

WESTERN AUSTRALIA ABALONE FISHERY

MSC FULL ASSESSMENT

PUBLIC CERTIFICATION REPORT

Abalone Industry Association of WA

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DATE OF FIELD AUDIT:
13-15 th June 2016
PCDR released: 20 th December 2016
Final report released: 23 rd March 2017
PCR released: 27 th April 2017

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Glossary of Acronyms

AAC	Aquatic Advisory Committee
AFZ	Australian Fishing Zone
AIAWA	Abalone Industry Association of Western Australia
AMF	Abalone Managed Fishery
AMM	Annual Management Meeting
ARMA	Aquatic Resource Management Act
AVG	Abalone viral ganglioneuritis
CALM Act	Conservation and Land Management Act
CDR	Catch and Disposal Record
CEO	Chief Executive Officer
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COP	Collaborative Operational Plan
CPUE	Catch Per Unit Effort
CWCE	Central West Coast Ecosystem
DG	Director General
DPaW	Department of Parks and Wildlife
DoE	Department of the Environment
DoF	Department of Fisheries (WA)
DoT	Department of Transport
EBFM	Ecosystem Based Fisheries Management
EEZ	Exclusive Economic Zone
ENSO	El Niño Southern Oscillation
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
ERA	Environmental Risk Assessment
ESD	Ecologically Sustainable Development
ETP	Endangered, Threatened or Protected species
FAO	Food and Agriculture Organization of the United Nations
FCM	Fisheries Certification Methodology
FHPA	Fish Habitat Protection Area
FMP	Fisheries Management Paper
FMO	Fisheries and Marine Officer
FOP	Fisheries Occasional Paper
FRMA	Fish Resources Management Act
FRMR	Fish Resources Management Regulations
FRR	Fisheries Research Report
HCR	Harvest Control Rules
HS	Harvest Strategy
ICU	Industry Consultation Unit
IFAAC	Integrated Fisheries Advisory Allocation Committee
IFM	Integrated Fisheries Management
IFQ	Individual Fishing Quota
ITQ	Individual Transferable Quota
IUCN	International Union for Conservation of Nature and Natural Resources
Kg	kilogram
KPI	Key Performance Indicator
LENS	List of Exempt Native Specimens
LOW	Letter of Warning
LRP	Limit Reference Point

MAC	Management Advisory Committee
MEMP	Management and Environmental Monitoring Plan
MPA	Marine Protected Area
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield
nm	nautical mile
NGO	Non-government Organisation
NRM	Natural Resource Management
NT Act	<i>Native Title Act 1993</i>
OCP	Operational Compliance Plan
OCS	Offshore Constitutional Settlement
OFL	Over-Fishing Level
PAP	Prosecution Advisory Panel
PCDR	Public Comment Draft Report
PCR	Public Certification Report
PI	Performance Indicator
PRI	Point of Recruitment Impairment
PSA	Productivity Susceptibility Analysis
QMS	Quota Management System
RFBL	Recreational Fishing from Boat Licence
RFW	RecFishWest
RSD	Regional Services Division
SAG	Scientific Advisory Group
SAT	State Administrative Tribunal
SCPUE	Standardised Catch Per Unit Effort
SCS	SCS Global Services
SG	Scoring Guidepost
SHL	Sustainable Harvest Level
SLA	Service Level Agreement
SMRCA	Sustainable Marine Research Collaboration Agreement
SRFAR	Status Report of the Fisheries and Aquatic Resources (of WA)
SSB	Spawning Stock Biomass
t and mt	metric ton
TAC	Total Allowable Catch
TACC	Total Allowable Commercial Catch
UoA	Unit of Assessment
UoC	Unit of Certification
VME	Vulnerable Marine Ecosystems
WA	Western Australia
WAFIC	Western Australia Fishing Industry Council
WCB	West Coast Bioregion
WTO	Wildlife Trade Operation
WWF	World Wildlife Fund

1. Executive Summary

SCS Global Services (SCS) is an independent third-party certification body that has undertaken the Marine Stewardship Council (MSC) endorsed assessment of the Western Australia Abalone Fishery in accordance with the MSC Principles and Criteria for sustainable fisheries. The assessment complies with the MSC Fisheries Certification Requirements and Guidance v2.0 (October 2014).

The team selected to undertake the assessment includes four team members that collectively meet the requirements for MSC assessment teams. These were:

- Dr. Sabine Daume, Team Leader, Principle 2 Expert
- Dr. Caleb Gardner, Principle 1 Expert
- Dr. Stephen Leporati, Principle 2 Expert
- Mr. Peter Trott, Principle 3 Expert

The team met with fishery representatives, scientists and stakeholders in Perth, Western Australia on 13-14th June 2016 and Augusta, Western Australia on 15th June 2016. Documents were presented by fishery representatives and fisheries scientists. Client representatives were thorough in their approach and provided the assessment team with supporting documents.

The assessment covers three Units of Certification (UoC):

- Greenlip abalone (*Haliotis laevis*), hand collection
- Brownlip abalone (*Haliotis conicopora*), hand collection
- Roe's abalone (*Haliotis roei*), hand collection

The Unit of Assessment (UoA) does not extend to any other fisheries or fishing vessels. All commercial licence holders are included in the unit of certification (UoC).

The key strengths of this fishery include that the fishery is based on hand collecting and therefore highly selective, so interactions with habitat and ecosystem are limited. A weakness of the assessed fishery is that the harvest strategy has not been fully evaluated. A key challenge is IUU particularly for greenlip abalone which is difficult to estimate.

In this assessment report, we provide the detailed rationales for scores assigned by the audit team for each of the Performance Indicators (PIs) under Principle 1 (Stock Status and Harvest Strategy), Principle 2 (Ecosystem Impact) and Principle 3 (Governance, Policy and Management System) of the MSC Standard. None of the PIs failed to reach the minimum scoring level of 60, and the average scores for each Principle were above 80 (for more details see Section 6.2). These findings support the conclusion reached by the assessment team that these Units of Certification are recommended for certification according to the Marine Stewardship Council Principles and Criteria for Sustainable Fisheries.

The rationales presented in the body of this report also provide details as to why some PIs scored below 80, and for which conditions were imposed. Three conditions have been set, all under Principle 1. For UoC 1 a condition was set under 1.1.1 (stock status) and for UoC 2; a condition was set under 1.1.1 (stock status) and 1.2.1 (Harvest Strategy). Neither Principle 2 nor Principle 3 received a condition.

Actions have been provided by the client to close the Conditions set out in this report for those PIs which scored below 80. The client has proposed an action plan for closing each Condition within the stipulated time frames (for more details see Appendix 1.3).

2. Authorship and Peer Reviewers

2.1 Assessment Team

Dr. Sabine Daume, SCS Global Services (SCS), Regional Director Australasia

Dr. Daume is the Regional Director for the SCS Sustainable Seafood Program in Australasia, which covers MSC, ASC and Fisheries Improvement programs. Since 2009, Dr. Daume has led numerous MSC evaluation audits on behalf of SCS, including several large and controversial assessments, and several in Australia.

Dr. Daume is a marine biologist with special expertise in the biology and ecology of exploited marine resources with a particular emphasis on invertebrates. Dr. Daume has more than 20 years' experience working with the Invertebrate fishing and aquaculture industry in Australia and internationally. 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. Prior to joining SCS, Dr. Daume worked as a Senior Research Scientist at the Research Division of the Department of Fisheries in Western Australia. She has extensive experience working with diverse groups, often in remote marine environments. She has worked with industry personnel at all levels (divers, technicians, managers, executive officers), as well as policy makers and managers in government departments. Dr. Daume led the WA rock lobster and Heard Island and McDonald Islands (HIMI) icefish annual surveillance and re-assessment, the HIMI toothfish assessment in 2011 and Macquarie Island toothfish assessment in 2011, as well as numerous audits in USA, Canada, Mexico and Japan. She also led the Australia Blue Grenadier assessment in 2015 and several new full assessments in Western Australia in 2015 and 2016 of which the WA Peel Harvey Estuarine and the WA Deep Sea Crab Fishery were recently certified. Dr. Daume 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.

Prof Caleb Gardner, Professor and Director Sustainable Marine Research Collaboration Agreement (SMRCA), Institute of Marine & Antarctic Studies, University of Tasmania, Australia

Caleb Gardner is director of collaborative research activities between the University of Tasmania and the Tasmanian State Government. This role involves supervision and resourcing of over 60 staff and 38 PhD students operating across around 150 projects. This research is mainly focused on the larger marine industries of farmed Atlantic salmon and wild harvest blacklip abalone and southern rock lobster, however also includes many other operations such as recreational fisheries, scalefish, crabs, scallops and oyster culture. In addition to his role as Director SMRCA, he leads several research projects dealing with wild fisheries species, generally with the objective of improving harvest strategies. Projects involve partnerships between research organisations around Australia and industry organisations including western rock lobster, southern rock lobster, abalone, finfish and prawn fisheries.

Dr. Stephen Leporati, SCS Global Services (SCS), Auditor

Dr Leporati has worked on a wide variety of research projects over the past 13 years across the fields of fisheries, aquaculture, biology and ecology, throughout Western Australia (Department of Fisheries), Tasmania (University of Tasmania) and Victoria (Marine and Freshwater Resources Institute). Focussing on developmental fisheries, population dynamics, invertebrate biology and environmental impacts, Dr Leporati has published his findings extensively in leading academic journals and research reports. In addition to scientific research, he is experienced in natural resource management (Fisheries Victoria) and extension services (OceanWatch). Through these experiences in the government, university and not-for-profit sectors, he has developed a strong understanding of the role that research and the seafood industry play in the broader community. This appreciation of the interconnectivity required for sustainable outcomes is aligned with his combined qualifications in the humanities (La Trobe University) and sciences (Deakin University and University of Tasmania). He has demonstrated this versatility across numerous platforms, including formal presentations at international conferences and industry meetings, involvement in national and international collaborations, stakeholder consultation and multi-organisational workshops.

Mr. Peter Trott, Principal of FishListic

Prior to co-founding FishListic, Peter had been with WWF-Australia fisheries program for over eight years, where he led work on international and domestic seafood markets, providing technical expert advice concerning imported and domestic seafood products, supply chains and traceability. Peter was the architect of developing and establishing several key strategic seafood market partnerships between WWF and a major Australian seafood retailer (Coles), brand owners (John West, Birdseye, I&J, Blackmores) and aquaculture companies (Tassal). He has also been involved in the Marine Stewardship Council (MSC) and fishery certifications across the globe for many years, including as a co-client on several high-profile Australian fisheries. Peter sits as a full member on the MSC Stakeholder Council Public Chamber and is the Co-Chair of the stakeholder Council and has a seat on the MSC Board of Trustees, the Australian Tropical Tuna Ministerial Advisory Committee, the Commonwealth Fisheries Research Advisory Board, and the Great Australian Bight Trawl Ministerial Advisory Committee. He has attended numerous international fisheries forums as a member of Australian Government delegations, including at meetings of Regional Fisheries Management Organisation's for tunas at the Western and Central Pacific Fisheries Commission and the Indian Ocean Fisheries Commission. Peter has also worked in fisheries management with two Australian state fisheries agencies (Tasmania and Western Australia) managing sharks, squid, octopus, small pelagics, rock lobster, and scalefish. Peter has over 15 years' experience in fisheries management, resource sharing, ecosystem principles, seafood markets and supply chains. Peter holds a Bachelor of Science in Fisheries Management and Aquaculture and an Honors degree in Aquatic Sciences (aquaculture systems and disease) from Deakin University.

2.2 Peer Reviewers

Prof Peter Britz, Rhodes University, South Africa

Peter Britz (MSc and PhD degrees in Fisheries Science) is a professor in the Department of Ichthyology and Fisheries Science at Rhodes University. His main research focus is on the biology, aquaculture, and fisheries of the South Africa abalone. Other research interests include the development of aquaculture technology for other indigenous species and, more recently, trans-disciplinary research on aspects of fishery governance. His research team has played a key role in the development the commercial farming technology abalone which is now a small industry producing 1500t of abalone. He has led research on the abalone poaching problem, which has included surveys of the Eastern Cape abalone population, quantifying fishing effort and poacher behavior, the economics of the fishery, abalone reseeding studies, and the development fishery management options. He was Chairman of the World Abalone Society from 2009-2014 and was a member of steering committee of the WWF Aquaculture Dialogue for abalone which led to the development of standards for sustainable abalone culture.

Dr Craig Mundy, University of Tasmania, Australia

Dr Craig Mundy is an abalone biologist at the Institute for Marine and Antarctic Studies, University of Tasmania. He is primarily responsible for fishery assessment and strategic research to ensure sustainable management of the Tasmanian abalone fishery. His current research interests are focused on the fisheries ecology of exploited abalone populations, and the use of geo-referenced fisheries data and the application of spatial statistical methods for informing fishery assessment in small vessel fisheries.

Prior to joining the University of Tasmania, Craig worked in the crown-of-thorns research program at the Australian Institute of Marine Science, where he had the unique opportunity of traversing the length of the Great Barrier Reef, gaining an understanding of changes in community structure and state over 2500 km of the GBR. His current field of interest is the quantitative ecology of subtidal benthic marine invertebrates, and he has experience both in applied and strategic research and in tropical and temperate ecosystems. Specific areas of expertise include fisheries management and ecology, spatial analyses and statistics, reproductive and spawning ecology, larval ecology, and recruitment dynamics. Craig's research philosophy is process- rather than species/ecosystem-focussed, and he has built a research career around exploring patterns within populations/communities, and understanding the key processes driving those patterns using a combined strategy of mensurative studies and manipulative field and laboratory experiments. Craig has a strong background in spatial methods/GIS, biometrics and experimental design, as well as database management.

3. Description of the Fishery

3.1 Unit(s) of Assessment (UoA) and Scope of Certification Sought

3.1.1 UoA and Proposed Unit of Certification (UoC)

The fishery described in the Unit of Certification (see under a below) is within scope of the MSC certification sought. This fishery has been found to meet scope requirements (FCR v2.0 7.4) for MSC fishery assessments as it:

- Does not operate under a controversial unilateral exemption to an international agreement, use destructive fishing practices, does not target amphibians, birds, reptiles or mammals and is not overwhelmed by dispute (FCR 7.4.1.1, 7.4.1.2, 7.4.1.3, 7.4.2).
- The fishery does not engage in shark finning, has mechanisms for resolving disputes (FCR 7.4.2.1), and has not previously failed assessment or had a certificate withdrawn.
- Is not an enhanced fishery, is not based on an introduced species, and does not represent an inseparable or practically inseparable species (FCR 7.4.3, 7.4.4, 7.4.13-15).
- Does not overlap with another MSC certified or applicant fishery (7.4.16), and
- Does not include an entity successfully prosecuted for violating forced labor laws (7.4.1.4).
- The Unit of Assessment, the Unit of Certification, and eligible fishers have been clearly defined, traceability risks characterized, and the client has provided a clear indication of their position relative to certificate sharing (7.4.6-7.4.12).

a. Units of Certification for the assessment are listed below:

3 Units of Certification			
	Species	Geographical Area	Method
UoC1	Greenlip abalone (<i>Haliotis laevis</i>)	South coast and West coast of Western Australia	Hand collection
UoC2	Brownlip abalone (<i>Haliotis conicopora</i>)	South coast and West coast of Western Australia	Hand collection
UoC3	Roe's abalone (<i>Haliotis roei</i>)	South coast and West coast of Western Australia	Hand collection
Management system	Output controls in the form of Total Allowable Commercial Catch (TACC) set annually for each species and allocated to licence holders as Individual Transferable Quotas (ITQs).		
Client	Abalone Industry Association of WA.		

b. Description of eligible fishers

There are no other eligible fishers. All fishers are included in the Unit of Certification.

Table 1: Unit of Assessment (UoA) and Unit of Certification (UoC).

Units of Assessment: Defined as the species, location and gear assessed	
UoA: Species & Stock (FCR V2.0 7.4.7.1)	Greenlip abalone (<i>Haliotis laevis</i>); Brownlip abalone (<i>Haliotis conicopora</i>) WA coastal waters on the west and south coast of WA. Roe's abalone (<i>Haliotis roei</i>) WA coastal waters from South Australian border to Shark Bay.
UoA: Gear Type (FCR V2.0 7.4.7.2)	Hand collection
UoA: Vessels (FCR V2.0 7.4.7.3)	30 vessels are used in the Fishery of which 12 are used to fish for Roe's and Greenlip/Brownlip abalone, 10 used to fish for Roe's abalone only and 8 used to fish for Greenlip/Brownlip only (see Appendix 6 for full list of vessels).
Further information: Geographic Area	The Western Australia Abalone Fishery covers all coastal waters of the Southern Ocean, Indian Ocean and Timor Sea between the Western Australia/Northern Territory border and the Western Australia/South Australia border. FAO Area 57.
Further information: Management System	Management primarily through output controls in the form of Total Allowable Commercial Catches (TACCs) set annually for each species in each management area and allocated to licence holders as Individual Transferable Quotas (ITQs). Minimum legal abalone sizes also apply.
Unit of Certification: Defined as the vessels allowed to use the MSC ecolabel for catch from the Unit of Assessment (defined as the species, location and gear assessed against the MSC standard).	
Client Group	Abalone Industry Association of WA.
Fishers in the UoC for the chosen stock	All 52 license holders included in the UoC. 29 of these fish for Roe's only and 23 fish for Greenlip/Brownlip only (see Appendix 6 for full list of license holders).
Other Eligible Fishers that may join the certificate for the chosen stock	No other eligible fishers.

3.1.2 Final UoC(s)

(PCR ONLY)

3.1.3 Total Allowable Catch (TAC) and Catch Data

Table 2. TAC and Catch Data:

	Greenlip abalone <i>Haliotis laevis</i>	Brownlip abalone <i>Haliotis conicopora</i>	Roe's abalone <i>Haliotis roei</i>
2016 TAC (all zones, whole weight, kg)	119,481	25,150	87,000
2016 UoA share of TAC	100%	100%	100%
2016 UoC share of total TAC	100%	100%	100%
2015 Total whole weight catch (t) by UoC	127	25	51
2014 Total whole weight catch (t) by UoC	159	34	49

3.1.4 Scope of Assessment in Relation to Enhanced Fisheries

There is no enhancement activity in this fishery, however the scope of the fishery includes greenlip abalone which are commercially harvested and relocated to a hatchery. The resulting spat from these animals are grown in a land-based facility before being transported to grow-out sites on artificial habitat in Flinders Bay, Augusta, Western Australia.

Whilst the fishery does not receive input from farmed abalone, additional PIs addressing genetics and translocation have been included in the assessment tree to assess any impacts on the commercial fishery stock and/or habitat.

3.2 Overview of the fishery

The information in this section has been largely drawn from Hart *et al.* (2016) except where otherwise indicated. More detail on the species and the fishery are provided in Hart *et al.* (2016).

3.2.1 Species

Three species of abalone are targeted and harvested by commercial fishers in the Western Australia Abalone Fishery; greenlip abalone (*Haliotis laevis*), brownlip abalone (*Haliotis conicopora*) and Roe's abalone (*Haliotis roei*). There are no other retained species.

3.2.2 Fishery Development and Current Activities

Commercial diving for abalone in Western Australia began in the early 1960s when there were no controls and the fishery was open access. The fishery initially focused on harvesting Roe's abalone stocks around Perth, before expanding to also include greenlip abalone. Brownlip abalone began to be caught in considerable amounts from 1985, although the catch taken is in much smaller quantities than greenlip abalone.

The first set of effort controls were introduced in 1971 in response to the rapid increase of catch and licence holders, and formal spatial management was introduced in 1975. Daily bag limits were in place for the Perth commercial fishery from 1978 to 1998, and minimum legal lengths were introduced in 1993. Changes in size limits and area closures have been an ongoing and regular management practice in these fisheries.

3.2.3 Fishing Methods and Gear

The commercial abalone fishery is a hand collection dive fishery operating in shallow coastal waters off the southern and western coasts of Western Australia. Greenlip and brownlip abalone are caught primarily on the south coast of WA, whilst Roe's abalone is most abundant on the south-west coast. Abalone divers work on small (<9 m) vessels using a 'hookah' (surface supplied breathing apparatus) or scuba equipment. Divers use an abalone 'iron' to prise abalone off rocks.

3.2.4 Catch and Effort

Annual catches were typically <20 tonnes (whole weight) during the early years of the fishery. After a peak of 440 tonnes in 1971 (Roe's and greenlip combined) catches declined until they reached a relatively stable level of around 330 t (120 t for Roe's abalone only) during the mid-late 1970s. The first catches of brownlip abalone were recorded in 1984.

A voluntary Total Allowable Commercial Catch (TACC) was set in Zone 1 in 1985, with other zones following in subsequent years. Non-transferable Individual Quotas were initially in place for the greenlip and brownlip fisheries, however were deemed no longer suitable after a drop in catch in 1990. The TACC in the Roe's abalone fishery was initially a state-wide competitive quota before Individual Quotas were introduced in 1993. Greenlip catches dropped rapidly after the introduction of the TACC to around 150 tonnes, and have further declined since 2013 as a result of TACC reductions. The decline in catches of Roe's abalone over the past five years have generally been attributed to environmental factors, specifically a heatwave in south-western Australian waters in 2010/11.

Transferable units and spatial TACs (6 areas) came in 1999, meaning fishing activity could be more evenly spread out across the fishery. Development of performance indicators and formal decision rules to assess annual TACs was introduced during 2005-2009, and these now underlie the main management functions relating to setting a sustainable catch.

3.3 Principle One: Target Species Background

3.3.1 Roe's Abalone

Taxonomy and Distribution

Roe's abalone (*Haliotis roei*) belong to the Family Haliotidae, which comprises around 75 species of shelled marine gastropods (Geiger & Owen 2012). Abalone are found along rocky shores in temperate and tropical waters, and are generally found in shallow subtidal waters 0-30 m deep. There are no abalone species of global distribution and most species have restricted ranges.

Roe's abalone can be found as far north as Shark Bay in WA and south around to Victoria, although they are not uniformly distributed throughout this range.

Stock Structure

Standardised variance in allelic frequencies between 10 sites in south-western Australia indicated high levels of gene flow across Roe's abalone in the 3000 km sampled (Hancock 2004).

Life History

Habitats and Movements

All commercially targeted WA species of abalone live on exposed, high-energy coasts. Roe's abalone populations occur on semi-continuous reef complexes, each of which is generally less than 10 km of coastal length. The habitat occupied by this species is the intertidal reef platforms and shallow adjoining subtidal reef for up to 30 to 40 m beyond the reef platforms.

Abalone are sedentary animals and generally only make small-scale movements within their local habitats, primarily to feed. Aggregative behaviour has been noted in relation to spawning (Shepherd 1986), but the primary source of movement is in the larval stage, mediated by ocean currents.

Reproduction

Roe's abalone are broadcast spawners; they release gametes (both sperm and eggs) into the water column where fertilisation occurs. The ova develop into a veliger stage and settlement usually occurs around eight to 10 days post-hatching. When they are ready to metamorphose they settle onto suitable habitat. Evidence has been found for the preferential selection onto certain habitat based on chemical cues emanating from coralline algae and biofilms that have been grazed by conspecifics (Daume *et al.* 1999; Roberts 2001).

The length at which 50% of Roe's abalone have attained maturity has been estimated as 40 mm. Roe's abalone in the Perth metropolitan area have major spawning events in winter (Wells & Keesing 1989), whereas in South Australia the species appears capable of spawning all year round (Shepherd & Laws 1974).

Size-Fecundity Relationships

Egg production by a female Roe's abalone can be very high, with a fecundity of up to 8.6 million eggs measured in a large (122 mm) individual (Wells & Keesing 1989).

Factors Affecting Recruitment of Juveniles

Factors affecting recruitment in juvenile Roe's abalone are not well understood. The animal lives in a highly-exposed environment with spatially limited recruitment. In the largest fishery (Area 7 of the Abalone Managed Fishery (AMF)), which encompasses the Perth metropolitan area and provides a significant recreational and commercial catch, recruitment surveys have been undertaken since 1997. Overall, density of Age 1 animals has a significant positive correlation with spawning biomass (2 years prior), however there are substantial variation between sites. Recruitment over time at most sites has been stable, with the exception of Mettams, where it has declined.

Age and Growth

Growth of Roe's abalone varies significantly between populations. At the higher range, Roe's abalone reach an average maximum size of 89 mm shell length. At the lower end of the growth spectrum, slow-growing stocks show an average maximum size of 73-75 mm. This is a difference in growth of between 6 and 14 mm year⁻¹ for a 40 mm animal.

Natural Mortality

Natural mortality for Roe's abalone in WA has been estimated as 0.38 year⁻¹ from length-composition data in the closed Waterman's Reserve. A second unpublished estimate of 0.32 ± 0.03 (range: 0.24 to 0.40) year⁻¹ has been obtained from the Kalbarri region (Area 8 of the AMF; Strain *et al.* in press), based on five replicate mark-release recapture experiments.

Diet

Abalone are macroalgal herbivores and feed on the most prevalent type of algae found in their particular area. All Australian abalone species feed primarily on red algae (70-80%) with small amounts of the more palatable brown algae such as *Lobospira* sp. also consumed (Shepherd & Steinberg 1992) when red algae is not as abundant. Abalone primarily feed on drift algae; the typical feeding pattern arises after sustained oceanic swells dislodge the algae and render them available to be trapped within the subtidal reef complexes and subsequently consumed by the resident abalone populations. Volumes of algae in gut contents were found to be greatest in winter, which coincides with the period of sustained oceanic swells and therefore highest food availability.

Juveniles feed on diatoms and associated biofilms (Daume *et al.* 1997, Daume 2006) and may progressively move to a more macroalgal dominated diet of smaller germlings of certain algal species (Strain *et al.* 2006).

Parasites and Disease

An Australia-wide survey of diseases and parasites in abalone found a number of organisms with disease potential (Handlinger *et al.* 2006). The principal parasite affecting abalone and other

commercial species is a protozoan parasite known as *Perkinsus* (Goggin & Lester 1995), which can cause flesh deformities and greatly reduce market value of abalone. *Perkinsus* parasites have been found in over 30 species of molluscs and are naturally occurring in abalone from South Australia (Goggin & Lester 1995) and New South Wales (Liggins & Upston 2010).

Perkinsus was heavily implicated in the demise of the blacklip abalone fishery in New South Wales. Evidence of substantial tissue necrosis, organ damage and haemocyte activity associated with *Perkinsus* cells in surveys between 2002 and 2005 showed that this parasite is pathogenic to abalone in that state (Liggins & Upston 2010). The parasite was found to be seasonally variable, with abalone being more susceptible to infection at high temperatures in late summer and autumn. In WA, a native *Perkinsus* species (*P. olseni*) has been found to be naturally occurring in Roe's and Greenlip abalone, as well as other molluscs such as cockles.

An extremely pathogenic herpes-like-virus (Abalone Viral Ganglioneuritis – AbHV-1) was discovered in wild abalone stocks in Victoria and Tasmania and is causing significant concern to the industry and community in all abalone-producing areas (Hooper *et al.* 2007; Corbeill *et al.* 2010; Savin *et al.* 2010). The Western Zone Blacklip Abalone Fishery in Victoria was decimated by this virus and TACC is current only around 10% of the levels experienced during pre-virus times.

3.3.2 Greenlip and Brownlip Abalone

As there are many similarities between greenlip and brownlip abalone, the taxonomy, stock structure, habitats and life history of these two species have been described together.

Taxonomy and Distribution

Greenlip abalone (*Haliotis laevis*) and brownlip abalone (*Haliotis conicopora*) belong to the Family Haliotidae. Brownlip abalone is considered a sub-species of *H. rubra*, which is the primary commercial abalone species in eastern Australia (Geiger & Owen 2012).

Greenlip abalone and brownlip abalone are co-occurring temperate endemic Australian species. The distribution of greenlip abalone extends from the south-west of WA to Tasmania, whereas brownlip abalone extend only as far as South Australia.

Stock Structure

The genetic structure of greenlip abalone has been investigated in south eastern Australia (Mayfield *et al.* 2014) and more recently in WA (Sandoval-Castillo *et al.* 2016).

Studies by Mayfield *et al.* 2014 based on microsatellite DNA found that south eastern Australia Greenlip and Brownlip abalone comprise small spatially disaggregated populations within a broader overall metapopulation structure (Shepherd & Brown, 1993). Genetic studies showed significant differences in allele structure between populations at a relatively fine scale of tens of kilometres, such that stocks are composed of local populations linked by occasional larval dispersal into metapopulations. Genetic subdivision indicated that greenlip abalone do not comprise a single, large, panmictic population across SE Australia. Differentiation was evident at the two scales: among biogeographic regions (i.e. hundreds of kilometres) and among locations within regions (i.e. tens of

kilometres). Overall it is estimated that populations generally encompass reef areas of around 30 km², which are largely maintained through self-recruitment, and that distances of up to 130 km are effective barriers to larval dispersal (Mayfield *et al.* 2014).

Recent research on greenlip abalone populations in WA has been undertaken using a new diagnostic genomic tool utilising Genotyping by Sequencing (GBS) (Sandoval-Castillo *et al.* 2016). This research found that the genetic structure of greenlip abalone populations was similar in all populations analysed, with the highest diversity detected in the easternmost populations. The screening of genome-wide variation in greenlip abalone samples collected from the wild showed that “neutral” SNPs (i.e. DNA markers that are not under the influence of natural selection) exhibit a pattern of high connectivity, indicating the existence of one single abalone population across the geographic range sampled.

However, when only a section of genome under selection (outlier SNPs) was considered, five genetically distinct groups can be clearly defined. These are:

- 1) the western part of the greenlip abalone distribution (from Outback to Windy Outside);
- 2) the Albany sub-area (Parrys Bay and Whalebone Port);
- 3) the Hopetoun sub-area (from Inner Island to Mason);
- 4) the West sub-area (Fanny Cove and Burton Rocks); and
- 5) the eastern sampling area (from Rob Island to Gulch).

These corresponded to geographic regions characterised by differences in oceanography, particularly differences in oxygen. The genetic differentiation detected is likely to be adaptive so that the fitness/performance of the abalone in those locations in relation to dissolved oxygen in the water is likely to be superior (Sandoval-Castillo *et al.* 2016).

The genetic structure of brownlip abalone is unknown.

Life History

Habitats and Movements

Greenlip and brownlip abalone inhabit suitably exposed hard surfaces (usually granite or limestone) on subtidal rocky reefs between 1 and 40 m depth, however, the commercial fishery primarily targets the 5 to 25 m depth range. The habitats need to be firm enough to provide a suitable substrate for attachment, be capable of trapping floating seaweed which the abalone feed on, and be sufficiently endowed with a supply of certain types of red algae (Rhodophyta) which are the preferred food source for these species (Shepherd & Steinberg 1992). The delicate structure and susceptibility of red algae to wave exposure ensures that the highest swell-exposed areas are usually sub-optimal habitat. The largest populations of greenlip abalone are found in the Augusta and Cape Arid regions of WA, which are characterised by small island complexes and headlands that buffer the southerly swells, create localised hydrodynamics that promote recruitment, and allow sufficient

seagrass meadows and Rhodophyte communities to develop. Seagrass meadows are particularly important due to the prevalence of epiphytic red algae that are the sought-after food species. The typical feeding pattern arises after sustained oceanic swells dislodge the algae and render them available to be trapped within the reef complexes and consumed by the resident abalone populations. Although inhabiting the same general reef areas, brownlip abalone have more specialised habitat requirements. They are a far more cryptic species, generally requiring a complex boulder structure that they shelter underneath.

A recent habitat survey of 32 hectares of commercially productive greenlip abalone reefs in the Augusta region established that abalone-specific habitat comprised only about 2-3% of the total area, the surrounding seagrass and associated macroalgal communities comprised around 30% of the total area. Within the rocky-reef complexes abalone abundance is positively correlated with area of available habitat and density of other co-occurring invertebrates such as the purple sea-urchin (Hart *et al.* 2013b), indicating that the structural complexity of a reef dictates its carrying capacity and diversity for both abalone and the reef community in general.

As with Roe's abalone, both greenlip and brownlip abalone are sedentary animals and generally only make small-scale movements within their local habitats, primarily to feed. Experimental investigations of stock enhancement in greenlip abalone tracked cohorts for over 6 years and found that 90% of animals moved less than 5 m from the point of release (unpublished data).

Reproduction

Abalone are broadcast spawners. The ova develop into a veliger stage and settlement usually occurs around eight to 10 days post-hatching. When they are ready to metamorphose, they settle onto suitable habitat. Evidence has been found for the preferential selection onto certain habitat based on chemical cues emanating from coralline algae and biofilms that have been grazed by conspecifics (Daume *et al.* 1999; Roberts 2001).

Size at-maturity for greenlip abalone varies with growth and averages between 78 and 97 mm in WA (Hart *et al.* 2013a). Based on growth rate, age-at-maturity is around three years, although there is some evidence that maturation is not entirely age dependent and can be accelerated under optimal conditions (McAvaney *et al.* 2004). Size at-maturity for brownlip abalone is less well known. Wells and Mulvay (1992) showed that maturation occurs rapidly between 110 and 130 mm, but all animals below 110 mm were immature. An approximate figure of 120 mm is assumed.

The breeding season of greenlip abalone varies between locations but is generally confined to the spring/summer months. Shepherd *et al.* (1992) found an extended season from September to March at one location, and a restricted season (December) at another location in South Australia. In WA, the spawning months were also confirmed as between October and December, with a peak in December (Wells and Mulvay 1992). Some sites showed evidence for partial spawning during the late summer months and it is likely that the exact timing within a season varies from year to year and location to location depending on the food availability (primarily dictated by swell) and temperature regime. There is no published information on the spawning season of brownlip abalone.

Size-Fecundity Relationships

Egg production by an individual female can be very high. Individual fecundity of large females has been measured at up to 8 million eggs in Greenlip abalone from both WA (Wells and Mulvey 1992), and South Australia (Shepherd *et al.* 1992), and 6 million eggs for Brownlip abalone (Wells & Mulvey 1992).

Factors Affecting Recruitment of Juveniles

Recruitment of two-year old juveniles in greenlip has been shown to be density dependent, with the likely mechanism hypothesised to be limitation in appropriate crevice habitat for sheltering juveniles (Dowling *et al.* 2004). However, the degree to which this occurs is location-specific, with areas carrying a higher proportion of suitable juvenile habitat exhibiting less density dependence. For example, Hart *et al.* (2013b, c) experimentally increased recruitment of greenlip abalone through a series of stock enhancement experiments, which resulted in significantly increased adult densities in the short-term, indicating that density dependence had not limited survival of recruits at those sites. Dixon (2011) experimentally examined density dependence in juvenile greenlip abalone by constructing and modifying experimental boulder habitats and found a strong density dependence effect on growth, and a significant, but weaker, density dependent effect on survival. An environmental signal affecting recruitment of both greenlip abalone and invertebrates in general on the west coast of South Australia was also postulated by Dowling *et al.* (2004), but the mechanism remains unconfirmed. Allee effects (or depensation) have also been implicated in the collapse of recruitment due to the importance of aggregation for fertilisation success and Dowling *et al.* (2004) constructed a stock-recruitment curve that incorporated a parameter (the x-intercept) for depensation in greenlip abalone in South Australia. A preliminary fit of this curve to WA stocks of greenlip abalone did show a positive x-intercept but the data needs to be interpreted with caution as it comprises different populations due to lack of long-term data within populations.

Age and Growth

Abalone exhibit large spatial heterogeneity in growth and “stunted” populations occur in all abalone fisheries (Wells and Mulvey 1992). In the case of greenlip abalone, comparisons of growth parameters from tag-recapture studies across Australia reveal wide variability within and between fisheries.

Natural Mortality

Natural mortality (M , year⁻¹) in greenlip abalone has been well studied, and long-term mark-recapture experiments are available for wild populations in both South Australia (Shepherd 1990) and WA (Hart *et al.* 2013a). A summary for estimates of natural mortality in South Australian Greenlip abalone is found in Mayfield *et al.* (2003), and Dixon *et al.* (2006) present additional experimental results of juvenile mortality rates. Greenlip abalone exhibit size-dependent mortality, with M being initially high and declining with increasing size, levelling out at around 0.15 to 0.25 year⁻¹ for large adults.

Diet

As described in Section 5.1.3.8 of Hart *et al.* (2016), abalone are herbivores and feed on the most prevalent type of algae found in their particular area. The plasticity in growth in greenlip abalone is hypothesized to be primarily caused by food limitation, as their relatively sedentary nature renders them susceptible to the localised algal productivity and habitat complexity.

Parasites and Disease

As per description for Roe's abalone.

3.3.3 Stock Status

Stock status information is copied directly from Hart *et al.* (2016) with conclusions on status documented as per that report.

Roe's Abalone

In general, the standardised commercial catch rates for Roe's abalone in the key management areas in which this species is targeted have remained relatively stable since the early 1990s but show some decline since 2010/11 (Figure 1). The three-year moving average Standardised Catch Per Unit Effort (SCPUE) used as the primary indicator for monitoring the status of this species has always remained above the target reference level specified for each management area (Figure 1).

The declining catch rates of Roe's abalone have generally been attributed to environmental factors, for example, the marine heatwave that caused catastrophic mortalities in Area 8 of the AMF and a closure of the fishery north of Moore River in 2010/11. This heatwave has also been implicated in growth stunting and other sub-lethal effects in other areas of the fishery (see Caputi *et al.* 2014). As a result, Total Allowable Commercial Catch (TACC) has been reduced accordingly, and the latest predictions forecast further declines in harvest-sized animals in some areas. Overall, multiple lines of evidence indicate that the Roe's abalone stock in WA is above the point at which fishing may cause recruitment to be impaired (Table 3).

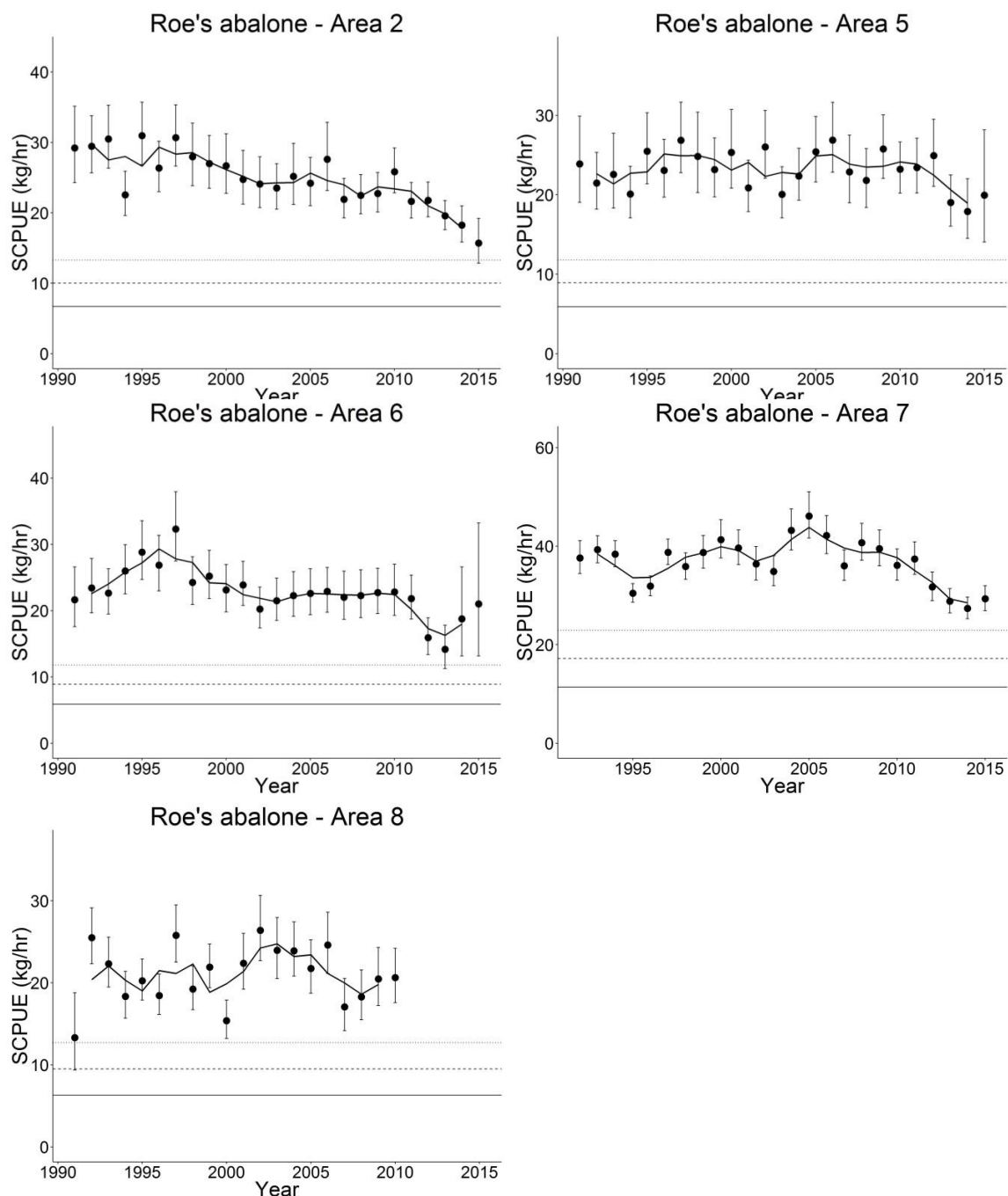


Figure 1. Annual standardised catch rates, SCPUE (kg/hr; $\pm 95\%$ confidence levels), and the three-year moving average of SCPUE (black line; i.e. the primary performance indicator) for Roe's abalone in Areas 2, 5, 6, 7 and 8 of the AMF relative to area-specific reference levels. The target, threshold and limit reference levels are denoted as the dotted (upper), dashed (middle) and solid (lower) horizontal lines, respectively. Note that the fishery north of Moore River (Area 8) has remained closed since 2011.

Table 3. Weight of evidence assessment of Roe's abalone. (by Hart *et al.* 2016).

Category	Lines of evidence (Consequence/Status)
Catch	Currently, around 70% of the total catch of Roe's abalone is taken by the commercial fishery, with the remaining catch retained by recreational fishers. The estimated total catch in 2015 of 71 tonnes whole weight was the lowest recorded over the past 25 years, with only 58% of the TACC taken. Reductions in catch are driven mostly by economic reasons as there are few economically viable markets for this species, and fishery closures implemented in 2010/11 after a heatwave severely impacted abundance in the northernmost parts of the fishery. This does not provide any indication of stock depletion.
Catch distribution	The majority of the commercial and recreational catch of Roe's abalone is currently taken in Area 7 of the AMF, with smaller catches landed in Areas 2 and 5. Distribution of both commercial and recreational catches has remained stable over the last 20 years, with the exception of Area 8. There have been no catches in Area 8 and the northern parts of Area 7 since the 2010/11 marine heatwave caused a catastrophic mortality in this area. This provides no evidence of fishing-related stock depletion.
Catch rates	The standardised catch rates since 2010 show a declining trend in most areas, with signs of a recovery in three of the four fished areas over the last year. Although this provides some evidence of currently lowered stock levels, the performance indicator (three-year moving average of the standardised commercial catch rate) is currently above the target reference point in all areas monitored.
Vulnerability (Productivity Susceptibility Analysis (PSA))	As a result of its sedentary nature and ease of accessibility, Roe's abalone is considered to have a high inherent vulnerability to fishing. However due to the high minimum length at first harvest, relative to length at maturity, and stringent catch controls, a low vulnerability PSA score was obtained (2.23). This is equivalent to an MSC score of >80 and provides no evidence of stock depletion.
Size composition (Area 7)	Fishery-independent size composition data from the most heavily fished area (Area 7) indicate a reduction in proportion of larger abalone between 2007 and 2012, followed by stabilisation between 2012 and 2014, and an increase between 2014 and 2016. This provides no evidence of stock depletion.
Total mortality (Z) (Area 7)	Time series of estimates of total mortality (Z) for Roe's abalone in Area 7 of the AMF, derived from a catch curve model that simultaneously estimates growth and mortality from tag-recapture and length frequency data, are linked to the trends in size-composition. Z increased between 2006 and 2012, oscillated between 2012 and 2014, and declined between 2014 and 2016.
Index of recruitment (Area 7)	Fishery-independent (Age 1+) settlement densities of Roe's abalone in fished and unfished regions of Area 7 over the period 1997 to 2016 are not significantly different from each other. This indicates that recruitment variability is primarily environmentally controlled. The data show a declining trend in recruitment since the 2010/11 heatwave, with an increase occurring in 2016 after reaching the lowest level in 2015. This provides no evidence of fishing-related stock depletion.

Greenlip Abalone

The three-year moving average SCPUE indicator for Greenlip abalone in Areas 2 and 3 (i.e. the key management areas on the south coast of WA in which this species is targeted by the AMF) has typically fluctuated around, or slightly below, the target reference level since the early 1990s (Figure 2). As with Roe's abalone, however, the effect of the 2010/11 marine heatwave on greenlip abalone is evident in the declining catch rate trend observed over the past five years (Figure 2). Although the three-year average SCPUE indicator has remained just above the threshold level for Area 2, the indicator fell below the threshold level in Area 3 in 2014 (i.e. the 2012-2014 average SCPUE of 9.1 kg/hr and the 2013-2015 average SCPUE of 8.3 kg/hr have been below the threshold level of 9.9 kg/hr). In response to these breaches, TACCs have been reduced accordingly, particularly in the last couple of years. Currently, TACCs for the new season (2016/2017) have been reduced to 45% in Area 2, and 30% in Area 3, of their long-term averages. Overall, multiple lines of evidence indicate that the Greenlip abalone stock in WA is above the point at which fishing may cause recruitment to be impaired (Table 4).

