



Seafood Risk Assessment
WA West Coast Demersal Scalefish (Interim)
Managed Fishery

WA West Coast Demersal Scalefish (Interim) Managed Fishery	Unit/s of Assessment:	
	Product Name/s:	<i>Redthroat emperor</i>
	Species:	<i>Lethrinus miniatus</i>
	Stock:	Western Australia
	Gear type:	Line
	Year of Assessment:	2017

Fishery Overview

This fishery summary is adapted from Fairclough et al (2015):

The West Coast Demersal Scalefish (Interim) Managed Fishery (WCDSIMF) is a handline and drop line fishery and it is the main commercial fishery that targets demersal species in the WA West Coast Bioregion. The most important species are West Australian dhufish (*Glaucosoma hebraicum*), Pink Snapper (*Chrysophrys auratus*), Redthroat emperor (*Lethrinus miniatus*), Bight redfish (*Centroberyx gerrardi*) and Baldchin groper (*Choerodon rubescens*), although up to 100 species may be taken in total.

The WCDSIMF encompasses the waters of the Indian Ocean just south of Shark Bay (at 26 30'S) to just east of Augusta (at 115 30'E) and extends seaward to the 200nm boundary of the Australian Fishing Zone (AFZ). The commercial fishery is divided into five management areas comprising four inshore areas and one offshore area. The inshore areas, i.e. Kalbarri, Mid-West, Metropolitan and South-West, extend outwards to the 250m depth contour, while the Offshore Area extends the entire length of the fishery from the 250m depth contour to the boundary of the AFZ. The Metropolitan Inshore Area was closed to commercial operators in the WCDSIMF and TDGDLF in November 2007.

The WCDSIMF was established in January 2008, following the introduction of the *West Coast Demersal Scalefish (Interim) Management Plan 2007*. Permit holders are permitted to retain all scalefish (other than a number of species that are under specific State or Commonwealth management) and are not permitted to take sharks and rays.

Access to the fishery is restricted to 59 Interim Managed Fishery Permit holders. The commercial fishery is currently managed under effort limits that are specified for each of the four fishery regions within the West Coast (WC) area.

The current management objective for the WCDSIMF is to maintain the catches of all scalefish and of demersal species below 50 % of those recorded in the West Coast Bioregion (WCB) during 2005/06 to reduce fishing mortality to a level that will enable recovery of all of these stocks. The status of the three indicator species (Pink Snapper, Western Australian Dhufish and Baldchin Groper) is used to indicate the status of the entire West Coast Inshore Demersal Suite of scalefish species.

The recreational fishery for demersal scalefish in the WCB is managed using input (e.g. size limits, seasonal closures and spatial closures) and output controls (e.g. daily bag limits, boat limits and possession limits). A suite of new management arrangements was introduced during 2009/10 aimed at reducing the recreational take of demersal scalefish in the WCB by at least 50 % from 2005/06 levels. These arrangements included changes to bag, boat and size limits for demersal scalefish species, a requirement to carry a release weight (to assist in minimising the effects of barotrauma) and the implementation of a closure prohibiting fishing for "high risk" demersal scalefish for two months between 15 October and 15 December.

Snapper and WA dhufish are caught throughout the main inshore areas of the WC fishery. Catches of Redthroat emperor are predominantly taken in the more northern area of the fishery, while Bight redfish are predominantly caught in the southern area of the fishery.



Figure 1: Boundaries of the West Coast Demersal Scalefish (Interim) Managed Fishery and its Management Areas in Western Australia.

Scoring

Performance Indicator	Redthroat Emperor
COMPONENT 1	
1A: Stock Status	HIGH RISK
1B: Harvest Strategy	MEDIUM RISK
1C: Information and Assessment	MEDIUM RISK
OVERALL	HIGH RISK
COMPONENT 2	
2A: Non-target Species	HIGH RISK
2B: ETP Species	LOW RISK
2C: Habitats	LOW RISK
2D: Ecosystems	LOW RISK
OVERALL	HIGH RISK
COMPONENT 3	
3A: Governance and Policy	LOW RISK
3B: Fishery-specific Management System	LOW RISK
OVERALL	LOW RISK

Summary of main issues

- Key target stocks of demersal scalefish in the WCDSIMF have been assessed as recruitment overfished in recent years. A rebuilding strategy was implemented in 2009 for three key target species in the fishery: Dhufish, Snapper and Baldchin Groper. Catches in 2015 were below target levels to promote rebuilding of the stocks and the most recent stock assessment indicated some level of recovery of demersal stocks at the Bioregion level. Nevertheless, the stocks have not yet recovered to acceptable management reference points and, consistent with their life-history characteristics, it is anticipated that this will take at least 10 years.
- There has been no stock assessment of Redthroat Emperor, although one was planned for 2017. At this stage it is assumed the stock is still recruitment overfished, but likely to be recovering.
- Limited information is available on the composition of discards in the fishery.
- The fishery is well placed against Habitat, Ecosystem and P3 performance indicators.

Outlook

Component	Outlook	Comments
Target species	Improving	Fishing mortality on indicator species in the West Coast Demersal Fisheries Resource is generally declining and spawning potential ratio is generally increasing. A stock assessment of the Western Australian stock of Redthroat emperor is scheduled for 2017.
Environmental impact of fishing	Improving	Catches of main other species are below target levels and should lead to stock rebuilding. The stock assessment for indicator species will be updated in 2017.
Management system	Stable	No major changes are expected.

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Disclaimer

This assessment has been undertaken in a limited timeframe based on publicly available information. Although all reasonable efforts have been made to ensure the quality of the report, neither this company nor the assessment's authors warrant that the information contained in this assessment is free from errors or omissions. To the maximum extent permitted by law, equity or statute, neither this company nor the authors accept any form of liability, be it contractual, tortious or otherwise, for the contents of this report or for any consequences arising from misuse or any reliance placed on it.

Background

This report sets out the results of an assessment against a seafood risk assessment procedure, originally developed for Coles Supermarkets Australia by MRAG Asia Pacific. FRDC is grateful for Coles' permission to use its Responsibly Sourced Seafood Framework. The aim of the procedure was to allow for the rapid screening of uncertified source fisheries to identify major sustainability problems, and to assist seafood buyers in procuring seafood from fisheries that are relatively well-managed and have lower relative risk to the aquatic environment. It uses elements from the GSSI benchmarked MSC Fishery Standard version 2.0, but is neither a duplicate of it nor a substitute for it. The methodology used to apply the framework differs substantially from an MSC Certification. Consequently, any claim about the rating of the fishery based on this assessment should not make any reference to the MSC.

