Smith, K.A., Brown, J.I., Travaille, K.L., Crowe, F., Oliver, R.K. and Fisher, E.A. 2015. Western Australian Marine Stewardship Council Report Series No. 3: West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Department of Fisheries, Western Australia.

Thomson, C.E. 2019. Regional Estuaries Initiative, Estuary condition report: Peel-Harvey 2016/17, Department of Water and Environmental Regulation, Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.5.1 – Ecosystem outcome – Sea mullet, gill nets

PI 2.5.1 The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function				
Scoring Issue		SG 60	SG 80	SG 100
a	Ecosystem status			
	Guide post	The UoA is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Yes	Yes	Yes
Rationale				

The key elements underlying ecosystem structure and function are physico-chemical characteristics of the estuarine waters, and drivers of those characteristics. Specifically, salinity, dissolved oxygen and water temperature are all affected by the riverine inputs to the estuary, rainfall and climate more broadly (including climate change). The UoA will not affect any of these, and its impact on the ecosystem would be driven by removal of target species biomass. The fish fauna of the estuary is diverse, and UoA removals are not considered likely to result in ecosystem disruption (including when explored through ecosystem modelling). The sea mullet stock is considered to be at a level close to its unfished biomass. Unrelated to the UoA, the trophic linkages have increased since the Dawesville Channel opened.

The Ecological Risk Assessment conducted in 2020 identified a low risk of the UoA to trophic interactions, and a negligible risk resulting from gear loss. Garbage was also considered a Negligible risk, with commercial fishers conducting day trips only, and not using packaged bait.

There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. SG60, SG80 and SG100 are met.

References

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Fretzer, S. 2013. Analysing the effects of anthropogenic activities on two aquatic ecosystems in Western Australia and identifying sustainable policies for ecosystem based management. Ph.D. Thesis, Murdoch University, Western Australia.

Hale, J. and Butcher, R. 2007. Ecological Character Description of the Peel-Yalgorup Ramsar Site, Report to the Department of Environment and Conservation and the Peel-Harvey Catchment Council, Perth.

Johnston, D.J., Smith, K.A., Brown, J.I., Travaille, K.L., Crowe, F., Oliver, R.K. and Fisher, E.A. 2015. Western Australian Marine Stewardship Council Report Series No. 3: West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Department of Fisheries, Western Australia.

Thomson, C.E. 2019. Regional Estuaries Initiative, Estuary condition report: Peel-Harvey 2016/17, Department of Water and Environmental Regulation, Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.5.2 – Ecosystem management strategy – Blue swimmer crab, crab pots

PI 2.5.2		There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place, if necessary which take into account the potential impacts of the UoA on key elements of the ecosystem.	There is a partial strategy in place, if necessary, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a strategy that consists of a plan , in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place.
	Met?	Yes	Yes	Yes
Rationale				

The blue swimmer crab and finfish harvest strategies both include objectives, performance indicators, reference levels and control rules relevant to ecosystem impacts of the UoA. Reference levels are risk-based, and performance indicators include the available information. Given the nature of potential UoA impacts on ecosystems, measures relate to the fishing operation, e.g. capacity, catch and effort restrictions, spatial and temporal closures, and reporting.

There is a strategy that consists of a plan, in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place. SG60, SG80 and SG100 are met.

Management strategy evaluation				
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general	There is some objective basis for confidence that the measures/ partial strategy will work, based	Testing supports high confidence that the partial strategy/ strategy will work, based on

		experience, theory or comparison with similar UoAs/ ecosystems).	on some information directly about the UoA and/or the ecosystem involved.	information directly about the UoA and/or ecosystem involved.
	Met?	Yes	Yes	No
Rationale				

The management measures in place are likely to work to restrain ecosystem impacts of the UoA, based on plausible argument. For example, catch controls and effort restrictions, and spatial and temporal closures, are ubiquitous fishery management measures. SG60 is met and the UoA has been managed with such measures for an extended period.

As for other components, the harvest strategies' response timeframes are not explicit for ecosystem impacts, being "*as soon as practicable*". This creates uncertainty regarding the efficacy of the strategy. However, overall the ecosystem appears relatively resilient to fishing impacts, given the findings of ecosystem modelling. This provides some objective basis for confidence that the measures/partial strategy will work. SG60 and SG80 are met.

The strategy does not appear to have been tested. SG100 is not met.

Management strategy implementation				
C	Guide post		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) .
	Met?		Yes	No
Rationale				

Evidence that the strategy is being implemented successfully includes fishery performance indicators, such as catch and effort, and compliance information. There is some evidence that the measures/partial strategy is being implemented successfully. SG80 is met.

The strategy does not appear to have been tested for the UoA. SG100 is not met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

<https://fish.gov.au/report/240-Yelloweye-Mullet-2018> [Accessed 17 February 2021]

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.5.2 – Ecosystem management strategy – Blue swimmer crab, drop nets

PI 2.5.2		There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place, if necessary which take into account the potential impacts of the UoA on key elements of the ecosystem.	There is a partial strategy in place, if necessary, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a strategy that consists of a plan , in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place.
	Met?	Yes	Yes	Yes
Rationale				

The blue swimmer crab and finfish harvest strategies both include objectives, performance indicators, reference levels and control rules relevant to ecosystem impacts of the UoA. Reference levels are risk-based, and performance indicators include the available information. Given the nature of potential UoA impacts on ecosystems, measures relate to fishing operations, e.g. capacity, catch and effort restrictions, spatial and temporal closures, and reporting. Catch share allocation between sectors is covered in the harvest strategy for blue swimmer crabs; this is important for managing ecosystem-level UoA impacts.

There is a strategy that consists of a plan, in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place. SG60, SG80 and SG100 are met.

Management strategy evaluation				
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ ecosystems).	There is some objective basis for confidence that the measures/ partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved.	Testing supports high confidence that the partial strategy/ strategy will work, based on information directly about the UoA and/or ecosystem involved.
	Met?	Yes	Yes	No

Rationale

The strategy in place is likely to work to restrain ecosystem impacts of the UoA, based on plausible argument. For example, gear controls, catch shares among sectors, and spatial and temporal closures are ubiquitous fishery management measures. Ecosim modelling (while now slightly dated) has shown that overall, reducing recreational fishing effort in the Estuary would not benefit the majority of functional groups. There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved. SG60 and SG80 are met.

The strategy does not appear to have been tested for the UoA. SG100 is not met.

Management strategy implementation			
C	Guide post	There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) .
	Met?	Yes	No
Rationale			

Evidence that the strategy is being implemented successfully includes fishery performance indicators, such as compliance information. There is some evidence that the measures/partial strategy is being implemented successfully. SG80 is met.

There is not recent clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a). SG100 is not met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

Fretzer, S. 2013. Analysing the effects of anthropogenic activities on two aquatic ecosystems in Western Australia and identifying sustainable policies for ecosystem based management. Ph.D. Thesis, Murdoch University, Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.5.2 – Ecosystem management strategy – Blue swimmer crab, scoop nets

PI 2.5.2		There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place, if necessary which take into account the potential impacts of the UoA on key elements of the ecosystem.	There is a partial strategy in place, if necessary, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a strategy that consists of a plan , in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place.
	Met?	Yes	Yes	Yes
Rationale				

The blue swimmer crab includes objectives, performance indicators, reference levels and control rules relevant to ecosystem impacts of the UoA. Reference levels are risk-based, and performance indicators include the available information. Given the nature of potential UoA impacts on ecosystems, measures relate to fishing operations, e.g. gear restrictions and spatial and temporal closures. Catch share allocation between sectors is covered in the harvest strategy for blue swimmer crabs; this is important for effective management of ecosystem-level UoA impacts.

There is a strategy that consists of a plan, in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place. SG60, SG80 and SG100 are met.

Management strategy evaluation				
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ ecosystems).	There is some objective basis for confidence that the measures/ partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved.	Testing supports high confidence that the partial strategy/ strategy will work, based on information directly about the UoA and/or ecosystem involved.
	Met?	Yes	Yes	No
Rationale				

The strategy in place is likely to work to restrain ecosystem impacts of the UoA, based on plausible argument. For example, gear controls, catch shares among sectors, and spatial and temporal closures are ubiquitous fishery management measures. Ecosim modelling (while now slightly dated) has shown that overall, reducing recreational fishing effort in the Estuary would not benefit the majority of functional groups. There is some objective basis for confidence that the measures/partial strategy will

work, based on some information directly about the UoA and/or the ecosystem involved. SG60 and SG80 are met.

The strategy does not appear to have been tested for the UoA. SG100 is not met.

Management strategy implementation			
C	Guide post	There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) .
	Met?	Yes	No
Rationale			

Evidence that the strategy is being implemented successfully includes fishery performance indicators, such as compliance information. There is some evidence that the measures/partial strategy is being implemented successfully. SG80 is met.

There is not recent clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a). SG100 is not met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

Fretzer, S. 2013. Analysing the effects of anthropogenic activities on two aquatic ecosystems in Western Australia and identifying sustainable policies for ecosystembased management. Ph.D. Thesis, Murdoch University, Western Australia.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.5.2 – Ecosystem management strategy – Sea mullet, haul nets

PI 2.5.2 There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function				
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place, if necessary which take into account the potential impacts of the UoA on key elements of the ecosystem.	There is a partial strategy in place, if necessary, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a strategy that consists of a plan , in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place.
	Met?	Yes	Yes	Yes
Rationale				

The finfish harvest strategy includes objectives, performance indicators, reference levels and control rules relevant to ecosystem impacts of the UoA, and ecosystem components (identified as target, retained, bycatch and ETP species, and habitats). Reference levels are risk-based, and performance indicators include the available information. Given the nature of potential UoA impacts on ecosystems, measures relating to the fishing operation are most relevant to restraining ecosystem impacts, e.g. fishing capacity, catch and effort restrictions, spatial closures, and reporting.

There is a strategy that consists of a plan, in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place. SG60, SG80 and SG100 are met.

Management strategy evaluation				
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ ecosystems).	There is some objective basis for confidence that the measures/ partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved.	Testing supports high confidence that the partial strategy/ strategy will work, based on information directly about the UoA and/or ecosystem involved.
	Met?	Yes	Yes	No
Rationale				

The management measures in place are likely to work to restrain ecosystem impacts of the UoA, based on plausible argument. For example, controlling fishing capacity, catch and effort restrictions, and spatial closures are ubiquitous fishery management measures. The UoA has been managed with such measures for an extended period. As for other components, the harvest strategies' response timeframes are not explicit for ecosystem impacts, being "*as soon as practicable*". This creates uncertainty regarding the efficacy of the strategy. However, overall the ecosystem appears relatively resilient to fishing impacts, given the findings of ecosystem modelling. This provides some objective basis for confidence that the measures/ partial strategy will work. SG60 and SG80 are met.

The strategy does not appear to have been tested. SG100 is not met.

Management strategy implementation			
C	Guide post	There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) .
	Met?	Yes	No
Rationale			

Evidence that the strategy is being implemented successfully includes fishery performance indicators, such as catch and effort, and compliance information. There is some evidence that the measures/partial strategy is being implemented successfully. SG80 is met.

The strategy does not appear to have been tested for the UoA. SG100 is not met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

<https://fish.gov.au/report/240-Yelloweye-Mullet-2018> [Accessed 17 February 2021]

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.5.2 – Ecosystem management strategy – Sea mullet, gill nets

PI 2.5.2		There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place, if necessary which take into account the potential impacts of the UoA on key elements of the ecosystem.	There is a partial strategy in place, if necessary, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a strategy that consists of a plan , in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place.
	Met?	Yes	Yes	Yes
Rationale				

The finfish harvest strategy includes objectives, performance indicators, reference levels and control rules relevant to ecosystem impacts of the UoA, and ecosystem components (identified as target, retained, bycatch and ETP species, and habitats). Reference levels are risk-based, and performance indicators include the available information. Given the nature of potential UoA impacts on ecosystems, measures relating to the fishing operation are most relevant to restraining ecosystem impacts, e.g. fishing capacity, catch and effort restrictions, spatial closures, and reporting.

There is a strategy that consists of a plan, in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place. SG60, SG80 and SG100 are met.

Management strategy evaluation				
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ ecosystems).	There is some objective basis for confidence that the measures/ partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved.	Testing supports high confidence that the partial strategy/ strategy will work, based on information directly about the UoA and/or ecosystem involved.
	Met?	Yes	Yes	No
Rationale				

The management measures in place are likely to work to restrain ecosystem impacts of the UoA, based on plausible argument. For example, controlling fishing capacity, catch and effort restrictions, and spatial closures are ubiquitous fishery management measures. The UoA has been managed with such measures for an extended period. As for other components, the harvest strategies' response timeframes are not explicit for ecosystem impacts, being "*as soon as practicable*". This creates uncertainty regarding the efficacy of the strategy. However, overall the ecosystem appears relatively

resilient to fishing impacts, given the findings of ecosystem modelling. This provides some objective basis for confidence that the measures/ partial strategy will work. SG60 and SG80 are met.

The strategy does not appear to have been tested. SG100 is not met.

Management strategy implementation			
C	Guide post	There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) .
	Met?	Yes	No
Rationale			

Evidence that the strategy is being implemented successfully includes fishery performance indicators, such as catch and effort, and compliance information. There is some evidence that the measures/partial strategy is being implemented successfully. SG80 is met.

The strategy does not appear to have been tested for the UoA. SG100 is not met.

References

DPIRD. 2020. Blue Swimmer Crab Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 304. DPIRD, Perth.

DPIRD. 2020. Estuarine and Nearshore Finfish Resource of South-west Western Australia Harvest Strategy 2020 – 2025. Fisheries Management Paper No. 303. DPIRD, Perth.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.5.3 – Ecosystem information – Blue swimmer crab, crab pots

PI 2.5.3 There is adequate knowledge of the impacts of the UoA on the ecosystem				
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Yes	Yes	
Rationale				

A large body of information is available on the Estuary from a variety of sources (e.g. see Hale and Butcher 2007, Fretzer 2013, Fisher et al. 2020, and references therein). Information is adequate to identify and broadly understand the key elements of the ecosystem. SG60 and SG80 are met.

Investigation of UoA impacts				
b	Guide post	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail .	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and have been investigated in detail .
	Met?	Yes	Yes	Yes
Rationale				

The main impact of the UoA is removal of the target stock, and bait use. Ecosim modelling, while now somewhat dated, explored the impacts of increasing and decreasing commercial crab fishing effort on other ecosystem elements (considered as functional groups). Bait stocks are part of the ecosystem, and subject to stock status and risk assessments. The influence of climate change on the ecosystem the UoA occurs in has been identified (e.g. rainfall events, changes in fish distributions). Main interactions between the UoA and ecosystem elements can be inferred from existing information, and have been investigated in detail. SG60, SG80, and SG100 are met.

Understanding of component functions				
c	Guide post		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are known .	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are understood .
	Met?		Yes	Yes
Rationale				

The main functions of components in the ecosystem are known, for example, from ecological characterisation work done in the Estuary as well as broader biological research of the components. Impacts of the UoA on the components are identified (e.g. through catch reporting and fishery monitoring), and the main functions of the component in the ecosystem are understood (e.g. through ecological characterisation work). Lost gear is considered to be minimal, and garbage from UoA operations has been assessed as a negligible risk. SG80 and SG100 are met.

Information relevance				
d	Guide post		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Yes	Yes
Rationale				

The impacts of the UoA are known from fishery-dependent and fishery-independent information. This includes, for example, fishery removals, bait use and habitat impacts. Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred. SG80 is met.

The elements of the ecosystem have also been characterised, and UoA impacts considered, for example, in terms of ecosystem impacts on functional groups of species. Adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred. SG100 is met.

Monitoring				
e	Guide post		Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?		Yes	Yes
Rationale				

Commercial catch landings are reported by fishers and DPIRD conducts monthly monitoring. Fishing locations are also reported. Compliance activities are ongoing, prioritised by risk. Adequate data continue to be collected to detect any increase in risk level and information is adequate to support the development of strategies to manage ecosystem impacts. SG80 and SG100 are met.

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Fretzer, S. 2013. Analysing the effects of anthropogenic activities on two aquatic ecosystems in Western Australia and identifying sustainable policies for ecosystem based management. Ph.D. Thesis, Murdoch University, Western Australia.

Hale, J. and Butcher, R. 2007. Ecological Character Description of the Peel-Yalgorup Ramsar Site, Report to the Department of Environment and Conservation and the Peel-Harvey Catchment Council, Perth.

Johnston, D.J., Smith, K.A., Brown, J.I., Travaille, K.L., Crowe, F., Oliver, R.K. and Fisher, E.A. 2015. Western Australian Marine Stewardship Council Report Series No. 3: West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Department of Fisheries, Western Australia.

Krumholz, O. 2019. Macrophyte communities in the Peel-Harvey Estuary: Historical trends and current patterns in biomass and distribution. Honours Thesis, Murdoch University.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.5.3 – Ecosystem information – Blue swimmer crab, drop nets

PI 2.5.3 There is adequate knowledge of the impacts of the UoA on the ecosystem				
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Yes	Yes	
Rationale				

A large body of information is available on the Estuary from a variety of sources (e.g. see Hale and Butcher 2007, Fretzer 2013, Fisher et al. 2020, and references therein). Information is adequate to identify and broadly understand the key elements of the ecosystem. SG60 and SG80 are met.

Investigation of UoA impacts				
b	Guide post	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail .	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and have been investigated in detail .
	Met?	Yes	Yes	No
Rationale				

The main impact of the UoA is removal of the target stock, and bait use. Ecosim modelling, while now somewhat dated, explored the impacts of increasing and decreasing recreational fishing effort on other ecosystem elements (considered as functional groups). Bait stocks are part of the ecosystem, and subject to stock status and risk assessments. The influence of climate change on the ecosystem the UoA occurs in has been identified (e.g. rainfall events, changes in fish distributions). Main interactions between the UoA and ecosystem elements can be inferred from existing information, and have been investigated in detail. SG60, SG80 are met.

Main interactions between the UoA and these ecosystem elements can be inferred from existing information, but have not been investigated in detail (for the UoA specifically). SG100 is not met.

Understanding of component functions				
c	Guide post		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are known .	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are understood .
	Met?		Yes	Yes

Rationale

The main functions of components in the ecosystem are known, for example, from ecological characterisation work done in the Estuary as well as broader biological research of the components. Impacts of the UoA on the components are identified (e.g. through catch reporting and fishery monitoring), and the main functions of the component in the ecosystem are understood (e.g. through ecological characterisation work). Lost gear is considered to be minimal, and garbage from UoA operations has been assessed as a Low risk. SG80 and SG100 are met.

Information relevance				
d	Guide post		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Yes	No
Rationale				

The impacts of the UoA are known from a relatively limited amount of UoA-dependent information, and a wide range of other information (including on the commercial fishery, for which some UoA impacts are broadly analogous). This includes, for example, fishery removals, bait use and habitat impacts, noting that fishery information on catch and bait is now dated. Given the large body of other information available on the Estuary, adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred. SG80 is met. While the fishery may not have changed significantly in terms of catch composition in recent years, adequate information is not available on the impacts of the UoA on the elements to allow the main consequences for the ecosystem to be inferred. SG100 is not met.

Monitoring				
e	Guide post		Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?		No	No
Rationale				

It is not clear that data continue to be collected to detect any increase in risk level of the UoA. SG80 and SG100 are not met.

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Fretzer, S. 2013. Analysing the effects of anthropogenic activities on two aquatic ecosystems in Western Australia and identifying sustainable policies for ecosystem based management. Ph.D. Thesis, Murdoch University, Western Australia.

Hale, J. and Butcher, R. 2007. Ecological Character Description of the Peel-Yalgrope Ramsar Site, Report to the Department of Environment and Conservation and the Peel-Harvey Catchment Council, Perth.

Johnston, D.J., Smith, K.A., Brown, J.I., Travaille, K.L., Crowe, F., Oliver, R.K. and Fisher, E.A. 2015. Western Australian Marine Stewardship Council Report Series No. 3: West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Department of Fisheries, Western Australia.

Krumholz, O. 2019. Macrophyte communities in the Peel-Harvey Estuary: Historical trends and current patterns in biomass and distribution. Honours Thesis, Murdoch University.

Draft scoring range	60-79
Information gap indicator	More information sought <i>The limited amount of UoA-specific information has become dated. Further information is sought regarding data collection relevant to the UoA, to detect any increase in ecosystem risk level.</i>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.5.3 – Ecosystem information – Blue swimmer crab, scoop nets

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Yes	Yes	
Rationale				

A large body of information is available on the Estuary from a variety of sources (e.g. see Hale and Butcher 2007, Fretzer 2013, Fisher et al. 2020, and references therein). Information is adequate to identify and broadly understand the key elements of the ecosystem. SG60 and SG80 are met.

Investigation of UoA impacts				
b	Guide post	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail .	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and have been investigated in detail .
	Met?	Yes	Yes	No
Rationale				

The main impact of the UoA is removal of the target stock. Ecosim modelling, while now somewhat dated, explored the impacts of increasing and decreasing recreational fishing effort on other ecosystem elements (considered as functional groups). The influence of climate change on the ecosystem the UoA occurs in has been identified (e.g. impacts of changing rainfall patterns). Main interactions between the UoA and ecosystem elements can be inferred from existing information, and have been investigated in detail. SG60, SG80 are met.

Main interactions between the UoA and these ecosystem elements can be inferred from existing information, but have not been investigated in detail (for the UoA specifically). SG100 is not met.

Understanding of component functions				
c	Guide post		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are known .	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are understood .
	Met?		Yes	Yes
Rationale				

The main functions of components in the ecosystem are known, for example, from ecological characterisation work done in the Estuary as well as broader biological research of the components. Impacts of the UoA on the components are identified (e.g. through catch reporting and fishery monitoring), and the main functions of the component in the ecosystem are understood (e.g. through ecological characterisation work). Lost gear is considered to be minimal, and garbage from UoA operations has been assessed as a Low risk. SG80 and SG100 are met.