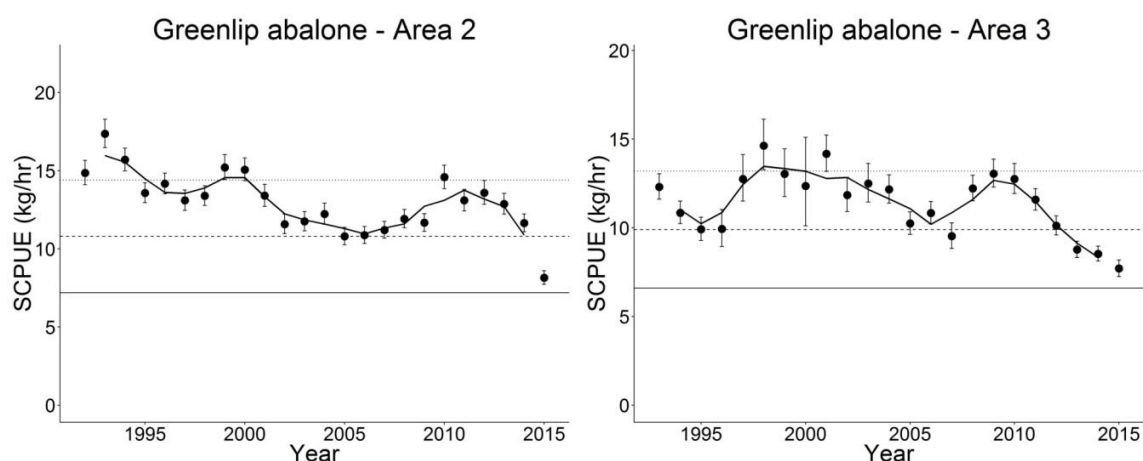


Figure 2. Annual standardised catch rates, SCPUE (kg/hr; $\pm 95\%$ confidence levels), and the three-year moving average of SCPUE (black line; i.e. the primary performance indicator) for greenlip abalone in Areas 2 and 3 of the AMF relative to area-specific reference levels. The target, threshold and limit reference levels are denoted as the dotted (upper), dashed (middle) and solid (lower) horizontal lines, respectively.

Table 4. Weight-of-evidence assessment summary for stock status of greenlip abalone in WA, with each source of information available for this species/stock considered as a separate line of evidence.

Category	Lines of evidence (Consequence/Status)
Catch	Currently, around 95% of the total catch of Greenlip abalone is taken by the commercial fishery, with the remaining catch retained by recreational fishers. The estimated total catch in 2015 of 47.6 tonnes meat weight (127 t whole weight) was the lowest recorded over the past 25 years. Reductions in TACC have been driven by lower SCPUE triggering harvest control rules. The fishery is considered to be in a low period of stock abundance, primarily due to environmental conditions.
Catch distribution	The vast majority of catches come from Area 2 and Area 3. The spatial distribution of this catch has remained consistent over the history of the fishery.

Catch rates	The three-year moving average of the standardised commercial catch rate is currently above the limit reference point in all areas monitored. However, it has breached the threshold in Area 3, and substantial reductions in TACC have been implemented.
Vulnerability (PSA)	As a result of its sedentary nature, greenlip abalone is considered to have a high inherent vulnerability to fishing. However due to the high minimum length at first harvest, relative to length at maturity, and stringent catch controls, a low vulnerability PSA score was obtained (2.23). This is equivalent to an MSC score of >80 and provides no evidence of stock depletion.
Size composition	Fishery-dependent length frequency data for greenlip abalone show oscillations in length at 50% selectivity (L_{50}), but no consistent trend. This provides no indication of stock depletion.

Brownlip Abalone

The three-year average SCPUE indicator for brownlip abalone in Areas 2 and 3 has typically fluctuated above or around the target levels since 1999 but has declined to historically low levels since the 2010/11 marine heatwave (Figure 3). Despite this reduction, the primary performance indicator is currently above the threshold level in both areas. In response to this decline TACC for this species has been reduced in accordance with the harvest control rules. Overall, multiple lines of evidence indicate that the brownlip abalone stock in WA is above the point at which fishing may cause recruitment to be impaired (

Table 5).

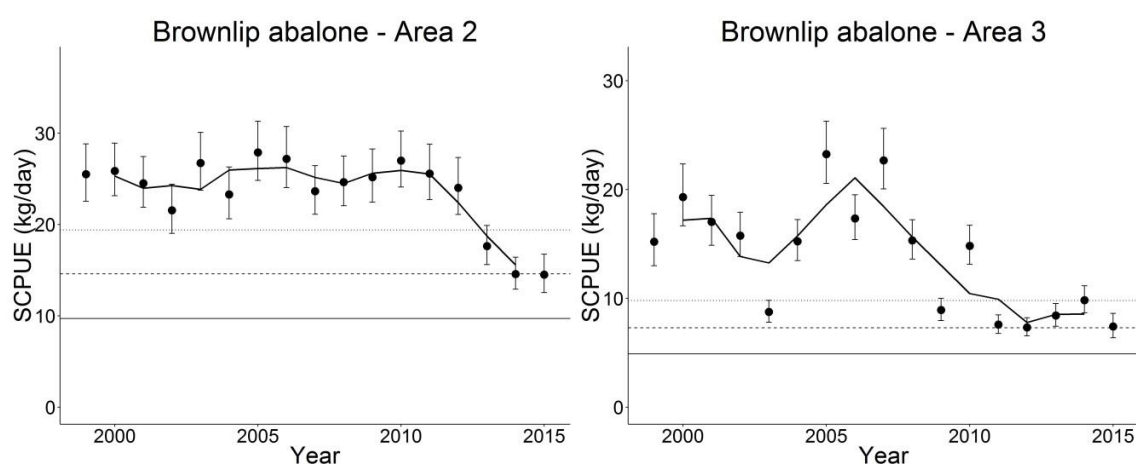


Figure 3. Annual standardised catch rates, SCPUE (kg/day; $\pm 95\%$ confidence levels), and the three-year moving average of SCPUE (black line; i.e. the primary performance indicator) for brownlip abalone in Areas 2 and 3 of the AMF relative to area-specific reference levels. The target, threshold and limit reference levels are denoted as the dotted (upper), dashed (middle) and solid (lower) horizontal lines, respectively.

Table 5. Weight-of-evidence assessment summary for stock status of brownlip abalone in WA, with each source of information available for this species/stock considered as a separate line of evidence.

Category	Lines of evidence (Consequence/Status)
Catch	Currently, around 97% of the total catch of brownlip abalone is taken by the commercial fishery, with the remaining catch retained by recreational fishers. The estimated total catch in 2015 of 10 tonnes meat weight (25 t whole weight) was the lowest recorded over the past 15 years. Reductions in TACC have been driven by lower SCPUE triggering harvest control rules. The fishery is considered to be in a low period of stock abundance, primarily due to environmental conditions.
Catch distribution	All catches come from Area 2 and Area 3. The spatial distribution of this catch has remained consistent over the history of the fishery.
Catch rates	The three-year moving average of the standardised commercial catch rate is currently above the threshold reference point in both areas.
Vulnerability (PSA)	As a result of its sedentary nature, brownlip abalone is considered to have a high inherent vulnerability to fishing. However due to the high minimum length at first harvest, relative to length at maturity, and stringent catch controls, a low vulnerability PSA score was obtained (2.23). This is equivalent to an MSC score of >80 and provides no evidence of stock depletion.
Size composition	Fishery-dependent length frequency data for brownlip abalone show a decline in length at 50% selectivity (L_{50}), from 158 mm (2004 to 2006) to 150 mm (2013-2015). This indicates a reduction in larger sized animals.

3.3.4 Stock Indicators and Biological Limits

Reference Points

Following a review of the abalone harvest strategy in 2015, updated (biologically-based) target, threshold and limit reference points were calculated for each of the three abalone species and their relevant management areas. These reference points were based on historical catch rate information from reference periods of stability in the AMF.

Roe's Abalone

The reference points for Roe's abalone have been calculated based on commercial catch rate data for the specified reference period of 1997-2010, using fishery-independent survey indices of abundance in the fished and unfished areas of Area 7 of the AMF from the same time period to determine the catch rate levels that would be expected when stock abundance is at 40%, 30% and 20% of unfished biomass levels (i.e. which correspond to the target, threshold and limit reference

points, respectively). Specifically, the fishery-independent data for the fished and unfished areas were applied to relate the standardised catch rate data to estimates of spawning biomass in this management area using the following procedure.

1. The average spawning biomass of Roe's abalone in unfished areas of Area 7 for the period 1997 to 2010 (i.e. B_0) was estimated as 2.61 kg per m². This is used as a measure of unfished biomass for the stock in this management area.
2. The average spawning biomass of Roe's abalone in fished areas during the same time period (B_F) was estimated as 1.97 kg per m².
3. The year in which the annual spawning biomass index for the fished area was the closest to B_F (1.9 kg per m² in 2004) was set as the reference year.
4. Given the ratio between the average fished and unfished spawning biomass during the reference period ($B_F/B_0 = 0.755$), the standardised commercial catch rate expected to relate to an unfished stock level was calculated as $SCPUE_0 = SCPUE_{2004} / (B_F/B_0)$. Based on a standardised catch rate in the reference year ($SCPUE_{2004}$) of 43.2 kg/hr in Area 7, the unfished catch rate level ($SCPUE_0$) in this management area was estimated as 57.2 kg/kr.
5. The SCPUE-based target, threshold and limit reference points for Roe's abalone in Area 7 were then calculated as 20%, 30% and 40% of $SCPUE_0$.

As no fishery-independent survey indices for abundance are available for Roe's abalone in areas other than Area 7 (i.e. which represents the key area of the fishery for this species), it has been assumed that the ratio between the average fished and unfished spawning biomass of the stock during the reference period is consistent across all Roe's abalone fisheries. For Areas 2, 5, 6 and 8, SCPUE-based reference points were thus determined from steps 4 and 5 of the above procedure.

Greenlip and Brownlip Abalone

Theoretical analyses of egg per recruit relationships have established that, at the minimum size limits for these two species in WA, egg conservation is well above the traditional target fishing mortality of 40% of unfished egg production (Hart *et al.* 2013a), based on the assumption of constant recruitment.

Due to a lack of robust estimates of spawning biomass relative to unfished levels for greenlip and brownlip abalone, reference points for these species have been determined based on the historical values of the commercial catch rates observed in each relevant management area during their reference periods (1992-2006 for greenlip abalone and 2000-2014 for brownlip abalone). Based on the data showing that the fisheries were operating at sustainable levels during these reference periods (i.e. recruitment was not impaired), threshold reference levels for each species have been set as the lowest catch rate observed in each management area (assuming this level corresponds to catch rates at 30% of unfished stock levels). Associated target (40%) and limit (20%) reference levels were then determined.

Table 6. Summary of the harvest strategy for Roe's, greenlip and brownlip abalone in WA.

Management Objective	Performance Indicator	Reference Points	Control Rules
To maintain spawning stock biomass of each target species at a level where the main factor affecting recruitment is the environment	Three-year moving average of the standardised catch rate in each relevant management area	<p>Target Roe's abalone (kg whole weight/hr): Area 2- 13.3, Area 5- 11.8, Area 6- 11.8, Area 7- 22.9, Area 8- 12.7 greenlip abalone (kg meat weight/hr): Area 2- 14.4, Area 3- 13.2 brownlip abalone (kg meat weight/day): Area 2- 19.4, Area 3- 9.8</p> <p>Threshold Roe's abalone (kg whole weight/hr): Area 2- 10.0, Area 5- 8.9, Area 6- 8.9, Area 7- 17.2, Area 8- 9.5 greenlip abalone (kg meat weight/hr): Area 2- 10.8, Area 3- 9.9 brownlip abalone (kg meat weight/day): Area 2- 14.6, Area 3- 7.3</p> <p>Limit Roe's abalone (kg whole weight/hr): Area 2- 6.7, Area 5- 5.9, Area 6- 5.9, Area 7- 11.4, Area 8- 6.3 greenlip abalone (kg meat weight/hr): Area 2- 7.2, Area 3- 6.6 brownlip abalone (kg meat weight/day): Area 2- 9.7, Area 3- 4.9</p>	<p>1. If the performance indicator is \geq the Target, set SHL to long-term level (or above this level when indicator is well above the Target).</p> <p>2. If the performance indicator is $<$ the Target and \geq the Threshold, set SHL at 90 % of long-term level.</p> <p>3. Area 7 Roe's abalone. If the performance indicator is \geq the Target, set SHL as a function of stock abundance using predictive model.</p> <p>If the performance indicator is $<$ the Threshold and $>$ the Limit, set SHL at 70 % of long-term level.</p> <p>If the performance indicator is \leq the Limit, set SHL at 0-50 % of long-term level.</p>

3.4 Principle Two: Ecosystem Background

Text here is largely drawn from Hart *et al.* (2016).

Ecosystem

The Abalone Managed Fishery (AMF) stretches over two distinctive coastlines, the west coast from Kalbarri (27.7° S 114.16° E) in the north to Augusta (34.31° S and 115.16° E) in the south, and the south coast from Augusta in the west to the South Australian border (31.67° S, 128.88° E) in the east. *Haliotis roei* are caught on both the west and south coasts, with catches concentrated around the Perth metropolitan area. *Haliotis laevis* and *Haliotis conicopora* are only caught in south coast waters.

West Coast

Stretching across six degrees of latitude, the West Coast is subject to a variety of temperature regimes, with a typical range of 18°C - 24°C. Classified as a mostly temperate zone, oceanographic processes are heavily influenced by the dominant Leeuwin Current. Flowing in a poleward direction, the Leeuwin Current transports warm tropical water along the edge of the continental shelf, with flows strongest during winter, when opposing winds subside. Flowing in the opposite equatorward direction at a greater depth is the Leeuwin undercurrent, which is considered as an extension of the south coast's Flinders Current (McLatchie *et al.* 2006). Also flowing counter to the Leeuwin Current, is the inshore and seasonal Capes Current. The Capes Current is sourced from shallow upwelling of water from the bottom of the Leeuwin Current (~100 m) (Gersbach *et al.* 1999). This water mostly comes from the region between capes Naturaliste and Leeuwin (McLatchie *et al.* 2006). The combined seasonal and inter-annual effects of these currents on temperature regimes and nutrient distributions, has a very strong influence on biodiversity and population dynamics. This was demonstrated during 2011, when a significant El Niño Southern Oscillation (ENSO) event strengthened the Leeuwin current, causing a marine heatwave (Feng *et al.* 2009; Pearce *et al.* 2011). With mean temperatures increasing by >3°C above monthly long term averages, a total mortality event occurred for *Haliotis roei* living in the northern extremes of the species distribution, leading to a contraction of the fishery (Pearce *et al.* 2011). An investigation into the potential impacts of such events becoming more frequent and intense as a product of climate change, has indicated that *H. roei* are at a greater risk than *H. laevis* or *H. conicopora*, due to their more northern and inshore distribution (Caputi *et al.* 2014).

The AMF's west coast operations span two designated ecosystems: the central west coast (CWCE) and the Leeuwin-Naturaliste (LNE). These ecosystems have been classified to assist in regional planning as part of the Integrated Marine and Coastal Regionalisation for Australia (IMCRA V 4.0 2006; Commonwealth of Australia 2001) and are based on ecological similarities. Available abalone habitat in the CWCE typically consists of limestone reefs and outcrops. Of the three target species in the AMF only Roe's abalone (*Haliotis roei*) are found in the CWCE, where they inhabit waters between 0-30 m. Research conducted by Wells *et al.* (2007) demonstrated that *H. roei* are unevenly distributed and tend to congregate in areas of bare reef. The highest production area for *H. roei* is in the waters around the Perth metropolitan area, Western Australia's largest city (population 2

million). Proximity to Perth and the species shallow reef distribution makes *H. roei* highly susceptible to both commercial and recreational fishing pressure.

The LNE is a transition zone between the CWCE and the south coast. Dominated by two large embayments (Cockburn Sound and Geographe Bay), the LNE is a diverse ecosystem demonstrating a high degree of endemism. The primary abalone fishing grounds in the LNE are between Cape Naturaliste (33.53° S, 115.016° E) and Cape Leeuwin (34.36° S, 115.13° E). All three species of abalone harvested in the AMF are caught in the capes region. This region has recently been classified by the Western Australian Government as the Ngari Capes Marine Park. The designation of these waters as a marine park includes general use areas, which allows commercial abalone fishing to occur in accordance with relevant legislation.

South Coast

The south coast of Western Australia stretches across 13 degrees of longitude and three degrees of latitude. The Leeuwin Current also plays a significant role on the south coast, with high seasonality in reach and intensity, peaking typically during winter. Flowing in the opposite direction to the Leeuwin current on the south coast are the smaller inshore Creswell Current and Flinders Current (McLatchie *et al.* 2006). Temperatures on the south coast are generally lower (15 – 21° C) than the west coast, with a more southerly distribution and a considerably narrower shelf region. However, the influence of the Leeuwin current generally increases temperature profiles above expected levels for these latitudes.

In comparison to the west coast, the south coast has a more rugged coastline dotted by numerous small bays, granite headlands and sandy beaches. East of Israelite Bay (33.61°S 123.87°E) sandy beaches dominate until limestone cliffs become more prevalent towards the South Australian border. As a high energy environment, the south coast is greatly influenced by large swells and strong winds from the Southern Ocean. A variety of habitats exist along the south coast from seagrass beds in protected waters and kelp beds in exposed rocky regions. Benthic invertebrate communities found in the eastern areas of the south coast, particularly sponges, ascidians and bryozoans, are among the world's most diverse in soft sediment ecosystems (CoA 2008).

Primary Species

According to the definition provided in the MSC Standard V2.0 (SA3.1.3.3) a primary species requires “management tools and measures in place, intended to achieve stock management objectives reflected in either limit or target reference points”. As a highly selective dive fishery with licences specifying that only target species can be harvested, there are no primary species caught in the AMF.

Secondary Species

All other species not considered under target or as primary species are considered secondary species following MSC guidance (MSC CR V2.0; SA 3.1.4). Secondary species in the AMF consist of

commensal species found on abalone shells. Such species primarily consists of coralline algae, small invertebrates and sponges. There are no known species that solely rely on abalone shells for habitat.

Coralline algae frequently grow on the backs of abalone shells. The species of coralline algae that grow on *H. roei*, *H. laevigata* or *H. conicopora* shells have not been identified or quantified in Western Australia. Given that coralline algae are found throughout rocky reef and platform habitats on the west and south coast, it is highly unlikely that the removal of coralline algae, via AMF operations, would have any significant impacts on algae diversity or distribution. Any possible impacts would be further ameliorated by AMF size and catch limits and area closures, along with large areas of abalone habitat being inaccessible due to depth, remoteness and prevailing conditions. These attributes and scenarios are also applicable to sponge and small invertebrate commensal species. Such species are generally members of highly abundant and broadly distributed populations, which opportunistically utilize abalone shells.

Endangered, Threatened and Protected (ETP) Species

The federal Department of the Environment and Energy is responsible for administering the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). The EPBC Act provides a framework for the protection and management of environmentally significant flora, fauna and ecological communities. The EPBC Act is the Australian government's central piece of environmental legislation for the management of ETP species. Several ETP species are listed under the EPBC Act for the West Coast and South Coast regions in which the AMF operates. These ETP species mostly comprise of elasmobranchs, cetaceans, turtles and migratory seabirds. In addition to the EPBC Act, these species are protected by various international agreements (International Union for Conservation of Nature and Natural Resources (IUCN)) and state legislation (Wildlife Conservation Act 1950). The conservation status for each species is listed in Table 7.

Table 7. ETP species found in the West Coast and South Coast regions that are listed under the Commonwealth EPBC Act.

Species common name	Species scientific name	IUCN Status	Commonwealth status	State/Territory status
Great White Shark	<i>Carcharodon carcharias</i>	Vulnerable	Vulnerable	Vulnerable
Grey Nurse Shark	<i>Carcharias taurus</i>	Vulnerable	Vulnerable	Vulnerable
Whale Shark	<i>Rhincodon typus</i>	Endangered	Vulnerable	Listed as other protected fauna
Blue Whale	<i>Balaenoptera musculus</i>	Endangered	Endangered	Endangered
Humpback Whale	<i>Megaptera novaeangliae</i>	Least Concern	Vulnerable	Conservation Dependent

Species common name	Species scientific name	IUCN Status	Commonwealth status	State/Territory status
Southern Right Whale	<i>Eubalaena australis</i>	Least Concern	Endangered	Vulnerable
Common Bottlenose dolphins	<i>Tursiops truncatus</i>	Least Concern	Data deficient	Not listed in NT Not listed in WA
Australian Sea Lion	<i>Neophoca cinerea</i>	Endangered	Vulnerable	Specially protected fauna.
Southern Elephant Seal	<i>Mirounga leonina</i>	Least Concern	Vulnerable	Not listed in WA
Loggerhead Turtle	<i>Caretta</i>	Vulnerable	Endangered	Endangered
Leatherback Turtle	<i>Dermochelys coriacea</i>	Vulnerable	Endangered	Rare or likely to become extinct
Green Turtle	<i>Chelonia mydas</i>	Endangered	Vulnerable	Vulnerable
Flatback Turtle	<i>Natator depressus</i>	Data deficient	Vulnerable	Vulnerable
Australian Fairy Tern	<i>Sternula nereis</i>	Vulnerable	Vulnerable	Vulnerable
Little Penguin	<i>Eudyptula minor</i>	Least Concern	Listed marine species	Listed marine species
Blue Petrel	<i>Halobaena caerulea</i>	Least Concern	Vulnerable	Not listed in WA
Southern Giant Petrel	<i>Macronectes giganteus</i>	Least Concern	Endangered	Not listed in WA
Soft-plumaged Petrel	<i>Pterodroma mollis</i>	Least Concern	Vulnerable	Not listed in WA
Wandering albatross	<i>Diomedea exulans</i>	Vulnerable	Vulnerable	Vulnerable
Black-browed Albatross	<i>Thalassarche melanophris</i>	Near threatened	Vulnerable	Endangered
Grey-headed Albatross	<i>Thalassarche chrysostoma</i>	Endangered	Endangered	Vulnerable

Species common name	Species scientific name	IUCN Status	Commonwealth status	State/Territory status
Shy Albatross	<i>Thalassarche cauta</i>	Near threatened	Vulnerable	Not listed in WA
Indian Yellow-nosed Albatross	<i>Thalassarche carteri</i>	Endangered	Vulnerable	Endangered
Leafy seadragon	<i>Phycodurus eques</i>	Near threatened	Listed Marine	Listed as P2 – priority flora and fauna

Elasmobranchs

Listed ETP elasmobranch species on the West Coast and South Coast of Western Australia primarily consist of large sharks (>2m). The only reported interactions with these species, has been sharks attacking divers. During 2008 to 2015, three interactions involving Great White Sharks were reported. Overall the threat to the diver is greater than the threat to the shark.

Whale Sharks are very large and conspicuous species, which are infrequently sighted off the west coast. During these rare occurrences, it would be unusual for a whale shark to venture into shallow water *H. roei* fishing grounds. The most commonly encountered elasmobranch species are wobbegongs, which are not listed as an ETP species in international, national or state legislation.

Cetaceans and Seals

The AMF primarily operates in areas inshore from the major whale migration routes on the West and South coasts. Whales are known to occasionally come inshore into waters where abalone fishing occurs. The greatest threat to whales is the possibility of a boat strike, however, the small size and high maneuverability of the vessels used in the AMF, minimises the probability of this occurring. The potential threat of a whale getting entangled in a hookah air hose is considered negligible, due to minimal slack, short overall hose length and the brief time periods lines are in the water. Although the humpback whale population which visits the Western Australian coast is listed as 'vulnerable' under the EPBC Act, it has been estimated that the population has recovered to 90% of the pre-whaling level (Bejder *et al.* 2015).

Dolphins are frequently seen in inshore waters where abalone fishing occurs. The threat to dolphins from boat strike from vessels operating in the AMF is no greater than any other boat user. As highly agile and intelligent animals, commonly sighted in high boat traffic estuarine environments, the threat of an AMF vessel striking a dolphin would be extremely unlikely. This rationale extends to seals and sea lions.

Turtles

There are four species of marine turtle known to occasionally enter waters where the AMF operates. These occurrences are exceptionally rare. Any threat of AMF activities to turtles is restricted to the potential entanglement with hookah air hoses and boat strikes. The probability of either of these

scenarios occurring is extremely low, due to minimal overlap between turtle distribution and AMF fishing grounds and the relatively benign activities of the AMF.

Birds

The birds listed in federal and state legislation for protection, found on the West Coast and South Coast regions, are mostly seabirds from the order Procellariiformes. Comprising of albatrosses and petrels, these birds are typically found in the open ocean. The lack of lines, hooks or other gear that may entangle or snare birds ensures that the activities of the AMF are of negligible threat to bird species.

Little Penguin colonies are found in several locations across the west and south coasts. The largest known colony is at the Shoalwater Islands Marine Park. Commercial abalone fishing is permitted in the General Use Zone of the Shoalwater Island Marine Park, which is in close proximity to Penguin Island, where the colony resides. The AMF is not considered a unique threat to the penguins, with 8 knot speed limits in set zones and reporting of any incidence applicable to all users (Department of Environment and Conservation 2007).

Leafy Seadragon

The leafy seadragon, *Phycodurus eques*, is found in the same habitats as the AMF operates, however, is under no threat from the fishery. The rationale for this view is that the fishery only takes abalone, and fishing operations are targeted and relatively passive.

Habitat Impacts

Overview

The most commonly encountered habitats in the AMF include rocky reefs, macroalgae, seagrass beds, sponge gardens and corals. All three abalone species reside on rocky reefs. *H. roei* is predominantly found near the low-tide mark on limestone rock platforms in wave swept areas at high densities on the west coast. *H. laevis* congregate on the edge of reefs and boulders near sand or seagrass beds. *H. conicopora* is found in subtidal areas similar to *H. laevis*, preferring crevices (Edgar 1997). These rocky reef habitats are generally associated with macroalgae, which requires hard substrata for anchorage. The most common species of macroalgae on the west and south coasts is common kelp (*Ecklonia radiata*). *E. radiata* is found just below the low tide mark in protected waters and is the deepest growing of the large macroalgae, reaching depths of 44 m (Edgar 1997). Abalone generally do not inhabit seagrass beds, and avoid sandy substrates, hence divers generally preclude these areas. Sponge and coral gardens are found in the general vicinity of abalone habitat, but are not targeted by divers.

All three abalone species are patchily distributed, resulting in fishing effort concentrated in select areas. These attributes combined with small fleet size, catch restrictions, and remoteness / inaccessibility of many locations, results in large expanses of habitat being exempt from the potential pressures of abalone fishing.

The greatest potential threat from the AMF to habitats is physical damage inflicted by divers. Abalone fishing is highly selective, with minimal damage incurred to the surrounding habitat through the prying of abalone off rocks with an abalone “iron”. When targeting *H. roei*, divers occasionally anchor themselves to bare limestone reef and walk across reef platforms. The potential for such activities to profoundly damage these habitats is considered minimal due to the high energy and resilience of these dynamic environments. For *H. laevigata* and *H. conicopora* diving occurs at greater depths, reducing the need for anchorage or traversing across reef platforms. Although there is potential for divers to damage fragile habitats, this is generally avoided by the divers remaining neutrally buoyant to conserve time and energy.

As indicated in the secondary species section, the taxa found on the backs of abalone shells predominantly consist of coralline algae, small invertebrates and sponges. At the population level it is believed that the removal of such taxa would have a negligible impact. However, at the individual reef level, the removal of these microhabitats could potentially have an influence on habitat complexity. This theory was investigated by Zeeman *et al.* (2013) looking at *Haliotis midae* populations in South Africa. The study revealed that the shells of *H. midae* consistently supported communities of coralline algae that were different to those on adjacent rocks. Although the rock substratum supported greater species diversity, the abalone shells provided unique microhabitats for some coralline algae species, particularly for medium aged abalone. Given that there are substantial areas of habitat unfished by the AMF, such effects would most likely be localized.

Vulnerable Marine Ecosystems (VME)

There are no Vulnerable Marine Ecosystems as defined by the MSC Standard V2.0 (GSA3.13.3.2) that have the potential to be impacted upon by the UoA.

Marine Protected Areas

A series of Marine Protected Areas (MPAs) have been established in Western Australia. The MPAs within the UoA are the Jurien Bay, Marmion, Ngari Capes and Shoalwater Islands Marine Parks, and the Rottnest Island Marine Reserve. Fish Habitat Protection Areas (FHPA) have also been established at Cottesloe Reef, Kalbarri Blue Holes and Lancelin Island Lagoon. Within the MPAs are various zones, as follows:

- Sanctuary zones: managed solely for nature conservation and low impact recreation and tourism. Passive recreational activities that do not compromise the ecological values are permitted but extractive activities are not;
- Special purpose zones: managed for a particular conservation purpose and / or priority use, such as protection of cultural heritage, seasonal events (e.g. whale breeding) or a particular type of activity, such as pearling. Uses that are not compatible with the specified conservation purpose are not permitted;
- Recreational zones: provide for conservation and compatible recreational activities. Commercial fishing, pearling, aquaculture and petroleum development is not permitted; and
- General use zones: activities (including commercial and recreational fishing) may be permitted where it is considered they do not compromise the cultural and ecological values

of the marine park. In some areas, proposals for activities must be assessed and approved by relevant agencies.

Ecosystem Impacts

Abalone ecological interactions occur through several mechanisms, including: feeding, competition, commensalism, predation and parasitism. Predator pressure varies with abalone life stage, with small abalone vulnerable to fish, crabs, starfish, octopus, lobster, rays and carnivorous gastropods (McClatchie *et al.* 2006). As an abalone develops, its main defense mechanism shifts from crypsis to a reliance on its thick protective shell and strong muscular foot, enabling them to adhere to rocky substrates. The main predators of adult abalone consist of large fish species, Port Jackson sharks and octopus. Abalone shells are also frequently bored by whelks that then feed on the foot muscle. In addition, boring polychaetes erode shells causing detrimental impacts on the health and growth of abalone (McDiarmid *et al.* 2004). There are no known species reliant on abalone (Jenkins 2004).

Post-larvae and juvenile abalone graze on coralline algae and associated biofilms of diatoms and bacteria upon settling from the water column to the benthos (Daume 2006). Abalone settlement is induced by the presence of non-geniculate coralline algae. Settlement rates are in turn dependent on the species of coralline algae present and is abalone species-specific (Daume *et al.* 1999; Roberts 2001). Once established, abalone diets alter to include a broad range of drift algae. As consumers of drift algae, abalone play a generally minor role in the structuring or performance of their ecological communities (Hart *et al.* 2013b). Once established abalone mostly remain within their immediate habitat range (<200 m) and conduct small -scale migrations relative to swell direction and food availability (Huchette *et al.* 2000).

The direct and indirect ecological impacts of the AMF have not been explicitly investigated in Western Australia. However, available information from other Australian states provides a solid basis for comparison. For instance, Hamer *et al.* (2010) investigated the ecological role of abalone in Victoria. This study found that unfished abalone aggregations were characterised by very stable, low diversity epibenthic communities, generally dominated by species of encrusting red algae. The fished sites showed a shift in the benthic community structure towards more structurally complex and diverse algal and invertebrate species. Thus, concluding that abalone play a role, albeit at a very local-scale (scale of aggregations), in limiting the overgrowth of encrusting red algae by other algae and invertebrate species (Hamer *et al.* 2010) and therefore enhancing settlement for abalone larvae (Daume *et al.* 1997; 1999).

A review by Jenkins (2004) on the ecosystem effects of abalone fishing concluded that the relevant impact of abalone fishing on ecosystem health was comparatively benign to trawling and dredging, with no issues of bycatch or discards. The trophic impact of the removal of abalone was also not considered to be great, with the most profound potential impact concerning competitive interactions for space.

Translocation Impacts

The greatest threat to the wild population from translocation is the development and spread of disease from a land-based hatchery. Of particular concern is the Abalone viral ganglioneuritis (AVG). AVG decimated wild abalone populations in Victoria during 2005, and although the source of the virus is unknown, early investigations concluded that the most likely source was the introduction of live wild abalone onto an abalone farm (Gavine *et al.* 2009). At present, there is a single abalone hatchery growing *H. laevigata* in Bremer Bay on the south coast. This hatchery supplies seedstock for an abalone sea ranch in Flinders Bay, Augusta. To minimize the development and potential spread of disease at and from the hatchery, protocols have been established to manage broodstock and hatchery operations, including the division of the farm into five physically separate facilities:

- Broodstock holding facility – in which wild caught broodstock are kept separate to minimise the risk of introducing disease. This facility has its own water supply and there is no discharge, with waste water directed to a sand infiltration gallery.
- Nursery facility– houses stock from settlement to juvenile stage.
- Weaning facility - which house abalone from 6 months to 1.5 years old.
- Growout facility - which holds stock until they are marketable size.
- Quarantine holding facility – consists of a deep tank, where abalone are held for two weeks before being exported off site.

Translocation of juvenile abalone from the land-based farm site to the sea-ranch occurs frequently. The ranch consists of 5,000 specially constructed concrete structures and is positioned on sandy substrate near seagrass beds, away from natural abalone reef habitat. The ranch abalone feed on available drift algae and are not provided with any supplementary food items. To minimize potential impacts, such as the spreading of diseases or pests to wild populations, the ranch must conform to a variety of licence conditions and measures detailed in their Management and Environmental Monitoring Plan (MEMP), such as:

- All received stock must be accompanied by a health certificate.
- Prior to the release of stock from the transport vessel, all stock are thoroughly examined for signs of disease.
- All equipment used to collect and transport stock, including dive equipment are required to be cleaned and disinfected.
- The number of artificial structures is limited to 5000 on the ranch.
- The stocking densities on the sea ranch are restricted to a biomass of three kilograms per square meter of artificial surface.
- Abalone stocked in the ranch are inspected regularly, typically on at least a weekly basis, as per the license conditions and a record maintained of all inspections.
- On a quarterly basis random abalone from the ranch are selected and delivered to the Fish Health unit for routine disease testing.

- Biosecurity protocols including incident and emergency response procedures if disease is detected.

3.5 Principle Three: Management System Background

Area of Operation and Relevant Jurisdictions

The Western Australian Commercial Abalone Managed Fishery (AMF) is a dive fishery using hand collection harvesting, operating in shallow coastal waters along the entire coastline of WA. The AMF is divided into eight management areas (Figure 4) and three management zones (Figure 5) that stretch across the Southern Ocean, Indian Ocean and Timor Sea, covering all WA coastal waters between the Northern Territory and South Australian border. Although the area of the fishery is extensive, only a small proportion of this area forms the functional fishery. Greenlip and brownlip abalone are caught primarily on the south coast of WA (Areas 1, 2 and 3), whilst Roe's abalone are most abundant on the south-west coast (Areas 6 and 7) (Hart *et al.* 2016). The AMF falls under a single jurisdiction that is managed and governed by the Western Australian Government.

The fishery has a significant recreational fishery component that is primarily based on the Roe's abalone operating out of Area 7 in close proximity to the Perth metropolitan northern suburbs. The recreational take of Roe's abalone represents 41% of the total catch of Roe's abalone from WA waters (15–25 tonnes in the metropolitan area and 14 tonnes in the remainder of the state) (Hart *et al.* 2015a). The recreational take of greenlip and brownlip abalone off the southern coast is much smaller at around 8 tonnes, which represents approximately 3–4 % of the total catch of these two species (Hart *et al.* 2015b).

There is evidence available that indicates Indigenous people have traditionally taken abalone for food and continue to do so (DoF 2005). Although, there is no quantitative information available, customary catches of abalone are likely to be negligible relative to the commercial and recreational sectors.



Figure 4. Eight management areas of the Western Australian Commercial Abalone Fishery (Source: Hart *et al.* 2016).



Figure 5. Three management Zones of the Western Australian Commercial Abalone Fishery (Source: DoF 2016).

National Level Management

There are three different statutory entities responsible for the control and management of fisheries within Australian waters off the coast of WA, they are:

- Commonwealth Australian Fisheries Management Authority (AFMA);
- Western Australian State Fisheries Joint Authority; and
- Western Australian Department of Fisheries (DoF).

The AMF is a State based fishery (operating solely in State based waters) and falls under the jurisdiction of the State and the DoF.

The Minister/DoF is responsible for the sustainable development and management of the State's aquatic resources, fisheries and aquaculture in accordance with its governing legislation. The Minister is responsible for making executive management decisions and has legislative power regarding fisheries and aquaculture within the State. The Chief Executive Officer (CEO) (or Director General) of DoF (and the DoF generally), has the responsibility of administration of management arrangements.

The DoF is governed by the *Public Sector Management Act 1994* and is required to provide an Annual Report to Parliament. This report includes a performance evaluation against a set of 'effectiveness' and 'efficiency' Key Performance Indicators (KPIs). The assessment against the effectiveness KPIs shows the extent to which the DoF has achieved its goal of conserving and sustainably developing the State's aquatic resources. The DoF's operations are guided by a Strategic Plan 2016–2020, which sets out explicit long-term objectives in three main areas:

- community and stakeholder benefits;
- sustainability; and
- management excellence.

The DoF provides management, licensing, research, 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 DoF 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 DoF also provides a marine safety service on behalf of the Department of Transport.

Below is an overview of the overarching management and governance of the commercial and recreational abalone fisheries.

Commercial Management System

The AMF is managed by the DoF under the following legislation:

- Fish Resources Management Act 1994 (FRMA);
 - FRMA Part 6 — Abalone Fishery Management Plan 1992 (the Management Plan);
 - FRMA Statement of Determination;
 - FRMA Section 7 Exemptions;
 - FRMA Section 43 Orders.
- Fish Resources Management Regulations 1995 (FRMR).
-
- Fishers must also comply with the requirements of the:
 - Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act);
 - WA Marine Act 1982;
 - WA Wildlife Conservation Act 1950; and
 - Conservation and Land Management Act 1984 (CALM Act).
-

Fish Resources Management Act 1994 (FRMA)

The FRMA is the primary instrument for fisheries management in WA and provides for the overarching legislative framework for the creation and implementation of subsidiary legislation, in the form of Regulations (i.e. FRMR), Orders, Management Plans, Ministerial Policy Guidelines and Policy Statements for all fisheries and aquaculture in WA.

The FRMA deals with broad principles and the provision of head powers and high-level overarching matters, while the FRMR and other subsidiary legislation deals with the details needed to put these matters into practice. Parts 5 and 6 of the FRMA set out the general regulation of fisheries through the use of orders and regulations and the specific management of fisheries via the declaration or creation/amendment of fisheries management plans. Fishery management plans in WA set out the operational rules (e.g. limited entry, fishing areas, gears, etc.) that control managed commercial fishing activities.

The FRMA specifies the long-term objectives of DoF and how these are to be achieved. The objectives of FRMA are:

- To develop and manage fisheries and aquaculture in a sustainable way; and

- To share and conserve the State's fish and other aquatic resources and their habitats for the benefit of present and future generations.
- These objects will be achieved by the following:
 - Conserving fish and protecting their environment;
 - 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;
 - Enabling the management of fishing, aquaculture, tourism that is reliant on fishing, aquatic eco-tourism and associated non-extractive activities that are reliant on fish and the aquatic environment;
 - Fostering the sustainable development of commercial and recreational fishing and aquaculture, including the establishment and management of aquaculture facilities for community or commercial purposes;
 - Achieving the optimum economic, social and other benefits from the use of fish resources;
 - 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;
 - Providing for the control of foreign interests in fishing, aquaculture and associated industries;
 - Enabling the management of fish habitat protection areas and the Abrolhos Islands reserve.

The DoF, as directed by the Minister, have recently drafted the *Aquatic Resource Management Act* (ARMA), this is likely to replace the FRMA once approved and passed through parliament. The ARMA, while covering all the current FRMA elements, has been developed to more explicitly reflect the DoF's objective of ensuring the sustainable development and conservation of the state's aquatic resources into the future and is based on the principles of Ecologically Sustainable Development and Ecosystem Based Fisheries Management. The ARMA aims to have sustainability as the priority focus and move from managing individual commercial fisheries to managing aquatic resources. As an example, the ARMA will provide for transparent and well- defined allocations of the total allowable catch between the commercial and recreational sectors after setting aside the quantity of the resource required for sustainability and public benefit purposes such as fisheries research and customary fishing. The ARMA is currently before parliament as the Aquatic Resource Management Bill 2015¹, and is expected to come into law in 2018.

Fish Resources Management Regulations

¹<http://www.parliament.wa.gov.au/parliament/bills.nsf/BillProgressPopup?openForm&ParentUNID=1D103914B411A4CF48257DF6001BBD6B>

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, detailing retained species catches, fishing effort, interactions with ETPs and fishing location. The FRMR also specifies the minimum size limits for certain finfish, crustacean and mollusc species.

Policies

The objectives for fisheries and aquatic resources are set out in the WA Government's Fisheries Policy Statement (DoF 2012a). These policies include:

- *Harvest Strategy Policy for the Aquatic Resources of Western Australia* (DoF 2015): outlines the main requirements of an effective harvest strategy (i.e., operational objectives, performance indicators, reference levels and harvest control rules) as well as sectoral allocation and the development of strategies for dealing with unacceptable risks to other ecological resources. This policy is consistent with the National Harvest Strategy Guidelines (Sloan *et al.* 2014).
- *Aquatic Biodiversity Policy*: describes the DoF's role, responsibilities and jurisdiction in the management of the State's aquatic biodiversity. The policy focuses on five key asset areas (retained fish species; non-retained fish species; endangered, threatened and protected species; fish habitats and ecosystem processes) and seven key threats imposed upon these asset areas (habitat loss, invasive pests, unsustainable harvest, external drivers, lack of information, governance and cumulative impacts).

Integrated Fisheries Management

Integrated Fisheries Management (IFM) considers the aggregate effects of all fishing sectors. IFM develops explicit resource allocations and/or re-allocations to each specific sector using a formal and structured allocation process facilitated by an independent body (the Integrated Fisheries Advisory Allocation Committee (IFAAC)). The DoF has completed an IFM for western rock lobster, metropolitan abalone fisheries (IFAAC, 2009) and the West Coast Demersal Scalefish Fishery.

IFM uses a framework in which decisions on optimum resource use are determined and implemented within a total sustainable catch for each fishery or resource. The IFM involves:

- Setting a total allowable harvest level of each resource that allows for an ecologically-sustainable level of fishing;
- Allocation of explicit proportional catch shares for use by the commercial and recreational sectors (after taking into account customary fishing);
- Continual monitoring of commercial and recreational catches;
- Managing each sector within its allocated catch share; and
- Developing mechanisms to enable the reallocation of catch shares between sectors.

In 2005, a formal allocation process was initiated to define and assign long-term sectoral shares (DoF 2005). Based on historical catch data, the IFAAC recommended that allocations should only consider Roe's abalone in the Perth metropolitan area due to its high relative importance within the overall

recreational abalone fishery and the availability of recreational catch information from this area (IFAAC 2009).

Under the IFM, an overall annual sustainable harvest level (SHL) is set and used to recommend catch levels for each sector. However, for abalone, IFAAC did not recommend an immediate introduction of proportional management of Roe's abalone within an overall SHL due to limited data and understanding of the relationship between abalone on the platform and subtidal habitats (IFAAC 2009). As a result, recreational catch of Roe's abalone in the Perth metropolitan area has been managed to an average annual catch target of 40 tonnes in conjunction with the commercial long-term SHL of 36 tonnes. Subject to recent concerns over environmental impacts on Roe's abalone stocks in this region, daily bag limits were reduced in 2014 so that metropolitan recreational catches are managed to a catch target of 20 tonnes.

Customary Fishing in WA

The FRMA recognizes, and contains powers to legislate and manage, the rights of Aboriginal persons to fish for a customary purpose and is defined as:

"fishing by an Aboriginal person that – a) is in accordance with the Aboriginal customary law and tradition of the area being fished; and b) is for the purpose of satisfying personal, domestic, ceremonial, educational or non-commercial communal needs."

Customary fishing by Aboriginal persons is permitted without a license, provided that it is not for commercial purposes.

In 2009, the DoF developed the Customary Fishing Policy position statement, which states explicitly that customary fishing will be clearly separated from all other forms of fishing in legislation and policy so that appropriate management arrangements for access rights, practices and sustainability requirements can be developed. The policy further states that *"customary fishing applies, within a sustainable fisheries management framework, to persons:*

- of Aboriginal descent;
- fishing in accordance with the traditional law or custom of the area being fished; and
- fishing for the purpose of satisfying personal, domestic, ceremonial, education or non-commercial communal needs."

These arrangements are expected to be maintained and strengthened under the ARMA, which will set out a resource allocation for customary fishing and public benefit purposes. Customary fishing will be able to continue in accordance with existing customary fishing arrangements. IFM also recognises the rights of customary fishers.

Ecosystem Management

The roles and responsibilities of the Commonwealth Government regarding ecological sustainability and conservation of marine resources in WA are clearly set out in the *EPBC Act* as well as in the *OCS*

1995 in relation to the management of fisheries outside the three nautical mile state-waters boundary.

Ecologically Sustainable Development

In accordance with international treaties and initiatives, the Australian Government is committed to implementing the principles of Ecologically-Sustainable Development (ESD).

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

The Commonwealth Department of the Environment (DoE) is responsible for acting on international obligations on a national level. The EPBC Act requires the Australian Government to assess the environmental performance of fisheries. For WA State-managed fisheries, an independent assessment of a fishery in accordance with the EPBC Act is required for export (wildlife trade operation) approval.