This report is a "live" document that will be reviewed and updated on an annual basis.

Methods

Risk Assessment

Detailed methodology for the risk assessment procedure is found in MRAG AP (2015). The following provides a brief summary of the method as it relates to the information provided in this report.

Assessments are undertaken according to a 'unit of assessment' (UoA). The UoA is a combination of three main components: (i) the target species and stock; (ii) the gear type used by the fishery; and (iii) the management system under which the UoA operates.

Each UoA is assessed against three components:

1. Target fish stocks;
2. Environmental impact of fishing; and
3. Management system.

Each component has a number of performance indicators (PIs). In turn, each PI has associated criteria, scoring issues (SIs) and scoring guideposts (SGs). For each UoA, each PI is assigned one of the following scores, according to how well the fishery performs against the SGs:

- Low risk;
- Medium risk;
- Precautionary high risk; or
- High risk

Scores at the PI level are determined by the aggregate of the SI scores. For example, if there are five SIs in a PI and three of them are scored low risk with two medium risk, the overall PI score is low risk. If three are medium risk and two are low risk, the overall PI score is medium risk. If there are an equal number of low risk and medium risk SI scores, the PI is scored medium risk. If any SI scores precautionary high risk, the PI scores precautionary high risk. If any SI scores high risk, the PI scores high risk.

For this assessment, each component has also been given an overall risk score based on the scores of the PIs. Overall risk scores are either low, medium or high. The overall component risk score is low where the majority of PI risk scores are low. The overall risk score is high where any one PI is scored high risk, or two or more PIs score precautionary high risk. The overall risk score is medium for all other combinations (e.g. equal number of medium/low risk PI scores; majority medium PI scores; one PHR score, others low/medium).

Outlook

For each UoA, an assessment of the future 'outlook' is provided against each component. Assessments are essentially a qualitative judgement of the assessor based on the likely future performance of the fishery against the relevant risk assessment criteria over the short to medium term (0-3 years). Assessments are based on the available information for the UoA and take into account any known management changes. Outlook scores are provided for information only and do not influence current or future risk scoring.

Table 1: Outlook scoring categories.

Outlook score	Guidance
Improving	The performance of the UoA is expected to improve against the relevant risk assessment criteria.
Stable	The performance of the UoA is expected to remain generally stable against the relevant risk assessment criteria.
Uncertain	The likely performance of the UoA against the relevant risk assessment criteria is uncertain.
Declining	The performance of the UoA is expected to decline against the relevant risk assessment criteria.

Information sources

Information to support scoring is obtained from publicly available sources, unless otherwise specified. Scores are assigned on the basis of the objective evidence available to the assessor. A brief justification is provided to accompany the score for each PI. Information sources may include information gathered from the internet, fishery management agencies, scientific organisations or other sources.

Assessment Results

COMPONENT 1: Target fish stocks

1A: Stock Status

CRITERIA: (i) The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing.

(a) Stock Status

HIGH RISK

Genetic analysis indicates that there are two separate biological stocks of Redthroat emperor in western and eastern Australian waters (Van Herwerden et al, 2009).

Roberts and Fairclough (2016) report that “a stock assessment of the Western Australian biological stock of Redthroat emperor has not yet been conducted (Roberts and Fairclough, 2016). Management arrangements introduced between 2008 and 2010 were designed to recover stocks of all demersal species (including the Western Australian biological stock of Redthroat emperor) in the Western Australian jurisdiction where Redthroat emperor is primarily exploited. This followed assessments in 2007 of three indicator species (West Australian dhufish, Snapper and Baldchin groper) for this demersal suite, which identified that overfishing had been occurring, with fishing mortality rates exceeding the limit reference point of 1.5 times the natural mortality rates for those species. The recovery strategy is designed to reduce F for these indicator species to less than the threshold reference point, by ensuring catches of demersal species do not exceed 50 per cent of 2005–06 levels (450 tonnes [t] commercial and 250 t recreational). The indicator species are assumed to represent the status of the whole demersal suite (including the Western Australian Redthroat emperor stock) and were selected based on a range of factors, including inherent vulnerability, social/economic importance and management requirements.”

Roberts and Fairclough (2016) conclude that the above evidence and assumptions indicate that the biomass of the Western Australian biological stock of Redthroat emperor is likely to be recruitment overfished, albeit the stock is likely to be recovering.

PI SCORE

HIGH RISK

1B: Harvest Strategy

CRITERIA: (i) There is a robust and precautionary harvest strategy in place.

(a) Harvest Strategy

MEDIUM RISK

The West Coast Demersal Scalefish Resource (WCDSR) was assessed to be in an overfished or depleted state based on the high fishing mortality rates estimated for the three indicator species: WA dhufish, pink Snapper and Baldchin groper (Wise et al, 2007). Following identification of overfishing, the current management arrangements designed to recover stocks were progressively introduced between late 2007 and early 2010. These include maintaining the retained catches of all sectors below 50% of their 2005/06 catch benchmarks in order to reduce fishing mortality rates (F) of indicator species to below the threshold reference point ($F=2/3M$) and to meet a formal sectoral allocation decision (Fairclough and Holtz, 2017). Indicator species were selected based on a range of factors including inherent vulnerability, social/economic importance and management requirements (DoF, 2011). Management targets for the WCDSR were independently reviewed based on available stock assessment advice for indicator species and considered appropriate (O’Neill, 2009).

In the commercial sector, the WCDSIMF is managed under an Individual Transferable Effort (ITE) system that specifies a Target Commercial Catch (TCC) setting for each area of the fishery. The total number of hours allocated to each area (known as the ‘Capacity’) is determined using the relevant TCC and Catch Per Unit Effort (CPUE) figures for each area and reviewed annually. The ITE system is intended to maintain species catches below the “recovery target” catch level during the stock rebuilding period. Available effort is apportioned among the fishery regions with most of the effort allocated to either Kalbarri or Midwest regions.

Measures to limit recreational catches include:

- A two month closure (15 October-15 December) to recreational fishing for demersal scalefish;
- A mixed daily bag limit of two demersal scalefish per fisher;
- A requirement to have a release weight on board when fishing for demersal scalefish; and
- A requirement to hold a “Recreational Fishing from Boat Licence” if taking demersal finfish from a boat.