Information relevance				
d	Guide post		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Yes	No

Rationale

The impacts of the UoA are known from a relatively limited amount of UoA-dependent information, and a wide range of other information (including on the commercial fishery, for which some UoA impacts are broadly analogous). This includes, for example, fishery removals and habitat impacts, noting that fishery information on catch and bait is now dated. Given the large body of other information available on the Estuary, adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred. SG80 is met.

The elements of the ecosystem have also been characterised, and UoA impacts considered. However, information has become dated, such that adequate information is not available from recent years on the impacts of the UoA on the elements to allow the main consequences for the ecosystem to be inferred. SG100 is not met.

Monitoring			
e	Guide post	Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?	No	No
Rationale			

It is not clear what data continue to be collected to detect any increase in risk level of the UoA. SG80 and SG100 are not met.

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Fretzer, S. 2013. Analysing the effects of anthropogenic activities on two aquatic ecosystems in Western Australia and identifying sustainable policies for ecosystem based management. Ph.D. Thesis, Murdoch University, Western Australia.

Hale, J. and Butcher, R. 2007. Ecological Character Description of the Peel-Yalgrope Ramsar Site, Report to the Department of Environment and Conservation and the Peel-Harvey Catchment Council, Perth.

Johnston, D.J., Smith, K.A., Brown, J.I., Travaille, K.L., Crowe, F., Oliver, R.K. and Fisher, E.A. 2015. Western Australian Marine Stewardship Council Report Series No. 3: West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Department of Fisheries, Western Australia.

Krumholz, O. 2019. Macrophyte communities in the Peel-Harvey Estuary: Historical trends and current patterns in biomass and distribution. Honours Thesis, Murdoch University.

Draft scoring range	60-79
Information gap indicator	More information sought <i>The limited amount of UoA-specific information has become dated. Further information is sought regarding data collected of relevance to the UoA, to detect any increase in ecosystem risk level.</i>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 2.5.3 – Ecosystem information – Sea mullet, haul nets

PI	2.5.3	There is adequate knowledge of the impacts of the UoA on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Yes	Yes	
Rationale				

A large body of information is available on the Estuary from a variety of sources (e.g. see Hale and Butcher 2007, Fretzer 2013, Fisher et al. 2020, and references therein). Information is adequate to identify and broadly understand the key elements of the ecosystem. SG60 and SG80 are met.

b	Investigation of UoA impacts			
	Guide post	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail .	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and have been investigated in detail .
	Met?	Yes	Yes	Yes
Rationale				

The main impact of the UoA is removal of the catch. Ecosim modelling, while now somewhat dated, explored the impacts of increasing and decreasing commercial fishing with gill nets on other ecosystem elements (considered as functional groups). The influence of climate change on the ecosystem the UoA occurs in has been identified (e.g. rainfall events, changes in fish distributions). Main interactions between the UoA and ecosystem elements can be inferred from existing information, and have been investigated in detail. SG60, SG80, and SG100 are met.

Understanding of component functions				
C	Guide post		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are known .	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are understood .
	Met?		Yes	Yes
Rationale				

The main functions of components in the ecosystem are known, for example, from ecological characterisation work done in the Estuary as well as broader biological research of the components. Impacts of the UoA on the components are identified (e.g. through catch reporting and fishery monitoring), and the main functions of the component in the ecosystem are understood (e.g. through ecological characterisation work). Lost gear is considered to be minimal, and garbage from UoA operations has been assessed as a negligible risk. SG80 and SG100 are met.

Information relevance				
d	Guide post		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Yes	Yes
Rationale				

The impacts of the UoA are known from fishery-dependent and fishery-independent information. This includes, for example, fishery removals, and habitat impacts. Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred. SG80 is met.

The elements of the ecosystem have also been characterised, and UoA impacts considered, for example, in terms of ecosystem impacts on functional groups of species. Adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred. SG100 is met.

Monitoring				
e	Guide post		Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?		No	No
Rationale				

Commercial catch landings are reported by fishers, while discarded catch is not routinely quantified. A monitoring programme for non-target catch was conducted in 2017/18. This comprised fishery-dependent reporting through monthly log sheets and bimonthly trips by DPIRD staff on commercial vessels to verify reported data, and included the collection of discard information. The intent to repeat this monitoring 5-yearly is stated, and this, together with additional data collection on fishing location would be adequate to detect any increase in risk level. Compliance activities are ongoing, prioritised by risk.

Adequate data may continue to be collected to detect any increase in risk level, if the monitoring programme is implemented 5-yearly as initially intended. SG80 and SG100 are not currently met.

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Fretzer, S. 2013. Analysing the effects of anthropogenic activities on two aquatic ecosystems in Western Australia and identifying sustainable policies for ecosystem based management. Ph.D. Thesis, Murdoch University, Western Australia.

Hale, J. and Butcher, R. 2007. Ecological Character Description of the Peel-Yalgrope Ramsar Site, Report to the Department of Environment and Conservation and the Peel-Harvey Catchment Council, Perth.

Johnston, D.J., Smith, K.A., Brown, J.I., Travaille, K.L., Crowe, F., Oliver, R.K. and Fisher, E.A. 2015. Western Australian Marine Stewardship Council Report Series No. 3: West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Department of Fisheries, Western Australia.

Draft scoring range

60-79

Information gap indicator

Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score

Condition number (if relevant)

PI 2.5.3 – Ecosystem information – Sea mullet, gill nets

PI 2.5.3 There is adequate knowledge of the impacts of the UoA on the ecosystem				
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Yes	Yes	
Rationale				

A large body of information is available on the Estuary from a variety of sources (e.g. see Hale and Butcher 2007, Fretzer 2013, Fisher et al. 2020, and references therein). Information is adequate to identify and broadly understand the key elements of the ecosystem. SG60 and SG80 are met.

Investigation of UoA impacts				
b	Guide post	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail .	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and have been investigated in detail .
	Met?	Yes	Yes	Yes
Rationale				

The main impact of the UoA is removal of the catch. Ecosim modelling, while now somewhat dated, explored the impacts of increasing and decreasing commercial fishing with gill nets on other ecosystem elements (considered as functional groups). The influence of climate change on the ecosystem the UoA occurs in has been identified (e.g. rainfall events, changes in fish distributions). Main interactions between the UoA and ecosystem elements can be inferred from existing information, and have been investigated in detail. SG60, SG80, and SG100 are met.

Understanding of component functions				
c	Guide post		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are known .	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are understood .
	Met?		Yes	Yes
Rationale				

The main functions of components in the ecosystem are known, for example, from ecological characterisation work done in the Estuary as well as broader biological research of the components. Impacts of the UoA on the components are identified (e.g. through catch reporting and fishery monitoring), and the main functions of the component in the ecosystem are understood (e.g. through ecological characterisation work). Lost gear is considered to be minimal, and garbage from UoA operations has been assessed as a negligible risk. SG80 and SG100 are met.

Information relevance				
d	Guide post		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Yes	Yes
Rationale				

The impacts of the UoA are known from fishery-dependent and fishery-independent information. This includes, for example, fishery removals, and habitat impacts. Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred. SG80 is met.

The elements of the ecosystem have also been characterised, and UoA impacts considered, for example, in terms of ecosystem impacts on functional groups of species. Adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred. SG100 is met.

Monitoring				
e	Guide post		Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?		No	No
Rationale				

Commercial catch landings are reported by fishers, while discarded catch is not routinely quantified. A monitoring programme for non-target catch was conducted in 2017/18. This comprised fishery-dependent reporting through monthly log sheets and bimonthly trips by DPIRD staff on commercial vessels to verify reported data, and included the collection of discard information. The intent to repeat this monitoring 5-yearly is stated, and this, together with additional data collection on fishing location would be adequate to detect any increase in risk level. Compliance activities are ongoing, prioritised by risk.

Adequate data may continue to be collected to detect any increase in risk level, if the monitoring programme is implemented 5-yearly as initially intended. SG80 and SG100 are not currently met.

References

DPIRD. 2020. West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Addendum 4. November 2020. Western Australian Marine Stewardship Council Report Series.

Fisher, E.A., Evans, S.N., Desfosses, C.J., Johnston, D.J., Duffy, R., Smith, K.A. 2020. Ecological Risk Assessment for the Peel-Harvey Estuarine Fishery. Fisheries Research Report No. 311. Department of Primary Industries and Regional Development, Western Australia.

Fretzer, S. 2013. Analysing the effects of anthropogenic activities on two aquatic ecosystems in Western Australia and identifying sustainable policies for ecosystem based management. Ph.D. Thesis, Murdoch University, Western Australia.

Hale, J. and Butcher, R. 2007. Ecological Character Description of the Peel-Yalgorup Ramsar Site, Report to the Department of Environment and Conservation and the Peel-Harvey Catchment Council, Perth.

Johnston, D.J., Smith, K.A., Brown, J.I., Travaille, K.L., Crowe, F., Oliver, R.K. and Fisher, E.A. 2015. Western Australian Marine Stewardship Council Report Series No. 3: West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Department of Fisheries, Western Australia.

Draft scoring range	60-79
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

7.4 Principle 3

7.4.1 Principle 3 background

Area and Target Species

The Peel-Harvey Estuary Fishery (PHE) is conducted in Area 2 of the West Coast Estuarine Managed Fishery (WCEMF). The commercial fishery for sea mullet and blue swimmer crab and the recreational fishery for blue swimmer crab are conducted in the Peel-Harvey Estuary and Murray, Serpentine, Harvey and Dandalup Rivers and their tributaries (see Figure 11). The commercial fishery is conducted within 3 nautical miles of the coast and falls within the sole jurisdiction of the Western Australian Government, which also has sole jurisdiction for the regulation of recreational fishing for blue swimmer crab.

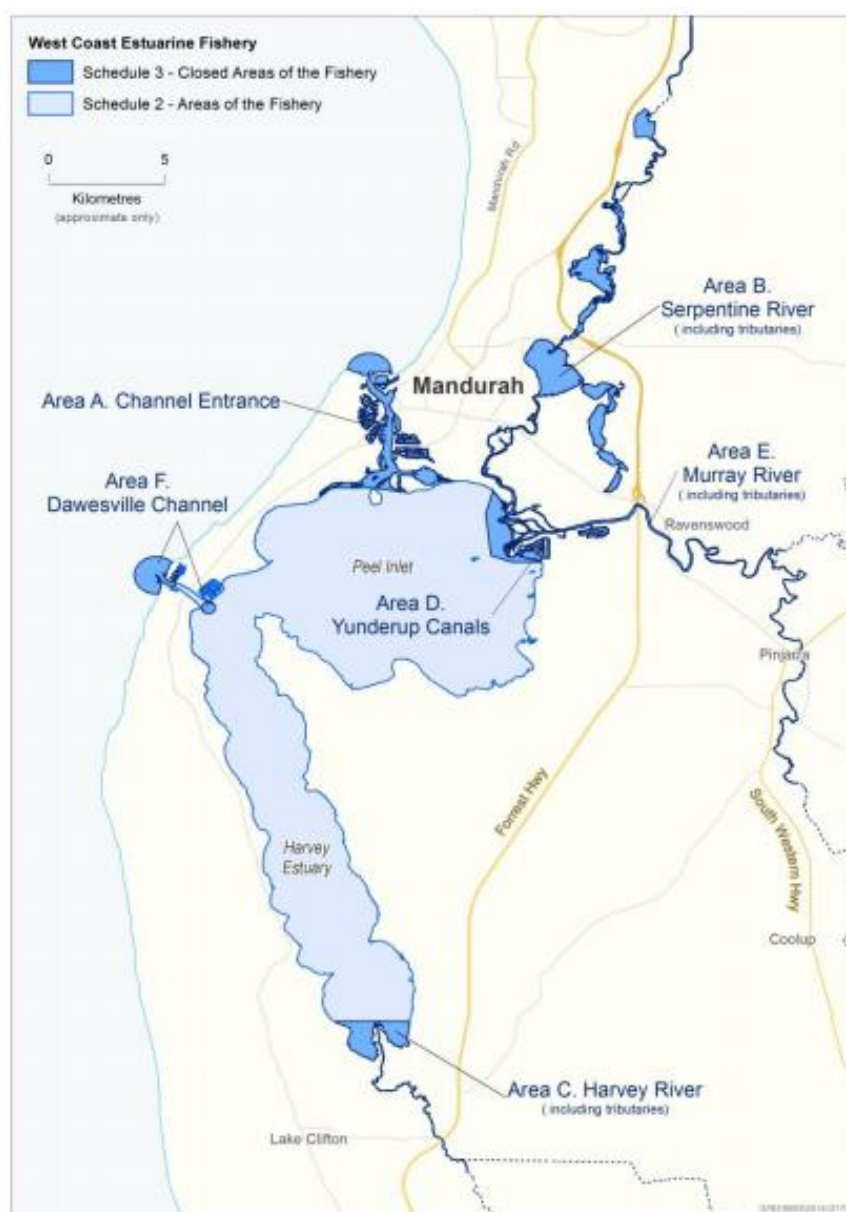


Figure 11: The boundaries, extent and closed areas of the WCEMF Area 2 (Source: Johnston et al. 2015)

Jurisdiction

The OCS sets out arrangements between the different Australian jurisdictions regarding responsibilities for fisheries. Under the OCS, the Australian states and the Northern Territory manage fisheries out to 3 nm from the coast, and for the Australian Government to manage fisheries from three to 200 nm (which is the extent of Australia's Exclusive Economic Zone (EEZ)). The settlement is not set out in a single document rather it is found multiple pieces of legislation that implements it. The OCS arrangements provide for the Commonwealth, the States and the NT to agree to adjust these arrangements by passing management responsibility for particular fisheries exclusively to the Commonwealth or to the adjacent States/Northern Territories (NT); or alternatively, for the Commonwealth and the States/NT to jointly manage a fishery in waters relevant to the Commonwealth and one or more States/NT (Borthwick, 2012). These are binding arrangements requiring both the State and the Commonwealth to implement fisheries management arrangements in their respective jurisdictions.

Under the Offshore Constitutional Settlement (OCS) (Brayford & Lyon 1995), WA retains control of crustacean resources out to the 200 nm limit of the EEZ and therefore the PHE falls entirely within the management jurisdiction of the WA Government.

National Legislation and International Obligations

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC 1999) is the Australian Commonwealth Government's central piece of environmental legislation. The EPBC Act is administered by the Commonwealth Department responsible for environment (currently the Department of Agriculture, Water and the Environment, DAWE) and provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places — defined in the EPBC Act as matters of national environmental significance (MNES).

Australia is a signatory to a number of international agreements and conventions (which it applies within its EEZ), such as:

- United Nations Convention on the Law of the Sea;
- Convention on Biological Diversity;
- Convention on International Trade in Endangered Species of Wild Fauna and Flora;
- FAO Code of Conduct for Responsible Fisheries;
- United Nations Fish Stocks Agreement; and
- State Member of the International Union for Conservation of Nature.

The DAWE's Environment Division is responsible for acting on international obligations on a national level, by enacting policy and/or legislation to implement strategies to address those obligations.

The legal rights for people dependent on fishing for food (non-commercial use) is enshrined in the *Native Title Act 1993*. This allows special provision for 'traditional fishing' to be made where they might apply in the context of both Commonwealth and State Fisheries Law.

Management framework and objectives

Western Australian fisheries are managed by Western Australia's Department of Primary Industries and Regional Development (DPIRD) under the following primary pieces of legislation:

- *Fish Resources Management Act 1994* (FRMA); and
- *Fish Resources Management Regulations 1995* (FRMR).

These functions were previously performed by the Department of Fisheries (DOF) prior to a government restructuring process which resulted in the amalgamation of several government functions, including the DOF, into the DPIRD.

The fishery-specific management framework for the fishery is outlined in the *West Coast Estuarine Managed Fishery Management Plan* (Management Plan), the Blue Swimmer Crab Resource of South-West Western Australia Harvest Strategy 2020-2025 (DPIRD, 2020a) and the Estuarine and Nearshore Finfish Resource of South-West Western Australia Harvest Strategy 2020-2025 (DPRID 2020b). These arrangements are applied under powers of the FRMA and the FRMR. The management objectives within the tiers of the management are explicit, clear and consistent. These are outlined below.

The Western Australian government is currently in the preparatory phases of introducing an *Aquatic Resources Management Act 2016* (ARMA) which will become the primary legislation used to manage fishing, aquaculture, pearling and aquatic resources in Western Australia. The ARMA will replace the FRMA (and the *Pearling Act 1990*), providing a set of new management methods and a modern, flexible framework designed to deliver more effective, efficient and integrated fisheries and aquatic resource management. It will allow for existing management arrangements for commercial and recreational fishing sectors to remain in place to enable a smooth transition between legislative frameworks.

The new Act was scheduled for commencement on 1 January 2019, however, this has been delayed due to required amendments to address some structural issues and to ensure DPIRD can continue to manage at the sub-resource level eg: zones or different TACCs for specific species.

Fish Resources Management Act 1994

The FRMA provides the overarching legislative framework to implement the management arrangements for the PHE fishery and contains the head powers to determine a Management Plan.

The objects of the FRMA are:

- (a) to develop and manage fisheries and aquaculture in a sustainable way; and
- (b) to share and conserve the State's fish and other aquatic resources and their habitats for the benefit of present and future generations.

The FRMA sets out that the two primary objects will be achieved, in particular, by the following means:

- (a) conserving fish and protecting their environment;
- (b) ensuring that the impact of fishing and aquaculture on aquatic fauna and their habitats is ecologically sustainable and that the use of all aquatic resources is carried out in a sustainable manner;
- (c) enabling the management of fishing, aquaculture, tourism that is reliant on fishing, aquatic ecotourism and associated non-extractive activities that are reliant on fish and the aquatic environment;
- (d) fostering the sustainable development of commercial and recreational fishing and aquaculture, including the establishment and management of aquaculture facilities for community or commercial purposes;
- (e) achieving the optimum economic, social and other benefits from the use of fish resources;
- (f) enabling the allocation of fish resources between users of those resources, their reallocation between users from time to time and the management of users in relation to their respective allocations;
- (g) providing for the control of foreign interests in fishing, aquaculture and associated industries;
- (h) enabling the management of fish habitat protection areas and the Abrolhos Islands reserve

Fish Resources Management Regulations 1995

The *Fish Resources Management Regulations 1995* (FRMR) contain a number of requirements pertaining to all commercial fisheries in WA. For example, regulation 64 requires commercial fishers to submit mandatory catch returns in the form approved for that fishery. The WCEMF Management Plan provides the framework for the management measures for the fishery.

West Coast Estuarine Managed Fishery Management Plan 2014

The management arrangements for the West Coast Estuarine resources are formalised in *West Coast Estuarine Managed Fishery Management Plan 2014*. WA Management Plans are subsidiary legislation which set out the operational rules that control managed commercial fishing activities. The Management Plan provides the power to issue and restrict the number of authorisations, to set the capacity of the fishery and to regulate other conditions and grounds relating to fishing.

The Management Plan provided the power to grant licenses to those that met criteria specified in the plan, divided the total fishing area into 3 areas, limited effort through specifying upper limits for the amount/length of gears, and determined a range of other gear specifications.

The 2014 Management Plan for the fishery does not contain objectives rather it contains the management measures for the fishery, to administer and apply the harvest control rules outlined in the Harvest Strategy, amongst other things. More details of the Management Plan are contained in the Section: *Details of individuals or groups granted rights of access to the fishery and particulars of the nature of those rights*.

Blue Swimmer Crab Resource of South-West Western Australia Harvest Strategy 2020-2025

The long-term ecological objectives of the fishery, consistent with the overarching objective of the FRMA, are defined in the Harvest Strategy (DPIRD, 2020a) are as follows:

Ecological sustainability objectives:

- a. To maintain spawning stock biomass of the target species (i.e. blue swimmer crabs) at a level where the main factor affecting recruitment is the environment;
- b. To maintain spawning stock biomass of each other retained species at a level where the main factor affecting recruitment is the environment;
- c. To ensure fishing impacts do not result in serious or irreversible harm to bycatch species populations;
- d. To ensure fishing impacts do not result in serious or irreversible harm to endangered, threatened and protected (ETP) species populations;
- e. To ensure the effects of fishing do not result in serious or irreversible harm to habitat structure and function; and
- f. To ensure the effects of fishing do not result in serious or irreversible harm to ecological processes.

Economic and social objectives:

- a. To provide commercial fisheries with reasonable opportunities to maximise their livelihood in supplying seafood to the community, within the constraints of ecological sustainability; and
- b. To provide fishing participants with reasonable opportunities to maximise cultural, recreational and lifestyle benefits of fishing, within the constraints of ecological sustainability.

Long-term management objectives are typically operationalised as short-term (e.g. annual or periodic) objectives through one or more performance indicators that can be measured and assessed against pre-defined reference levels to ascertain actual performance. Within the context of the long-term ecological objectives outlined above, operational objectives aim to maintain each resource 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.

Estuarine and Nearshore Finfish Resource of South-West Western Australia Harvest Strategy 2020-2025

The long-term ecological objectives of the fishery, consistent with the overarching objective of the FRMA, are defined in the Harvest Strategy (DPIRD, 2020b) are as follows:

Ecological sustainability objectives:

- g. To maintain spawning stock biomass of the target species (i.e. blue swimmer crabs) at a level where the main factor affecting recruitment is the environment;
- h. To maintain spawning stock biomass of each other retained species at a level where the main factor affecting recruitment is the environment;
- i. To ensure fishing impacts do not result in serious or irreversible harm to bycatch species populations;
- j. To ensure fishing impacts do not result in serious or irreversible harm to endangered, threatened and protected (ETP) species populations;
- k. To ensure the effects of fishing do not result in serious or irreversible harm to habitat structure and function; and
- l. To ensure the effects of fishing do not result in serious or irreversible harm to ecological processes.

Economic and social objectives:

- c. To provide commercial fisheries with reasonable opportunities to maximise their livelihood in supplying seafood to the community, within the constraints of ecological sustainability; and
- d. To provide fishing participants with reasonable opportunities to maximise cultural, recreational and lifestyle benefits of fishing, within the constraints of ecological sustainability.

Long-term management objectives are typically operationalised as short-term (e.g. annual or periodic) objectives through one or more performance indicators that can be measured and assessed against pre-defined reference levels to ascertain actual performance. Within the context of the long-term ecological objectives outlined above, operational objectives aim to maintain each resource 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.

