Preparation of this document

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Photo credits: Millstream Productions, Tasmanian Abalone Council Ltd and the Department.
SUMMARY

This document brings together elements of the harvest strategy for the Tasmanian abalone fishery.

The Tasmanian abalone fishery consists of three sectors: the commercial sector, the recreational sector and the Aboriginal cultural sector.

Sustainable take of abalone is regulated in these sectors using limits on catch and size.

Understanding how allowable catches and size limits are calculated and apply to the two species of abalone by area over time in each sector goes a long way towards understanding the harvest strategy in the Tasmanian abalone fishery and is the primary focus in this document.

An important three-page table summarises the orienting logic of the harvest strategy, and largely structures this document. The four first-order aims in the harvest strategy are:

1. Ensure abalone are sustainably harvested.
2. Ensure use of the abalone resource provides appropriate benefits to the community.
3. Minimise harmful ecosystem impacts.
4. Practise good governance.

The four aims of the harvest strategy relate to concrete management actions. Some of the main instruments used in arriving at these management actions, such as the empirical harvest strategy and harvest control rule used in annual total allowable catch setting and the three-year rule used in size limit setting, are discussed in greater detail due to their centrality in the harvest strategy process.

This document also contains a brief introduction to the fishery, and the harvest strategy's national context and State head of power are also set out.

This is the first formal Tasmanian abalone harvest strategy and has been developed by the Department in consultation with stakeholders, and approved by the Minister. The harvest strategy provides greater transparency and objectivity for the fisheries management process. The harvest strategy runs until 2020, in which year it will be reviewed. It is intended that there be no change to the harvest strategy until review; however, in the interim, it may be altered by Ministerial approval.
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1. INTRODUCTION

This document encapsulates the harvest strategy for the Tasmanian abalone fishery.

SECTORS OF THE FISHERY

The Tasmanian abalone fishery consists of three sectors: the commercial sector, the recreational sector and the Aboriginal cultural sector. The latter two sectors are referred to collectively in much of this document as non-commercial.

RESPONSIBILITY

The Tasmanian abalone fishery is managed by the Department of Primary Industries, Parks, Water and Environment (the Department). The Department administers powers of the Minister and Secretary under the Living Marine Resources Management Act 1995 (the Act).

Central to the Act is ecologically sustainable development (ESD), which is also central to the Commonwealth Environment Protection and Biodiversity Conservation Act 1999.

Various pieces of legislation subordinate to the Act have eventuated since 1995 that relate to the Tasmanian abalone fishery, primarily the Fisheries (Abalone) Rules 2017, the Fisheries (General and Fees) Regulations 2016 and the Fisheries (Processing and Handling) Rules 2010. Taken together, these rules and regulations contain most of the laws which govern commercial and non-commercial participants in the fishery.

NATIONAL GUIDELINES

The harvest strategy set out here is consistent with the National Guidelines to Develop Fishery Harvest Strategies.

PURPOSE OF THE HARVEST STRATEGY

The harvest strategy for the Tasmanian abalone fishery provides a set of approaches, strategies and actions by which the fishery will be managed and is provided for the guidance of the decision-maker, i.e., primarily for the Minister. The harvest strategy does not have any status under the Act and it cannot derogate from, or limit the exercise of discretion of, the
independent decision-maker as he or she seeks to fulfil the objectives of the Act. That said, the harvest strategy provides clear guidance, and there is an expectation that decisions, especially those relating to total allowable catches, will be in accordance with the control rules laid out in the harvest strategy.

What the harvest strategy accomplishes is to make explicit the objectives, performance indicators and harvest control rules that are considered when preparing, in particular, total allowable catch advice for the Minister. It also provides a range of management actions necessary to meet the objectives for the management of the abalone fishery and the broader goals of ESD.

LOGIC OF THE HARVEST STRATEGY

The logic of the harvest strategy is set out in Table 1 in section 4. The four first-order aims of management for the fishery are:

1. Ensure abalone are sustainably harvested.
2. Ensure use of the abalone resource provides appropriate benefits to the community.
3. Minimise harmful ecosystem impacts.
4. Practice good governance.

Various approaches and strategies to achieve ESD outcomes are tracked through to concrete management actions. The instruments listed in Table 1 include documents crucial to the fishery’s annual management cycle such as the fishery assessment, the empirical harvest strategy (EHS) and the biomass model. Much technical detail is contained in these documents that is not repeated here. Readers who wish to understand more about the detail of the assessment and the EHS control rules are encouraged to consult these documents. The fishery assessment is available on the Institute for Marine and Antarctic Studies’ website: www.imas.utas.edu.au/research/fisheries-and-aquaculture/publications-and-resources

APPLICATION OF THE HARVEST STRATEGY

The annual application of the harvest strategy takes place through a series of industry and Department organised meetings. These meetings bring together industry, researchers, the Department, police, community representatives and so on to develop recommendations to be put to the Minister. The peak advisory group is the Minister’s Abalone Fishery Advisory Committee (AbFAC). The Minister has also established a Recreational Fishery Advisory Committee (RecFAC) to advise on recreational matters across all fisheries, including abalone.
Much time is spent each year in co-management meetings considering documents such as the annual fishery assessment mentioned above, among others.

Industry, with involvement of the Department, has established the Abalone Fishery Resource Advisory Group (AbFRAG). The independently chaired FRAG considers all aspects associated with the fisheries assessment and related management aspects of the fishery, including the application of the multi-criteria decision analysis (MCDA), size limits and spatial management. The FRAG provides advice to the Tasmanian Abalone Council Ltd and to the Minister’s Abalone Fishery Advisory Committee (AbFAC).

The AbFRAG and AbFAC usually meet four times each a year.

Once a decision is reached by the Minister, it is put into law where required. Readers are encouraged to familiarise themselves with the relevant parts of the Act and related statute. As legal language and logic are not easily interpreted, an operational document for commercial fishers, updated annually, is available on the Department’s website: www.fishing.tas.gov.au/com/abalone

Rules relating to non-commercial fishers are described in the annual Recreational Sea Fishing Guide.

RESOURCE RENT

The abalone fishery provides financial returns to the community in the form of a resource rent, which is covered by contractual arrangements contained in the abalone deeds of agreement. The deeds involve fees that return on average approximately $7 million per annum to the State.

REMAINDER OF THE DOCUMENT

What follows in this document, after introducing the fishery, is a synopsis of the harvest strategy, starting with its national context. The harvest strategy’s head of power in Tasmania is set out before discussing the orienting logic of the harvest strategy’s schema. Some of the main instruments used in taking these management actions, such as the EHS and the three-year rule, are discussed in greater detail due to their importance to total allowable catch and size limit settings.
2. THE TASMANIAN ABALONE FISHERY

ABALONE

Abalone are gastropod molluscs, or in more common language, marine snails. Two species of abalone are harvested in Tasmania: *Haliotis rubra* (blacklip abalone) and *Haliotis laevigata* (greenlip abalone). Both species are mobile bottom dwellers that graze on drift seaweeds as well as on algae on rock surfaces. They predominantly occur on rocky substrate, mainly within the littoral zone from depths of five to thirty meters, though they are also found from the shallows down to 40 meters. Blacklip abalone are distributed around Tasmania. Greenlip abalone are found along the north coast and around the Bass Strait islands.