Both sectors are subject to a minimum legal size limit of 28cm, which is slightly smaller than the estimated size at 50% female maturity (31cm) (Roberts and Fairclough, 2016).

Although Redthroat emperor is yet to have a stock specific assessment undertaken or harvest control rules developed, there is some evidence to indicate the harvest strategy is expected to achieve the stock management objectives reflected in criterion 1A(i). Roberts and Fairclough (2016) report that commercial catches of Redthroat Emperor have been stable (48–65 t) since 2009 at less than 50 per cent of 2005–06 levels (less than 95 t), indicating that fishing mortality rates would have decreased for this biological stock. Recreational and charter catches are small (9t), and overall recreational catches have been below the multi-species WCDSR benchmark (Fairclough and Holtz, 2017). Fishing mortality rates for the demersal indicator species have also demonstrated early signs of stock recovery, having decreased since the previous assessment. Accordingly, we have scored this indicator medium risk.

We note that the first assessment of age-based fishing mortality rates for the Redthroat emperor biological stock was scheduled for 2017 and the results of this assessment should be taken into account in future updates to this assessment.

(b) Shark-finning

NA

CRITERIA: (ii) There are well defined and effective harvest control rules (HCRs) and tools in place.

(a) HCR Design and application

MEDIUM RISK

There are currently no well-defined HCRs in place for Redthroat emperor, although the targets and trigger points in the WCDSR rebuilding strategy could be considered to constitute a generally understood HCR consistent with the medium risk SG.

The rebuilding strategy has been designed to maintain annual catches of the commercial and recreational fishery at or below 50% of the 2005/06 species catch (benchmark). Species catches in excess of the benchmark for at least three years triggers a review of the current management and/or the determination of an appropriate management response to reduce catches. The rebuilding strategy also includes a control rule based on successive estimates of fishing mortality for each species. Fishing mortality estimates from the most recent assessment are compared to the previous assessment. If there has been no (significant) reduction in fishing mortality then current management is reviewed.

There are no specific management responses associated with the control rules although there is a clearly stated intention to introduce measures to reduce catches once the higher tier control rules are triggered. The primary tools available for the management of the commercial fishery are 1) the facility to vary the total available effort allocation and 2) the allocation of effort by fishery areas.

In tandem, the two control rules should be adequate to facilitate the recovery of the stocks over the longer term, although it is unclear whether the control rules would be sufficiently responsive to reduce the exploitation rates as limit reference points are approached. The responsiveness of the harvest strategy will be influenced by the frequency of the monitoring of fishing mortality levels and the reliability of the fishing mortality estimates, particularly given the lag time associated with fishing mortality estimates derived from catch curve analyses. Accordingly, we have scored this SI medium risk.

PI SCORE

MEDIUM RISK

1C: Information and Assessment

CRITERIA: (i) Relevant information is collected to support the harvest strategy.

(a) Range of information

LOW RISK

The current harvest strategy for the WCDSR is based on maintaining the retained catches of all sectors below 50% of their 2005/06 catch benchmarks in order to reduce fishing mortality rates (F) of indicator species to below the threshold reference point ($F=2/3M$). Sufficient information on stock structure, stock productivity and fleet composition for both Redthroat Emperor and indicator species appears to be available to support the harvest strategy. The basic biology of each of the three indicator species and Redthroat Emperor is relatively well known (e.g. summarised in Lenanton et al, 2009a; Fairclough et al, 2014; Leigh et al, 2006), and appears sufficient to conclude that Redthroat Emperor is unlikely to be inherently more vulnerable than the indicator species (DoF, 2011). Stock structure of Redthroat Emperor has been determined through genetic studies (Van Herwerden et al, 2009).

Reliable information is available on the past and present distribution of commercial catch and fishing effort for each species and regular estimates of recreational harvest are also available (e.g. Ryan et al, 2013). Routine monitoring of the age composition of commercial and recreational catches is also occurring, with regular estimates of fishing mortality developed from catch age composition data (e.g. Fairclough et al, 2014). Given the current structure of the harvest strategy applying to Redthroat Emperor, these data appear sufficient to support the harvest strategy.

(b) Monitoring and comprehensiveness

MEDIUM RISK

Fishery removals are monitored with high precision, although there are no species specific measures of stock abundance in place for Redthroat Emperor. Current monitoring of the WCDSR is based on three indicator species. For these species, regular monitoring of length and age-at-capture has occurred, together with periodic estimates of standardised CPUE, fishing mortality and spawning potential ratio (e.g. Fairclough et al, 2014). The outcomes of these analyses allow for a 'weight of evidence' based assessment of the status across the entire WCDSR.

Given the unusual nature of the indicator species based harvest strategy, scoring against this SI is not straightforward. Stock abundance for Redthroat Emperor is not monitored directly, but is assumed based on assessments of indicator species assessed to be equally or more vulnerable to fishing pressure than Redthroat Emperor (DoF, 2011). On the basis that stock abundance of the WCDSR is monitored generally and one indicator (catch) is monitored to allow for concerning trends to be detected, we have scored this SI medium risk. We have not scored the stock low risk on the basis that a direct measure of species specific stock abundance is not currently monitored.

Nevertheless, Roberts and Fairclough (2016) note that an assessment of Redthroat emperor was scheduled to be completed in 2017 and should be taken into account in future assessments of this SI.

CRITERIA: (ii) There is an adequate assessment of the stock status.

(a) Stock assessment

MEDIUM RISK

As described above, the status of the full WCDSR is assessed using a weight of evidence-based approach, taking into account estimates of fishing mortality and spawning potential ratio derived from length and age-at-catch information. Indicator species were most recently assessed in 2014, using data collected between 2008 and 2011 (Fairclough et al, 2014). As with issue 1C(i)(b) above, scoring of this SI is not straightforward given no direct assessment of Redthroat Emperor stock status has to date been undertaken. Nevertheless, under the approach set out in DoF (2011) a generic assessment of stock status for non-indicator species can be made, which is considered appropriate for the species given their inherent vulnerability compared to indicator species. Accordingly, we have scored this SI medium risk. A more direct assessment of Redthroat Emperor stock status would be required for a low risk score.

