

# Northern Territory Fisheries Harvest Strategy Policy

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Courtesy of NT Seafood Council



## Contents

<b>1. Title .....</b>	<b>2</b>
<b>2. Preface .....</b>	<b>2</b>
<b>3. Policy objectives.....</b>	<b>2</b>
<b>4. Introduction .....</b>	<b>2</b>
4.1 Objectives of the Northern Territory Fisheries Act 1988 .....	2
4.2 What is a harvest strategy? .....	2
4.2.1 Definition .....	3
4.3 Benefits.....	3
4.4 Where does a harvest strategy fit? .....	3
4.5 Prerequisites.....	4
<b>5. Core policy principles.....</b>	<b>4</b>
5.1 Precautionary.....	4
5.2 Defined operational objectives.....	5
5.3 Fishery performance indicators related to operational objectives .....	5
5.4 Reference points for performance indicators .....	5
5.5 A statement defining acceptable levels of risk .....	6
5.6 Monitoring strategy to collect data to assess fishery performance .....	7
5.7 Decision rules that control the intensity of fishing activity/catch .....	7
5.8 Cost-effective and feasible .....	8
5.9 Transparent, inclusive and easy to understand .....	8
5.10 Unambiguous.....	8
5.11 Adaptability.....	8
5.12 Technical evaluation of harvest strategy.....	8
5.13 Reporting and periodic review.....	8
<b>6. Addressing resource recovery .....</b>	<b>9</b>
<b>7. Roles and responsibility .....</b>	<b>9</b>
<b>8. Implementation .....</b>	<b>9</b>
<b>9. Review of this policy .....</b>	<b>9</b>
<b>10. Glossary.....</b>	<b>10</b>
<b>11. References .....</b>	<b>12</b>

# 1. Title

Northern Territory Fisheries Harvest Strategy Policy

## 2. Preface

This policy describes what a harvest strategy is, where it fits within the broader fishery management context, and outlines the core principles that must be applied to harmonise their development in the Northern Territory. It should be read in conjunction with the Guidelines for Implementation of the Northern Territory Fisheries Harvest Strategy Policy.

This policy is consistent with, and utilises text and information contained within the National Guidelines to Develop Fishery Harvest Strategies (Sloan et al. 2014). Adopting and applying the national guidelines will facilitate more consistency across borders so that the use of fishery resources at the stock level can be better coordinated.

## 3. Policy objectives

The objective of this policy is to provide an overarching framework for the development of consistent harvest strategies for Northern Territory fisheries, to:

1. provide clarity and certainty to all users regarding management decisions; and
2. further the objectives of the NT *Fisheries Act 1988*.

## 4. Introduction

### 4.1 Objectives of the Northern Territory Fisheries Act 1988

The Northern Territory Fisheries Act requires the long term sustainable management of aquatic resources. Whilst managing aquatic resources, the Act sets out three clear objectives, with the first objective having legal primacy over the second and third. Those objectives are:

1. to manage the aquatic resources of the Northern Territory in accordance with the principles of ecologically sustainable development, whether managing a single fish species or an ecosystem, to ensure the promotion of appropriate protection of fish and fish habitats;
2. to maintain a stewardship of aquatic resources that promotes fairness, equity and access to aquatic resources by all stakeholder groups, including:
  - (i) indigenous people;
  - (ii) commercial operators and aquaculture farmers;
  - (iii) amateur fishers; and
  - (iv) others with an interest in the aquatic resources of the Territory; and
3. by means of a flexible approach to the management of aquatic resources and their habitats, to promote the optimum utilisation of aquatic resources to the benefit of the community.

### 4.2 What is a harvest strategy?

Harvest strategies integrate the ecological, social and economic dimensions of fisheries management into a single operational framework for decision making. In its simplest form, a harvest strategy provides a framework to ensure that fishery managers, fishers and other stakeholders have a shared understanding of the objectives of using a specific resource and work together to consider and document responses that will be applied to various fishery conditions (desirable and undesirable) before they occur. This provides greater certainty and avoids ad-hoc decision making (Sloan et al. 2014).

#### 4.2.1 Definition

To enable a common understanding among key stakeholders of the scope and purpose of harvest strategies in the Northern Territory, the following national definition is adopted, based on Sloan et al. (2014):

***“A harvest strategy is a 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”.***

#### 4.3 Benefits

Harvest strategies are considered to represent a best-practice approach to operational fisheries management and they have been widely adopted nationally and internationally (FAO 2011; McIlgorm 2013; Smith et al. 2013; Sloan et al. 2014). Harvest strategies identify clear objectives of how a given fishery resource is to be used to optimise benefit. They put in place measurable indicators of performance to ensure the fishery moves towards meeting the objectives and specific management actions that will be implemented if reference points are met to ensure that the fishery stays on track.