Ecosystem Based Fisheries Management (EBFM)

Since 2010, the DoF has implemented EBFM as the primary strategy/policy to achieve sustainable fisheries and ecosystem management in WA. This framework is based on the global standard for risk assessment and risk management (AS/NZS ISO 31000). Within the EBFM framework, WA has been divided into six aquatic bioregions, with a high-level set of ecological resources. The risks associated with each individual ecological resource are examined separately using formal qualitative risk assessment. Risk levels are then used as key input in the DoF Risk Register, which combined with the assessment of the economic and social values and risk associated with these assets, is an integral part of the annual planning cycle for assigning activity priorities that are captured in Fish Plan and a five-year research plan.

Risk Assessments

The DoF uses a risk-based framework that assesses the impacts of an individual fishery on target species, bycatch (both retained and discarded), ETP species, habitats, and any potential indirect impacts on the broader ecosystem.

Resolution of Disputes

The DoF resolves disputes through both informal and well established mechanisms. Informal mechanisms involve significant educative role carried out by Fisheries and Marine Officers and other Departmental staff, as well as through ongoing communication and consultation with WAFIC and sectoral bodies. The Department has dedicated community education officers in each of the regions.

The more structured and well established mechanisms to resolve disputes such as administrative and legal disputes in relation to fisheries, is through the WA State Administrative Tribunal (SAT) or WA court system. Dispute resolution for administrative decisions made under the *FRMA* is provided for in Part 14 via appeal to the SAT. Criminal offences are dealt with by the Magistrates Courts. Decisions of the SAT and the Courts are binding on the DoF, and all SAT decisions must be carried out by the DoF under the State Administrative Tribunal Act 2004. Fishers are advised of the

opportunity to lodge an appeal with the SAT following a decision made by the CEO of the DoF. There is evidence that the SAT has been successful in settling disputes for WA fisheries.

Furthermore, there is Parliamentary and public scrutiny of all fisheries legislation given that all changes to existing or new fisheries 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.

Compliance staff working in the field (Fisheries and Marine Officers) are formally appointed pursuant to the *FRMA* and their powers to enforce fisheries legislation, enter and search premises, obtain information and inspect catches are clearly defined. The *FRMA* also sets out legal proceedings for offences, evidentiary provisions, forfeiture of gear and fish, additional penalties and serving of infringement notices.

Fisheries and Marine Officers must be closely familiar with the legislation they are responsible for enforcing, and must follow a strict protocol for undertaking their duties and recording information relating to contacts with commercial and recreational fisheries, infringement warnings, infringement notices and prosecution offences.

Disputes regarding statutory validity are dealt with by the Courts, which test the validity of legislation.

Respect for Rights

Commonwealth legislation, the *Native Title Act 1993* (NT Act), provides the means by which the Australian legal system recognises the traditional rights and interests of Aboriginal and Torres Strait Islander people. This ensures access to fish and shellfish resources for people who depend on fishing for their food.

A 2013 Australian High Court decision related to the application of State fisheries law to native title holders fishing for abalone in South Australia concluded that the State fisheries legislation did not extinguish native title rights to fish and that the defence under the NT Act was applicable.² The DoF has taken the view that due to this ruling, it is likely that the same would apply to WA and therefore any fisheries legislation does not extinguish native title rights to fish where that right is exercised by an Aboriginal person for a traditional, non-commercial purpose.

A key aspect of the NT Act concerns proposed developments or activities that may affect native title are classed as 'future acts'. In 1999, the DoF obtained a 'Report for Fisheries Western Australia' in respect to the interaction between fisheries/pearling legislation and the NT Act. The report advised that:

² <http://www.hcourt.gov.au/assets/publications/judgment-summaries/2013/hca47-2013-11-06.pdf>

- The very wide scope of what can be done under a fishery management plan means that fisheries/pearling do have the potential to affect native title. As a result, a new management plan would be considered a 'future act' for the purpose of the NT Act.
- Because a new management plan would be covered by section 24 HA of the NT Act, it can be validly made without the need for any specific native title notification or comment procedure.
- While specific notification is not required, it would, however, be prudent for comment to be sought from any native title parties likely to be affected by the new management plan under the provisions of the FRMA section 64(2).
- The granting of licences and permits under management plans will not be 'future acts' in their own right, and they can therefore be granted without the need for any native title procedure or notification requirement.

The DoF provides any native title party or parties with an opportunity to comment on the development of a proposed fishery. The Native Title Tribunal facilitates the negotiation of indigenous land use agreements following a claim or determination and is required to keep registers of approved native title claims and determinations. There are a number of native title determinations and applications along the Western Australian coast that include marine waters that overlap with fishing grounds, although these do not impact native title rights.

Consultation

The recognised interest groups for the commercial AMF are:

- DoF
- The AMF Association and Western Australian Fishing Industry Council (WAFIC) representing the interests of commercial fishers
- Recfishwest representing the interests of recreational fishers
- Indigenous groups
- The Department of Parks and Wildlife, Western Australia (DPaW)
- Fish processors, retailers and consumers
- Non-government Organisations, conservation groups
- The wider community.

The Western Australian Minister for Fisheries and DoF are responsible for advising licensees, WAFIC and Recfishwest of Ministerial/Departmental decisions that are the subject of a consultation process.

The Minister/Department is also responsible for ensuring that the recreational fishing sector, through Recfishwest, is formally consulted on 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 of the WCRLF, respectively (Hart, et.al. 2016). The Department or Minister may seek and provide advice directly through peak bodies (WAFIC and Recfishwest) and/or sector associations.

The DoF and WA Government commitment to consultation and engagement with stakeholders is delivered through a range of mechanisms that include established codified instruments and policies, and traditional informal processes that are consistently applied and continually utilized by DoF. Consultation and engagement commitments are set out in the Western Australian Government's Fisheries Policy Statement of 2012. The management system and legislation of fisheries in WA has effective codified consultation processes with stakeholders who are clearly identified in the DoF Annual Report and include commercial, recreational and customary fishers, pearling and aquaculture industries, charter fishing operators, fish processors, environmental groups, businesses and communities directly and indirectly dependent upon fishing, offshore industries and other state, national and international government agencies and tertiary institutions.

All stakeholders have the ability to also informally engage and input into fisheries matters throughout the entire year, with access to both the DoF, managers, researchers, compliance officers as well as the Minister for fisheries. This engagement usually involves communication on topics important to stakeholders through submission of letters or in person communication. All stakeholder engagement is promptly dealt with by DoF directly with clear responses provided in timely fashion to the stakeholder.

To broaden and better define opportunities for stakeholder engagement, the Department has developed a Stakeholder Engagement Guideline (DoF 2016a) to ensure that all stakeholders (including non-fisher stakeholders and interested parties) are provided with opportunities to be involved (Figure 6).

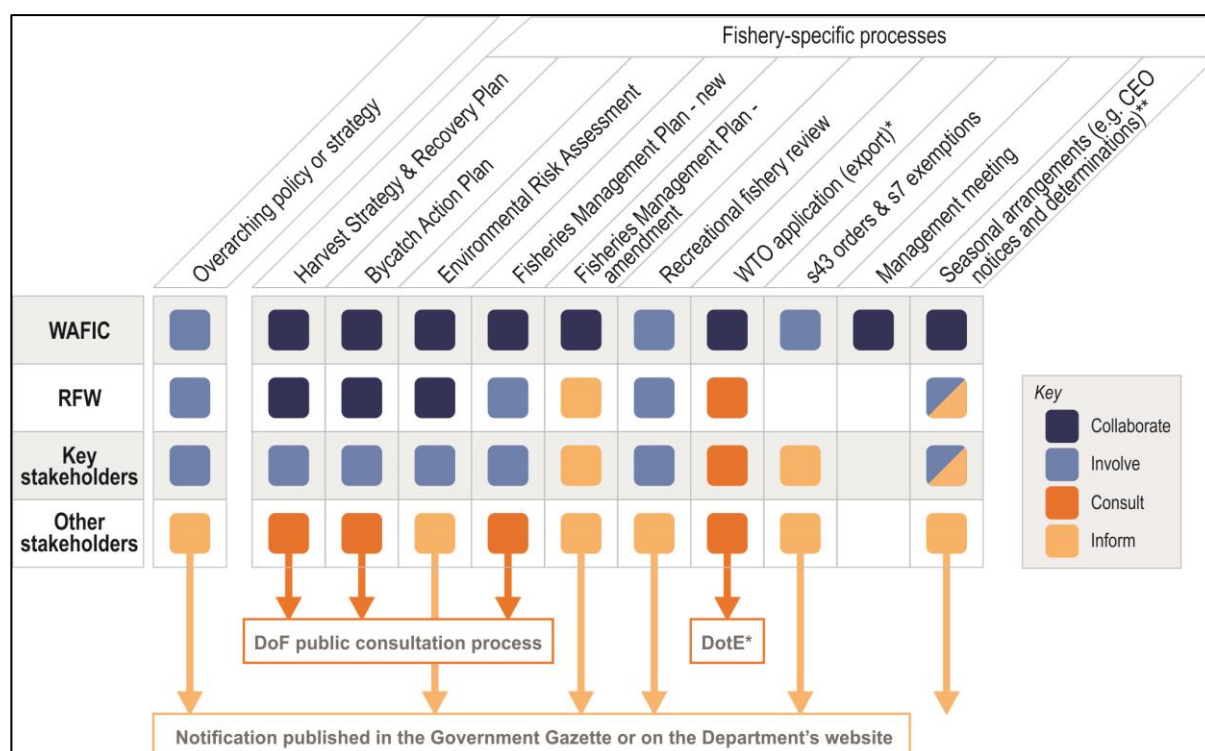


Figure 6. Levels of stakeholder engagement for each stakeholder group and for each of a number of key processes associated with the management of the State's fisheries and aquatic resources (source: DoF 2016a).

Consultation Processes

The WA Government's commitment to consultation with stakeholders is set out in the WA Government's Fisheries Policy Statement (Figure 6). The current framework ensures that decisions are made only after all available relevant information (including local knowledge) is sought out and considered. As the recognised peak bodies for commercial and recreational fishing in WA, and each acting in accordance with the relevant SLA with the Department, WAFIC and RFW are responsible for providing effective professional representation of commercial and recreational fishing views and interests on matters referred to it by the Minister or Department. There are quarterly meetings held between the Director General of DoF, WAFIC CEO and RFW CEO. Importantly, all stakeholders have the opportunity to play a role in the management process of fisheries through direct contact with the DoF, contact with the relevant sector Association or, in the case of compliance issues, by reporting any illegal fishing to FISHWATCH

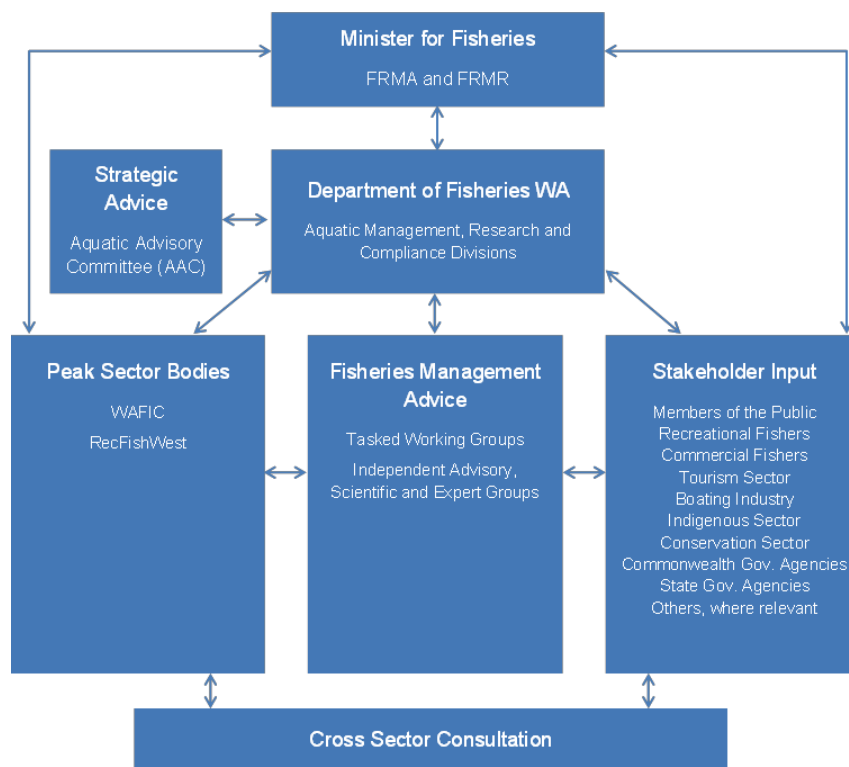


Figure 7. Broad fisheries management consultation framework in WA (Source: DoF 2016).

An example of the efficacy of this arrangement is the consultation process undertaken by RFW in relation to the proposed reform of state-wide recreational fishing rules in 2012 as outlined in Fisheries Management Paper 252. RFW completed a consultation report (available on request) which summarized the process and outcomes for consideration by the Department. The consultation process included visiting regional locations such as Albany, Broome, Carnarvon, Denham, Derby, Esperance, Exmouth and Karratha, as well as holding information sessions at several metropolitan locations, allowing RFW to connect with anglers all over the state. RFW also conducted an online

survey and produced a “Have your say” document to encourage involvement and seek input. A total of 996 submissions were received, including 850 via the online survey. A follow-up survey was coordinated by RFW in early 2014 to record how changes to fishing rules implemented in February 2013 have affected angler’s experiences. RFW received 943 responses to this survey from a range of regions that closely resembles the distribution of Recreational Fishing from Boat Licence (RFBL) holders throughout the state. The results supported the changes made by the Department.

Participation

DoF works closely with national, state and regional partners and other stakeholders in every aspect of its business and provides opportunities for involvement through a number of different processes. These include meeting directly with stakeholders in such forums as:

- Annual Management Meetings (AMM);
- Bi-monthly meeting between the CEO of the Department and the WAFIC CEOs;
- Meeting with members of the Ministerial Whale Entanglement Taskforce;
- Non-extractive stakeholder briefing and meeting held on 17 November 2015; and
- Stakeholder Forum Meetings with the CEO of the Department, WAFIC and Recfishwest.
-

Roles and Responsibilities

The roles and responsibilities of all organisations (e.g. Department of the Environment, DoF, WAFIC, RFW, etc.) and individuals (e.g. Minister for Fisheries) involved in management processes are well understood with key powers explicitly defined in legislation (e.g. FRMA) or relevant policy statements and agreements.

There are several established instruments that explicitly outline the roles and responsibilities of all key parties involved in management of the States fisheries, these are: the FRMA, the OCS 1995 and the Western Australian Government Fisheries Policy Statement (March 2012). The FRMA provides a division of power between the Minister for Fisheries and the statutory office of the DoF’s CEO such as, it is the Minister for Fisheries who establishes legal and policy framework for fisheries management in line with consultation processes, while the DoF’s CEO (and staff) carries out the day-to-day administration of these frameworks.

The DoF is structured around clearly defined divisions with specific roles relating to aquatic management, research and regional services (compliance and licensing). The roles and responsibilities of each of these areas is spelt out in the DoF’s Annual Report to Parliament.

The government is responsible for advising and formally consulting with licensees, WAFIC and RFW of government decisions that are the subject to consultation process regarding fisheries management (e.g., proposed changes, new plans, fishing areas, etc.). The Department is responsible for providing RFW with a proportion of the income generated from annual recreational fishing licence fees to undertake its role as the peak body representing recreational fishing interests in WA.

Responsibilities of the DoF in formal consultation arrangements with peak sector bodies are clearly defined. WAFIC, RFW are formally recognized by the government as the key sources of coordinated industry advice for the commercial and recreational sectors, respectively. Both WAFIC and RFW operate under a Service Level Agreement with the DoF.

- Western Australian Fishing Industry Council (WAFIC)

WAFIC is the peak industry body representing professional fishing, pearling and aquaculture enterprises, as well as processors and exporters. WAFIC is an incorporated association that was created by 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 aims to secure a sustainable industry that is confident of:

- Resource sustainability and security of access to a fair share of the resource;
- Cost-effective fisheries management;
- That its business can be operated in a safe, environmentally-responsible and profitable way; and
- That investment in industry research and development is valued and promoted.

WAFIC Responsibilities include:

- Coordinating Government funding for industry representation;
- Taking on a leadership role for matters that involve, impact on, or across a number of fisheries or are of an industry-wide or generic nature;
- Representing commercial fishing sectors that do not have capability for self-representation;
- Providing effective professional representation of commercial fishing interests and the commercial fishing sector to Government, industry, other relevant organisations and the community. This includes engaging, facilitating and consulting, as necessary in order to meet this responsibility;
- Providing representation of commercial fishing interests on fisheries management and Ministerial committees, as required;
- Documenting priority issues for commercial fishing interests each year (by 30 March) to the Department;
- Providing feedback to the Department on proposed deliverables and budget priorities for expenditure of the Fisheries Research and Development account;
- Engaging with RFW and other appropriate parties with a view to identifying joint priorities and solutions to issues of shared concern;
- Engaging in promotion, education and awareness of key sustainability messages consistent with best practice fisheries management and objects of the FRMA; and
- Conducting agreed activities that are consistent with the FRMA as it relates to the provision of assistance to, or promotion of, the fishing industry (i.e. s238(5)(1) of the FRMA). WAFIC's

responsibilities for consultation services are clearly outlined in a Service Level Agreement (SLA) with the Department.

WAFIC roles and responsibilities are clear and have a close working relationship. The close partnership between DoF, WAFIC enables them to perform the above roles with the aid of a number of established and well-recognised processes designed to constantly scan the environment (in its broad sense) for issues that can and do affect the management system. In particular the National Ecologically Sustainable Development (ESD) Reporting framework, ecological risk assessments (ERA), expert-based groups such as the Sea Lion Scientific Reference Group (SLSRG), the Effects of Fishing Advisory Group (EFAG), Whale Entanglement Taskforce (WET) and stock assessment and modelling workshops and reviews are used to provide advice to Government, Department and stakeholders on the risks posed by fishing the stock and more broadly the ecosystem and to recommend strategies to mitigate those risks or research to investigate them.

■ RecFishWest (RFW)

RFW is responsible for representation of recreational fishing interests. RFW key deliverables include:

- Provide recreational fishing representation, consultation and engagement;
- Provide peak body advice;
- Promote key sustainability messages; and,
- Project management.

Similar to the funding model for WAFIC, RFW receives 15% of the revenue raised from recreational fishing licence fees.

Licensees / Sector Associations

All fishery licence holders have a responsibility to inform themselves of the fisheries legislation that relates to their activities. DoF helps licence holders in this matter by explicitly reminding them in writing of where they can access the latest legislation. The following information can be found on every licence:

“Fisheries legislation changes from time to time. To assist fishers, aquaculturists and members of the public to access fisheries legislation, the Chief Executive Officer has arranged for up to date fisheries legislation to be made available on the internet. Fisheries legislation may be viewed by logging on to the Department of fisheries website (www.fish.wa.gov.au) and clicking on the Legislation link on the top of the home page. The Chief Executive Officer recommends that the licence holders and persons acting on their behalf (e.g. employees), regularly access this legislation service and make themselves aware of the fisheries legislation that relates to their activities.”

Fishery-Specific Management

Operational Objectives

Long-term management objectives are operationalised as short-term (e.g. annual) fishery-specific objectives through performance indicators that can be measured and assessed against pre-defined reference levels to ascertain actual performance. Within the context of the long-term objectives provided above, each fishery (commercial and recreational) has operational objectives to maintain each resource / component above the threshold level (and, where relevant, close to the target level), or rebuild the resource if it has fallen below the threshold or the limit levels (DoF 2016).

Fleet and access rights

There are currently 52 managed fishery licences in the AMF, with 29 licences endorsed to take Roe's abalone and 23 and 24 endorsed to take either greenlip and brownlip abalone respectively. There are 30 vessels used in the AMF; 12 of which target all three abalone species, 10 targeting only Roe's abalone and eight targeting only greenlip and brownlip abalone. The licence period runs from 1 April–31 March the following year.

The majority of Roe's abalone are caught in Area 7. Ocean Reef is considered the best location with 16 tonnes of Roe's abalone, Hillary's with 8 tonnes of Roe's abalone and the back of Garden Island producing 12 tonnes of Roe's abalone (Hart *et al.* 2013a).

Greenlip and brownlip abalone may be shucked at sea and packed into saltwater filled containers. However, the shells must be kept in bags and available for inspection until the meat arrives at an approved processor. The catch is weighed and CDRs are completed once catch is landed on shore. This data is important for research and compliance purposes. Abalone are then transported to the processor for weighing, cleaning, and packaging.

Apart from legislated requirements and voluntary measures introduced by industry, the environment and weather plays a significant role in helping manage the fishery and restricting when operators can actually fish, particularly in the south of WA. This results in limited time to fish due to weather, low human population in the south, limited access points along the coast, operating in isolated areas, operating out of small vessels which restricts distance able to be traveled to fishing grounds all resulting in low fishing pressure.

The AMF has a "code of conduct" that was established under agreement rather than a codified document, which all divers adhere to. The majority of divers are lease divers, and there are usually no official contracts or lease arrangements between the diver and the license holder, which means a diver could lose an agreement and employment to fish a license holder's quota entitlement if they are non-compliant with either voluntary industry decisions or legislated requirements. There is very little turnover within the industry, as a result there is a long history across the industry members which is very close-knit. This results in strong and effective self-compliance. Industry members hold meetings in which the fishery and management, as well as sustainability, are discussed. Decisions taken at these meetings are captured in minutes and communicated to industry members as well as

DoF. Once a decision has been agreed and approved at these meetings, it is communicated to the entire industry and becomes a voluntary law which is adhered to by all members. There are severe penalties for any industry member that goes against these passed motions or does wrong by the licence holder. Although these penalties are not legislated, they do, however, have the potential for significant economic impact on any non-compliant member through loss of employment, no available quota offered, and effectively reducing or eliminating their fishing ability. This is self-governed by industry.

The AMF abalone association has now established a public website (www.abalonewa.com.au) that provides information to all stakeholders regarding the fishery.

Decision-Making Processes

There are established decision-making processes in the AMF that result in measures and strategies to achieve the objectives listed above. These processes and the decision making framework, roles and responsibilities are explicit in legislation (e.g. FRMA, Abalone Management Plan 1992) and policy documents (e.g. Fisheries Policy Statement) and are publicly available.

There are two main processes for making decisions about the implementation of management measures and strategies in the AMF:

- Annual decision-making processes that may result in measures to meet the short-term fishery objectives (driven by the annual quota limit control rules contained in the AMF Harvest Strategy); and
- Longer-term decision-making processes that result in new measures and/or strategies to achieve the long-term fishery objectives. These decisions are generally taken by the CEO or 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. Consultation in this case may then be retrospective.

Decision-making processes can also be triggered through the identification of any issues during numerous processes, such as an ERA, results of research, management or compliance projects or investigations, monitoring or assessment outcomes, expert workshops and peer review of aspects of research and management. If an issue is identified, mitigation measures are developed and implemented in consultation with industry. Alternatively, if appropriate, additional research may be undertaken, with research results used to inform management action. A recent example was the decision to completely close Area 8 of the Roe's abalone fishery following the mass mortality event associated with the marine heatwave in 2010/11.

The TACC setting process also involves key stakeholders within the decision making process including information provided by AMF divers, and logbooks. The quota setting process is flexible, with movement of quota allowed downwards after the initial setting process has been completed. However, quota movement upwards is not allowed after the initial setting process is completed. This has allowed industry and DoF to take proactive decision making when required, which allows additional data to be collected and considered in detail throughout the season in real time. An example of this proactive decision making management strategy in practice involved the Perth

metropolitan fishery, where all commercial fishers agreed to only harvest 50% of their individual allowable quota entitlement until additional survey and monitoring data had been collected and fully considered by DoF and industry. This was a voluntary proactive decision taken by fishers.

Further proactive decision making by the industry includes all fishers agreeing to fish well above the legal minimum size limits set by DoF in all zones for all species. This is primarily driven by market and economic forces, however, it is also employed for long term sustainability of the fishery, especially for greenlip abalone in the southern fishery. These proactive measures are usually discussed and agreed upon by industry members as voluntary measures, and then some may become legislated arrangements.

The industry's ability to make proactive real time decisions was also well illustrated when the heatwave hit the north of the fishery during 2010/11. Two weeks prior to the heat wave, DoF increased the quota. When the heat wave hit the coast, industry acted immediately by voluntarily significantly reducing the quota.

There is also an established decision-making process in place to ensure the long-term management objectives are met by considering the longer-term trends in annual fishery performance. Variations in the operating environment caused by other factors (e.g. environmental conditions, market forces, fishing behaviour, conflicts with other user groups, marine planning, etc.) can also trigger an investigation and discussion that may lead to more-permanent changes in the management system. Longer-term changes are often implemented in legislation. This involves a high level of consultation with industry and other stakeholders through a number of mechanisms, including:

- Directly in writing;
- At licensee meetings;
- At internal workshops, e.g. harvest strategy development, compliance risk assessments;
- Through the establishment of a tasked working group; and/or
- As part of external / expert workshops (e.g. ecological risk assessments).

This consultation generally considers options for addressing emerging issues and provide the opportunity for decision-makers to consider all interested stakeholder advice and broader management implications. In 2015, the Scientific Advisory Group (SAG) was formed (consisting of DoF and industry) to facilitate communication on scientific research and development to the wider industry. The SAG provides review mechanism of scientific advice, research and stock assessments. Three formal meetings were held in 2015. The SAG also prepared two research and development funding applications. Research results inform management of changes to the system often in the longer term.

Responsiveness of Processes

There is evidence that the governance system is responsive in a timely manner where management changes need to be applied to avoid unacceptable risks to sustainability. An example of highly responsive management action in the AMF was the closure of Area 8 for the commercial take of Roe's abalone following a marine heatwave in 2010/11 which resulted in mass mortality event

(>90%). Area 8 remains closed and will be closely monitored for the recovery of stocks. For the recreational fishery, the bag limit for Roe's abalone was reduced from 20 to 15 in 2014 to help protect stocks following a decline from environmental factors (Hart *et al.* 2016). Further examples are illustrated in DoF's annual report. All decisions are transparent and well communicated to stakeholders (e.g., media releases, publications of reports and papers on the DoF's website, etc.) and must meet the requirements contained within the FRMA.

The Annual Management Meeting is held January – February each year prior to the setting of the TACC. The AMM is an industry only meeting, with participants including DoF staff, AIAWA, WAFIC, licence holders and divers. Research, management and compliance reports are provided at the meeting. The primary objectives of the meeting are to discuss and agree on the management arrangements for the fishery for the following season including:

- The TACC;
- Size limits;
- Abalone research and assessment results;
- Evaluation of the fisheries performance; and
- Changes to management arrangements.

These often result in action items which some may require to go through the DoF to seek Ministerial approval.

Management Plan

The *Abalone Managed Fishery Management Plan 1992* (the Plan) is the primary statutory management instrument for the commercial AMF. The Plan implements the following set of statutory measures to meet the fishery-specific management objectives for the AMF:

- *Species restriction*: Limited to the harvest of Roe's, greenlip and brownlip abalone.
- *Limited entry*: Limited entry with fishers required to hold an Abalone Managed Fishery licence (limited by the requirement that each boat hold a minimum quota (800 Roe's units or 450 greenlip/brownlip units)), a commercial fishing boat licence and a commercial fishing licence. Only two people can operate on each licence.
- *Management areas*: The AMF covers all WA coastal waters and is divided into eight management areas (see Figure 4).
- *Minimum size limits*: The minimum size limit for Roe's abalone is 60 mm, with the exception of Areas 1 and 7 where the minimum size for commercial catches is 75 mm and 70 mm, respectively. The minimum size limit for greenlip and brownlip abalone is 140 mm for both recreational and commercial fisheries. In certain areas where there are 'stunted stocks' greenlip can be commercially fished from 120 mm under special exemptions.
- *Spatial and Temporal restrictions*: Commercial fishing for Roe's abalone is not permitted in Area 7 on any Saturday, Sunday or public holiday. Commercial fishers must not, when operating in the waters on the west coast of the State lying between the northern sea wall

of Hillarys Boat Harbour and Cape Bouvard: (a) stand or remain on any reef top while fishing for abalone, or (b) fish for abalone other than from a boat authorised to be used in the fishery. Commercial fishing for Roe's abalone is not permitted between the North Mole at Fremantle and Trigg Island at any time. This is to ensure that stock levels on the shallow reef tops, which are the main areas fished by the recreational fishers, are not depleted in a way that would disadvantage recreational fishers. Additionally, there are a number of closed areas in the fishery where abalone fishing is prohibited at all times.

- *Catch allocations:* The AMF is managed primarily through output controls in the form of annually set species and area TACCs. These are issued as Individual Transferable Quotas (ITQs). Each AMF licence has attached to it transferable units of entitlement. Each unit is given a value by dividing the TACC for a given area and species by the total number of units allowed for that area and species.

The annual quota for each zone and species is published each year as a Statement of Determination. In 2016 the TAC for abalone that could be taken from relevant areas for each species is presented in Table 8.

Table 8. 2016 TAC (kg whole weight) allocation for species and Area.

Species	Area							
	1	2	3	4	5	6	7	8
Roe's	5,000	18,000	0	0	20,000	12,000	32,000	0
Greenlip	3200	48006	68275	0	0	0	0	0
Brownlip	150	12500	12500	0	0	0	0	0

Reporting: Within 90 minutes of bringing abalone ashore, the personal who is the nominated operator of the licence must complete a CDR logbook with accurate details of the weight and number of abalone caught (by species), fishing locations, diving time and any ETP interactions.

Export Approval under the EBPC Act

The AMF was first accredited by the Commonwealth DoEE under the EPBC Act in 2002. Abalone is now listed on the List of Exempt Native Specimens (LENS). The LENS is a list of native specimens that are exempt from export prohibitions. The AMF was reassessed in June 2014. The AMF has had their export approval extended until May 2025.

Harvest Strategies

The Abalone Harvest Strategy has been developed in line with the Department's Harvest Strategy Policy. It contains long and short-term fishery specific management objectives (DoF, 2016). The harvest strategy contains performance indicators to measure performance against these objectives; reference levels for each performance indicator; and associated control rules, which articulate pre-defined management responses designed to maintain each resource at target levels and achieve the management objectives for the fishery.

As well as ensuring the biological sustainability of all captured aquatic resources, Harvest strategies include broader ecological objectives for each relevant ecosystem component, and social and economic objectives for each fishery as a whole. The social and economic objectives are applied within the context of ESD.

Ecological objectives specific to AMF includes:

- To maintain spawning stock biomass of each target species (i.e. Roe's, greenlip and brownlip abalone) at a level where the main factor affecting recruitment is the environment;
- To ensure fishing impacts do not result in serious or irreversible harm³ 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 Abalone Harvest Strategy also includes economic and social objectives, in accordance with the FRMA, relating to the provision of opportunities to ensure:

- commercial fishers can maintain/enhance their livelihood and
- that all fishers can maximise cultural, recreational and/or lifestyle benefits of fishing.

Currently, these objectives do not have explicit performance measures. However, through formal consultation processes, matters effecting or impacting the ability of these objectives being met are discussed. Fisheries management arrangements can be amended to help meet these objectives, but not at the expense of sustainability of the resource. DoF have stated that once suitable and measurable indicators for monitoring performance against these objectives are identified, they will be included in future revisions of this harvest strategy.

The harvest strategy ensures that:

- if catch rates (the performance indicator) fall below the Threshold the TAC will be reduced and set at 70% of the long term level.
- If the catch rate is equal to or less than the Limit Reference Levels, the TAC will be reduced to 0–50% of the long term level depending on the severity of the breach.
- if the impacts of fishing on bycatch species, ETPs, habitats or ecosystems are no longer at an acceptable level, research and management staff will undertake a review of the reasons. This review includes an investigation of any changes that may have taken place in the fishery

³ Serious or irreversible harm relates to a change caused by the fishery that fundamentally alters the capacity of the component to maintain its function or to recover from the impact.

(e.g. fishing behavior, environmental variation, markets, etc.). Such reviews are often undertaken in conjunction with the licence holders, as they provide many of the details needed during the review process (e.g. changes in effort).

The DoF and industry review and discuss on an annual basis, the outcomes from the previous season's assessments against the defined reference levels. If issues and/or risks are identified which may require action, then changes to the management arrangements are discussed with the licensees, agreed upon and proposed changes for the following fishing season.

The Abalone Harvest Strategy is in draft form and was out for public consultation until 30 June 2016. All comments will be compiled by the DoF and considered in full before a briefing being prepared for the Ministers consideration. The current harvest strategy has not yet been externally peer-reviewed, but has undergone internal peer review and will undergo another round of internal peer review prior to being developed into a final Fisheries Management Paper.

Notices and Orders

There are several notices and orders in place for the AMF including:

- Statement of Determination⁴ Published annually stating the annual quota maximum quantities of Greenlip, Brownlip and Roes abalone which can be harvested from each management area.
- Prohibition on taking Abalone
- Prohibition from taking any species of abalone north of 31°21.300'S. The northern areas of the fishery were closed due to large-scale stock mortalities resulting from exceptionally high water temperatures in early 2011.

Prohibition Orders relating to commercial fishing in WA Marine Parks and Management Area⁵. Several Orders have been published prohibiting and/or restricting fishing activities in WA Marine Parks.

Use of the precautionary approach

The precautionary approach underlies decision making processes for all fisheries in the State, addressed in the FRMA. The precautionary approach is a fundamental consideration of the DoF's EBFM and ERA processes and decision making by the Minister and DoF. Furthermore, the control rules for the AMF incorporate a precautionary approach to decision-making requiring a review of the fishing activities and management arrangements when a threshold reference level is met. This allows an early identification and mitigation action to be implemented before potential major issues arise in the AMF. Given that the control rules are reviewed annually, this frequency allows for

⁴[http://www.slp.wa.gov.au/statutes/subsiduary.nsf/0/F5D979043020BD5448257E0700279043/\\$file/13.03.15.+abalone+state+ment+of+determination+2015.pdf](http://www.slp.wa.gov.au/statutes/subsiduary.nsf/0/F5D979043020BD5448257E0700279043/$file/13.03.15.+abalone+state+ment+of+determination+2015.pdf)

⁵<http://www.slp.wa.gov.au/statutes/subsiduary.nsf/FisheriesO?OpenPage&Start=1&Count=30&Expand=2.1>

management action to address risks before a limit level is reached and long-term sustainability may be compromised.

For example, during the 2012/13 TACC setting process for the Area 2 greenlip fishery, the performance indicator breached the threshold reference level. Consequently, the decision rule concluded that the TACC should be set at the long term sustainable level of 30 t. Following industry consultation on stock status, and examination of the outcomes of a new harvest control rule, a precautionary approach was adopted for Area 2 and the TACC was maintained at 28.8 tonnes.

Another example of the precautionary approach in the AMF is that the commercial industry has its own self-imposed size limits for the greenlip and brownlip, which can vary from 153 mm to 145 mm and can change between areas whenever industry sees the need. The legal minimum length is 140 mm shell length.

Review of Management

There have been a number of reviews of the legislative framework (Act and regulations) under which the AMF operate, and on the effectiveness of compliance/enforcement. The research and management of the AMF has also been externally reviewed (further detail provided in review section below). Stakeholder and community satisfaction with the Department's fisheries management processes is reviewed annually and outcomes published in the Annual Report.

While neither the FRMA nor the AMF Management Plan provide for a formal review of the plan, the plan can, and has been, amended over time and is reviewed, informally, in light of issues raised by stakeholders and/or identification of matters requiring amendment through various other processes, such as the AMM. There are also mechanisms in place for monitoring and evaluating the performance of various aspects of the management system for the AMF Fishery. Evaluation of all parts of the management system occurs by the following:

Strategic Planning and Risk Assessments

- Fish Plan (an internal Department high-level operational management planning document) is reviewed annually in conjunction with WAFIC and Recfishwest.
- Annual internal DoF strategic management planning meeting held prior to AMMs to discuss/identify issues important to the management of the fishery which may require major changes to the management system.
- An internal Department strategic research planning meeting is held at least annually.
- Annual EBFM risk assessments undertaken in the Status Reports of the Fisheries and Aquatic Resources of Western Australia: the state of the fisheries.
- Annual Internal Department compliance risk assessment meetings.
- Internal Department committees that convert Department and stakeholder (WAFIC and RecfishWest) priorities into operational deliverables set within the budget context.

Review Workshops

- AMMs are held with all AMF licence holders 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 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.
- Annual review and evaluation of the DoF's performance against its key performance indicators of the overarching long-term objectives, results published in the Department's Annual Report to Parliament.
- Annual performance review against fishery-specific short-term (operational) objectives for the AMF using the performance indicators, reference levels and management control rules that are explicitly identified in the AMF harvest strategy.
- Harvest Strategies for AMF will be reviewed in 2021 however, the documents may be subject to further review and amended as appropriate within the five-year period as further relevant information becomes available (e.g. new research, risk assessments, expert advice, etc.).
- The broader management framework for fisheries in WA has been internally reviewed as part of the publication of several Departmental reports.
- Ecological risk assessments (ERAs) for the AMF will generally be undertaken every 3 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.
- Resource sharing arrangements between commercial, recreational and customary fishing sectors have been reviewed as part of the: Integrated Fisheries Management Report: Abalone Resource. Fisheries Management Paper No. 204. (DoF 2005).
- Aboriginal Fishing Strategy (DoF 2003); and
- Integrated Fisheries Management Allocation Report – Roe's Abalone Resource, Perth Metropolitan Region. Fisheries Management Paper No. 226. (IFAAC 2009).

Evaluation Coverage

Performance against the short-term (annual) objectives is measured using the performance indicators, reference levels and management control rules that are explicitly identified in the Abalone Harvest Strategy.

The annual fishery performance outcomes are provided to licence holders at the AMM. The Department is also required to report to Parliament on the stock assessment outcomes for all target species, with this information provided in the Department's Annual Report. The fishery performance outcomes for target and retained non-target species, bycatch, ETP species, habitats and ecosystems

is evaluated annually and made publicly available in the Status Report of the Fisheries and Aquatic Resources of Western Australia: the state of the fisheries (SRFAR; e.g. Fletcher and Santoro 2015).

The effectiveness of the compliance regime is evaluated through periodic risk assessments, revision of OCPs and monitoring and analysis of compliance statistics and trends.

Review of the Management System

■ Internal Review

The Department maintains an effective Internal Audit function which provides an independent and objective review of operational controls designed to achieve the Department's objectives. A 3-year strategic audit plan, that is reviewed annually, ensures (among other things) that there is adequate audit coverage across all activities of the Department. The Internal Audit Committee approve the annual audit plan.

■ FishPlan

FishPlan is the guiding document that outlines the review schedule for the 5-year planning schedule and the next planning cycle. It includes a timeframe for review of compliance activities and management. Scientific reviews for some resources may also be identified in FishPlan. This process is established by the Department to provide formal independent or Departmental level reviews of specific research projects or monitoring and assessment programs/outputs to ensure continued relevance and/or focus on continuous improvement and best practice. FishPlan undergoes an annual review that involves input from WAFIC and RFW.

■ State of the Fisheries

Overall performance is reviewed and reported on annually in the SRFAR. The EBFM risk assessment process is also reviewed annually, reported on in SRFAR and informs the decisions and priorities of management. There are numerous internal validation processes that are undertaken to ensure all of the catch and effort data that is compiled for the SRFAR is presented accurately. Routine validation within the database checks for errors and inconsistencies within the data.

■ Management Plan

Whilst there is no in built review period specified in the management plan, amendments are made on a regular basis. The latest amendments to the plan were completed in March 2015, February 2013 and September 2011.

■ Annual Management Meetings

The fishery and stocks are reviewed annually both prior and during the AMM, with quota decisions are made each February. A mid-season research update is carried out during August to September.

■ Risk Assessments and Research

As previously discussed in above sections, risk assessments are undertaken periodically (every 3 – 5 years) in the AMF. Risk assessments can also be triggered ahead of time if significant changes occur or are identified in operations or management activities or controls. The risk assessments inform a major review of the management system, including FishPlan, research activities and compliance requirements. Participants in risk assessments include both internal and external stakeholders.

The abalone research program is reviewed annually with subsequent advice provided to management. The last comprehensive review of the current stock assessment in Western Australian

abalone fisheries that included a summary of the biology, demography, research and management was published in 2013 (Hart *et al.* 2013a).

- Review of Harvest Strategy

The AMF Harvest Strategy undergoes an annual evaluation of performance of the fishery against the specified performance indicators and a major review every five years (scheduled for 2021). However, the harvest strategy may be further refined and updated in the interim as additional information becomes available (e.g. new research results, updated risk assessments, expert advice, etc.). The harvest strategy was subject to internal and external review in 2016.

- Compliance Review

The Abalone OCP is reviewed following each compliance risk assessment (every 1 to 2 years). The last compliance risk assessment was conducted in May 2015 and the OCP was reviewed and updated in September 2015. In addition, annual reviews of the OCP allows the plan to be modified to take into account changes in technology, fishing practices, community attitudes and evolving factors. The effectiveness of the compliance regime is also evaluated through monitoring and analysis of compliance statistics.

A significant evaluation project of the compliance program in all Western Australian fisheries was undertaken by Green and McKinlay (2009).

- External Review

Since July 2013 there have been 41 audits undertaken by external reviewers (Auditors from Stantons International). Examples of some of the more relevant reviews/audits that have been undertaken include the MSC initiative, prosecution processes and procedures, Service level and funding agreements with peak bodies (consultation and representation) and operational compliance plans.

Outcomes of these reviews are disseminated to the relevant management and action taken as appropriate. Follow up reviews to ensure that the recommendations have been implemented are conducted.

- Peer Review

The Department has had a schedule for internal and external peer review of research and assessments for fisheries, and management systems. The abalone fishery assessment was peer reviewed in 2010 by Professor Neil Loneragan (Murdoch University) and Dr Steve Mayfield (SARDI). Among other things, this external review looked at the stock assessment methodology, harvest strategy framework, research programs and the standard operating procedures for data collection and analyses. Following this review, the Department published a comprehensive review of the management system for the abalone fisheries in Western Australia in Research Report No. 241: Biology, History and Assessment of Western Australian Abalone Fisheries (Hart *et al.* 2013a).

- External Government Audit

The compliance system was the subject of a specific external review by the Western Australian Auditor General. This Public Sector Performance Report on compliance in Western Australia's commercial and recreational fisheries was submitted to Parliament in June 2009.

- Annual Processes

AIWA receive numerous briefings from the DoF throughout the season on issues concerning monitoring and research results, current state of the stocks, abalone meat condition, etc. The AIWA reports back to its industry meetings, allowing detailed information and discussion exchange to occur, enacting co-management process to occur.

The annual TACC for the AMF is determined by the Director General (DG) of the Department through a consultative process that occurs at the end of the abalone fishing season. Preliminary advice on the recommended SHLs and an industry consultation form, are developed by DoF and sent to abalone licence holders, the AIWA and WAFIC for consultation. AIWA consults with industry regarding the information and determines the industries position on the recommended SHLs for the coming season. AIWA advises the DoF of their recommended SHLs and any additional feedback. The Department's SHL recommendations are considered by the AIWA and abalone industry more broadly at the AMM, along with co- management arrangements such as voluntary size limits and any fish-down arrangements.

Final advice and recommendations on the SHL DoF, with the AMM and AIWA positions on the recommendations, are provided to the DG of the DoF for consideration and a final determination. Once the final determination is made, the DG notifies AIWA in writing through publication of a Notice of Determination, and licence renewals and season arrangements for the following year commence.

Accountability and Transparency

The DoF has a long history of providing all stakeholders with published comprehensive formal reports on most facets of the AMF including, annual fishery performance, fishery outcomes, management, research, monitoring, evaluation and review activities. This information is published and publicly available on the DoF's website and includes:

- The Annual Status Reports of the Fisheries and Aquatic Resources of Western Australia: the state of the fisheries (e.g. Fletcher & Santoro 2015).
- The Department's Annual Report to Parliament.
- The Research, Monitoring, Assessment and Development Plan 2015–2020 Fisheries Occasional Publication No. 122, Department of Fisheries 2015.
- Fisheries Management Papers (FMP);
- Fisheries Research Reports (FRR);
- Fisheries Occasional Papers (FOP);
- Peer-reviewed scientific journal articles. For example, recent publications relevant to the AMF includes:
- The Abalone Resource Harvest Strategy 2016 – 2021.
- Fisheries Research Report No 269. Bioeconomic evaluation of commercial- scale stock enhancement in abalone (Hart and Strain (eds), 2016)

- Fisheries Management Paper No. 204. Integrated Fisheries Management Report – Abalone Resource. (DoF 2005).
- Fisheries Management Paper No. 226. Integrated Fisheries Management Allocation Report – Roe’s Abalone Resource, Perth Metropolitan Region. (DoF 2009).
- Fisheries Management Paper No. 243. Future management of the metropolitan recreational Roe’s abalone fishery.
- Fisheries Research Report No 227. Assessment of the risks associated with the release of abalone sourced from abalone hatcheries for enhancement or marine grow-out in the open ocean areas of WA. (Jones & Fletcher, 2012).
- Fisheries Occasional Publication No 32. Allocation of the Western Australian Abalone Resource between user groups.
- Fisheries Research Report No 185. Performance indicators, biological reference points and decisions rules for Western Australian abalone fisheries (*Haliotis* sp): (1) Standardised catch per unit effort. (Hart *et al.* 2009).
- Fisheries Research Report No. 170. Biomass and commercial catch estimates for abalone stocks in areas proposed as sanctuary zones for the Capes Marine Park. (Hesp, A et al 2008).
- Fisheries Research Report No. 241. Biology History and assessment of Western Australian abalone fisheries.
- Hart, A.M., Strain, L., Fabris, F., Brown, J., Davidson, M. (2013). Stock enhancement of Greenlip abalone: (1): Long-term growth and mortality. Reviews in Fisheries Science 21: 299-309.
- Hart, A.M., Fabris, F., Murphy, D., Brown, J., Strain, M., Davidson, M., (2013). Stock enhancement of Greenlip abalone: (2): Population and ecological effects. Reviews in Fisheries Science 21: 310-320.
- Hart, A.M., Strain, L.W.S., Hesp, A. (2013). Stock enhancement of Greenlip abalone: (3): Bioeconomic evaluation. Reviews in Fisheries Science 21: 354- 374.
- Mayfield, S., Mundy, C., Gorfine, H., Hart, A.M., Worthington, D. (2012). Fifty years of sustained production from the Australian abalone fisheries. Reviews in Fisheries Science 24: 220-250.

