

# Draft Harvest Strategy Policy

FOR TASMANIAN WILD FISHERIES (2023)

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# Contents

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<b>1. Purpose</b>	<b>5</b>
<b>2. Introduction</b>	<b>5</b>
2.1 What is a harvest strategy?	6
2.2 Where do harvest strategies fit in the management of Tasmanian fisheries?	7
2.2.1 <i>Living Marine Resources Management Act 1995</i>	7
2.2.2 Other legislation and policy	8
<b>3. Policy principles</b>	<b>9</b>
3.1 Consistency with relevant legislation and overarching policy objectives	9
3.2 Reliance on best available information	9
3.3 Precautionary principle	9
3.4 Cost effectiveness	10
3.5 Transparency, inclusiveness, and ease of understanding	10
3.6 Adaptiveness	10
3.7 Shared stocks	11
3.8 Multi-species fisheries	11
<b>4. Elements of a harvest strategy</b>	<b>12</b>
4.1 Define the fishery	12
4.2 Objectives	12
4.3 Performance indicators	13
4.4 Reference points for indicators	13
4.5 Monitoring strategy	15
4.6 Assessing fishery performance relative to operational objectives	15
4.7 Acceptable levels of risk	16
4.8 Decision rules	17
4.9 Testing the harvest strategy	18
4.10 Review of individual harvest strategies	18
4.11 Exceptional circumstances that trigger departure from a harvest strategy	18



<b>5. Elements of a rebuilding strategy</b>	<b>19</b>
5.1 Establishing rebuilding strategies	19
5.2 Rebuilding targets	20
5.3 Rebuilding timeframes	21
5.4 Recommencement of targeted fishing	21
5.5 Review of rebuilding strategies	21
<b>6. Implementation</b>	<b>22</b>
6.1 Consultative strategy development	22
6.2 Roles and responsibilities	22
6.3 Public consultation	22
6.4 Harvest strategy implementation guidelines	22
6.5 Review of the Policy and Guidelines	22
<b>7. Acronyms</b>	<b>23</b>
<b>8. Definitions</b>	<b>23</b>
<b>9. References</b>	<b>29</b>
<b>Appendix</b>	<b>30</b>
Appendix I	30



# Draft Harvest Strategy Policy for Tasmanian Wild Fisheries (2023)

## I. Purpose

The purpose of the *Harvest Strategy Policy for Tasmanian Wild Fisheries (2023)* (the Policy) is to provide an overarching framework for the development of harvest strategies and, where relevant, rebuilding strategies for Tasmanian fisheries to further the objectives of the *Living Marine Resources Management Act 1995*. Harvest strategies do this by using best available information on stock status to guide management actions to ensure activities by all fishing sectors (commercial, recreational, and Aboriginal cultural) are sustainable.

While harvest strategies manage extraction by all sectors this document does not establish a resource sharing policy.

## 2. Introduction

Harvest strategies are a key component of modern fisheries management across Australia. Harvest strategies are considered to represent a best-practice approach to fisheries management, as demonstrated by their wide use nationally and internationally. They provide a robust and transparent framework for decision making, including the determination of Total Allowable Catch (TAC) or Total Allowable Effort (TAE).

Consistent with this Policy, harvest strategies will be developed by the Department of Natural Resources and Environment Tasmania (NRE Tas) in close collaboration with scientists and fishery stakeholders and based on the best available information. The development of harvest strategies for Tasmanian fisheries will build on a range of existing fisheries management measures already in place. Harvest strategies will improve current arrangements by enhancing clarity and connectivity of scientific monitoring and assessment processes, fisheries management objectives, engagement with stakeholders, and transparency in decision making.



Using this Policy, harvest strategies will be developed for all Tasmanian fisheries listed under Appendix I within the next ten years, using a tailored approach to suit the scope, scale and individual characteristics of each species and/or fishery. Where a fishery is not yet managed under a harvest strategy, appropriate management arrangements as required under the *Living Marine Resources Management Act 1995* (the Act) will ensure the sustainability of that fishery.

The *Implementation Guidelines for Harvest Strategy Policy for Tasmanian Wild Fisheries (2023)* (the Guidelines) support this Policy and provides guidance for consistent application of the Policy across the range of fisheries. This Policy and the associated Guidelines go hand in hand and should be read together.

## 2.1 What is a harvest strategy?

A harvest strategy is a framework that specifies management actions in a fishery for defined species (at the stock or management unit level) necessary to achieve the agreed ecological, economic, and social management objectives (Sloan et al. 2014).

Importantly, harvest strategies can be used to integrate extractive stakeholders for each fishery such as commercial, recreational and Aboriginal cultural sectors, together with other key stakeholders, such as the conservation sector.

Harvest strategy development requires fishery managers and scientists to work together with all stakeholders to evaluate, determine and document appropriate management objectives and collectively agree on appropriate responses to various fishery conditions (desirable and undesirable), ideally before they occur. This promotes transparent, proactive, and precautionary management that avoids ad hoc, reactionary, or delayed decisions.

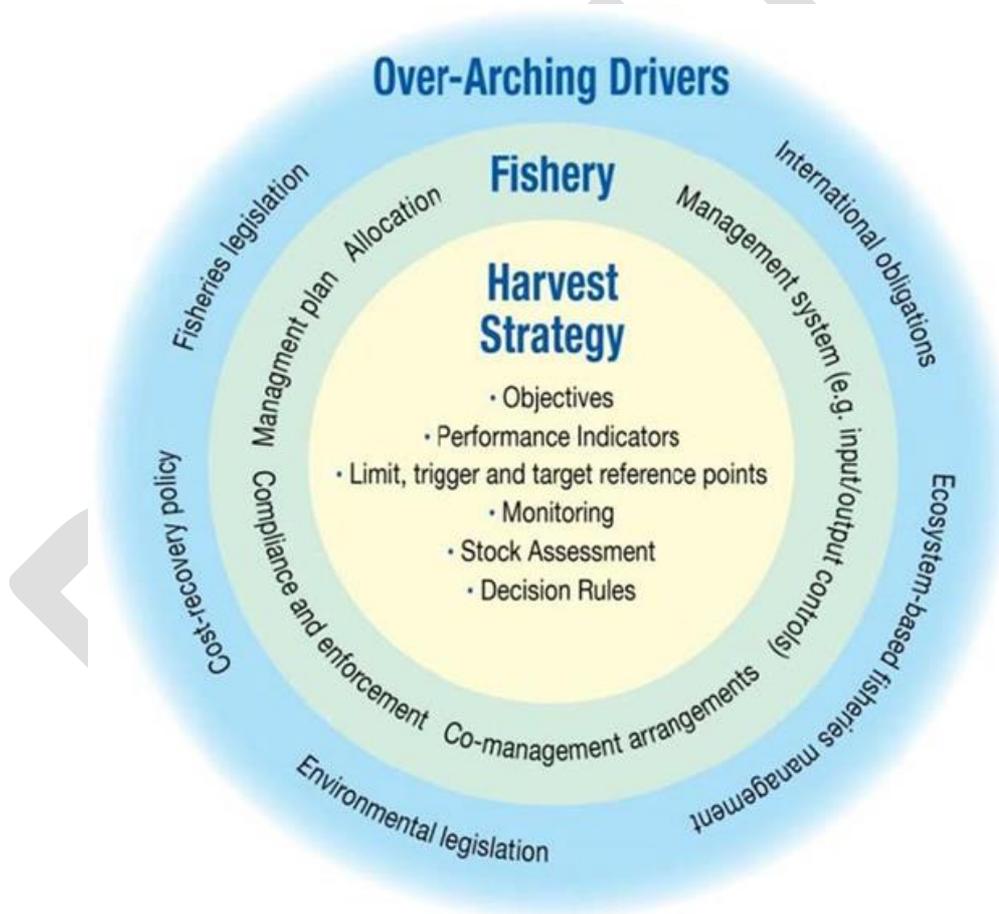
Benefits of the harvest strategy approach to fisheries management may include:

- more transparent, predictable, and timely decisions on harvest levels
- stability in the fishery which supports longer term thinking and planning by fishers
- enhanced stewardship through consultative strategy development
- improved community confidence in fishing
- responsiveness to potential ecological, economic, social and cultural impacts on each fishery
- improved transparency in fisheries status reporting



## 2.2 Where do harvest strategies fit in the management of Tasmanian fisheries?

To understand the role of harvest strategies in fisheries management, it is important to consider how they fit within the legislative and policy framework for management of fisheries resources in Tasmania. Harvest strategies are not specifically required under the Act, however they are increasingly used nationally to support fisheries management. Harvest strategies alone do not necessarily result in improved social benefits, ecological sustainability, or economically viable fisheries. Harvest strategies work in conjunction with a range of other management tools, including Ecological Risk Assessments (ERA), biotoxin plans and bycatch management. A representation of how harvest strategies fit in the broader context is given in Figure 1.



**Figure 1:** How a harvest strategy fits into the fisheries management process (Sloan et al. 2014)

### 2.2.1 Living Marine Resources Management Act 1995

The Act sets out the objectives for the sustainable management of living marine resources in Tasmania and provides the framework for developing and implementing management plans for



each of the State’s fisheries. The objectives of the Act are provided in [Section 7](#) of the Act. The objectives of the Resource Management and Planning System of Tasmania can be found in [Schedule 1 of the Act](#).

Under the Act, a fishery management plan is clearly defined as “the legislative rules applying to the fishery”, not the strategic or operational policy framework applying to the fishery. The rules (the management plans) that provide the legislative controls for Tasmanian fisheries can be found on the [Tasmanian Legislation website: www.thelaw.tas.gov.au](http://www.thelaw.tas.gov.au). Additionally, other legislation such as the *Fisheries (General and Fees) Regulations 2016* also provide controls for certain fisheries.

A harvest strategy can be an integral component of the management of a fishery. In Tasmania the process for preparing a harvest strategy is part of the process for developing fishery management policy and legislative processes which may include quota or effort management systems, allocation arrangements, co-management arrangements, education and extension strategies, compliance, etc. However, the absence of a harvest strategy is not a reason to undertake appropriate fisheries management under the Act.

## 2.2.2 Other legislation and policy

At international and national level, fisheries management is guided by:

- The United Nations Convention on the Law of the Sea (1982) (UNCLOS 1982)
- The FAO Code of Conduct for Responsible Fisheries (FAO 1995)
- Broad policy frameworks directed at addressing issues such as ecologically sustainable development (ESD), bycatch reduction, and ecosystem-based fisheries management.
- Commonwealth, State and Territory environment legislation, including the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

Sitting beneath these higher-level obligations, each fishery has a specific management framework, such as quota or effort control systems. These provide a set of management controls, which are usually described in legislation—a fishery management plan, or other legislative instruments such as regulations and orders—or fishery management policy.

The management objectives in international, Commonwealth and State legislations and overarching policy frameworks are ‘high-level’ and frequently expressed in broad terms, such as ‘maximise benefit for the community’. As such, they are not designed to be used as operational objectives for a harvest strategy.



## 3. Policy principles

The broad objectives of this Policy require Tasmanian harvest strategies to:

- Be in place for all fisheries listed in Appendix I within the next 10 years
- Use output-based or input-based controls as appropriate
- Ensure biological objectives are protected with decision rules that use the precautionary principle
- For data-poor and non-quota species, stock status and fishing mortality will be quantitatively assessed when possible, using, for example, catch-only assessments (e.g., Catch-maximum sustainable yield (CMSY) or length-based assessments or other assessment approaches as appropriate.

To ensure consistency in approach, this section outlines several core policy principles that harvest strategies should be considered when a harvest strategy is developed.

### 3.1 Consistency with relevant legislation and overarching policy objectives

Relevant legislation and policy objectives should be identified and considered in developing harvest strategies for Tasmanian fisheries. This includes the Act and subordinate legislation and policies, and other State and Commonwealth legislation. To ensure their effectiveness at achieving the wider objectives that relate to ESD and other objectives in legislation, harvest strategies should, where possible, integrate biological, economic and/or social objectives relevant to a fishery where they relate to harvest.

### 3.2 Reliance on best available information

In developing harvest strategies for Tasmanian fisheries, the best available information should be considered. When the best available information or data is sub-optimal, for use as a performance indicator, or to inform other aspects of the harvest strategy, this should not be used as a reason to delay development or implementation of the strategy.

Information that could potentially inform a harvest strategy for a Tasmanian fishery should be identified in individual harvest strategies as future fisheries information needs and incorporated over time as relevant.

### 3.3 Precautionary principle

Harvest strategies should apply the precautionary principle in guiding how risk is managed and in the development of reference points, particularly when a high degree of uncertainty exists.

A lack of full scientific certainty should not be used as a reason to postpone measures to avoid, minimise or mitigate fishing impacts on managed stocks or environmental damage. In line with



precautionary management, fishery exploitation levels should reduce as biological indicators of stock status decline or uncertainty around biological stock status increases.

### 3.4 Cost effectiveness

Efforts should be made to ensure that harvest strategies are cost effective to implement and administer. Costs should be proportional to the social and economic values of the fishery in question.