(b) Uncertainty and Peer review

MEDIUM RISK

The assessment approach used for indicator species takes uncertainty into account (e.g. by using multiple variations of catch curve methods to estimate total mortality) and has been independently peer-reviewed (Haddon in Wise et al, 2007; O'Neill, 2009). Nevertheless, the current assessment approach does not provide a direct estimate of the status the Redthroat Emperor stock. The main uncertainty is the extent to which the status of indicator species can be assumed to reflect the status of Redthroat Emperor. This is arguably identified under the current assessment approach (DoF, 2011), but not taken into account in a species specific way. Accordingly, we have scored this SI medium risk.

PI SCORE

MEDIUM RISK

COMPONENT 2: Environmental impact of fishing

2A: Other Species

CRITERIA: (i) The UoA aims to maintain other species above the point where recruitment would be impaired (PRI) and does not hinder recovery of other species if they are below the PRI.

(a) Main other species stock status

HIGH RISK

The intent of this scoring issue is to examine the impact of the fishery on 'main' other species taken while harvesting the target species. 'Main' is defined as any species which comprises >5% of the total catch (retained species + discards) by weight in the fishery, or >2% if it is a 'less resilient' species. The aim is to maintain other species above the point where recruitment would be impaired and ensure that, for species below PRI, there are effective measures in place to ensure the fishery does not hinder recovery and rebuilding. The total retained catch of all species in 2015 by the WCDSIMF was 271 t, of which, 246 t comprised demersal species (Fairclough and Holtz, 2017). Information on species discarded in the fishery was not available, although some information suggests the discard rate is likely to be low (~24%) as commercial fishers are unlikely to stay in areas where they are catching undersize fish (Lenanton et al., 2009b). In the absence of information on total catch by weight, we have assessed as 'main other' species the indicator species that do not form part of the unit of assessment here, namely western Australian dhufish (*Glaucosoma herbraicum*), Snapper (*Chrysophrys auratus*) and Baldchin groper (*Choerodon rubescens*). The total catch of Snapper in 2015 was 84t, accounting for 31% of the total WCDSIMF catch. Dhufish and Baldchin groper accounted for 27% and 6% of the WCDSIMF 2015 catch respectively.

Snapper (Medium risk)

At least six separate stocks of Snapper have been identified in Western Australia (Fowler et al, 2016), although the main stock accessed by the WCDSIMF is the west coast stock.

Fowler et al (2016) report that "assessments completed in 2007, 2009 and 2014 indicated that fishing mortality in the West coast management unit of Western Australia exceeded the limit reference point of 1.5 times natural mortality. However, the most recent assessment indicated that fishing mortality rates had decreased, providing evidence that stock recovery had begun, following significant changes to the management of the commercial and recreational sectors. Based on agreed decision rules to reduce fishing mortality to a level that would allow the stock to recover, the total catch of Snapper by all sectors had to be reduced by at least 50 per cent, to no more than 163 tonnes (t). Catches of Snapper by the commercial West Coast Demersal Scalefish Interim Managed Fishery in this region were above the acceptable level of 120 t for that fishery for a period of 3 years, but further management action reduced catches in 2015 to around 91 t, a level expected to allow recovery to continue. The above evidence indicates that the stock is likely to be recruitment overfished, but that the current level of fishing mortality should allow the stock to recover."

Accordingly, the stock is not likely to be above the point of recruitment impairment, but there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of Snapper.

WA Dhufish (Precautionary high risk)

Fairclough and Holtz (2017) report that retained catches of West Australian dhufish in the WCDSIMF have been at acceptable levels (below stock recovery benchmarks) since inception of the current management regime, i.e. < 72t. WCDSIMF catches in the Midwest and South-west areas have also remained at or below recovery benchmarks of 44 t and 19 t.

The most recent assessment of F at the biological stock level, using age composition data collected between 2008/09 and 2010/11 decreased from the previous period 2005/06-2007/08 (Fairclough et al., 2014). However, F was still marginally above the limit reference point of 1.5M, and had increased in the substantially in the South west area. Spawning potential ratio lay between the limit (0.2) and threshold (0.3) reference point.

Accordingly, the stock is not likely to be above the point of recruitment impairment, although it is clear that the management agency has measures in place designed to ensure the fishery does not hinder recovery of WA dhufish. It is also clear that the fishery has complied with the measures, with catches coming in below stock and area specific limits since the new management arrangements were introduced. Nevertheless, estimated fishing mortality in the most recent assessment remained marginally above the limit reference point and to that end, it is not clear that the medium risk SG is met. Nevertheless, spawning potential ratio is above the limit reference and appears to be increasing across the stock as a whole. Overall, Fairclough et al (2014) concluded that the evidence indicated the stock at the bioregion level is beginning to recover. Accordingly, we have scored the stock precautionary high risk. Future assessments indicating F has been reduced below limit reference levels would result in a lower risk score.

Baldchin Groper (High risk)

Retained catches of Baldchin groper in the WCDSIMF have been at or below stock recovery benchmarks since commencement of the current management regime, i.e. < 17t (Fairclough and Holtz, 2017). Nevertheless, rates of F at the biological stock level, using age composition data collected from 2008/09 to 2010/11 indicated no change since the previous assessment and were above the limit reference point of 1.5M. Accordingly, although the management system has measures in place designed to ensure the fishery does not hinder recovery, there appears to be some uncertainty around whether existing catch limits will reduce F to target levels. Fairclough et al (2014) reported that the lack of evidence of recovery could indicate overfishing was still occurring, although it was more likely that recovery was not yet evident due to the overlap of the sampling period (2007-08 – 2010-11) and the introduction of management changes (2007-2010).

Nevertheless, on the basis that the most recent assessment indicated F had increased since the previous assessment and was clearly above the limit reference point, and that the spawning potential ratio of the stock as a whole had declined, we have scored this stock high risk.

We note that the next assessment of indicator species stocks in the WCDSIMF was scheduled to be completed in 2017. Future assessments should take these outcomes into account.

CRITERIA: (ii) There is a strategy in place that is designed to maintain or to not hinder rebuilding of other species.

(a) Management strategy in place

MEDIUM RISK

The harvest strategy for the main other species is largely the same as that for Redthroat emperor. Following an assessment showing the fishery to be in a depleted state based on a number of indicator species (including the three main other species assessed here) (Wise et al, 2007), new management measures were progressively introduced between 2007 and 2010 with the aim of rebuilding the stocks to achieve the target fishing mortality level of $F=2/3M$. The primary management objective for the WCDSIMF is to maintain catches of all demersal scalefish below 50% of those recorded in the WCB during 2005/06 to reduce fishing mortality to a level that will enable recovery of all of these stocks.