Fishery-specific legislation (FRMA, FRMR and Government Gazettes) are publicly available on the State Law Publishers Website. The implementation of any new statutory arrangements is formally communicated to the license holders in writing. The Department is required to maintain a public register of authorisations under the FRMA available for public inspection. The register contains the names and business address of the holder, any security interest in the authorisation, entitlement, black marks and other details as prescribed.

Compliance and Enforcement

The DoF have designed their compliance and enforcement program to maximise the potential for fishers to voluntarily comply with legislation, but ensure that there are strong incentives for fishers to be compliant, and the systems are in place to have high level of detection of noncompliance and a significant penalties regime. DoF has various strategies for compliance including monitoring and surveillance, appropriately trained staff, suitable deterrents in the forms of fines and administrative penalties and targeted education campaigns.

DoF's Regional Services Division (RSD) (200 staff) is responsible, with support of the Communications and Education Branch, for compliance and education services. The staff are allocated across the State in regional and district offices.

For compliance purposes, the AMF is considered part of the West and South Coast Bioregion and the majority of compliance services are delivered by Fisheries and Marine Officers (FMOs), based at the Busselton, Albany and Esperance offices, from the Bunbury office if required and district patrol vessels. Abalone fishing north of the Busselton jetty is the responsibility of the wider metropolitan regional staff located in Mandurah, Fremantle and Hillarys. Given the geographical spread of the fishery and the remote locations being fished, it is very hard to have strong compliance in the field as it is expensive and time resource hungry, however, factory audits and paper trail audits are very robust and provide for the greatest value for resources, both money and time, if assume that paper trail is being compiled with by most operators. Compliance also involves specific targeted covert operations based on intelligence and is based on risk assessment approach. Another development in the fishery has been "Fisheye" which is an electronic logbook (CDR) in real time. This allows the data to be sent to the DoF Quota Management System (QMS) and can be reviewed before the fisher actually arrives at the processing plant. However, not all fishers are using this technology yet. These operations are mainly targeted at illegal operators selling into the black market and not the industry.

During 2015, there were 271.5 patrol hours of compliance and community education services in the field for abalone resource. A continuing emphasis was placed on employing risk and intelligence based approaches to compliance planning and prioritisation.

Regular land, air and sea patrols, using a risk assessment process and associated operational planning framework through the Operational Compliance Plan (OCP), are conducted. Compliance activities in the AMF include land patrols, sea patrols, landing inspections, covert surveillance and operations, factory inspections, wholesale/retail checks, aerial surveillance and intelligence gathering. FMOs are well equipped with resources including all terrain vehicles, small patrol vessels and surveillance equipment. They also provide a wide variety of educational and extension services through formal and informal media to commercial fishers, fishing related operations (wholesale / retail / processors), other resource management agencies and community members (Fletcher and Santoro 2014).

The DoF also delivers at-sea marine safety compliance services on behalf of the Department of Transport (DoT) in the Metropolitan Region extending from Mandurah to Lancelin. Outside of this area, marine safety is unfunded, and inspections are carried out in combination with fisheries compliance inspections. Marine park education and compliance functions are also undertaken in the Ngari Capes Marine Park (South West), Shoalwater and Marmion Marine Parks (Metropolitan) and Jurien Bay Marine Park (Midwest). These functions are primarily related to the integrity of

management arrangements for the different zoning within the marine parks (Fletcher and Santoro 2015).

Implementation of Monitoring, Control and Surveillance Systems

The MCS system for the AMF is administered by the Department's RSD through the Abalone Operational Compliance Plan (OCP). The OCP is informed through a risk assessment (conducted every 2-3 years). The objective of this OCP is to provide direction and guidance to FMO's for the annual delivery of compliance services. As such, the OCP objectives and intent can be summarized as follows:

- a) The protection of the fisheries environmental values whilst providing fair and sustainable access to the resources.
- b) to encourage voluntary compliance through education, awareness and consultation activities.
- c) Enforcement should be a process of last resort and reserved for the more serious and continuous breaches of the act and regulations.

The Abalone OCP provides a formal process for staff to carry out defined compliance activities in order to monitor, inspect and regulate the compliance risks in the AMF, and in turn confirm they are at an acceptable and manageable level. Annual reviews of the OCP allows the plan to be modified to take into account changes in technology, fishing practices, community attitudes and evolving factors. Following a formal review of the OCP and associated compliance strategies, compliance activities are prioritized in accordance with risk, budget and resourcing considerations. Annual planning meetings are held with regular specific planning of day-to-day targeted and non-targeted patrols linked to the OCP based on resources and competing priorities.

Compliance Risk Assessments

The Department conducts compliance risk assessments every 1–2 years in major fisheries (e.g. the AMF) or those be at high risk. Minor fisheries every 3–5 years. The compliance risk assessment identifies modes of offending, compliance countermeasures and risks. The process relies on a weight-of-evidence approach, considering information available from specialist units, trends and issues identified by local staff and Departmental priorities set through Fish Plan. The risk assessment process can be triggered by a change in management arrangements in a fishery. For example, a compliance risk assessment for the commercial abalone fishery was conducted in 2015 to review the existing risk assessment in light of the fishery moving to extended fishing trips. Identification of any new major issues that would require RSD managers to assess their compliance program also include (but not limited to):

- A sectoral complaint;
- Ministerial or Parliamentary enquiry;
- Management framework issues;
- Public complaint or sustained media interest;
- Market changes;

- Intelligence; and/or
- Upward trend in non-compliance.

There are broadly three levels of compliance risk assessment and associated planning and monitoring undertaken by the RSD. The AMF undergoes a Level 2 compliance risk assessment, planning and monitoring, with a review and update of compliance assessment and associated compliance strategies, manuals and procedures. Risk assessments are usually undertaken by the relevant Compliance Manager, in consultation with the Regional Manager, Regional FMOs and Fisheries Management Officers, Supervising FMOs and often broader departmental staff, with a focus on the introduction of major or important changes affecting compliance delivery, which may include changes arising from technology, fishing practices, community attitudes, environmental factors or policy re-alignment.

Resourcing Compliance Operations

RSD staff are responsible for coordinating and prioritizing the allocation of resources across all programs in the region using a risk assessment framework and OCPs. Regular planning meetings ensure that resources are appropriate for compliance activities. Resources are reviewed based on risk assessment approach, and compliance statistics collected throughout the year. The resources and compliance strategies (i.e. monitoring, surveillance and education activities) are outlined in the OCP, discussed in above sections of this report. There is flexibility to allocate additional resources to respond to changes, such as the need for a planned tactical operation in response to new intelligence.

Key Compliance Personnel

The Regional Office of the Department relevant to the AMF is located in Albany, providing the primary on-ground compliance and education delivery for the fishery. Key compliance and enforcement personnel located in the region and their responsibilities include:

Compliance Manager:

- Overall responsibility for the OCP, including creating the plan, reviewing it and ensuring its outcomes are delivered;
- Responsible for providing sufficient and appropriate resources to achieve the operational compliance plans outcomes;
- Ensuring that FMO safety is considered at all times and the Region's occupational health and safety requirements are met;
- Monitoring the progress of the OCP during its execution;
- Consulting with all key stakeholders when reviewing the OCP; and
- Reporting outcomes.

Supervising FMO:

- Field responsibility for the OCP, including reporting any deficiencies in the execution of the plan and reporting the outcomes as they are delivered or achieved;
- Supervision of staff performance in relation to the OCP;
- Ensuring that FMO safety is considered at all times and the district's occupational health and safety requirements are met;
- Provide briefings and de-briefings as required;
- Ensuring all equipment required to execute the OCPs is serviced, operational and available; and
- Liaising with staff from other agencies operating in a joint servicing arrangement.

FMOs:

Appointed formally under the FRMA with clear powers to enforce fisheries legislation, enter and search premises, obtain information and inspect catches. FMOs are highly trained; they must have a thorough knowledge of the legislation they are responsible for enforcing and follow a strict protocol for undertaking their duties in accordance with the FRMA and in recording information relating to the number and type of contacts, offences detected and sanctions applied.

- Day-to-day responsibility for the execution of the OCP in their interaction with users of the Fishery;
- Ensuring that FMO safety is considered at all times and that individual occupational health and safety requirements are met;
- Reporting any deficiencies and outcomes in a timely and accurate manner; and
- Complying with the, Prosecution Policy Guidelines, the Department's Code of Conduct and promoting the vision and mission statement of the Department and its joint-servicing partners.

In addition to regional compliance staff, there are a number of units within the Department that support the delivery of compliance outcomes, including:

- Patrol Boat Business Unit;
- Vessel Monitoring System Unit;
- Serious Offences Unit;
- Fisheries Intelligence Unit;
- Compliance Statistics Unit;
- Prosecutions Unit; and
- Strategic Policy Section of the Regional Services Branch.
-

Formal Monitoring, Control and Surveillance Systems

There are four focal areas for monitoring, control and surveillance in the AMF:

- Monitoring of quota through auditing CDRs;
- Landing inspections and CDR checks;
- Factory, wholesale and retail inspections; and
- Black market.

Quota compliance

Abalone divers are required to provide daily catch and disposal records (CDRs) containing information on the number and weight of abalone and the date, location, details of persons harvesting the abalone and the approved fish processor/consignee. These CDRs form the basis of the compliance program and also assists with research and management of the fishery.

Quota compliance is primarily conducted by inspecting the CDRs at the point of landing and at approved processor facilities to ensure the weights are correct. The CDR form is in triplicate to ensure checks and balances are in place during transportation and at the processors facility. Exceeding entitlement and/or failure to complete the CDRs correctly are offences that could result in prosecution. Penalties are commensurate with the number of abalone over quota.

Marine Park compliance

There are several marine parks, marine reserves and other fishing closures within the boundaries of the AMF. Fishing for abalone is prohibited, restricted or allowed in all or parts of each of these marine reserves. Regular marine patrols are undertaken to ensure that abalone fishing is not occurring in prohibited or restricted areas. There are currently several dedicated vessels and staff for marine patrols of the marine parks both within the Department and DPaW.

Daily Patrol Contact Form

Surveillance and compliance activities undertaken during air, sea and land based patrols are recorded and reported by FMOs using a daily patrol contact (DPC) form. The forms record and classify contacts and time spent in the field for each FMO. These forms provide managers with information about:

- The number of field contacts made, which provides a context for the number of offences detected and reported. This includes random contacts and offences from random inspections;
- The number of targeted contacts made, which provides information on the effectiveness of the intelligence gathering capacity at identifying 'targets';
- The number of face-to-face contacts outside of a compliance context made, which provides information on the educative effort of FMOs in a fishery;
- Inspection of quota;
- Inspection of abalone size;
- Inspection of licences;

- Inspection of Vessels; and
- Other routine information that can be used to help managers' report on where and which fisheries FMOs have undertaken patrols.

This information is used in patrol planning and risk assessments and ensures accountability of the compliance program. Table 9 provides statistics on the contacts made for the AMF between 2010 and 2014.

Table 9. Compliance contact statistics for the commercial abalone fishery between 2010 and 2014.

Year	2010	2011	2012	2013	2014
Greenlip/Brownlip Fishery	119	91	103	130	77
Roe's Fishery	45	30	17	34	16
Total	164	120	120	164	93

The Department has also implemented an initiative called Fishwatch, whereby the community can report instances of suspected illegal fishing. The Fishwatch phone line provides a confidential quick and easy way to report any suspicious activity to Departmental compliance staff.

Applying Sanctions

There is an explicit and statutory sanction framework that is applied in the AMF. Sanctions to deal with non-compliance are listed in the FRMA and FRMR and can be severe. These sanctions consist of:

- Significant monetary penalties;
- Licence cancellations or suspensions; and,
- Confiscation of gear and catch.

FMOs undertake every opportunity to provide education, awareness and advice to fishers. All offences detected in the fishery are considered to be of significant concern and are addressed via the Department's Prosecution Guidelines and rules set out in the FRMA and FRMR. There are four tiers of enforcement measures applied when an offence is detected in the fishery including:

- Infringement warnings: These are written warnings issued for minor fisher offences. They do not incur a fine, but are a written record of a minor offence that may be referred to by Fishery Officers in the future. A certain number of infringement warnings for similar offences in a designated period may result in an infringement notice;
- Infringement notices: These are written notifications to pay a monetary penalty for an observed offence. Fishers issued infringement notices may choose to defend the matter in court. The Department may initiate a prosecution brief for habitual offenders;
- Letters of warning: A letter of warning (LOW) is a formal record of a commercial offence where a prosecution may be unduly harsh under the circumstances. A LOW may be issued where an offence may have been committed but detected outside of the 45-day period

where an infringement can be issued. A LOW formally advises the offender of their actions and seeks future 'voluntary' compliance;

- Prosecutions: These are offences of serious nature (prescribed in the FRMA) that immediately proceed to formal, legal prosecution. Such matters often incur hefty fines or can even result in incarceration.

Modified penalties are prescribed in the FRMR and can only be applied to particular sections of the FRMA and the FRMR. 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. The PAP consists of three panel members (legal, executive services, and compliance and aquatic management branches). The PAP operates on a majority basis, with the prosecution process continuing where the majority of the PAP agrees with the recommendation to prosecute. If the majority of the PAP disagrees with the recommendation to prosecute, the matter is referred to the CEO, who will then make a determination on the matter. Should prosecution action be undertaken, the outcomes are generally released to the public via media releases and recorded on the Department's website. There have been no PAP hearings for commercial abalone fishery in recent times.

Penalties are commensurate with the value of the illegal fish involved and the type of illegal activity. This can result in large monetary penalties for certain types of activities, with large penalties considered necessary in order to create a deterrent for high-value species, such as western rock lobster or abalone. Additional penalty provisions that apply should there be a prosecution are provided in the FRMA.

A successful prosecution for a serious offence in a commercial fishery may result in a 'black mark' against the fisher or the commercial licence. If an authorisation holder or a person acting on behalf of the holder accumulates three black marks within a 10-year period, the authorisation is suspended for one year. Additionally, the CEO has the administrative power to cancel, suspend or not renew an authorisation in certain circumstances, which can be used even if cancellations through the court are unsuccessful. These powers have been used to deal with serious offending in other fisheries but not to date in the AMF.

All fisheries offences in WA are recorded in a dedicated Departmental offences system, which also manages the workflow associated with infringements and prosecutions. In order to link this information with patrol data, FMOs include information about the fishery, DPC area, type of patrol and whether the offence resulted from a targeted inspection in all offence paperwork.

Sanctions in the AMF

Non-compliance in the AMF in the last ten years has been dealt with using the sanctions described above. LOWs have not been issued in the AMF over the last 10 years. During this period, the number of prosecution briefs has reduced and no offences were detected in 20011/12 and 2013/14 (Table 10) demonstrating that the sanctions provide an effective deterrence.

Table 10. Summary of detected offences in the AMF from 2005/06 – 2014/15 (Source: DoF 2016).

Year	Infringement Warnings	Infringement Notices	Prosecution Briefs
2005/06			2
2006/07			5
2007/08			8
2008/09		1	4
2009/10			4
2010/11	3	1	10
2011/12			0
2012/13	1	1	6
2013/14		2	0
2014/15			4

Most of the offences that resulted in a prosecution brief related to contravention of clause 17A of the Abalone Management Plan 1992. This clause relates to fishing in excess of the unit value. However, clause 17B prescribes the administrative penalty system whereby it is a defence for the person charged to prove that a) the amount of abalone was not more than 20 kilograms meat weight or 60 kilogram whole weight; and b) not more than 28 days after being notified by the Department of the offence the licence holder paid to the Fisheries Research and Development Fund a monetary sum derived by multiplying the number of kilograms by which the entitlement was exceeded by the prescribed value (per unit of weight) for that species of abalone as set out in Schedule 9 of the regulations. For example, during 2010/11, 7 of the 10 prosecution briefs were for over quota and all monies owing under clause 17B were paid. The process in which prosecutions, penalties and infringements are decided by compliance staff is illustrated in Figure 8.

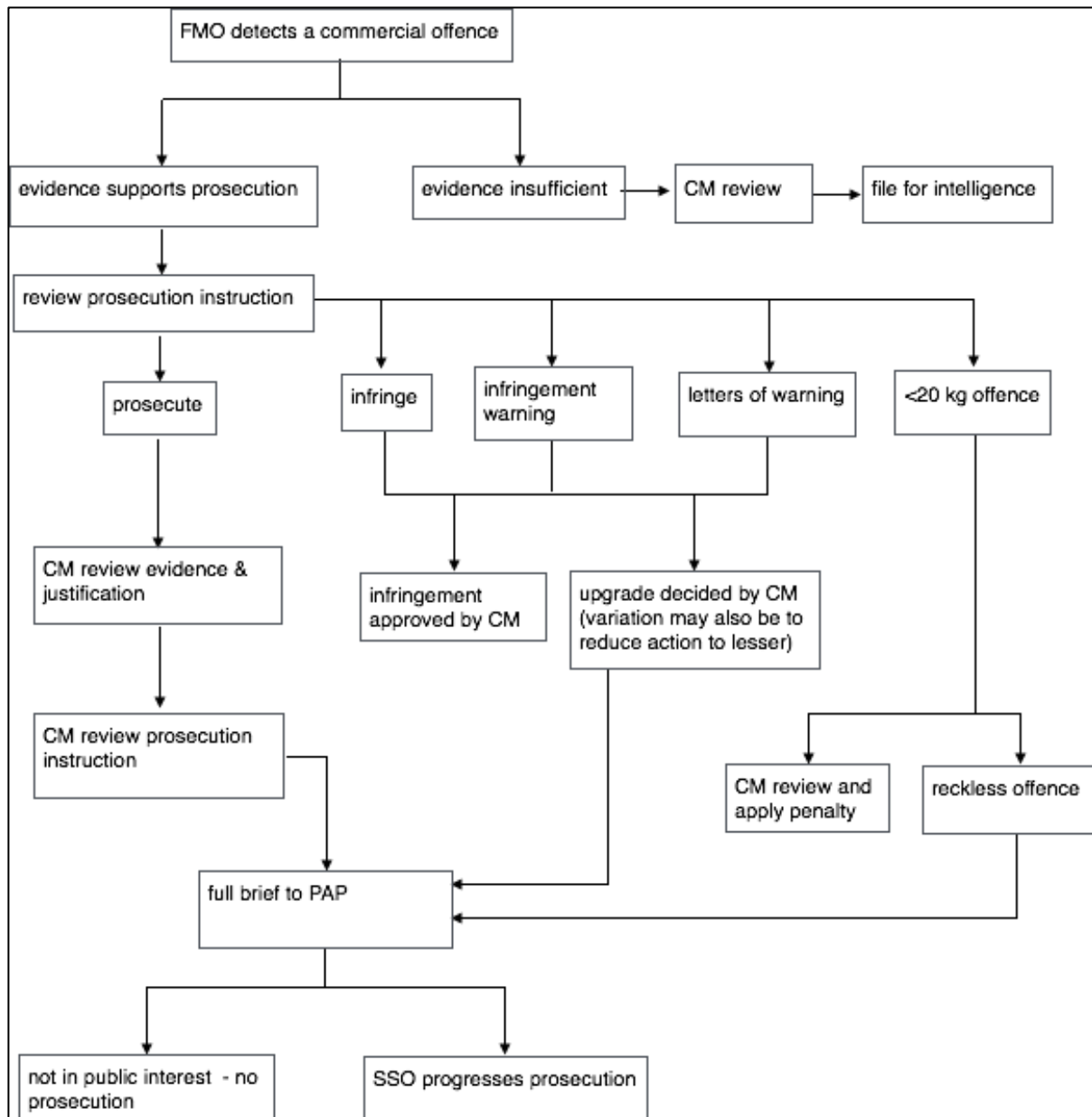


Figure 8. Process of how sanctions and level of penalty are decided by compliance officers within the AMF. (note: FMO – Fisheries & Marine Officer, CM – Compliance Manager, SSO – State Solicitors Office, PAP – Prosecution Advisory Panel).

Level of Compliance

The DoF uses a weight-of-evidence approach when evaluating compliance in a specific fishery. this includes:

- Ongoing evidence of a sustainable fishery, i.e. whether ecological objectives continue to be met;
- Assessment of the risk posed by the fishery to target species and ecosystem components under the current management regime;

- Annual outputs arising from formal MCS systems, number of offences and successful prosecutions (dependent on whether compliance is undertaken in a random or targeted manner);
- Number of reports of illegal activity logged by Fishwatch and from intelligence gathered by FMOs that is entered into the “Seastar” database;
- General level of industry support / buy-in around fishing rules; and
- Level of compliance education and communications during key stakeholder engagement (at least annually).

Using this weight-of-evidence approach, there is a high degree of confidence that abalone fishers comply with the management system in place, including providing information of importance to the effective management of the fishery. Industry compliance with CDRs is very high.

The AIAWA, through distribution of the Code of Practice, actively encourages fishers to comply with the management system by informing them of their obligations to ensure a sustainable fishery. The Code of Practice for the abalone industry explicitly sets out its purpose as:

- establishing a voluntary set of standards or behaviour for responsible commercial fishing of the resource;
- demonstrating our commitment to ensuring these fisheries are, and continue to be, managed in a sustainable way and to reduce the risk of a bio-security threat to the fish stock; and
- providing a valuable source of information to those wanting to know more about the abalone fishery within WA.

Illegal Fishing

The abalone fishery has been intensively targeted by illegal fishers at certain periods in its history. The quantity taken depends on the species. Overall, intelligence operations have revealed that Greenlip abalone is the most desirable and is easily sold.

It is estimated that at least 3 tonnes of Greenlip abalone per year is taken for the black market on the south coast of WA. On the west coast, small quantities of excess possession limit Roe’s abalone are taken overseas as hand luggage or baggage to Hong Kong, and Singapore (Hart *et al.* 2013a).

Monitoring and Management Performance Evaluation

The Department has a number of processes in place for monitoring and evaluating the performance of the AMF management system against its objectives. An annual review of the fishery’s performance is undertaken by Departmental research, management and compliance staff, with outcomes used to assess the extent to which the fishery’s management system has met both the long- and short-term objectives.

4. Evaluation Procedure

4.1 Harmonized Fishery Assessment

For this assessment, harmonization is required as follows:

Principle 1: Not required.

Principle 2: Not required.

Principle 3: In accordance with FCR 7.4.16 and Annex PB, 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. The most recent and applicable fishery in this instance are the Western Australian Peel Harvey Estuarine and the West Coast Deep Sea Crab Fisheries which were certified by SCS in May and June 2016. The AMF or the target species, has not been subject of a prior MSC assessment and there is no requirement to harmonise Principle 1 or Principle 2 outcomes of the AMF with any other fishery. However, the AMF shares a management system with the MSC-certified Western Australia Rock Lobster Fishery, and Exmouth Gulf Prawn Trawl and Shark Bay Prawn Trawl Fisheries, and the Peel Harvey Estuarine Fishery and the West Coast Deep Sea Crab Fishery. Harmonisation is, therefore, required with the Governance and Policy PIs (3.1.1-3.1.3). However, it should be noted that since the last certification, there have been progress made with regard to 3.1.2. In addition, the new stakeholder engagement document was discussed with the MRAG team of the recent surveillance audits for the Exmouth Gulf Prawn and Shark Bay Prawn Trawl Fisheries. The MRAG team closed the existing condition and re-scored this PI at 95. The progress on meeting this condition for all other Western Australian fisheries will be considered at the 1st annual audit for Peel Harvey Estuarine Fishery and the West Coast Deep Sea Crab Fisheries and at the re-assessment (draft report) for the Australian Western Rock Lobster Fishery.

Table 11. Fisheries in the MSC System Considered for Harmonization.

Fishery	Status	Principles for Harmonization	Conformity Assessment Body
1.Australian Western Rock Lobster	Certified (in re-assessment)	3	SCS
2.Peel Harvey Estuarine Fishery	Certified	3	SCS
3.West Coast Deep Sea Crab	Certified	3	SCS
4.Exmouth Gulf Prawn	Certified	3	MRAG
5.Shark Bay Prawn	Certified	3	MRAG
6.Australia Pearl Oyster	In assessment (Final Report)	3	SCS

Table 12. Alignment of Scores for Harmonization.

PI	Fishery Number (as indicated in Table 11)						Comments
	1	2	3	4	5	6	
3.1.1	100	100	100	100	100	100	-
3.1.2	75	75	75	75 Re-scored to 95 at 1 st surveillance	75 Re-scored to 95 at 1 st surveillance	UoC 1: 75 UoC 3:	A new Stakeholder Engagement Document has recently been published by DoF which resulted in this PI

						100	scoring higher in the current assessment.
3.1.3	100	100	100	100	100	UoC 1: 75 UoC 3: 100	UoC 1 of Fishery 6 also includes management from a different management system of Northern Territory, Australia which resulted in different score.

4.2 Previous assessments

This fishery has not previously undergone full MSC assessment. A pre-assessment was completed in 2014 by MRAG Americas Inc.

4.3 Assessment Methodologies

This assessment was conducted by SCS Global Services, an accredited MSC certification body. The fishery was assessed using the MSC Certification Requirements Version 2.0, October 2014 and the reporting template used in this report is also V2.0.

Changes to the Default Assessment Tree

A modified assessment tree was used, which consisted of the default assessment tree with the addition of specific genetics and translocation PIs (Genetic Outcome, PI 1.1.3; Genetics Management, PI 1.2.5; Genetics Information, PI 1.2.6; Translocation Outcome, PI 2.6.1; Translocation Management, PI 2.6.2; Translocation Information, PI 2.6.3). The risk based framework was not used for the assessment of this fishery.

There is no enhancement activity in this fishery, however the scope of the fishery includes greenlip abalone which are commercially harvested and relocated to a hatchery. The resulting spat from these animals are grown in a land-based facility before being transported to grow-out sites on artificial habitat in Flinders Bay, Augusta, Western Australia. These abalone are harvested by the operator only and are not available to the commercial fishery. Whilst the fishery does not receive input from farmed abalone, additional PIs addressing genetics and translocation have been included in the assessment tree to assess any impacts on the commercial fishery stock and/or habitat.

The additional PIs which have been added to the assessment tree (for greenlip abalone only) and the weight assigned to each are listed in the table below:

Table 13. Additional PIs included in the assessment tree for greenlip abalone.

Performance Indicator		Weight in Principle
1.1.3	Genetics Outcome	0.167
1.2.5	Genetics Management	0.111

1.2.6	Genetics Information	0.111
2.6.1	Translocation Outcome	0.333
2.6.2	Translocation Management	0.333
2.6.3	Translocation Information	0.333

Stakeholder Identification and Engagement Process

In order to ensure a thorough and robust assessment process, and a process in which all interested parties could and would participate, SCS provided opportunities for input at all stages of the assessment process, whether required or not by MSC procedures.

Stakeholders were identified as per the SCS Stakeholder Engagement Procedure, which includes requesting a list of potential stakeholders and contact information from the client, evaluating overlap from stakeholder lists from other clients, and consulting with the team and identified stakeholders for their input on any additional stakeholders.

Stakeholder announcements were posted to the MSC website for each milestone of the fishery assessment. In addition to this, stakeholders were informed via email of the different milestones of the fishery assessment and when they would have an opportunity to make comments no longer than four days from the start of the consultation period. These milestones are when the fishery enters full assessment, when peer reviewers are proposed, when the Public Comment Draft Report is available for comment and when the objection period begins. These communications also included a link to the fishery assessment on the MSC website and a copy of the stakeholder comment form and MSC guide to stakeholders.

Assessment Process

The general steps followed during the assessment were:

Announcement of Re-Assessment and Team Selection (28 April 2016)

At this first step of the assessment process, SCS submitted the announcement that the fishery had entered assessment. The notification also included the nomination of the team and the announcement of the onsite assessment dates (13-15 June 2016 in Perth and Augusta). No stakeholder submissions were received.

Input on Fishery Performance (May-June 2016)

SCS requested that the applicants compile and submit written information to the assessment team illustrating the fishery's compliance with the required performance indicators (PIs). At the same time, SCS requested that stakeholders submit their views on the fishery management system's functions and performance. Stakeholders were identified as per the SCS Stakeholder Engagement Procedure.

Meetings with Industry, Managers, and Stakeholders (June 2016)

SCS planned for an onsite meeting and conducted meetings with industry, fishery managers, and fishery scientists on the 13th and 14th June in Perth, Western Australia, and on the 15th June in Augusta, Western Australia. Stakeholders were invited to meet with the assessment team. Additional documentation was requested from the client and the management agency after the meeting.

Scoring the Fishery (June 2016 – September 2016)

The assessment team reviewed and discussed the available information and determined preliminary scores on the last day of the onsite visit using the required MSC methodology and the default assessment tree, without any direct input from the client group or stakeholders.

Drafting Report (July 2016 - September 2016)

The assessment team in collaboration with the SCS representative on the team, Dr. Daume, drafted the report in accordance with MSC-required process. Before the client draft report was completed, the team participated in discussions to review and finalise the scores. The draft was finalised in September 2016 and submitted to the client for review.

Peer Review (November 2016-December 2016)

SCS, as required, released an announcement on 2nd June 2016 of potential peer reviewers soliciting comment from stakeholders on the merit of the selected reviewers. No negative stakeholder comments were received and two peer reviewers were confirmed on October 2016. The peer review was conducted during November-December 2016.

Release of Public Comment Draft Report PCDR (20th December 2016)

SCS released the draft report for public comment, soliciting stakeholder response through posting on the MSC website and direct email to known stakeholders.

Final Report with Team Determination (28th March 2017)

SCS released the final report with the team determination for a 15-working day objection period. Stakeholders were informed through posting on the MSC website and direct email.

Public Certification Report (27th April 2017)

The SCS certification board accepted the recommendations by the assessment team and the decision to certify the fishery was taken. SCS released the public certification report after the certification decision was taken.

4.4 Evaluation Processes and Techniques

Site Visits

The assessment team selected sites and interviewees based on information needed to assess management operations of the unit of assessment. The client group and other relevant stakeholders

helped identify and contact fisheries management, research, compliance, and habitat protection personnel and agency representatives. Before the site visit and meetings were conducted, an audit plan was provided to the client and relevant stakeholders. The on-site meetings took place in Perth and Augusta, Western Australia between June 13-15th.

Table 14. Audit Plan: Key Meetings and Locations

Meeting number	Date	Location	Topic
1	13 th June 2016	Department of Fisheries, Hillarys, WA	P1 scoring issues, P3 scoring issues
2	14 th June 2016	Department of Fisheries, Hillarys, WA	P2 scoring issues, stakeholder meetings
3	15 th June 2016	Community Resource Centre, Augusta	Operation of the fishery from an industry perspective, traceability

Table 15. 2016 Meeting Attendees.

Name	Organization and Title
Dr. Sabine Daume	Lead auditor, SCS
Dr. Caleb Gardner	P1 Expert, University of Tasmania/SCS
Dr. Stephen Leporati	P2 Expert, SCS
Mr. Peter Trott	P3 Expert, Fishlistic/SCS
Julia Kent	Program Coordinator, SCS
Dr. Anthony Hart	Scientist, DoF
Nathan Adams	License holder and EO, AIAWA
Peter Rickerby	Chairman, AIAWA
Dr. Fred Wells	Scientist, Curtin University
Russell Adams	Regional Manager, DoF
Dr. Fiona Webster	Research Scientist, DoF
Matt Watson	Fisheries Outreach Officer, MSC
Dr. Emily Fisher	Research Scientist, DoF
Dr. Lachlan Strain	Research Scientist (Mollusc), DoF
Shane Walters	Fisheries Management Officer, DoF
Martin Holtz	Principle Management Officer, DoF
Tim Nicholas	Manager, South West Bioregions, DoF
David Sutcliffe	Diver, AIAWA
Dr. Fran Stanley	DPaW
Dr. Mike Rule	DPaW
Melissa Evans	DPaW
Dr. Cecile Dang	Scientist (Fish Health), DoF
Dr. Matt Hourston	Research Scientist, DoF
Dr. Kim Walshe	Certification Manager, DoF
John Lashmar	Diver, AIAWA
Sascha Brand-Gardner	SF Management Officer, DoF
Richard Petty	Compliance Manager
Matt Dasey	Marine Park Co-ordinator, DPaW

Fiona Graham

Marine Park Ranger, DPaW

Consultations

Stakeholders were identified and contacted as per the SCS Stakeholder Engagement Procedure (described in Section 4.3 of this report). SCS worked with MSC outreach in advance of the fishery entering full assessment, to compile an extensive stakeholder list used for emailing announcements and assessment progress to stakeholders. This list contained individuals and organizations spanning the government, private, and non-profit sectors. SCS sent out separate emails to inform stakeholders about the scheduled onsite meetings. Stakeholders from Department of Parks and Wildlife (listed above) attended the stakeholder meetings in both Perth and Augusta, and provided a submission in writing after the onsite meeting (see Appendix 3).

4.4.2 Evaluation Techniques

Methodology Used:

The assessment team received a detailed submission of documents related to the fishery and its management system from the client and DoF prior to the onsite meeting. Further documents were requested from the client as well as DoF and received throughout the assessment process.

Media Used for Public Announcements:

At the start of the process a list of stakeholders was created based on individuals and organizations previously engaged in MSC assessments in the region. Several names were added throughout the process when the team became aware of their interest. All public announcements were sent separately by email to the whole list of identified stakeholders.

Documentation

One of the most significant, and difficult, aspects of the MSC certification process is ensuring that the assessment team gets a complete and thorough grounding in all aspects of the fishery under evaluation. In even the smallest fishery, this is no easy task as the assessment team typically needs information that is fully supported by documentation in all areas of the fishery from the status of stocks, to ecosystem impacts, through management processes and procedures.

Under the MSC program, it is the responsibility of the applying organizations or individuals to provide the information required proving the fishery or fisheries comply with the MSC standards. It is also the responsibility of the applicants to ensure that the assessment team has access to any and all scientists, managers, and fishers that the assessment team identifies as necessary to interview in its effort to properly understand the functions associated with the management of the fishery. Last, it is the responsibility of the assessment team to make contact with stakeholders that are known to be interested, or actively engaged in issues associated with fisheries in the same geographic location.

Information for the assessment was gathered from stakeholder comments during the onsite visit (see submissions received in Appendix 3), and via phone conversations.

The DoF were key in providing many of the scientific analyses, figures as well as operational and regulatory information, and were helpful and cooperative throughout the process.

Scoring Process

The scoring methodology followed the procedure described in Section 7.10 of the MSC Certification Requirements and Guidance v 2.0.

The Assessment Team member responsible for each Principle led the discussion on that Principle and drafted the scores and rationales to justify the score for that Principle. Other team members also asked questions or responded in turn during the onsite meeting and helped facilitate communication between the team and the client and scientists of the fishery. Scoring was initiated during the site visit and completed iteratively through phone calls, emails and skype teleconferences between June and September 2016. Following the onsite visit, the team compiled a list of requested documents that were conveyed by the client coordinator, to the relevant parties. These materials were returned to the team leader and disseminated to the team by the team leader. In cases where consensus cannot be reached, the scoring process calls for the scores to be decided by the team leader with consideration of the recommendation of the pertinent Principle expert. This was not the case with any of the performance indicators during this assessment.

The scoring elements considered under each of the Principles are outlined in Table 16. None were considered data deficient or requiring the use of the RBF for the assessment.

Decision rules for final outcome

The decision rule for MSC certification is as follows:

- No PIs score below 60 (cannot receive certification)
- The aggregate score for each Principle, rounded to the nearest whole number, is 80 or above
- The aggregate score for each Principle is calculated by taking the average score for each section followed by the average of all the section scores (see Table 16).

Scoring was completed by consensus through team meetings and exchanging rationales by email and draft score and report sharing.

Table 16. Scoring elements.

Component	Scoring elements	Main/Not main	Data-deficient or not
<u>Target species</u>	Greenlip abalone (<i>Haliotis laevis</i>) Brownlip abalone (<i>Haliotis conicopora</i>) Roe's abalone (<i>Haliotis roei</i>)	NA NA NA	Not data deficient Not data deficient Not data deficient
<u>Secondary species</u>	Commensal species (coralline algae, sponges, small invertebrates)	Not main	NA
<u>ETP species</u>	Elasmobranchs Cetaceans and Seals Marine Turtles Sea birds Leafy Seadragon (<i>Phycodurus eques</i>)	NA NA NA NA NA	Not data deficient Not data deficient Not data deficient Not data deficient Not data deficient
Habitats	Benthic habitats in fishing grounds	NA	Not data deficient
Ecosystems	Interaction of fishery with ecosystem structure and function	NA	Not data deficient

5. Traceability

5.1 Eligibility Date

The actual eligibility date is the 28 April 2017, the actual certification date of the fishery.

5.2 Traceability within the Fishery

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.

The fishery is operated by 52 licence holders (29 of these fish for Roe's only and 23 fish for Greenlip/Brownlip only) using small vessels (<9 meters in length). 80-100 days out of the year, abalone are harvested and delivered straight to processing facilities using couriers. The UoC covers approximately 800 km of shoreline with 4 sub areas: Augusta, Windy Harbour, Albany, and Hopetoun. The quota is governed from April to April each year and the minimum size limit for Greenlip and Brownlip abalone is 153 mm.

All licensees are included in the UoC (see Appendix 6), therefore there is no risk of certified and non-certified catches being mixed by legally operating fishermen. The abalone fishery is heavily regulated and highly policed. For all catches, a Catch & Disposal Record (CDR) is maintained, with an associated CDR number. Three copies of catch sheets are retained for the catches: 1 for the boat, 1 for the diver, and 1 for the courier. The data from these catches is then posted online to the Western Australia Department of Fisheries' website. More recently, this data has been transitioned to a smart phone application known as 'fish eye,' although the use of the program is not currently required. At the present time, 22% of catches are documented using the smartphone application.

Once the abalone are delivered to the processing facilities, they are sold on consignment. Thus, ownership is retained by the licensee throughout processing and sale to the buyer. The processors are then paid processing fees for their services. For all licence holders, an induction and instruction manual for areas 3 & 2 lists the procedures for the above. The fishermen are also governed by a code of conduct. The management system of the Western Australia Department of Fisheries is highly robust.

Table 17. Traceability Factors within the Fishery.

Traceability Factor	Description of risk factor if present. Where applicable, a description of relevant mitigation measures or traceability systems (this can include the role of existing regulatory or fishery management controls)
Potential for non-certified gear/s to be used within the fishery	N/A – diving is the only used method for abalone fishing.
Potential for vessels from the UoC to fish outside the UoC or in different	Due to the geography of the UoC (800 km of shoreline), it is not practical for fishermen to go outside of it. The distance is too great and there is also a lack of boat/beach ramps. The fishery is also quite small and

geographical areas (on the same trips or different trips)	there has been no problem filling the quota within the UoC.
Potential for vessels outside of the UoC or client group fishing the same stock	Limited to none due to geographical separation and quotas in respective area. The stock in both zones is great enough to fill the quotas without having to exit the UoC. Additionally, the area is heavily regulated and policed.
Risks of mixing between certified and non-certified catch during storage, transport, or handling activities (including transport at sea and on land, points of landing, and sales at auction)	All (100%) licensees are participating in the MSC certification process, so there is no risk of certified and non-certified catches being mixed by legally operating fishermen. Some low risk exists from the illegal product entering the supply chain at the processor. As noted above, the abalone fishery is heavily regulated and highly policed. Several measures are in place to prevent illegal or recreational product entering the chain with sophisticated compliance and enforcement measures (factory audits, paper trail audits, using forensics, etc..) as well as the penalties associated to act as a deterrent (see rationales for PI 3.2.3 below). The greatest risk of mixing exists at the processing facilities rather than with the fishermen on the water or in transit but this risk considered medium because there are good systems in place to mitigate the risks.
Risks of mixing between certified and non-certified catch during processing activities (at-sea and/or before subsequent Chain of Custody)	Low risk. The fishermen are required to carry Catch and Disposal Records (CDR) with them during any harvesting or transport of abalone. The fishery is highly policed and, thus, there are high risks associated with participating in any illegal trade. However, due to the consignment arrangement, the processor never has legal possession of the products. The process facilities will need to hold their own CoC certification as contract processors.
Risks of mixing between certified and non-certified catch during transshipment	Low risk. As above, CDR documentation is required at all times during shipment from port to processing facility, making verification by enforcement officers straightforward.
Any other risks of substitution between fish from the UoC (certified catch) and fish from outside this unit (non-certified catch) before subsequent Chain of Custody is required	Low risk. Again, due to the geography of the UoC (800 km of shoreline), it is not practical to substitute certified catch with non-certified catch from outside the UoC. Additionally, there is ample abalone from within the UoC to fill the quota for all licence holders.

5.3 Eligibility to Enter Further Chains of Custody

Only abalone harvested from the Western Australia Abalone Fishery in the manner defined in the UoA (Section 3.1) are eligible to be sold as MSC certified and carry the MSC ecolabel and be eligible to enter the Chain of Custody (CoC).

Due to the consignment arrangement, the processor never has legal possession of the products. However, Chain of Custody certification is required upon delivery to the processing facilities. These facilities will need to hold their own CoC certification as contract processors. Product may then enter further CoC.

The points of landings for each abalone species are listed in Appendix 7 of the report.

All members of the AIAWA (52 license holders in total, 29 of these fish for Roe's only and 23 fish for Greenlip/Brownlip only) can use the fishery certificate and sell product as MSC certified.

6. Evaluation Results

6.1 Principle Level Scores

Table 18. Final Principle Scores.

Final Principle Scores	Score		
Principle	Greenlip abalone	Brownlip abalone	Roe's abalone
Principle 1 – Target Species	88.3	84.2	96.7
Principle 2 – Ecosystem	88.8	87.0	87.0
Principle 3 – Management System	99.4	99.4	99.4

6.2 Summary of PI Level Scores

Principle	Component	PI No.	Performance Indicator (PI)	Greenlip abalone	Brownlip abalone	Roe's abalone
One	Outcome	1.1.1	Stock status	70	70	100
		1.1.2	Stock rebuilding	80	NA	NA
		1.1.3	Genetics outcome	100	NA	NA
	Management	1.2.1	Harvest strategy	85	70	95
		1.2.2	Harvest control rules & tools	85	95	95
		1.2.3	Information & monitoring	90	90	100
		1.2.4	Assessment of stock status	90	90	90
		1.2.5	Genetics Management	95	NA	NA
		1.2.6	Genetics Information	100	NA	NA
Two	Retained species	2.1.1	Outcome	100	100	100
		2.1.2	Management	80	80	80
		2.1.3	Information	100	100	100
	Bycatch species	2.2.1	Outcome	100	100	100
		2.2.2	Management	85	85	85
		2.2.3	Information	85	85	85
	ETP species	2.3.1	Outcome	90	90	90
		2.3.2	Management	80	80	80
		2.3.3	Information	80	80	80
	Habitats	2.4.1	Outcome	95	95	95
		2.4.2	Management	85	85	85
		2.4.3	Information	80	80	80
	Ecosystem	2.5.1	Outcome	80	80	80
		2.5.2	Management	80	80	80
		2.5.3	Information	85	85	85
	Translocation	2.6.1	Outcome	100	NA	NA
		2.6.2	Management	95	NA	NA
		2.6.3	Information	100	NA	NA
Three	Governance & policy	3.1.1	Legal & customary framework	100	100	100
		3.1.2	Consultation, roles & responsibility	100	100	100
		3.1.3	Long term objectives	100	100	100
	Fishery specific mgt.	3.2.1	Fishery specific objectives	100	100	100
		3.2.2	Decision making processes	100	100	100
		3.2.3	Compliance & enforcement	95	95	95
		3.2.4	Research plan	100	100	100

6.3 Summary of Conditions

Table 19. Summary of Conditions.

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/NA)
1	By the 3rd surveillance audit, provide evidence that changes to catch are sufficient to move the stock to a level where it is at or fluctuates around the target reference point.	PI 1.1.1: Greenlip	N
2	By the 3rd surveillance audit, provide evidence that changes to catch are sufficient to move the stock to a level where it is at or fluctuates around the target reference point.	PI 1.1.1: Brownlip	N
3	By the 3rd surveillance audit, adjust the harvest strategy or provide evidence that it is responsive to the state of the Brownlip stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1. This should address providing a biological basis for selection of the limit reference point.	PI 1.2.1: Brownlip	N

6.4 Recommendations

PI 1.2.1: Greenlip abalone.

- (i) The harvest strategy would be substantially strengthened by testing the assumption that the threshold reference point equates to 30% unfished spawning biomass. This could be explored through comparison with unfished areas as has been attempted with Roe's abalone. Reference points should then be updated through review of the HS.
- (ii) The harvest strategy is somewhat vulnerable from the averaging of catch rate over a period of three years. This dampens any signal of decline and would slow management response to a period of rapid decline in the stock. Consideration should be given to reducing this risk, for example by developing a weighted index of the last three years with greatest weight given to the most recent period.

PI 1.2.1: Brownlip abalone.