### 3.5 Transparency, inclusiveness, and ease of understanding

The main purpose of harvest strategies is to provide a structured decision-making framework, where pre-determined management actions are transparent and understood by key stakeholders.

For a harvest strategy to be accepted by fishers and key stakeholders, it must be easy to understand. It must also reflect the scope, scale, and context of a fishery. This includes data and information needs to monitor and assess the fishery.

The process used to develop harvest strategies, including their implementation and application, must involve fishers and other key stakeholders. A transparent and inclusive process to inform the development, implementation and application of a harvest strategy will promote understanding, acceptance, and ownership among stakeholders.

As some harvest strategies use a complex system of indicators and reference points, the development of an accompanying simple summary guide may be required.

### 3.6 Adaptiveness

The trade-off between certainty and flexibility in allowing for adaptation and consideration of new issues and information needs to be considered in the development of a harvest strategy. One way to achieve this balance is to identify “exceptional circumstances” that may trigger a review, or a departure from, or even suspension of the harvest strategy such as a major mortality (i.e., a disease outbreak).

The flexibility required to accommodate improved information, or deal with exceptional circumstances, should not be confused with flexibility in interpreting the results of assessments and applying the harvest decision rules. Both of which can undermine the application of a harvest strategy, particularly when fishing intensity needs to be reduced (Smith et al. 2008). The key point is that harvest strategies need to be adaptive enough to address deficiencies, exceptional circumstances and allow for improvements.



### 3.7 Shared stocks

Where stocks are shared between sectors, for example commercial, recreational, Aboriginal cultural fishing, this should be explicitly recognised. Harvest strategies provide a mechanism to focus on the overall extraction by all sectors by integrating them in the management of fish stocks, rather than separate sector specific processes.

Where stocks are shared with other jurisdictions, steps should be taken to collaborate with other jurisdictions to develop complementary objectives within each jurisdiction's management framework.

### 3.8 Multi-species fisheries

There are many multi-species fisheries in Tasmania, and it may not be possible for all species to be simultaneously at or above their 'optimum' target biological reference points.

Thus, in multi-species fisheries, it may be necessary to manage individual stocks to different target reference points to avoid limit reference points for all species.



## 4. Elements of a harvest strategy

To ensure consistency in harvest strategies for Tasmanian fisheries, and noting that one size does not fit all, this Policy outlines several core elements that must be observed when a harvest strategy is developed.

### 4.1 Define the fishery

Harvest strategies should clearly define the fishery to which the strategy will apply.

Harvest strategies developed for the management of Tasmania’s fisheries should apply at a stock level wherever possible. Where justified, consideration may also be given to defining management units on grouping similar species, grouping stocks by region, or using indicator species as proxies for a group of species, for example, more sensitive species.

### 4.2 Objectives

Robust and effective harvest strategies rely on a set of tiered objectives that help determine what the harvest strategy is trying to achieve.

**Tier 1:** Policy objectives set out the high-level strategic direction across fisheries and provide consistency.

**Tier 2:** Fishery objectives identify direction and aspirations for the fishery.

**Tier 3:** Operational objectives, translate the broader objectives into tangible and specific outcomes to be achieved that can link to reference points.

Policy objectives are often prescribed in legislation while fishery and operational objectives are developed in consultation with stakeholders. The figure below (Figure 1) provides examples of objectives and demonstrates the linkages between the three tiers of harvest strategy objectives based on a fictitious example from the Rock Lobster Fishery.

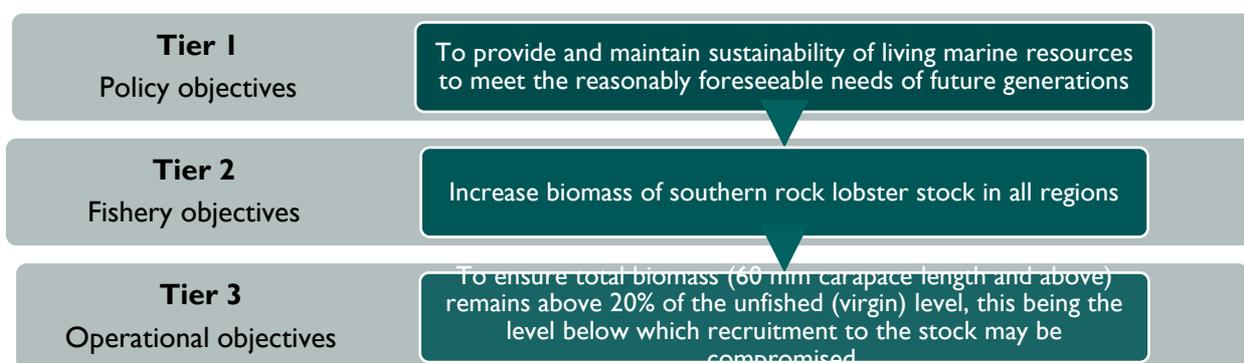


Figure 1: Hierarchy of harvest strategy objectives showing relationship between ‘high-level’ policy objectives, ‘conceptual’ fishery objectives and operational objectives using a fictitious example for the Rock Lobster Fishery.



Clear and concise tiered fishery and operational objectives should be established depending on the individual fishery and its characteristics. For this reason, defining the fishery to which the harvest strategy applies is an important first step in the development process (Refer to Section 3.1 of the Policy Guidelines).

Operational objectives must be precise and formulated to measure fishery performance by being linked, where possible, to the performance indicators and reference points of the harvest strategy. This may not be possible for all policy objectives, particularly those relating to social, cultural or economic objectives where data deficiencies exist.

Under the Act, ecological objectives such as protecting aquatic resources from over-exploitation and ensuring they are not endangered have primacy over economic and social objectives. It is important to note that this Policy is consistent with this approach and requires precedence is given to biological stock conservation objectives.

### 4.3 Performance indicators

Under a harvest strategy, a performance indicator is a quantitative source of information, with statistical value, that can be used to measure the performance of a fishery against the defined operational objectives. Fishery performance indicators should be considered for each operational objective. These indicators will be used to measure fishery performance against the established objectives by assessing indicators in relation to reference points over time.

Indicators on their own provide little context of a fishery's performance at any given point in time. It is for this reason performance indicators will be monitored over time.

### 4.4 Reference points for indicators

Harvest strategies should clearly state reference points for each performance indicator being used. Appropriate limit and target reference points should be considered for each performance indicator to ensure appropriate management responses are implemented in response to changes in fish stock abundance or changing economic and/or social conditions (see [Figure 2](#)).