The rebuilding strategy is designed to ensure that the stocks of the three key target species (WA dhufish, Snapper, Baldchin groper) in each management area will have been rebuilt (i.e. to the point where estimated values of fishing mortality have fallen below a threshold level, $F=M$) within about 20-25 years of the start of the recovery period (commencing in 2009/10). Accordingly, it is clear that measures are in place that are expected to maintain main other species at levels which are likely to be above PRI and we have scored this SI medium risk. Nevertheless, we note that fishing mortality has remained above the limit reference point for some species, despite compliance with rebuilding catch limits (Fairclough et al, 2014) and the fishery would be better placed against this SI with additional evidence that fishing mortality is likely to decline such that the current catch limits will result in rebuilding to target levels.

(b) Management strategy evaluation

MEDIUM RISK

The rebuilding strategy has been in place since 2009 and there is a plausible argument to suggest that it will work: decreasing fishing mortality increases the likelihood of abundance increasing. While the most recent estimates of F across all three main other species remained above the limit reference point, Fairclough et al (2015) note that “the limited levels of recovery for each of the indicator species at the time of this assessment was expected because changes to management were only introduced between late 2007 and early 2010, which overlaps the sampling period for age data used in this assessment. The precise rate at which the stocks for each indicator species will recover will also be influenced by their biological characteristics. Recovery to threshold management levels is estimated to take at least 10 years.” Based on recent catch levels across all sectors, Fairclough and Holtz (2017) conclude that the current level of fishing pressure should allow all three main other species stocks to recover from overfishing. Accordingly, we have scored this SI medium risk. Additional evidence demonstrating F had fallen below threshold levels and spawning potential ratio was moving towards target levels would provide some objective basis for confidence that the strategy will work.

(c) Shark-finning

NA

CRITERIA: (iii) Information on the nature and amount of other species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage other species.

(a) Information

MEDIUM RISK

Commercial catch and effort returns provide qualitative and quantitative information on the amount of main retained species taken by the fishery and, together with other monitoring (age, length) and assessment (F, SPR) information, are sufficient to support a management strategy (e.g. Wise et al, 2007; Fairclough et al, 2014).

Notwithstanding that, information on discarded species in the fishery is limited. While anecdotal information indicates these species may not constitute a main other species in the fishery (e.g. Fairclough and Holz, 2017), discards are not currently reported in CAES logbooks and no other forms of monitoring are currently in place to provide estimates of species composition or volume. To that end,

no current and reliable quantitative information exist on discarded species which would assist in determining whether discarded species qualified as a main other, or in assessing the impact of the UoA with respect to status. Nevertheless, available qualitative information suggests that line fishing is highly selective for demersal scalefish, with discards limited to inedible species such as silver toadfish and wrasse and under-sized individuals of key commercial species (Fairclough and Holz, 2017). Fairclough and Holz (2017) report that while these species may not all survive release, overall impacts are likely to their stocks are likely to be minor. Moreover, Evans and Molony (2010) assessed the cumulative impact on finfish bycatch species in the West Coast and Gascoyne Coast Bioregions to be low or negligible. Arguably then, at least some qualitative information exists which has been sufficient to make a judgement about the likely impact of the UoA on non-target species with respect to status. Accordingly, we have scored this SI medium risk. Nevertheless, the fishery would be considerably better positioned with more quantitative monitoring of total catch (retained + discard) volume and composition.

PI SCORE

HIGH RISK

2B: Endangered Threatened and/or Protected (ETP) Species

CRITERIA: (i) The UoA meets national and international requirements for protection of ETP species. The UoA does not hinder recovery of ETP species.

(a) Effects of the UoA on populations/stocks

LOW RISK

Overall, the level of interactions with ETP species in the fishery is reported as being relatively minor (Fairclough and Holtz, 2017). Commercial WCDSIMF fishers are required to record listed species interactions in their statutory returns, and there appears to be confidence that the level of compliance is sufficient to provide a good indicator of interactions. During 2014 and 2015, a total of four grey nurse sharks were caught by the WCDSIMF and all were reportedly released alive (Fairclough et al, 2015; Fairclough and Holtz, 2017). Fairclough and Holz (2017) conclude that the impact on ETP species is likely to be negligible. Given the apparently low level of interaction and the nature of the gear type which is likely to allow for live release of ETP species live, we have scored this SI low risk. Nevertheless, confidence in the scoring would be increased with a mechanism to independently validate commercial fisher logbook reporting.

CRITERIA: (ii) The UoA has in place precautionary management strategies designed to:

- meet national and international requirements; and
- ensure the UoA does not hinder recovery of ETP species.

(a) Management strategy in place

LOW RISK

The measures in place to manage fishery impacts on ETP species include:

- limited entry;
- zoning and effort limits;
- gear restrictions (limiting gear to line apparatus);
- spatial and temporal closures; and
- compulsory reporting of all ETP species interactions in daily logbooks.

Given the apparently low rate of interactions with ETP species and the nature of the gear type which is conducive to live release, these measures are likely to be considered at least a partial strategy to ensure the fishery does not hinder recovery. The main weakness is the absence of a mechanism to independently verify logbook reporting of interactions.

(b) Management strategy implementation

LOW RISK

The nature of the gear type which is conducive to live release of prohibited species, together with logbooks showing limited interactions and Departmental risk assessments assessing risks as negligible, provides objective basis for confidence that the strategy will work.

CRITERIA: (iii) Relevant information is collected to support the management of UoA impacts on ETP species, including:

- 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.

(a) Information

LOW RISK

All fishers are required to report ETP interactions in daily logbooks. In order to improve reporting accuracy, fishers have been provided with a *Protected Marine Species Identification Guide* (National Heritage Trust 2005), which contains a picture and brief description of relevant protected species, specific details to include in interactions reports and current contact details for interaction reports. Given the high likelihood of live releases, logbook records are likely to provide sufficient information to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species. The main weakness is the absence of a mechanism to independently validate commercial fisher logbook reporting (e.g. observers).