- (i) The harvest strategy is somewhat vulnerable from the averaging of catch rate over a period of three years. This dampens any signal of decline and would slow management response to a period of rapid decline in the stock. Consideration should be given to reducing this risk, for example by developing a weighted index of the last three years with greatest weight given to the most recent period.

PI 1.2.2: All species.

The control rule allows a large increase in catch when the stock moves upwards over the Threshold RP. This risk sending the stock immediately back below this RP. This could be resolved by breakout rules that allow smaller upward steps with an increment every two years, or, requiring the PI to be above the RP for at least two years before action is taken.

6.5 Determination, Formal Conclusion and Agreement

The assessment team recommended that the fishery as defined by the Unit of Certification in Section 3.1 be awarded MSC-endorsed certification based on MSC Certification Requirements v2.0. This is based on the fact that none of the scores assigned to the Performance Indicators fall below the required SG60 and also that the average score for each Principle is above 80. On the basis of a careful review of this certification audit report, the SCS Certification Board has accepted the recommendation from the assessment team and determined that the Western Australian Abalone Fishery as defined by the Units of Certification in Section 3.1, merits certification.

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Appendices

Appendix 1. Scoring and Rationales

Performance Indicator Scores and Rationale

Procedure for Scoring and Rationales

After the team compiled and analysed all relevant information, each UoA was scored against the Performance Indicator Scoring Guideposts (PISGs) in the final assessment tree (the structure of PIs and scoring guideposts that make up the evaluation). The team discussed the evidence in detail before agreeing on a final score for each PI. A brief explanation of the MSC scoring process is provided below and is explained in more detail in MSC Fisheries Certification Requirements and Guidance v2.0 (2014).

The team first assesses each PI against each scoring issue at the SG60 level. If one or more of the SG60 scoring issues is not met, the UoA fails and no further scoring is required.

If all the SG60 scoring issues are met the PI will achieve a minimum score of 60, and the team proceeds to assess each scoring issue against the SG80 level. In order to achieve an 80 score, all of the SG60 scoring issues and all of the SG80 scoring issues must be met. If not all scoring issues are met at SG80 the PI is given an intermediate score in increments of 5 (65, 70 or 75), which reflects overall performance against the SG80 scoring issues:

- The PI will score 65 when performance is slightly above 60 (few scoring issues are met at SG80 but most are not)
- The PI will score 70 when performance is mid-way between SG60 and SG80 (some scoring issues are met at SG80 and some are not)
- The PI will score 75 when performance is almost at SG80 (most scoring issues are met at SG80 and few are not)

If one or more of the SG80 scoring issues is not met, the PI is assigned a condition. Only if all of the SG80 scoring issues are met will the team proceed to assess the PI against the SG100 scoring issues. If not all scoring issues meet SG80 then the SG100 scoring issues are not scored.

In order to achieve a 100 score, all of the SG60, SG80 and SG100 scoring issues must be met. If all of the SG60 and SG80 scoring issues are met, but not all of the SG100 scoring issues are met, then the PI is given an intermediate score in increments of 5 (85, 90 or 95) which reflects overall performance against the SG100 scoring issues:

- The PI will score 85 when performance is slightly above 80 (few scoring issues are met at SG100 but most are not)
- The PI will score 90 when performance is mid-way between SG80 and SG100 (some scoring issues are met at SG100 and some are not)
- The PI will score 95 when performance is almost at SG100 (most scoring issues are met at SG100 and few are not)

When there is only one scoring issue for a PI then it may be 'partially scored' in increments of 5 if the requirements are partially met.

In Principle 1 or 2 the team scores PIs are comprised of differing scoring elements (species or habitats) that comprise part of a component affected by the UoA. If any single scoring element fails to meet SG80 then the overall score for that element shall be less than 80 and a condition is raised (regardless of whether other elements may be at SG100). The PI is given a score which reflects the number of elements at each SG rather than being a numerical average.

Principle 1

Under Principle 1, seven performance indicators (PIs) are used that are grouped into two key aspects of a fishery's performance: 1) The current status of the target stock resource with three PIs; and 2) Harvest Strategy (Management) with four PIs. The PIs under (1) consider the impact of the fishery on the target species, and particularly whether the stock is at sustainable levels. In contrast, the PIs under (2) consider the tools, measures or strategies that are being used specifically to manage the impact of the fishery on the target species.

PI 1.1.1 – Stock status: Greenlip abalone

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			
	Guided 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?	Y	Y	N
	Justification	<p>Catch is dominated by the commercial fishery (~95%) with spawning biomass primarily protected by the total allowable catch and the legal minimum size. The status of this stock, as assessed using the standardised catch rate has been relatively stable until the last few years when declines were seen in this species and many others in the region due to a heat wave (Hart et al., 2016) causing mortalities of harvestable stock or lower recruitment due to this or other environmental factors.</p> <p>The minimum size limit is high relative to size at onset of maturity and provides protection of an estimated 40% of the spawning biomass (Hart <i>et al.</i> 2013a). There is information on trends in recruitment which suggests stability through time apart from the last few years when decline has occurred simultaneously with decline in the legal sized biomass (Hart et al., 2016). The absence of a lag between declines in legal sized stock and recruits means this is consistent with environmental factors rather than fishing induced decline in recruitment. This meets the requirements of the SG 60 and SG 80 levels.</p> <p>There is not, however, a high degree of certainty that the stock is above the PRI for the following reasons:</p> <p>Although the level of recruitment has been monitored by fishery-independent surveys since 2005, this time series of data has not been considered sufficiently long to provide a high degree of certainty (Hart et al., 2016).</p> <p>Stock abundance has declined in the last few years and catches have been substantially reduced in response (30-45%) but there is insufficient knowledge of the stock to provide a high degree of certainty that this catch reduction is sufficient to ensure there is a low probability of recruitment overfishing.</p> <p>This meets the requirements of the SG 60 and SG 80 levels but not of the SG 100 level.</p>		

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
b	Stock status in relation to achievement of MSY			
	Guided 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?		N	N
	Justification	Target reference points have only been recently implemented in the fishery but the performance of the fishery has been examined in relation to these using data from the last 20 years. Over this period, the stock has only occasionally exceeded a target consistent with a proxy for MSY (Hart et al., 2016). It thus cannot be said to be fluctuating around this level. There has not been a history of change in catch consistent with attempting to keep the stock around the target SCPUE. There is evidence that this fishery has experienced changes in productivity due to natural environmental fluctuations in 2010/11. Given this, adjustments to the reference points consistent with natural environmental fluctuations are acceptable, although have not been developed in this case. Catch has been reduced in attempt to increase the stock abundance, however it is not clear that this is maintaining the stock around a level consistent with MSY given this reduced productivity.		
References		Hart <i>et al.</i> 2013a; Hart <i>et al.</i> 2016.		
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)	3y moving average of SCPUE	Area 2- 7.2, Area 3- 6.6 (kg meat / h)	Area 2- ~7.5, Area 3- 8.3 (kg meat / h) (that is, approaching).	
Reference point used in scoring stock relative to MSY (SIb)	3y moving average of SCPUE	Area 2- 14.4, Area 3- 13.2 (kg meat / h)	Area 2- ~7.5, Area 3- 8.3 (kg meat / h) (that is, well below).	
OVERALL PERFORMANCE INDICATOR SCORE:				70
Overall 70 (one of two scoring issues meets SG80).				
CONDITION NUMBER 1				1
By the 3rd surveillance audit, provide evidence that changes to catch are sufficient to move the stock to a level where it is at or fluctuates around the target reference point.				

PI 1.1.1 – Stock status: Brownlip abalone

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			
	Guidpost	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?	Y	Y	N
	Justification	<p>Catch is dominated by the commercial fishery (~97%) with spawning biomass primarily protected by the total allowable catch and the legal minimum size. The status of this stock, as assessed using the standardised catch rate has been relatively stable until the last few years when declines were seen in this species and many others in the region due to a heat wave (Hart <i>et al.</i> 2016).</p> <p>The minimum size limit is high relative to size at onset of maturity, and provides protection of an estimated 40% of the spawning biomass (Hart <i>et al.</i> 2013a). SCPUE has declined but remains above the LRP. Catch has been reduced in response to declining SCPUE in line with the harvest strategy. This meets the requirements of the SG 60 and SG 80 levels.</p> <p>There is not, however, a high degree of certainty that the stock is above the PRI for the following reasons:</p> <ul style="list-style-type: none">-recruitment has not been monitored directly;-SCPUE has been volatile (due to the small size of the catch) which reduces certainty in interpretation. <p>Stock abundance has declined in the last few years and catches have been substantially reduced in response but there is insufficient knowledge of the stock to provide a high degree of certainty that this catch reduction is sufficient to ensure there is a low probability of recruitment overfishing.</p> <p>This meets the requirements of the SG 60 and SG 80 levels but not of the SG 100 level.</p>		
b	Stock status in relation to achievement of MSY			
	Guidpost		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?		N	N
	Justification	Target reference points have only been recently implemented in the fishery, but the performance of the fishery has been examined in relation to these using data from the last 20 years (Hart <i>et al.</i> 2016). Over this period, the stock has generally		

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
		<p>exceeded a target consistent with a proxy for MSY. This low level of exploitation has occurred as the catch tends to be small and taken secondary to the larger greenlip fishery.</p> <p>There is evidence that this fishery has experienced changes in productivity due to natural environmental fluctuations in 2010/11. Since this period the indicator of SCPUE has fallen below the target reference point. Catches have been reduced in response but at this stage there is not a high degree of certainty that fishing mortality has been sufficiently reduced to ensure the stock will be maintained at a level consistent with MSY.</p> <p>A downward trend in stock below BMSY over recent years is not consistent with meeting SG80 unless accompanied by projections or other information suggesting that the trend will soon be reversed. Given the absence of projection / information on recovery, other than implementation of a catch reduction, the fishery does not meet SG80.</p>		
References		Hart <i>et al.</i> 2013a; Hart <i>et al.</i> 2016.		
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 (S1a)	3y moving average of SCPUE	Area 2- 9.7, Area 3- 4.9 (kg meat / h)	Area 2- ~14.6, Area 3- ~7.3 (kg meat / h) (that is, above).	
Reference point used in scoring stock relative to MSY (S1b)	3y moving average of SCPUE	Area 2- 19.4, Area 3- 9.8 (kg meat / h)	Area 2- ~14.6, Area 3- ~7.3 (kg meat / h) (that is, below).	
OVERALL PERFORMANCE INDICATOR SCORE:				70
Overall 80 (all scoring issues at SG80)				
CONDITION NUMBER (if relevant):				2
By the 3rd surveillance audit, provide evidence that changes to catch are sufficient to move the stock to a level where it is at or fluctuates around the target reference point.				

PI 1.1.1 – Stock status: Roe's abalone

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			
	Guided 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?	Y	Y	Y
	Justification	<p>Catch is dominated by the commercial fishery (~70%) with spawning biomass primarily protected by the total allowable catch and the legal minimum size. The status of this stock, as assessed using the standardised catch rate has been relatively stable until the last few years when declines were seen in this species and many others in the region due to a heat wave (Hart <i>et al.</i> 2016).</p> <p>Spawning biomass and the effects of fishing are estimated through the assessment process. Harvests remove only a small fraction of the total spawning biomass (Hart <i>et al.</i> 2013a). There is information on trends in recruitment which suggests variation through time is driven by environmental processes rather than fishing mortality (Hart <i>et al.</i> 2016). This meets the requirements of the SG 60 and SG 80 levels.</p> <p>There is uncertainty about some trends in the stock. Although spawning biomass has been monitored, this time series of data has not been collected for a sufficiently long period to provide a high degree of certainty. Stock abundance has steadily declined in several areas in a pattern that cannot be fully explained by the heatwave event in 2010/11.</p> <p>Despite the short time series of spawning biomass data, there is a high degree of certainty that the stock is being managed above the PRI (SG 100), that is, that recruitment overfishing is not occurring. This is because catch reductions or complete closures have been implemented and are sufficient to ensure the stock remains above the LRPs.</p>		
b	Stock status in relation to achievement of MSY			
	Guided 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?		Y	Y
	Justification	Target reference points have only been recently implemented in the fishery but the performance of the fishery has been examined in relation to these using data from the last 20 years. Over this period, the stock has always exceeded the target consistent with a proxy for MSY. This is for all areas, including Area 7 where most of the catch is taken each year.		

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
		There is evidence that this fishery has experienced changes in productivity due to natural environmental fluctuations in 2010/11. Since this period the indicator of SCPUE has fallen in some areas but has remained above the target reference point with signs of stability or improvement in recent years. This provides a high degree of certainty that the stock is above the target reference point.		
References		Hart <i>et al.</i> 2013a.; Hart <i>et al.</i> 2016.		
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 (S1a)	3y moving average of SCPUE	Area 2- 6.7, Area 5- 5.9, Area 6- 5.9, Area 7 – 10.4, Area 8- 6.3 (kg meat / h)	Area 2 ~15, Area 5 ~20, Area 6 ~20, Area 7 ~30, Area 8 - closed (kg meat / h) (that is, well above).	
Reference point used in scoring stock relative to MSY (S1b)	3y moving average of SCPUE	Area 2- 13.3, Area 5- 11.8, Area 6- 11.8, Area 7 – 20.8, Area 8- 12.7 (kg meat / h)	Area 2 ~15, Area 5 ~20, Area 6 ~20, Area 7 ~30, Area 8 - closed (kg meat / h) (that is, well above).	
OVERALL PERFORMANCE INDICATOR SCORE:				100
Overall 100 (all scoring issues meet SG100).				
CONDITION NUMBER (if relevant):				-

PI 1.1.2 – Stock rebuilding: Greenlip abalone

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			
	Guidepost	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?	Y		N
	Justification	Greenlip abalone stocks have fallen below the threshold reference point but remain marginally above the limit reference in both assessed areas (Hart <i>et al.</i> 2013a). The use of a three-year SCPUE tends to smooth trends in this indicator, which means with a trend of declining SCPUE, the status in the most recent year is lower than indicated by the SCPUE average. The generation time of greenlip abalone is around 3 to 4 years so that the applicable 2-generation time period for rebuilding is around 7 years. The harvest strategy has responded to declines in SCPUE by reducing catch. The timeframe is not specified but the historical response of the stock to changes in catch shows that rebuilding at lower catch can occur within the 2-generation period. The shortest possible timeframe (and less than one generation time) is not however specified and historical periods of recovery suggest durations longer than the one-generation period of 3-4 years will be required so the fishery cannot be said to meet SG100.		
b	Rebuilding evaluation			
	Guidepost	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?	Y	Y	N
	Justification	The reference point uses SCPUE as an indicator and this is collected and reported annually so effectiveness of the strategy in rebuilding the stock will be monitored. Simulation modelling have been conducted of the probability of the reference		

PI 1.1.2		Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe
		<p>points being breached, given assumptions of recruitment and natural mortality which indicate very low risk at current catch, thus the fishery meets SG80.</p> <p>Rebuilding of the stocks is not yet apparent, and there is some uncertainty around interpreting the likelihood of rebuilding from simulation modelling because of the static nature of these models and assumption of constant recruitment. That assumption is difficult in this fishery given the recent environmental- driven declines in recruitment. For this reason, the fishery does not meet SG100.</p>
References		Hart <i>et al.</i> 2016.
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION		

PI 1.1.2 – Stock rebuilding: Brownlip abalone

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			
	Guidpost	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?	NA		NA
	Justification	Not scored because indicator 1.1.1 scored 80 (CR V.2.0 SA 2.3.1).		
b	Rebuilding evaluation			
	Guidpost	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?	NA	NA	NA
	Justification	No scores		
References				
OVERALL PERFORMANCE INDICATOR SCORE:				NA
CONDITION NUMBER:				

PI 1.1.2 – Stock rebuilding: Roe's abalone

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			
	Guidepost	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?	NA		NA
	Justification	Not scored because 1.1.1 scored at 100 (CR V.2.0 SA 2.3.1). Roe's abalone stocks remain above the limit reference in all assessed areas.		
b	Rebuilding evaluation			
	Guidepost	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?	NA	NA	NA
	Justification			
References		Hart <i>et al.</i> 2016.		
OVERALL PERFORMANCE INDICATOR SCORE:				NA
CONDITION NUMBER:				

PI 1.1.3 – Genetics: Greenlip abalone

PI 1.1.3		The fishery has negligible discernible impact on the genetic structure of the population		
Scoring Issue		SG 60	SG 80	SG 100
a	Genetic impact of enhancement activity			
	Guidpost	The fishery is unlikely to impact genetic structure of wild populations to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to impact genetic structure of wild populations to a point where there would be serious or irreversible harm.	An independent peer-reviewed scientific assessment confirms with a high degree of certainty that there are no risks to the genetic structure of the wild population associated with the enhancement activity.
	Met?	Y	Y	Y
	Justification	<p>The abalone farming operation is not an attempt to enhance the wider stock or the fishery, rather it is an attempt to grow out hatchery produced juveniles within a farm lease. The lease is in open water with abalone placed on artificial (concrete) reef. There is potential for larvae produced by these ongrown abalone to settle on natural reef in the region. This risk exists with abalone grown on land-based farms also (not present here) where effluent water is released back into the sea.</p> <p>This operation is highly unlikely to impact the wild genetic structure because the broodstock are taken from natural reef in the Augusta area where the farm is located and only F1 generation abalone can be seeded onto the sea ranch (Hart <i>et al.</i> 2016).</p> <p>Broodstock numbers are managed by government policy to ensure diversity of progeny (Webster <i>et al.</i> 2016). There are no F2 generations, hybrid or polyploid abalone seeded onto the artificial structures. For this reason, the fishery meets SG80.</p> <p>An independent peer-reviewed scientific assessment has confirmed with a high degree of certainty that the impacts of the abalone hatchery and sea ranch on the genetic structure of wild populations have negligible risk (Webster <i>et al.</i> 2016). The fishery thus meets SG100.</p>		
References		Hart <i>et al.</i> 2016, Webster <i>et al.</i> 2016		
OVERALL PERFORMANCE INDICATOR SCORE:				100
CONDITION NUMBER (if relevant):				

PI 1.2.1 – Harvest strategy: Greenlip abalone

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			
	Guidpost	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?	Y	Y	N
	Justification	<p>The harvest strategy (HS) responds to decline in standardized catch rate by lowering catches as this proxy for biomass declines. The strategy involves regular annual assessments with associate regular adjustment to the total allowable catch if indicated. The harvest strategy thus meets SG60.</p> <p>Elements of the harvest strategy work together to achieve stock management objectives so it meets SG80. The strategy is strongly reliant on the protection of the legal minimum size limit for greenlip abalone. Size at onset of maturity is well established for this species in WA.</p> <p>The selection of the limit reference point is reliant on a single arbitrary decision in the development of the HS. This is that the lowest catch rate observed during the reference period (1992 to 2006 in the case of greenlip abalone) equates to 30% of the unfished stock (Hart <i>et al.</i> 2016, WA Government 2016). From this arbitrary decision, the limit reference point is set at 2/3 of the lowest observed biomass during the reference period.</p> <p>The use of observed historical catch rates to set reference points is a common approach but limit reference points are more commonly based on catch rates actually seen historically. That is because the subsequent history of the stock provides evidence on whether recruitment was affected.</p> <p>The approach used here for the greenlip HS enables the exploitable biomass component of the stock to be depleted to levels substantially lower than at any point seen historically (i.e. 2/3) yet not be classified as recruitment overfished. Despite this problem, the elements of the harvest strategy can be considered to work together to achieve the management objective of maintaining spawning stock biomass at a level where the main factor affecting recruitment is the environment. This is because of protection of spawning biomass with the minimum size limit.</p>		
b	Harvest strategy evaluation			
	Guidpost	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.

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Met?	Y	Y	N
	Justification	Testing of the reference points within the HS has been conducted although to a basic level assuming constant recruitment. Outcomes were highly reliant on assumptions of possible (unknown) levels of F and M. This analysis did involve full evaluation of the whole strategy; thus, the fishery cannot be said to meet SG100. Nonetheless, evidence exists that the HS is meeting its objectives through the effect of the HS on catch, which has been cut in recent years in response to the performance indicator (SCPUE) falling below the threshold reference point. Thus, the fishery meets SG80.		
c	Harvest strategy monitoring			
	Guided post	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	The fishery is assessed each year which provides updated information on trends in the stock, and whether the decision rules effectively maintain the stock around target reference points.		
d	Harvest strategy review			
	Guided post			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			not scored
	Justification	The harvest strategy has only been implemented for a short period but there is a demonstrated history of review and improvement. Changes were made to shift emphasis away from industry selected reference points to those with a biological basis.		
e	Shark finning			
	Guided 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?	(Not relevant)	(Not relevant)	(Not relevant)
	Justification	Not relevant		
f	Review of alternative measures			
	Guided 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 biannual 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.

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Met?	(Not relevant)	(Not relevant)	(Not relevant)
	Justification	Scoring issue not scored as there is no unwanted catch of the target stock.		
References		Hart <i>et al.</i> 2016, WA Government 2016.		
OVERALL PERFORMANCE INDICATOR SCORE:				
Overall 85 (all scoring issues meet SG80 where possible, one of three scoring issues meet SG 100 where possible).				85
Recommendation:				
<div><div>(i)</div><div>The harvest strategy would be substantially strengthened by testing the assumption that the threshold reference point equates to 30% unfished spawning biomass. This could be explored through comparison with unfished areas as has been attempted with Roe’s abalone. Reference points should then be updated through review of the HS.</div></div> <div><div>(ii)</div><div>The harvest strategy is somewhat vulnerable from the averaging of catch rate over a period of three years. This dampens any signal of decline and would slow management response to a period of rapid decline in the stock. Consideration should be given to reducing this risk, for example by developing a weighted index of the last three years with greatest weight given to the most recent period.</div></div>				

PI 1.2.1 – Harvest strategy: Brownlip abalone

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			
	Guidepost	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?	Y	N	N
	Justification	<p>The harvest strategy responds to decline in standardized catch rate by lowering catches as this proxy for biomass declines. The strategy involves regular annual assessments with associate regular adjustment to the total allowable catch if indicated. The harvest strategy thus meets SG60.</p> <p>It is uncertain if elements of the harvest strategy work together to achieve stock management objectives so it cannot be said to meet SG80. In contrast to greenlip abalone, the HS has less protection through the legal minimum size limit. This is because onset of maturity is less well established for this species and the gap between the presumptive size at 50% onset of maturity (120 mm) and the legal minimum length (140 mm) is less.</p> <p>The selection of the limit reference point thus becomes critical for this certification unit. The value of the LRP is critical to preventing recruitment overfishing and is reliant on an arbitrary decision in the development of the HS. This is that the lowest catch rate observed during the reference period (2000 to 2014) equates to 30% of the unfished stock. From this arbitrary decision, the limit reference point is set at 2/3 of the lowest observed biomass during the reference period. This reference point is also highly sensitive to the reference period selected. For example, a reference period of 2000 to 2012 would have resulted in the limited reference point being set around 40% higher in Area 2.</p> <p>The use of observed historical catch rates to set reference points is a common approach but limit reference points are more commonly based on catch rates actually seen historically. That is because the subsequent history of the stock provides evidence on whether recruitment was affected. There is no historical evidence that the brownlip stock can be depleted below the threshold reference point and recover.</p> <p>The approach used here for the brownlip HS enables the stock to be depleted to levels substantially lower than at any point seen historically (i.e. 2/3) yet not be classified as recruitment overfished.</p> <p>The SG80 level is therefore not met.</p>		
b	Harvest strategy evaluation			
	Guidepost	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	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
			exists that it is achieving its objectives.	objectives including being clearly able to maintain stocks at target levels.
	Met?	Y	Y	N
	Justification	Testing of the reference points within the HS has not been conducted, thus the fishery cannot be said to meet SG100. Nonetheless, evidence exists that the HS is meeting its objectives through the effect of the HS on catch, which has been cut in recent years in response to the performance indicator (SCPUE) falling below the threshold reference point. Thus, the fishery meets SG80.		
c	Harvest strategy monitoring			
	Guidpost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	The fishery is assessed each year which provides updated information on trends in the stock, and whether the decision rules effectively maintain the stock around target reference points.		
d	Harvest strategy review			
	Guidpost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			Not scored
	Justification	The harvest strategy has only been implemented for a short period but there is a demonstrated history of review and improvement. Changes were made to shift emphasis away from industry selected reference points to those with a biological basis.		
e	Shark finning			
	Guidpost	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?	(Not relevant)	(Not relevant)	(Not relevant)
	Justification	NA		
f	Review of alternative measures			
	Guidpost	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	There is a biannual 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

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
			are implemented as appropriate.	implemented, as appropriate.
	Met?	(Not relevant)	(Not relevant)	(Not relevant)
	Justification	Scoring issue not scored as there is no unwanted catch of the target stock.		
References		Hart et al., 2016., WA Government 2016.		
OVERALL PERFORMANCE INDICATOR SCORE:				70
Overall 70 (all scoring issues meet SG60, one of two scoring issues meets SG80 where possible).				
CONDITION NUMBER 2 By the 3rd surveillance audit, adjust the harvest strategy or provide evidence that it is responsive to the state of the Brownlip stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1. This should address providing a biological basis for selection of the limit reference point. RECOMMENDATION The harvest strategy is somewhat vulnerable from the averaging of catch rate over a period of three years. This dampens any signal of decline and would slow management response to a period of rapid decline in the stock. Consideration should be given to reducing this risk, for example by developing a weighted index of the last three years with greatest weight given to the most recent period.				3

PI 1.2.1 – Harvest strategy: Roe’s abalone

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			
	Guidpost	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?	Y	Y	Y
	Justification	<p>The harvest strategy responds to decline in standardized catch rate by lowering catches as this proxy for biomass declines. The strategy involves regular annual assessments with associated regular adjustment to the total allowable catch if indicated. The harvest strategy thus meets SG60.</p> <p>The selection of the limit reference point, critical to preventing recruitment overfishing, is backed by empirical data on the abundance of Roe’s abalone in unfished areas. This provides assurance that the reference point elements are designed to work together with the decision rule element (SG100) to achieve the management objective of maintaining spawning stock biomass at a level where the main factor affecting recruitment is the environment.</p>		
b	Harvest strategy evaluation			
	Guidpost	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?	Y	Y	N
	Justification	<p>Testing of the reference points within the HS has been conducted although was to a basic level assuming constant recruitment. Outcomes were highly reliant on assumptions of possible (unknown) levels of F and M. Analyses were somewhat circular as the test of whether the HS was effective was dependent on the M selected. But decisions on whether an M was feasible was based on whether the HS had previously been effective. This analysis did involve full evaluation of the whole strategy; thus, the fishery cannot be said to meet SG100.</p> <p>Nonetheless, evidence exists that the HS is meeting its objectives through the effect of the HS on catch, which has been cut in recent years in response to the performance indicator (SCPUE) falling below the threshold reference point. Thus, the fishery meets SG80.</p>		
c	Harvest strategy monitoring			
	Guidpost	Monitoring is in place that is expected to		

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
		determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	The fishery is assessed each year which provides updated information on trends in the stock, and whether the decision rules effectively maintain the stock around target reference points.		
d	Harvest strategy review			
	Guidpost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			Y
	Justification	The harvest strategy has only been implemented for a short period but there is a demonstrated history of review and improvement. Changes were made to shift emphasis away from industry selected reference points to those with a biological basis.		
e	Shark finning			
	Guidpost	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?	(Not relevant)	(Not relevant)	(Not relevant)
	Justification	NA		
f	Review of alternative measures			
	Guidpost	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 biannual 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?	(Not relevant)	(Not relevant)	(Not relevant)
	Justification	Scoring issue not scored as there is no unwanted catch of the target stock.		
References		Hart et al., 2016., WA Government 2016.		
OVERALL PERFORMANCE INDICATOR SCORE:				
Overall 95 (all scoring issues meet SG80, two of three scoring issues meet SG100 where possible).				95
CONDITION NUMBER (if relevant):				

PI 1.2.2 – Harvest control rules and tools: Greenlip abalone

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			
	Guidepost	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?	Y	Y	N
	Justification	Harvest control rules are in place to reduce catch as the performance indicator of SCPUE falls below the threshold reference point and approaches the limit reference point. The fishery thus meets SG60. The harvest control rule is expected to maintain stock around the Target reference point, which is intended to approximate MSY. The fishery thus meets SG80. The HCR implements catch at higher levels of stock abundance that have historically prevented the stock staying above the target reference point most of the time therefore not meeting the SG100.		
b	HCRs robustness to uncertainty			
	Guidepost		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?		Y	Y
	Justification	The HCRs increasingly reduce catch to the point that the fishery is closed when unexpected events occur in the example of the 2010/11 heatwave. This has been tested in the example of Roe’s abalone which has remained closed in Area 8. Therefore, the SG 100 is met.		
c	HCRs evaluation			
	Guidepost	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.

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
	Met?	Y	Y	N
	Justification	There is evidence that controls on catch are effective in achieving required exploitation rates, as evidenced by stability in the fishery prior to 2010. The fishery thus meets SG80. There is not yet clear evidence that the HCR has been sufficiently responsive to restore SCPUE following the heatwave induced decline from 2010. Hence the fishery does not meet SG100.		
References		Hart <i>et al.</i> 2016.		
OVERALL PERFORMANCE INDICATOR SCORE:				85
Overall 85 (two scoring issues at SG80, one at SG100).				
CONDITION NUMBER (if relevant):				
RECOMMENDATION				
The control allows a large increase in catch when the stock moves upwards over the Threshold RP. This risks sending the stock immediately back below this RP. This could be resolved by breakout rules that allow smaller upward steps with an increment every two years, or, requiring the PI to be above the RP for at least two years before action is taken.				

PI 1.2.2 – Harvest control rules and tools: Brownlip abalone

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			
	Guidepost	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?	Y	Y	Y
	Justification	Harvest control rules are in place to reduce catch as the performance indicator of SCPUE falls below the threshold reference point and approaches the limit reference point. The fishery thus meets SG60. The harvest control rule is expected to maintain stock around the Target reference point, which is intended to approximate MSY. The fishery thus meets SG80. The HCR implements catch at higher levels of stock abundance that have historically kept the stock well above the target reference point most of the time, thus meeting SG100.		
b	HCRs robustness to uncertainty			
	Guidepost		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?		Y	Y
	Justification	The HCRs increasingly reduce catch to the point that the fishery is closed when unexpected events occur in the example of the 2010/11 heatwave. This has been tested in the example of Roe’s abalone which has remained closed in Area 8 therefore meeting the SG 100.		
c	HCRs evaluation			
	Guidepost	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?	Y	Y	N

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place	
	Justification	There is evidence that controls on catch are effective in achieving required exploitation rates, as evidenced by stability in the fishery prior to 2010. The fishery thus meets SG80. There is not yet clear evidence that the HCR has been sufficiently responsive to restore SCPUE following the heatwave induced decline from 2010. Hence the fishery does not meet SG100.	
References		Hart <i>et al.</i> 2016.	
OVERALL PERFORMANCE INDICATOR SCORE: Overall 95 (one scoring issue at SG80, two scoring issues at SG100).			95
CONDITION NUMBER (if relevant): RECOMMENDATION The control allows a large increase in catch when the stock moves upwards over the Threshold RP. This risks sending the stock immediately back below this RP. This could be resolved by breakout rules that allow smaller upward steps with an increment every two years, or, requiring the PI to be above the RP for at least two years before action is taken.			

PI 1.2.2 – Harvest control rules and tools: Roe's abalone

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			
	Guidepost	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?	Y	Y	Y
	Justification	Harvest control rules are in place to reduce catch as the performance indicator of SCPUE falls below the threshold reference point and approaches the limit reference point. The fishery thus meets SG60. The harvest control rule is expected to maintain stock around the Target Reference Point, which is intended to approximate MSY. The fishery thus meets SG80. The HCR implements catch at higher levels of stock abundance that have historically kept the stock well above the target reference point most of the time, thus meeting SG100.		
b	HCRs robustness to uncertainty			
	Guidepost		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?		Y	Y
	Justification	The HCRs increasingly reduce catch to the point that the fishery is closed when unexpected events occur in the example of the 2010/11 heatwave. This has been tested in the example of Roe’s abalone which has remained closed in Area 8. The SG 100 is met.		
c	HCRs evaluation			
	Guidepost	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?	Y	Y	N

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place	
	Justification	There is evidence that controls on catch are effective in achieving required exploitation rates, as evidenced by stability in the fishery prior to 2010. The fishery thus meets SG80. There is not yet clear evidence that the HCR has been sufficiently responsive to stabilize SCPUE in all areas following the heatwave induced decline from 2010. Hence the fishery does not meet SG100.	
References		Hart <i>et al.</i> 2016.	
OVERALL PERFORMANCE INDICATOR SCORE:			95
Overall 95 (one scoring issue at SG80, two scoring issues at SG100).			
CONDITION NUMBER (if relevant):			
RECOMMENDATION			
The control allows a large increase in catch when the stock moves upwards over the Threshold RP. This risks sending the stock immediately back below this RP. This could be resolved by breakout rules that allow smaller upward steps with an increment every two years, or, requiring the PI to be above the RP for at least two years before action is taken.			

PI 1.2.3 – Information and monitoring: Greenlip abalone

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			
	Guidepost	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 is 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?	Y	Y	N
	Justification	Biological information and assessment approaches for greenlip abalone are available from other jurisdictions and this has been utilized wherever relevant. The harvest strategy primarily relies on SCPUE which is collected through compulsory logs. Testing of the HCR relied on additional available information such as onset of maturity. Monitoring of recruitment is of value for interpreting trends in the stock. The fishery thus meets SG80 but cannot be said to have a comprehensive range of information (SG100) because of lack of monitoring of information such as detailed spatial stock structure, or detailed fleet dynamics (which is known to be important in abalone fisheries).		
b	Monitoring			
	Guidepost	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?	Y	Y	Y
	Justification	The HS is designed to use data that has been collected for several years and is monitored through an ongoing compulsory log program. Recreational catch is also monitored through surveys that are sufficiently regular for the purposes of the HS. The SG 100 is met.		

PI 1.2.3		Relevant information is collected to support the harvest strategy		
c	Comprehensiveness of information			
	Guided post		There is good information on all other fishery removals from the stock.	
	Met?		Y	
	Justification	All commercial catch is monitored in high detail with high precision. Recreational catch is relatively minor, <5% and collected regularly through telephone and integrated surveys (these involve an off-site phone diary survey, on-site boat ramp surveys and a remote camera survey). Greenlip is the only one of the three UoA that has a non-negligible illegal market and this has been estimated as well as possible at 3 t. Meeting this scoring issue at the SG 80 level		
References		Hart <i>et al.</i> 2016.		
OVERALL PERFORMANCE INDICATOR SCORE:				90
Overall 90 (all scoring issues meet SG80, one of two scoring issues meets SG100 where possible).				
CONDITION NUMBER (if relevant):				

PI 1.2.3 – Information and monitoring: Brownlip abalone

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			
	Guided 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 is 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?	Y	Y	N
	Justification	The harvest strategy primarily relies on SCPUE which is collected through compulsory logs. Some independent survey data collected although this has mainly been targeted towards greenlip abalone. The fishery thus meets SG80 but cannot be said to have a comprehensive range of information (SG100) because of lack of monitoring of information such as detailed spatial stock structure, or detailed fleet dynamics (which is known to be important in abalone fisheries).		
b	Monitoring			
	Guided 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?	Y	Y	Y
	Justification	The HS is designed to use data that has been collected for several years and is monitored through an ongoing compulsory log program. Recreational catch is also monitored through surveys that are sufficiently regular for the purposes of the HS. Therefore, the SG 100 is met.		
Comprehensiveness of information				

PI 1.2.3		Relevant information is collected to support the harvest strategy		
c	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		Y	
	Justification	All commercial catch is monitored in high detail with high precision. Recreational catch is relatively minor, <5% and collected regularly through telephone and integrated surveys (these involve an off-site phone diary survey, on-site boat ramp surveys and a remote camera survey). This meets the SG 80 level.		
References		Hart <i>et al.</i> 2016.		
OVERALL PERFORMANCE INDICATOR SCORE:				
Overall 90 (all scoring issues meet SG80, one of two scoring issues meets SG100 where possible).				90
CONDITION NUMBER (if relevant):				

PI 1.2.3 – Information and monitoring: Roe's abalone

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			
	Guidepost	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 is 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?	Y	Y	Y
	Justification	The harvest strategy primarily relies on SCPUE which is collected through compulsory logs. Independent survey data is collected to provide information on density and biomass of all age classes, recruitment and spawning stock levels, and growth patterns. The fishery thus meets SG100.		
b	Monitoring			
	Guidepost	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?	Y	Y	Y
	Justification	The HS is designed to use data that has been collected for several years and is monitored through an ongoing compulsory log program. Recreational catch is also monitored through field surveys that are conducted for each of the brief open periods. This meets the SG 100 level.		
c	Comprehensiveness of information			
	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		Y	

PI 1.2.3		Relevant information is collected to support the harvest strategy	
	Justification	All commercial catch is monitored in high detail with high precision. Recreational catch is collected through well designed field surveys and the SG 80 is met.	
References		Hart <i>et al.</i> 2016.	
OVERALL PERFORMANCE INDICATOR SCORE:			100
Overall 100 (all scoring issues meet SG100 where possible).			
CONDITION NUMBER (if relevant):			

PI 1.2.4 – Assessment of stock status: Greenlip abalone

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			
	Guidepost		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?		Y	Y
	Justification	The assessment and application to the HS is primarily focused on SCPUE as this is the basis for the HCR and thus meets SG80. In addition, the assessment considers a range of other major features relevant to the biology of the species. These include variation in recruitment with information from independent surveys and also the size structure of the catch which is sampled by the commercial fishers. The fishery thus meets SG100.		
b	Assessment approach			
	Guidepost	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?	Y	Y	
	Justification	Information on larval dispersal and genetic stocks of greenlip abalone is available and indicates wide dispersal. This justifies the spatial scale of the assessments (zones 2 and 3). The assessment includes indicators used as reference points, thus meeting SG80.		
c	Uncertainty in the assessment			
	Guidepost	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?	Y	Y	N
	Justification	Reference points are based on SCPUE with uncertainty estimated and reported as confidence limits. The process of standardization is intended to reduce the influence of known factors affecting CPUE such as weather prediction. The fishery thus meets SG80. A probabilistic analysis of reference points has been conducted that includes estimates of uncertainty around inputs where possible (such as growth). However, the assessment does not evaluate status each year relative to the reference in a probabilistic manner, for example by requiring a certain level of certainty or probability that the assessed status exceeds the LRP. For this reason, the fishery does not meet SG100.		

PI 1.2.4		There is an adequate assessment of the stock status			
d	Evaluation of assessment				
	Guidpost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.	
	Met?			N	
	Justification	The assessment uses a range of data with a weight of evidence approach. However, alternative hypotheses and assessment approaches have not been rigorously explored. This includes an analysis of the importance of weightings of different information sources so that potentially important information such as size structure does not necessarily get included in catch decisions. As a result, the fishery does not meet SG100.			
e	Peer review of assessment				
	Guidpost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.	
	Met?		Y	Y	
	Justification	The assessment is subject to annual internal review through the process of status reporting for the jurisdiction. Independent external review occurs through a process of periodic reviews commissioned by the Department of Fisheries and also to a lesser extent for export approval by the Commonwealth Government. The fishery thus meets SG100.			
References		Hart et al. 2016, Sandoval-Castillo et al. 2016, Fletcher and Santoro 2015			
OVERALL PERFORMANCE INDICATOR SCORE:					90
Overall 90 (all scoring issues meet SG80, two of four scoring issues meet SG100 where possible).					
CONDITION NUMBER (if relevant):					

PI 1.2.4 – Assessment of stock status: Brownlip abalone

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			
	Guidepost		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?		Y	Y
	Justification	The assessment and application to the HS is primarily focused on SCPUE as this is the basis for the HCR and thus meets SG80. In addition, the assessment considers a range of other major features relevant to the biology of the species. These include variation in recruitment with information from independent surveys and also the size structure of the catch which is sampled by the commercial fishers. The fishery thus meets SG100.		
b	Assessment approach			
	Guidepost	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?	Y	Y	
	Justification	Information on larval dispersal and genetic stocks of brownlip abalone is unknown but assumed to be more similar to that of blacklip abalone, which has less dispersal than greenlip abalone. Assessment on smaller spatial scale is indicated for these species, which occurs in the brownlip abalone assessments through both the use of zones (zones 2 and 3) and trends on blocks within zones. The assessment includes indicators used as reference points, thus meeting SG80.		
c	Uncertainty in the assessment			
	Guidepost	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?	Y	Y	N
	Justification	Reference points are based on SCPUE with uncertainty estimated and reported as confidence limits. The process of standardization is intended to reduce the influence of known factors affecting CPUE such as weather prediction. The fishery thus meets SG80. A probabilistic analysis of reference points has been conducted that includes estimates of uncertainty around inputs where possible (such as growth). However, the assessment does not evaluate status each year relative to the reference in a probabilistic manner, for example by requiring a certain level of		

PI 1.2.4		There is an adequate assessment of the stock status		
		certainty or probability that the assessed status exceeds the LRP. For this reason, the fishery does not meet SG100.		
d	Evaluation of assessment			
	Guided post			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			N
	Justification	The assessment uses a range of data with a weight of evidence approach. However, alternative hypotheses and assessment approaches have not been rigorously explored. This includes an analysis of the importance of weightings of different information sources so that potentially important information such as size structure does not necessarily get included in catch decisions. As a result, the fishery does not meet SG100.		
e	Peer review of assessment			
	Guided post		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Y	Y
	Justification	The assessment is subject to annual internal review through the process of status reporting for the jurisdiction. Independent external review occurs through a process of periodic reviews commissioned by the Department of Fisheries and also to a lesser extent for export approval by the Commonwealth Government. The fishery thus meets SG100.		
References		Hart <i>et al.</i> 2016, Fletcher & Santoro 2015.		
OVERALL PERFORMANCE INDICATOR SCORE:				
Overall 90 (all scoring issues meet SG80, two of four scoring issues meet SG100 where possible).				90
CONDITION NUMBER (if relevant):				

PI 1.2.4 – Assessment of stock status: Roe's abalone

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			
	Guidepost		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?		Y	Y
	Justification	The assessment and application to the HS is primarily focused on SCPUE as this is the basis for the HCR and thus meets SG80. In addition, the assessment considers a range of other major features relevant to the biology of the species. These include variation in recruitment with information from independent surveys and information from unfished sites. The fishery thus meets SG100.		
b	Assessment approach			
	Guidepost	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?	Y	Y	
	Justification	Research on gene flow in Roe’s Abalone is available and indicates wide dispersal across scales of 1000’s kms sampled. This justifies broad spatial scale of assessments in terms of recruitment. The assessment includes indicators used as reference points, thus meeting SG80.		
c	Uncertainty in the assessment			
	Guidepost	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?	Y	Y	N
	Justification	Reference points are based on SCPUE with uncertainty estimated and reported as confidence limits. The process of standardization is intended to reduce the influence of known factors affecting CPUE such as weather prediction. The fishery thus meets SG80. A probabilistic analysis of reference points has been conducted that includes estimates of uncertainty around inputs where possible (such as growth). However, the assessment does not evaluate status each year relative to the reference in a probabilistic manner, for example by requiring a certain level of certainty or probability that the assessed status exceeds the LRP. For this reason, the fishery does not meet SG100.		
	Evaluation of assessment			

PI 1.2.4		There is an adequate assessment of the stock status		
d	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			N
	Justification	The assessment uses a range of data with a weight of evidence approach. However, alternative hypotheses and assessment approaches have not been rigorously explored. This includes an analysis of the importance of weightings of different information sources so that potentially important information such as size structure does not necessarily get included in catch decisions. As a result, the fishery does not meet SG100.		
e	Peer review of assessment			
	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Y	Y
	Justification	The assessment is subject to annual internal review through the process of status reporting for the jurisdiction. Independent external review occurs through a process of periodic reviews commissioned by the Department of Fisheries and also to a lesser extent for export approval by the Commonwealth Government. The fishery thus meets SG100.		
References		Hart et al. 2016, Hancock 2004, Fletcher and Santoro 2015		
OVERALL PERFORMANCE INDICATOR SCORE:				
Overall 90 (all scoring issues meet SG80, two of four scoring issues meet SG100 where possible).				90
CONDITION NUMBER (if relevant):				

PI 1.2.5 – Genetics component: Greenlip abalone

PI 1.2.5		There is a strategy in place for managing the hatchery enhancement activity such that it does not pose a risk of serious or irreversible harm to the genetic diversity of the wild population.		
Scoring Issue		SG 60	SG 80	SG 100
a	Genetic management strategy in place			
	Guidepost	There are measures in place, if necessary, which are expected to maintain the genetic structure of the population at levels compatible with the SG80 Genetic outcome level of performance (PI 1.1.3).	There is a partial strategy in place, if necessary, which is expected to maintain the genetic structure of the population at levels compatible with the SG80 Genetic outcome level of performance (PI 1.1.3).	There is a strategy in place to maintain the genetic structure of the population at levels compatible with the SG80 Genetic outcome level of performance (PI 1.1.3).
	Met?	Y	Y	Y
	Justification	There is a strategy in place for managing the hatchery and farming activity such that it does not pose a risk of serious or irreversible harm to the genetic diversity of the wild population. This is through policy and legislated management measures are specified in the FRMA 1994, the FRMR 1995, Abalone Aquaculture Policy (DoF 2013a) and the Policy on Restocking and Stock Enhancement in WA (DoF 2013b). There is a Policy on Restocking and Stock Enhancement in WA (DoF 2013b) which is applied to new and existing abalone sea ranch operations. The genetic principles relate to broodstock collection and maintenance, spawning management procedures, distance of sea ranching operation from significant wild stocks, potential spawning biomass of sea ranched animals and compliance procedures. These measures were considered in the independent review described in PI1.1.3 and demonstrate a strategy is in place, consistent with SG100.		
b	Genetic management strategy evaluation			
	Guidepost	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 partial strategy will work based on information directly relevant to the population(s) involved.	The strategy is based on in-depth knowledge of the genetic structure of the population, and testing supports high confidence that the strategy will work.
	Met?	Y	Y	N
	Justification	There is an in depth understanding of the genetic structure of Greenlip abalone populations (Sandoval-Castillo et al. 2016) in WA. This provides information to assess effects of farming and to assess validity of strategies used to manage risk. Potential effects on wild stocks are currently being obtained by periodic spawning biomass surveys of each sea-ranching facility. These provide an estimate of the spawning biomass of cultured populations relative to existing wild populations. It is anticipated that when spawning biomass of cultured populations in sea ranching operations reaches a large enough proportion, e.g. 10% or more of wild populations, more in-depth genetic monitoring will be undertaken, which will		

PI 1.2.5		There is a strategy in place for managing the hatchery enhancement activity such that it does not pose a risk of serious or irreversible harm to the genetic diversity of the wild population.		
		include on-going monitoring of the diversity of wild stocks. There is thus some objective basis for confidence that the partial strategy will work, thus meeting SG80. The strategy has not however been tested or modelled thus the fishery does not meet SG100.		
c	Genetic management strategy implementation			
	Guided post		There is some evidence that the partial strategy is being implemented successfully, if necessary.	There is clear evidence that the strategy is being implemented successfully. There is some evidence that the strategy is achieving its overall objective.
	Met?		Y	Y
	Justification	Monitoring of the current operation provides clear evidence that the strategy is being implemented, thus meeting SG100. This includes collection of information on potential effects on wild stocks by periodic spawning biomass surveys of each sea-ranching facility. These provide an estimate of the spawning biomass of cultured populations, which can be compared to existing wild populations (currently less than 0.2%). Broodstock collection and diversity protocols have been monitored and provide evidence the strategy is being implemented.		
References		FRMA 1994, FRMR 1995, DoF 2013a, DoF 2013b, Sandoval-Castillo et al. 2016, Hart et al., 2016.		
OVERALL PERFORMANCE INDICATOR SCORE:				95
CONDITION NUMBER (if relevant):				

PI 1.2.6 – Genetics component: Greenlip abalone

PI 1.2.6		Information on the genetic structure of the population is adequate to determine the risk posed by the enhancement activity and the effectiveness of the management of genetic diversity.		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guidpost	<p>Qualitative or inferential information is available on the genetic structure of the population</p> <p>Information is adequate to broadly understand the likely impact of hatchery enhancement.</p>	<p>Qualitative or inferential information and some quantitative information are available on the genetic structure of the population.</p> <p>Information is sufficient to estimate the likely impact of hatchery enhancement.</p>	<p>The genetic structure of the population is understood in detail.</p> <p>Information is sufficient to estimate the impact of hatchery enhancement with a high degree of certainty.</p>
	Met?	Y	Y	Y
	Justification	There is an in depth understanding of the genetic structure of abalone populations from WA (Sandoval-Castillo et al. 2016) and also on the species from across the range of the species (Mayfield et al., 2014). This shows that dispersal is extensive compared to many abalone species so that there is a high degree of certainty that dilution of any hatchery impact will occur. Strategies in place to manage broodstock numbers and controls on generations are based on well-established genetic principles and information on breeding. The fishery can thus be said to have information sufficient to estimate the impact of hatchery enhancement with a high degree of certainty (SG100).		
b	Information adequacy for genetic management strategy			
	Guidpost	Information is adequate to support measures to manage main genetic impacts of the enhancement activity on the stock, if necessary.	Information is adequate to support a partial strategy to manage the main genetic impacts of the enhancement activity on the stock, if necessary.	Information is adequate to support a comprehensive strategy to manage the genetic impacts of the enhancement activity on the stock and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	Y
	Justification	The strategy to manage genetic impacts contains key elements. Progeny diversity involves the use of explicit broodstock collection and breeding programs to ensure only genetically appropriate progeny are released into the marine environment. In this case the progeny are restricted to F1 and broodstock are required to be diverse and sourced from the same region. Dilution of propagules from the farm is managed and monitored by the level of spawning biomass on artificial reef on the farm relative to natural reef. Information collected is adequate to support this strategy through access to existing baseline genetic information, monitoring of		

PI 1.2.6	Information on the genetic structure of the population is adequate to determine the risk posed by the enhancement activity and the effectiveness of the management of genetic diversity.	
		broodstock collection and use, and monitoring of relative spawning biomass. The fishery thus meets SG100.
References	Sandoval-Castillo et al. 2016, Hart et al, 2016, Mayfield et al., 2014	
OVERALL PERFORMANCE INDICATOR SCORE:		100
CONDITION NUMBER (if relevant):		

Principle 2

There are five components that need to be assessed under Principle 2, with each consisting of three Performance Indicators (PIs) each. The first PI of each component is focused on the outcome status, the second one concerns the management and the third one relates to the information available. The five components are: 1) Primary species; 2) Secondary species (not managed); 3) Endangered, Threatened or Protected Species; 4) Impacts on the Habitats; and 5) Impacts on the Ecosystem.