**4.4.1 Limit reference points** define the value of an indicator for a stock or management unit that are not considered acceptable and when a stock or management unit has fallen below this reference point, it has become depleted (and in many instances, recruitment overfished). Limit reference points are generally defined for biological objectives. Limit reference points represent fishery conditions that when breached, in some circumstances, could require a fishery closure. Where information to support selection of a suitable stock specific limit reference point is not available, 20% of the unfished biomass level should be used as the default. In cases where biomass levels are not estimated for a specific fishery, a suitable proxy may be used if required. A limit reference point should link to decision rules requiring significant management action including measures such as substantially reducing fishing intensity or catch levels, or



fishing closure, to ensure recovery. In most cases a stock recovery or rebuilding strategy should be developed and implemented when the biological limit reference point is reached. It should be noted that an effective harvest strategy will act to keep the fishery at or near the target reference point and therefore risk of breaching the limit reference point would be extremely low.

**4.4.2 Trigger reference points** define the value of an indicator for a fish stock or fisheries management unit at which a change in the level of monitoring or management is considered or implemented. Trigger reference points are used to initiate agreed pre-determined management responses to different stock levels in response to the stock transitioning towards a changed status. A review of the harvest strategy may be triggered at a reference point well before a stock declined to the limit reference point. Additionally, trigger reference points can also be used to define the value of an indicator for a fish stock or fisheries management unit that is transitioning from a depleted status to a recovering status (i.e., they represent an interim rebuilding target under a rebuilding strategy at which point management transitions from a rebuilding strategy back into a harvest strategy).

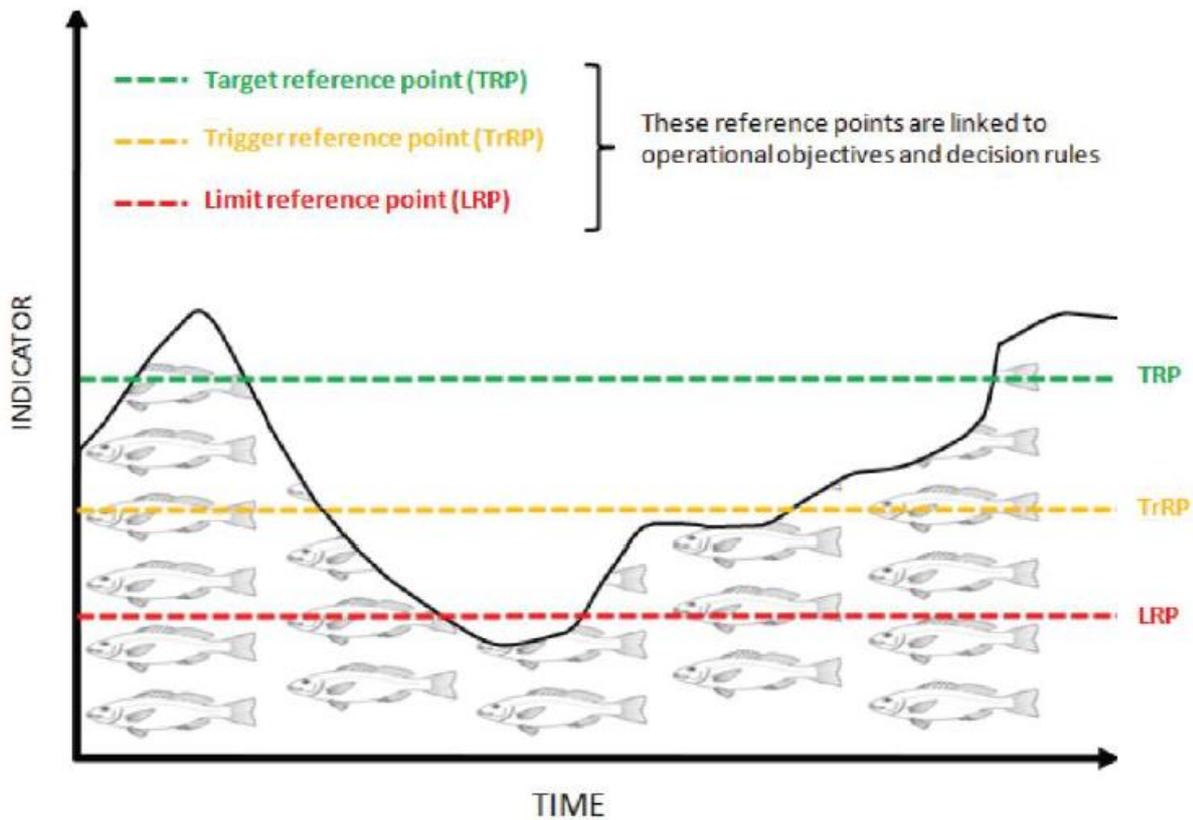
Note that trigger reference points may not be necessary for all harvest strategies.

**4.4.3 Target reference points** define the value of an indicator for a fish stock or management unit that are desirable or ideal and at which fisheries management should aim for within the duration of the harvest strategy. Harvest strategies will be designed to maintain, or where appropriate increase, fish stocks consistent with the target reference points in line with the overarching objectives. At a minimum, biological target reference points should be based on a biomass target of 0.4 times the unfished biomass for exploited fisheries or other target appropriate for the biology of the stock. Alternative target proxies may be applied provided they can be demonstrated to be compliant with the policy objective.

For all harvest strategies in Tasmania there must be at least two specific reference points that relate directly to the biological health of the target species.

Appropriate reference points should be considered for each performance indicator, to ensure appropriate management responses are implemented in response to changes not only in fish stock abundance but also changing economic or social conditions.





**Figure 2:** The relationship between a performance indicator (e.g., Performance indicator shown as the solid line on the graph), the different types of reference points, operational objectives, and decision rules as presented in the *Australian National guidelines to develop fishery harvest strategies* (Sloan et al., 2014).

## 4.5 Monitoring strategy

A monitoring strategy must be developed to collect data that will inform how the performance indicators are tracking relative to the operational objectives and reference points over time. The form of monitoring required will depend on the choice of indicators and reference points used in the harvest strategy, as well as the scale and intensity of the fishery.

The costs of different monitoring strategies reflect the choice of performance indicators, reference points and decision rules. The level of acceptable risk determined (refer to Section 4.7), in relation to breaching reference points, will also influence the extent of monitoring and data required.

## 4.6 Assessing fishery performance relative to operational objectives

An assessment is required to determine fishery performance. Fishery performance is measured by comparing where the performance indicator sits in relation to a reference point (Table 1). Assessments will have different levels of precision and accuracy and it is important that this is factored into the selection of the reference points that are used as limits, triggers, and targets. It is also important for an assessment to be able to estimate or describe the uncertainty in an



assessment to inform the decisions made. For example, the more uncertainty in the assessment of biological stock status, the more precautionary the biological reference points and decision rules should be to meet the acceptable level of risk to achieve the objectives.