PI SCORE

LOW RISK

2C: Habitats

CRITERIA: (i) The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area(s) covered by the governance body(s) responsible for fisheries management

(a) Habitat status

LOW RISK

Examples of “serious or irreversible harm” to habitats include the loss (extinction) of habitat types, depletion of key habitat forming species or associated species to the extent that they meet criteria for high risk of extinction, and significant alteration of habitat cover/mosaic that causes major change in the structure or diversity of the associated species assemblages (MSC, 2014). Further, if a habitat extends beyond the area fished then the full range of the habitat should be considered when evaluating the effects of the fishery. The ‘full range’ of a habitat shall include areas that may be spatially disconnected from the area affected by the fishery and may include both pristine areas and areas affected by other fisheries.

The WCDSIMF targets the inshore (20 – 250 m depth) and offshore (> 250 m depth) demersal scalefish suite along the WA coastline from north of Kalbarri to Black Point, east of Augusta. The target species occur over a range of habitats including shallow coral and rocky reefs, deeper shoal areas between reefs, mud and sand areas and deep water reefs (200 – 500 m) along the edge of the continental shelf. Line fishing used in the WCDSIMF (i.e. hand lines and droplines) has little physical impact on the benthic environment, and DoF risk assessments have judged the fishery to be a negligible risk to benthic habitats (Fairclough and Holtz, 2017). Accordingly, we have scored this SI low risk.

CRITERIA: (ii) 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.

(a) Management strategy in place

LOW RISK

The main ‘strategy’ to limit habitat damage in the fishery is to limit gear to benign hook and line apparatus. The fishery is also subject to substantial spatial closures through Commonwealth and State marine parks, as well as effort restrictions designed to recover stocks of the target species. Given the negligible risk associated with line fishing, these measures are likely to be considered at least a partial strategy which is expected to achieve the outcome reflected in criterion 2C(i).

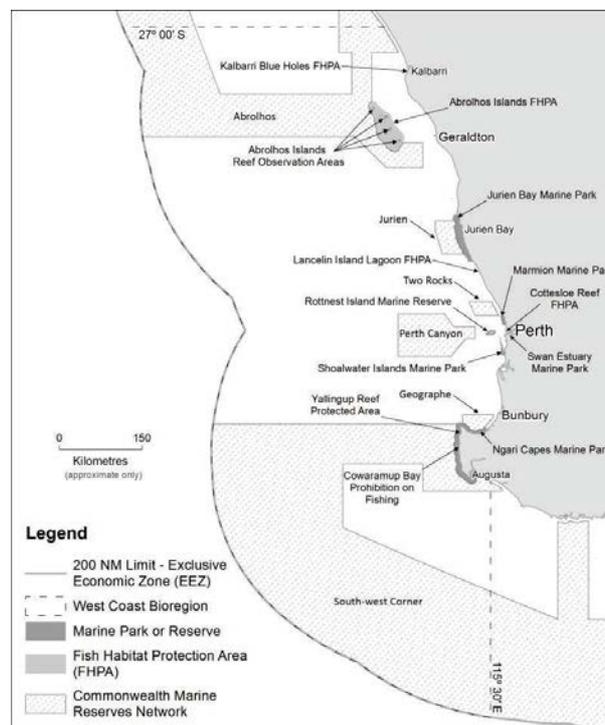


Figure 2: Current and proposed marine reserves in the West Coast bioregion (from Fletcher et al, 2017)

(b) Management strategy implementation

LOW RISK

Compliance information showing fishers comply with requirements to use line fishing apparatus. VMS information shows compliance with spatial closures. This provides some objective basis for confidence that the strategy will work and that the measures are being implemented.

CRITERIA: (iii) 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.

(a) Information quality

LOW RISK

A substantial portion of the West Coast bioregion has been mapped to describe both the physical substratum and the biological communities present in order to support coastal development projects and marine reserve planning initiatives (e.g. CoA, 2008). Given

the relatively benign nature of line fishing apparatus, the nature, distribution and vulnerability of the main habitats are likely to be known at a level of detail relevant to the nature and scale of the fishery.

(b) Information and monitoring adequacy

LOW RISK

The physical impacts of line fishing gear on habitats are expected to be minimal, albeit this may not have been quantified fully due to higher research priorities being placed on other issues. However, existing information is likely to be sufficient to understand the potential impacts and spatial (areal and vertical) overlaps. VMS information on spatial effort patterns in the fishery together with logbook information on gear types used is likely to provide sufficient data to detect any increase in risk to habitat.

PI SCORE

LOW RISK

2D: Ecosystems

CRITERIA: (i) The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.

(i)(a) Ecosystem Status

LOW RISK

Serious or irreversible harm in the ecosystem context should be interpreted in relation to the capacity of the ecosystem to deliver ecosystem services (MSC, 2014). Examples include trophic cascades, severely truncated size composition of the ecological community, gross changes in species diversity of the ecological community, or changes in genetic diversity of species caused by selective fishing. Given the limited impact of the fishery on ETP species and habitats, the main ecosystem impact is likely to come from the removal of target and other bycatch species from the ecosystem. The total quantity of scalefish removed from the ecosystem by the WCDSIMF has been stable during the 2008-09 to 2014-15 period at between 270-400t annually. Hall and Wise (2011) demonstrated that there has been no reduction in either mean trophic level or mean maximum length in the finfish catches recorded within the WCB over the past 30 years, indicating that the fish faunas have not been impacted by scalefish fisheries to the extent that ecosystem function has been affected. Accordingly, it appears highly likely that the fishery will not disrupt the key elements underlying ecosystem structure and function to the point of serious or irreversible harm.

CRITERIA: (ii) There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.

(a) Management Strategy in place

LOW RISK

The main measures in place to limit ecosystem impacts are both operational (use of benign hook and line gear) and those in place to limit harvest of the target species. Formal risk assessments of ecosystem level impacts are also undertaken according to the DoF risk assessment process (Fletcher et al, 2010). These measures constitute at least a partial strategy which takes into account the available information and is expected to restrain the impacts of the UoAs on the ecosystem so as to achieve the outcomes reflected in criterion 2D(i).

(b) Management Strategy implementation

LOW RISK

The measures in place take account of the nature of the fishing gear and the role of the target species in the ecosystem. The measures could be expected to work given the stability in the catch over the period 2008-09 to 2014-15 and the absence of any empirical observations of ecosystem disturbance (e.g. Hall and Wise, 2011). Compliance information and targeted research studies (e.g. Hall and Wise, 2011) provide some evidence that the measures are being implemented effectively.