The adoption of a consistent approach to the development of a harvest strategy is expected to lead to better managed fisheries and encourage responsible fishing, as decisions on harvest levels are forecast and will be made in a more transparent, predictable and timely manner. Harvest strategies will also provide adaptability to social, economic and ecological change and create a level of transparency and reporting that will foster greater community confidence in the way fisheries are managed.

#### 4.4 Where does a harvest strategy fit?

To understand the role of a harvest strategy, it is important to consider how they fit into the broader fisheries management framework. At the higher level, fisheries management is guided by international obligations, national and jurisdictional legislation, and broad policy frameworks directed at addressing issues such as ecologically sustainable development (ESD), inter-sector resource allocation and integrated ecosystem-based fisheries management (Figure 1).

Sitting beneath these higher-level legislative and policy arrangements, each individual fishery has a specific management framework to provide a set of management controls, which are usually described in fisheries regulations, a fishery management plan or a fishery management policy. The focus of the management frameworks is on the broader set of controls needed to manage a fishery, which may include quota or effort management systems, gear and area controls, allocation arrangements, co-management arrangements, research strategies and compliance monitoring.

In The Northern Territory, the process for preparing a harvest strategy is incorporated into the process for developing a management framework to provide for a high level of certainty and accountability. A harvest strategy forms an integral part of the management framework and describes how the resource will be used operationally from within the context of what is allowable.

To ensure their effectiveness at achieving the wider policy objectives that relate to ESD, as well as optimal and equitable resource use, harvest strategies should integrate the full set of biological, customary, economic and social objectives relevant to a fishery, where they relate to operational harvest.

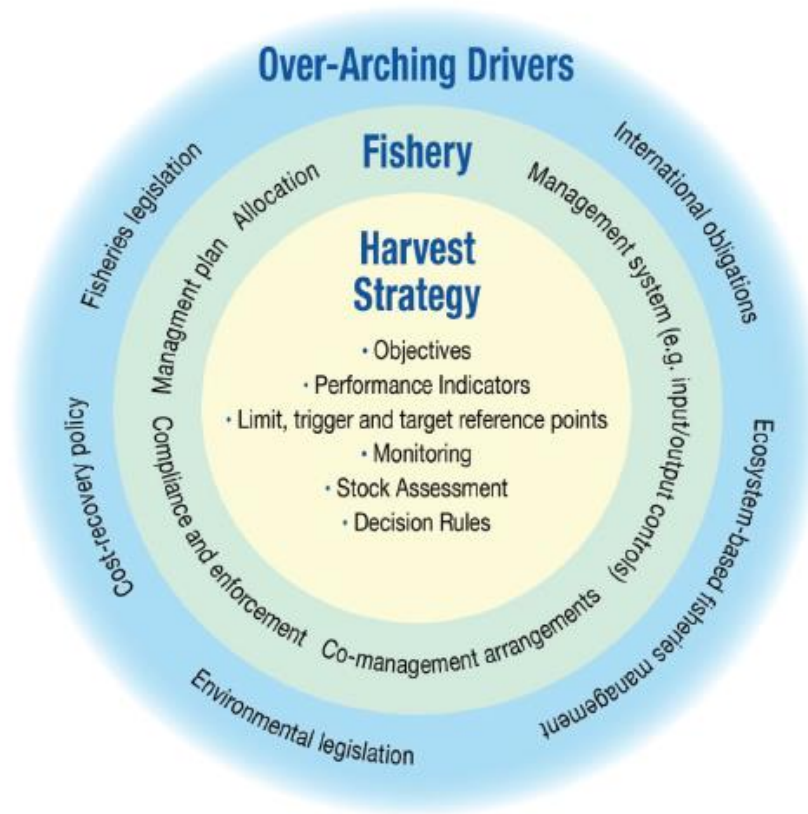


Figure 1: A schematic representation of how a harvest strategy fits within the overall fishery management framework (Sloan et al. 2014).

## 4.5 Prerequisites

There are a number of requirements that should be defined and agreed upon by key stakeholders prior to development of a harvest strategy for a fishery managed under the NT *Fisheries Act*. These include:

1. A fishery specific management framework that contains:
  - 1.1. Long term conceptual objectives including ecological, and where appropriate, economic, social and customary objectives that define how the fishery is carried out to the benefit of the community; and
  - 1.2. Resource access and allocation arrangements between sectors to maximise the benefit of resources shared among all users (commercial, recreational, customary and fishing tourism).
2. An ESD risk assessment to identify and prioritise the full suite of ecological, economic, social and customary issues in the fishery

## 5. Core policy principles

This policy outlines several core policy principles that must be addressed when a harvest strategy is developed for a fishery managed under the NT *Fisheries Act*.