Environmental Risk Assessment

A risk-based Ecosystem Based Fisheries Management (EBFM) process forms part of the WCEF management framework. The framework assesses the impacts of fishing on all parts of the marine environment, including target species, retained non-target species, bycatch, ETP species, habitats and the ecosystem. A periodic risk assessment is undertaken for the fishery which is employed to prioritise research, data collection, monitoring needs and management actions for this fishery, with the objective of fishing activities that are managed both sustainably and efficiently.

Other relevant legislation

In addition to the FRMA, FRMR and the Management Plan, fishers must also comply with these pieces of legislation

- Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- *Western Australian Marine Act 1982*; and
- *West Australian Wildlife Conservation Act 1950*

Recognised interest groups and consultation





The recognised interest groups for the commercial and recreational fisheries in the PHE are:

- DPIRD
- The Western Australian Fishing Industry Council (WAFIC) representing the interests of commercial fishers
- The Mandurah Licensed Fishermen's Association (MLFA), of which all commercial licence holders in the PHE are members
- Recfishwest representing the interests of recreational fishers

- Research bodies including the Western Australian Marine Science Institution
- Department of Parks and Wildlife, Western Australia
- Department of Water, Western Australia
- Local Government bodies including the City of Mandurah and the Shire of Murray
- Representatives from the conservation sector, including the Peel-Harvey Catchment Council and the Conservation Council of Western Australia and Birdlife Australia
- South West Land and Sea Council, representing native title interests
- Fish processors, retailers and consumers
- The wider community.

The DPIRDs approach to stakeholder engagement follows its Stakeholder Engagement Guideline (DOF, 2016) designed to assist with selecting the appropriate level of engagement for different stakeholder groups. The framework consists of four levels of engagement as set out in Table 22 below.

Table 22 – Level of Stakeholder Engagement (from DOF, 2016)

	Goal	Promise to stakeholder	Methods of engagement
 COLLABORATE	To collaborate with key stakeholders on the development of project outcomes.	We will work with you in formulating solutions and will incorporate your advice and recommendations into the outcomes to the maximum extent possible.	Collaboration through a tasked working group, panel, committee, workshop, meeting or other form of project-specific discussion.
 INVOLVE	To work directly with key stakeholders to ensure that their concerns and needs are understood and considered.	We will actively seek your involvement to ensure your concerns and aspirations contribute to the outcomes and will provide feedback on how stakeholder input influenced the outcomes.	Seek advice prior to or during the development process; and/or Seek key stakeholder input on draft document(s).
 CONSULT	To obtain public feedback on analysis, alternatives and/or outcomes.	We will keep you informed, listen to, acknowledge and consider your concerns and aspirations and will provide feedback on how stakeholder input influenced the outcomes.	Seek input on draft document(s) as part of a public consultation process (e.g. through the Department's website or targeted input).
 INFORM	To provide interested parties with balanced, objective and accurate information to assist them in understanding the issues.	We will keep you informed.	Publication of a decision/policy (e.g. in the Government Gazette, Annual Report, fishery status reports or on the Department's website).

The WA Minister for Fisheries and DPIRD are responsible for advising licensees, WAFIC and Recfishwest of Ministerial/Departmental decisions, including proposed changes to recreational fisheries management, and is advised of Ministerial/Departmental decisions which are the subject of a consultation process.

The WA Government formally recognises WAFIC and Recfishwest as the key sources of coordinated industry advice for the commercial and recreational sectors, respectively. The Department or Minister may seek and provide advice directly through these peak bodies and/or sector associations. WAFIC and Recfishwest undertake the statutory consultation functions, such as those associated with developing and amending Management Plans, on behalf of DPIRD under service level agreements (SLAs). They have

direct input into the annual planning and priority setting process used to determine management, compliance, research and other priorities.

Commercial Fishery for Blue Swimmer Crab and Sea Mullet

WAFIC is the peak industry body representing professional fishing, pearling and aquaculture enterprises, as well as processors and exporters in WA. WAFIC works in partnership with the WA Government to set the direction for the management of commercial fisheries in WA. In relation to WAFIC's consultation role, the Department provides annual funding to WAFIC, equivalent to 0.5% of WA commercial fishing gross value of production (based on a three year average), plus a pro-rata amount equivalent to 10% of water access fees paid by aquaculture and pearling operators.

WAFIC's responsibilities can be summarised as:

- Providing effective professional representation of commercial fishing interests and the commercial fishing sector to Government, industry, other relevant organisations and the community, by engaging, facilitating and consulting as necessary. WAFIC representatives attend WCEMF Annual Management Meetings to advocate on behalf of commercial fishers
- Providing representation of commercial fishing interests on fisheries management and Ministerial committees, as required;
- Documenting priority issues for commercial fishing interests (by 30 March) each year to DPIRD;
- Providing feedback to DPIRD on proposed deliverables and budget priorities for expenditure of the Fisheries Research and Development account;
- Engaging with Recfishwest and other appropriate parties with a view to identifying joint priorities and solutions to issues of shared concern; and
- Engaging in promotion, education and awareness of key sustainability messages consistent with best practice fisheries management and the objectives of the FRMA.

Recreational Fishery for Blue Swimmer Crab

Recfishwest is an incorporated association and receives 15% of the revenue raised from recreational fishing licence fees to advocate for and represent the recreational fishing sector. Recfishwest undertakes numerous key roles including consultation on management reforms, advocating for the sector on significance issues, education, and overseeing recreational fishing initiatives. Recfishwest's peak body operations and its representation role include:

- Effective representation of the WA recreational fishing community;
- Provision of professional advice to Government on issues affecting recreational fishing;
- Coordination of recreational fishing stakeholder views on management proposals;
- Advice on use of the Recreational Fishing Account; and
- Assistance with education of fishers and promotion of responsible fishing through, for example, the recreational fishing clinics held by Recfishwest in Mandurah.

Recfishwest's monthly electronic newsletter reaches over 32,000 recreational fishers, keeping subscribers up to date with recreational fishing initiatives, research results and issues affecting the recreational fishing sector.

DPIRD holds Annual Management Meetings with fishery licensees to discuss research, management, compliance and other specific issues affecting the fishery. These meetings are usually held at the start or the end of the licensing year and are attended by DPIRD personnel, WAFIC and licence holders, but are also open to other stakeholder groups such as Recfishwest, processors, universities, other government departments, the conservation sector and the general public.

DPIRD also seeks public comment on research, management and discussion papers from time to time.

Details of individuals or groups granted rights of access to the fishery and particulars of the nature of those rights

The PHE fishery is a limited entry fishery and there are currently seven Managed Fishery Licence (MFL) holders, licensed issued under the Management Plan. Currently, the quota is consolidated onto three vessels.

Commercial Fishery for Blue Swimmer Crab and Sea Mullet

There are currently 11 licensed commercial fishers in the WCEMF Area 2 who use haul and gillnets to target a mix of temperate estuarine finfish species. Sea mullet generally comprises around 50% of the total annual finfish catch. The majority of catch is taken using haul nets and visual targeting of schools.

Different net lengths and mesh sizes are used to target different species and different sized fish. Gillnets are also set overnight when targeting species such as cobbler and whiting. Ten of the eleven licensed commercial fishers are also permitted to retain blue swimmer crab which is taken using crab traps. Over 99% of the annual trap catch is comprised of blue swimmer crab.

Some shore-based recreational net fishing also occurs in the PHE, with fishers primarily using gillnets to target sea mullet. A Recreational Net Fishing Licence (RNFL) is required for all recreational net fishing using set (gill) nets, haul nets or throw nets.

Recreational Fishery for Blue Swimmer Crab

The proximity of the PHE to the cities of Mandurah and Perth makes it one of the most popular estuaries for recreational fishing in the south-west of Western Australia. Blue swimmer crabs are the most commonly targeted species by recreational fishers in the PHE. Most recreational fishers use baited drop nets from boats to capture blue swimmer crab. Drop nets are also set from bridges, jetties and canal houses. Shore-based recreational fishers primarily use wire scoop nets to catch crabs in shallow water areas of the estuary. There is no limit on the number of recreational fishers that may fish for blue swimmer crabs. There is no species-specific recreational fishing licence for blue swimmer crab.

Regulation of Fishing

The WCEMF Area 2 is managed by DPIRD under the following legislation:

- The FRMA
- Fish Resources Management Regulations 1995 (FRMR)
- WCEMF Management Plan
- FRMA Section 43 Order – Closed Waters Professional Netting (Rivers, Estuaries, Inlets and Lakes South of 23o South Latitude) Notice 1992.

The FRMA provides the overarching legislative framework to implement the management arrangements for the WCEMF and contains the head powers to determine a management plan (section 54). WA management plans are subsidiary legislation which set out the operational rules that control managed commercial fishing activities. The management plan provides the power to issue and restrict the number of authorisations, to set the capacity of the fishery and to regulate other conditions and grounds relating to fishing.

The FRMR contain a number of requirements pertaining to all commercial fisheries in WA. For example, regulation 64 requires commercial fishers to submit mandatory catch returns in the form approved for that fishery.

The WCEMF Management Plan provides the framework for the management measures for the commercial fishery in the PHE. The Plan imposes the following restrictions on commercial operators.

1. Gear restrictions:

- Operators may only fish using a set net, haul net, beam tide prawn net or a hand dip net.
- Haul nets must have a mesh size ≥ 51 mm or:
 - A mesh size of ≥ 28 mm but < 44 mm if the net is 55 metres (m) or less in length;
 - A mesh size of ≥ 44 mm but < 47 mm if the net is 110 m in length; or
 - A mesh size of ≥ 47 mm but < 51 mm if the net is 500 m or less in length
- Set nets must have a mesh size ≥ 51 mm and ≤ 114 mm. If the mesh size is ≥ 57 mm, the net must have a depth of 50 meshes or less; if the mesh size is < 57 mm, the net must have a depth of 33 meshes or less.
- Blue swimmer crabs may only be targeted using traps, which must have an internal volume of ≤ 0.31 m³ or, in the case of a cylindrical trap, have a diameter of ≤ 1 m.

2. Effort controls:

- The maximum number of boats specified on a licence is three; however, only one boat may be used by each licence holder at any time. All boats used in the fishery are limited to a maximum size of 6.5 m length.
- The total capacity of fishing gear in the WCEMF Area 2 is restricted to the following:
 - 12,000 m of haul net;
 - 12,000 m of set net; or 96 m of beam-tide prawn net; and
 - 420 crab traps.
- Additionally, an operator must not set, pull or haul more than 1000 m (total combined length) of set and hauls nets in the WCEMF Area 2 at any one time.

3. Seasonal closure: There is a seasonal fishing closure for blue swimmer crabs from 1 September to 31 October each year (both commercial and recreational sectors).

4. Temporal closures: Specific weekend and daytime closures are in place for both the net and trap commercial fisheries.

- Set and haul nets must not be used between 0800 hours on any Saturday and 0500 hours on the following Monday.
- Crab traps may not be set nor remain in the water:
 - From 1 November to 31 March at any time between 0900 hours on any Saturday and 0330 hours on the following Monday.
 - From 1 April to 31 August at any time between 1000 hours on any Saturday and 0330 hours on the following Monday.
- Daily time restrictions also limit when permit holder fishers can set or retrieve their crab traps. Fishers must not pull a crab trap:
 - At any time before 0330 hrs or after 0900 hrs from 1 November to 31 March; or
 - At any time before 0330 hrs or after 1000 hrs from 1 April to 31 August.
- Spatial closures: There are a number of closed areas throughout the WCEMF Area 2 (see Figure 17), including within the channel entrance (Area A), Serpentine River (Area B), Harvey River (Area C), Yunderup Canals (Area D), Murray River (Area E) and the Dawesville Channel (Area F).
- The Closed Waters Professional Netting (Rivers, Estuaries, Inlets and Lakes South of 23° South Latitude) Notice 1992 prohibits all people, other than specified professional fishermen (such as licensees in the WCEMF Area 2), from taking fish by means of set (gill) net, hauling gill net or throw net in the waters described in this notice.

The MLFA has also developed a Code of Practice (see Appendix F, Johnston et al. 2015) which is a voluntary agreement between the licensees of the WCEMF (Area 2) to:

- Demonstrate the highest level of stewardship possible;
- At all times act as environmental custodians;
- Ensure the use of fishing practices that are environmentally sustainable;
- Lead the way in community education by providing valuable information through the EMS;
- Aid in present and future research projects; and
- Comply with the Departmental Management Plan at all times whilst ensuring new entrants are practicing sustainable fishing methods within the regulations. The Code of Practice includes operational guidelines for fishing methodology and vessel operations and voluntary management resolutions for resource sharing between commercial and recreational fishers.

Recreational fishery for blue swimmer crab

The PHE Blue Swimmer Crab Recreational Sector is managed by DPIRD under the following legislation:

- FRMA;
- FRMR; and
- FRMA Section 43 Order – Prohibition on Fishing for Crabs (Peel Inlet and Harvey Estuary) Order 2007.

As with commercial fishers, recreational fishers must also comply with the requirements of:

- The EPBC Act;
- Western Australian Marine Act 1982; and
- Western Australian Wildlife Conservation Act 1950.

The FRMA provides the overarching legislative framework to implement the management arrangements for recreational fishing. The power to regulate recreational fishing is in Section 258 (1)(b), while Section 257 (1)(b) provides the power to license recreational fishers. Fish are protected from recreational fishing under Section 45 (1)(c) of the FRMA. Under Section 43 the Minister may prohibit fishing by order published in the Government Gazette.

The FRMR outlines the permitted ways for recreational fishers to fish for blue swimmer crabs and also outlines the legal (commercial and recreational) size restrictions and (recreational) bag/boat limits in place for many species:

- Recreational gear/method restrictions: Recreational fishers are only permitted to catch blue swimmer crabs by hand, wire hook, drop net or scoop net. There is a maximum limit of 10 drop nets per person or 10 drop nets per boat, regardless of how many people are on board.
- Size, condition and species limits: Blue swimmer crabs have a minimum size limit of 127 mm carapace width. All berried or undersize crabs are totally protected and must be returned to the water within five minutes of catching them. All protected crabs caught in drop nets must be released before any more drop nets are pulled.
- Bag/boat limits: A daily bag limit of 10 crabs and a daily boat limit of 20 crabs (where two or more people are fishing from the boat) applies to all recreational fishers in the West coast Bioregion (WCB) in which the PHE is located.

Within WA, recreational fishers are not required to hold a general recreational fishing licence, unless fishing from a powered boat, in which case a Recreational Fishing Boat Licence (RFBL) is required. Species-specific recreational fishing licences apply for some species, but there is no requirement for such a licence for blue swimmer crab.

The Prohibition on Fishing for Crabs (Peel Inlet and Harvey Estuary) Order 2007 closes the PHE to recreational fishing for blue swimmer crabs from 1 September to 31 October each year.

Recfishwest and the Department of Fisheries undertake a range of communications and extension activities focused on promoting sustainable and best practice recreational crab fishing practices. These materials and activities include dedicated crab fishing brochures in multiple languages, on site signage and awareness campaigns during peak fishing times, distribution of free crab measuring gauges as well as social media and YouTube education features.

Integrated Fisheries Management (IFM)

The Department's IFM policy aims to address how fish resources in WA are shared between competing users within the broad context of Ecologically Sustainable Development (ESD). The Integrated Fisheries Allocation Advisory Committee, established under section 42 of the FRMA, makes recommendations on resource allocation issues and on optimal resource use. The recommendations generally relate to proportional allocations based on historical catch shares of a resource between fishing sectors (e.g. commercial, recreational and customary).

The blue swimmer crab resource of the lower west coast (including the PHE) is currently being considered by Integrated Fisheries Allocation Advisory Committee in order to make recommendations on how future blue swimmer crab catches in the region should be allocated between the commercial and recreational fishing sectors.

The revised harvest strategy reflects the agreed objectives regarding catch of the south-west WA blue swimmer crab resource between the commercial and recreational sectors. Furthermore, the recent Voluntary Fishery Adjustment Scheme (VFAS) has reduced the number of commercial crab trap licenses in the Peel-Harvey Estuary from 10 to six to reallocate a component of the resource to recreational fishers and the ecosystem. Noting this and the agreed objectives within the revised harvest strategy, the formalisation under the IFM policy is not currently required.

Decision Making Processes

The FRMA, together with the WCEMF Management Plan, provide the framework for decision-making on long-term management of the commercial fisheries for blue swimmer crab and sea mullet and recreational for blue swimmer crab in the PHE. Decision-making roles and responsibilities are well defined. Decisions are generally taken by the Director General of DPIRD or the Minister, after consultation with commercial and recreational fishers. However, the FRMA provides for decisions to be taken without such consultation where there is an urgent need for action.

The 2020 harvest strategies define two interrelated decision-making processes:

- A formal review of targeted stocks and other ecological assets against defined reference levels determines performance against management objectives relating to ecological sustainability. This process assesses the status of relevant target stocks and performance in relation to each ecological objective. Suitable indicators have been selected to determine the status against defined reference levels established to separate acceptable from unacceptable performance.
- An annual fishery-level review determines whether the current catch/effort by each of the relevant fisheries/sectors is consistent with the levels expected when ecological objectives are met.

Review and Evaluation of Management

There are mechanisms in place for monitoring and evaluating the performance of various aspects of the management system of the WCEMF, including:

(1) Strategic Planning and Risk Assessments

- An internal Department strategic management planning meeting is held annually prior to Annual Management Meetings to discuss the issues of importance to the management of the fishery. Such reviews may identify management or compliance projects or may indicate the need for major changes to the management system.
- Aquatic Resource Program Briefs outline annual operations, short and long-term projects, workload requirements, priorities and risks associated with the Offshore Crustacean Resource.
- Ecosystem-based Fisheries Management (EBFM) risk assessments are reported on every year in the Status Reports of the Fisheries and Aquatic Resources of Western Australia (DPIRD, 2020b).
- Internal Department compliance risk assessment meetings are held annually.
- Internal Department committees that convert Department and stakeholder (WAFIC and Recfishwest) priorities into operational deliverables set within the budget context.

(2) Review Workshops

- Annual Management Meetings are held with all WCEMF Area 2 licence holders and stakeholders (Recfishwest) to discuss current research programs, management changes and future research needs. Additional meetings may also be held, on an as needs basis, throughout the year to address specific issues or initiatives.
 - Where appropriate, research workshops are held with stakeholder groups. An example of this is the workshop held in September 2011 to review the blue swimmer crab Development and Better Interest Fund project.
- (3) An annual evaluation of the performance of fisheries is undertaken by Departmental research, management and compliance staff, with outcomes used to assess the extent to which the management system has met both the long- and short-term objectives of the fisheries.
 - (4) To evaluate how well the Department is meeting the overarching long-term objectives, performance against its key performance indicators is measured annually, with results published in the Department's Annual Report to Parliament (see, for example, DPIRD 2020a).
 - (5) Performance against fishery-specific short-term (operational) objectives for WCDSCMF has been measured annually using the performance indicators, reference levels and management control rules that are explicitly identified in the previous 2015-2020 harvest strategy and will continue under the newly revised Harvest Strategy 2020-2025.
 - (6) Harvest Strategies for finfish and blue swimmer crab in the PHE was reviewed in 2020
 - (7) The broader management framework for fisheries in WA has been internally reviewed as part of the publication of several Departmental reports:
 - Management directions for WA's estuarine and marine embayment fisheries – a strategic approach to management (DoF, 1999);
 - Management strategies /approaches for recreational fishing on the west coast of WA (Harrison 1999, 2001; DoF 2012b); and
 - Implementation of ESD for fisheries and aquaculture within WA (DoF 2002a).
 - (8) Ecological risk assessments (ERAs) for the WCEMF and the PHE Blue Swimmer Crab Recreational Sector will be undertaken every 3–5 years to reassess any current or new issues that may arise in the fisheries; however, a risk assessment can also be triggered if there are significant changes identified in fishery operations or management activities or controls.
 - (9) There have been a number of reviews of the legislative framework (Act and regulations) under which the WCEMF and the PHE Blue Swimmer Crab Recreational Fishery operate, and on the effectiveness of compliance/enforcement.

Neither the FRMA nor the WCEMF Management Plan provide for the review of the WCEMF Management Plan.

Monitoring, Control and Surveillance

The FRMA provides a wide range of compliance powers and controls relating to entry, search, inspection, seizure, arrest, prosecution, forfeiture and penalties, including imprisonment. These powers are exercised by Fisheries Officers appointed under the relevant legislation.

Compliance Strategy

Compliance planning and implementation in WA fisheries is directed by the Western Australian Fisheries Compliance Strategy (the Compliance Strategy) which has been developed to: *provide an understanding of the principles underlying the Department's compliance role and how its compliance services are delivered to the Western Australian community.* The Strategy aligns with, and complements, the Department's Compliance Framework and Risk Assessment Policy which informs the risk-based model, compliance planning and the governance structure applied to fisheries compliance services.

The Department's compliance model is based on the Australian Fisheries National Compliance Strategy 2016-2020 (National Strategy). Senior compliance fisheries practitioners across Australia and New Zealand were consulted in the production of the National Strategy.

The Department's compliance program promotes three key compliance strategies recommended by the National Strategy: (1) maximising voluntary compliance; (2) effective deterrence; and (3) organisational capability and capacity.

Enforcement tools and their application

A set of enforcement tools exist and may be taken in respect to offenders under Fisheries legislation:

- Infringement Warning Notice – involves issuing a written warning in lieu of a penalty;
- Infringement Notices – involves a penalty;
- Letter of Warning – a written warning in lieu of a prosecution; and
- Prosecution – instigation of legal proceedings and/or proposed court action.

In addition to these enforcement tools, Fisheries Officers also have the power to seize fish and fishing gear that on reasonable grounds is believed to be the subject of, or used in the commission of an offence. Likewise, Fisheries Officers may seize any item where the item may afford evidence of the commission of an offence.

The compliance program deploys a wide range of tools to encourage compliant behaviour with the Department's control measures, ranging of encouraging voluntary compliance through educative means, through to the use of sophisticated compliance tools such as covert surveillance and covert operations.