CRITERIA: (iii) There is adequate knowledge of the impacts of the UoA on the ecosystem.

(a) Information quality

MEDIUM RISK

The West Coast bioregion has been relatively well studied such that it is possible to at least broadly understand the key elements of the ecosystem. The main weakness in the WCDSIMF ecosystem related information is on the species specific composition of bycatch. However, this has been studied to some extent by Evans and Molony (2010) who assessed the cumulative risk to sustainability of bycatch species of multiple fisheries in the West Coast and Gascoyne bioregions. In the West Coast bioregion, all species received a low to low-moderate risk ranking. The absence on ongoing information on bycatch means that it may not be possible to detect increased risk to this ecosystem component.

(b) Investigations of UoA impacts

LOW RISK

The main impacts of the fishery can be inferred from the existing information and some studies have examined potential ecosystem impacts from the development of scalefish fisheries in the West Coast bioregion (e.g. Hall and Wise, 2011).

PI SCORE

LOW RISK

COMPONENT 3: Management system

3A: Governance and Policy

CRITERIA: (i) The management system exists within an appropriate and effective legal and/or customary framework which ensures that it:

- Is capable of delivering sustainability in the UoA(s); and
- Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood.

(a) Compatibility of laws or standards with effective management

LOW RISK

Relevant Australian Commonwealth and Western Australian Acts, subsidiary legislation and cooperative instruments, including the EPBC Act 1999, FRMA, FRMR and OCS, provide an effective legal framework for the purposes of delivering management outcomes consistent with Components 1 and 2.

(b) Respect for Rights

LOW RISK

The rights of Aboriginal persons to fish for a customary purpose are recognized in the FRMA which provides that “an Aboriginal person is not required to hold a recreational fishing licence to the extent that the person takes fish from any waters in accordance with continuing Aboriginal tradition if the fish are taken for the purposes of the person or his or her family and not for a commercial purpose”. Additional customary rights may be sought under Commonwealth Native Title legislation.

CRITERIA: (ii) 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.

(a) Roles and Responsibilities

LOW RISK

The roles and responsibilities of the main people (e.g. Fisheries Minister, DoF Chief Executive) and organisations (WAFIC) involved in the Western Australian fisheries management process are well-understood, with relationships and key powers explicitly defined in legislation (e.g. FRMA) or relevant policy statements (e.g. Western Australian Government Fisheries Policy Statement March 2012; DoF, 2012).

(b) Consultation Process

LOW RISK

DoF has recently adopted a new *Guideline for stakeholder engagement on aquatic resource management-related processes* (SEG) (DoF, 2016) which applies across all fisheries and operates in parallel to Funding and Service Level Agreements with the Western Australian Fishing Industry Council (WAFIC) and Recfishwest (RFW). The SEG broadly defines the stakeholders to be engaged in the management of aquatic resources (e.g. fishing sector, others dependent on the fishing sector, relevant State and Commonwealth agencies, Native Title Holders, NGOs, anyone else with an interest in the management of the State’s aquatic resources) as well as establishing a framework to assist in selecting an appropriate level of engagement for each stakeholder group. The engagement approach established by the SEG is summarised in Figure 3. The colour of each cell depicts the suggested minimum level of engagement for a particular process and stakeholder group.

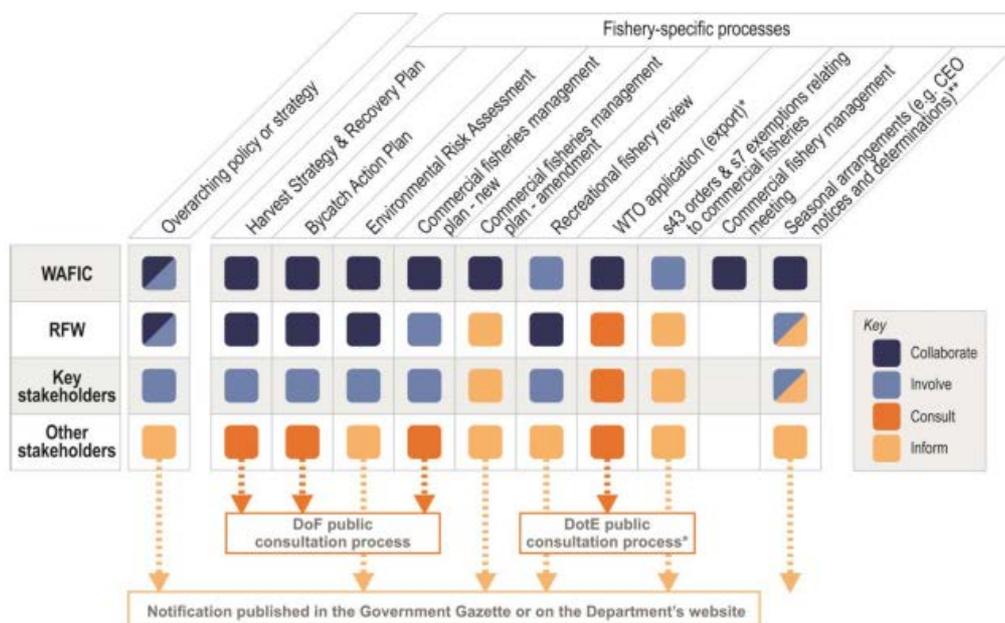


Figure 3: Suggested minimum levels of stakeholder engagement for each stakeholder group and for each of a number of key processes associated with the management of the State’s fisheries and aquatic resources (DoF, 2016)

Public consultation documents for which the Department is responsible (i.e. harvest strategies, recovery plans, bycatch action plans and new fisheries management plans), are made available (along with the details of the public consultation process) on the Department's website. The Department is also currently investigating options to enable interested parties to subscribe to news feeds and/or register as an interested party through the website, which will allow automatic notifications to be sent (e.g. in relation to documents released for public comment and information regarding decisions, arrangements or initiatives) (DoF, 2016).

At the industry level, consultation usually occurs directly with license holders/companies on operational issues affecting the fishery (e.g. through Annual Management Meetings). Industry Annual Management Meetings are convened by WAFIC, who are also responsible for statutory management plan consultation under a Service Level Agreement with the Department.