Abalone are broadcast spawners, that is, they release their eggs and sperm into the water where fertilisation occurs. Abalone produce large numbers of eggs, which hatch within 24 hours of fertilisation. There is a brief (usually a few days but up to 14 days) pelagic larval stage prior to settlement on the bottom. This commonly results in limited dispersal of the larvae. This aspect of abalone biology makes them susceptible to overfishing and, in some cases, local extinctions. The latter occurs where management is unable to prevent fishing to very low densities, at which point recruitment (replacement by breeding) fails and stocks collapse. There are many instances of such events in abalone fisheries world-wide. After settlement, juvenile abalone hide under rocks during the day, and emerge at night to feed. When abalone reach sexual maturity (about five to eight years old) most animals no longer engage in this cryptic behaviour and they become vulnerable to fishing. Abalone can live to be upwards of 50 years of age.

FISHERY

For the past 7500 years, at least, Tasmanian Aborigines have been harvesting abalone. During the nineteenth century there was minor exploitation of abalone by Chinese immigrants. Commercial fishing for abalone in Tasmanian waters began in the late 1950s with annual catches in the order of 2000 tons being landed by the mid-1960s.
The fishery has predominantly focused on blacklip abalone, with greenlip abalone typically accounting for around 5% of the total wild harvest. Copies of catch returns are not available for the fishery prior to 1975; complete digital records exist only from 1975 onwards (Figure 1).

The Tasmanian wild harvest abalone fishery, the world’s largest, currently produces approximately 25% of the total annual global production of wild caught abalone.

In 2017, the gross value of production (GVP) of the fishery was estimated to be approximately $70 million from a total allowable catch of 1,561 tonnes.

The 2018 TAC of 1,333.5 tonnes is the lowest since TACs were introduced in 1985, down from a high of 3,806 tonnes in that year.

Figure 1 above divides catch in the fishery by ‘zone’, or ‘part’ under the Act. Zones are integral to ensuring that the total allowable catch (TAC) is sustainably spatially distributed. The first
three zones, east and west blacklip zones and a greenlip zone were introduced in 2000. Their value in spreading the catch was almost immediately recognized and a number of zones have been added since. Without zones, managing areas within the TAC would most likely require a combination of Olympic catch cap closures and more precautionary TAC setting.

Of concern to industry and government has been the decline in fishery production, particularly this decade. This decline has been responded to by total allowable catch reductions by industry and government as stocks have declined due to a range of factors including a downturn in recruitment and external influences such as climate change. The reduction in total allowable catch of around 1,300 tonnes has had significant impacts on the industry.

MARKETS

There are at present 25 fish processing licences authorised to receive abalone in Tasmania. In actuality, the vast majority of the catch is received from divers by only a handful of such processors, which specialise in the handling of abalone and marketing them predominantly into Asia.

About 95% of Tasmanian abalone is exported from Australia to a range of destinations in Asia including China, Hong Kong, Singapore, Taiwan and Japan. The product may be sold live, canned, frozen, dried or vacuum packed, but live abalone is now the main export product.

Australian beach prices for abalone are affected by a complex array of factors including competition from Asian aquaculture product, exchange rates, politically determined austerity or anti-corruption initiatives in China, tariffs and import restrictions in China, and structural changes in the market. Within Australia, beach prices are affected by seasonal quality factors and pulses in local supply. The ability for an abalone to be marketed live in Asia compared with those that need to be processed is usually a strong price differentiator in favour of the live product at present. The beach price range can be as great as $65/kg for live product compared with $25/kg for canning-quality abalone. Large size is a defining factor in the market regarding wild abalone. Small size is associated with farmed abalone.

Market preference for certain sizes and condition of abalone have flow-on effects for the management of the fishery, since industry will tend to seek to maximise the value of quota through selective fishing.
MANAGEMENT HISTORY

The commercial fishery has limited entry via a cap on dive licences and is managed using a system of legal minimum lengths, total allowable catches and regional catch caps. The recreational fishery is managed by licensing, daily catch and possession limits and size limits. Commercially, limited entry and legal minimum lengths are more long-term arrangements, while total allowable catches and regional catch caps are the subject of annual co-management meetings and settings developed by the AbFRAG/AbFAC process. A size limit for abalone was first introduced in Tasmania in 1962, for the purpose of ensuring adequate egg production and recruitment. The number of divers was limited to 120 in 1969. A total allowable catch (TAC) was first introduced in 1985 together with a system of individual transferable quotas (ITQs) within the TAC. Each diving entitlement was initially issued with 28 units of quota. The diving entitlements were uncoupled from quota holdings in 1991 and lower and upper limits on the number of units able to be held were removed. The fishery now consists of 121 abalone dive entitlements and 3500 quota units held across approximately 450 quota owning entities; 83% of quota owning entities reside in Tasmania.
3. THE LEGISLATIVE FRAMEWORK

Ecologically sustainable development (ESD) is the overarching legislative objective for Tasmania and other Australian fishery management jurisdictions. It is also incorporated in the Guidelines for the Ecologically Sustainable Management of Fisheries – 2nd Edition to support fishery assessment for export under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999. The Tasmanian abalone fishery is presently accredited under part 13 of this Act. This accreditation exempts Tasmanian abalone from Commonwealth export controls.

Within this national context, each State’s or Territory’s legislation determines what can be taken into account in applying ESD.

THE LIVING MARINE RESOURCES MANAGEMENT ACT 1995

The head of power for managing living marine resources in Tasmania is the Living Marine Resources Management Act 1995 (the Act).

Section 7 of the Act reads as follows:

**Purpose and objectives**

**1** The purpose of this Act is to achieve sustainable development of living marine resources having regard to the need to –

(a) increase the community’s understanding of the integrity of the ecosystem upon which fisheries depend; and

(b) provide and maintain sustainability of living marine resources; and

(ba) take account of a corresponding law; and

(c) take account of the community's needs in respect of living marine resources; and

(d) take account of the community's interests in living marine resources.

**2** A person must perform any function or exercise any power under this Act in a manner which furthers the objective of resource management [see schedule 1].
Section 18 of the Act states that the Minister must ensure that the Act is administered in a way that promotes the sustainable management of living marine resources. This means that the Minister, Secretary and Department need to be aligned with the principle of ESD or risk being in contravention of the Act.

Objectives for natural resource management are provided in schedule 1 of the Act. Schedule 1 sets out how ESD is to be used as the guiding principle for the management of living marine resources in Tasmania, including abalone.