Harvest strategies must be developed and adapted to suit an individual fishery (either for individual species or at the fishery level). Depending on how the fishery is managed, it is likely that sector-based harvest strategies will be appropriate to ensure that the resource allocated to that sector is used for maximum benefit.

### 5.1 Precautionary



The precautionary principle should be applied to help guide how risk is managed in the development of harvest strategies, particularly when a high degree of uncertainty exists or when stocks are recovering from overfishing. The precautionary principle requires that if there is a threat of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason to postpone measures to prevent environmental damage. The precautionary principle can also help to guide the development of limit reference points to mitigate the risk of fish stocks becoming overfished.

## 5.2 Defined operational objectives

A set of clear and concise operational objectives must be established for defined species in the fishery and explicitly translated from the ecological, and where appropriate, economic, social and customary conceptual objectives articulated within the fishery management framework. The operational objectives must be precise and formulated in a way that they can measure fishery performance (i.e. must be linked to the performance indicators and reference points of the harvest strategy) and should clearly identify the fish stock or fisheries management unit to which they apply.

## 5.3 Fishery performance indicators related to operational objectives

Performance indicators must be established for each operational objective. These performance indicators will be used to measure fishery performance with respect to achieving the objectives (by comparing where the indicator sits in relation to a reference point) (see Figure 2).

## 5.4 Reference points for performance indicators

Three types of reference points are used to assess the ecological, and where appropriate customary, economic and social performance of the fishery:

1. **Limit Reference Points** define the value of a performance indicator for a stock or management unit that are considered unacceptable and when a stock or management unit has become recruitment overfished or environmentally limited.
2. **Trigger Reference Points** define the value of a performance indicator for a fish stock or fisheries management unit at which a change in the management is considered or adopted. Trigger reference points may be used to determine staged management responses to different stock levels or to define when a stock or management unit is transitional-depleting or transitional-recovering.
3. **Target Reference Points** define the values of a performance indicator for a fish stock or management unit that are desirable or ideal and at which management should aim.

Appropriate limit, trigger and target reference points should be considered for each performance indicator. All harvest strategies must include a biological limit reference point and trigger reference point to ensure appropriate management responses are implemented in response to changes in fish stock abundance.

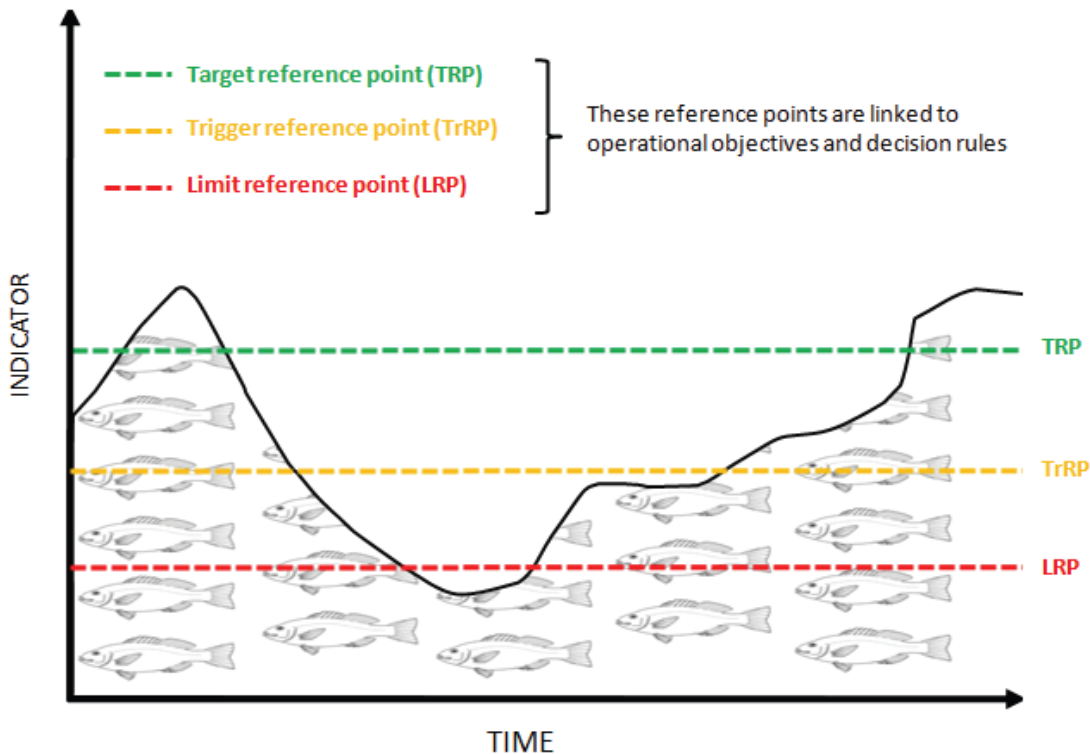


Figure 2 The relationship between a performance indicator (e.g. biomass shown as the solid line on the graph), the different types of reference points, operational objectives and decision rules (Sloan et al. 2014).