Accordingly, the management system includes processes that regularly seek and accept information from all interested and affected parties, including local knowledge. The management system also demonstrates consideration of the information obtained through feedback provided to stakeholders on Ministerial decisions and through AMMs.

CRITERIA: (iii) The management policy has clear long-term objectives to guide decision making that are consistent with the outcomes expressed in Components 1 and 2, and incorporates the precautionary approach.

(a) Objectives

LOW RISK

The overarching objectives for the management of Western Australia's fisheries set out in Section 3 of the FRMA are consistent with Components 1 and 2 and are explicitly set out in the Act. Moreover, the FRMA explicitly requires application of the precautionary principle in Section 4A which states: "in the performance or exercise of a function or power under this Act, lack of full scientific certainty must not be used as a reason for postponing cost-effective measures to ensure the sustainability of fish stocks or the aquatic environment." The FRMA is supported by a number of public policy and strategic documents, including the Department's *Strategic Plan 2009-2018* and *Fisheries Policy Statement 2012*, which further define Western Australia's commitment to management principles consistent with Components 1 and 2 (e.g. Ecologically Sustainable Development, Ecosystem Based Fisheries Management).

PI SCORE

LOW RISK

3B: Fishery Specific Management System

CRITERIA: (i) The fishery specific management system has clear, specific objectives designed to achieve the outcomes expressed by Components 1 and 2.

(a) Objectives

MEDIUM RISK

Generic cross-fishery objectives consistent with Components 1 and 2 are explicitly specified in the FRMA, as well as other policy documents (e.g. Department's Strategic Plan; Harvest Strategy Policy). To that extent, these objectives are likely to be considered implicit within the WCDSIMF fishery-specific management system and therefore consistent with medium risk. The main fishery specific objective for the fishery is to maintain catches of all scalefish and the suites of demersal species below 50 % of those recorded in the WCB during 2005/06 to reduce fishing mortality to a level that will enable recovery of all of these stocks. The status of the three indicator species (Snapper, Western Australian dhufish and Baldchin groper) is used to indicate the status of the entire West Coast Inshore Demersal Suite of scalefish species. This objective is likely to be considered consistent with Component 1 at the low risk level, and some elements of Component 2 (e.g. main other species), but there are no fishery specific objectives for the remaining elements of Component 2. Accordingly, we have scored this SI medium risk.

CRITERIA: (ii) The fishery specific management system includes effective decision making processes that result in measures and strategies to achieve the objectives.

(a) Decision making

LOW RISK

Western Australia's fisheries decision making process is well established and set out explicitly in relevant legislation (e.g. FRMA) and policy documents (e.g. Fisheries Policy Statement). The response of the management system to research indicating that WCDSF stocks were overfished - including the establishment of the commercial WCDSIMF and effort management system and changes to recreational fisheries management including bag, boat and size limits for demersal scalefish species, a requirement to carry a release weight (to assist in minimising the effects of barotrauma) and the implementation of a closure prohibiting fishing for "high risk" demersal scalefish for two months between 15 October and 15 December - indicates the decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation. Moreover, the public release of reports discussing future management options to achieve stock recovery objectives indicates the decision making system takes account of wider implications.

(c) Accountability and Transparency

LOW RISK

Information on the biological, ecological, economic and social performance of the fishery is tracked and reported annually through the Department's Fisheries Status Report process. Relevant information on recent changes to management and new scientific or monitoring results are also discussed with license holders during annual management meetings, coordinated through WAFIC. These measures are generally consistent with the low risk SG.

CRITERIA: (iii) Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.

(a) MCS Implementation

LOW RISK

The Department's MCS arrangements including prioritizing through risk assessments, development of fishery and regionally specific Operational Compliance Plans, networks of regionally-based Fisheries Management Officers, and support through dedicated units within the Regional Services Division (Serious Offences, Fisheries Intelligence, Compliance Statistics and Prosecutions) are consistent with the low risk SG. Although specific statistics are not available for the WCDSIMF, general statistics on rates of compliance amongst both commercial and recreational fishers suggest that the system has demonstrated an ability to enforce relevant management measures, strategies and/or rules (e.g. Fletcher and Santoro, 2015).

(b) Sanctions and Compliance

LOW RISK

There is an explicit statutory sanction framework that is applied should a person contravene legislation relevant to the WCDSIMF. Four tiers of sanctions exist to deal with fisheries offences depending on the nature and severity of the offence: prosecutions, letter of warning, infringement notices and infringement warnings. Fisheries Management Officers (FMOs) have the autonomy to issue an infringement warning after detecting some 'minor' offences that have resulted from a lack of understanding of the rules or an error of judgment, while infringement notices are used to apply a modified penalty and are usually used in cases where the offence does not warrant prosecution action that is likely to end up in court. More serious offences against the legislation will require the Department to seek to prosecute. The Department's Prosecution Advisory Panel (PAP) reviews recommendations made by the RSD in respect to alleged offending against the FRMA and considers whether such decisions are in the 'public interest'. This process ensures fairness, consistency and equity in the prosecution decision-making process. Some evidence exists that fishers generally comply with the management system (e.g. Fletcher and Santoro, 2015).

CRITERIA: (iv) There is a system for 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.

(a) Evaluation coverage

LOW RISK

The Department has a number of processes in place to evaluate key parts of the management system including the effectiveness of its target species harvest control arrangements, arrangements to mitigate unacceptable ecological risks, and compliance with management arrangements. The effectiveness of commercial and recreational management arrangements are primarily monitored through commercial catch and effort returns and periodic recreational fishing surveys, and reported against through the Fisheries Status Reports process (e.g. Fletcher et al, 2017). Effectiveness of Component 2 management arrangements are evaluated through ongoing EBFM risk assessment (Fletcher et al, 2010). The effectiveness of the compliance regime is evaluated through periodic risk assessments, monitoring and analysis of compliance statistics and trends and revision of OCPs.

(b) Internal and/or external review

LOW RISK

Internal review of the management system occurs through the periodic review of the Department's Fish Plan over a 5 year planning cycle, as well as through the annual assessment of fishery performance against the harvest control rules. No external review of the WCDSF occurs through the Commonwealth EPBC export accreditation process given product is sold domestically. Notwithstanding this, a number of external reviews have been undertaken of some parts of the WCDSF management system (e.g. O'Neil, 2009). Moreover, the statewide compliance system has been the subject of a specific external review by the Western Australian Auditor General in 2009.

PI SCORE

LOW RISK

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