The fishery assessment employed under a harvest strategy should link to the national approach used in the Status of Australian Fish Stocks (SAFS) reporting wherever possible.

Table 1: Stock status categories used to classify Tasmanian fish stocks—which are consistent with the national approach and have been used in the SAFS reporting since 2018.

<b>STOCK STATUS</b>	<b>DESCRIPTION</b>	<b>POTENTIAL BIOLOGICAL REFERENCE POINTS</b>	<b>POTENTIAL IMPLICATION FOR STOCK MANAGEMENT</b>
<b>SUSTAINABLE</b>	Biomass (or proxy) is at a level sufficient to ensure that, on average, future levels of recruitment are adequate (recruitment is not impaired) and for which fishing mortality (or proxy) is adequately controlled to avoid the stock becoming recruitment impaired.	Target Reference Point	Appropriate management is in place.
<b>RECOVERING</b> ↑	Biomass (or proxy) is depleted, and recruitment is impaired, but management measures are in place to promote stock recovery, and recovery is occurring.	Trigger Reference Point	Appropriate management is in place, and there is evidence that the biomass is recovering.
<b>DEPLETING</b> ↓	Biomass (or proxy) is not yet depleted, and recruitment is not yet impaired, but fishing mortality (or proxy) is too high (overfishing is occurring) and moving the stock in the direction of becoming recruitment impaired.	Trigger Reference Point	Management is needed to reduce fishing mortality and ensure that the biomass does not become depleted.
<b>DEPLETED</b>	Biomass (or proxy) has been reduced through catch and/or non-fishing effects, such that recruitment is likely impaired. Current management is not adequate to recover the stock, or adequate management measures have been put in place, but have not yet resulted in measurable improvements.	Limit Reference Point	Management is needed to recover this stock; if adequate management measures are already in place, more time may be required for them to take effect.
<b>UNDEFINED</b>	Not enough information exists to determine stock status.	Trigger Reference Point	Data required to assess stock status are needed.

## 4.7 Acceptable levels of risk

Regardless of the level of uncertainty in assessments, all harvest strategies must ensure that there is a high likelihood that the biological objectives will be achieved, particularly those that are designed to avoid a stock or management unit becoming depleted or recruitment impaired occurring (i.e., those that are linked to biological limit reference points). This is an explicit



recognition of the need for precaution in the face of uncertainty. In practice, this means that there should be a 'high likelihood' that the stock or management unit will be above the established biological limit reference point at least 90% of the time under the application of the harvest strategy. For any fish stock or management unit that is classified as depleted, there should be a high probability (i.e., 90%) of stock recovery to levels above the limit reference point, within specified timeframes related to the generation time of the species. Depending on the fishery data and assessment available, the probability of achieving objectives could be determined by various quantitative, qualitative, or empirical methods available to evaluate a harvest strategy and show if it will meet the risk criterion.

If a stock becomes depleted while being managed under a harvest strategy, that harvest strategy must be reviewed and revised, if necessary, to ensure it meets its objectives.

## 4.8 Decision rules

Decision rules (also known as Harvest Control Rules) are defined management actions (i.e., changes to input or output controls such as TAC or bag limit adjustments, seasonal closures or delayed season openings, size limit changes etc.) or responses, such as increased data collection and monitoring, that are to occur in response to a defined change in the performance indicator. All harvest strategies must contain decision rules designed to achieve the objectives by specifying pre-agreed actions that should be taken to control intensity of fishing or catch.

Decision rules are intended to provide certainty, ensure good governance, and enable all stakeholders to adopt consistent decisions using an agreed framework. These decision rules must be clearly linked to the established objectives, indicators, and reference points.

The decision rules need to clearly specify the circumstances in which fishing or catch can increase. For example, a stock may need to be above the target for a set number of years.

In some circumstances, a graded management response may be appropriate as a stock reduces or increases. This graded approach can be established using continuous trigger points and decision rules. When a stock is decreasing, this may set off a series of progressively more stringent actions. When a stock is increasing, harvest may be gradually increased. The intent of a graded response is to ensure that actions/adjustments are taken in an orderly way and avoid the need for more substantial intervention, however, using this approach can lead to continuous delay of appropriate action which may be detrimental to the stock.

A range of possible decision rules should, where possible, be tested, ideally through Management Strategy Evaluation (MSE) to identify the decision rules that are most likely to achieve the strategy's stated objectives.

### 4.8.1 Setting Total Allowable Catch (TAC) Limits

The harvest strategies developed under this Policy will be used to provide clear guidance to the process of determining TAC or TAE levels for relevant Tasmanian fisheries and will be used to structure the advice provided to the Minister for Primary Industries and Water or their delegate.



## 4.9 Testing the harvest strategy

All harvest strategies should be tested for their robustness prior to implementation in order to demonstrate that they meet their objectives within acceptable risk tolerances, preferable by Management Strategy Evaluation (MSE). MSE, or other suitable methods, can be used to test both model-based and empirical harvest strategies theoretically. This is particularly important if information is uncertain and when the relationship between decision rules and management arrangements is complex.

### 4.10 Review of individual harvest strategies

Harvest strategies should be subject to periodic review to allow new information or changing circumstances to be considered.

Periodic review of a harvest strategy will be undertaken:

- Where a harvest strategy has been in place for five years and not reviewed
- Where stock assessment process of a key target species in a fishery has been peer reviewed and that review recommends changes to the assessment process
- Where new relevant sources of information become available that could be used as performance indicators
- If the harvest strategy decision rules require a review be undertaken once a predetermined level of performance is reached by the fishery.

A formal review of a harvest strategy should be planned and undertaken on an agreed time frame with fishers and key stakeholders, for example, every three to five years.

### 4.11 Exceptional circumstances that trigger departure from a harvest strategy

Harvest strategies must avoid being ambiguous, particularly when it comes to the development of operational objectives and decision rules. However, a balance must be struck between the harvest strategy being too rigid and providing for a level of flexibility necessary to allow for adaptation to issues that are not anticipated and for new information to be considered.

A harvest strategy will identify circumstances that may trigger departure from the harvest strategy using break-out rules, meta-rules or an 'exceptional circumstances', describing how such circumstances may trigger an expedited review, or a departure from, or a suspension of the harvest strategy.

This allows for flexibility in a structured way, but not so much flexibility that it undermines the intent of having a harvest strategy. Documenting the boundaries of flexibility in a harvest strategy is part of the iterative process to develop mutual understanding among managers, fishers, and



key stakeholders about expectations from adopting a formal harvest strategy. Specifically, this could include defining the circumstances that may trigger such a change.