Resourcing compliance

The Department has a regionalised compliance model to support the need for a compliance presence statewide. Four compliance regions have been defined: Northern; Gascoyne Mid-West; Metropolitan; and Southern. Regional compliance staff operate from four regional and 13 district offices. Within these regions, Fisheries Officers and Community Education Officers are generally located in coastal towns. Regional Compliance Managers oversee and support the works of the Fisheries Officers. Further support is provided by Perth-based specialist compliance units which provide intelligence, prosecution, surveillance and investigation, training, quality control and governance services.

The compliance program comprises about 120 Fisheries Officers, in addition to eight regional Compliance Managers and four Regional Managers.

Fisheries Officers raise community awareness and provide advice, in relation to:

- liaise with the fishing and marine industry, community groups, volunteer organisations, clubs, the public and other government agencies and advise on fisheries matters;
- the public and other government agencies and advise on fisheries matters;
- provide advice and assist with the effective delivery of volunteer programs if required; and
- promote fisheries initiatives and messages through liaison, presentations and provision of advice.

Fisheries Officers also lead compliance actions, including:

- undertake inspections, investigations and enforce legislation;
- plan and lead patrols, issue notices and infringements; and
- apprehend and prosecute offenders, seize illegal equipment and evidence as authorised.

Compliance resources are allocated in accordance with the Regional Services Division's Compliance Framework and Risk Assessment Policy.

Compliance risk assessments

The Department conducts compliance risk assessments every 1 – 2 years in major fisheries or those perceived to be at high risk and every 3 – 5 years in minor fisheries such as the WCDSCMF. The risk assessment process regularly involves DPIRD management staff, field-based FMOs and researchers. If appropriate, the process could also include commercial and recreational fishers, fish processors and representatives from other interested stakeholder groups. The risk assessment process is a significant input into the development of a Operational Compliance Plan (OCP) for the fishery, which provides the formal framework for the delivery of specific compliance services that remove or mitigate those identified risks.

The Department also uses the State-wide Tasking Coordination Group as an oversight body for state-wide high priority investigations and operations. STCG provides advice on the allocation of high priority intelligence for investigation, allocating resources, monitoring and reviewing outcomes and operational assessments, managing risks and recommending process improvements.

Operational Compliance in the PHE

Ongoing annual or seasonal review of compliance service delivery in the PHE is undertaken using a compliance risk assessment process, which may involve the participation of management, field-based FMOs, researchers, commercial and recreational fishers, fish processors and representatives from other interested stakeholder groups. The risk assessment process feeds into an OCP, which provides the formal framework for the delivery of specific compliance services that remove or mitigate those identified risks.

OCPs are available for both the commercial and recreational sectors in the PHE. Each OCP is reviewed following a compliance risk assessment. Compliance activities are prioritised in accordance with risk, budget and resourcing considerations. The recreational and commercial sector OCPs for the PHE were reviewed and updated during 2014/15. Staff located at Mandurah Regional Office provide the primary on-ground compliance and educative delivery for the WCEMF and the PHE Blue Swimmer Crab Recreational Fishery. Flexibility within the compliance resources across the WCB provides for allocation of additional resources to respond to changes, such as the need for a planned tactical operation in response to fresh intelligence. Compliance activities in the PHE are delivered via:

- On-water enforcement (by three dedicated compliance vessels, e.g. checking for interference with commercial fishing gear by unauthorised people);
- Land-based enforcement (at landing locations);
- Recreational mobile patrols that operate along the shores of the estuary;
- Road-side check points (in collaboration with the WA Police) for protected species (e.g. undersize fish / crabs or berried female crabs);
- Processor factory inspections of catches;

- Wholesale retail inspections of catches; and
- Attending industry meetings.

Commercial fishing compliance

Compliance of the commercial fishing sector is monitored via both on water and on-land inspections, with the majority of checks being carried out at the point of landing (i.e. boat ramps). Individual commercial vessel inspections focus on checking that:

- The vessel and fisher hold current authorisations and have a valid commercial fishing licence
- The gear used by the operator complies with relevant requirements
- The operator is compliant with minimum legal size and protected fish requirements (e.g. berried crabs)
- No bycatch has been retained (e.g. blue swimmer crabs when fishing using haul and gillnets)
- There is no fishing in closed areas.

Recreational fishing compliance

Recreational Fishery include crabbing from boats, crabbing from shore and diving. Compliance of the recreational fishing sector is monitored via on-water and on-land inspections, both through checks at points of landing (boat ramps) and along the foreshore area of the PHE. The inspections focus on checking that recreational fishers:

- Are compliant with minimum legal size and protected fish requirements (i.e. berried crabs), and bag/boat limits (e.g. 10 blue swimmer crabs per person, 20 crabs per boat if more than one person is in the boat)
- Are compliant with the seasonal closure;
- If relevant, hold a current RFBL (when fishing from a boat)
- If relevant, hold a recreational skippers ticket (inspection done on behalf of the Department of Transport – Marine Safety)
- Use gear compliant with relevant requirements
- Retain no totally protected species.

Compliance activities in the PHE Blue Swimmer Crab Recreational Sector are primarily focused on the peak summer period, between December and January. All available compliance staff are directed to peak period compliance programs, which include daily 10-hour shifts of evening, night and early morning patrols, with extra staff deployed over the weekend periods. Weekend compliance activity is rostered consistently from October until April, which is considered to be the end of the peak recreational fishing period for blue swimmer crabs in the PHE.

7.4.2 Principle 3 Performance Indicator scores and rationales

PI 3.1.1 – Legal and/or customary framework

UoAs: Sea mullet – haul net; sea mullet – gillnet; blue-swimmer crab – commercial crab pot

PI 3.1.1		The management system exists within an appropriate legal and/or customary framework which ensures that it:		
		<ul style="list-style-type: none"> - Is capable of delivering sustainability in the UoA(s); - Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and - Incorporates an appropriate dispute resolution framework 		
Scoring Issue		SG 60	SG 80	SG 100
a	Compatibility of laws or standards with effective management			
	Guide post	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	Yes	Yes	Yes
Rationale				

In accordance with the Offshore Constitutional Settlement 1995 (OCS) (Brayford and Lyon 1995), the WCEF falls under the management jurisdiction of the WA Government. The WA Government provides management, licensing (where applicable), research and compliance and education services for commercial fisheries, recreational fisheries and customary fishing.

Under the OSC, the Commonwealth Government retains responsibility for implementing Australia's commitments under a range of international fisheries legislation and instruments. This responsibility is undertaken through the Commonwealth EPBC Act.

The key legislative elements of the fisheries management system in WA are the FRMA, the FRMR and the statutory Fishery Management Plan. Commercial fishers must also comply with the requirements of the *Western Australian Marine Act 1982* and the *Wildlife Conservation Act 1950* (WA).

These legislative instruments are supported by a range of high level policies including:

- The WA Government's Fisheries Policy Statement (DOF, 2012);
- The Harvest Strategy Policy and Operational Guidelines for the Aquatic Resources of Western Australia (DOF, 2015);
- Ecosystem Based Fisheries Management (as described in DPIRD 2020bF).

The Minister for Fisheries is the responsible Minister in the WA Government and has legislative power to act upon knowledge and advice he is provided with. Administration of the management arrangements is the responsibility of the Deputy Director General (DDG) of the Department of Primary Industries and Regional Development (DPIRD). DPIRD is governed by the *Public Sector Management Act 1994*, which requires, among other things, that DPIRD provide an Annual Report to Parliament that includes an

assessment of the extent to which the Department has achieved its goal of conserving and sustainably developing the State's aquatic resources (e.g. DPRID, 2020a).

There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2. The fishery meets the requirements of SG 60, 80 and 100.

Resolution of disputes				
b	Guide post	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the UoA.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective .
	Met?	Yes	Yes	Yes
Rationale				

The following is noted regarding mechanisms for the resolution of legal disputes:

- Changes to existing or new fisheries legislation, including subsidiary legislation such as the Fishery Management Plans, are potentially subject to review through the disallowance process of State Parliament. All subsidiary legislation is also reviewed by the Joint Standing Committee on Delegated Legislation, which may seek further advice on the reasons for the legislation and potentially move to disallow. These processes provide for parliamentary and public scrutiny of all fisheries legislation.
- There are well-established formal dispute mechanisms for administrative and legal appeals of decisions taken in respect to fisheries (contained in Part 14 of the FRMA).
- Most decisions made by the DDG of the DPIRD and disputes regarding the implementation and administration of fisheries legislation can be taken to the Western Australian State Administrative Tribunal (SAT) for review, or to the WA (and Commonwealth) Court System. The decisions of the SAT and Courts are binding on DPIRD, and all SAT decisions must be carried out by the Department (under section 29(5) of the State Administrative Tribunal Act 2004). These mechanisms have been used and tested.
- Dispute resolution mechanisms have been used and tested in Western Australian fisheries.
- Resource allocation between commercial and recreational sectors represents a source of potential dispute. Proposed changes to these regulations and proposals for resource allocation are subject to consultation by DPIRD or the Integrated Fisheries Allocation Advisory Committee with WAFIC, which is charged with consulting with its constituents. This consultation process seeks to avoid disputes.
- Disputes in the fishery are also informally avoided or addressed through a system of ongoing of communication and consultation processes between the fishery's management and research staff and industry.

The assessment team saw no evidence of ongoing disputes or disagreements between DDG and WAFIC, commercial fishers or other individuals or sectors. This suggests that the mechanisms for dispute

resolution are effective. The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective. The fishery meets the requirements of SG 60, 80 and 100.

Respect for rights				
C	Guide post	The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	Yes	Yes	Yes
Rationale				

The management system provides access rights to the commercial fishery by way of the issue of a limited number of licences. These licences are issued in accordance with the WCEMF Management Plan which derives its power from the FRMA.

In 1992, the High Court of Australia recognised native title, i.e. that indigenous Australians may continue to hold native title and to be uniquely connected to the land. Australian law recognises that native title exists where Aboriginal people have maintained a traditional connection to their land and waters, since sovereignty, and where acts of government have not removed it. Indigenous rights are formally committed to in WA by the Aboriginal Heritage Act of 1972, which recognizes Aboriginal peoples' strong relationships to the land and provides automatic protection for all places and objects in Western Australia.

A 2013 High Court decision concluded that State fisheries legislation in South Australia did not extinguish native title rights to fish. It is likely that this decision also means that DPIRD legislation does not extinguish native title rights to fish where that right is exercised for a traditional, non-commercial purpose by an Aboriginal person. There are currently no native title claims that relate to the sea mullet or blue swimmer crab resources of the PHE.

The rights of Aboriginal persons fishing for customary purposes are recognised under Section 6 of the FRMA and S258(1)(ba) of the Act provides the power to make regulation to manage customary fishing.

DPIRD's Integrated Fisheries Management (IFM) policy (DoF 2009a) seeks to share resources between fishing sectors i.e. commercial, recreational and customary.

The Aquatic Resources Management Bill (which, when enacted will replace the FRMA) provides for a quantity of an aquatic resource to be reserved for conservation and reproductive purposes before setting a sustainable harvest level for by the fishing sectors. It is proposed that this 'reserve' include an allowance for customary fishing if required.

The Department of Fisheries of Western Australia also has a customary fishing policy. This applies to those of aboriginal descent, fishing in a traditional manner, for non-commercial needs. This requires fisheries policy and management to provide specific and appropriate consideration of management

practices in customary fisheries. Reference to custodial rights is explicitly set out in the FRMA as are the specific protection of aboriginal rights.

The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2 and the requirements of SG60, 80 and 100 are met.

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Draft scoring range

≥80

Information gap indicator

Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

UoAs: Blue-swimmer crab – recreational drop net; blue-swimmer crab – recreational scoop

PI 3.1.1		The management system exists within an appropriate legal and/or customary framework which ensures that it:		
		<ul style="list-style-type: none"> - Is capable of delivering sustainability in the UoA(s); - Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and - Incorporates an appropriate dispute resolution framework 		
Scoring Issue		SG 60	SG 80	SG 100
a	Compatibility of laws or standards with effective management			
	Guide post	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	Yes	Yes	Yes
Rationale				

The following is noted in relation to the legal and/or customary framework for management:

- The Responsible Minister in the WA Government is the Minister for fisheries who has legislative power to act upon knowledge and advice he is provided with. Administration of the management arrangements is the responsibility of the DDG of DPIRD. The Department is governed by the *Public Sector Management Act 1994*, which requires among other things that DPIRD provide an Annual Report to Parliament that includes an assessment of the extent to which the Department has achieved its goal of conserving and sustainably developing the State's aquatic resources.
- The Commonwealth Government retains responsibility for implementing Australia's commitments under a range of international fisheries legislation and instruments. This responsibility is undertaken through the Commonwealth EPBC Act. Recreational fishing for blue swimmer crab in the PHE is subject to the requirements of that Act in so far as it interacts with species protected under the Act.
- Section 258 of the FRMA provides the WA Minister for Fisheries with the power to regulate recreational fishing.
- The other key legislative components of the DPIRD management system that relate to the PHE recreational sector for blue swimmer crab are the FRMR and the FRMA Section 43 Order – Prohibition on Fishing for Crabs (Peel Inlet and Harvey Estuary) Order 2007.
- Recreational fishers must comply with the requirements of the Western Australian *Marine Act 1982* and the Western Australian *Wildlife Conservation Act 1950*. These legislative instruments are supported by a range of high level policies including:
 - the WA Government's Fisheries Policy Statement (DoF 2012a)
 - the Harvest Strategy Policy and Operational Guidelines for the Aquatic Resources of Western Australia (DoF 2015c)
 - Ecosystem Based Fisheries Management (as described in Fletcher and Santoro 2014)
 - A Resource-Based Management Approach for Recreational Fishing In Western Australia 2012 – 2017 (DoF 2012b)

There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2 and the requirements of SG60, 80 and 100 are met.

Resolution of disputes				
b	Guide post	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the UoA.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective .
	Met?	Yes	Yes	Yes
Rationale				

All changes to or new fisheries legislation, including subsidiary legislation, are potentially subject to review through the disallowance process of State Parliament. All subsidiary legislation is also reviewed by the Joint Standing Committee on Delegated Legislation, which may seek further advice on the reasons for the legislation and potentially move to disallow. In this way, there is Parliamentary and public scrutiny of all fisheries legislation.

Most decisions made by the DDG of the Department and disputes regarding the implementation and administration of fisheries legislation, including decisions taken on the issue of a recreational fishing licence, can be taken to the Western Australian State Administrative Tribunal (SAT) for review, or to the WA (and Commonwealth) Court System. The decisions of the SAT and Courts are binding on the Department, and all SAT decisions must be carried out by the Department (under section 29(5) of the State Administrative Tribunal Act 2004). However, these mechanisms have not been used and tested in relation to recreational fishing disputes.

Most decisions with respect to recreational fishing relate to changes to prescribed gear, fishing methods, limits on size, condition or species of fish, and bag/boat limits. Resource allocation between commercial and recreational sectors also represents a source of potential dispute. Proposed changes to these regulations and proposals for resource allocation are subject to consultation by DPIRD or the Integrated Fisheries Allocation Advisory Committee with Recfishwest, which is charged with consulting with its constituents. This consultation process seeks to avoid disputes.

The assessment team saw no evidence of ongoing disputes or disagreements between DPIRD and Recfishwest or recreational fishers generally. This suggests that the above mechanisms for dispute resolution are effective.

The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the fishery and the requirements of SG60 and 80 are met. However not all aspects of the dispute resolution system have been tested and the management system does not, therefore, meet all the requirements of SG 100.

c Respect for rights

	Guide post	The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	Yes	Yes	Yes
Rationale				

The management system provides access rights to the commercial fishery by way of the issue of a limited number of licences. These licences are issued in accordance with the WCEMF Management Plan which derives its power from the FRMA.

In 1992, the High Court of Australia recognised native title, i.e. that indigenous Australians may continue to hold native title and to be uniquely connected to the land. Australian law recognises that native title exists where Aboriginal people have maintained a traditional connection to their land and waters, since sovereignty, and where acts of government have not removed it. Indigenous rights are formally committed to in WA by The Aboriginal Heritage Act of 1972, which recognizes Aboriginal peoples' strong relationships to the land and provides automatic protection for all places and objects in Western Australia.

A 2013 High Court decision concluded that State fisheries legislation in South Australia did not extinguish native title rights to fish. It is likely that this decision also means that DPIRD legislation does not extinguish native title rights to fish where that right is exercised for a traditional, non-commercial purpose by an Aboriginal person. There are currently no native title claims that relate to the sea mullet or blue swimmer crab resources of the PHE.

The rights of Aboriginal persons fishing for customary purposes are recognised under Section 6 of the FRMA and S258(1)(ba) of the Act provides the power to make regulation to manage customary fishing.

DPIRD's Integrated Fisheries Management (IFM) policy (DoF 2009a) seeks to share resources between fishing sectors i.e. commercial, recreational and customary.

The Aquatic Resources Management Bill (which, when enacted will replace the FRMA) provides for a quantity of an aquatic resource to be reserved for conservation and reproductive purposes before setting a sustainable harvest level for by the fishing sectors. It is proposed that this 'reserve' include an allowance for customary fishing if required.

The Department of Fisheries of Western Australia also has a customary fishing policy. This applies to those of aboriginal descent, fishing in a traditional manner, for non-commercial needs. This requires fisheries policy and management to provide specific and appropriate consideration of management practices in customary fisheries. Reference to custodial rights is explicitly set out in the FRMA as are the specific protection of aboriginal rights.

The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2 and the requirements of SG60, 80 and 100 are met.

References

Brayford, H. and Lyon, G. (1995). Offshore Constitutional Settlement 1995. Fisheries Management Paper 77, WA Department of Fisheries, Perth.

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Western Australian Marine Act 1982.

https://www.legislation.wa.gov.au/legislation/statutes.nsf/main_mrtitle_1046_homepage.html

Western Australian Wildlife Conservation Act 1950.

https://www.legislation.wa.gov.au/legislation/statutes.nsf/main_mrtitle_1080_homepage.html

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 3.1.2 – Consultation, roles and responsibilities

UoAs: Sea mullet – haul net; sea mullet – gillnet; blue-swimmer crab – commercial crab pot

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties		
Scoring Issue		SG 60	SG 80	SG 100
a	Roles and responsibilities			
	Guide post	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood .	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
	Met?	Yes	Yes	Yes
Rationale				

The following is noted regarding the functions, role and responsibilities of organisations and individuals involved in the management of the fishery:

- The roles and responsibilities of the Commonwealth and WA Governments in the management of fisheries resources are well articulated in the OCS (Brayford and Lyons, 1995).
- The Commonwealth EPBC Act sets out in the roles and responsibilities of the Commonwealth Government with respect to ecological sustainability and conservation of marine resources in WA marine waters.
- The FRMA sets out the roles and responsibilities of the WA Government in relation to the management of Western Australian commercial fisheries are set out in. DPIRD has identified the key organisations and individual positions relevant in the Department and their roles and responsibilities are clearly articulated.

Within the State Government, the key roles and responsibilities are well described and understood:

- DPIRD provides management, licensing, research and compliance and education services for commercial fisheries, recreational fisheries, customary fishing, pearling and aquaculture in all State waters (including marine parks) and the fish processing and charter boat industries.
- The Minister for Fisheries has legislative power to turn knowledge and advice he is provided with into action, while the administration of these management arrangements is the responsibility of the DDG of the Department, and the Department more generally.

DPIRD is structured around three key service delivery areas:

- Aquatic Management: provides management, policy development, licensing and legislation related to the State's commercial and recreational fisheries, pearling, aquaculture, fish processing, the charter boat industry, customary fishing and protection of aquatic ecosystems;

- Compliance and Education: provides state-wide fisheries compliance and community education, in accordance with the provisions of relevant legislation; and
- Research and Monitoring: provides timely, quality scientific knowledge and advice to support the conservation and sustainable use of the State's fish resources and aquatic systems.

The roles and responsibilities of each of these areas are outlined in more detail out in the DPIRD's Annual Report to Parliament (for example, DPIRD, 2020a).

WAFIC is the peak industry body representing professional fishing, pearling and aquaculture enterprises, as well as processors and exporters in WA. WAFIC is an incorporated association, created by the industry more than 40 years ago to work in partnership with Government to set the directions for the management of commercial fisheries in WA. WAFIC plays a central role in the management system of commercial fisheries as the Government's principle source of coordinated advice from the commercial fishing industry. A Service Level Agreement with DPIRD formalises and outlines WAFIC's consultation roles and responsibilities and interactions with DPIRD.

WAFIC's responsibilities include coordinating Government funding for industry representation and taking on a leadership role for matters which involve or impact on or across a number of fisheries, or are of an industry-wide or generic nature. WAFIC also represents those commercial fishing sectors that do not have capability of self-representation.

Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction. The fishery therefore meets the requirements of SG 60, 80 and 100.

Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction and the requirements of SG60, 80 and 100 are met.

Consultation processes				
b	Guide post	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used .
	Met?	Yes	Yes	Yes
Rationale				

The following is noted regarding consultation processes included in the management system:

- The WA Government's commitment to consultation with stakeholders is stated in the Government's Fisheries Policy Statement (2012) which specifies that WAFIC and Recfishwest are the key sources of coordinated industry advice for the commercial and recreational fishing sectors respectively. Under Service Level Agreements, these two peak sector bodies work in partnership with DPIRD to ensure adequate consultation is conducted with their constituents on broad or fishery/specific species policy issues.

- The FRMA requires the Minister to consult with 'affected persons' (commercial licence holders) when developing a new Management Plan or amending an existing plan (Sections 64 and 65, FRMA).
- Annual Management Meetings are held with licensees in managed fisheries throughout WA, including the WCDSCMF. These meetings provide an opportunity for fishers, managers and researchers to discuss and exchange information on the fishery.
- DPIRD seeks public comment on research, management and discussion papers from time to time. Draft Fisheries Management Papers are released for public comment and those comments must be taken into account before a decision is made on future management (How et al. 2015).
- The Department published its Stakeholder Engagement Guidelines in August 2016, which outlined the processes through which the Department is to provide opportunities for all interested and affected parties to be involved (DOF, 2016).
- The Stakeholder Engagement Guidelines sets out the overarching processes through which the Department seeks out relevant information from, and involvement by, stakeholders and interested parties on proposals relating to the management of WAs aquatic resources. The guideline was an outcome of the Non-Fisher Stakeholder Engagement Project, which included a key stakeholder consultation phase during which more than 20 key stakeholders were interviewed. The Stakeholder Engagement Guidelines suggests levels of stakeholder engagement for each stakeholder group and for each of a number of key processes associated with the management of the State's fisheries and aquatic resources.
- DPIRD has created a public comment space on its website (<http://www.fish.wa.gov.au/About-Us/Public-Comment/Pages/default.aspx>), which provides for interested and affected parties to view information and make submissions on draft documents released for public.