Schedule 1 of the Act is given below in full as it contains objectives that are central to management of the Tasmanian abalone fishery.

**SCHEDULE 1 - Objectives of the Resource Management and Planning System of Tasmania**

1. The objectives of the resource management and planning system of Tasmania are –

   (a) to promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity; and

   (b) to provide for the fair, orderly and sustainable use and development of air, land and water; and

   (c) to encourage public involvement in resource management and planning; and

   (d) to facilitate economic development in accordance with the objectives set out in paragraphs (a), (b) and (c); and

   (e) to promote the sharing of responsibility for resource management and planning between the different spheres of Government, the community and industry in the State.

2. In clause 1(a), "sustainable development" means managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural well-being and for their health and safety while –

   (a) sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations; and

   (b) safeguarding the life-supporting capacity of air, water, soil and ecosystems; and

   (c) avoiding, remedying or mitigating any adverse effects of activities on the environment.
4. HARVEST STRATEGY

As noted above, ESD entails four specific aims relating to the Tasmanian abalone fishery:

1. Ensure abalone are sustainably harvested.

2. Ensure use of the abalone resource provides appropriate benefits to the community.

3. Minimise harmful ecosystem impacts.

4. Practise good governance.

The harvest strategy is oriented according to these four aims (Table 1). Each of the aims has a number of objectives associated with it, and approaches and specific strategies flow from each objective. Management actions are then linked with each strategy, each of which, where possible, has a means by which it can be measured. Finally, the instruments used to achieve management actions are cited.

As an example of how to read Table 1, the first ESD aim is to ensure that abalone are sustainably harvested. The harvest strategy states that the first objective of management to achieve this aim is to maintain stocks at or near target reference point levels (where management wants the fishery to be) and be as sure as possible that limit reference points (where management does not want the fishery to go) will not be breached. The first approach that follows from this objective is to limit the take of abalone by the commercial sector. Specific strategies to achieve this include management actions such as capping commercial access at 121 FLADs and setting an annual total allowable catch to be distributed across the sector’s 3500 quota units. The instruments used to accomplish this control of commercial take are a combination of statute (licences and quota) and the management and TAC setting process using documents such as the fishery assessment and the empirical harvest strategy (EHS) in a series of consultative meetings throughout the year.

Importantly, while the abalone harvest strategy deals with managing the effects of fishing on the target species, habitats and communities, a range of impacts external to the fishery has the potential to influence the status of the abalone resource significantly. For example, warming average sea temperatures will have some, as yet not fully understood, negative impact on the abalone resource, especially off Tasmania’s east coast, where recent warm water events have reportedly been responsible for substantial abalone mortality. Liaison by the Institute for Marine and Antarctic Studies (IMAS) with the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and other agencies to develop predictive capabilities to inform management action in the face of environmental change will help the fishery to adapt to, and
mitigate for, such changes. Action to address the effects of external impacts will frequently require whole of government responses and are thus related to, but are outside of, this harvest strategy. Central to this harvest strategy, however, is catch setting and spatial management, and ongoing management of catches and where they are taken from will almost certainly be required to be adjusted to adapt to the influence of externalities.

In the remainder of this document, without restating each line in Table 1, each of the aims listed above is taken from its general statement to its concrete application.
<table>
<thead>
<tr>
<th>AIM</th>
<th>OBJECTIVE</th>
<th>APPROACH</th>
<th>SPECIFIC STRATEGY</th>
<th>MANAGEMENT ACTION</th>
<th>BASIS/INSTRUMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure abalone are sustainably harvested</td>
<td>Maintain stocks at or near target levels</td>
<td>Manage commercial catch at or around target levels (target reference points)</td>
<td>Restrict commercial capacity</td>
<td>121 FLADs, 3500 quota units</td>
<td>Statute</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cap total catch</td>
<td>Set TAC annually</td>
<td>Empirical harvest strategy (EHS), statute</td>
</tr>
<tr>
<td></td>
<td>Spatial management of commercial catch to avoid local depletion</td>
<td>Conduct annual assessment for each spatial unit to determine risk of exceeding catch limit (limit reference point)</td>
<td>Catch caps established and enforced for selected spatial units annually</td>
<td></td>
<td>Annual fishery assessment, empirical harvest strategy (EHS), statute</td>
</tr>
<tr>
<td></td>
<td>Limit catch of abalone by the non-commercial sector</td>
<td>Restrict daily catch and possession limits for the non-commercial sector</td>
<td>Daily bag limit, possession limits, adjusted as necessary</td>
<td></td>
<td>Statute, Section 12 permits</td>
</tr>
<tr>
<td>Maintain levels of recruitment to rebuild or keep stocks at or near target levels</td>
<td>Determine growth and size-at-maturity and allow sufficient spawning per recruit prior to commercial harvest</td>
<td>Ascertain the shell length at which 50% of abalone are mature, and add three years growth to determine minimum legal length</td>
<td>Setting of legal minimum lengths to maintain desired recruitment levels, noting that biomass must also be maintained at or around target levels</td>
<td></td>
<td>Annual fishery assessment, statute</td>
</tr>
<tr>
<td>Manage stocks using best available scientific advice</td>
<td>Assess status of abalone stocks</td>
<td>Test, set and improve formal methods for assessing stock status</td>
<td>Assess stocks annually using empirical harvest strategy (MCDA) and industry input and, where appropriate, analytical techniques</td>
<td></td>
<td>Empirical harvest strategy (EHS), FRAG, MSE modelling</td>
</tr>
<tr>
<td></td>
<td>Collect size data, primarily from abalone processors</td>
<td>Ascertain size distribution of the commercial catch</td>
<td>Market shell measuring program to collect data on the size distribution of the commercial catch</td>
<td></td>
<td>Processors, IMAS/Annual fishery assessment</td>
</tr>
<tr>
<td></td>
<td>Collect abalone population density and size distribution data in high value spatial units, including sub-legal</td>
<td>Estimate density of size distribution of abalone in selected high value spatial units</td>
<td>Conduct fishery-independent surveys at key sites</td>
<td></td>
<td>IMAS/Annual fishery assessment</td>
</tr>
<tr>
<td>Ensure use of the abalone resource provides appropriate benefits to the community</td>
<td>Maintain, and where appropriate increase, profitability in the commercial sector</td>
<td>Maximise the value of the abalone harvest</td>
<td>Consider commercial and marketing operating imperatives, support industry marketing initiatives, support industry quality assurance code</td>
<td>Management arrangements including decisions on catch distribution and size limits that do not unduly constrain economic efficiency and returns, targeted funding</td>
<td>GVP, unit value, beach price, royalty reported in annual fishery assessment, industry Quality Assurance Code of Practice, industry feedback</td>
</tr>
<tr>
<td>Provide appropriate access to the non-commercial sector</td>
<td>Understand non-commercial expectations and expenditures</td>
<td>Survey recreational catch and effort, consider economic and other values of non-commercial sector</td>
<td>Annual IMAS survey</td>
<td>IMAS recreational fishing survey report</td>
<td></td>
</tr>
<tr>
<td>Minimise harmful ecosystem impacts</td>
<td>Manage fishery impacts on the ecosystem</td>
<td>Reduce the potential for disruption of community structure associated with localised depletion of abalone</td>
<td>Maintain appropriate stock levels; spatially distribute catch</td>
<td>Set size limits, set TACs, set sub-block catch caps, set limit reference points</td>
<td>Statute, empirical harvest strategy (MCDA), annual fishery assessment</td>
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<tr>
<td></td>
<td>Encourage industry awareness of the importance of water quality and habitat</td>
<td>Use of an industry code of practice to promote awareness of impact of the fishery on water quality and habitat</td>
<td>Implementation of industry code of practice</td>
<td>Industry Quality Assurance Code of Practice</td>
<td></td>
</tr>
<tr>
<td>Minimise impacts on abalone stocks associated with diseases, parasites and invasive species</td>
<td>Identify and manage any harmful diseases, parasites and invasive species</td>
<td>Support research and management of invasive species, parasites and diseases of abalone, both on farms and in the wild, to prevent their introduction and spread</td>
<td>Abalone biosecurity project initiatives in the processing, wild harvest and farming sectors, support research and action regarding invasive species such as Undaria and Centrostephanus</td>
<td>AVG Risk Assessment, industry Quality Assurance Code of Practice, biosecurity protocols in Recreational Sea Fishing Guide &amp; Tas Fish</td>
<td></td>
</tr>
<tr>
<td>Ensure food safety</td>
<td>Support PST management</td>
<td>Shell-MAP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practise good</td>
<td>Participative</td>
<td>Promote awareness of</td>
<td>Encourage stakeholder input</td>
<td>Facilitate Minister’s fishery advisory</td>
<td>AbFAC, RecFAC, TACL</td>
</tr>
<tr>
<td>Governance</td>
<td>Fishery management, consultation and decision-making processes</td>
<td>to the co-management of the fishery</td>
<td>committees and provide input to FRAG and TAACL deliberations as appropriate</td>
<td>FRAG, TARFish</td>
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<tr>
<td></td>
<td>Understand and meet community expectations regarding fishery management</td>
<td>Ensure fishery management reflects interests of the community, meet and promote third party accreditation</td>
<td>Statutory and other consultation of development and review of management arrangements, EPBC, MSC, SAIFS</td>
<td>Statute, policy documents &amp; Dept &amp; industry communication media, SAIFS reports</td>
<td></td>
</tr>
<tr>
<td>Community education and engagement</td>
<td>Communicate fishery information and regulations to the community and stakeholders</td>
<td>Develop effective means of communicating fishery information and regulations</td>
<td>Communication by Dept officers, and via various media</td>
<td>Department website, <em>Recreational Sea Fishing Guide</em>, Facebook, Fishcare, TSIC News, priority communications strategies</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Encourage the community to report offences</td>
<td>Promote the Fishwatch phone number</td>
<td>Fishwatch phone staffed 24/7</td>
<td>Department website, <em>Recreational Sea Fishing Guide</em>, educational activities</td>
<td></td>
</tr>
<tr>
<td>Compliance with management arrangements</td>
<td>Resource fishery compliance and liaison with Tasmania Police</td>
<td>Develop clear management actions to promote voluntary compliance and assist enforcement</td>
<td>Implement and amend relevant legislation as required, promote awareness of and compliance with rules</td>
<td>Statute, commercial operational document, recreational community education &amp; engagement programs</td>
<td></td>
</tr>
</tbody>
</table>
5. REVIEW OF THE HARVEST STRATEGY