Rationales are provided for all three UoC as they differ only on target species and not the gear type.

PI 2.1.1 – Primary species outcome

PI 2.1.1		The UoA aims to maintain primary species above the 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			
	Guidepost	<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?	Y	Y	Y
	Justification	<p>There are no primary species.</p> <p>Fisheries regulations (Fish Resources Management Regulations 1995 (FRMR)) dictate that only <i>H. laevigata</i>, <i>H. conicopora</i> and <i>H. roei</i> are permitted to be landed in the AMF. As a dive fishery, consisting of a relatively small and highly skilled workforce, it is with a high degree of certainty that the only other species collected are commensal species on abalone shells, such as coralline algae, sponges and small invertebrates. Management tools or measures are not in place for such taxa in Western Australia, hence they do not meet the requirements of a</p>		

PI 2.1.1		The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.		
		primary species as defined in MSC guidance SA3.1.3. Following MSC guidance SA 3.2.1. the UoA shall receive a score of SG100 under the Outcome PI.		
b	Minor primary species stock status			
	Guidepost			For minor species that are below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species
	Met?			Y
	Justification	There are no primary species. Following MSC guidance SA 3.2.1 the UoA shall receive a score of SG100 under the Outcome PI.		
References				
OVERALL PERFORMANCE INDICATOR SCORE:				100
Overall 100 (all scoring issues meet SG100).				
CONDITION NUMBER (if relevant):				

PI 2.1.2 – Primary species management strategy

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			
	Guidepost	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 above the point where recruitment would be impaired.	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 point where recruitment would be impaired.	There is a strategy in place for the UoA for managing main and minor primary species.
	Met?	Y	Y	
	Justification	There are no primary species. Following MSC guidance GSA 3.5.1 ‘if necessary’ – if the UoA has no or negligible impact on this component scoring issue (a) does not need to be scored for SG60 and SG80. Therefore, the UoA shall receive a default score of SG80.		
b	Management strategy evaluation			
	Guidepost	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?		Y	
	Justification	The highly selective gear used in this fishery can be considered a measure to reduce impacts on primary species. There are no primary species caught, thus demonstrating these measures are working and SG80 is met.		
c	Management strategy implementation			
	Guidepost		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?		Y	
	Justification	The highly selective gear used in this fishery can be considered a measure to reduce impacts on primary species. There are no primary species caught, thus demonstrating these measures are working and SG80 is met.		

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.		
d	Shark finning			
	Guidpost	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?	(Not relevant)	(Not relevant)	(Not relevant)
	Justification	Scoring issue not scored as no primary species are sharks.		
e	Review of alternative measures			
	Guidpost	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?	(Not relevant)	(Not relevant)	(Not relevant)
	Justification	There are no primary species, hence the issue has not been scored.		
References				
OVERALL PERFORMANCE INDICATOR SCORE:				80
Overall 80 (all scoring issues at SG80).				
CONDITION NUMBER (if relevant):				

PI 2.1.3 – Primary species information

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 species			
	Guidepost	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?	Y	Y	Y
	Justification	There are no main primary species. The catches of all retained species are reported by all licensees to the Department of Fisheries in statutory daily Catch Disposal Records (CDRs). Processor unload information on the CDR is used to validate catches recorded by the fishers. Data from these logbooks indicate there have been no non-target species retained by the wild collection fishery. This is considered quantitative information (i.e. the catch of primary species is zero), and has been verified through compliance checks and monitoring, providing a high degree of certainty. SG 100 is met.		
b	Information adequacy for assessment of impact on minor species			
	Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	Met?			Y
	Justification	There are no minor primary species. The catches of all retained species are reported by all licensees to the Department of Fisheries in statutory daily Catch Disposal Records (CDRs). Processor unload information on the CDR, is used to validate catches recorded by the fishers. Data from these logbooks indicate there have not been non-target species retained by the wild collection fishery. This is considered quantitative information (i.e. the		

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		
		catch of primary species is zero), and has been verified through compliance checks and monitoring, providing a high degree of certainty. SG 100 is met.		
c	Information adequacy for management strategy			
	Guidepost	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?	Y	Y	Y
	Justification	There are no primary species. As above, catches of all retained species are reported and verified. This information is considered adequate to support a strategy to manage all primary species and evaluate the strategy with a high degree of certainty. SG100 is met.		
References				
OVERALL PERFORMANCE INDICATOR SCORE:				100
Overall 100 (all scoring issues meet SG100).				

PI 2.2.1 – Secondary species outcome

PI 2.2.1		The UoA aims to maintain secondary species above a biological 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			
	Guided post	<p>Main Secondary species are likely to be within 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 also 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 within biologically based limits.</p>
	Met?	Y	Y	Y
	Justification	<p>There are no main secondary species, therefore this scoring issue receives a default score of SG100.</p> <p>Abalone shells are often encrusted with commensal species such as coralline algae, sponges and small invertebrates. There is a high degree of certainty that the commensal species attached to abalone shells are above the biologically based limit. Adult abalone live in high-energy environments which are unfavorable for settling invertebrates. Typically, the quantity of biota encrusting abalone shells is low due to the harsh environment, with no known species that exclusively use</p>		

PI 2.2.1		The UoA aims to maintain secondary species above a biological based limit and does not hinder recovery of secondary species if they are below a biological based limit.		
		abalone shells for habitat. Such taxa also inhabit other hard surfaces such as rocky reefs which are widely distributed and abundant. Although it has not been quantified, all accounts from fishers and researchers indicate that commensal species would consist of <5% of the UoA catch. In accordance with MSC guidance GSA3.1.1 – 3.1.4 such secondary species would be considered minor.		
b	Minor secondary species stock status			
	Guided post			For minor species that are below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	Met?			N/A
	Justification	None of the minor secondary species are considered as below biologically based limits, hence this scoring issue does not apply.		
References				
OVERALL PERFORMANCE INDICATOR SCORE:				100
Overall 100 (all scoring issues meet SG100).				
CONDITION NUMBER (if relevant):				

PI 2.2.2 – Secondary species management strategy

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			
	Guided 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 within 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 within 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?	Y	Y	Y
	Justification	The Harvest Strategy for the AMF has reference levels and control rules for bycatch (non-ETP) species. The management objective for this strategy is to ensure fishing impacts do not result in serious or irreversible harm to bycatch species populations. This covers all bycatch species (non-ETP) with specific reference to commensal species. The performance indicators for this strategy are periodic risk assessments incorporating current management arrangements, catch levels, species information and available research. The reference level threshold is defined as when fishing impacts are considered to generate an undesirable level of risk (i.e. high) to any bycatch species' population. The control rule response to any breach of the threshold is an investigation into variation and appropriate management actions implemented to reduce risk to an acceptable level (Department of Fisheries 2016). Therefore, the SG 100 is met.		
b	Management strategy evaluation			
	Guided 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?	Y	Y	N
	Justification	Formal Ecosystem-Based Fisheries Management (EBFM) risk assessments have been conducted on the AMF during 2002, 2009, 2014 and 2016 (Webster <i>et al.</i> 2016). This approach is aligned with the performance indicator detailed in the harvest strategy for bycatch species (PI 2.2.2 a). In 2002, 04 and 14 the removal of commensal species was given a risk rating of low, in 2016 the risk rating was negligible. This risk assessment provides an objective basis for confidence, however testing has not been undertaken, SG80 is met.		
		Management strategy implementation		

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.		
c	Guidepost		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?		Y	N
	Justification	The consistent low risk rating for this issue over a 12-year period and adjustment to a negligible risk rating in 2016 indicates that the strategy is being implemented successfully and consistently. A score of SG80 is given due to the lack of quantifiable evidence that populations of commensal species are not being adversely affected by the activities of the AMF.		
d	Shark finning			
	Guidepost	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?	(Not relevant)	(Not relevant)	(Not relevant)
	Justification	No secondary species are sharks hence this issue is not scored.		
e	Review of alternative measures to minimise mortality of unwanted catch			
	Justification	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?	Y	Y	N
	Guidepost	The Harvest Strategy, under which all management strategies and measures relating to secondary species are set, is reviewed every five years. Control rules defined in the strategy, can be triggered following the identification of new or potential issues as part of i) a risk assessment (generally reviewed every 3 – 5 years); ii) results of research, management or compliance projects; iii) monitoring or assessment outcomes; iv) expert workshops or v) peer review outcomes of research and management. This format provides adaptability for alternative measures to be introduced to minimize mortality of unwanted catch. This meets the requirements of the SG 80 level.		
References		DoF 2016; Webster <i>et al.</i> 2016		

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.	
OVERALL PERFORMANCE INDICATOR SCORE: Overall 85 (three scoring issues at SG80, one scoring issue at SG100).		85
CONDITION NUMBER (if relevant):		

PI 2.2.3 – Secondary species information

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			
	Guidepost	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?	Y	Y	Y
	Justification	There are no main secondary species. Therefore, a default score of SG 100 is met.		
b	Information adequacy for assessment of impacts on minor secondary species			
	Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
	Met?			N
	Justification	There is no quantitative information available to estimate the impact of UoA on minor secondary species. The general perception conveyed by researchers and industry alike, is that any potential impact of removing abalone on these minor species would be offset by the inaccessibility of some abalone populations due to diving constraints, remoteness of location and TAC regulations. Lack of quantitative information does not meet the requirements for SG100.		
	Information adequacy for management strategy			

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.		
c	Guidepost	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?	Y	Y	N
	Justification	There are no main secondary species. Therefore, a default score of SG 80 is met. Identification, abundance and distribution surveys have not been undertaken for commensal species on abalone in Western Australia. A reliance is placed on peer reviewed scientific papers for other regions and qualitative risk assessments in accordance with the Harvest Strategy.		
References				
OVERALL PERFORMANCE INDICATOR SCORE:				85
Overall 85 (all scoring issues meet SG80, one of three scoring issues meets SG100 where possible).				
CONDITION NUMBER (if relevant):				

PI 2.3.1 – ETP species outcome

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			
	Guidepost	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?	(Not relevant)	(Not relevant)	(Not relevant)
	Justification	This scoring issue has not been scored as there are no national or international requirements that set limits for ETP species (following SA3.10.1.1).		
b	Direct effects			
	Guidepost	Known direct effects of the UoA are likely to not hinder recovery of ETP species.	Known 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?	Y	Y	Y
	Justification	A formal risk assessment was conducted to determine the AMF’s alignment with the federal Environmental Protection and Biodiversity Act (EBPC Act 1999). The conclusions from this assessment indicated that any potential impacts of the AMF on ETP species (e.g. whales, sharks, turtles, penguins) are highly unlikely and primarily center around interactions such as vessels strikes and entanglements with hookah air-hoses. There is a high degree of certainty that the risk of AMF vessels striking ETP species is no greater than any other water users and the risk of hookah air-hose entanglements would be negligible. There have not been any reported incidences of direct effects of the UoA on ETP species. The reporting of any interactions with ETP species is a statutory requirement of their CDRs. This meets the requirements for the SG100 level.		
c	Indirect effects			
	Guidepost		Indirect effects have been considered 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 fishery on ETP species.
	Met?		Y	N

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	
	Justification	<p>Dedicated studies on the potential indirect effects of AMF activities on ETP species have not been conducted. Given that there are no known ETP or any other species, reliant on abalone as their main food source, it is considered highly unlikely that the fishery would create unacceptable impacts.</p> <p>This meets the requirements for the SG80 level.</p>	
References			
OVERALL PERFORMANCE INDICATOR SCORE: Overall 90 (one scoring issue at SG80, one scoring issue at SG100).			90
CONDITION NUMBER (if relevant):			

PI 2.3.2 – ETP species management strategy

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)			
	Guidepost	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?	NA	NA	NA
	Justification	This scoring issue has not been scored as there are no national or international requirements that set limits for ETP species (following SA3.11.2.1).		
b	Management strategy in place (alternative)			
	Guidepost	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?	Y	Y	N
	Justification	The Harvest Strategy for the AMF has reference levels and control rules for the management of ETP species. The management objective for this strategy is to ensure fishing impacts do not result in serious harm to ETP species populations. This covers all ETP species. The performance indicator for this strategy is periodic risk assessments incorporating current management arrangements, number of reported interactions, species information and available research. The reference level threshold is defined as when fishing impacts are considered to generate an undesirable level of risk (i.e. high) to any bycatch species’ population. The control rule response to any breach of the threshold is an investigation into variation and appropriate management actions implemented to reduce risk to an acceptable level (Department of Fisheries 2016). It is a statutory requirement to report any ETP species interactions in daily Catch and Disposal Records (CDRs), which are checked by Department of Fisheries staff. This meets the requirements for the SG80 level.		
Management strategy evaluation				

PI 2.3.2		<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.</p>		
c	Guidepost	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?	Y	Y	N
	Justification	<p>The Harvest Strategies control rules are based on evidence provided in the CDRs, compliance reports, and the cross checking of records by Department of Fisheries staff. The periodic and action plan orientation of risk assessments ensures the progressive development of the strategy.</p> <p>This meets the requirements for the SG80 level.</p>		
D		Management strategy implementation		
	Guidepost		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?		Y	N
	Justification	<p>The lack of frequent and consequential interactions with ETP species reported in the CDRs from the AMF, demonstrates that the strategy in being implemented successfully.</p> <p>This meets the requirements for the SG80 level.</p>		
E		Review of alternative measures to minimize mortality of ETP species		
	Guidepost	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?	Y	Y	N

PI 2.3.2	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.</p>	
	Justification	<p>The Department of Fisheries and industry undertake regular (approximately every three to five years) reviews of the risk to ETP species from industry operations. Where a risk is considered undesirable (e.g. has increased from low to medium or is assessed as high), new and/or further risk control measures are investigated and implemented, with a goal of reducing the risk to an acceptable level.</p> <p>This meets the requirements for the SG80 level.</p>
References	DoF 2016	
OVERALL PERFORMANCE INDICATOR SCORE: Overall 80 (all scoring issues at SG80).		80
CONDITION NUMBER (if relevant):		

PI 2.3.3 – ETP species information

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			
	Guidepost	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?	Y	Y	N
	Justification	Some quantitative information is available through the statutory reporting of ETP species interactions on the CDRs. These interactions are collated and checked by Department of Fisheries staff and aligned with the Harvest Strategy for the fishery. The results are then assessed during periodic risk assessments (DoF 2015). This meets the requirements for the SG80 level.		
	Information adequacy for management strategy			
b	Guidepost	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, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
	Met?	Y	Y	N
	Justification	The information pertaining to the management of ETP species is appropriate to the associated risk of the AMF to ETP species. The strategy has the ability to		

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.
		capture with a high degree of certainty any negative impacts the AMF may have on ETP species and enlist appropriate action. This meets the requirements for the SG80 level.
References		DoF 2015.
OVERALL PERFORMANCE INDICATOR SCORE:		80
Overall 80 (all scoring issues at SG80).		
CONDITION NUMBER (if relevant):		

PI 2.4.1 – Habitats outcome

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(s) covered by the governance body(s) responsible for fisheries management.		
Scoring Issue		SG 60	SG 80	SG 100
a	Commonly encountered habitat status			
	Guidepost	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?	Y	Y	N
	Justification	An Ecological Risk Assessment (ERA) on the potential impacts of the AMF on a variety of habitats rated the risk to rocky reefs, seagrass beds, macroalgae and sponge beds/coral gardens as negligible (Webster 2016). Compliance officers from the Department of Fisheries have confirmed that commercial abalone diving activities cause minimal damage to the habitats. Reasons for this include: swimming off the bottom of the sea floor, professionalism of approach, consideration of the environment and the resilience of the habitats they are working in (high to moderate energy environments). To maintain the standard of environmental stewardship in the commercial sector, new divers are inducted and trained in appropriate practices. This meets the requirements for SG80 level.		
b	VME habitat status			
	Guidepost	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?	Y	Y	Y
	Justification	There are no Vulnerable Marine Ecosystems as defined by the MSC Standard V2.0 (GSA3.13.3.2) that may be impacted upon by the UoA. This meets the requirements for SG100 level.		
c	Minor habitat status			
	Guidepost			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?			Y

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(s) covered by the governance body(s) responsible for fisheries management.	
	Justification	Independent surveys are conducted by the Research Division of the Department of Fisheries at multiple sites each year, spanning <i>H. laevigata</i> , <i>H. conicopora</i> and <i>H. roei</i> habitats. Anecdotal evidence provided by these researchers, indicate that the UoA is highly unlikely to impact upon minor habitats. In addition, limited access, small fleet size (51 vessels), depth constraints of diving (max 30 m), plus vast remote coastlines, all contribute to considerable expanses of abalone habitat being unavailable to the AMF. Although, the <i>H. roei</i> fishery operates at a shallower depth and in closer vicinity to Perth than the other two species, the potential impacts of the <i>H. roei</i> fishery on minor habitats were also rated as negligible. This assessment included the impacts on intertidal reef and anchoring, which are factors only relevant to the <i>H. roei</i> fishery (Webster 2016). This meets the requirements for the SG100 level.
References	Webster 2016.	
OVERALL PERFORMANCE INDICATOR SCORE: Overall 95 (one scoring issue at SG80, two scoring issues at SG100).		95
CONDITION NUMBER (if relevant):		

PI 2.4.2 – Habitats management strategy

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			
	Guidepost	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?	Y	Y	N
	Justification	<p>Impacts of the UoA on habitats are managed through size limits, catch quotas, spatial management, and statutory reporting of catch and location of fishing activities, all of which are aligned with the objectives of the Harvest Strategy. The management objective of this strategy is to ensure the effects of fishing do not result in serious or irreversible harm to habitat structure and function. This covers rocky reefs, macroalgae, seagrass beds, sponge gardens and corals.</p> <p>The performance indicator for this strategy is periodic risk assessments incorporating current management arrangements, extent of fishing activities, habitat distribution and available research. The reference level threshold is defined as when fishing impacts are considered to generate an undesirable level of risk (i.e. high) to any benthic habitat. The control rule response to any breach of the threshold is an investigation into variation and appropriate management actions implemented to reduce risk to an acceptable level (Department of Fisheries 2016).</p> <p>An industry based Code of Practice is also in place, to help promote best environmental practices across all operators. According to Abalone Industry Association of Western Australia representative’s, uptake and compliance with the code of practice is across the industry.</p> <p>This meets the requirements for the SG80 level.</p>		
b	Management strategy evaluation			
	Guidepost	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?	Y	Y	N
	Justification	<p>The ERA rated the potential impacts of AMF activities on all relevant habitats as negligible (Webster 2016). The current strategy of revisiting the risk assessment periodically (every 3 to 5 years) and on a needs basis, provides a level of confidence that any measures would be given sufficient scope to be effectual.</p> <p>The development and implementation of the industry Code of Practice, provides some objective confidence that it is in the industry’s interests to maintain the habitats from which they harvest from. This position is strengthened by the</p>		

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.		
		conditions in which the fishery operates both physically (i.e. highly resilient habitats) and commercially (small fleet, limited entry and high value). This meets the requirement for the SG80 level.		
c	Management strategy implementation			
	Guidpost		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?		Y	N
	Justification	The ERA conducted by government and industry representatives deemed the fishery to be a negligible risk to habitats (Webster 2016). The ongoing fishery performance against long-term objectives for habitats is monitored annually via the Harvest Strategy (DoF 2015). This meets the requirement for the SG80 level.		
d	Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs			
	Guidpost	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?	Y	Y	Y
	Justification	Compliance with management measures is monitored by field officers who patrol the entire fishing area. There are no VMEs within the UoA, hence a default score of SG100 is met.		
References		DoF 2015; Webster 2016.		
OVERALL PERFORMANCE INDICATOR SCORE:				85
Overall 85 (three scoring issues at SG80, one scoring issue at SG100).				
CONDITION NUMBER (if relevant):				

PI 2.4.3 – Habitats information

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			
	Guidepost	<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:</p> <p>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:</p> <p>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?	Y	Y	N
	Justification	<p>West Coast</p> <p>Detailed habitat descriptions and mapping has been provided throughout the UoA on the West Coast. This information has been collated from a variety of sources, including the government, university and private sectors. Spanning several decades, projects and technologies, this composite information provides a comprehensive overview of the benthic habitats in the region. Although, this information is not specific to the UoA, it provides the necessary details to determine the vulnerability for commonly encountered habitats.</p> <p>South Coast</p> <p>Habitat surveys and mapping is generally less complete on the South Coast compared to the West Coast. The reason for this, is the remoteness of the region, large expanse of the coastline and the higher energy system restricting access. Although, there is less comprehensive information from an array of sources, the Research Division has been conducting fishery independent surveys across the region since 2005. Covering a large expanse of area and numerous sites, the information gathered provides a means of monitoring habitat effects.</p> <p>This meets the requirement for the SG80 level.</p>		
b	Information adequacy for assessment of impacts			
	Guidepost	<p>Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats.</p>	<p>Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable</p>	<p>The physical impacts of the gear on all habitats have been quantified fully.</p>

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.		
		including spatial overlap of habitat with fishing gear. 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.	information on the spatial extent of interaction and on the timing and location of use of the fishing gear. 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?	Y	Y	N
	Justification	The provided habitat information is adequate to determine the risk posed by the UoA (Hart et al 2016). The gear used in the fishery does not generally interact with the habitat for <i>H. laevigata</i> or <i>H. conicopora</i> fishing. Vessels generally do not anchor and the divers remain above the seafloor whilst swimming. The Roe’s abalone fishery occurs in exposed reef in waters generally shallower than 5 m and anchors are used on occasion. The ERA ranked the risk of this activity on the bare limestone reefs as negligible (Webster 2016). This meets the requirement for the SG80 level.		
c	Monitoring			
	Guided post		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in habitat distributions over time are measured.
	Met?		Y	N
	Justification	The Research Division have conducted, and continue to conduct, fishery independent surveys across the south and west coast, covering a total of 202 survey sites that were selected on the basis of known stock distribution and different levels of productivity. A further 150 sites were established as baselines for proposed marine parks, and an additional 28 sites were surveyed for stock enhancement experiments (Hart <i>et al.</i> 2013). The consistent and comprehensive nature of this research program indicates that any increases in risk to main habitats would most likely be detected. This meets requirements for the SG80 level.		
References		Hart <i>et al.</i> 2013; Hart <i>et al.</i> 2016; Webster 2016.		
OVERALL PERFORMANCE INDICATOR SCORE:				
Overall 80 (all scoring issues at SG80).				80
CONDITION NUMBER (if relevant):				

PI 2.5.1 – Ecosystem outcome

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			
	Guided 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?	Y	Y	N
	Justification	<p>West Coast</p> <p>Research conducted by Wells et al (1986; 2007) on the impacts <i>H. roei</i> fishing on populations and habitats in the Perth region, indicated that during a 20-year period detectable changes within acceptable temporal and spatial expectations occurred (Wells <i>et al.</i> 2007). The Research Division continues to monitor sites annually in the same region as Wells et al. (2007), to inform the Harvest Strategy, and monitor fishery impacts on stocks and habitats.</p> <p>South Coast</p> <p>The Research Division has been conducting fishery independent stock surveys of 202 sites across the south coast for <i>H. laevigata</i> or <i>H. conicopora</i> since 2005. Fifty-five sites in representative sub-areas are surveyed annual, with the others surveyed every 2-3 years. During these surveys, available abalone habitat is recorded (Hart <i>et al.</i> 2013). Anecdotal evidence provided by research staff indicates that any potential ecosystem effects associated with the AMF would be identifiable during these surveys.</p> <p>The aforementioned research programs provide a basis for observation of visual impacts at discrete sites. Such surveys coupled with spatial management, catch and effort monitoring and a highly selective fishing method, instils confidence that the UoA is highly unlikely to disrupt the ecosystem. However, it does not provide explicit evidence that the UoA does not induce serious or irreversible harm to ecosystem structure or function. This meets requirements for the SG80 level.</p>		
References		Hart <i>et al.</i> 2013; Wells & Keesing 1986; Wells <i>et al.</i> 2007		
OVERALL PERFORMANCE INDICATOR SCORE:				80
Overall 80 (one scoring issue at SG80).				
CONDITION NUMBER (if relevant):				

PI 2.5.2 – Ecosystem management strategy

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			
	Guidepost	There are measures in place, if necessary which take into account the potential impacts of the fishery 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?	Y	Y	N
	Justification	Impacts of the UoA on ecosystem structure and function are managed through limited entry, gear restrictions, size limits, catch quotas, spatial management, and statutory reporting of catch and location of fishing activities, all of which are aligned with the objectives of the Harvest Strategy. The management objective of this strategy is to ensure the effects of fishing do not result in serious or irreversible harm to ecological processes. This covers trophic interactions and community structure. The performance indicator for this strategy is periodic risk assessments incorporating current management arrangements, extent of fishing activities, ecosystem information and available research. The reference level threshold is defined as when fishing impacts are considered to generate an undesirable level of risk (i.e. high) to ecological processes within the ecosystem. The control rule response to any breach of the threshold is an investigation into variation and appropriate management actions implemented to reduce risk to an acceptable level (Department of Fisheries 2016). This meets the requirements for the SG80 level.		
b	Management strategy evaluation			
	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ 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?	Y	Y	N
	Justification	The ERA that informs the Harvest Strategy is conducted against Ecologically Sustainable Development (ESD) objectives as defined in the <i>National Strategy for Ecologically Sustainable Development 1992</i> . The ERA identified 9 associated risks to ecosystem structure and the broader environment from AMF activities. All of these risks were rated as negligible (consequence score = 1, Likelihood score = 1). Such ratings provide objective confidence that the measures in place will be		

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.		
		effectual. However, due to monitoring data as it relates to the broader ecosystem having not been conducted or published, an SG80 score is appropriate.		
c	Management strategy implementation			
	Guidpost		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?		Y	N
	Justification	The ERA conducted by government and industry representatives deemed the fishery to be a negligible risk to ecosystems (Webster 2016). The ongoing fishery performance against long-term objectives for ecosystems is monitored annually via the harvest strategy (DoF 2015). This meets the requirements for the SG80 level.		
References		DoF 2015; Webster 2016.		
OVERALL PERFORMANCE INDICATOR SCORE:				80
Overall 80 (all scoring issues at SG80).				
CONDITION NUMBER (if relevant):				

PI 2.5.3 – Ecosystem information

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			
	Guidepost	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	The fishery independent surveys conducted by the DoF Research Division cover a considerable time series and broad scope for all three species over a variety of habitats, across all three distinctive ecosystems. This information coupled with research from the university and private sectors has enabled the acquisition of a broad understanding of key ecosystem elements (e.g. McClatchie <i>et al.</i> 2006). Although such research is not specific to the impacts of the UoA, it provides a solid basis from which to infer and understand the key elements of the ecosystem. This meets the requirements for the SG80 level.		
b	Investigation of UoA impacts			
	Guidepost	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?	Y	Y	N
	Justification	The ecosystem effects of abalone fishing have been investigated in greater detail in other Australian states (Jenkins 2004; Hamer 2010). Similarity in species, habitats and industries makes these studies highly transferrable, particularly for the south coast. For the west coast and associated <i>H. roei</i> fishery, there is less information available, however, the main impacts of the UoA can still effectively be inferred from existing information. This meets the requirements for the SG80 level.		
c	Understanding of component functions			
	Guidepost		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?		Y	N

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem.			
	Justification	The impacts of the UoA on the target species are well researched and understood (Mayfield <i>et al.</i> 2012). The impacts of the UoA on primary, secondary and ETP species have been rated by the ERA as effectively negligible and provided with appropriate research attention. There is an overall understanding on the potential impacts of the UoA on habitats and the subsequent influence on ecosystem function. The largest knowledge gaps concern effects of the UoA on competition in the benthic environment and impacts on the diets of predators. The ERA deemed these risks to be negligible (Webster <i>et al.</i> 2016). However, further research is required for it to be fully understood (McClatchie <i>et al.</i> 2006). This meets the requirements for the SG80 level.			
d	Information relevance				
	Guided 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?		Y	N	
	Justification	The available information is deemed adequate, due to the perceived benign effects the UoA has on ecosystem function and structure (Webster <i>et al.</i> 2016). Many case studies from other abalone fisheries in Australia and elsewhere have been documented, which provide valuable accounts to make relevant inferences for the UoA. This meets the requirements for the SG80 level.			
e	Monitoring				
	Guided 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?		Y	Y	
	Justification	Information on the impacts on abalone removal on benthic community structure, is adequate to support the development of strategies to the manage effects (Hart <i>et al.</i> 2013). Minimal information is available on the trophic effects of abalone fishing. However, given the potential abundance of abalone in areas inaccessible to the AMF and lack of abalone reliant predators, the probability of a significant trophic impact is low. This meets the requirements for the SG100 level.			
References		Hamer <i>et al.</i> 2010; Hart <i>et al.</i> 2013; Mayfield <i>et al.</i> 2012; McClatchie <i>et al.</i> 2006; Jenkins 2004; Webster <i>et al.</i> 2016			
OVERALL PERFORMANCE INDICATOR SCORE:					85
Overall 80 (all scoring issues at SG80).					

PI 2.5.3	There is adequate knowledge of the impacts of the UoA on the ecosystem.		
CONDITION NUMBER (if relevant):			

PI 2.6.1 – Translocation outcome

PI 2.6.1	The translocation activity has negligible discernible impact on the surrounding ecosystem.		
Scoring Issue	SG 60	SG 80	SG 100
a	Impact of translocation activity		
Guidpost	The translocation activity is unlikely to introduce diseases, pests, pathogens, or non-native species (species not already established in the ecosystem) into the surrounding ecosystem.	The translocation activity is highly unlikely to introduce diseases, pests, pathogens, or non-native species into the surrounding ecosystem.	There is evidence that the translocation activity is highly unlikely to introduce diseases, pests, pathogens, or non-native species into the surrounding ecosystem.
Met?	Y	Y	Y
Justification	The greatest known translocation threat is the spread of Abalone viral ganglioneuritis (AVG) from the farm to wild stocks. To combat the risk of AVG, each batch of juvenile abalone destined for translocation, requires a veterinary certificate from the Department of Fisheries Fish Health Unit. Once in the sea-ranching site the abalone are monitored for any signs of AVG. These measures minimize the risk of AVG or any other translocation threat occurring. This meets the requirements for the SG 100 level.		
References			
OVERALL PERFORMANCE INDICATOR SCORE:			100
CONDITION NUMBER (if relevant):			

PI 2.6.2 – Translocation management

PI 2.6.2		There is a strategy in place for managing translocations such that the fishery does not pose a risk of serious or irreversible harm to the surrounding ecosystem.		
Scoring Issue		SG 60	SG 80	SG 100
a	Translocation management strategy in place			
	Guidpost	There are measures in place which are expected to protect the surrounding ecosystem from the translocation activity at levels compatible with the SG80 Translocation outcome level of performance (PI 2.6.1).	There is a partial strategy in place, if necessary, that is expected to protect the surrounding ecosystem from the translocation activity at levels compatible the SG80 Translocation outcome level of performance (PI 2.6.1).	There is a strategy in place for managing the impacts of translocation on the surrounding ecosystem.
	Met?	Y	Y	Y
	Justification	A condition of the Aquaculture Licenses for both the abalone farm and sea-ranching site is the development and implementation of a Management and Environmental Monitoring Plan (MEMP), which includes a Biosecurity Plan. These plans are signed off by the Department of Fisheries and direct the actions required to ensure the surrounding ecosystem is protected from translocation activities. This meets the requirements for the SG100 level.		
b	Translocation management strategy evaluation			
	Guidpost	The measures are considered likely to work based on plausible argument (e.g. general experience, theory, or comparison with similar fisheries/species).	A valid documented risk assessment or equivalent environmental impact assessment demonstrates that the translocation activity is highly unlikely to introduce diseases, pests, pathogens, or non-native species into the surrounding ecosystem.	An independent peer-reviewed scientific assessment confirms with a high degree of certainty that there are no risks to the surrounding ecosystem associated with the translocation activity.
	Met?	Y	Y	N
	Justification	An ERA was conducted to determine the risk of spreading AVG via translocation, which deemed the risk to be medium (likelihood = possible; consequence = high). This risk rating describes current risk control measures in place as acceptable with no new management required. Given that it has been deemed that no action is required, nor history of AVG has been reported in Western Australia and the importation of abalone outside of Western Australia is illegal, an SG80 is considered appropriate.		
c	Translocation contingency measures			
	Guidpost		Contingency measures have been agreed in the case of an accidental introduction of diseases, pests, pathogens, or non-	A formalised contingency plan in the case of an accidental introduction of diseases, pests, pathogens, or non-native

PI 2.6.2		There is a strategy in place for managing translocations such that the fishery does not pose a risk of serious or irreversible harm to the surrounding ecosystem.		
			native species due to the translocation.	species due to the translocation is documented and available.
	Met?		Y	Y
	Justification	A formal Australian Aquatic Veterinary Emergency Plan and Disease Strategy has been constructed for the potential outbreak of AVG in Western Australia. The Department of Fisheries has a passive surveillance program throughout the UoA, actively investigating any reports of abnormal mortalities, which are backed up by emergency response capability in the areas of both aquatic pests and diseases. This meets the requirements for the SG100 level.		
References				
OVERALL PERFORMANCE INDICATOR SCORE:				
Overall 95 (one scoring issue at SG80, two scoring issues at SG100).				95
CONDITION NUMBER (if relevant):				

PI 2.6.3 – Translocation information

PI 2.6.3		Information on the impact of the translocation activity on the environment is adequate to determine the risk posed by the fishery.		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guided post	Information is available on the presence or absence of diseases, pests, pathogens, and non-native species at the source and destination of the translocated stock to guide the management strategy and reduce the risks associated with the translocation.	Information is sufficient to adequately inform the risk and impact assessments required in the SG80 Translocation management level of performance (PI 2.6.2).	Information from frequent and comprehensive monitoring demonstrates no impact from introduced diseases, pests, and non-native species with a high degree of certainty.
	Met?	Y	Y	Y
	Justification	All abalone that leave the farm for translocation into the wild are provided with a veterinarian certificate. Prior to translocation the juvenile abalone are quarantined for two weeks in a single direction flow-through system with its own dedicated filtration system. Once at the sea-ranching site the abalone are continually monitored. Records and declarations from the Fish Health Unit of the Department of Fisheries demonstrate that there have been no incidences of AVG or any other diseases, pests of non-native species during translocation. This meets the requirements for the SG100 level.		
References		Hart <i>et al.</i> 2016		
OVERALL PERFORMANCE INDICATOR SCORE:				100
Overall 100 (one scoring issue at SG100).				
CONDITION NUMBER (if relevant):				

Principle 3

The intent of Principle 3 is to ensure that there is an institutional and operational framework, appropriate to the size and scale of the fishery, for implementing Principles 1 and 2, that is capable of delivering sustainable fisheries in accordance with the outcomes articulated by Principles 1 and 2. The Assessment Tree structure divides the performance indicators into two categories: the first, 1) Governance and Policy, captures the broad, high-level context of the fishery management system within which the fishery under assessment is found, it has three PIs and the second, 2) Fishery Specific Management System, has four PIs, and focuses on the management system directly applied to the fishery undergoing assessment.