The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained. The fishery therefore meets the requirements of SG 60, 80 and 100.

The management system demonstrates consideration of the information obtained and the requirements of SG60, 80 and 100 are met.

Participation				
C	Guide post		The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.
	Met?		Yes	No
Rationale				

At the management system level, there are both statutory and non-statutory consultation processes in place. In particular the legislation requires that the Minister be consulted with respect to changes to management plans.

The mechanisms related to involvement of non fishing stakeholders are noted:

- In August 2016, the Department published its Stakeholder Engagement Guidelines (SEG) which outlined the processes through which the Department will provide opportunities for all interested and affected parties to be involved (DoF 2016). The SEG sets out the overarching processes

through which the Department seeks out relevant information from, and involvement by, stakeholders and interested parties on proposals relating to the management of WAs aquatic resources. The guideline was an outcome of the Non-Fisher Stakeholder Engagement Project, which included a key stakeholder consultation phase during which more than 20 key stakeholders were interviewed.

- The SEG suggested levels of stakeholder engagement for each stakeholder group and for each of a number of key processes associated with the management of the State's fisheries and aquatic resources.
- The Department conducts external communications through corporate Facebook and Twitter accounts.
- DPIRD has created a public comment space on its website (<http://www.fish.wa.gov.au/About-Us/Public-Comment/Pages/default.aspx>), which provides for interested and affected parties to view information and make submissions on draft documents released for public.

At the fourth surveillance audit, it was noted that, in 2016, a meeting regarding the finfish harvest strategy for the Peel Harvey Estuarine Fishery was held which focussed on yellowfin whiting. Only license holders, Recfishwest, WAFIC and Department staff attended the meeting. An information sheet regarding yellowfin whiting was developed following that briefing and distributed via the department's website. However, no specific consultation via any of the departments forums was provided to non-fishing stakeholders at that time.

The yellowfin whiting stock assessment was then completed and the team was expecting that results and conclusions will be communicated to the wider stakeholder community in due course through appropriate channels as indicated by the SEG. In this instance, the SEG policy did not appear to have been implemented to its fully extend. As a result the Fourth Surveillance audit resulted in the recommendation: *"The surveillance team recommends that the department consults widely with non-fishing stakeholder on the outcome of the latest yellowfin whiting stock assessment..."*

Following the issuing of the recommendation, the following is noted with regards to further effects to consult on the matter of the yellowfin whiting assessment specifically, and more broadly regarding participatory mechanisms:

- While there is not focussed independent yellowfin whiting stock assessment available for publication, information is available on the Departments website within FMP No.303 and the Departments Annual State of the Fisheries Reports. Both are publicly available online at http://www.fish.wa.gov.au/Documents/management_papers/fmp303.pdf and <http://www.fish.wa.gov.au/About-Us/Publications/Pages/State-of-the-Fisheries-report.aspx> (respectively).
- DPIRD undertook consultation during the development of the revised Harvest Strategies for Blue Swimmer Crab and Finfish. DPIRD advised that they consulted on widely with all interested stakeholders and groups invited to comment. The draft Harvest Strategies were also posted on the DPIRD website inviting comment.
- Mechanisms to negotiate catch shares between the commercial and recreational sector have been included in the Harvest Strategy, i.e. tolerance levels are agreed to by commercial and recreational sectors and should the agreed 'trigger level' be reached, the Department initiates a meeting between stakeholders to evaluate the appropriateness of the tolerance level for the present season, in the context of existing environmental and fishing factors.
- A Blue Swimmer Crab Working Group has been established which includes representatives from Recfishwest and WAFIC, assists in identifying and addressing potential conflicts both within Peel-Harvey and at the resource level.

There are significant opportunities for commercial and recreational sectors to be involved and engaged in the fishery's management. There are also some opportunities provided for non-industry sectors to be involved. However, DPRID do not currently "encourage" all interest groups, in particular the non-fishing sector, to be involved and facilitate effective engagement. The fishery therefore meets the requirements of SG 80 but not SG100.

References

Brayford, H. and Lyon, G. (1995). Offshore Constitutional Settlement 1995. Fisheries Management Paper 77, WA Department of Fisheries, Perth.

DOF (2012). Western Australian Government Fisheries Policy Statement March 2012. Department of Fisheries, WA, 12 pp.
http://www.fish.wa.gov.au/Documents/corporate_publications/wa_govt_fisheries_policy_statement.pdf

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Draft scoring range

≥80

Information gap indicator

Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score

Condition number (if relevant)

UoAs: Blue-swimmer crab – recreational drop net; blue-swimmer crab – recreational scoop

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties		
Scoring Issue		SG 60	SG 80	SG 100
a	Roles and responsibilities			
	Guide post	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood .	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
	Met?	Yes	Yes	Yes
Rationale				

The following is noted regarding the functions, role and responsibilities of organisations and individuals involved in the management of the fishery:

- The roles and responsibilities of the Commonwealth and WA Governments in the management of fisheries resources are well articulated in the OCS (Brayford and Lyons, 1995).
- The Commonwealth EPBC Act sets out in the roles and responsibilities of the Commonwealth Government with respect to ecological sustainability and conservation of marine resources in WA marine waters.
- The FRMA sets out the roles and responsibilities of the WA Government in relation to the management of Western Australian commercial fisheries are set out in. DPIRD has identified the key organisations and individual positions relevant in the Department and their roles and responsibilities are clearly articulated.

Within the State Government, the key roles and responsibilities are well described and understood:

- DPIRD provides management, licensing, research and compliance and education services for commercial fisheries, recreational fisheries, customary fishing, pearling and aquaculture in all State waters (including marine parks) and the fish processing and charter boat industries.
- The Minister for Fisheries has legislative power to turn knowledge and advice he is provided within into action, while the administration of these management arrangements is the responsibility of the DDG of the Department, and the Department more generally.

DPIRD is structured around three key service delivery areas:

- Aquatic Management: provides management, policy development, licensing and legislation related to the State's commercial and recreational fisheries, pearling, aquaculture, fish processing, the charter boat industry, customary fishing and protection of aquatic ecosystems;
- Compliance and Education: provides state-wide fisheries compliance and community education, in accordance with the provisions of relevant legislation; and
- Research and Monitoring: provides timely, quality scientific knowledge and advice to support the conservation and sustainable use of the State's fish resources and aquatic systems.

The roles and responsibilities of each of these areas are outlined in more detail out in the DPIRD's Annual Report to Parliament (for example, DPIRD, 2020a).

Recfishwest is an incorporated association and receives 15 % of the revenue raised from recreational fishing licence fees to advocate for, and represent, the recreational fishing sector. Key roles undertaken by Recfishwest include undertaking consultation on management reforms, advocating for the sector on issues of significance, education, and overseeing recreational fishing initiatives.

Recfishwest plays a central role in the management system of recreational fisheries since it is the Governments principle source of coordinated advice from the recreational fishing sector. Recfishwest's consultation roles and responsibilities and interaction with DPIRD are defined in an SLA with the Department.

Recfishwest's peak body operations and its representation role includes:

- Effective representation of the Western Australian recreational fishing community;
- Provision of professional advice to Government on issues affecting recreational fishing. For example, Recfishwest representatives will co-ordinate and facilitate the consultation with the recreational sector on the allocation proposals for the PHE blue swimmer crab resource with the Integrated Fisheries Allocation Advisory Committee;
- Coordination of recreational fishing stakeholder views on management proposals;
- Advice on use of the Recreational Fishing Account; and
- Assistance with education of fishers and promotion of responsible fishing. An example of this is recreational fishing clinics held by Recfishwest in Mandurah.

Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction and the requirements of SG60, 80 and 100 are met.

Consultation processes				
b	Guide post	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used .
	Met?	Yes	Yes	Yes
Rationale				

The following is noted regarding consultation processes included in the management system:

- The FRMA requires the Minister to consult with 'affected persons' (commercial licence holders) when developing a new Management Plan or amending an existing plan (Sections 64 and 65, FRMA).
- The Department is required as part of the Act to receive consultation responses and 'genuinely' consider these before making a final decision. Giving effect to this, the management system includes consultation processes that regularly seek and accept relevant information, including

local knowledge on key fisheries policy matters and initiatives. A number of activities proactively include stakeholder participation, and respond directly to their inputs. These include the ERA workshops, which thereafter provide input to the Bycatch Action Plan; In season arrangements consultation and in season review process.

- DPIRD seeks public comment on research, management and discussion papers from time to time. Draft Fisheries Management Papers are released for public comment and those comments must be taken into account before a decision is made on future management (How et al. 2015).
- The WA Government's commitment to consultation with stakeholders is stated in the Government's Fisheries Policy Statement (2012) which specifies that WAFIC and Recfishwest are the key sources of coordinated industry advice for the commercial and recreational fishing sectors respectively. Under Service Level Agreements, these two peak sector bodies work in partnership with DPIRD to ensure adequate consultation is conducted with their constituents on broad or fishery/specific species policy issues.
- Recfishwest coordinates recreational fishing stakeholder views on management proposals. In order to effectively represent the views of the recreational fishing community, Recfishwest undertakes consultation throughout WA using a number of different methods:
 - Face to face meetings
 - Recfishwest visits all major regional coastal centres over a 12 month period and meets one on one with fishing clubs, industry contacts and community groups
 - Recfishwest attends major community events such as fishing tournaments and boat shows to speak one on one with fishers
 - Reference groups designed to attract recreational fishers who have a great deal of expertise in specific fisheries. Recfishwest utilises the knowledge that these groups provide to guide Board decisions and help in identifying strategic goals for particular fisheries.
 - Electronic surveys on issues such as changes to fishing rules and expenditure of licence money have elicited very positive responses from the community (Recfishwest 2015)
- The Stakeholder Engagement Guidelines sets out the overarching processes through which the Department seeks out relevant information from, and involvement by, stakeholders and interested parties on proposals relating to the management of WAs aquatic resources. The guideline was an outcome of the Non-Fisher Stakeholder Engagement Project, which included a key stakeholder consultation phase during which more than 20 key stakeholders were interviewed. The Stakeholder Engagement Guidelines suggests levels of stakeholder engagement for each stakeholder group and for each of a number of key processes associated with the management of the State's fisheries and aquatic resources.
- DPIRD has created a public comment space on its website (<http://www.fish.wa.gov.au/About-Us/Public-Comment/Pages/default.aspx>), which provides for interested and affected parties to view information and make submissions on draft documents released for public.

The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained. The fishery therefore meets the requirements of SG 60, 80 and 100.

Participation		
C	Guide post	<p>The consultation process provides opportunity for all interested and affected parties to be involved.</p> <p>The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.</p>

Met?	Yes	No
Rationale		

At the management system level, there are both statutory and non-statutory consultation processes in place. In particular the legislation requires that the Minister be consulted with respect to changes to management plans.

The mechanisms related to involvement of non-fishing stakeholders are noted:

- In August 2016, the Department published its Stakeholder Engagement Guidelines (SEG) which outlined the processes through which the Department will provide opportunities for all interested and affected parties to be involved (DoF 2016). The SEG sets out the overarching processes through which the Department seeks out relevant information from, and involvement by, stakeholders and interested parties on proposals relating to the management of WAs aquatic resources. The guideline was an outcome of the Non-Fisher Stakeholder Engagement Project, which included a key stakeholder consultation phase during which more than 20 key stakeholders were interviewed.
- The SEG suggested levels of stakeholder engagement for each stakeholder group and for each of a number of key processes associated with the management of the State's fisheries and aquatic resources.
- The Department conducts external communications through corporate Facebook and Twitter accounts.
- DPIRD has created a public comment space on its website (<http://www.fish.wa.gov.au/About-Us/Public-Comment/Pages/default.aspx>), which provides for interested and affected parties to view information and make submissions on draft documents released for public.

At the fourth surveillance audit, it was noted that, in 2016, a meeting regarding the finfish harvest strategy for the Peel Harvey Estuarine Fishery was held which focussed on yellowfin whiting. Only license holders, Recfishwest, WAFIC and Department staff attended the meeting. An information sheet regarding yellowfin whiting was developed following that briefing and distributed via the department's website. However, no specific consultation via any of the departments forums was provided to non-fishing stakeholders at that time.

The yellowfin whiting stock assessment was then completed and the team was expecting that results and conclusions will be communicated to the wider stakeholder community in due course through appropriate channels as indicated by the SEG. In this instance, the SEG policy did not appear to have been implemented to its fully extend. As a result the Fourth Surveillance audit resulted in the recommendation: *"The surveillance team recommends that the department consults widely with nonfishing stakeholder on the outcome of the latest yellowfin whiting stock assessment..."*

Following the issuing of the recommendation, the following is noted with regards to further effects to consult on the matter of the yellowfin whiting assessment specifically, and more broadly regarding participatory mechanisms:

- While there is not focussed independent yellowfin whiting stock assessment available for publication, information is available on the Departments website within FMP No.303 and the Departments Annual State of the Fisheries Reports. Both are publicly available online at http://www.fish.wa.gov.au/Documents/management_papers/fmp303.pdf and <http://www.fish.wa.gov.au/About-Us/Publications/Pages/State-of-the-Fisheries-report.aspx> (respectively).
- DPIRD undertook consultation during the development of the revised Harvest Strategies for Blue Swimmer Crab and Finfish. DPIRD advised that they consulted on widely with all interested

stakeholders and groups invited to comment. The draft Harvest Strategies were also posted on the DPIRD website inviting comment.

- Mechanisms to negotiate catch shares between the commercial and recreational sector have been included in the Harvest Strategy, i.e. tolerance levels are agreed to by commercial and recreational sectors and should the agreed 'trigger level' be reached, the Department initiates a meeting between stakeholders to evaluate the appropriateness of the tolerance level for the present season, in the context of existing environmental and fishing factors.
- A Blue Swimmer Crab Working Group has been established which includes representatives from Recfishwest and WAFIC, assists in identifying and addressing potential conflicts both within Peel-Harvey and at the resource level.

There are significant opportunities for commercial and recreational sectors to be involved and engaged in the fishery's management. There are also some opportunities provided for non-industry sectors to be involved. However, DPRID do not currently "encourage" all interest groups, in particular the non-fishing sector, to be involved and facilitate effective engagement. The fishery therefore meets the requirements of SG 80 but not SG100.

References

Brayford, H. and Lyon, G. (1995). Offshore Constitutional Settlement 1995. Fisheries Management Paper 77, WA Department of Fisheries, Perth.

DOF (2012). Western Australian Government Fisheries Policy Statement March 2012. Department of Fisheries, WA, 12 pp.
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Johnston, D., Smith, K., Brown, J., Travaille, K., Crowe, F. & Fisher, E. (2015). MSC Report Series: West Coast Estuarine Managed Fishery (Area 2: Peel-Harvey Estuary) & Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery. Department of Fisheries, Western Australia. Harrison, N. (ed.) (1999). A Quality Future for Recreational Fishing on the West Coast. Fisheries Management Paper No. 139. Department of Fisheries, WA. Retrieved from:
http://www.fish.wa.gov.au/Documents/management_papers/fmp139.pdf.

Draft scoring range

≥80

Information gap indicator

Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score

Condition number (if relevant)

PI 3.1.3 – Long term objectives

UoAs: Sea mullet – haul net; sea mullet – gillnet; blue-swimmer crab – commercial crab pot

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Fisheries Standard, and incorporates the precautionary approach		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	Long-term objectives to guide decision-making, consistent with the MSC Fisheries Standard and the precautionary approach, are implicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach, are explicit within and required by management policy.
	Met?	Yes	Yes	Yes
Rationale				

The long-term objectives of the management system are specified in the FRMA (see section 3.5.4) and are consistent with the MSC Principles and Criteria. Section 4A of the FRMA requires that the precautionary principle be applied in exercising functions or powers under the Act.

The long-term objectives are reflected in DPRID's Strategic Intent 2018-2021 document (DPRID 2018) which outlines the following goals:

- Protect - To manage and provide for sustainable use of our natural resources and soils, and to protect Western Australia's brand and reputation as a reliable producer of premium, clean and safe food, products and services.
- Grow - To enable the primary industries sector and regions to increase international competitiveness, and grow in value and social amenity, strengthening these key pillars of the State's economy.
- Innovate - To support a culture of scientific inquiry, innovation and adaptation across primary industries and regions to boost industry transformation, economic growth and employment.

The Strategic Intent document also includes fisheries specific initiatives and targets:

- Sustainable fisheries management - WA benefits from sustainable fisheries that support and optimise social, economic and environmental outcomes
- Natural resource management planning and assessment - WA's natural resources are sustainably used and managed using a sound risk-based planning and assessment approach, incorporating partnerships with traditional landowners and custodians

The legislative long-term objectives are translated into clearly-defined operational arrangements and procedures for commercial resource/fisheries in the form of harvest strategies (see Harvest Strategy Policy and Operational Guidelines for the Aquatic Resources of Western Australia (DOF, 2015)). Harvest Strategies relevant to the were first implemented in 2015. Revised Harvest Strategies were finalised in 2020 and are now in force. The Harvest Strategy for Estuarine and Nearshore Finfish Resource of South-West Western Australia (DPIRD, 2020c) and Blue Swimmer Crab Resource of South-West Western Australia (DPIRD, 2020b) contain long term ecological sustainability objectives:

- a. To maintain spawning stock biomass of the target species (i.e. blue swimmer crabs) at a level where the main factor affecting recruitment is the environment;
- b. To maintain spawning stock biomass of each other retained species at a level where the main factor affecting recruitment is the environment;
- c. To ensure fishing impacts do not result in serious or irreversible harm to bycatch species populations;
- d. To ensure fishing impacts do not result in serious or irreversible harm to endangered, threatened and protected (ETP) species populations;
- e. To ensure the effects of fishing do not result in serious or irreversible harm to habitat structure and function; and
- f. To ensure the effects of fishing do not result in serious or irreversible harm to ecological processes.

The harvest strategy also contains the following the economic and social objectives:

- g. To provide commercial fisheries with reasonable opportunities to maximise their livelihood in supplying seafood to the community, within the constraints of ecological sustainability; and
- h. To provide fishing participants with reasonable opportunities to maximise cultural, recreational and lifestyle benefits of fishing, within the constraints of ecological sustainability.

A practical, risk-based framework for use with regional-level management of marine resources has been developed by the Department to enable cross / multiple fishery management at the bioregional level to fully implement Ecosystem Based Fisheries Management (EBFM) (Fletcher, 2014).

The available evidence indicates that clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy. The fishery therefore meets the requirements of SG 60, 80 and 100.

References

DOF (2015). Harvest Strategy Policy and operational Guidelines for the Aquatic Resources of Western Australia. Fisheries Management Paper No. 271. Department of Fisheries, Western Australia

DPIRD (2018). DPIRD Strategic Intent. <https://dpiird.wa.gov.au/our-strategic-intent>

DPIRD (2020b) Fisheries Management Paper No. 304 Blue Swimmer Crab Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Government of Western Australia

DPIRD (2020c) Fisheries Management Paper No. 303 Estuarine and Nearshore Finfish Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Government of Western Australia

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

UoAs: Blue-swimmer crab – recreational drop net; blue-swimmer crab – recreational scoop

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Fisheries Standard, and incorporates the precautionary approach		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	Long-term objectives to guide decision-making, consistent with the MSC Fisheries Standard and the precautionary approach, are implicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach, are explicit within and required by management policy.
	Met?	Yes	Yes	Yes
Rationale				

The long-term objectives of the management system are specified in the FRMA (see section 3.5.4) and are consistent with the MSC Principles and Criteria. Section 4A of the FRMA requires that the precautionary principle be applied in exercising functions or powers under the Act.

The long-term objectives are reflected in DPRID's Strategic Intent 2018-2021 document (DPRID 2018) which outlines the following goals:

- Protect - To manage and provide for sustainable use of our natural resources and soils, and to protect Western Australia's brand and reputation as a reliable producer of premium, clean and safe food, products and services.
- Grow - To enable the primary industries sector and regions to increase international competitiveness, and grow in value and social amenity, strengthening these key pillars of the State's economy.
- Innovate - To support a culture of scientific inquiry, innovation and adaptation across primary industries and regions to boost industry transformation, economic growth and employment.

The Strategic Intent document also includes fisheries specific initiatives and targets:

- Sustainable fisheries management - WA benefits from sustainable fisheries that support and optimise social, economic and environmental outcomes
- Natural resource management planning and assessment - WA's natural resources are sustainably used and managed using a sound risk-based planning and assessment approach, incorporating partnerships with traditional landowners and custodians

The legislative long-term objectives are translated into clearly-defined operational arrangements and procedures for commercial resource/fisheries in the form of harvest strategies (see Harvest Strategy Policy and Operational Guidelines for the Aquatic Resources of Western Australia (DOF, 2015)). A Harvest Strategies for Finfish and Blue Swimmers Crabs of the South-West Western Australia were first implemented in 2015. Revised Harvest Strategies were finalised in 2020 and are now in force. The Harvest Strategies (DPIRD, 2020 b&c) contains long term ecological sustainability objectives:

- a. To maintain spawning stock biomass of the target species at a level where the main factor affecting recruitment is the environment;

- b. To maintain spawning stock biomass of each other retained species at a level where the main factor affecting recruitment is the environment;
- c. To ensure fishing impacts do not result in serious or irreversible harm to bycatch species populations;
- d. To ensure fishing impacts do not result in serious or irreversible harm to endangered, threatened and protected (ETP) species populations;
- e. To ensure the effects of fishing do not result in serious or irreversible harm to habitat structure and function; and
- f. To ensure the effects of fishing do not result in serious or irreversible harm to ecological processes.