This is the first formal Tasmanian abalone harvest strategy and has been developed by the Department in consultation with stakeholders, and approved by the Minister. The harvest strategy provides greater transparency and objectivity for the fisheries management process. The harvest strategy runs until 2020, in which year it will be reviewed. Reassessment, in an orderly and transparent way, is essential to improving the harvest strategy. It is intended that there be no change to the harvest strategy until review; however, in the interim, the harvest strategy may be altered by Ministerial approval.

6. FIRST AIM: ENSURE ABALONE ARE SUSTAINABLY HARVESTED

A key objective of this aim is to maintain abalone stocks at or near target levels by constraining the catch taken by the commercial and non-commercial abalone sectors. Levels of egg production also need to be maintained in all regions of the fishery using size limits sufficient to maintain stocks at sustainable levels. A third objective relates to the need for adequate data to support management decisions.

The principal approaches that flow from these objectives may be found in the first column of Table 1.

EMPIRICAL HARVEST STRATEGY

The first approach, Restricting the catch of the commercial sector requires further explanation. The total allowable catch (TAC) of the commercial fishery is set as a result of multiple co-management meetings each year, based primarily on the fishery assessment and associated information, further informed by diver input. An empirical harvest strategy (EHS) based on multi-criteria decision analysis (MCDA) methods is applied, based on a selection of performance measures. A crucial orienting document prepared for TAC discussions contains the output from the EHS/MCDA which generates TACs by area. The EHS document is many pages in length and contains much detail, and has an important initiating role in TAC setting.

The examples of the application of the EHS below use fishery-dependent catch rate as their input, but other indicators can be added as relevant or available. The EHS is a based on a weighted-sum MCDA approach, commonly used in the field of operations research. The EHS
identifies targets for each of the performance measures with the goal of managing the fishery towards those targets. The EHS is run at the scale of individual reporting blocks to arrive at a combined score for each block, followed by a control rule to assign a recommended management action based on the combined score.

The summary below is adapted from the 2016 Tasmanian Abalone Fishery Assessment, which was published by IMAS in 2017.

**SELECTION OF PERFORMANCE MEASURES**

Over the past decade in Tasmania, annual reviews of abalone fishery performance and setting of TACs have been achieved through an expert-driven weight-of-evidence approach, considering magnitude of catch rates, trends in catch rates and spatial structure in the distribution of effort. The EHS formalises this subjective process by developing Reference Points (RP) for three catch per unit effort (CPUE) performance measures (PM) previously evaluated in graphical form. The three performance measures used are:

- **Target CPUE**: the current CPUE scored against a target CPUE defined by block.
- **Gradient 1**: gradient of change in CPUE in the past 12 months (current year over the previous year).
- **Gradient 4**: gradient of change in CPUE over the past four years including year-to-date.

**PERFORMANCE MEASURE SCORING FUNCTIONS**

The scoring functions incorporate targets and limits. A scoring function is established for each PM, with the value of the PM (e.g., Target CPUE) translated to a score of between 0 and 10. For all PMs the target is always a score of 5, with 0 implying the worst under-performance and 10 the highest over-performance. It has been agreed that the data set used for determining the targets and limits for the scoring functions be restricted to catch and effort data between 1992 and the current year. Prior to 1992 there were substantial differences in the reporting and return of catch dockets, such that the recorded daily effort prior to 1992 is not considered adequate for purpose of assessment.