PI 3.1.1 – Legal and/or customary framework

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); and 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			
	Guidepost	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?	Y	Y	Y
	Justification	<p>In accordance with the Offshore Constitutional Settlement 1995 (Brayford & Lyon 1995), the AMF, within which the commercial units of certification occur, fall 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.</p> <p>However, 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 AMF is subject to the requirements of that Act in so far as they interact with species protected under that Act and they export product and therefore need to be assessed. A memorandum of understanding is being developed between the Commonwealth and DoF to facilitate and formalise procedures for reporting of protected species interactions.</p> <p>The key legislative components of the DoF management system are the FRMA, the FRMR and the AMF Management Plan. Commercial fishers must also comply with</p>		

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); and• 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.		
		<p>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:</p> <ul style="list-style-type: none">■ 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 & Santoro 2014) <p>The objectives of these legislative instruments and policies are consistent with MSC Principles 1 and 2.</p> <p>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 Chief Executive Officer (CEO) of DoF. The Department is governed by the Public Sector Management Act 1994, which requires, among other things, that DoF 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.</p> <p>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.</p>		
b	Resolution of disputes			
	Guideline	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?	Y	Y	Y
	Justification	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		

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); and• 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.		
		<p>reasons for the legislation and potentially move to disallow. In this way, there is Parliamentary and public scrutiny of all fisheries legislation.</p> <p>There are also well-established formal dispute mechanisms for administrative and legal appeals of decisions taken in respect to fisheries (as prescribed in Part 14 of the FRMA).</p> <p>Most decisions made by the Director General of the Department, 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 the Department, and all SAT decisions must be carried out by the Department (under section 29(5) of the State Administrative Tribunal Act 2004).</p> <p>Disputes in the fishery are also informally dealt with or avoided through the ongoing processes of communication and consultation between the fishery’s management and research staff and industry. Proposed changes to these regulations and proposals for resource allocation are subject to consultation by DoF or the Integrated Fisheries Allocation Advisory Committee (IFAAC) with WAFIC, which is charged with consulting with its constituents. This consultation process seeks to avoid disputes.</p> <p>The assessment team saw no evidence of ongoing disputes or disagreements between DoF and WAFIC or commercial fishers generally. This suggests that the above mechanisms for dispute resolution are effective.</p> <p>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. This has been tested and proven to be effective, and the requirements of SG60, 80 and 100 are met.</p>		
c	Respect for rights			
	Guidepost	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?	Y	Y	Y

PI 3.1.1	<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • 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; and • Incorporates an appropriate dispute resolution framework.
	<p>Justification</p> <p>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 AMF Management Plan which derives its power from the FRMA.</p> <p>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. 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 DoF 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 abalone resources of Western Australia or the AMF.</p> <p>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.</p> <p>DoF's Integrated Fisheries Management (IFM) policy (DoF 2009a) seeks to share resources between fishing sectors i.e. commercial, recreational and customary.</p> <p>The abalone resource was considered by IFAAC over a lengthy process from 2005 – 2009. The IFAAC recommended that sectoral allocations for the abalone resource should consider only Roe's abalone in the Perth metropolitan area due to its high relative importance within the overall recreational abalone fishery and the availability of recreational catch information from this area (IFACC 2009).</p> <p>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 the fishing sectors. It is proposed that this 'reserve' include an allowance for customary fishing if required.</p> <p>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.</p>
References	<p>Brayford & Lyon 1995; DoF 2009a; DoF 2012a; DoF 2015c; Fletcher & Santoro 2014, IFAAC 2009, SCS Peel Harvey 2016.</p>

PI 3.1.1	<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • 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; and • Incorporates an appropriate dispute resolution framework.
<p>OVERALL PERFORMANCE INDICATOR SCORE:</p> <p>Overall 100 (all scoring issues meet SG100).</p>	100
CONDITION NUMBER (if relevant):	

PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2		<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>		
Scoring Issue		SG 60	SG 80	SG 100
a	Roles and responsibilities			
	Guidepost	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?	Y	Y	Y
	Justification	<p>The roles and responsibilities of the Commonwealth and WA Governments in the management of fisheries resources are well articulated in the Offshore Constitutional Settlement 1995. The roles and responsibilities of the Commonwealth Government with respect to ecological sustainability and conservation of marine resources, in relation to WA marine waters, are clearly set out in the Commonwealth EPBC Act. The roles and responsibilities of the WA Government in relation to the management process for Western Australian commercial fisheries are set out in the FRMA.</p> <p>DoF has identified the key areas and individual positions relevant in the Department and their roles and responsibilities are clearly articulated. (Hart <i>et al.</i> 2016). DoF is structured along clearly defined roles relating to aquatic management, research and regional services (including compliance and licensing). The roles and responsibilities of each of these areas are explicit in the DoF's Annual Report to Parliament (see for example, DoF 2014).</p> <p>WAFIC and RWF are the recognised peak bodies for commercial and recreational fishing in WA. WAFIC and RFW are responsible for providing effective professional representation of commercial and recreational fishing views and interests on matters referred to them by the Minister or Department.</p> <p>WAFIC plays a central role in the management system of commercial fisheries since it is the Government's principle source of coordinated advice from the commercial fishing industry.</p> <p>RFW is the peak body for the recreational sector and plays a significant role in the ongoing management of WA fisheries for the recreational sector and is the principle source of coordinated advice from the recreational sector. RFW are responsible for representation of recreational fishing interests.</p>		

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		
		<p>The roles of WAFIC and RFW in providing consultation services, as requested, to both the Minister and the Department are formalised through a Service Level Agreement with each peak body.</p> <p>The roles and responsibilities of all organisations (e.g. DoEE, DoF, WAFIC, RFW, etc.) and individuals (e.g. Minister for Fisheries) involved in management processes are well understood with key powers explicitly defined in legislation (e.g. FRMA) or relevant policy statements and agreements.</p> <p>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 and the requirements of SG60, SG80 SG100 are met.</p>		
b	Consultation processes			
	Guidepost	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?	Y	Y	Y
	Justification	<p>The DoF and WA Government’s commitment to consultation and engagement with stakeholders is delivered through a range of mechanisms that include established codified instruments and policies, and traditional informal processes which have been consistently applied and continually utilized by DoF.</p> <p>The WA Government’s commitment to consultation with stakeholders is stated in the Government’s Fisheries Policy Statement (2012a). This document identifies WAFIC and Recfishwest as the key sources of coordinated industry advice for the commercial and recreational fishing sectors respectively. These two peak sector bodies work in partnership with DoF under SLAs to ensure adequate consultation is conducted with their constituents on broad or fishery/specific species policy issues. The broad stakeholder consultation framework is described in Figure 6.</p> <p>Consultation requirements with ‘affected persons’ (commercial licence holders) that the Minister must adhere to when developing a new management plan or amending an existing plan are specified in the FRMA (Sections 64 and 65). DoF also</p>		

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	
		<p>seeks public comment on research, management and discussion papers (e.g., Harvest Strategies) 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 (Hart <i>et al.</i> 2016).</p> <p>AMMs are held with licensees for most fisheries, including the AMF. These meetings provide an opportunity for fishers, managers and researchers to discuss and exchange information on the fishery.</p> <p>The DoF and Minister for Fisheries accept submissions/comments from all stakeholders regarding all facets of the AMF and other WA fisheries and aquatic resource management matters throughout the year. These are provided through either official (e.g., ERA) or unofficial processes. All comments/submissions provided by stakeholders throughout all official or non-official processes, are appropriately considered by the DoF and the Minister, with direct feedback/responses provided to those making such submissions. The Minister/DoF often directly corresponds with the individuals involved, ensuring that there is clear reason/justification why or why not their comments have been incorporated into aquatic resource management. This is either conducted via publication of notices, FMP, management plans, fish status reports, etc, or written correspondence to an individual.</p> <p>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 and there are clear explanations of how it is used or not used in aquatic resource management with clear feedback loops, meeting the requirements of SG60, SG80 and SG100 are met.</p>	
c	Participation		
	Guided 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?	Y	Y
	Justification	<p>PI 3.1.2 for AMF was subject to a harmonized condition as a result of the outcomes of MSC assessments for the Exmouth and Shark Bay Prawn fisheries. The condition was focused on scoring issue C – Participation, namely affording non-extractive stakeholders the opportunity to participate and be engaged in all consultation processes and the fishery management systems.</p>	

PI 3.1.2		<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>
		<p>As stated in the previous section above, there are various consultation processes (both formal and informal) provided by DoF and the Minister for Fisheries, providing all interested stakeholders and affected parties the opportunity to be involved. Detailed formal consultation mechanisms have been established for the commercial and recreational sectors through the peak bodies of WAFIC and RFW. The DoF have developed and implemented formal guidelines “Stakeholder Engagement Guideline” (SEG). This document was finalised in July 2016 (DoF 2016a). 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 (Figure 6). The SEG allows flexibility for managers and stakeholders to participate in consultation processes.</p> <p>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.</p> <p>While naturally, there is a stronger emphasis placed on formal statutory mechanisms to ensure effective consultation with user groups such as the commercial and recreational fishing sectors (as evidenced through WAFIC and RFW peak body arrangements), DoF, through its guidelines, has a new formal mechanism in place for all other stakeholders to be involved. This guideline sets out the DoF’s approach to stakeholder engagement on processes associated with the management of the State’s fisheries and aquatic resources consistent with, and builds on, the statutory consultation requirements under the FRMA. The guideline, along with all other consultation mechanisms, encourages and facilitates stakeholder engagement, through FMOs on the ground, research efforts, RFW, WAFIC, ERA’s, and public notices through newspapers, posters or DoF website.</p> <p>Given the above information the assessment team considers that the DoF and the AMF have consultation processes that clearly provide opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement therefore meeting requirements for SG60, SG80 and SG100.</p>
References		Hart <i>et al.</i> 2016, DoF 2014, DoF 2016a, DoF 2012a.
OVERALL PERFORMANCE INDICATOR SCORE:		
Overall 100 (all scoring issues meet SG100).		100

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
CONDITION NUMBER (if relevant):	

PI 3.1.3 – Long term objectives

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			
	Guided 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?	Y	Y	Y
	Justification	<p>The long-term objectives of the management system are specified in Sections 3 and 4a of the FRMA 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 Department's operations are guided by a Strategic Plan 2016 – 2020 (DoF 2016b), which sets out explicit long-term objectives in three main areas: community and stakeholder benefits, sustainability and management excellence.</p> <ul style="list-style-type: none"> ■ Sustainability – to ensure WA's fisheries and aquatic resources are sustainable and to provide services based on risk to ensure fish for the future and support the maintenance of healthy aquatic ecosystems; ■ Community Outcomes – to achieve an optimum balance between economic development and social amenity in accordance with a framework to achieve sustainability; ■ Partnerships – to promote effective strategic alliances and community stewardship; and ■ Agency Management – deliver services on behalf of Government in accordance with the Department's statutory requirements to achieve effective and efficient use of resources to support the delivery of our strategy. ■ Management excellence: Striving for excellence through strong accountability and governance systems, and effective and efficient practices across all areas of the Department. <p>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) and the Abalone resources of Western Australia Harvest Strategy (DoF 2016)).</p>		

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.
		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 and the requirements of SG60, 80 and 100 are met.
References		FRMA 1994; DoF 2016b; DoF 2015, DoF 2016
OVERALL PERFORMANCE INDICATOR SCORE:		100
Overall 100 (all scoring issues meet SG100).		
CONDITION NUMBER (if relevant):		

PI 3.2.1 Fishery-specific objectives

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			
	Guided 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?	Y	Y	Y
	Justification	<p>The AMF short and long-term ecological, social and economic objectives, consistent with the overarching objective of the FRMA, are defined in the AMF harvest strategy (DoF 2016). The social and economic objectives are applied within the context of ESD and fisheries management arrangements can be amended to help meet the social and economic objectives, but not at the expense of sustainability of the resource. These objectives are defined as follows:</p> <p>Ecological Sustainability</p> <ul style="list-style-type: none"> ■ To maintain spawning stock biomass of each target species (i.e. Roe's, Greenlip and Brownlip abalone) at a level where the main factor affecting recruitment is the environment; ■ To ensure fishing impacts do not result in serious or irreversible harm⁶ 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. <p>Economic and Social Benefits</p>		

⁶ Serious or irreversible harm relates to a change caused by the fishery that fundamentally alters the capacity of the component to maintain its function or to recover from the impact.

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.	
		<div><ul style="list-style-type: none">■ To provide flexible opportunities to ensure fishers can maintain or enhance their livelihood, 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.</div> <p>The harvest strategy for the AMF translates these objectives into short-term operational objectives. The harvest strategy contains measurable performance indicators to enable monitoring of the fishery's performance against the objectives; reference levels for each performance indicator; and associated control rules, which articulate pre-defined management responses designed to maintain each resource at target levels and achieve the management objectives for the fishery.</p> <p>The harvest strategy ensures that:</p> <div><ul style="list-style-type: none">■ if catch rates (the performance indicator) fall below the Threshold the TAC will be reduced and set at 70% of the long-term level.■ If the catch rate is equal to or less than the Limit Reference Levels, the TAC will be reduced to 0-50 % of the long-term level depending on the severity of the breach.■ if the impacts of fishing on bycatch species, ETPs, habitats or ecosystems are no longer at an acceptable level, research and management staff will undertake a review of the reasons. This review includes an investigation of any changes that may have taken place in the fishery (e.g. fishing behavior, environmental variation, markets, etc.). Such reviews are often undertaken in conjunction with the licence holders, as they provide many of the details needed during the review process (e.g. changes in effort).</div> <p>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.</p>	
References		DoF 2016	
OVERALL PERFORMANCE INDICATOR SCORE:			100
Overall 100 (all scoring issues meet SG100).			
CONDITION NUMBER (if relevant):			

PI 3.2.2 – Decision-making processes

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			
	Guidpost	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?	Y	Y	
	Justification	<p>There are established decision-making processes in the AMF that result in measures and strategies to achieve the objectives of the fishery. These processes and the decision making framework, roles and responsibilities are explicit in legislation (e.g. FRMA, Abalone Management Plan 1992) and policy documents (e.g. Fisheries Policy Statement) and are publicly available.</p> <p>There are two main processes for making decisions about the implementation of management measures and strategies in the AMF:</p> <ul style="list-style-type: none"> ■ Annual decision-making processes that may result in measures to meet the short-term fishery objectives (driven by the annual quota limit control rules contained in the AMF Harvest Strategy); and ■ Longer-term decision-making processes that result in new measures and/or strategies to achieve the long-term fishery objectives. These decisions are generally taken by the CEO or 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. Consultation in this case may then be retrospective. A recent example was the decision to completely close Area 8 of the Roe's abalone fishery following the mass mortality event associated with the marine heatwave in 2010/11. <p>The harvest strategy (DoF 2016) contains harvest controls rules that drive decision-making in pursuit of short-term operational objectives. There are established processes for reviewing the status of the AMF and for the discussion of any other internal or external pressures for change, with the commercial industry (e.g. through AMMs), WAFIC and RFW.</p> <p>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 market conditions, changes in fishing behaviour and resource allocation issues, as well as ERAs. These drivers may dictate the need for higher level changes to the management regime</p>		

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.		
		for the fishery, often through changes to legislation. Decisions to proceed with such changes involve a higher level of consultation with industry and other stakeholders. This may include the provision of written information, meetings, internal workshops, external/expert workshops or tasked working groups. 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 are met.		
b	Responsiveness of decision-making processes			
	Guided 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?	Y	Y	Y
	Justification	Decision-making processes respond to all issues raised through a range of various avenues, including but not limited to: <ul style="list-style-type: none">■ ecological risk assessments;■ results of research, management or compliance projects or investigations;■ monitoring or assessments outcomes (including those assessed as part of the harvest strategy);■ expert workshops and peer review of aspects of research and management; and■ expert local knowledge, especially abalone diver experience and knowledge of the fishery. Harvest strategy control rules (DoF 2016) dictate the management response to performance of the fishery against established indicators. While the AMF harvest strategy is still considered to be in draft form (consultation recently closed on 30 June 2016), the harvest strategy has been employed in the AMF for many years in an unofficial capacity. The current draft simply officially codifies what has been implemented in the fishery for a number of years. Furthermore, experience with other harvest strategies employed by DoF provides confidence that decisions will be taken in line with control rules.		

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.
	<p>As discussed above, more 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.</p> <p>The governance system has demonstrated that it is responsive in a timely manner where management changes need to be applied to avoid unacceptable risks to sustainability. One example of highly responsive management action in the AMF was the closure of Area 8 for the commercial take of Roe's abalone following a marine heatwave in 2010/11 which resulted in mass mortality event (>90%). Area 8 remains closed and will be closely monitored for the recovery of stocks. For the recreational fishery, the bag limit for Roe's abalone was reduced from 20 to 15 in 2014 to help protect stocks following a decline from environmental factors (Hart <i>et.al.</i> 2016).</p> <p>Such decisions must meet the requirements contained within the FRMA, even if action is implemented immediately without stakeholder consultation. The decisions are transparent and well communicated to all stakeholders (e.g., media releases, publications of reports and papers on the DoF's website, etc.).</p> <p>The assessment team was provided with further examples of the responsiveness of the decision making processes to operational matters raised by industry. These included, industry voluntarily raising the minimum size limit on abalone in certain areas.</p> <p>The decision-making processes are subject to various transparency requirements which are met through:</p> <ul style="list-style-type: none"> ■ publication of Fisheries Management Papers, Fisheries Occasional Papers and Fisheries Research Reports on the DoF website; ■ fish status reports; ■ 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; ■ public access to relevant legislation including the FRMA, FRMR and the AMF Management Plan, harvest strategy, the Department's research plan and annual status report of fisheries. <p>The assessment team did not identify any instances where the management system had failed to respond in a timely way to research, monitoring, evaluation and consultation and considered that decision making was undertaken in a transparent, timely and adaptive manner. The requirements of SG60, 80 and 100 are met.</p>

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.	
c	Use of precautionary approach		
	Guided post		Decision-making processes use the precautionary approach and are based on best available information.
	Met?		Y
	Justification	<p>The precautionary approach underlies decision making processes for all fisheries in the State, addressed in the FRMA. The precautionary approach is a fundamental consideration of the DoF’s EBFM and ERA processes and decision making by the Minister and DoF.</p> <p>Decision making is driven by the AMF harvest strategy (DoF 2016). This is consistent with DoF’s Harvest Strategy Policy (DoF 2015) 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 control rules for the AMF incorporate a precautionary approach to decision-making requiring a review of the fishing activities and management arrangements when a threshold reference level is met. This allows an early identification and mitigation action to be implemented before potential major issues arise in the AMF. Given that the control rules are reviewed annually, this frequency allows for management action to address risks before a limit level is reached and long-term sustainability may be compromised.</p> <p>Examples of the precautionary being implemented in the AMF include:</p> <ul style="list-style-type: none">■ during the 2012/13 TACC setting process for Area 2 Greenlip fishery, the performance indicator breached the threshold reference level. Consequently, the decision rule concluded that the TACC should be set at the long term sustainable level of 30 t. Following industry consultation on stock status, and examination of the outcomes of a new harvest control rule, a precautionary approach was adopted for Area 2 and the TACC was maintained at 28.8 tonnes.■ The commercial industry has its own self-imposed size limits for the Greenlip and Brownlip, which can vary from 153 mm to 145 mm and can change between areas whenever industry sees the need. The legal minimum length is 140 mm shell length. <p>The performance indicators in the harvest strategy 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.</p>	

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.		
		Decision-making processes use the precautionary approach and are based on best available information, and the requirements of SG 80 are met.		
d	Accountability and transparency of management system and decision-making process			
	Guidepost	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?	Y	Y	Y
	Justification	<p>The DoF has a long history of providing all stakeholders with published comprehensive formal reports on most facets of the AMF including annual fishery performance, fishery outcomes, management, research, monitoring, evaluation and review activities. This information is published and publicly available on the DoF’s website (see Section Accountability and Traceability).</p> <p>WAFIC and RFW, through their consultation role, also provides a mechanism for providing information to industry and recreational sectors 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.</p> <p>The Department is required to maintain a public register of authorisations under the FRMA available for public inspection. The register contains the names and business address of the holder, any security interest in the authorisation, entitlement, black marks and other details as prescribed.</p> <p>The assessment team found that information on fishery performance and management action is comprehensive, available both on request and in open publications, 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 SG60, SG80 and SG 100 are met.</p>		
e	Approach to disputes			
	Guidepost	Although the management authority or fishery may be subject to continuing court	The management system or fishery is attempting to comply in a timely fashion with judicial	The management system or fishery acts proactively to avoid legal disputes or rapidly implements

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.		
		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.	decisions arising from any legal challenges.	judicial decisions arising from legal challenges.
	Met?	Y	Y	Y
	Justification	<p>The management system for the AMF proactively avoids legal disputes through both informal and well established mechanisms. Inclusion, education and information dissemination to key stakeholders, notably commercial and recreational fishers, in its management decision making and compliance outreach carried out by the Fisheries and Marine Offices (FMO's) have been key to avoiding disputes in the AMF.</p> <p>These elements have allowed changes in management to be disseminated and considered by all parties, avoiding confusion and conflict and allowing stakeholders ample opportunity to voice issues and work through any contentious matters. An example of this is the IFM process for allocation of the Roe's abalone resource which contained multiple consultations including a stakeholder workshop. Furthermore, significant collaboration and regular communication between the DoF and the Abalone Industry Association of Western Australia (AIAWA) provides a strong basis for collaborative working relationship with mutual understanding.</p> <p>Informal mechanisms involve significant educative role carried out by FMO's and other DoF staff, as well as through ongoing communication and consultation with WAFIC and RFW, and sectoral bodies (i.e. AIAWA).</p> <p>The well-established mechanisms include the WA State Administrative Tribunal (SAT) or WA court system. Dispute resolution for administrative decisions made under the FRMA is provided for in Part 14 through appeal to the SAT. Criminal offences are dealt with by the Magistrates Courts. Decisions of the SAT and the Courts are binding on the DoF, and all SAT decisions must be carried out by the DoF under the State Administrative Tribunal Act 2004.</p> <p>The SAT has been successful in settling disputes for numerous fisheries, however, there have been no appeals lodged for the AMF. Fishers are advised of the opportunity to lodge an appeal with the SAT following a decision made by the CEO of the DoF.</p> <p>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.</p>		

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.	
References	DoF 2016, Hart <i>et al.</i> 2016, DoF 2015, Fletcher & Santoro 2015 ,	
OVERALL PERFORMANCE INDICATOR SCORE:		100
Overall 100 (all scoring issues meet SG100).		
CONDITION NUMBER (if relevant):		

PI 3.2.3 – Compliance and enforcement

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			
	Guidpost	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?	Y	Y	N
	Justification	<p>The MCS system for the AMF is administered by the Department's Regional Services Division (RSD) through the Abalone Operational Compliance Plan (OCP). The OCP is informed through a risk assessment (conducted every 1-2 years) and reviewed annually at which time can be updated. The objective of this OCP is to provide direction and guidance to FMO's for the annual delivery of compliance services. As such, the OCP objectives and intent can be summarized as follows:</p> <ul style="list-style-type: none"> a) The protection of the fisheries environmental values whilst providing fair and sustainable access to the resources. b) To encourage voluntary compliance through education, awareness and consultation activities. c) Enforcement should be a process of last resort and reserved for the more serious and continuous breaches of the act and regulations. <p>The OCP is informed and underpinned by a compliance risk assessment which may involve participation of managers, field based fisheries management officers, researchers, commercial and recreational fishers. The risk assessment relies on a weight of evidence approach considering information available from specialist units and trends and issues identified by local staff and Departmental priorities. The passage of new legislation can also trigger a compliance risk assessment.</p> <p>This comprehensive MCS system is delivered through a sophisticated compliance structure within DoF (as described in Section Compliance).</p> <p>There are four focal areas for monitoring, control and surveillance in the AMF:</p> <ul style="list-style-type: none"> ■ Monitoring of quota through auditing CDRs; ■ Landing inspections and CDR checks; ■ Factory, wholesale and retail inspections; and 		

PI 3.2.3	Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.
	<ul style="list-style-type: none"> ■ Black market. <p>These focal areas are further underpinned by key components of the comprehensive MCS system in the AMF, through:</p> <ul style="list-style-type: none"> ■ On land patrols; ■ sea patrols using DoF vessels; ■ catch, licence and gear inspections; ■ covert surveillance of gear/persons of interest for suspected illegal activity; ■ aerial surveillance; and ■ intelligence gathering. <p>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.</p> <p>Data on detection of offences and the nature of the offence are available from DoF (See Table 10) indicating that the MCS system consistently enforces relevant management measures, strategies and/or rules.</p> <p>Marine park education and compliance functions are also undertaken at specific locations.</p> <p>The main compliance risk to the fishery is the threat of illegal, unreported and unregulated (IUU) fishing for abalone (particularly greenlip). In the past this has been a significant threat for the abalone stock fished in many parts of the world. It is estimated that approximately 3t of greenlip abalone are taken illegally in Western Australia but these figures can be higher.</p> <p>Given the geographical spread of the fishery and the remote locations being fished, it is very hard to have strong compliance in the field. Factory audits and paper trail audits are conducted and provide the greatest value for resources, assuming that paper trail is being complied with by most operators. Compliance also involves specific targeted covert operations based on intelligence and is based on a risk assessment approach.</p> <p>These measures act as deterrent to, and increase the likelihood of detection of, IUU fishing.</p> <p>Overall the MCS system is comprehensive and demonstrates an ability to enforce relevant management measures, strategies and/or rules. However, the variability in the level of possible field inspections along the whole coastline of WA where fishing is possible and the unknown effectiveness of paper trail audits at the factory level, did not demonstrate consistent ability to enforce all management measures. As a result SGs 60 and 80 are met but SG 100 is not.</p>

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
b	Sanctions			
	Guidepost	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?	Y	Y	Y
	Justification	<p>There is an explicit and statutory sanction framework that is applied in the AMF. Figure 8 illustrates the process of how sanctions and penalties are decided within the AMF by compliance officers. Sanctions to deal with non-compliance are listed in the FRMA and FRMR and can be severe. These sanctions consist of:</p> <ul style="list-style-type: none">▪ Significant monetary penalties;▪ Licence cancellations or suspensions; and,▪ Confiscation of gear and catch. <p>All offences detected in the fishery are considered to be of significant concern and are addressed via the DoF's Prosecution Guidelines and rules set out in the FRMA and FRMR. There are four tiers of enforcement measures applied when an offence is detected in the fishery including:</p> <ul style="list-style-type: none">▪ Infringement warnings;▪ Infringement notices;▪ Letters of warning; and▪ Prosecutions. <p>Non-compliance in the AMF in the last ten years has been dealt with using the sanctions described above. Letters of warning have not been issued in the AMF over the last 10 years. During this period, the number of prosecution briefs has reduced and no offences were detected in 20011/12 and 2013/14 (Table 10) demonstrating that the sanctions provide an effective deterrence.</p> <p>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.</p>		
c	Compliance			
	Guidepost	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
		importance to the effective management of the fishery.	importance to the effective management of the fishery.	importance to the effective management of the fishery.
	Met?	Y	Y	Y
	Justification	<p>The DoF have designed the compliance and enforcement program to maximise the potential for fishers to voluntarily comply with legislation, but ensure that there are strong incentives for fishers to be compliant, and the systems are in place to have a high level of detection of non-compliance. DoF has various strategies for compliance including monitoring and surveillance, appropriately trained staff, suitable deterrents in the forms of fines and administrative penalties and targeted education campaigns. The effectiveness of the compliance regime is evaluated through periodic risk assessments, revision of OCPs and monitoring and analysis of compliance statistics and trends.</p> <p>As discussed in above sections, the offending rate in the AMF is very low (Table 10) 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.</p> <p>Fishers participate actively in the collection of data through submission of mandatory logbook data, fishing effort and catch, landing of shells of shucked abalone and attending AMM's. Fishers compliance with CDRs is very high.</p> <p>The AMF has a "code and conduct" which is established under a gentlemen's agreement rather than a codified document, which all divers adhere to. The AIAWA, through distribution of the Code of Practice, actively encourages fishers to comply with the management system by informing them of their obligations to ensure a sustainable fishery. The Code of Practice for the abalone industry explicitly sets out its purpose as:</p> <ul style="list-style-type: none"> ■ establishing a voluntary set of standards or behaviour for responsible commercial fishing of the resource; ■ demonstrating our commitment to ensuring these fisheries are, and continue to be, managed in a sustainable way and to reduce the risk of a bio-security threat to the fish stock; and ■ providing a valuable source of information to those wanting to know more about the abalone fishery within WA. <p>All Fishery licence holders have a responsibility to inform themselves of the fisheries legislation that relates to their activities. DoF helps licence holders in this matter by explicitly reminding them in writing of where they can access the latest legislation.</p>		

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
		<p>Using the weight-of-evidence approach, there is a high degree of confidence that abalone fishers comply with the management system in place, including providing information of importance to the effective management of the fishery.</p> <p>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, and the requirements of SG60, 80 and 100 are met.</p>		
d	Systematic non-compliance			
	Guided post		There is no evidence of systematic non-compliance.	
	Met?		Y	
	Justification	<p>The level of detected offences in the AMF (see Table 10) is extremely low with 6 detections in the past three years.</p> <p>There is no evidence of systematic non-compliance and SG80 is met.</p>		
References				
OVERALL PERFORMANCE INDICATOR SCORE:				
Overall 95 (2 out of 3 possible scoring issues meet SG100).				95
CONDITION NUMBER (if relevant):				

PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4		<p>There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives.</p> <p>There is effective and timely review of the fishery-specific management system.</p>		
Scoring Issue		SG 60	SG 80	SG 100
a	Evaluation coverage			
	Guidepost	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?	Y	Y	Y
	Justification	<p>The Department has a number of processes in place for monitoring and evaluating the performance of the AMF management system against its objectives. An annual review of the fishery's performance is undertaken by Departmental research, management and compliance staff, with outcomes used to assess the extent to which the fishery's management system has met both the long- and short-term objectives.</p> <p>Performance against the short-term (annual) objectives is measured using the performance indicators, reference levels and management control rules that are explicitly identified in the Abalone Harvest Strategy.</p> <p>The annual fishery performance outcomes are provided to licence holders at the AMM. The Department is also required to report to Parliament on the stock assessment outcomes for all target species, with this information provided in the Department's Annual Report. The fishery performance outcomes for target and retained non-target species, bycatch, ETP species, habitats and ecosystems is evaluated annually and made publicly available in the Status Report of the Fisheries and Aquatic Resources of Western Australia: the state of the fisheries. The effectiveness of the compliance regime is evaluated through periodic risk assessments, revision of OCPs and monitoring and analysis of compliance statistics and trends.</p> <p>There are mechanisms in place for monitoring and evaluating the performance of all parts of the management system for the AMF Fishery. Evaluation of all parts of the management system occurs by the following:</p> <ul style="list-style-type: none"> ■ Strategic Planning and Risk Assessments; ■ Fish Plan; ■ Annual internal DoF strategic management and research planning meetings held annually; ■ Annual EBFM risk assessments; ■ Annual Internal Department compliance risk assessment meetings; 		

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.		
		<ul style="list-style-type: none">Internal Department committees that convert Department and stakeholder (WAFIC and Recfishwest) priorities into operational deliverables set within the budget context;Review Workshops;AMMs;research workshops;Annual evaluation of the performance of fisheries;Annual review and evaluation of the DoF’s performance against its key performance indicators of the overarching long-term objectives, results published in the Department’s Annual Report to Parliament;Annual performance review against fishery-specific short-term (operational) objectives;Harvest Strategy for AMF will be reviewed in 2021;Ecological risk assessments (ERAs);Resource sharing arrangements review under IFAAC;Quarterly Scientific Advisory Group meetings <p>There have been a number of reviews of the legislative framework (Act and regulations) under which the AMF operate, and on the effectiveness of compliance/enforcement. The research and management of the AMF has also been externally reviewed.</p> <p>Stakeholder and community satisfaction with the Department’s fisheries management processes is reviewed annually and outcomes published in the Annual Report.</p> <p>There are mechanisms in place to evaluate all parts of the fishery-specific management system therefore requirements of SG60, SG80 and SG100 are met.</p>		
b	Internal and/or external review			
	Guidepost	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
	Met?	Y	Y	Y
	Justification	A described above, there are numerous regular internal reviews, some mechanisms highlighted are: <ul style="list-style-type: none">FishPlan;		

PI 3.2.4	<p>There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives.</p> <p>There is effective and timely review of the fishery-specific management system.</p>
	<ul style="list-style-type: none"> ■ State of the Fisheries; ■ Management Plan; ■ Annual Management Meetings; ■ Risk Assessments and Research; ■ Review of Harvest Strategy; and ■ Compliance Review. <p>Furthermore, the AMF is also subject to regular external reviews relative to the intensity of the fishery. In particular, since July 2013, there have been 41 audits undertaken by external reviewers (Auditors from Stantons International). Such external reviews conducted by Stantons include:</p> <ul style="list-style-type: none"> ■ the MSC initiative; ■ prosecution processes and procedures; ■ Service level and funding agreements with peak bodies; ■ consultation and representation; and ■ operational compliance plans. <p>Outcomes of these reviews are disseminated to the relevant management and action taken as appropriate. Follow up reviews to ensure that the recommendations have been implemented are conducted.</p> <p>Further external review of the AMF includes export approval under the EBPC Act, external government audits and peer reviews of research, assessment and management systems of the AMF. Example of a recent peer review involves the abalone fishery assessment in 2010 by Professor Neil Loneragan (Murdoch University) and Dr Steve Mayfield (SARDI). Among other things, this external review looked at the stock assessment methodology, harvest strategy framework, research programs and the standard operating procedures for data collection and analyses.</p> <p>Following this review, the Department published a comprehensive review of the management system for the abalone fisheries in Western Australia in Research Report No. 241: Biology, History and Assessment of Western Australian Abalone Fisheries (Hart et al. 2013a).</p> <p>The AMF fishery-specific management system is subject to regular internal and external review relative to the intensity of the fishery and therefore requirements of SG60, SG80 and SG100 are met.</p>
References	Hart et.al 2013
OVERALL PERFORMANCE INDICATOR SCORE:	
100	

PI 3.2.4	<p>There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives.</p> <p>There is effective and timely review of the fishery-specific management system.</p>
Overall 100 (all scoring issues meet SG100).	
CONDITION NUMBER (if relevant):	

Appendix 1.2 Risk Based Framework (RBF) Outputs

RBF has not been used

Appendix 1.2.1 Consequence Analysis (CA) for Principle 1

Complete the CA tables below for each data-deficient species identified under PI 1.1.1, including rationales for scoring each of the CA attributes.

(Reference FCR Annex PF 3.1)

Appendix 1.2.3 Consequence Spatial Analysis (CSA)

The report shall include:

- An 'MSC CSA Worksheet for RBF' for PI 2.4.1 where the RBF is used to assess this PI
- Complete one CSA Rationale Table for each habitat assessed.

(Reference: FCR Annex PF 7)

Appendix 1.2.4 Scale Intensity Consequence Analysis (SICA)

1. Complete the SICA tables below for the ecosystem component in PI 2.5.1 including rationales for scoring each of the SICA attributes.

(Reference FCR Annex PF 8)

Appendix 1.3 Conditions

Table A1.3: Condition 1

Performance Indicator	1.1.1 (Greenlip abalone)
Score	70
Rationale	<p>Target reference points have only been recently implemented in the fishery but the performance of the fishery has been examined in relation to these using data from the last 20 years. Over this period, the stock has only occasionally exceeded a target consistent with a proxy for MSY. It thus cannot be said to be fluctuating around this level. There has not been a history of change in catch consistent with attempting to keep the stock around the target SCPUE.</p> <p>There is evidence that this fishery has experienced changes in productivity due to natural environmental fluctuations in 2010/11. Given this, adjustments to the reference points consistent with natural environmental fluctuations are acceptable, although have not been developed in this case. Catch has been reduced in attempt to increase the stock abundance, however it is not clear that this is maintaining the stock around a level consistent with MSY given this reduced productivity.</p>
Condition	By the 3rd surveillance audit, provide evidence that changes to catch are sufficient to move the stock to a level where it fluctuates around the target reference point.
Milestones	<p>By the 1st Surveillance Audit - Provide an assessment of various stock indicators to demonstrate that the stock is responding to the harvest control rule (changes in catch).</p> <p>By the 3rd Surveillance Audit - Provide a consolidated assessment of the various stock indicators.</p>
Client action plan	<p>This condition will be met by examining the performance indicator (annual catch rate) against specified reference points, as stipulated in the harvest strategy. That is, a formal harvest strategy with harvest control rules for the management of Greenlip abalone is in place for this fishery, so tracking annual catch rate is an appropriate method to determine if changes to catch are moving the stock back towards the target reference level.</p> <p>1st Audit - Provide an assessment of various stock indicators (e.g. annual catch rate and recruitment surveys where available), and taking into account factors that may be affecting these indicators (e.g. catch reductions and/or environmental conditions), to demonstrate that the stock is responding to the harvest control rule (changes in catch).</p>

	<p>2nd Audit - Provide an assessment of various stock indicators (e.g. annual catch rate and recruitment surveys where available), and taking into account factors that may be affecting these indicators (e.g. catch reductions and/or environmental conditions), to demonstrate that the stock is responding to the harvest control rule (changes in catch).</p> <p>3rd Audit - Provide a consolidated assessment of the various stock indicators (e.g. annual catch rate and recruitment surveys where available) over the past three years.</p> <p>Use the results as a basis for reviewing the outcomes of applying the harvest strategy (e.g. the time series to date) with particular reference to testing that the harvest strategy facilitates the stocks ability to fluctuate around the target reference level. Also, demonstrate that fishing effort is being constrained to a level that is not having a significant impact on recruitment to the stock.</p>
Consultation on condition	The action plan has been developed in close consultation with the Department of Fisheries (WA) and the AIAWA.

Table A1.3: Condition 2

Performance Indicator	1.1.1 (Brownlip abalone)
Score	70
Rationale	<p>Target reference points have only been recently implemented in the fishery, but the performance of the fishery has been examined in relation to these using data from the last 20 years (Hart <i>et al.</i> 2016). Over this period, the stock has generally exceeded a target consistent with a proxy for MSY. This low level of exploitation has occurred as the catch tends to be small and taken secondary to the larger greenlip fishery.</p> <p>There is evidence that this fishery has experienced changes in productivity due to natural environmental fluctuations in 2010/11. Since this period the indicator of SCPUE has fallen below the target reference point. Catches have been reduced in response but at this stage there is not a high degree of certainty that fishing mortality has been sufficiently reduced to ensure the stock will be maintained at a level consistent with MSY.</p> <p>A downward trend in stock below BMSY over recent years is not consistent with meeting SG80 unless accompanied by projections or other information suggesting that the trend will soon be reversed. Given the absence of projection / information on recovery, other than implementation of a catch reduction, the fishery does not meet SG80.</p>
Condition	By the 3 rd surveillance audit, provide evidence that changes to catch are sufficient to move the stock to a level where it fluctuates around the target reference point.
Milestones	By the 1 st Surveillance Audit - Provide an assessment of various stock indicators to demonstrate that the stock is responding to the harvest control rule (changes in catch).

	By the 3 rd Surveillance Audit - Provide a consolidated assessment of the various stock indicators.
Client action plan	<p>This condition will be met by examining the performance indicator (annual catch rate) against specified reference points, as stipulated in the harvest strategy. That is, a formal harvest strategy with harvest control rules for the management of Brownlip abalone is in place for this fishery, so tracking annual catch rate is an appropriate method to determine if changes to catch are moving the stock back towards the target reference level.</p> <p>1st Audit - Provide an assessment of various stock indicators (e.g. annual catch rate and recruitment surveys where available), and taking into account factors that may be affecting these indicators (e.g. catch reductions and/or environmental conditions), to demonstrate that the stock is responding to the harvest control rule (changes in catch).</p> <p>2nd Audit - Provide an assessment of various stock indicators (e.g. annual catch rate and recruitment surveys where available), and taking into account factors that may be affecting these indicators (e.g. catch reductions and/or environmental conditions), to demonstrate that the stock is responding to the harvest control rule (changes in catch).</p> <p>3rd Audit - Provide a consolidated assessment of the various stock indicators (e.g. annual catch rate and recruitment surveys where available) over the past three years.</p> <p>Use the results as a basis for reviewing the outcomes of applying the harvest strategy (e.g. the time series to date) with particular reference to testing that the harvest strategy facilitates the stocks ability to fluctuate around the target reference level. Also, demonstrate that fishing effort is being constrained to a level that is not having a significant impact on recruitment to the stock.</p>
Consultation on condition	The action plan has been developed in close consultation with the Department of Fisheries (WA) and the AIAWA.

Table A1.3: Condition 3

Performance Indicator	1.2.1 (Brownlip abalone)
Score	70
Rationale	The harvest strategy responds to decline in standardized catch rate by lowering catches as this proxy for biomass declines. The strategy involves regular annual assessments with associate regular adjustment to the total allowable catch if indicated. The harvest strategy thus meets SG60.

	<p>It is uncertain if elements of the harvest strategy work together to achieve stock management objectives so it cannot be said to meet SG80. In contrast to greenlip abalone, the HS has less protection through the legal minimum size limit. This is because onset of maturity is less well established for this species and the gap between the presumptive size at 50% onset of maturity (120 mm) and the legal minimum length (140 mm) is less.</p> <p>The selection of the limit reference point thus becomes critical for this certification unit. The value of the LRP is critical to preventing recruitment overfishing and is reliant on an arbitrary decision in the development of the HS. This is that the lowest catch rate observed during the reference period (2000 to 2014) equates to 30% of the unfished stock. From this arbitrary decision, the limit reference point is set at 2/3 of the lowest observed biomass during the reference period. This reference point is also highly sensitive to the reference period selected. For example, a reference period of 2000 to 2012 would have resulted in the limited reference point being set around 40% higher in Area 2.</p> <p>The use of observed historical catch rates to set reference points is a common approach but limit reference points are more commonly based on catch rates actually seen historically. That is because the subsequent history of the stock provides evidence on whether recruitment was affected. There is no historical evidence that the brownlip stock can be depleted below the threshold reference point and recover.</p> <p>The approach used here for the brownlip HS enables the stock to be depleted to levels substantially lower than at any point seen historically (i.e. 2/3) yet not be classified as recruitment overfished.</p>
Condition	By the 3rd surveillance audit, adjust the harvest strategy or provide evidence that it 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. This should address providing a biological basis for selection of the limit reference point.
Milestones	<p>At the 1st Surveillance Audit - Provide an update on how the fishery is performing to validate if the current reference levels are appropriate.</p> <p>At the 3rd Surveillance Audit – Provide a review of the state of the stock with respect to the application of the harvest strategy to provide evidence that elements of the harvest strategy work together towards achieving stock management objectives.</p>
Client action plan	<p>A formal harvest strategy with performance indicators and control rules for the management of Brownlip abalone is in place for this fishery. The reference levels and control rules in the harvest strategy have recently been reviewed and require a suitable time series to determine if the performance indicator (annual catch rate) is responsive to the state of the Brownlip abalone stock.</p> <p>1st Audit - Provide an update on how the fishery is performing to validate if the current reference levels are appropriate. Demonstrate that additional research and analyses in biological aspects relevant to the efficacy of the reference levels has started.</p>

	<p>2nd Audit - Provide an update on how the fishery is performing to validate if the current reference levels are appropriate. Demonstrate that additional research and analyses in biological aspects relevant to the efficacy of the reference levels are progressing, including evidence of data required to estimate the current size at onset of maturity with more certainty.</p> <p>3rd Audit - Finalise research and data analyses in biological aspects relevant to the efficacy of the reference levels and whether there is sufficient stock protection between the size at onset of maturity and the legal minimum length. Review the fisheries performance (state of the stock) with respect to the application of the harvest strategy (e.g. the time series to date) in consultation with the above mentioned research findings, to provide evidence that elements of the harvest strategy work together towards achieving stock management objectives.</p>
Consultation on condition	The action plan has been developed in close consultation with the Department of Fisheries (WA) and the AIAWA.

Appendix 2 Peer Review Reports

Peer Reviewers Overall Opinion

Overall Opinion of the Report		
	Peer Reviewer 1	Peer Reviewer 2
Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report? (Yes/No)	Yes	YES
Peer Reviewer Justification	<p>The overall fishery review presents a concise and very well written overview of the fishery and contextualising of the governance and management system. The assessment sections clearly summarise the detailed evidence to motivate the scores allocated against MSC standards. The scoring is considered to err on the conservative side, and a few minor suggestions are made where a higher score could be considered. Overall, the assessment is based on extensive evidence, and well-motivated arguments to justify scores the score allocated. There is evidence of industry and fishery management authority support for the assessment and it is concluded that the assessment team arrived at the appropriate conclusion.</p>	<p>There is a large body of published and unpublished information on the biology of the UoC species, collected over the past three decades by well-respected researchers. There is a Harvest Strategy in place which will prevent ad hoc decisions on TACC. The Harvest Strategy is relatively new, and will necessarily involve a period of learning and revision.</p>
Certification Body Response	No response required.	
Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe? (Yes/No)	Yes	NO
Peer Reviewer Justification	The client action plan clearly outlines how the conditions	The conditions correctly identify the weak point in the Harvest

	will be met over a three year audit cycle. Client and supporting fishery management institutional capacity is clearly sufficient to achieve these goals.	Strategy – the ability of the PI and Control Rule to ensure the stock fluctuates around the proxy for MSY. There are two issues with this Harvest Strategy that are likely to dampen both management response and stock recovery such that the condition may not be met in the time frame required; a) the 3 year moving average will dampen the response both upwards and downwards; and b) the Control rule is precautionary when the PI are decreasing and move past Reference Points, but is likely to be over optimistic when the PI are increasing. Combined with target species that are long-lived and slow growing, my concerns are that expectations of stock response times to the Harvest Strategy (with/without revisions) may be unrealistic, but not that the Harvest Strategy is faulty. More detail and possible solutions are offered below.
Certification Body Response	Two concerns are raised but they both relate to PIs where the reviewer agrees that the fishery scores above 80. So, while we agree with the suggestions, we have responded with recommendations rather than conditions. Details below	

Client Action Plan Comments

Client Action Plan Comments (if included)		
	Peer Reviewer 1	Peer Reviewer 2
Do you think the client action plan is sufficient to close the conditions raised? (Y/N)	Yes	NO
Peer Reviewer Justification	The client action plan clearly outlines how the conditions will be met over a three audit cycle. Client and supporting fishery management institutional capacity is clearly sufficient to	The client action plan appropriately proposes to review the metrics available and stock response to management action, and in regard to other environmental factors that may

	achieve these goals.	contribute to trends in stock status. I would prefer to see more explicit reference to an intent to consider improvements in the Harvest Strategy itself.
Certification Body Response	<p>There is a technical difficulty in responding to this comment as the issues raised were not sufficient to require new conditions to be raised (as agreed by both the CAB and the reviewer). Therefore, the existing client action plan is acceptable for the existing conditions. The reviewer raises excellent points for improving the harvest strategy and we have included these as recommendations.</p>	

Peer Reviewers General Comments

Peer Reviewer General Comments (optional)	
Peer Reviewer 1	Peer Reviewer 2
<p>Evidence is presented of a very well governed and managed fishery, aligned with modern sustainable ecosystem objectives. Robust fishery governance and management institutions with a track record of accountability and responsiveness to changing environmental and social conditions are in place. Overall the evidence presented indicates that the fishery is very well positioned to meet MSC standards. The assessment report was excellent, being easy to read, and synthesizing extensive evidence into well-reasoned motivations to justify the scores recommended.</p>	<p>Developing and implementing a Harvest Strategy in abalone fisheries is particularly challenging given key aspects of commercially exploited haliotids; a) these species are long-lived, slow growing, have a sedentary adult phase and limited larval dispersal; b) that the fishery is located in wave exposed remote localities making research efforts challenging, and c) variation in habitat quality and the capacity of haliotids to show phenotypic responses to local environmental conditions confounds understanding of overall stock dynamics. Experience and success in developing Harvest Strategies in other Australian abalone fisheries has been mixed, but it would be fair to say that no other state has yet found the perfect Harvest Strategy for abalone fisheries. The application is well written and details a comprehensive framework within which the UoC are managed.</p>
Certifying Body Response	
No response required.	

Peer Reviewers Comments Related to Scores and Rationales

Principle 1

Performance Indicator 1.1.1		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	Yes	YES
Peer Reviewer Justification	<p>Greenlip: Sound stock recruitment information, uncertainty in recruitment and modelling of MSY by Hart et al is used to motivate the assessment. Given the history fishing well below MSY the score and condition is justified. It is understood that this is however contingent on possibly lowering the reference indicators due if an environmentally induced reduction in the productivity of the stock is found.</p> <p>Brownlip: Sound evidence on recruitment, stock status, reference points and uncertainties presented by Hart et al justify the score.</p> <p>Roe Abalone: Sound stock-recruitment information is presented by Hart et al to justify the score. Despite acknowledged uncertainties, robust reference point evidence of stock health and low fishing pressure justify the score of SG100</p>	<p>CAVEAT: If the client plan includes consideration of the mechanics of the Harvest Strategy.</p> <p>Comment: The 3yr moving average of SCPUE used as performance indicator will dampen the management response in situations where stock trends are both downwards and upwards. The rationale for this is to smooth over high inter-annual variation in SCPUE. In relation to the Conditions set as part of the Review, the 3yr moving average will slow the signal and therefore the management action, and consequently it may be a 5yr – 10yr process to observe the functioning of the Harvest Strategy.</p> <p>Suggestion: The client may have considered this already, but a 3yr weighted mean SCPUE, with a higher weight on the most recent year may improve the responsiveness of the HS to trends in the PI.</p>

Certification Body Response	Agree with this comment so recommendations added for both Greenlip and Brownlip abalone (actually at 1.2.1 rather than 1.1.1)
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Performance Indicator 1.1.2		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	<p>All species: The fishing effort is well monitored and good stock dynamic data is available. The score of SG80 is justified based on the evidence and stock model uncertainties provided.</p>	<p>I don't have problem with the review conclusions, but with the guidepost. Where there is a significant time difference between reproductive maturity and recruiting to the fishery, and the only metric of recovery is SCPUE, then SCPUE cannot provide evidence of stock rebuilding at the 2-generation time frame. The measurable effect will occur at the 1-generation time (3-4 years here) plus the time to recruit to the fishery (~ 7 years+ here). Thus, it will be 10+ years to provide comprehensive evidence of recruitment based stock rebuilding. It's a nice rule of thumb, but I'm not convinced it works well for abalone.</p>
Certification Body Response	No response required.	

Performance Indicator 1.1.3 Greenlip		
	Peer Reviewer 1	Peer Reviewer 2

Has all the relevant information available been used to score this indicator? (yes/no)	Yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	Robust reasons with high certainty are provided to justify the SG100 score	While the growout site in Flinders Bay is not an enhancement project, the high density of animals on this artificial reef system will most certainly contribute to the larval pool in this region based on molecular ecology and connectivity of Greenlip abalone populations. [Miller, K.J.; Mundy, C. N. & Mayfield, S. Molecular genetics to inform spatial management in benthic invertebrate fisheries: a case study using the Australian Greenlip Abalone. <i>Molecular Ecology</i> , 2014, 23, 4958-4975] There is a sound basis to the management of genetic diversity of broodstock for this operation as identified by the reviewers, and the operation will provide an unintended but positive contribution to the resilience of the wild stocks as a consequence.
Certification Body Response	Agreed. No change required.	