The economic and social objectives 2020 harvest strategies are:

- g. To provide commercial fisheries with reasonable opportunities to maximise their livelihood in supplying seafood to the community, within the constraints of ecological sustainability; and
- h. To provide fishing participants with reasonable opportunities to maximise cultural, recreational and lifestyle benefits of fishing, within the constraints of ecological sustainability.

Management arrangements demonstrate a precautionary approach, particularly in the absence of information. A practical, risk-based framework for use with regional-level management of marine resources has been developed by the Department to enable cross / multiple fishery management at the bioregional level to fully implement Ecosystem Based Fisheries Management (EBFM) (Fletcher, 2014).

The available evidence indicates that clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy. The fishery therefore meets the requirements of SG 60, 80 and 100.

References

DOF (2015). Harvest Strategy Policy and operational Guidelines for the Aquatic Resources of Western Australia. Fisheries Management Paper No. 271. Department of Fisheries, Western Australia

DPIRD (2018). DPIRD Strategic Intent. <https://dpird.wa.gov.au/our-strategic-intent>

DPIRD (2020b) Fisheries Management Paper No. 304 Blue Swimmer Crab Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Government of Western Australia

DPIRD (2020c) Fisheries Management Paper No. 303 Estuarine and Nearshore Finfish Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Government of Western Australia

DPIRD, Annual report (2020a) (<https://dpird.wa.gov.au/sites/default/files/2019-10/DPIRD%20Annual%20Report%202019%20-%20PDF.pdf>)

Fletcher, W.J. (2014), Review and refinement of an existing qualitative risk assessment method for application within an ecosystem-based management framework, ICES Journal of Marine Science, doi: 10.1093/icesjms/fsu 142

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score

Condition number (if relevant)

PI 3.2.1 – Fishery-specific objectives

UoAs: Sea mullet – haul net; sea mullet – gillnet; blue-swimmer crab – commercial crab pot

PI	3.2.1	The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	Objectives , which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery-specific management system.	Short and long-term objectives , which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system.	Well defined and measurable short and long-term objectives , which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system.
	Met?	Yes	Yes	Yes
Rationale				

The blue swimmer crab and finfish harvest strategies include:

- high-level, long-term objectives of management which relate to biological sustainability of all captured aquatic resources, as well as broader ecological objectives for each ecosystem component, as well as high-level social and economic objectives for the fisheries/sectors targeting this resource.
- the short-term, operational objectives
- narrative on how these translate into the management approach for this resource

The long-term ecological objectives of the WCEMF, consistent with the overarching objective of the FRMA. The ecological sustainability objectives defined in the Harvest Strategies (DPIRD, 2020b & DPIRD 2020c) are as follows:

- To maintain spawning stock biomass of the target species (i.e. blue swimmer crabs) at a level where the main factor affecting recruitment is the environment;
- To maintain spawning stock biomass of each other retained species at a level where the main factor affecting recruitment is the environment;
- To ensure fishing impacts do not result in serious or irreversible harm to bycatch species populations;
- To ensure fishing impacts do not result in serious or irreversible harm to endangered, threatened and protected (ETP) species populations;
- To ensure the effects of fishing do not result in serious or irreversible harm to habitat structure and function; and
- To ensure the effects of fishing do not result in serious or irreversible harm to ecological processes.

The economic and social objectives in the 2020 harvest strategies are:

- g. To provide commercial fisheries with reasonable opportunities to maximise their livelihood in supplying seafood to the community, within the constraints of ecological sustainability; and
- h. To provide fishing participants with reasonable opportunities to maximise cultural, recreational and lifestyle benefits of fishing, within the constraints of ecological sustainability

The social and economic objectives are applied within the context of ESD and are considered once the ecological objectives have been met (Department of Fisheries 2020d).

The 2020 Harvest Strategies are the result of a review of the initial Harvest Strategies prepared for the fishery in 2015. The scope of the revised Harvest Strategy has been extended:

- For Blue Swimmer Crab - the south-west WA blue swimmer crab resource is defined as waters of the West Coast Bioregion from Geographe Bay up to, and including, the Swan and Canning Rivers
- For Sea Mullet - the estuarine and nearshore finfish resource of south-west WA covers all nearshore and estuarine waters within the West Coast Bioregion (Black Point, east of Augusta, to the Zuytdorp Cliffs, north of Kalbarri, all land and water south of 27° S and west of 115° 30' E)

Long-term management objectives are typically operationalised as short-term (e.g. annual or periodic) objectives through one or more performance indicators that can be measured and assessed against pre-defined reference levels to ascertain actual performance. Within the context of the long-term ecological objectives outlined above, operational objectives aim to maintain each resource 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.

The strategy will remain in place for a period of five years, after which time it will again be fully reviewed. If required, however, this document may be subject to review and amended within this five-year period.

There are well defined and measurable short and long-term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system and the requirements of SG60, 80 and 100 are met.

References

DPIRD (2020b). Blue Swimmer Crab Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Fisheries Management Paper No. 304. DPIRD November 2020, pp. 35. http://www.fish.wa.gov.au/Documents/management_papers/fmp304.pdf

DPIRD (2020c). Estuarine and Nearshore Finfish Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Fisheries Management Paper No. 303. DPIRD November 2020, pp. 33. http://www.fish.wa.gov.au/Documents/management_papers/fmp303.pdf

Draft scoring range

≥80

Information gap indicator

Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score

Condition number (if relevant)

UoAs: Blue-swimmer crab – recreational drop net; blue-swimmer crab – recreational scoop

PI 3.2.1 The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2				
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	Objectives , which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery-specific management system.	Short and long-term objectives , which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system.	Well defined and measurable short and long-term objectives , which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system.
	Met?	Yes	Yes	Yes
Rationale				

The blue swimmer crab and finfish harvest strategies include:

- high-level, long-term objectives of management which relate to biological sustainability of all captured aquatic resources, as well as broader ecological objectives for each ecosystem component, as well as high-level social and economic objectives for the fisheries/sectors targeting this resource.
- the short-term, operational objectives
- narrative on how these translate into the management approach for this resource

The long-term ecological objectives of the WCEMF, consistent with the overarching objective of the FRMA. The ecological sustainability objectives defined in the Harvest Strategies (DPIRD, 2020b & DPIRD 2020c) are as follows:

- To maintain spawning stock biomass of the target species at a level where the main factor affecting recruitment is the environment;
- To maintain spawning stock biomass of each other retained species at a level where the main factor affecting recruitment is the environment;
- To ensure fishing impacts do not result in serious or irreversible harm to bycatch species populations;
- To ensure fishing impacts do not result in serious or irreversible harm to endangered, threatened and protected (ETP) species populations;
- To ensure the effects of fishing do not result in serious or irreversible harm to habitat structure and function; and
- To ensure the effects of fishing do not result in serious or irreversible harm to ecological processes.

The economic and social objectives in the 2020 harvest strategies are:

- To provide commercial fisheries with reasonable opportunities to maximise their livelihood in supplying seafood to the community, within the constraints of ecological sustainability; and
- To provide fishing participants with reasonable opportunities to maximise cultural, recreational and lifestyle benefits of fishing, within the constraints of ecological sustainability

The social and economic objectives are applied within the context of ESD and are considered once the ecological objectives have been met (Department of Fisheries 2020d).

The 2020 Harvest Strategies are the result of a review of the initial Harvest Strategy prepared for the fishery in 2015. The scope of the revised Harvest Strategy has been extended:

- For Blue Swimmer Crab - the south-west WA blue swimmer crab resource is defined as waters of the West Coast Bioregion from Geographe Bay up to, and including, the Swan and Canning Rivers
- For Sea Mullet - the estuarine and nearshore finfish resource of south-west WA covers all nearshore and estuarine waters within the West Coast Bioregion (Black Point, east of Augusta, to the Zuytdorp Cliffs, north of Kalbarri, all land and water south of 27° S and west of 115° 30' E)

Long-term management objectives are typically operationalised as short-term (e.g. annual or periodic) objectives through one or more performance indicators that can be measured and assessed against pre-defined reference levels to ascertain actual performance. Within the context of the long-term ecological objectives outlined above, operational objectives aim to maintain each resource 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.

The strategies will remain in place for a period of five years, after which time they will again be fully reviewed. If required, however, this document may be subject to review and amended within this five-year period.

There are well defined and measurable short and long-term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system and the requirements of SG60, 80 and 100 are met.

References

DPIRD (2020b). Blue Swimmer Crab Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Fisheries Management Paper No. 304. DPIRD November 2020, pp. 35. http://www.fish.wa.gov.au/Documents/management_papers/fmp304.pdf

DPIRD (2020c). Estuarine and Nearshore Finfish Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Fisheries Management Paper No. 303. DPIRD November 2020, pp. 33. http://www.fish.wa.gov.au/Documents/management_papers/fmp303.pdf

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 3.2.2 – Decision-making processes

UoAs: Sea mullet – haul net; sea mullet – gillnet; blue-swimmer crab – commercial crab pot

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery		
Scoring Issue		SG 60	SG 80	SG 100
a	Decision-making processes			
	Guide post	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	Yes	Yes	
Rationale				

The FRMA, together with the WCEMF Management Plan, provide the framework for decision-making on long-term management of the commercial fisheries for blue swimmer crab and sea mullet in the PHE. Decision-making roles and responsibilities are well defined. Decisions are generally taken by the Director General of DPIRD or the Minister, after consultation with commercial and recreational fishers. However, the FRMA provides for decisions to be taken without such consultation where there is an urgent need for action.

The 2020 harvest strategies define two interrelated decision-making processes.

(1) Formal review of targeted stocks and other ecological assets against defined reference levels to determine performance against management objectives relating to ecological sustainability.

A formal, resource-level review process is undertaken by the Department to assess the status of relevant target stocks and performance in relation to each ecological objective. Suitable indicators have been selected to determine the status of the blue swimmer crab resource of south-west WA, and other ecological assets, against defined reference levels established to separate acceptable from unacceptable performance. Where relevant, these reference levels include:

- 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).

Harvest Control Rules (HCRs) define the management actions management needed to meet sustainability objectives, specifically for each indicator. These HCRs are designed to maintain the resource above the threshold level and close to a target level, or rebuild it where it has fallen below the threshold (undesirable) or the limit (unacceptable) levels. A summary of the management objectives, performance indicators, reference levels and HCRs is provided in Table 1 of the HS.

(2) An annual fishery-level review that determines whether the current catch/effort by each of the relevant fisheries/sectors is consistent with the levels expected when ecological objectives are met.

Annual (or periodic) catch or effort tolerance levels have been defined to provide a formal basis to evaluate the effectiveness of current management arrangements in delivering the levels of catch and/or effort specified by the HCRs and, where relevant, any sectoral allocation decisions (Fletcher et al. 2016).

Annual catch tolerance levels have been developed for the commercial fisheries that target the blue swimmer crab resource in peel Harvey specifically.

In the absence of MSY estimates for the Peel-Harvey Estuary (due to crab movement in and out of estuary), the tolerance ranges for the commercial fishery have been based on catch levels observed during the specified reference period of 2000/01-2016/17 and adjusted downwards to account for the effect of the recent VFAS.

If the catch of either fishery/sector breaches the specified tolerance level and this cannot be adequately explained (e.g. clear environmental impacts or marketing reasons), the performance is termed 'Unacceptable'. This would trigger a review to determine if management arrangements are appropriate and if a reassessment of resource status is necessary to inform adjustments to the HCRs and/or tolerance levels.

The economic objective for the fisheries that target the blue swimmer crab resource in south-west WA does not have an explicit performance measure within this harvest strategy. Rather, it is through the formal consultation process (facilitated by annual management meetings with the commercial fishers) that regulatory impediments to maintaining economic return, or opportunities for enhancing economic return, are discussed. If measurable indicators for monitoring performance against the economic objectives are identified, these will be included in future revisions of this harvest strategy.

The SG 60 and 80 are met.

Responsiveness of decision-making processes				
b	Guide post	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	Yes	Yes	Yes
Rationale				

Harvest strategy control rules (DPRID, 2020 b&c) dictate the management response to performance of the fishery against established indicators. While this Harvest Strategy has only recently been revised, it builds on the previous Harvest Strategy which has proven effective.

More broadly, decision-making processes respond to other issues raised through:

- Ecological risk assessments;

- Results of research, management or compliance projects or investigations, and
- Relevant workshops and peer review of aspects of research and management.

Overarching changes to the fishery-specific management system are the subject of broader consultation and examination. This provides a mechanism to identify and consider the broader implications of management options.

The decision-making processes are subject to various transparency requirements which are met through:

- Publication of Fisheries Management Papers, Fisheries Occasional Papers and Fisheries Research Reports on the DPIRD website;
- Written advice to licence holders and other stakeholders regarding new statutory arrangements;
- A requirement to report annually to the WA Parliament on the performance of the Department against the objectives of the FRMA (e.g. DPIRD, 2020a);
- Public access to relevant legislation including the FRMA, FRMR and the WCEMF Management Plan, harvest strategies, the Department's research plan and annual status report of fisheries.

No evidence of the management system not responding to relevant issues in a timely and transparent manner were observed. As a result the assessment team considered that decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions. The requirements of SG 60, 80 and 100 are met.

Use of precautionary approach			
C	Guide post	Decision-making processes use the precautionary approach and are based on best available information.	
	Met?	Yes	
Rationale			

Decision making is driven by the blue swimmer crab and finfish harvest strategies (DPIRD 2020 b&c). These are consistent with the Harvest Strategy Policy (DoF 2015c) which is predicated on the application of the precautionary approach and the use of EBFM which responds to the assessed risk that fishing poses to target, other retained species, bycatch, ETP species, habitats and ecosystems.

The use of threshold reference levels in the harvest strategies for blue swimmer crabs and finfish (DPIRD 2020b and DPIRD 2020c), also demonstrates the use of the precautionary approach by triggering a review where fishery performance is below the target. This ensures that any significant impacts are detected, examined and responded to if necessary, in a proactive way, effectively minimising the risk that the limit reference point will be approached.

Consistent with a precautionary approach the West Coast Bioregion, including the Peel-Harvey Estuary, stock of sea mullet is managed as a separate stock from those in the Gascoyne and South Coast Bioregions even though it is considered to represent a genetically homogeneous stock. The performance indicators in the harvest strategies rely on the best available information on catch, effort, catch rates, interactions with protected species and periodic risk assessments of target, other retained species, bycatch, ETP species, habitats and ecosystems.

Decision-making processes use the precautionary approach and are based on best available information, and the requirements of SG 80 are met.

Accountability and transparency of management system and decision-making process				
d	Guide post	Some information on the fishery's performance and management action is generally available on request to stakeholders.	Information on the fishery's performance and management action is available on request , and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on the fishery's performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	Yes	Yes	No
Rationale				

DPIRD provides information on fishery performance and management action to stakeholders through Annual Management Meetings where annual reports against the Harvest Strategy Performance Indicator have been presented together with relevant recommendations; annual status reports (e.g. DPIRD, 2020d), and fisheries management papers, fisheries occasional papers and fisheries research reports. In particular, DPIRD provides considerable information regarding the established management systems (DOF, 2015; Johnston et al, 2020; DPIRD, 2020).

While a revised Harvest Strategy has been only recently implemented, it builds significantly on the previous strategy and is considered to be highly likely to be as effective as that which has been in place for the last 5 years.

WAFIC, through its consultation role, also provides a mechanism for providing information to industry on fishery performance and management. Opportunities exist for stakeholders to query actions or lack of action in response to research, monitoring evaluation and review outcomes.

The assessment team found that information on fishery performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity and the requirements of SG80 were met.

The assessment team considered that while comprehensive information is available on the management system, it has not been demonstrated that it provides comprehensive information on fishery performance and management actions to all interested stakeholders, and that SG100 was not met.

Approach to disputes				
e	Guide post	Although the management authority or fishery may be subject to continuing court challenges, it is not	The management system or fishery is attempting to comply in a timely fashion with judicial decisions	The management system or fishery acts proactively to avoid legal disputes or rapidly implements

		indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	arising from any legal challenges.	judicial decisions arising from legal challenges.
	Met?	Yes	Yes	Yes
Rationale				

The management system for the WCEMF proactively avoids legal disputes through inclusion of key stakeholders, notably commercial and recreational fishers, in its management decision making.

The fishery system is not subject to continuing court challenges, however, where legal challenges have been made to the management system (see, for example, Shine Fisheries Pty Ltd vs Minister for Fisheries at <http://decisions.justice.wa.gov.au/supreme/supdcsn.nsf/judgment.xsp?documentId=89CBEA251EC082BB48256B5A000C1635&action=openDocument>), the (then) DoF responded promptly to the judicial decision by making the necessary changes to management arrangements.

Disputes are addressed on a case-by-case basis with the Department actively working with peak sector bodies WAFIC and Recfishwest. An example is the process described in Fisheries Management Paper No. 303 around catch share arrangement of yellowfin whiting, i.e. tolerance levels are agreed to by commercial and recreational sectors and should the agreed 'trigger level' be reached, the Department initiates a meeting between stakeholders to evaluate the appropriateness of the tolerance level for the present season, in the context of existing environmental and fishing factors.

In addition, the development of the Blue Swimmer Crab Working Group that is currently in progress and includes representatives from peak sector bodies Recfishwest and WAFIC, assists in identifying and addressing potential conflicts both within Peel-Harvey and at the resource level.

The management system acts proactively to avoid legal disputes and rapidly implements judicial decisions arising from legal challenges and the requirements of SG60, 80 and 100 are met.

References

DOF (2015). Harvest Strategy Policy and operational Guidelines for the Aquatic Resources of Western Australia. Fisheries Management Paper No. 271. Department of Fisheries, Western Australia

DPIRD (2020b). Blue Swimmer Crab Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Fisheries Management Paper No. 304. DPIRD November 2020, pp. 35. http://www.fish.wa.gov.au/Documents/management_papers/fmp304.pdf

DPIRD (2020c). Estuarine and Nearshore Finfish Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Fisheries Management Paper No. 303. DPIRD November 2020, pp. 33. http://www.fish.wa.gov.au/Documents/management_papers/fmp303.pdf

Johnston, D., Yeoh, D., Harris, D. and Fisher, E. 2020. Blue Swimmer Crab (*Portunus armatus*) Resource in the West Coast Bioregion, Western Australia. Part 1: Peel-Harvey Estuary, Cockburn Sound and Swan-Canning Estuary. Fisheries Research Report No. 307. Department of Primary Industries and Regional Development, Western Australia. 194pp.

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

UoAs: Blue-swimmer crab – recreational drop net; blue-swimmer crab – recreational scoop

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery		
Scoring Issue		SG 60	SG 80	SG 100
a	Decision-making processes			
	Guide post	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	Yes	Yes	
Rationale				

The FRMA, together with the WCEMF Management Plan, provide the framework for decision-making on long-term management of the recreational fisheries for blue swimmer crab in the PHE. Decision-making roles and responsibilities are well defined. Decisions are generally taken by the Director General of DPIRD or the Minister, after consultation with commercial and recreational fishers. However the FRMA provides for decisions to be taken without such consultation where there is an urgent need for action.

The 2020 harvest strategies define two interrelated decision-making processes.

(1) A formal review of targeted stocks and other ecological assets against defined reference levels to determine performance against management objectives relating to ecological sustainability

A formal, resource-level review process is undertaken by the Department to assess the status of relevant target stocks and performance in relation to each ecological objective. Suitable indicators have been selected to determine the status of the blue swimmer crab resource of south-west WA, and other ecological assets, against defined reference levels established to separate acceptable from unacceptable performance (Section 3.4.1). Where relevant, these reference levels include:

- 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).

Due to a lack of information about the total recreational effort and catch of blue swimmer crabs in south-west WA, the harvest strategy for these stocks is primarily based on standardised commercial catch rates relative to reference levels for each of the two key areas.

Harvest Control Rules (HCRs) define the management actions management needed to meet sustainability objectives, specifically for each indicator. These HCRs are designed to maintain the resource above the threshold level and close to a target level, or rebuild it where it has fallen below the threshold (undesirable) or the limit (unacceptable) levels. A summary of the management objectives, performance indicators, reference levels and HCRs is provided in Table 1 of the HS.

As recreational catch information for blue swimmer crabs in south-west WA is often incomplete or uncertain, implementing the HCR as a reduction of the current catch for this sector may not be appropriate. A catch reduction for this sector will instead typically be applied indirectly through an equivalent reduction in the current bag/boat limit and/or the length of the fishing season expected to achieve the required response. Where data are available to suggest the current bag/boat limit is often not achieved by fishers, the review may determine that a stronger management response is necessary to achieve the desired catch reduction.

(2) Annual fishery-level review that determines whether the current catch/effort by each of the relevant fisheries/sectors is consistent with the levels expected when ecological objectives are met.

Annual (or periodic) catch or effort tolerance levels have been defined to provide a formal basis to evaluate the effectiveness of current management arrangements in delivering the levels of catch and/or effort specified by the HCRs and, where relevant, any sectoral allocation decisions (Fletcher et al. 2016).

Tolerance ranges have also been developed for the boat-based recreational sector in the Peel-Harvey estuary, broadly based on preliminary catch estimates for the estuary from the four boat-based fishing surveys completed to date. The tolerance ranges have been adjusted upwards (by 20%) to account for recent changes to management, include the ongoing VFAS and extended seasonal closure to increase protection of breeding stocks. It is acknowledged that the tolerance levels will be refined with time and, for the Peel-Harvey Estuary, additional tolerance levels for the shore-based scooping sector (likely based on effort as a proxy for catch) may be added to this harvest strategy.

If the catch of either fishery/sector breaches the specified tolerance level and this cannot be adequately explained (e.g. clear environmental impacts or marketing reasons), the performance is termed 'Unacceptable'. This would also trigger a review to determine if management arrangements are still appropriate and if a reassessment of resource status is necessary to inform adjustments to the HCRs and/or tolerance levels.

The economic objective for the fisheries that target the blue swimmer crab resource in south-west WA does not have an explicit performance measure within this harvest strategy. Rather, it is through the formal consultation process (facilitated by annual management meetings with the commercial fishers) that regulatory impediments to maintaining economic return, or opportunities for enhancing economic return, are discussed. If measurable indicators for monitoring performance against the economic objectives are identified, these will be included in future revisions of this harvest strategy.