Currently, the upper and lower scoring function limits for all three PMs are determined for each individual statutory reporting block as follows. The range of each PM is determined over the reference period (1992 – present), and that range is extended by 10% in either direction. The rationale for extending the observed range is that within the reference period, fishing
pressure has not led to biological collapse of populations, thus using the actual range observed would risk creating an overly conservative output.

**SCORING FUNCTIONS FOR CPUE PERFORMANCE MEASURES**

**TARGET CPUE**

The objective of the Target CPUE PM is to maintain CPUE at or above a target value (i.e., 5 or greater on the PM scoring function). An empirical process is used to determine CPUE targets for each reporting block, based on mean annual CPUE back to 1992. As the time series of data used to determine the CPUE target excludes the period of low CPUE during the late 1980’s and early 1990’s, a mildly precautionary approach using the 55th percentile is adopted.

The Target CPUE was determined for each statutory block, and scoring function implemented according to the magnitude of the CPUE Target (Figure 2). Where the current standardised CPUE is below the target CPUE, a low score is achieved (red arrow) and when the current CPUE exceeds the CPUE Target a high score is achieved (green arrow).

![Figure 2](image.png)

*Figure 2. Illustration of the translation of an observed CPUE relative to a defined Target CPUE into an MCDA score.*
GRADIENT 4 CPUE

The objective of this scoring function is to lend weight to an increase in the total allowable catch (TAC) if the gradient of CPUE over a four year period is positive and conversely it suggests a decrease in the TAC if that gradient is negative (Figure 3). The assumption is that where TAC is constant or decreasing, and a negative CPUE gradient is observed, the harvest level is likely to exceed recruitment to the fishery.

Where the current CPUE gradient is below the target of zero a low score is achieved (red arrow), and when the current CPUE gradient exceeds the target a high score is achieved (green arrow).

![Figure 3: Illustration of the translation of an observed CPUE trend into an MCDA score.](image)

GRADIENT 1

The objective of this scoring function is to highlight occasions when performance of the fishery is changing rapidly. Thus where rapid increases in CPUE between the current year and the previous year are observed, it acts in addition to the Gradient 4 PM to suggest increases in
TAC, and conversely suggest decreases in the TAC if there are recent rapid decreases in CPUE. The scoring function process for Gradient 1 is the same as for Gradient 4 (Figure 3).

**PERFORMANCE MEASURE WEIGHTING AND COMBINED SCORE**

A level of importance is assigned to each PM in the MCDA by applying a determined weighting. The PM weights can be determined according to the preferred strategy, to emphasize or dampen the contribution of each PM. For example in a rebuilding phase a higher weight is given to the CPUE Target PM, whereas once the fishery has reached the CPUE Target, this variable can be down-weighted, and emphasis placed on the Gradient 4 PM to maintain continuity. The final combined index of performance is then a sum of the PM score x PM weight, for all PMs (Table 2).

<table>
<thead>
<tr>
<th>PM SCORE</th>
<th>TARGET CPUE</th>
<th>RATE 1</th>
<th>GRADIENT CPUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM WEIGHT</td>
<td>0.65</td>
<td>0.25</td>
<td>0.10</td>
</tr>
<tr>
<td>PM TOTAL</td>
<td>a x 0.65</td>
<td>b x 0.25</td>
<td>c x 0.10</td>
</tr>
<tr>
<td>COMPOSITE INDEX SCORE</td>
<td>(a x 0.65) + (b x 0.25) + (c x 0.10)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CONTROL RULE FOR TAC ADJUSTMENT**

A control rule system is applied to the composite score to determine the action to be recommended. A TAC reduction is recommended if the composite index score is less than 4, and a TAC increase may be recommended if the score is greater than 6 (Table 3).

Where the control rule recommends a TAC decrease, the control rule specifies the minimum reduction given the composite score. For TAC increases, the control rule specifies the maximum increase, and the recommended TAC increase could optionally not be taken if arguments can be rationalised to support the status quo (e.g., market dynamics). The logic here is that for long-lived species such as commercially exploited haliotids where adult mortality is relatively low, from a biological standpoint there is little to be lost in delaying a TAC increase by 12 months.
Table 3: Example control rule applied to combined performance management score; actual control rule may vary, and is published in the annual fishery assessment.

<table>
<thead>
<tr>
<th>Composite score</th>
<th>&lt; 1</th>
<th>1-2</th>
<th>2-3</th>
<th>3-4</th>
<th>4-6</th>
<th>6-7</th>
<th>7-8</th>
<th>8-9</th>
<th>&gt; 9.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAC Adjust</td>
<td>-75%</td>
<td>-20%</td>
<td>-15%</td>
<td>-10%</td>
<td>NC</td>
<td>5%</td>
<td>10%</td>
<td>15%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Below is the current control rule in place, agreed at FRAG 2 or 3 last year.

<table>
<thead>
<tr>
<th>Composite Score</th>
<th>&lt;1</th>
<th>1-2</th>
<th>2-3</th>
<th>3-4</th>
<th>4-5</th>
<th>5-6</th>
<th>6-7</th>
<th>7-8</th>
<th>8-9</th>
<th>&gt;9</th>
</tr>
</thead>
<tbody>
<tr>
<td>TACC Adjust</td>
<td>-75%</td>
<td>-25%</td>
<td>-20%</td>
<td>-15%</td>
<td>-10%</td>
<td>NC</td>
<td>5%</td>
<td>10%</td>
<td>15%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Consideration of individual scoring systems, weighting coefficients, control rules and any constraints are ongoing through a series of formal workshops with experienced fishers.

The EHS ultimately produces a suggested percentage TAC adjustment of the current year’s catch as a starting point tonnage for the coming year. This tonnage then becomes the focus for the consideration of other data inputs, such as the biomass model and diver information. Eventually, all data are interpreted via the meeting processes to result in TAC recommendations to the Minister. Reference to the EHS outputs occurs throughout, and a rationale is needed if a recommendation is to depart from that suggested by the EHS. To this end, a number of meta-rules have been developed to account for acceptable possible departures.

**META-RULES**

Meta-rules are modifications to the empirical harvest strategy outcomes, to account for extraneous factors, for example:

1) Only reduce TAC if zone change is > 5%.
2) Annual vs Biannual TAC response:
   a. Respond annually to EHS recommendations for TAC reduction/increase.
b. Biannual response to EHS recommendations for TAC reduction/increase.
   i. Must include a risk factor to account for no change in the previous year.

3) Combined score below X triggers Freycinet principle (~75% TAC reduction, consider temporary size limit increase).

4) Waive reduction where acceptable signs of recovery are evident.
   a. Proposed benchmark to be 2 consecutive years of improvement.