Performance Indicator 1.2.1		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	yes	YES

Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	<p>Greenlip: The fishery is well monitored with a history of a responsive harvest strategy and a conservative size limit protection for recruitment overfishing. The uncertainties in the assumptions of the stock dynamics modeling are acknowledged.</p> <p>Brownlip: The concerns about the basis for setting the harvest strategy reference points and risk to the stock are justified. It is in the interest of the fishery to adopt a more robust harvesting strategy to reduce the risk to the stock</p> <p>Roe's abalone: The harvesting strategy is based on conservative reference points with evidence that they have been validated. The fishing strategy is responsive to monitoring of the stock status and the stock is demonstrated to be in good health with fishing above MSY. The score of SG95 is thus justified.</p>	<p>The LRP is set at a level not actually experienced in the fishery, and could be considered to be less than precautionary. However, if the HS is working well (actions around the Target and Threshold RPs), then the key PI should never reach this hypothetical LRP. If the PI does fall below this LRP, then perhaps this is evidence the HS is not achieving the intended goal, or, there is a factor other than commercial fishing accelerating declines in stock abundance.</p>
Certification Body Response	<p>Agreed. No change required although Recommendation added here based on comment at 1.1.1:</p> <p>(i) "The harvest strategy is somewhat vulnerable from the averaging of catch rate over a period of three years. This dampens any signal of decline and would slow management response to a period of rapid decline in the stock.</p>	

	Consideration should be given to reducing this risk, for example by developing a weighted index of the last three years with greatest weight given to the most recent period. “
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Performance Indicator 1.2.2		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	No
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	YES
Peer Reviewer Justification	<p>Greenlip: Substantial evidence is presented that fishery has a record of operating sustainably under a responsive and well governed HCR regime. The reasons for not achieving SG100 are clear due to HCR not allowing MSY to rise to the required level.</p> <p>Brownlip: Substantial evidence is presented that fishery has a record of operating sustainably under a responsive and well governed HCR regime. The record of sustainable harvest at or above MSY, with acknowledged uncertainty of the effectiveness of the responsiveness of the HCRs to environmental uncertainty justifies the SG95 score.</p> <p>Roe's abalone: Substantial evidence is presented that fishery has a record of operating sustainably under a</p>	<p>The Harvest Control Rule is precautionary when a Performance Indicator is declining and moves over the Target, Threshold or Limit Reference Points. However, when the PI is improving and steps above the Limit Reference Point or the Threshold Reference Point, the Control Rule is optimistic. For example, when the PI moves upwards and across the Threshold RP, there is a TACC increase from 70% of the SHL to 90% of the SHL. This equates to a 28% TACC increase. Such a large increase is likely to push the PI back down below the Threshold Reference Point. The consequence being that the PI may fluctuate around the Threshold Reference Point rather than the Target Reference Point.</p> <p>Suggestion: This could be resolved by breakout rules that allow smaller upward steps with an increment every two years, or, requiring the PI to be above the RP for at least two years before action</p>

	responsive and well governed HCR regime. The record of sustainable harvest at or above MSY, with acknowledged uncertainty of the effectiveness of the responsiveness of the HCRs to environmental uncertainty justifies the SG95 score.	is taken.
Certification Body Response	<p>Agree. Recommendation added for all species.</p> <p>“The control rule allows a large increase in catch when the stock moves upwards over the Threshold RP. This risks sending the stock immediately back below this RP. This could be resolved by breakout rules that allow smaller upward steps with an increment every two years, or, requiring the PI to be above the RP for at least two years before action is taken. ‘</p>	

Performance Indicator 1.2.3		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	<p>Greenlip and Brownlip: A comprehensive and rigorous monitoring strategy is in place with a suite of indicators. Data uncertainties are acknowledged including an estimate of illegal catch. The SG90 score is thus justified.</p> <p>Roe's abalone: A comprehensive and rigorous monitoring strategy is in place with a suite of indicators. Data</p>	The review justification is adequate and appropriate.

	uncertainties are acknowledged. The long-term monitoring supports HRs that maintain the fishery above MSY. The SG100 score is thus justified.	
Certification Body Response	No response required.	

Performance Indicator 1.2.4		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	<p>Greenlip and Brownlip: An effective and rigorous system of stock assessment based on SCPUE is in place which includes additional studies such as genetics and stock structure. Alternative approaches to stock assessment have not been tested. The SG90 score is thus justified.</p> <p>Roe's abalone: An effective and rigorous system of stock assessment based on SCPUE is in place which includes additional studies such as;- recruitment patterns, genetics and stock structure. Alternative approaches to stock assessment have not been tested. The SG90 score is thus justified.</p>	The review justification is adequate and appropriate.

Certification Body Response	No response required.
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Performance Indicator 1.2.5 Greenlip		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	The substantive evidence presented indicates that there is a robust and conservative stock enhancement genetic management and monitoring strategy in place which will maintain the genetic diversity of the wild greenlip population.	The review justification is adequate and appropriate.
Certification Body Response	No response required.	

Performance Indicator 1.2.6 Greenlip		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	The substantive evidence presented indicates that there	The review justification is adequate and appropriate.

	is a robust and conservative genetic management strategy in place which will maintain the genetic diversity of the wild greenlip population.	
Certification Body Response		

Principle 2

Performance Indicator 2.1.1		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification		The review justification is adequate and appropriate.
Certification Body Response	No response required.	

Performance Indicator 2.1.2		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	It is clear that no primary species are caught with the fishing techniques employed.	The review justification is adequate and appropriate.

Certification Body Response	No response required.
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Performance Indicator 2.1.3		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	Extensive monitoring evidence is cited to verify that primary species are not caught.	The review justification is adequate and appropriate.
Certification Body Response	No response required.	

Performance Indicator 2.2.1		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	Clear evidence presented that secondary species impacts are not an issue in this fishery	The review justification is adequate and appropriate.
Certification Body Response	No response required.	

Performance Indicator 2.2.2		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant	Yes	YES

information available been used to score this indicator? (yes/no)		
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	Clear evidence presented that secondary species impacts are managed in WA and are not an issue in this fishery	The review justification is adequate and appropriate.
Certification Body Response	No response required.	

Performance Indicator 2.2.3		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	While the impact of the fishery on commensal species is considered insignificant, the lack of quantitative information justifies the SG85 score	The review justification is adequate and appropriate.
Certification Body Response	No response required.	

Performance Indicator 2.3.1		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been	yes	YES

used to score this indicator? (yes/no)		
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	Clear evidence presented that RTP species are not impacted in any significant way by the abalone fishery	The review justification is adequate and appropriate.
Certification Body Response	No response required.	

Performance Indicator 2.3.2		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	ETP species management strategies are outlined in the context of abalone fishing and meet criteria for the SG80 score	The review justification is adequate and appropriate.
Certification Body Response	No response required.	

Performance Indicator 2.3.3		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	yes	YES

Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	Evidence that sufficient monitoring and reporting protocols are in place to provide sufficient information to manage any ETP impacts.	The review justification is adequate and appropriate.
Certification Body Response	No response required.	

Performance Indicator 2.4.1		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	No	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	In my view is that there is sufficient evidence to support a SG100 score for 'commonly encountered habitat status' and an overall SG100 score	The review justification is adequate and appropriate.
Certification Body Response	Categorical evidence or direct research is not available to support a claim that the status of commonly encountered habitats, aren't being adversely affected. Hence, an overall score of SG95 is considered appropriate.	

Performance Indicator 2.4.2		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been	yes	YES

used to score this indicator? (yes/no)		
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	Despite a lack of quantitative information, there is clear evidence that the abalone fishery management strategy minimizes impacts on habitats.	The review justification is adequate and appropriate.
Certification Body Response	No response required.	

Performance Indicator 2.4.3		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	Sufficient information is available to assess and detect the impacts, generally considered negligible, of the fishery on habitats.	The review justification is adequate and appropriate.
Certification Body Response	No response required.	

Performance Indicator 2.5.1		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been	Yes	YES

used to score this indicator? (yes/no)		
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	In my opinion sufficient evidence is cited to meet the criteria 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'. Thus, a higher score of SG85 would be justified.	The review justification is adequate and appropriate.
Certification Body Response	The reviewer appraisal is noted. However, a score of SG80 is considered more appropriate, due to the general lack of ecological information available for the three-abalone species, across both the western and southern coasts of Western Australia.	

Performance Indicator 2.5.2		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	The assessment and score is well motivated based on the available fishery management strategy, risk assessments, and	The review justification is adequate and appropriate. Abalone primarily consume drift algae, and otherwise

	monitoring.	<p>might be considered to be 'trackers' rather than 'drivers' of local community structure. There have been notions of abalone self-maintaining habitat quality through movement and feeding, however this has never been adequately demonstrated in the field.</p> <p>Zeeman, Z., Branch, G.M., Pillay, D. et al. An experimental test of the effect of the abalone <i>Haliotis midae</i> on benthic community composition. Mar Biol (2014) 161: 329.</p>
Certification Body Response	No response required.	

Performance Indicator 2.5.3		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	The assessment of ecosystem information is well motivated citing all relevant sources and conservatively scored. I would recommend a "Yes" for 'Information is adequate to support the development of strategies to manage ecosystem impacts'	The review justification is adequate and appropriate.
Certification Body Response	The reviewer makes a valid point and the score has been changed to SG100 for 2.5.3e.	

Performance Indicator 2.6.1		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	No	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	<p>In my opinion sufficient evidence is presented to meet the criterion for a SG100 score: 'There is evidence that the translocation activity is highly unlikely to introduce diseases, pests, pathogens, or non-native species into the surrounding ecosystem'. The justification for not awarding a score of SG100 seems unreasonably strict ('However, without the system being tested against an actual threat, there is no evidence that translocation activities are highly unlikely to introduce diseases or serendipitous.')</p>	<p>The review justification is adequate and appropriate. In addition, the pattern of circulation within Flinders Bay may will more than likely transport and disease particles away from the nearest rocky reef system supporting wild populations of greenlip abalone and onto larger stretches of sandy coast. This in effect provides a greater actual separation than might be apparent based on geographic proximity to natural reef, a key factor in halting the spread of AVG in Victoria. Humans appeared to be the primary vector enabling AVG to travel considerable distances in Victoria.</p>
Certification Body Response	<p>Reviewer 1 makes a valid point, to only award a score of SG80 for a scenario tested on the basis that an actual occurrence hasn't occurred is unduly strict. Hence the score has been changed to SG100 and the text altered accordingly.</p>	

Performance Indicator 2.6.2

	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	The assessment and score is well motivated based on evidence for controlling translocation impacts.	The review justification is adequate and appropriate.
Certification Body Response	No response required.	

Performance Indicator 2.6.3		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	Evidence is presented that translocations are highly regulated, monitored and documented. The score of SG100 is thus justified.	The review justification is adequate and appropriate.
Certification Body Response	No response required.	

Principle 3

Performance Indicator 3.1.1

	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	The policy, legal and customary rights framework within which abalone fisheries operate are clearly explained and the SG100 score well motivated.	The review justification is adequate and appropriate.
Certification Body Response	No response required.	

Performance Indicator 3.1.2		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	The highly transparent, participative and accountable Western Australian fishery governance system, with its established institutions for representation and consultation, is outlined justifying the SG100 score.	The review justification is adequate and appropriate.
Certification Body Response	No response required.	

Performance Indicator 3.1.3		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	The alignment of the fishery long term objectives (including governance and management systems) with MSC standards is explicitly outlined.	The review justification is adequate and appropriate.
Certification Body Response	No response required.	

Performance Indicator 3.2.1		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	The fishery specific objectives are clearly outlined against MSC standards.	The review justification is adequate and appropriate.
Certification Body Response	No response required.	

Performance Indicator 3.2.2		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	The highly developed and accountable institutional structure and management protocols for fishery decision making is outlined with examples of its responsiveness. The SG100 score is well motivated.	The review justification is adequate and appropriate.
Certification Body Response	No response required.	

Performance Indicator 3.2.3		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	Evidence is presented of a highly controlled and compliant legal fishery with minimal offences. The unquantified level of illegal harvest is acknowledged.	The review justification is adequate and appropriate.

Certification Body Response	No response required.
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Performance Indicator 3.2.4		
	Peer Reviewer 1	Peer Reviewer 2
Has all the relevant information available been used to score this indicator? (yes/no)	Yes	YES
Does the information and/or rationale used to score this indicator support the given score? (yes/no)	Yes	YES
Will the condition(s) raised improve the fishery's performance to the SG80 level? (yes/no/NA)	NA	NA
Peer Reviewer Justification	The highly developed and established system for WA general fishery and abalone fishery monitoring and performance evaluation is outlined to motivate the SG100 score	The review justification is adequate and appropriate.
Certification Body Response	No response required.	

Any Other Comments (optional)		
	Peer Reviewer 1	Peer Reviewer 2
	I did not have access to the supporting evidence from which the estimated 3t illegal catch was derived from. It was acknowledged the illegal take could be higher. While the legal fishery is highly compliant, given the serious illegal trade in abalone in other countries, some more consideration could be given to assessing the risk to the fishery of the existing, and possible future increase in illegal abalone fishing.	
Certification Body Response	No response required.	

Appendix 3 Stakeholder submissions



Government of Western Australia
Department of Parks and Wildlife

Your ref:
Our ref:
Enquiries: Fran Stanley
Phone: (08) 9219 9977
Email: fran.stanley@dpaw.wa.gov.au

Ms Julia Kent
SCS Global Services
JKent@scsglobalservices.com

Dear Julia

ASSESSMENT OF WESTERN AUSTRALIAN ABALONE FISHERY FOR MARINE STEWARDSHIP COUNCIL ENDORSEMENT

Thank you for facilitating recent meetings between staff of the Department of Parks and Wildlife and the assessors undertaking the above assessment in Perth and Augusta.

Please find attached a written submission to the assessment, which outlines and clarifies the matters discussed at those meetings.

Please contact me if you have any further queries.

Yours sincerely

A handwritten signature in blue ink that reads "Fran Stanley".

Fran Stanley
ASSISTANT DIRECTOR CONSERVATION

5 July 2016

Att

Attachment 1

Western Australia Abalone Fishery Assessment

**Stakeholder submission from the Department of Parks and Wildlife, 5 July 2016
(follow up to meeting with assessors on 14 June 2016)**

The WA Department of Parks and Wildlife is the State Government agency responsible for conservation of the State's flora and fauna and management of a range of conservation reserves, including marine parks, marine nature reserves and marine management areas. The key areas of interest for Parks and Wildlife with respect to assessing the abalone fishery are those locations where the fishery overlaps with marine parks and where it impacts on marine fauna both inside and outside marine reserves. The WA abalone fishery overlaps Ngari Capes Marine Park (in the south-west), Shoalwater Islands Marine Park (near Rockingham just south of Perth) and Marmion Marine Park (just north of Perth).

The commercial abalone fishery is highly selective and appears to have little impact in terms of habitat removal, and it is assumed that fishers have a vested interest in maintaining the habitat for future years. It is suspected the catch isn't large enough to have much of an impact on the trophic structure but there is no specific research to answer this question. It is possible that ecological impacts could arise from abalone harvesting and these could be measured by monitoring other species, such as echinoderms, to detect trophic changes as a fishery-independent measure of ecological impacts. Such changes could occur even while catch per unit effort (CPUE) and total harvests remain stable. Marine park sanctuary zones could be used as reference sites to determine if there are trophic changes from removing abalone biomass from ecosystems.

The recreational abalone fishery has impacts on marine habitats, mostly along the shoreline and nearshore reefs, rather than on offshore reef areas or islands. During the 1hr Roe's recreational period very obvious impacts can be observed, including dead shells, seaweed etc. washing up afterwards. The recreational fishers also trample the habitat.

Parks and Wildlife is not aware of major issues with commercial abalone fishermen in terms of illegal fishing, although it is understood that there is a black market for abalone. However, there was a large incident recently involving recreational fishers at Shoalwater Islands (within the Perth metropolitan area). Parks and Wildlife and the Department of Fisheries (DoF) have a joint responsibility for compliance in marine parks and reserves, and there is a lot of collaborative work on fisheries-related issues and sharing of information. There is a collaborative operational plan for each marine park, which outlines work planned in the areas of compliance, education, research and monitoring and implementation of these plans is reported annually. Infringements come under the *Fish Resources Management Act 1994* and DoF takes the lead on this. However, many Parks and Wildlife officers are cross authorised under fisheries legislation and assist in detecting and reporting infringements. There is a lot of informal communication between the two departments and a good working relationship. Usually Parks and Wildlife is invited to risk assessments where there is an obvious overlap with marine parks and/or obvious large fauna. There is also generally a good relationship between Parks and Wildlife and Recfishwest.

Parks and Wildlife discussed a means of influencing the behaviour of commercial fishers in Ngari Capes Marine Park, where a few commercial fishers behave very poorly, generating public criticism of them and the department. It was noted that this is a social (governance) issue and not a biological impact. An MSC endorsed code of practice could be a method of addressing this issue.

Parks and Wildlife is not aware of any negative interactions between the abalone fishery and ETP species such as cetaceans, pinnipeds or turtles, but it was identified that there could be impacts on syngnathids. However, Parks and Wildlife tends not to monitor specific fish species; rather, monitoring programs focus more on habitat/communities. Parks and Wildlife prepares an annual report for key values of marine parks and aims to include some data on invertebrates, such as abalone and lobsters. Parks and Wildlife also seeks data from DoF to include in these reports (from stock assessment monitoring etc.). However, the scale at which DoF collects data is generally much larger than the marine park scale and so it is often difficult to use these data to inform management at the marine park level.

There is a small amount of monitoring of fished vs unfished sites, and Parks and Wildlife has been finding that the differences between habitats are large, and that teasing out the differences will be very complicated. The small size of the Perth metropolitan marine parks and the lack of abalone habitat in sanctuary zones means that it cannot be replicated sufficiently and there may not be much power to detect differences. There would be a better chance in the larger Ngari Capes Marine Park but this area tends to be subject to different types of pressure (more seasonal) and the zoning scheme is not yet legally in place for Ngari Capes Marine Park.

During the planning process for Ngari Capes Marine Park, there was a detailed project to determine where the key areas targeted by abalone fishers were. DoF did a lot of work to estimate how much catch was taken out of particular areas and this contributed to the planning process. Some of the areas in the park will become no-take zones, and it is not known if commercial fishing is still occurring in these areas.

The spread of invasive species is not considered an issue for areas in which the abalone fishery occurs. DoF is the lead State agency for responding to marine biosecurity matters. There was a fairly recent incident at Barrow Island and there was a good collaborative response between the two departments.

Parks and Wildlife has had some input into the development of the Public Environmental Review document for the Ocean Reef Development (process under the *Environmental Protection Act 1986*). This development will impact on a significant amount of intertidal reef, sand, seagrass and macroalgae habitats. The development is inside Marmion Marine Park and if it was approved, could result in an area being excised from the park. This could also result in a process to expand the park and/or reconsider the zoning scheme.

There was a lot of interaction with the abalone hatchery facility near Augusta when it was being set up, and Parks and Wildlife provided input into the risk assessment and were provided with feedback. If the sea-ranching were to expand then the ranching facility may have to look at other EIAs.

There is an unknown amount of translocation of abalone occurring by commercial fishers, which seems to be fairly unregulated. Parks and Wildlife understands that this practice is designed to enhance production of abalone. Although it is understood that typically this

practice does not take small abalone, such translocations could denude some areas of abalone and concentrate them in other areas, and could have impacts on ecosystem function through removal this element of the system. There is an unknown level of disturbance or mortality of the translocated animals, especially if they are small animals. As well, wild animals are being collected, taken onto boats and returned to the ocean all of which may stress them and make them more susceptible to disease or introduce disease to new areas.

In addition, translocation practices may disadvantage recreational fishers if abalone are moved away from areas of easy access to more inaccessible reefs by commercial fishers. This is an impact on park users that cannot be controlled by commercial harvesting restrictions. Finally, as outlined above, as the zoning scheme is yet to be legally established in Ngari Capes Marine Park, commercial fishers should be encouraged not to take abalone from or translocate abalone into proposed sanctuary zones.

Parks and Wildlife would like to clarify if this 'catch effort' is recorded in fishery statistics, if disease risks have been identified and are managed, and whether any monitoring is conducted to determine the impacts (if any) of this practice and whether it is sustainable from an ecosystem perspective.

Parks and Wildlife
5 July 2016

Western Australia Abalone Fishery Assessment Stakeholder submission from the Department of Parks and Wildlife, 5 July 2016 (follow up to meeting with assessors on 14 June 2016)

The WA Department of Parks and Wildlife is the State Government agency responsible for conservation of the State's flora and fauna and management of a range of conservation reserves, including marine parks, marine nature reserves and marine management areas. The key areas of interest for Parks and Wildlife with respect to assessing the abalone fishery are those locations where the fishery overlaps with marine parks and where it impacts on marine fauna both inside and outside marine reserves. The WA abalone fishery overlaps Ngari Capes Marine Park (in the south-west), Shoalwater Islands Marine Park (near Rockingham just south of Perth) and Marmion Marine Park (just north of Perth). The commercial abalone fishery is highly selective and appears to have little impact in terms of habitat removal, and it is assumed that fishers have a vested interest in maintaining the habitat for future years. It is suspected the catch isn't large enough to have much of an impact on the trophic structure but there is no specific research to answer this question. It is possible that ecological impacts could arise from abalone harvesting and these could be measured by monitoring other species, such as echinoderms, to detect trophic changes as a fishery-independent measure of ecological impacts. Such changes could occur even while catch per unit effort (CPUE) and total harvests remain stable. Marine park sanctuary zones could be used as reference sites to determine if there are trophic changes from removing abalone biomass from ecosystems.

Team responses:

The use of Marine park sanctuary zones as reference sites would provide insight into the impacts of abalone fishing. However, the means in which such issues are addressed, are outside the scope of the MSC assessment. Rather it is the responsibility of the Department of Fisheries' Research Division to determine if such an approach is compatible with their research efforts for the AMF.

The recreational abalone fishery has impacts on marine habitats, mostly along the shoreline and nearshore reefs, rather than on offshore reef areas or islands. During the 1hr Roe's recreational period very obvious impacts can be observed, including dead shells, seaweed etc. washing up afterwards. The recreational fishers also trample the habitat. Parks and Wildlife is not aware of major issues with commercial abalone fishermen in terms of illegal fishing, although it is understood that there is a black market for abalone. However, there was a large incident recently involving recreational fishers at Shoalwater Islands (within the Perth metropolitan area). Parks and Wildlife and the Department of Fisheries (DoF) have a joint responsibility for compliance in marine parks and reserves, and there is a lot of collaborative work on fisheries-related issues and sharing of information. There is a collaborative operational plan for each marine park, which outlines work planned in the areas of compliance, education, research and monitoring and implementation of these plans is reported annually.

Infringements come under the Fish Resources Management Act 1994 and DoF takes the lead on this. However, many Parks and Wildlife officers are cross authorised under fisheries legislation and assist in detecting and reporting infringements. There is a lot of informal communication between the two departments and a good working relationship. Usually Parks and Wildlife is invited to risk assessments where there is an obvious overlap with marine parks and/or obvious large fauna. There is also generally a good relationship between Parks and Wildlife and Recfishwest.

Team responses:

The Department of Parks and Wildlife's accounts of a strong working relationship between government agencies, along with the suitable delegation of responsibilities, is an important consideration for the audit team's assessment. In addition, the provision of insights into the potential environmental impacts the recreational sector may have, has been utilized by the audit team when gauging the relative impacts of the AMF.

Parks and Wildlife discussed a means of influencing the behaviour of commercial fishers in Ngari Capes Marine Park, where a few commercial fishers behave very poorly, generating public criticism of them and the department. It was noted that this is a social (governance) issue and not a biological impact. An MSC endorsed code of practice could be a method of addressing this issue. Parks and Wildlife is not aware of any negative interactions between the abalone fishery and ETP species such as cetaceans, pinnipeds or turtles, but it was identified that there could be impacts on syngnathids. However, Parks and Wildlife tends not to monitor specific fish species; rather, monitoring programs focus more on habitat/communities. Parks and Wildlife prepares an annual report for key values of marine parks and aims to include some data on invertebrates, such as abalone and lobsters. Parks and Wildlife also seeks data from DoF to include in these reports (from stock assessment monitoring etc.). However, the scale at which DoF collects data is generally much larger than the marine park scale and so it is often difficult to use these data to inform management at the marine park level. There is a small amount of monitoring of fished vs unfished sites, and Parks and Wildlife has been finding that the differences between habitats are large, and that teasing out the differences will be very complicated. The small size of the Perth metropolitan marine parks and the lack of abalone habitat in sanctuary zones means that it cannot be replicated sufficiently and there may not be much power to detect differences. There would be a better chance in the larger Ngari Capes Marine Park but this area tends to be subject to different types of pressure (more seasonal) and the zoning scheme is not yet legally in place for Ngari Capes Marine Park. During the planning process for Ngari Capes Marine Park, there was a detailed project to determine where the key areas targeted by abalone fishers were. DoF did a lot of work to estimate how much catch was taken out of particular areas and this contributed to the planning process. Some of the areas in the park will become no-take zones, and it is not known if commercial fishing is still occurring in these areas. The spread of invasive species is not considered an issue for areas in which the abalone fishery occurs. DoF is the lead State agency for responding to marine biosecurity matters. There was a fairly recent incident at Barrow Island and there was a good collaborative response between the two departments. Parks and Wildlife has had some input into the development of the Public Environmental Review document for the Ocean Reef Development (process under the Environmental Protection Act 1986). This development will impact on a significant amount of intertidal reef, sand, seagrass and macroalgae habitats. The development is inside Marmion Marine Park and if it was approved, could result in an area being excised from the park. This could also result in a process to expand the park and/or reconsider the zoning scheme. There was a lot of interaction with the abalone hatchery facility near Augusta when it was being set up, and Parks and Wildlife provided input into the risk assessment and were provided with feedback. If the sea-ranching were to expand then the ranching facility may have to look at other EIAs.

Team responses:

The comments from Parks and Wildlife are noted and appreciated. The future development of the Ocean Reef Marina and monitoring of Marine Parks are not within the scope of the current audit, yet the general insights provided will be used as a point of reference for future audits of the AMF.

There is an unknown amount of translocation of abalone occurring by commercial fishers, which seems to be fairly unregulated. Parks and Wildlife understands that this practice is designed to enhance

production of abalone. Although it is understood that typically this practice does not take small abalone, such translocations could denude some areas of abalone and concentrate them in other areas, and could have impacts on ecosystem function through removal this element of the system. There is an unknown level of disturbance or mortality of the translocated animals, especially if they are small animals. As well, wild animals are being collected, taken onto boats and returned to the ocean all of which may stress them and make them more susceptible to disease or introduce disease to new areas. In addition, translocation practices may disadvantage recreational fishers if abalone are moved away from areas of easy access to more inaccessible reefs by commercial fishers. This is an impact on park users that cannot be controlled by commercial harvesting restrictions. Finally, as outlined above, as the zoning scheme is yet to be legally established in Ngari Capes Marine Park, commercial fishers should be encouraged not to take abalone from or translocate abalone into proposed sanctuary zones. Parks and Wildlife would like to clarify if this 'catch effort' is recorded in fishery statistics, if disease risks have been identified and are managed, and whether any monitoring is conducted to determine the impacts (if any) of this practice and whether it is sustainable from an ecosystem perspective.

Team responses:

The translocation of abalone by commercial fishers is presently not within the scope of the audit. Regardless, such information adds to the overall picture of the fishery and highlights the broader complexity of issues, which the audit team has taken into consideration.

Stakeholder comments received on the public comment draft report

Comments on the public draft report were received from the MSC

Grade	Requirement	Description	Pi	Team responses
Guidance	FCR-7.10.6.1 v2.0	<p>PI 1.1.1.: Scoring issue a: Greenlip abalone. As per the values presented in Figure 2, it would be useful to include the 95% confidence intervals for "Area 2- ~7.5, Area 3- 8.3 (kg meat / h)" to provide clarity around meeting the SG80 level, and therefore the 'highly likely' confidence level of the 80th percentile (SA2.2.1.2).</p> <p>Also, PI 1.2.3 scoring issue d mentions a 3t estimate of IUU catch. It would likely add to the error of the catch estimates if the IUU component was not.</p>	1.1.1	<p>Regarding confidence estimates around CPUE, there are two method issues with this suggestion. The first is that the harvest strategy uses a three-year average of the standardised CPUE while the 95% CLs presented are annual. The second issue is that these CLs only measure variation around the mean annual standardised catch rate - they don't reflect confidence in the indicator as a proxy for biomass. As per the greenlip example in Fig 2., we can see year-to-year CPUE bounced around from 2005 to 2008 and seemed to misrepresent the real underlying trend in biomass that was apparent over the longer time series. Confidence limits during this period were tight and didn't reflect the true uncertainty on whether the biomass was above the PRI. Scoring on this PI is admittedly subjective to an extent but the CLs on CPUE can't help unfortunately because they underestimate the uncertainty. The clients approach of using a three-year average is basic but seems to be a fair solution to bridging the uncertainty between CPUIE data and the real issue of trends in biomass. Regarding IUU this could affect error of catch estimates. This is relevant to 1.1.1 if it affects CPUE data which is based on logged catch and effort by licenced commercial divers. The 3t estimate of IUU in greenlip was considered to include a large proportion from outside the licenced fishery. This implies it would not create error in CPUE estimates (that is, CPUE would be reduced by IUU but it is still a proxy of biomass). IUU could however influence the outcomes of harvest strategies as dealt with in 3.2.3.</p>

Major	FCR-7.10.6.1 v2.0	<p>PI 1.1.1: scoring issue b: Brown abalone: The team presents rationale to support the SG80 score of the stock fluctuating around a level consistent with MSY. However, the stock has been less than the target since around 2011/12.</p> <p>From GSA2.2.2, an expectation of fluctating around MSY level is an understanding of the life history relative to the time period over which the stock estimates occur. Such a comparison is lacking for brown abalone. In addition, GSA2.2.2 states that to meet SG80, "a consistent downward trend over recent years to levels below BMSY would not be consistent with this expectation [meeting SG80] unless accompanied by projections or other information suggesting that the trend will soon be reversed." A downward trend is apparent for this UOA (particularly Area 2, Figure 3)and accompanied projections or other information are lacking. Given the above, the rationale does not currently justify the score.</p>	1.1.1	Agreed and scoring revised. This PI now has an overall score of 70 and a new condition has been developed.
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Major	FCR-7.10.6.1 v2.0	<p>PI 1.2.1: Scoring issue b: Greenlip abalone: The objective of the harvest strategy given in Table 6, is "To maintain spawning stock biomass of each target species at a level where the main factor affecting recruitment is the environment." The team has identified in PI 1.1.1 scoring issue b state that "catch has been reduced in attempt to increase the stock abundance, however it is not clear that this is maintaining the stock around a level consistent with MSY given this reduced productivity." Granted the MSY level is not explicitly linked to the objective, at present, it is not clear if the reductions in catch are in line with having the environment as the main factor driving recruitment. As such, the rationale does not currently justify the score.</p>	1.2.1	<p>The MSY TRP is only linked to the exploitable biomass. This PI also needs to consider controls that exclude a portion of the stock from the exploitable biomass, such as spatial closures or size limits. In the case of this greenlip abalone fishery, the minimum legal size is highly conservative and there is robust information to show egg production is maintained at high levels. This ensures the main factor affecting recruitment is the environment. Theoretically the exploitable biomass could become highly depleted in this fishery and while yield would be affected, the strategy would be precautionary in terms of maintaining recruitment. This rationale has been applied in other MSC fisheries, such as the Oregon Dungeness Crab Fishery, which demonstrated precautionary management of recruitment with a harvest strategy which emphasised size limits and controls on harvest of females rather than changes in the exploitable portion of the stock.</p>
Guidance	FCR-PB3.3.2 v2.0	<p>PI 3.1.2: The assessment team has explained why the score for PI 3.1.2 is different in this fishery than those previously certified. However, it is not clear whether they have discussed this conclusion with other assessment teams in order to ensure these fisheries also take up harmonised outcomes at their next audits.</p>	3.1.2	<p>Extra explanation was added under section 4.1 to include discussions with the other assessment teams and rescoreing at the surveillance audit.</p>
Minor	FCR-7.6.1 v2.0	<p>The eligibility date can be one of two options: the certification date or the publication date of the 1st PCDR (20 December 2016). At the moment the "date" provided (August 2017) is not correct as it is "within 6 months of the date of the PCDR". Please choose one of the appropriate dates.</p>		<p>The eligibility date has been changed to the certification date.</p>

Minor	FCR-7.12.1.5c v2.0	<p>On p88 section 5.2 it is stated that "80-100 days out of the year, abalone are harvested and delivered straight to processing facilities using couriers". Pg 88 states "ownership is retained by the licensee throughout processing and sale to the buyer." On p 89 Section 5.3 it is stated that "CoC starts at the first point of sale."</p> <p>Based on the wording above, transport couriers and processors are included in the fishery certificate. However there is no assessment of traceability risks at transport and processing. Further, pg 89 states, "the greatest risk of mixing exists at the processing facilities." The report must assess the risks and describe any mitigation measures in order to determine that these activities can be covered by the fishery certificate.</p> <p>Section 5.3(d) of the MSC Full Assessment Reporting Template v2.0 also requires a list of eligible landing points to be included in the report.</p>	Further explanation added that the higher risk is from the illegal product entering at this stage of the supply chain (processor) rather than from fishers. The text has been revised to indicate that Chain of Custody certification is required upon delivery to the processing facilities. These facilities will need to hold their own CoC certification as contract processors. A full list of landing sites for each of the abalone species was also added in the Appendix of the report
Minor	FCR-7.12.1.4 v2.0	<p>On p88 it is stated that "there is no risk of certified and non-certified catches being mixed by legally operating fishermen" and then in Table 17 "The greatest risk of mixing exists at the processing facilities rather than with the fishermen on the water or in transit." Please assess the degree of risk of such mixing from abalone coming from non-legally operating fishers, or catches made by the recreational fishery? Is there any possibility that such catches could enter the certified supply chain? What measure are in place to prevent this from happening?</p>	<p>The risk has been assessed and is considered to be medium. However the risk is managed with compliance and enforcement measures (paper trail audits, factory audits, using forensics, etc..) in place as well as the penalties associated to act as a deterrent. Extra wording has been added to explain this in the traceability section.</p>

Guidance	FCR_7.4.13 v2.0	On p12 and 14 it is stated that it is not an enhanced fishery, but on p14 section 3.1.4 it does describe a type of stock enhancement - releasing hatchery derived spat at grow-out sites. One assumes that these abalone are part of the UoC, although this is not clearly stated. If they are not they might represent IPI. Please clarify.		The hatchery derived stock is not part of the UoC. There is no issue of mixing or IPI because hatchery derived abalone can be easily identified and enter different market.
Minor	FCR-7.12.2.1 v2.0	The traceability information in the report on pgs 88-89 refers in three instances to 14 licenses in the fishery, however Table 1 on page 13 states there are 52 licence holders in the UoC and Appendix 6 reflects this. Please clarify this inconsistency on the licence holders eligible to use the certificate.		There are 52 licenses in the fishery but less license holders (multiple licenses to license holders). To avoid confusion this has been changed to only reflect number of licenses throughout the report.

Appendix 4 Surveillance Frequency

A level 5 surveillance program is suggested for this fishery. During the initial certification period an on-site audit for the first surveillance audit. The third audit should also be on-site because the 3 conditions are scheduled to be closed out. The second surveillance can be conducted off-site. The final surveillance audit is likely to occur with the re-assessment and should also be conducted on-site.

Table 4.1: Surveillance level rationale

Year	Surveillance activity	Number of auditors	Rationale
2	Off-site audit	2 auditors off-site	From client action plan it can be deduced that information needed to verify progress towards the milestones of conditions 1 and 2. can be provided remotely in year 2. Considering that these will be closed out in year 3, the CAB proposes to have an on-site audit in year 3 for the closing but review evidence off-site during the second year.

Table 4.2: Fishery Surveillance Program

Surveillance Level	Year 1	Year 2	Year 3	Year 4
Level 5	On-site surveillance audit	Off site surveillance audit	On-site surveillance audit	On-site surveillance audit & re-certification site visit

Appendix 5 Client Agreement



Sabine Daume
SCS Global Services
sdaume@scsglobalservices.com

P.O Box 66,
Augusta WA 6290

Dear Sabine,

I am writing to you on behalf of the Abalone Industry Association of Western Australia regarding the Marine Stewardship Council certification for the abalone fishery in Western Australia. The Abalone Industry Association of WA accepts the report and the conditions placed on the fishery for it to become certified.

Yours Sincerely

Peter Rickerby
Executive Officer
Abalone Industry Association of Western Australia
3rd April 2017

Appendix 6: Abalone MFL License holders and vessels registration numbers in the UoC

Abalone MFL	Abalone MFL Licence Holders	Boat Registration
AB1015	FLORENCE M ADAMS	B27A
AB1021	Mr KERRY J ROWE	E23
AB1022	GEORGE BERES	B139
AB1023	WAYNE MICHAEL SPENCER	F423
AB1024	Robert A Desma J & Todd J STRICKLAND	
AB1208	ROKROL PTY LTD	E11
AB1208	ROKROL PTY LTD	E11
AB1208	ROKROL PTY LTD	E12
AB1209	DOMENIC W LAMERA	G75
AB1210	ROBERT GEORGE WELBORN	
AB1238	JOHN KEANE SOUTH	E19
AB1239	ARNOLD PICCOLI	P3
AB1240	MARK RAYMOND NEAVE	F72
AB1241	JENNY LYNNE RICKERBY & PETER JAMES RICKERBY	E48
AB1241	JENNY LYNNE RICKERBY & PETER JAMES RICKERBY	E48A
AB1242	JOHN KEANE SOUTH	E19A
AB1243	ALAN ROY WILSON	E2
AB1244	ALAN ROY WILSON	E1
AB1245	TASMANIAN SEAFOODS PTY LTD	B5
AB1246	THE ESTATE OF THE LATE WENDY JEAN CLAUSON	B146
AB1250	JOHN KEANE SOUTH	
AB1251	GORDON DAVOR KRBAVAC	P1
AB1252	MARILYN JOYCE DAVIS	G66
AB1306	PRISMAN PTY LTD	E8
AB1859	LELAND RICHARD WARNER	E17
AB1876	Robert A Desma J & Todd J STRICKLAND	A73
AB1877	JOHN KEANE SOUTH	E72
AB1878	JOHN F BRINDLE	E15
AB1881	GORDON DAVOR KRBAVAC	P2
AB1882	SCOTT RICHARD GRANT & LOUIS GERARD PARKER	A90
AB1884	JENNY LYNNE RICKERBY & PETER JAMES RICKERBY	E48
AB1884	JENNY LYNNE RICKERBY & PETER JAMES RICKERBY	E48A
AB1885	ALAN ROY WILSON	
AB1886	Mr KERRY J ROWE	E23A
AB1887	THE ESTATE OF THE LATE WENDY JEAN CLAUSON	B146
AB1888	GEORGE BERES	B139
AB1889	ROKROL PTY LTD	E11
AB1889	ROKROL PTY LTD	E12

AB1890	JOHN KEANE SOUTH	A48
AB1891	JOHN KEANE SOUTH	A48
AB1892	JOHN KEANE SOUTH	E19
AB1893	Mr KERRY J ROWE	E23A
AB1894	LELAND RICHARD WARNER	E17
AB1895	TASMANIAN SEAFOODS PTY LTD	B5
AB1896	PRISMAN PTY LTD	E8
AB1897	FLORENCE M ADAMS	B42
AB1898	ALAN ROY WILSON	
AB1900	ALAN ROY WILSON	E3
AB1901	FLORENCE M ADAMS	B42
AB1902	THE ESTATE OF THE LATE WENDY JEAN CLAUSON	
AB1903	ARNOLD PICCOLI	E19
AB1904	JOHN KEANE SOUTH	E19A
AB1905	JOHN KEANE SOUTH	A48
AB1906	JOHN KEANE SOUTH	
AB250263315	JOHN F BRINDLE	E19A

Appendix 7: List of Abalone landing sites by species

Roe's	Greenlip/Brownlip
Big Hill North	Quindalup Boat Ramp
Big Hill	Dunsborough
Big Hill South	Three Bears
Henry's Mouth	Yallingup
Henry's Mouth South	Canal Rocks
Yellow Cliffs	Injidup
Middle Gully/ Goat Gully	Cape Clairault
North Wire	Moses Rock
South Wire	Cowaramup Bay (Gracetown)
Bay of Plenty/ Beehives	Ellenbrook
Witches Hat	Kilcarnup
Ash's Camp	Margaret River
Shell Pile Wire	Gnarabup
Wreck	Redgate
Hilton North	Cape Freycinet/ Boranup
Hilton	Hamelin Bay
Hilton South	Augusta
Pink Patch	Flinders Bay
Emu Fence	Black Point
Hazduck	Scott River Station
Middle Shack	Windy Harbour
Fifth Fence	Fish Creek
Newspaper/ Paper Track	Broke Inlet
Old Shack	Cliffy Head
Fourth Fence	Banksia Camp
One Rock	Walpole
Bald Face	Rame Head
Sand Patches	Peaceful Bay
Frustrations/ River Mouth	Boat Harbour
Red Bluff	Parry Beach
Pot Alley Gorge	William Bay
Wagoe	Green's Pool
Lucky Bay	Madfish Bay
Port Gregory	Denmark
Horrocks	Anvil Beach
Cape Burney	Aquarium
Lucy's	Lowlands
Cervantes	Back of Farm
Wedge Island	Hartmans
Lancelin	Golden Gates
Ledge Point	West Cape Howe

Seabird	Torbay/ Cosy Corner
Two Rocks Boat Harbour	Mutton Bird Island
Mindarie Keys	Sharp Point
Ocean Reef Marina	Blow Holes/ Cable Beach
Hillary's Boat Harbour	Frenchmans Bay/ Whale World
Woodman Point	Albany Yacht Club
Point Peron Boat Ramp (HMAS Stirling)	Albany Port
Safety Bay Boat Ramp	Emu Point Ramp/ Oyster Harbour
Mandurah Boat Ramp	Nanarup
Dawesville Boat Ramp	Two Peoples Bay
Quindalup Boat Ramp	Sinker Reef
Dunsborough	Bettys Beach
Three Bears	Cheyne's Beach
Yallingup	Cape Riche
Canal Rocks	Groper Bay/ Pallinup Beach
Injidup	Bremer Bay Harbour (Fishery Beach)
Cape Clairault	Doubtful Bay
Moses Rock	House Beach
Cowaramup Bay (Gracetown)	Trigelow Beach
Ellenbrook	Point Ann
Kilcarnup	Quoin Head
Margaret River	Hamersley Inlet
Gnarabup	Hopetoun - Town Ramp
Redgate	Hopetoun 12 mile
Cape Freycinet/ Boranup	Hopetoun 14 mile
Hamelin Bay	Hopetoun 18 mile
Augusta	Masons Bay
Flinders Bay	Starvation Boat Harbour
Black Point	Munglinup
Scott River Station	Pincer Point (Twin Peaks)
Windy Harbour	Margaret Cove
Fish Creek	Skippy Rock/ Torradup Point
Broke Inlet	Dunster Castle/ Stokes Inlet
Cliffy Head	Shoal Cape
Banksia Camp	Munro's
Walpole	Fanny Cove
Rame Head	Quagi
Peaceful Bay	Barker Inlet
Boat Harbour	Warrenup
Parry Beach	Shelly Beach
William Bay	Quarrelup (Quallilup)
Green's Pool	Butty Head
Madfish Bay	Esperance Town Ramp
Denmark	Bandy Creek
Anvil Beach	Lucky Bay
Aquarium	Mississippi Beach (Rossiter Bay)

Lowlands	Dunn Rocks
Back of Farm	Victoria Harbour
Hartmans	Wharton (Big)
Golden Gates	Wharton (Little)
West Cape Howe	Duke of Orleans Bay
Torbay/ Cosy Corner	Alexander Bay
Mutton Bird Island	Kennedy's Beach
Sharp Point	Barrier Anchorage
Blow Holes/ Cable Beach	Cape Arid
Frenchmans Bay/ Whale World	Thomas Fishery (Fry's Camp)
Albany Yacht Club	Seal Creek
Albany Port	Poison Creek
Emu Point Ramp/ Oyster Harbour	Cape Pasley
Nanarup	Bellinger Island
Two Peoples Bay	Point Malcolm
Sinker Reef	Israelite Bay
Bettys Beach	Baxter Cliffs
Cheyne's Beach	Cocklebidy
Cape Riche	Twilight Cove
Groper Bay/ Pallinup Beach	Eyre Bird
Bremer Bay Harbour (Fishery Beach)	Scorpion Point
Doubtful Bay	Scorpion Bight (Mussel ramp)
House Beach	Madura
Trigelow Beach	Red Rocks Point
Point Ann	Mundrabilla
Quoin Head	Eucla
Hamersley Inlet	
Hopetoun - Town Ramp	
Hopetoun 12 mile	
Hopetoun 14 mile	
Hopetoun 18 mile	
Masons Bay	
Starvation Boat Harbour	
Munglinup	
Pincer Point (Twin Peaks)	
Margaret Cove	
Skippy Rock/ Torradup Point	
Dunster Castle/ Stokes Inlet	
Shoal Cape	
Munro's	
Fanny Cove	
Quagi	
Barker Inlet	
Warrenup	
Shelly Beach	
Quarrelup (Quallilup)	
Butty Head	

Esperance Town Ramp
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