Having flexibility to depart from the harvest strategy to deal with certain circumstances should not be confused with flexibility in interpreting the results of assessments and applying the harvest decision rules within years, which will tend to undermine the process itself (Smith et al. 2008).

## 5. Elements of a rebuilding strategy

While a harvest strategy acts to maintain a fishery on average around a target reference point a rebuilding strategy generally acts solely to return a depleted fishery to a defined point. Some elements of a rebuilding strategy can be similar to those of a harvest strategy, and include:

- defining the fishery to which the rebuilding strategy applies
- establishing rebuilding objectives, targets and timeframes
- defining acceptable risk tolerance
- establishing performance indicators and monitoring programs to assess how the fishery is recovering

This section provides an explanation of the strategy elements unique to a rebuilding strategy.

### 5.1 Establishing rebuilding strategies

While a harvest strategy can act to recover stocks, sometimes a separate rebuilding strategy is required to return a stock to a certain level at which point a harvest strategy can then be implemented to keep the stock at that level:

- If a stock is identified as depleted, and the stock has not previously been managed under a harvest strategy, or
- If a stock is identified as depleted, and targeted fishing for that species ceases resulting in the loss of fishery-dependant data for which the harvest strategy is reliant upon, or
- If a stock, managed under a harvest strategy is identified as depleted, and continues to decline further despite enacting the harvest strategy decisions rules which are to apply at the limit reference point, or
- In some instances, for species that are listed as conservation dependent under the *Environment Protection and Biodiversity Conservation Act 1999*.

In the above situations, immediate and urgent management response may be required to stop the decline and promote the recovery of the stock. Where possible, all targeted fishing for the stock should cease until a rebuilding strategy can be developed. However, it may be necessary to permit some level of fishing to continue even on heavily depleted stocks in order that important data on the status of that stock continues to be collected.



Where a separate rebuilding strategy is required for any depleted species within a multi-species fishery, a harvest strategy will consider the potential for ongoing discard mortality, despite there being non-targeted fishing pressure in a multi-species fishery with high co-catch of different species.

## 5.2 Rebuilding targets

Rebuilding strategies may define an interim target reference point and a rebuilding timeframe (See section 5.3) for stock to recover to that target level, with a reasonable level of certainty (Figure 2).

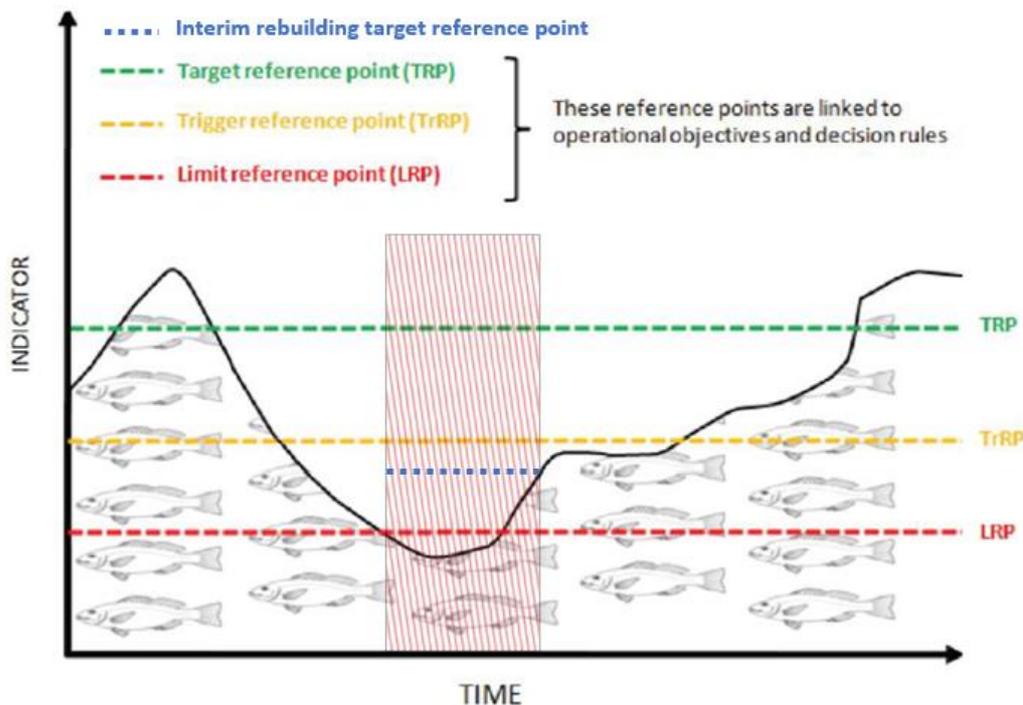


Figure 2: Representation of when a rebuilding strategy (red diagonal-lined shadowed area) is established which defines an interim target reference (blue dotted line) and timeframe for rebuilding to above the LRP and interim target, overlaid on Figure 1.

Where depleted stocks have previously been managed under a formal harvest strategy, rebuilding targets should be set at levels above the Limit Reference Point (LRP), to reduce the risk of the stock falling below the LRP after the recommencement of targeting fishing, and to enable the rebuild strategy to transition back into a harvest strategy.

Where a rebuilding strategy is being developed for a stock that is depleted, and no previous harvest strategy exists, the fishery may not be required to implement a fishery closure. However, if a stock that is recovering under a rebuilding strategy shows signs of further decline in the stock biomass (i.e., not a continuous recovery), immediate management response should be required and where possible all targeted fishing for the stock should cease.



## 5.3 Rebuilding timeframes

The rebuilding timeframe should consider the estimated mean generation time (MGT) which is defined as the average age of a reproductively mature animal in an unexploited population. The rebuilding timeframe may be defined as the lesser of 3 times the MGT, or the MGT plus 10 years. However, additional factors influencing the rebuilding timeframe and target reference points include the species' biology, productivity, recruitment, current level of biomass and any factors external to the fishery that may have impacted on the stock status, such as disease or environmental changes.

Where there is scientific evidence that the productivity, growth, or recruitment of the stock may be impacted by environmental factors, for example, regime shift or high natural variability, the rebuilding strategy should consider these when determining appropriate timeframes and reference points. Such decisions should be documented and supported by scientific evidence as this may have ongoing implications for the success of management actions aimed at recovering the stock.

In determining an appropriate timeframe in which to recover stocks, there must also be consideration of the social and economic costs and impacts associated with various management actions. While a fishery closure or reduction to catch limits, may lead to the best outcomes for an overfished stock, it can come at severe social and economic cost. The trade off in this type of scenario may be acceptance that stocks will take longer to recover, and should this be the case, the reasons should be documented.