**MINIMUM LEGAL LENGTH: THREE YEAR RULE**

The specific strategy to set appropriate size limits in support of the objective to maintain adequate levels of recruitment also requires further explanation, primarily regarding blacklip abalone. Growth rates, maximum size and median size at maturity are highly variable among blacklip abalone populations around Tasmania. Generally, abalone in the north grow slower and to a smaller maximum size, and become sexually mature at a smaller size, than abalone in the south. On a smaller scale, within each region and even at the sub-block level, there is also variation in growth and maturity between populations.

It is impractical to develop different size limits that accommodate all the combinations of growth and size at maturity exhibited by populations within a region; management aims to achieve the best compromise. Abalone populations around the coast are regularly sampled by IMAS to estimate their median size at maturity. In addition, abalone growth is measured through tagging programs in key parts of the fishery. These maturity and growth studies have been in place since the late 1980s and are ongoing. As a result, useful information from approximately 500 maturity samples and over 40 growth studies is available.

With this information the following rule is progressively being applied, as far as practical and possible, to the setting of blacklip abalone size limits around Tasmania:

*That, from 50 per cent size at maturity in an area, blacklip abalone should be given three years size limit protection before entering the legally exploitable biomass.*

In other words, the legal minimum length should be set at where 50 per cent of blacklip abalone in an area have had the opportunity to grow for three years after reaching maturity.

Previously, minimum size limits were set where abalone had the opportunity to grow for two years after reaching maturity. Concern about declining spawning biomass and evidence that two years provided insufficient protection, however, has prompted the move from two to
three years protection. This change has upwards implications for a number of blacklip size limits around Tasmania. For example, by using a hypothetical population structure, conditioned for south-west Tasmania, and applying different legal minimum lengths (127, 132, 140, and 150 mm) the proportion of unfished mature biomass protected increases rapidly from 0.7% at 127 mm to 18.5% at 150 mm (Table 4).

Table 4: Proportion of unfished mature biomass protected off the south-west of Tasmania at different legal minimum lengths

<table>
<thead>
<tr>
<th>LML</th>
<th>Mature Biomass Protected</th>
<th>Exploitable Biomass</th>
<th>MSY</th>
<th>% Depletion MSY</th>
<th>% Biomass Protected</th>
<th>% Biomass &gt; LML</th>
</tr>
</thead>
<tbody>
<tr>
<td>127</td>
<td>97</td>
<td>14214</td>
<td>765.418</td>
<td>33.0</td>
<td>0.7</td>
<td>99.3</td>
</tr>
<tr>
<td>130</td>
<td>227</td>
<td>14041</td>
<td>768.327</td>
<td>33.2</td>
<td>1.6</td>
<td>98.4</td>
</tr>
<tr>
<td>132</td>
<td>365</td>
<td>13881</td>
<td>770.177</td>
<td>33.6</td>
<td>2.6</td>
<td>97.4</td>
</tr>
<tr>
<td>135</td>
<td>633</td>
<td>13591</td>
<td>771.825</td>
<td>34.3</td>
<td>4.5</td>
<td>95.5</td>
</tr>
<tr>
<td>140</td>
<td>1144</td>
<td>13067</td>
<td>773.012</td>
<td>35.6</td>
<td>8.1</td>
<td>91.9</td>
</tr>
<tr>
<td>145</td>
<td>1744</td>
<td>12463</td>
<td>774.842</td>
<td>37.2</td>
<td>12.3</td>
<td>87.7</td>
</tr>
<tr>
<td>150</td>
<td>2630</td>
<td>11576</td>
<td>777.639</td>
<td>39.2</td>
<td>18.5</td>
<td>81.5</td>
</tr>
<tr>
<td>155</td>
<td>3786</td>
<td>10419</td>
<td>768.131</td>
<td>42.6</td>
<td>26.7</td>
<td>73.3</td>
</tr>
<tr>
<td>160</td>
<td>5206</td>
<td>9000</td>
<td>734.517</td>
<td>47.4</td>
<td>36.6</td>
<td>63.4</td>
</tr>
<tr>
<td>165</td>
<td>6847</td>
<td>7359</td>
<td>645.284</td>
<td>55.1</td>
<td>48.2</td>
<td>51.8</td>
</tr>
</tbody>
</table>


Given that most of the mass of the unfished abalone stock in the south-west lies above 140mm, it is not surprising regarding the table above that a legal minimum length of 127mm only protects 0.7% of the unfished spawning biomass, and even a legal minimum length of 140mm protects only 8.1%.

Applying 50 per cent maturity plus 3 year around the coast of Tasmania yields the following size limits.
Table 5: Theoretical mean shell lengths of blacklip abalone at 1, 2 and 3 years post maturity for each fishing block. n is number of data sets; n CFA is number of data sets outside of commercial fishing area described by the abalone georeferenced data set (2012-2015). Maturity estimates are LM50% and LM90%. SL max and MM SL max are the 95th percentile of maximum shell length recorded for each block from size at maturity records (SL max) and commercial catch sampling records (MMSLmax).

<table>
<thead>
<tr>
<th>Zone</th>
<th>Block No</th>
<th>n</th>
<th>n CFA</th>
<th>LM50%</th>
<th>LM90%</th>
<th>SL max</th>
<th>MM SL max</th>
<th>2017 lml</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS</td>
<td>33</td>
<td>1</td>
<td>109</td>
<td>123</td>
<td>133</td>
<td>118</td>
<td>130</td>
<td>138</td>
</tr>
<tr>
<td>RS</td>
<td>28</td>
<td>2</td>
<td>102</td>
<td>109</td>
<td>114</td>
<td>111</td>
<td>116</td>
<td>120</td>
</tr>
<tr>
<td>CW</td>
<td>6</td>
<td>11</td>
<td>117</td>
<td>129</td>
<td>137</td>
<td>123</td>
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<tr>
<td>L</td>
<td>13</td>
<td>67</td>
<td>127</td>
<td>138</td>
<td>146</td>
<td>132</td>
<td>142</td>
<td>149</td>
</tr>
<tr>
<td>E</td>
<td>14</td>
<td>22</td>
<td>127</td>
<td>138</td>
<td>146</td>
<td>133</td>
<td>142</td>
<td>149</td>
</tr>
<tr>
<td>F</td>
<td>16</td>
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<td>138</td>
<td>147</td>
<td>131</td>
<td>142</td>
<td>150</td>
</tr>
<tr>
<td>E</td>
<td>17</td>
<td>7</td>
<td>119</td>
<td>134</td>
<td>144</td>
<td>126</td>
<td>139</td>
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<td>121</td>
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<td>147</td>
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<tr>
<td>C</td>
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<td>136</td>
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<tr>
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<td>27</td>
<td>16</td>
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<td>136</td>
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<tr>
<td>E</td>
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<td>W</td>
<td>9</td>
<td>3</td>
<td>132</td>
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<td>145</td>
<td>152</td>
<td>142</td>
<td>149</td>
<td>154</td>
</tr>
</tbody>
</table>


Regarding south-west Tasmania, by moving to a three year rule what results is a legal minimum length of 150mm, which protects 18.5% of the unfished spawning biomass.