Decision-making in pursuit of longer-term objectives responds to processes including periodic ecological risk assessments (every 3-5 years), results of monitoring programs and research projects, changes in fishing behaviour, including compliance, and resource allocation issues.

These drivers may dictate the need for higher level changes to the management regime for the fishery, often through changes to legislation e.g. changes to the overarching management measures for recreational fishing for blue swimmers crab. Decisions to proceed with such changes involve a higher level of consultation with recreational fishers and this would be conducted through Recfishwest.

The assessment team concluded that there are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives and the requirements of SG60 and 80 met.

Responsiveness of decision-making processes				
b	Guide post	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	Yes	Yes	Yes
Rationale				

Harvest strategy control rules (DPRID, 2020b&c) dictate the management response to performance of the fishery against established indicators. While this Harvest Strategy has only recently been revised, it builds on the previous Harvest Strategy which has proven effective.

More broadly, decision-making processes respond to other issues raised through:

- Ecological risk assessments;
- Results of research, management or compliance projects or investigations, and
- Relevant workshops and peer review of aspects of research and management.

Overarching changes to the fishery-specific management system are the subject of broader consultation and examination. This provides a mechanism to identify and consider the broader implications of management options.

The decision-making processes are subject to various transparency requirements which are met through:

- Publication of Fisheries Management Papers, Fisheries Occasional Papers and Fisheries Research Reports on the DPIRD website;
- Written advice to licence holders and other stakeholders regarding new statutory arrangements;
- A requirement to report annually to the WA Parliament on the performance of the Department against the objectives of the FRMA (e.g. DPIRD, 2020a);
- Public access to relevant legislation including the FRMA, FRMR and the WCEMF Management Plan, harvest strategies, the Department's research plan and annual status report of fisheries.

No evidence of the management system not responding to relevant issues in a timely and transparent manner were observed. As a result the assessment team considered that decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a

transparent, timely and adaptive manner and take account of the wider implications of decisions. The requirements of SG 60, 80 and 100 are met.

Use of precautionary approach				
C	Guide post	Decision-making processes use the precautionary approach and are based on best available information.		
	Met?		Yes	
Rationale				

Decision making is driven by the blue swimmer crab and finfish harvest strategies (DPIRD 2020 b&c). These are consistent with the Harvest Strategy Policy (DoF 2015c) which is predicated on the application of the precautionary approach and the use of EBFM which responds to the assessed risk that fishing poses to target, other retained species, bycatch, ETP species, habitats and ecosystems.

The use of threshold reference levels in the harvest strategies for blue swimmer crabs and finfish (DPIRD 2020 b&c), also demonstrates the use of the precautionary approach by triggering a review where fishery performance is below the target. This ensures that any significant impacts are detected, examined and responded to if necessary, in a proactive way, effectively minimising the risk that the limit reference point will be approached.

The performance indicators in the harvest strategies rely on the best available information on catch, effort, catch rates, interactions with protected species and periodic risk assessments of target, other retained species, bycatch, ETP species, habitats and ecosystems. Given the lack of details recreational fishing information, this data mostly relates to the commercial fishery, however this reflects appropriate decision making regarding best data to inform management.

Decision-making processes use the precautionary approach and are based on best available information, and the requirements of SG 80 are met.

Accountability and transparency of management system and decision-making process				
d	Guide post	Some information on the fishery's performance and management action is generally available on request to stakeholders.	Information on the fishery's performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on the fishery's performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	Yes	Yes	No
Rationale				

DPIRD provides information on fishery performance and management action to stakeholders through a range of mechanisms including annual management meetings, annual status reports (e.g. Fletcher and Santoro 2014), fisheries management papers, fisheries occasional papers and fisheries research reports. In particular, DPIRD provides considerable information regarding the established management systems (DOF, 2015; Johnston et al, 2020; DPIRD, 2020).

Recfishwest, through its consultation role, also provides a mechanism for providing information to recreational fishers on fishery performance and management. Opportunities exist for stakeholders to query actions or lack of action in response research, monitoring evaluation and review outcomes.

The assessment team found that information on fishery performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity and the requirements of SG80 were met.

Comprehensive fishery-specific performance indicators, established as part of the Harvest Strategy have now been tested (and reviewed and refined in the 2020 Harvest Strategies) and demonstrated to be effective.

The assessment team considered that while comprehensive information is available on the management system, it has not been demonstrated that it provides comprehensive information on fishery performance and management actions to all interested stakeholders, and that SG100 was not met.

Approach to disputes				
e	Guide post	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	Yes	Yes	Yes
Rationale				

The management system for the WCEMF proactively avoids legal disputes through inclusion of key stakeholders, notably commercial and recreational fishers, in its management decision making.

The fishery system is not subject to continuing court challenges, however, where legal challenges have been made to the management system (see, for example, Shine Fisheries Pty Ltd vs Minister for Fisheries at <http://decisions.justice.wa.gov.au/supreme/supdcsn.nsf/judgment.xsp?documentId=89CBEA251EC082BB48256B5A000C1635&action=openDocument>), DoF has responded promptly to the judicial decision by making the necessary changes to management arrangements.

Disputes are addressed on a case by case basis with the Department actively working with peak sector bodies WAFIC and Recfishwest. An example is the process described in Fisheries Management Paper No. 303 around catch share arrangement of yellowfin whiting, i.e. tolerance levels are agreed to by commercial and recreational sectors and should the agreed 'trigger level' be reached, the Department

initiates a meeting between stakeholders to evaluate the appropriateness of the tolerance level for the present season, in the context of existing environmental and fishing factors.

In addition, the development of the Blue Swimmer Crab Working Group that is currently in progress and includes representatives from peak sector bodies Recfishwest and WAFIC, assists in identifying and addressing potential conflicts both within Peel-Harvey and at the resource level.

The management system acts proactively to avoid legal disputes and rapidly implements judicial decisions arising from legal challenges and the requirements of SG60, 80 and 100 are met.

References

DOF (2015). Harvest Strategy Policy and operational Guidelines for the Aquatic Resources of Western Australia. Fisheries Management Paper No. 271. Department of Fisheries, Western Australia

DPIRD (2020b). Blue Swimmer Crab Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Fisheries Management Paper No. 304. DPIRD November 2020, pp. 35.
http://www.fish.wa.gov.au/Documents/management_papers/fmp304.pdf

DPIRD (2020c). Estuarine and Nearshore Finfish Resource of South-West Western Australia Harvest Strategy 2020-2025 Version 1.0. Fisheries Management Paper No. 303. DPIRD November 2020, pp. 33.
http://www.fish.wa.gov.au/Documents/management_papers/fmp303.pdf

Johnston, D., Yeoh, D., Harris, D. and Fisher, E. 2020. Blue Swimmer Crab (*Portunus armatus*) Resource in the West Coast Bioregion, Western Australia. Part 1: Peel-Harvey Estuary, Cockburn Sound and Swan-Canning Estuary. Fisheries Research Report No. 307. Department of Primary Industries and Regional Development, Western Australia. 194pp.

Draft scoring range	≥80
Information gap indicator	Sufficient information to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 3.2.3 – Compliance and enforcement

UoA: Sea mullet – haul net; sea mullet – gillnet; blue-swimmer crab – commercial crab pot

PI	3.2.3	Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with		
Scoring Issue		SG 60	SG 80	SG 100
a	MCS implementation			
	Guide post	Monitoring, control and surveillance mechanisms exist, and are implemented in the fishery and there is a	A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant	A comprehensive monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a

		reasonable expectation that they are effective.	management measures, strategies and/or rules.	consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	Yes	Yes	Yes
Rationale				

The Western Australian Fisheries Compliance Strategy (the Strategy; DPIRD 2018) was published in 2018 with the purpose of outlining the principles underlying the DPIRD's compliance role and how its compliance services are delivered to the WA community.

The Strategy aligns with, and complements, DPIRD's Compliance Framework and Risk Assessment Policy which informs the risk-based model, compliance planning and the governance structure applied to fisheries compliance services.

The Department's compliance model is based on the Australian Fisheries National Compliance Strategy 2016-2020 (the National Strategy). DPIRD's compliance program contains three key compliance strategies recommended by the National Strategy:

- maximising voluntary compliance;
- effective deterrence; and
- organisational capability and capacity.

Operational Compliance Plan Management arrangements are enforced under the combined Operational Compliance Plan (OCP) for minor commercial fisheries. The OCP is informed and underpinned by compliance risk assessments conducted for each fishery. Annual planning meetings are held for OCPs, with regular specific planning of day-to-day targeted and non-targeted patrols linked to the OCP based on resources and competing priorities.

Management arrangements for the blue swimmer crab and sea mullet resource of south-west WA are enforced under Operational Compliance Plans (OCPs). The OCPs are informed and underpinned by a compliance risk assessment conducted for each fishery, which are reviewed every two years. These OCPs have the following objectives:

- to provide clear and unambiguous direction and guidance to Fisheries and Marine Officers for the yearly delivery of compliance in the fishery;
- to protect the fisheries' environmental values, while providing fair and sustainable access to the fishery's commercial and social values; and
- to encourage voluntary compliance through education, awareness and consultation activities.

Compliance strategies and activities that are used in the commercial and recreational fisheries targeting the blue swimmer crab resource of south-west WA include:

- Land patrols
- on-water patrols;
- road-side checkpoints;
- catch, licence and gear inspections;
- wholesale and retail inspections; and
- covert surveillance of persons of interest under approved operations.

These strategies are supported by appropriately trained staff, suitable deterrents in the forms of fines and administrative penalties and targeted education campaigns to promote voluntary compliance.

Compliance effort in the PHE, with regards to overall presence of Fisheries Officers has remained very similar since 2014/15, however, increased in 2019/20 as a result of staffing in Mandurah being back at

full capacity, and with some extra assistance called in from the Metropolitan region for the peak season (**Table 23**).

Table 23: Summary of compliance hours in broader PHE area (incorporating oceanic waters outside the estuary)

Financial year	Total Presence (Officer Hours) in area
2012/13	3,562
2013/14	3,788
2014/15	4,506
2015/16	4,910
2016/17	4,646
2017/18	4,233
2018/19	3,890
2019/20	6,530

Compliance contacts and offences in the commercial sector for the whole of the WCEF is reported in **Table 24** for calendar years between 2016 and 2021 (part thereof). During the entire period 5 offences were recorded, and only one offence has been recorded since 2019. In the PHE specifically, only 5 offences have been recorded since 2016 and no offences have been recorded since 2018.

Table 10: West Coast Estuarine Commercial Fishery Contacts and Offences by Calendar Year

Year	Compliance Contacts	ALE Contacts	Total Contacts	Offences
2016	21	5	26	2
2017	15	6	21	1
2018	14	2	16	1
2019	5	3	8	1
2020	14	7	21	0
2021 (part)	9	0	9	0
Total	78	23	101	5

Compliance contacts and offences in the commercial sector for the PHE fishery only are in Table 25 below.

Table 25. WCE Fishery Contacts and Offences by Calendar Year - PHE Only

	Compliance Contacts	ALE Contacts	Total Contacts	Offences
2016	19	5	24	2
2017	15	6	21	1
2018	13	1	14	1
2019	2	2	4	0
2020	10	7	17	0
2021	11	0	11	0
Total	70	21	91	4

The assessment team concluded that a comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules and that SG 60, 80 and 100 are met.

Sanctions				
b	Guide post	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
	Met?	Yes	Yes	Yes
Rationale				

The FRMA contains an explicit sanction framework, including the nature and extent of sanctions to be applied to non-compliance with commercial fishing regulations. A tiered system of sanctions includes infringement warnings, infringement notices, letters of warning, and prosecutions. Sanctions arising from prosecution can include monetary penalties, licence cancellations or suspensions and confiscation of gear or catch. The penalties are commensurate with the value of illegal fish and the type of illegal activity. The level of detected offences in the commercial fishery in the Peel-Harvey Estuary (see Table **24** and **25**) is extremely low.

The assessment team considered that, in the context of the comprehensive MCS system in place, this was likely to reflect the effectiveness of the system, including the deterrent effect of sanctions, rather than a failure of the detection system. Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence and the requirements of SG60, 80 and 100 are met.

Compliance				
c	Guide post	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	Yes	Yes	Yes
Rationale				

The offending rate in the PHE fishery is very low (Tables **24** and **25**) and there is a comprehensive MCS system in place which provides confidence that the available data are credible. The reported level of compliance is also supported by the positive status of the target fish stocks.

Fishers participate actively in the collection of data through submission of mandatory logbook data and reports on interactions with ETP species. Commercial fishers also participate in the observer monitoring for blue swimmer crab and also cooperate voluntarily to implement some management measures.

The MLFA's Code of Practice includes undertakings by commercial licence holders to, among other things, aid in present and future research projects and to comply with the Departmental Management Plan at all times.

The level of detected offences in the commercial fishery in the Peel-Harvey Estuary (see **Table 24**) is extremely low with a maximum of 2 infringements issued in any of the four years to 2013/14. The SG 60, 80 and 100.

Systematic non-compliance			
d	Guide post		There is no evidence of systematic non-compliance.
	Met?		Yes
Rationale			

The level of detected offences in the commercial fishery in the Peel-Harvey Estuary (see Table 10) is extremely low with a maximum of 2 infringements issued in any of the four years to 2013/14.

There is no evidence of systematic non-compliance and SG80 is met.

References

DPIRD (2018). Fisheries compliance strategy September 2018.
https://www.fish.wa.gov.au/Documents/corporate_publications/fisheries_compliance_strategy.pdf

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

UoAs: Blue-swimmer crab – recreational drop net; blue-swimmer crab – recreational scoop

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with		
Scoring Issue		SG 60	SG 80	SG 100
a	MCS implementation			
	Guide post	Monitoring, control and surveillance mechanisms exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.

Met?	Yes	Yes	No
Rationale			

The Western Australian Fisheries Compliance Strategy (the Strategy; DPIRD 2018) was published in 2018 with the purpose of outlining the principles underlying the DPIRD's compliance role and how its compliance services are delivered to the WA community.

The Strategy aligns with, and complements, DPIRD's Compliance Framework and Risk Assessment Policy which informs the risk-based model, compliance planning and the governance structure applied to fisheries compliance services.

The Department's compliance model is based on the Australian Fisheries National Compliance Strategy 2016-2020 (the National Strategy). DPIRD's compliance program contains three key compliance strategies recommended by the National Strategy:

- maximising voluntary compliance.
- effective deterrence; and
- organisational capability and capacity.

Operational Compliance Plan Management arrangements are enforced under the combined Operational Compliance Plan (OCP) for minor commercial fisheries. The OCP is informed and underpinned by compliance risk assessments conducted for each fishery. Annual planning meetings are held for OCPs, with regular specific planning of day-to-day targeted and non-targeted patrols linked to the OCP based on resources and competing priorities.

Management arrangements for the blue swimmer crab resource of south-west WA are enforced under Operational Compliance Plans (OCPs). The OCPs are informed and underpinned by a compliance risk assessment conducted for each fishery, which are reviewed every two years. These OCPs have the following objectives:

- to provide clear and unambiguous direction and guidance to Fisheries and Marine Officers for the yearly delivery of compliance in the fishery;
- to protect the fisheries' environmental values, while providing fair and sustainable access to the fishery's commercial and social values; and
- to encourage voluntary compliance through education, awareness and consultation activities.

Compliance strategies and activities that are used in the recreational fisheries targeting the blue swimmer crab resource of south-west WA include:

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

These strategies are supported by appropriately trained staff, suitable deterrents in the forms of fines and administrative penalties and targeted education campaigns to promote voluntary compliance.

Compliance effort in the PHE, with regards to overall presence of Fisheries Officers has remained very similar since 2014/15, however, increased in 2019/20 as a result of staffing in Mandurah being back at full capacity, and with some extra assistance called in from the Metropolitan region for the peak season.

The number of compliance contacts made with fishers increased in 2018/19 compared to the previous three years, and remained high in 2019/20 (**Table 11**). A lack of increase in contact numbers to follow the substantial increase in officer presence in 2019/20 is likely due mainly to the shorter crabbing season

since the extension of the closure in 2019 to include November, and an increase in the number of prosecution briefs issued, which typically take more time to process.

An updated summary of offences by recreational fishers is provided in **Table 26** and reveals the following:

- The number of recreational netting offences have remained at a low level.
- Recreational crabbing offences are high, by comparison to netting.
- While recreational crabbing offences reduced from approximately 700-1000 offences per annum throughout 2013-2016, to 432 in 2016/17, the trend since then has seen a further increase in offences to a level of 492 in 2019/20.
- The increased crabbing offences in 2019/20 are thought to be mostly due to a greater number of infringements and warnings issued during the closed season. The data continues to show that retention of undersized crabs remains the main offence type in the recreational crab fishery (**Table 26**).

Given the increasing trend in non-compliance in the recreational sector observed since the 2017 MSC certification (particularly with respect to minimum size limits), the MSC assessment team recommended that DPIRD and Recfishwest review the existing compliance strategy and management measures to ensure that the system is capable of minimizing non-compliance. In response, DPIRD advised that the Blue Swimmer Crab Working Group (including representatives from peak sector bodies Recfishwest and WAFIC) has been established and the matter of recreational fishing compliance will be considered by this group.

Table 11: Summary of offence data relative to the compliance effort in the broader PHE area (incorporating oceanic waters outside the estuary)

Financial year	Total Presence (Officer Hours) in area	Rec Crabbing Compliance Contacts in area	Rec Crabbing Offences in area	Rec Netting Offences in area
2012/13	3,562	5,854	511	41
2013/14	3,788	9,286	1,058	20
2014/15	4,506	10,930	1,009	49
2015/16	4,910	7,422	773	36
2016/17	4,646	7,156	432	31
2017/18	4,233	7,429	361	13
2018/19	3,890	10,527	435	9
2019/20	6,530	9,256	492	29

Table 27: Summary of detected offences by recreational fishers in the PHE estuary between 2016/17 and 2019/20.

Offence Type	Prosecution Briefs				Infringement Notices				Infringement Warnings			
	16/17	17/18	18/19	19/20	16/17	17/18	18/19	19/20	16/17	17/18	18/19	19/20
Crabbing												
Closed Season	1				6	2	3	10		2	1	22
Closed Waters	1			1		1						
Excess Bag	22	7	12	18	6	22	12	12	27	22	23	20
Excess Gear					1							
Illegal Gear	4		1		2			4	21	2	13	
Licensing												
No Licence				1	2	1	9	4	1	7	7	4
Obstruction	5	8	5	6								
Species												
Undersize	28	12	18	34	173	161	160	177	127	113	169	179
Processing	4					1						
Other	1		2									
TOTAL	66	27	38	60	190	188	184	207	176	146	213	225
Netting												
Closed Season	3			1			1					
Closed Waters	6	1	3	2	7	4		5	1			
Excess Bag				1				5			1	1
Illegal Gear	3	1	1	2	1			1	3	2		2
No Licence		1	1	2	1	2	2	2	1			2
Undersize												
Other	2				2	1		1	1	1		2
TOTAL	14	3	5	8	11	7	3	14	6	3	1	7

A comprehensive monitoring, control and surveillance system has been implemented in the fishery however it has not demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules given the increasing trend in recreational fishing non-compliance around size limits. Therefore SG 60 and 80 have been met.

Sanctions				
b	Guide post	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
	Met?	Yes	Yes	No
Rationale				

The FRMA contains an explicit framework, including the nature and extent of sanctions to be applied to non-compliance with recreational fishing regulations. A tiered system of sanctions includes infringement warnings, infringement notices, letters of warning and prosecutions. Sanctions arising from prosecution can include monetary penalties, licence cancellations or suspensions and confiscation of gear or catch. The penalties are commensurate with the value of illegal fish and the type of illegal activity.

The level of detected offences in the recreational fishery in the Peel-Harvey Estuary (see **Table 25** and **Table 26**) is generally quite low in the context of the numbers of recreational fishers participating in the Peel-Harvey Estuary Blue Swimmer Crab Fishery in any year. However, there has been an upward trend in the number of infringement notices and warnings for catch of undersize crabs since 2010/11. DPIRD attributes this to better targeting of compliance activity by compliance officers and increased participation rates.

The assessment team considered that there is evidence that the sanctions available are consistently applied and there is sufficient evidence to suggest that these are likely to be providing a deterrent. SG60 and 80 are therefore met. However, the available evidence did not support a finding that the sanctions demonstrably provide effective deterrence and SG100 is not met.

Compliance				
C	Guide post	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	Yes	Yes	No
Rationale				

The available data suggest that there is a level of compliance with the management system for recreational take of blue swimmer crab in the PeelHarvey Estuary. A state-wide survey of recreational fishers (Ryan et al. 2013) found a willingness of recreational fishers to supply information and Johnston et al. (2015) note that there is community pressure to “do the right thing”.

Community members regularly advise DPIRD when they observe unusual or illegal behavior, and such reports have led to successful prosecutions. There is therefore some evidence to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery, and SG60 and 80 are met.

It remains unclear whether the increasing number of infringements detected in the recreational sector in recent years, including in the season starting November 2015 (<http://www.abc.net.au/news/2015-11-20/late-start-to-mandurah-crabseason-flagged/6958460>), is a result of changed compliance activity and increased participation or whether it reflects, in whole or in part, a level of increasing noncompliance.

As a result, there is not a high degree of confidence that fishers comply with the management system and SG100 is not met. Further, given the uncertainty about the causes of the trend in non-compliance, particularly non-compliance with the minimum size limit, it is recommended that DPIRD and Recfishwest review the existing compliance strategy and management measures to ensure that the system is capable of minimizing non-compliance.

d Systematic non-compliance

	Guide post		There is no evidence of systematic non-compliance.	
	Met?		Yes	

Rationale

There is no evidence of systematic non-compliance, and SG80 is met.