## 5.4 Recommencement of targeted fishing

To ensure that adequate information is available to assess the performance of the stock in the absence of fishing (i.e., loss of fishery-dependent data) a dedicated monitoring program should be developed and built into the rebuilding strategy. Where targeted fishing has ceased it should not recommence until the biomass (or suitable proxy) for the stock has recovered to the interim rebuilding target, and there is a harvest strategy developed to ensure that the stock does not fall below the LRP with the recommencement of fishing mortality.

## 5.5 Review of rebuilding strategies

A rebuilding strategy must specify performance measures to be used to monitor how well the strategy is working to recover the stock. A review of the rebuilding strategy is to be undertaken where there is evidence that a stock is not recovering as expected or will not recover in the specified timeframe.

Such reviews should document and evaluate the performance of the present rebuilding strategy and detail the possible reasons for its failure. The review should identify how the failings will be addressed (including revised actions), and whether a new rebuilding strategy or timeframe is required. Following consideration of the review, the rebuilding strategy should be revised as necessary and re-implemented.



# 6. Implementation

## 6.1 Consultative strategy development

Harvest strategies will be developed in consultation with Fishery Advisory Committees (FACs), and key stakeholders. Harvest Strategy Working Groups or co-management forums may also be established. These groups may comprise of NRE Tas fishery managers, independent experts and key stakeholder experts for the fishery or species as required.

## 6.2 Roles and responsibilities

NRE Tas is the lead government agency responsible for the implementation of this Policy. FACs have a role in advising the Minister on high level policy issues surrounding harvest strategy development. Individual working groups of fishery or species-specific harvest strategies have a role in the design and development process.

## 6.3 Public consultation

All harvest and rebuilding strategies will be subject to public consultation to seek feedback from all stakeholders. Draft harvest and/or rebuilding strategies will be published on the Fisheries Tasmania website and open for comment for a minimum of 28 days.

## 6.4 Harvest strategy implementation guidelines

The *Implementation Guidelines for the Harvest Strategy Policy for Tasmanian Wild Fisheries (2023)* (the Guidelines) accompany this Policy to provide practical guidance for applying this Policy. The Guidelines must be read in conjunction with this Policy and provide expanded explanation of key concepts for the development of harvest strategies.

## 6.5 Review of the Policy and Guidelines

A formal review of this Policy, namely the *Harvest Strategy Policy for Tasmanian Wild Fisheries (2023)* and accompanying Guidelines, namely the *Implementation Guidelines for the Harvest Strategy Policy for Tasmanian Wild Fisheries (2023)*, will be undertaken after five years. However, any new initiatives that arise, or improvements may be incorporated into the Policy and/or Guidelines over time as required.



## 7. Acronyms

DAFF	Australian Government Department of Agriculture, Fisheries and Forestry
DAWR	Australian Government Department of Agriculture and Water Resources
ESD	Ecologically Sustainable Development
FAC	Fishery Advisory Committee
FAO	Food and Agriculture Organisation of the United Nations
FRDC	Fisheries Research and Development Corporation
LMRMA	<i>Living Marine Resources Management Act 1995</i>
MSE	Management Strategy Evaluation
SAFS	Status of key Australian Fish Stocks
TAC	Total Allowable Catch
TAE	Total Allowable Effort

## 8. Definitions

**Aboriginal activity or Aboriginal cultural fishing:** is

- (a) the non-commercial use of the sea and its resources by Aborigines; and
- (b) the taking of prescribed fish by Aborigines for the manufacture, by Aborigines, of artefacts for sale; and
- (c) manufacturing of the kind referred to in [paragraph \(b\)](#).

**Allocation:** Distribution of the opportunity to access fisheries resources, within and between fishing sectors.

**Biomass (B):** Total weight of a stock or a component of a stock; for example, the weight of spawning stock biomass is the combined weight of sexually mature fish. Is often described as a ratio of current biomass to unfished biomass. Can be referred to in a number of ways, for example:

- Spawning stock biomass would refer to all adult (reproductively mature) fish in a population, or
- Exploitable biomass would refer to the combined weight of fish that are accessible to the fishery or venerable capture.

**Byproduct species:** Any part of the catch which is kept or sold by the fisher that was not the target species.



**Catch-maximum sustainable yield (Catch-MSY or CMSY):** A widely used catch-only stock assessment approach. CMSY is based on a stock reduction analysis which reconstructs historical abundance and exploitation rates by simulating biomass trajectories that could produce the observed catch time series given informative priors on initial and final year depletion and stock dynamics such as carrying capacity,  $K$ , or intrinsic growth rate,  $r$ , in the Schaefer model (Schaefer, 1954).

**Co-management arrangements:** A arrangement in which responsibilities and obligations for sustainable fisheries management are negotiated, shared, and delegated between government, fishers, and other interest groups and stakeholders.

**Commercial fishing:** Fishing undertaken for the purpose of sale, processing, manufacture, or any other purpose that is directed to gain or reward.

**Compliance and enforcement:** Enforce the provision of the *Living Marine Resources Management Act 1995* (LMRMA) through the detection of illegal fishing activity in Tasmanian waters.

**Cost of management:** Fishery management costs will generally include biological monitoring and reporting; policy, regulation, and legislation development; compliance and enforcement services; licensing services and fisheries monitoring, and research for commercial fisheries and recreational fisheries (where relevant).

**Cost recovery policy:** A framework for consistent, transparent and accountable cost recovery arrangements, which promote the efficient allocation of resources. The Tasmanian Government does not have a policy to recover the cost for fisheries management.

**Decision rules:** Pre-determined actions, linked directly to performance indicators and information about current status, and designed to maintain fishery performance in line with operational objectives. These management actions may also be linked to reference points.

**Ecologically sustainable development (ESD):** Using, conserving, and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased. ESD principles require that:

- decision making processes should effectively integrate both long-term and short-term economic, environmental, social and equity considerations
- if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation
- the principle of inter-generational equity: that the present generation should ensure that the health, diversity, and ecological integrity should be a fundamental consideration in decision making and
- the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision making



- improved valuation, pricing and incentive mechanisms should be promoted.

**Depleted stock:** Spawning stock biomass (or proxy) has been reduced through catch and/or non-fishing effects, such that recruitment is impaired. Current management is not adequate to recover the stock, or adequate management measures have been put in place, but have not yet resulted in measurable improvements.

**Depleting stock:** Biomass (or proxy) is not yet depleted, and recruitment is not yet impaired, but fishing mortality (or proxy) is too high (overfishing is occurring) and moving the stock in the direction of becoming recruitment impaired.

**Ecosystem:** A dynamic complex of plant, animal, fungal, and micro-organism communities and the associated non-living environment interacting as an ecological unit.