Where these size limits do not yet apply, there needs to be in place a plan to transition an area to the size limit stipulated by the new rule. In some cases, stepped size limit increases may be required to minimise the impact on divers.
Regarding greenlip abalone, due to the wide size range at maturity, with some greenlip abalone maturing as small as 70 mm shell length, a rule such as for blacklip abalone is not readily applicable. Instead, ensuring adequate egg production is achieved by setting size limits with reference to greenlip abalone research in South Australia. This research proposes a 50 per cent egg-per-recruit threshold for intermediate-sized metapopulations and 40 per cent for large metapopulations.

SUSTAINABLE CATCH TARGETS

Fishing effort needs to be distributed across the fishery to reduce the likelihood of localised overfishing. Each year, therefore, a number of areas in the fishery have catch caps applied to them at a smaller scale than a zone. Once a catch cap is 80% caught, it is reviewed with a view to allowing the catch to run up to 20% over its cap. This review takes account of diver feedback as to how the area is fishing, catch rates, and so on. The review is undertaken in consultation with the Tasmanian Abalone Council Ltd and the Institute for Marine and Antarctic Studies.

NON-COMMERCIAL SECTOR

Tasmanian Aboriginal people harvested abalone prior to the arrival of Europeans, and this practise continues. The Act states that Aboriginal people, when undertaking Aboriginal cultural fishing, are not required to hold any fishing licences. However, all persons, including Aboriginal people, must abide by recreational take and possession limits, size limits, and any closed seasons or areas.

While it is the case that the annual Tasmanian recreational catch of around 30 tonnes is small compared with the commercial total allowable catch of 1333.5 tonnes for 2018, the proportional 2.25% catch of the recreational sector is highly appreciated by those taking abalone and it is eagerly fished. The Department seeks to provide access to abalone stocks to recreational fishers and Aboriginal people to a degree that is sustainable as well as to restrict the daily catch or ‘feed of fish’ of non-commercial fishers such that it is not a cover for illegal commercial fishing. It is also important to mitigate against localised depletion of popular recreational diving areas for abalone, and size and bag limits play an important role in this regard. In addition, the Department is mindful of the need to keep the commercial and non-commercial size limits as closely aligned as possible.

Establishing a Legal Minimum Length (LML) to provide protection of spawning biomass is particularly crucial for areas that are commercially exploited, or subject to high levels of recreational fishing pressure (for example, prime summer holiday destinations on Tasmania’s east and south-east coasts). Where recreational fishing pressure is low, particularly in remote
areas where the population is small and recreational fishing is primarily by residents accessing nearby reef systems, the risk of significantly depleting local populations of abalone is considered very low. Where recreational fishing pressure is low, choice of LML is less important to the long-term sustainability of local populations of abalone.

The Department plays a central role in preparing and disseminating information regarding the non-commercial fishery. The Department’s website, the *Recreational Sea Fishing Guide* and app, Facebook and the Fishcare volunteers program are the main means through which information is communicated with the non-commercial fishery.
7. SECOND AIM: PROVIDING APPROPRIATE BENEFITS TO THE COMMUNITY

Facilitation of access to the abalone resource in such a way as to ensure its sustainable use is the starting point for ongoing benefit to the Tasmanian community (see section 5).

The Tasmanian Government has an interest in understanding the extent of this benefit as well as in recouping some of the value generated by the commercial fishery. Measures such as gross value of production (GVP), licence and unit values, beach price and the fee paid by holders of an abalone deed of agreement give an indication of how the commercial fishery is performing economically.

Management arrangements are developed, where possible, with a view to industry viability. For example, greenlip abalone vary in weight from summer (lighter) to winter (heavier) by approximately 13 per cent. A seasonal arrangement, therefore, that sees more greenlip taken in winter will result in fewer animals being taken to achieve the TAC. This arrangement means, in turn, that the TAC may be able to be set higher than if fishing is concentrated in summer. A higher TAC, all other things being equal, increases the value of the fishery. The animals are also taken in better condition in winter which usually results in a better beach price.

Value of the fishery is affected, in part, by quality of the product. Maximising product quality commonly maximises price in the market. The Department supports a high level of quality assurance for abalone and encourages best practice in the handling and processing of abalone for human consumption through the development and extension of the industry Quality Assurance Code of Practice. This document seeks to include all aspects involved in ensuring that abalone put into the market are of the highest possible quality. This is especially important given that the vast majority of the product is sent live into markets in Asia. The biology of the species is described in the document as well as the importance of water and habitat quality. The clean, green nature of the Tasmanian marine environment is another of the factors used to sell the product. Operationally, quality carriage on fishing vessels and live storage and handling of abalone by fish processors are detailed in the code with a view to promoting high value abalone in the market.

Facilitation of sustainable access to the abalone resource by the non-commercial sector is an important part of community benefit, too. As well as the framework provided by regulation, e.g., size and bag limits, the Department is involved in surveying recreational catch and effort to understand better the expectations and expenditures associated with the non-commercial sector.
8. THIRD AIM: MINIMISE HARMFUL ECOSYSTEM IMPACTS

To maintain the good health of the marine ecosystems on which Tasmania’s fisheries resources depend and to minimise the impact of fishing on those ecosystems are foundational to the Act. Hand collecting present amounts of abalone from inshore reefs off Tasmania using abalone irons is not demonstrably having any long-term impact on the ecology of those reefs. If such an impact was to be evident, however, it could affect the ability of such reefs to support abalone, and possibly other species. Minimum legal size limits for abalone are therefore partly set to reduce the potential for localised depletion and disruption of the community structure of abalone.

Any degrading of the inshore marine environment, through release of pollutants (such as toxins, heavy metals and organic waste), or through habitat destruction, may impact on the ability of inshore reefs to sustain stocks of abalone. The Department encourages the commercial sector to follow the industry Quality Assurance Code of Practice in these regards.

The harvesting of other species in the marine ecosystem of which abalone are part may impact on the viability of those ecosystems and therefore on populations of abalone. Harvesting of native seaweeds could pose a threat to abalone through loss of food supply or variety, or loss of shelter. Also, the spread of introduced species may lead to habitat changes or increased predation. For example, the Japanese brown seaweed, Undaria pinnatifida, may pose a threat if it displaces native seaweeds, since it dies off over winter leaving no food for abalone. Undaria is also a rapid coloniser of clear areas of rocky reef and may prevent native seaweeds from re-colonising these areas.

An area of concern, but of unknown magnitude, is the impact that changes in ocean temperature and acidification may have on abalone stocks. It is possible that the abalone fishery may become less productive off the east coast of Tasmania due to warming sea temperature. The southern spread of the long-spined sea urchin Centrostephanus roderii in eastern Tasmanian waters in recent years appears to be related to increased water temperature. This species can occur in very high densities and can cause a decline in abalone stocks through habitat degradation and competitive interaction with abalone.