References

DPIRD (2018). Fisheries compliance strategy September 2018.
https://www.fish.wa.gov.au/Documents/corporate_publications/fisheries_compliance_strategy.pdf

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 3.2.4 – Monitoring and management performance evaluation

UoAs: Sea mullet – haul net; sea mullet – gillnet; blue-swimmer crab – commercial crab pot

PI 3.2.4		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives There is effective and timely review of the fishery-specific management system		
Scoring Issue		SG 60	SG 80	SG 100
a	Evaluation coverage			
	Guide post	There are mechanisms in place to evaluate some parts of the fishery-specific management system.	There are mechanisms in place to evaluate key parts of the fishery-specific management system.	There are mechanisms in place to evaluate all parts of the fishery-specific management system.
	Met?	Yes	Yes	No
Rationale				

The following is noted in relation to evaluating the fishery-specific management system:

- Most parts of the WCEMF fishery management system are subject to evaluation.
- Evaluation processes include strategic planning and risk assessments (ecological risk assessments for the WCEMF will be undertaken every 3–5 years and annual compliance risk assessments),
- Annual Management Meetings are held with all WCEMF Area 2 licence holders and stakeholders (Recfishwest) to discuss current research programs, management changes and future research needs. Additional meetings may also be held, on an as needs basis, throughout the year to address specific issues or initiatives.
- Where appropriate, research workshops are held with stakeholder groups. An example of this is the workshop held in 2020 to conduct the ERA for the fishery.
- The revised harvest strategies implemented in 2020 will be fully reviewed after 5 years. If required, the document may be subject to review and amended within this five-year period.
- The Harvest strategies incorporate annual reviews against reference points.
- Ecological risk assessments are undertaken periodically (every 3-5 years) which respond to the results of monitoring programs and research projects, changes in fishing behaviour, including compliance, and resource allocation issues. These drivers may dictate the need for higher level changes to the management regime for the fishery, often through changes to legislation e.g. changes to the overarching management measures for recreational fishing for blue swimmers crab. Decisions to proceed with such changes involve a higher level of consultation with recreational fishers and this would be conducted through Recfishwest.
- Fishery performance against long-term and short-term objectives is evaluated annually through the Status Reports of the Fisheries and Aquatic Resources of Western Australia and more broadly through DPIRD's Annual Report to the Western Australian Parliament.

However, neither the FRMA nor the WCEMF Management plan provide for the regular review of the management plan. Therefore, the fishery has in place mechanisms to evaluate key, but not all, parts of the management system and SG 60 and 80 are met.

b	Internal and/or external review			
	Guide post	The fishery-specific management system is	The fishery-specific management system is	The fishery-specific management system is

		subject to occasional internal review.	subject to regular internal and occasional external review.	subject to regular internal and external review.
	Met?	Yes	Yes	No
Rationale				

The management system is subject to regular internal review as described under scoring issue (a).

Some aspects of the fishery are subject to occasional external review. for example:

- The research and management of the PHE blue swimmer crab fishery was externally reviewed in 2010 by Wayne Sumpton as part of the DBIF project (Johnston et al. 2015, Appendix D).
- DPIRD's Research Division's Supervising Scientists manage the peer review process of all fisheries (with external reviewers).

The stock assessment for the fishery is subject to internal review however not external review.

It is noted that the fishery has not submitted for assessment under the EPBC Act against Guidelines for the Ecologically Sustainable Management of Fisheries (the Guidelines) (Department of the Environment and Water Resource (DEWR), 2007).

The fishery-specific management system is subject to regular internal and occasional external review and SG60 and 80 are met. While there is regular internal review of the management system, external review is ad hoc and occasional at best and SG100 is not met.

References

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Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

UoAs: Blue-swimmer crab – recreational drop net; blue-swimmer crab – recreational scoop

PI 3.2.4		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives There is effective and timely review of the fishery-specific management system		
Scoring Issue		SG 60	SG 80	SG 100
a	Evaluation coverage			
	Guide post	There are mechanisms in place to evaluate some parts of the fishery-specific management system.	There are mechanisms in place to evaluate key parts of the fishery-specific management system.	There are mechanisms in place to evaluate all parts of the fishery-specific management system.
	Met?	Yes	Yes	No
Rationale				

The following is noted in relation to evaluating the fishery-specific management system:

- Most parts of the WCEMF fishery management system are subject to evaluation.
- Evaluation processes include strategic planning and risk assessments (Ecological Risk Assessments for the WCEMF and the Peel-Harvey Estuary Blue Swimmer Crab Recreational Fishery will be undertaken every 3–5 years and annual compliance risk assessments),
- Annual Management Meetings are held with stakeholders including Recfishwest to discuss current research programs, management changes and future research needs..
- Additional meetings may also be held, on an as needs basis, throughout the year to address specific issues or initiatives.
- Where appropriate, research workshops are held with stakeholder groups. An example of this is the workshop held in 2020 to conduct the ERA for the fishery.
- The revised harvest strategies implemented in 2020 will be fully reviewed after 5 years, If required, the document may be subject to review and amended within this five-year period.
- The Harvest strategies incorporate annual reviews against reference points.
- Ecological risk assessments are undertaken periodically (every 3-5 years) which respond to the results of monitoring programs and research projects, changes in fishing behaviour, including compliance, and resource allocation issues. These drivers may dictate the need for higher level changes to the management regime for the fishery, often through changes to legislation e.g. changes to the overarching management measures for recreational fishing for blue swimmers crab. Decisions to proceed with such changes involve a higher level of consultation with recreational fishers and this would be conducted through Recfishwest.
- Fishery performance against long-term and short term objectives is evaluated annually through the Status Reports of the Fisheries and Aquatic Resources of Western Australia and more broadly through DPIRD's Annual Report to the Western Australian Parliament.

However, neither the FRMA nor the WCEMF Management plan provide for the regular review of the management plan. Therefore the fishery has in place mechanisms to evaluate key, but not all, parts of the management system and SG 60 and 80 are met.

b Internal and/or external review				
Guide post	The fishery-specific management system is	The fishery-specific management system is	The fishery-specific management system is	The fishery-specific management system is
	subject to regular	subject to regular	subject to regular	subject to regular

		subject to occasional internal review.	internal and occasional external review.	internal and external review.
	Met?	Yes	Yes	No
Rationale				

The management system is subject to regular internal review as described under scoring issue (a). The fishery is not subject to external assessment under the EPBC Act since it does not sell, and specifically does not export, product.

Some aspects of the fishery are subject to occasional external review. for example:

- The research and management of the PHE blue swimmer crab sectors was externally reviewed in 2010 by Wayne Sumpton as part of the DBIF project (Johnston et al. 2015).
- DPIRD's Research Division's Supervising Scientists manage the peer review process of all fisheries (with external reviewers).

The fishery-specific management system is subject to regular internal and occasional external review and SG60 and 80 are met. While there is regular internal review of the management system, external review is ad hoc and occasional at best and SG100 is not met.

References

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Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

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9 Appendices

9.1 Assessment information

9.1.1 Previous assessments

The fishery was first certified to the MSC requirements in 2016 using the default assessment tree MSC Fisheries Certification Requirements Version 1.3, January 2013. All reports including the 4 annual surveillance reports are available on the MSC website ([here](#)).

The fishery received 9 conditions (Table 28 below). All the conditions are closed.

Table 28 – Summary of previous assessment conditions

Condition	PI(s)	Year closed	Justification
1 Blue swimmer crab	1.2.1	2019 (year 3)	The primary indicators have remained within the target ranges. They provide a strong evidence that the harvest strategy (primarily input controls) are maintaining effort at a level that is not affecting recruitment to the stock and hence the harvest strategy is achieving its objectives.
2 Blue swimmer crab	1.2.2	2020 (year 4)	The updated HCR has well defined thresholds, indicates the broad range of required catch

			reduction and the likely management instruments that will be used to implement the catch reduction.
3 Sea mullet	1.2.1	2020 (year 4)	The new Harvest Strategy (2020e) has been signed off by the Minister and published. This harvest strategy provides a substantial revision and changes from CPUE as the primary indicator to using an estimate of biomass (B) relative to the unfished level (B_0). With appropriate model-based estimates of B/B_0 this provides an improvement to the harvest strategy and the elements continue to work together.
4 Sea mullet	1.2.2	2020 (year 4)	The harvest strategy for sea mullet has been reviewed and updated. The HCR detailed in the harvest strategy uses estimates of biomass (B) compared to the unfished level (B_0) as the primary indicator. This indicator is compared against threshold and limit reference levels which are B_{MSY} and $0.5B_{MSY}$ respectively.
5 Sea mullet (gill net)	2.2.3	2017 (year 1)	There is now an ongoing bycatch monitoring program of bycatch across the fishery. The program is capable of detecting any risk to bycatch species The SG 80 is met.
6 Sea mullet (haul net)	2.2.3	2017 (year 1)	There is now an ongoing bycatch monitoring program of bycatch across the fishery. The program is capable of detecting any risk to bycatch species The SG 80 is met.
7 (All UoCs)	2.4.1	2020 (year 4)	The results of a recently finished project by Krumholz (2019) on changes in macrophyte biomass and distribution were considered in the 2020 ERA assessed the impacts of commercial and recreational fishing activities on the key benthic habitat types in the PHE (sand, macroalgae and seagrass) as negligible or low risk (Fisher et al. 2020).
8 (commercial)	3.1.2	2017 (year 1); recommendation	<p>The Stakeholder Engagement Guideline (SEG) was finalised in July 2016 (DoF 2016). The SEG ensures all stakeholders (including non-fisher stakeholders and interested parties) are provided with opportunities to be involved, engaged and consulted.</p> <p>The SEG identifies and defines all stakeholders and provides clear guidance to DoF fishery managers regarding stakeholder participation in consultation processes. The SEG allows flexibility for managers and stakeholders to participate in consultation processes. All stakeholders are provided the opportunity to comment on, and/or be involved in consultation processes involving various materials published on the DoF website including FMP's, management plans, status reports, annual reports, harvest strategies, and other papers. The SG 80 is met. Specific examples where this</p>

			fishery has consulted with the wider stakeholder group and non-fishing stakeholders have not been provided.
9 (recreational)	3.1.2	2017 (year 1); recommendation	<p>The DoF have developed and implemented formal guidelines, “Stakeholder Engagement Guideline” (SEG) which was finalised in July 2016 (DoF 2016). The SEG ensures all stakeholders (including non-fisher stakeholders and interested parties) are provided with opportunities to be involved, engaged and consulted. The SEG identifies and defines all stakeholders and provides clear guidance to DoF fishery managers regarding stakeholder participation in consultation processes. The SEG allows flexibility for managers and stakeholders to participate in consultation processes. The SG 80 is met.</p> <p>However specific examples where Recfishwest has consulted with all stakeholders of this fishery and non-fishing stakeholders have not been provided to the team.</p>

9.1.2 Small-scale fisheries

Table 29 – Small-scale fisheries

Unit of Assessment (UoA)	Percentage of vessels with length <15m	Percentage of fishing activity completed within 12 nautical miles of shore
1 BSC – baited trap	100	100
2 BSC – drop net	NA	NA
3 BSC – scoop net	NA	NA
4 SM – gill net	100	100
5 SM – haul net	100	100

9.2 Evaluation processes and techniques

9.2.1 Site visits

The CAB shall include in the report:

- An itinerary of site visit activities with dates.
- A description of site visit activities, including any locations that were inspected.
- Names of individuals contacted.

Reference(s): FCP v2.2 Section 7.16

If remote audit is chosen and qualifies under the Covid-19 derogation, include explanation, “the site visit was not conducted due to COVID19 and meetings were conducted remotely.”

9.2.2 Stakeholder participation

The CAB shall include in the report:

- Details of people interviewed: local residents, representatives of stakeholder organisations including contacts with any regional MSC representatives.
- A description of stakeholder engagement strategy and opportunities available.

Reference(s): FCP v2.2 Section 7.16

9.2.3 Evaluation techniques

At Announcement Comment Draft report stage, if the use of the RBF is triggered for this assessment, the CAB shall include in the report:

- The plan for RBF activities that the team will undertake at the site visit.
- The justification for using the RBF, which can be copied from previous RBF announcements, and stakeholder comments on its use.
- The RBF stakeholder consultation strategy to ensure effective participation from a range of stakeholders including any participatory tools used.
- The full list of activities and components to be discussed or evaluated in the assessment.

At Client Draft Report stage, if the RBF was used for this assessment, the CAB shall include in the report:

- A summary of the information obtained from the stakeholder meetings including the range of opinions.
- The full list of activities and components that have been discussed or evaluated in the assessment, regardless of the final risk-based outcome.

The stakeholder input should be reported in the stakeholder input appendix and incorporated in the rationales directly in the scoring tables.

Reference(s): FCP v2.2 Section 7.16, FCP v2.2 Annex PF Section PF2.1

9.3 Peer Review reports

To be drafted at Public Comment Draft Report stage

The CAB shall include in the report unattributed reports of the Peer Reviewers in full using the relevant templates. The CAB shall include in the report explicit responses of the team that include:

- Identification of specifically what (if any) changes to scoring, rationales, or conditions have been made; and,
- A substantiated justification for not making changes where Peer Reviewers suggest changes, but the team disagrees.

Reference(s): FCP v2.2 Section 7.14

9.4 Stakeholder input

To be drafted at Client and Peer Review Draft Report stage

The CAB shall use the 'MSC Template for Stakeholder Input into Fishery Assessments' to include all written stakeholder input during the stakeholder input opportunities (Announcement Comment Draft Report, site visit and Public Comment Draft Report). Using the 'MSC Template for Stakeholder Input into Fishery Assessments', the team shall respond to all written stakeholder input identifying what changes to scoring, rationales and conditions have been made in response, where the changes have been made, and assigning a 'CAB response code'.

The 'MSC Template for Stakeholder Input into Fishery Assessments' shall also be used to provide a summary of verbal submissions received during the site visit likely to cause a material difference to the outcome of the assessment. Using the 'MSC Template for Stakeholder Input into Fishery Assessments' the team shall respond to the summary of verbal submissions identifying what changes to scoring, rationales and conditions have been made in response, where the changes have been made, and assigning a 'CAB response code'.

Reference(s): FCP v2.2 Sections 7.15, 7.20.5 and 7.22.3

9.5 Conditions

9.5.1 Summary of conditions closed under previous certificate

Nine conditions were raised during the original assessment of the fishery (see Table 28 above). All the conditions are closed.

9.5.2 Conditions

To be drafted at Client and Peer Review Draft Report stage

The CAB shall document in the report all conditions in separate tables.

Reference(s): FCP v2.2 Section 7.18, 7.30.5 and 7.30.6

Table X – Condition 1

Performance Indicator	
Score	<i>State score for Performance Indicator.</i>
Justification	<i>Cross reference to page number containing scoring template table or copy justification text here.</i>
Condition	<i>State condition.</i>
Condition deadline	<i>State deadline for the condition.</i>
Exceptional circumstances <input type="checkbox"/>	<i>Check the box if exceptional circumstances apply and condition deadline is longer than the period of certification (FCP v2.2 7.18.1.6). Provide a justification.</i>
Milestones	<i>State milestones and resulting scores where applicable.</i>
Verification with other entities	<i>Include details of any verification required to meet requirements in FCP v2.2 7.19.8.</i>
<i>Complete the following rows for reassessments.</i>	
Carried over condition <input type="checkbox"/>	<i>Check the box if the condition is being carried over from a previous certificate and include a justification for carrying over the condition (FCP v2.2 7.30.5.1.a).</i> <i>Include a justification that progress against the condition and milestones is adequate (FCP v2.2 7.30.5.2). The CAB shall base its justification on information from the reassessment site visit.</i>
Related condition <input type="checkbox"/>	<i>Check the box if the condition relates to a previous condition that was closed during a previous certification period but where a new condition on the same Performance Indicator or Scoring Issue is set.</i> <i>Include a justification – why is a related condition being raised? (FCP v2.2 7.30.6 & G7.30.6).</i>
Condition rewritten <input type="checkbox"/>	<i>Check the box if the condition has been rewritten. Include a justification (FCP v2.2 7.30.5.3).</i>

9.6 Client Action Plan

To be drafted at Public Comment Draft Report stage

The CAB shall include in the report the Client Action Plan from the fishery client to address conditions.

Reference(s): FCP v2.2 Section 7.19

9.7 Surveillance

To be drafted at Client and Peer Review Draft Report stage

The CAB shall include in the report the program for surveillance, timing of surveillance audits and a supporting justification.

Reference(s): FCP v2.2 Section 7.28

Table X – Fishery surveillance program

Surveillance level	Year 1	Year 2	Year 3	Year 4
e.g. Level 5	e.g. On-site surveillance audit	e.g. On-site surveillance audit	e.g. On-site surveillance audit	e.g. On-site surveillance audit & re-certification site visit

Table X – Timing of surveillance audit

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
e.g. 1	e.g. May 2018	e.g. July 2018	e.g. Scientific advice to be released in June 2018, proposal to postpone audit to include findings of scientific advice

Table X – Surveillance level justification

Year	Surveillance activity	Number of auditors	Rationale
e.g.3	e.g. On-site audit	e.g. 1 auditor on-site with remote support from 1 auditor	e.g. From client action plan it can be deduced that information needed to verify progress towards conditions 1.2.1, 2.2.3 and 3.2.3 can be provided remotely in year 3. Considering that milestones indicate that most conditions will be closed out in year 3, the CAB proposes to have an on-site audit with 1 auditor on-site with remote support – this is to ensure that all information is collected and because the information can be provided remotely.

9.8 Harmonised fishery assessments

The fishery shares a management system with the MSC-certified fisheries in Western Australia. Harmonisation is, therefore, required with the Governance and Policy PIs (3.1.1-3.1.3). Efforts have been made to harmonise those parts of Principle 3 with the most recent full assessment and certification outcome from a Western Australian fishery.

For this assessment, harmonization is required for the following fisheries (latest certification at the end) and PIs in accordance with FCP v2.2 Annex PB:

Table 30 – Overlapping fisheries

Fishery name	Certification status and date	Performance Indicators to harmonise
West Coast Deep Sea Crab	July 2016 – Jan. 2022	3.1.1, 3.1.2, 3.1.3
Western Australia Abalone	April 2017-Oct. 2022	3.1.1, 3.1.2, 3.1.3
Western Rock Lobster	May 2017-Nov. 2022	3.1.1, 3.1.2, 3.1.3
Australia Silver-lipped Pearl Oyster	Sept. 2017 - March 2023	3.1.1, 3.1.2, 3.1.3 (WA only)
Western Australia Octopus	Oct 2019- April 2025	3.1.1, 3.1.2, 3.1.3
Sea cucumber	Dec. 2019 – Dec. 2025	3.1.1, 3.1.2, 3.1.3
Exmouth Gulf Prawn Trawl	Dec. 2020-December 2025	3.1.1, 3.1.2, 3.1.3
Shark Bay Prawn Trawl	Dec. 2020-December 2025	3.1.1, 3.1.2, 3.1.3

Table 31 – Overlapping fisheries

Supporting information	
The PI 3.1.2 will be further examined, and more evidence attempted to be identified at the site visit, in order to seek a harmonised outcome for all PIs.	
Was either FCP v2.2 Annex PB1.3.3.4 or PB1.3.4.5 applied when harmonising?	NA at this stage
Date of harmonisation meeting	NA at this stage
If applicable, describe the meeting outcome	
<ul style="list-style-type: none"> e.g. Agreement found among teams or lowest score adopted. 	

Table 32 – Scoring differences

Performance Indicators (PIs)	Exmouth Gulf Prawn	Silver Lipped Pearl Oyster Fishery	WC Deep Sea Crab Fishery	Shark Bay Prawn Fishery	Western Australia Abalone Fishery	Western Australian Rock Lobster Fishery	Western Australian Sea Cucumber Fishery
PI 3.1.2	100	100	85	95	100	100	100

Table 33– Rationale for scoring differences

If applicable, explain and justify any difference in scoring and rationale for the relevant Performance Indicators (FCP v2.2 Annex PB1.3.6).

3.1.2 c is scored 80 in the ACDR for this fishery which varies from other assessments as outlined below based on a review of other initial, surveillance and re-assessment reports for WA fisheries:

- **Exmouth Gulf Prawn** - In this fishery assessment, evidence was required to demonstrate that consultation processes provide an opportunity for all interested and affected parties to be involved, resulting in a score of 75 for PI 3.1.2. This PI has been re-scored at the SG100 level in subsequent surveillance audits.
- **Silver Lipped Pearl Oyster Fishery** – A score of 100 was awarded for this fishery for PIs 3.1.1, 3.1.2 and 3.1.3 in WA. The score of 75 for PI 3.1.2 in UoC1 of this fishery relates to Governance and Policy issues in the Northern Territory, and is not therefore relevant to Western Australia.
- **West Coast Deep Sea Crab Fishery** – a score of 75 for PI 3.1.2 was awarded due to limited stakeholder engagement. This was increased to 85 at the first surveillance audit in 2017. A higher score was not deemed to be appropriate because there was at that time a lack of evidence about how the consultation processes established by the new WA Stakeholder Engagement Guidelines have been applied to the specific fishery.
- **Shark Bay Prawn Fishery** – a score of 75 was awarded for PI 3.1.2 when the fishery was certified, in response to concern about the level of stakeholder engagement in management. This score was revised to 95 at the first surveillance audit in 2016.
- **Western Australia Abalone Fishery** – scores of 100 were awarded for 3.1.2 when this fishery was certified in April 2017.
- **Western Australian Rock Lobster Fishery** – the original score of 95 for PI 3.1.2 was revised to 75 at the third surveillance audit as a harmonisation response to the Shark Bay Prawn Fishery assessment. At the fourth surveillance audit, progress with the condition raised in response to this issue was found to be on target. A score of 100 was awarded when the fishery was re-certified in 2016.
- **Western Australian Sea Cucumber Fishery**. 3.1.2 was awarded a score of 100.

This PI will be further examined and more evidence attempted to be identified in the site visit, in order to seek a harmonised outcome for all PIs.

If exceptional circumstances apply, outline the situation and whether there is agreement between or among teams on this determination.

9.9 Objection Procedure – delete if not applicable

To be added at Public Certification Report stage

The CAB shall include in the report all written decisions arising from the Objection Procedure.

Reference(s): MSC Disputes Process v1.0, FCP v2.2 Annex PD Objection Procedure