**Empirical stock assessment:** An assessment of the status of a stock based on the systematic consideration of a range of biological and fisheries information, based on direct interpretation of data. An empirical stock assessment does not use a population model to interpret data and cannot be used for future projections of the stock. This type of assessment is consistent with the 'weight-of evidence approach' described in the 'Status of key Australian Fish Stocks Report 2012' by Flood et al. (2012).

**Environmentally limited stock:** Spawning stock biomass has been reduced to the point where average recruitment levels are significantly reduced, primarily as a result of substantial environmental changes/impacts or disease outbreaks—i.e., the stock is not recruitment overfished. Fisheries management has responded appropriately to the environmental change in productivity. Not currently used in Tasmanian Fisheries Assessment Reports.

**Fishery:** A term used to describe the collective enterprise of taking, processing, or handling fish. A fishery is usually defined by its purpose (commercial, recreational, or Aboriginal), a combination of the species caught (one or several), the gear and/or fishing methods used, season, and the area of operation.

**Fishery assessment:** An assessment that produces information on the biological status of a fishery.

**Fishery management unit:** Defined in terms of the area of water or seabed that is fished, the jurisdictional boundaries that exist, the people involved in the fishery, the species caught, the fishing methods and the types of vessels used.

**Fishing mortality (F):** The instantaneous rate of fish deaths due to fishing a designated component of the fish stock. F reference points may be applied to entire stocks or segments of stocks and should match the scale of management unit. Instantaneous fishing mortality rates of 0.1, 0.2 and 0.5 are equivalent to 10 percent, 18 percent and 39 percent, respectively, of deaths of stock due to fishing. See also Mortality, Natural mortality (M).

**Fish stock:** A discrete population of a fish species, usually in a given geographical area and with negligible interbreeding with other biological stocks of the same species.



**Harvest strategy:** Framework that specifies pre-determined actions in a fishery for defined species (at the stock or management unit level) necessary to achieve the agreed ecological, economic and social management objectives (Sloan et al. 2014).

**Limit reference point (LRP):** Defines the values of a performance indicator for a fish stock or fisheries management unit that are not considered acceptable to go below.

**Living Marine Resources Management Act 1995 (LMRMA):** is the overarching legislation that is used to manage fish and their environment in Tasmania.

**Management plan:** Under the LMRMA, a management plan consists of rules relating to a specified fishery. In other jurisdictions a management plan is a document created under the relevant Act to manage a fishery.

**Management Strategy Evaluation (MSE):** Qualitative or quantitative procedure, whereby alternative management strategies are evaluated and compared before implementation.

**Management unit:** A defined fish stock, functional grouping of species or geographic area to which a harvest strategy applies.

**Maximum Economic Yield (MEY):** The sustainable catch level for a commercial fishery that allows net economic returns to be maximised. For most practical discount rates and fishing costs, MEY implies that the equilibrium stock of fish is larger than that associated with maximum sustainable yield (MSY).

**Maximum Sustainable Yield (MSY):** The maximum average annual catch that can be removed from a stock over an indefinite period under prevailing environmental conditions.

**Mean Generation Time (MGT):** is the average age of spawners (weighted by fecundity) in an unfished population. (Babcock et al. 2007)

**Meta-rule (or break-out rule):** A rule, or set of rules, defining the circumstances which allow for a deviation or suspension of a decision rule.

**Mortality / Natural Mortality (M):** The rate of deaths (usually on an annual basis in terms of the proportion of the stock dying) caused by any factor other than fishing. M includes only deaths generated by factors such as aging, predation and disease.

**National Guidelines:** Refers to the Fisheries Research and Development Corporation (FRDC)'s *National Guidelines to develop Fishery Harvest Strategies*.

**Non-target species:** Species unintentionally caught during a fishing operation.

**Operational objective:** An objective that has a direct and practical interpretation in the context of a fishery and against which performance can be evaluated (in terms of achievement) (Fletcher et al. 2002).

**Performance indicator:** A quantity that can be measured and used to track changes in an operational objective.



**Precautionary principle:** Approach to fisheries management where the lack of full scientific certainty should not be used as a reason for postponing measures to conserve target species, associated or dependent species and non-target species and their environment.

**Protected species:** A species of aquatic resource declared by legislation to be a protected species for the purposes of the LMRMA.

**Recovering stock:** Biomass (or proxy) is depleted, and recruitment is impaired, but management measures are in place to promote stock recovery, and recovery is occurring.

**Recreational fishing:** Fishing other than commercial fishing or Aboriginal cultural fishing, where the catch is released or used for personal consumption or taken for sport.

**Recruitment impaired:** The point at which a stock is considered to be recruitment impaired is the point at which the spawning stock biomass has been reduced through catch, so that average recruitment levels are significantly reduced.

**Quantitative model-based stock assessment:** An assessment that produces information on the biological status of a stock using a mathematical model of the population to make inferences from data. Common examples include the estimation of biomass and egg production, which are not usually measured directly but can be inferred through modelling observed patterns in catch rate, size structure, growth, etc.

**Stock assessment:** An assessment that produces information on the biological status of a stock.

**Stakeholder:** An individual or a group with an interest in, or connection with, the conservation, management and use of a resource.

**Sustainable stock:** Biomass (or proxy) is at a level sufficient to ensure that, on average, future levels of recruitment are adequate (i.e., recruitment is not impaired) and for which fishing mortality (or proxy) is adequately controlled to avoid the stock becoming recruitment overfished.

**Target reference point (TRP):** Defines the values of a performance indicator for a fish stock or fisheries management unit that are desirable or ideal and at which management should aim.

**Target species:** Species sought by commercial, recreational and Aboriginal fishers when fishing.

**TMIN and 2TMIN:** TMIN is the time to rebuild with no fishing activity. 2TMIN is the defined maximum recovery time for stocks (Babcock et al., 2007).

**Total Allowable Catch (TAC):** For a fishery, a catch limit set as an output control on fishing. Where resource-sharing arrangements are in place between commercial and recreational fishers, the term total allowable commercial catch (TACC) and total allowable recreational catch (TARC) apply. The term 'global' is applied to TACs that cover fishing mortality from all fleets, including Commonwealth, State, and Territory fleets.

**Trigger reference point:** Defines the values of a performance indicator for a fish stock or fisheries management unit at which a change in management is considered or adopted.



**Triple bottom line objectives:** Ecological, Economic and Social objectives.

**Undefined stock:** Insufficient information exists to determine stock status.



## 9. References

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# Appendix

## Appendix I:

The list of species for which harvest strategies will be developed within the next 10 years include:

- Abalone
- Rock Lobster
- Flathead
- Calamari
- And emerging species such as:
  - King George whiting
  - Snapper
  - Yellow-tail king fish





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