The Department is managing the Undaria fishery and the Centrostephanus fishery with a view both to generating a financial return from these species and to controlling their ecosystem impacts.
Tasmania has Australia’s most valuable wild abalone fishery, as well as a viable abalone aquaculture sector. Both would be seriously compromised if clinical disease was to become established in State waters.

There are no imports allowed of live abalone into Tasmania, which means that any source of infection is most likely to come from populations in the State. Wild abalone populations may develop disease intrinsically, or they may possibly become infected extrinsically from Victorian populations, though this is less likely due to the barrier of Bass Strait.

There is also the possibility that new parasites and diseases of abalone could be introduced through abalone farms.

Naturally occurring parasites and diseases may also be spread by the movement of abalone among regions, as well as into, and among, abalone processors and abalone farms.

Important papers in the above contexts are *Biosecurity Classification of Tasmanian Abalone Processors* and the *Abalone Industry Biosecurity Plan*, both of which use abalone viral ganglioneuritis (AVG) as a case study. The industry *Quality Assurance Code of Practice* is also an important document in these regards.

The Department will continue to conduct research into parasites and diseases of abalone, both on farms and in the wild, to reduce their introduction and impact. The Department will continue to support the abalone biosecurity project, which includes initiatives in the processing, wild harvest and farming sectors of the abalone fishery.

Food safety is also an important area of management for the Department. For example, the Department supports programs for managing harmful algal blooms that can give rise to paralytic shellfish toxins (PSTs). The Shellfish Market Access Program (Shell-MAP) is managed under the *Primary Produce Safety Act 2011*. The Tasmanian Abalone Council Ltd has a biosecurity management plan for PSTs, and liaises closely with Shell-MAP as well as with the Commonwealth Department of Agriculture and Water Resources.
9. FOURTH AIM: PRACTISE GOOD GOVERNANCE

The Act requires that the Department involves stakeholders and the community as far as possible in the management of the fishery. Much effort is expended each year in the abalone fishery bringing together industry, scientists and management in recommending TACs and other management arrangements in the fishery, culminating in AbFAC. Non-commercial input is facilitated through RecFAC. General community involvement occurs through statutory and other consultation processes.

AbFAC is remade annually, linked with the Tasmanian Abalone Council Ltd's (TACL) annual general meeting, and consists of the following positions:

- Independent Chair.
- President TACL.
- Vice President TACL.
- Chair, Divers Sub-Council TACL.
- Chair, Quota Holders Sub-Council TACL.
- Chair, Processors Sub-Council TACL.
- Independent industry representative.
- Tasmanian Seafood Industry Council (TSIC) representative.
- Community and conservation representative: Tasmanian Conservation Trust (TCT).
- Scientific researcher representative (IMAS).
- Tasmania Police (Marine and Rescue) representative.
- Department Abalone Fishery Manager.
- Department Fisheries Compliance and Licensing Manager.
- TACL Chief Executive.
- TACL Executive Officer.

It is legislated that the Minister must consult with the relevant advisory committee prior to making a determination on key arrangements such size limits, seasonal closures, gear
restrictions and total allowable catch. However, in practice, the role and work of AbFAC is broader than this.

AbFAC is an essential part of the co-management framework for the management of the abalone fishery and acts as a conduit between industry and the Department. The AbFAC process provides a forum for industry members and the Department to raise matters of importance to the fishery. There is also an expectation that AbFAC members will be available to engage with other industry and community members to communicate issues regarding the fishery. Minutes of AbFAC meetings are published on the Department’s website.

The Department also spends much time consulting with stakeholders and the community outside the FAC process. Development or review of any statutory rules must be formally consulted, as per the Act, for periods up to 60 days. Prior to this stage, however, the Department routinely consults with the fishery to establish the policies to be drafted into the rules.

The Department also supports various third party accreditation processes involving Commonwealth (EPBC, SAFS) and international (MSC) bodies.

Communication of management arrangements and responsibilities occurs through commercial operational documents and directly with the Tasmanian Abalone Council Ltd. It also occurs through the fishing industry periodical *Tasmanian Seafood Industry News* as well as through the Department’s website. The Department communicates with the non-commercial sector through Facebook, with volunteers via Fishcare, and through the *Recreational Sea Fishing Guide* and app. Members of the community are encouraged to report offences through the Fishwatch phone number which is staffed 24/7.

### COMPLIANCE WITH MANAGEMENT ARRANGEMENTS

### COMPLIANCE AND ENFORCEMENT

As global populations of wild abalone decline, there is increased pressure on the Australian abalone fishery to meet ongoing international demand. This demand, which is not currently entirely being met by legitimate operations, creates incentives for people to supply the market with abalone that has been unlawfully obtained. Consequently, abalone has become an attractive criminal commodity where profitable illegal markets exist alongside legitimate markets. The Tasmanian wild abalone industry is the largest wild abalone fishery in the world providing around 25% of the annual harvest.
Entry to, and operations within, the Tasmanian abalone industry are restricted to manage the fishery sustainably. The rights to take abalone are marketable and are tradable interests of high economic value.

The Department protects the sustainability of this fishery and the value of fishery interests by maintaining a compliance and enforcement regime.

**COMPLIANCE**

The Department maintains a register of fisheries interests for abalone deed holders. The registration of fisheries interests facilitates their commercial trade and maintains an economic value in a registered interest. The economic value creates an incentive for the industry to self-regulate and prevent illegal activity that is potentially destructive to the value of fisheries interests.

The Department maintains a licensing system to ensure those persons taking and processing abalone are subject to a stringent monitoring regime.

The Department monitors, both in real time and through auditable trails, activities within the industry from the time abalone is taken to the point at which it is dispatched from a processor to market.

**ENFORCEMENT**

The Department checks for non-compliance through its monitoring and licensing systems and engages with Tasmania Police to investigate and prosecute matters detected.

The Department participates in a co-operative arrangement with Tasmania Police to patrol and detect illegal fishing activity more generally.
10. CONCLUSION

This harvest strategy is supported by a number of different technical documents mentioned which readers would do well to digest in full; there is no substitute for understanding the annual fishery assessment or the workings of the MCDA, for example.

Just as importantly, any strategy, if it is to be more than a strategy, has to be put into practice. Thus, the many meetings attended by stakeholders each year form the performative setting for a weight-of-evidence approach to the management of the fishery, particularly regarding TAC recommendations to the Minister. In this way, the best available science and fishery data are brought together with stakeholders in a structured conversation with a view to reaching recommendations that most appropriately balance stock sustainability with industry viability.

The harvest strategy will change, and should change, as new information becomes available. Some changes will flow through to law but, importantly, the harvest strategy will continue to evolve and it must be able and relatively easy to do so.

This document, then, sets the scene and introduces some of the structure that is presently built into the annual management cycle of the Tasmanian abalone fishery.