In this policy the criteria for classifying stock status is based on the follow those given in the “Status of key Australian fish stocks reports” (Flood et al. 2014), which assesses fisheries against the definition of ‘recruitment overfished’. If a stock is harvested to the point where the spawning stock biomass has been reduced so that average recruitment levels are significantly reduced, the stock is considered to be recruitment overfished. The stock status categories described by Flood et al. (2014) include:

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

**Transitional-recovering stock** – A recovering stock-biomass is recruitment overfished, but management measures are in place to promote stock recovery, and recovery is occurring.

**Transitional-depleting stock** – A deteriorating stock-biomass is not yet recruitment overfished, but fishing pressure is too high and moving the stock or management unit in the direction of becoming recruitment overfished.

**Overfished stock** – Spawning stock biomass has decreased through catch, so that average recruitment levels are significantly reduced (i.e. recruitment overfished). 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.

**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 or disease outbreaks (i.e. stock is not recruitment overfished). Fisheries management has responded appropriately to the environmental change in productivity.

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

## 5.5 A statement defining acceptable levels of risk

All harvest strategies must ensure that there is at least a 90% probability that the ecological objectives designed to avoid a stock or management unit becoming recruitment overfished or recruitment overfishing occurring will be achieved (i.e. those that are linked to biological limit reference points). This is an explicit recognition of the need for precaution regardless of the level of uncertainty in fishery performance assessments.

In practice, this means that there should be no more than a 10% chance that a stock or management unit will fall below the established biological limit reference point under the application of the harvest strategy. This translates to no more than 1 year in 10 that it would fall below this limit. This is consistent with the risk standard applied in the Commonwealth Harvest strategy Policy (Australian Government 2007).

For any fish stock or management unit that is classified as overfished, there should be a high probability 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 (Sloan et al. 2014). Further information on these methods is provided in the section titled 'Testing the robustness of the harvest strategy' in the accompanying Guidelines.

## 5.6 Monitoring strategy to collect data to assess fishery performance

A monitoring strategy must be developed to collect the ecological, economic, social and customary data that will inform how the performance indicators are tracking relative to the reference points. 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 will be relevant to the choice of performance indicators. The level of acceptable risk determined, in relation to breaching reference points, will also influence the extent of monitoring and data required.

An assessment is required to determine fishery performance. Fishery performance is measured by comparing where the performance indicators sit in relation to the reference points and achieving the operational objectives. Assessments will have varying levels of precision and accuracy, and it is important that this is factored into the selection of the performance levels 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 decisions rules should be to meet the required 'acceptable level of risk' to achieve the objectives.

## 5.7 Decision rules that control the intensity of fishing activity/catch

All harvest strategies must contain clear decision rules that are designed to achieve the biological, economic, social and customary objectives of a fishery. Decision rules specify pre-determined management actions that will be taken to influence fishing activity or catch according to the reference point met. Meeting a target reference point may provide for growth and development (e.g. via a controlled increase in total allowable catch). Reaching a trigger reference point, or breaching a limit reference point, will result in preventative measures to protect the resource. These decision rules must be explicitly linked to quantifiable performance indicators and reference points.

When a stock or management unit is classified as overfished, transitional-depleting, transitional-recovering or environmentally limited, the decision rules must enable the stock or management unit to begin or continue to rebuild towards a sustainable level within specified timeframes. Adjustments to fishing intensity for a stock classified as overfished must be more intensive, put in place promptly and target a shorter timeframe for resource rebuilding than those classified as transitional-depleting. The rate of rebuilding for a stock classified as transitional-depleting shall be determined in a way that considers the appropriate balance between short term losses and longer term gains.



In some circumstances, a graded management response is appropriate as a fish stock size reduces. This may involve a series of progressively more stringent actions as a sequence of trigger reference points is exceeded. The intent of a graded response is to take appropriate measures to prevent drastic management action.

## 5.8 Cost-effective and feasible

An analysis of the costs and benefits of alternative approaches and the explicit recognition of the ongoing and future data and monitoring requirements associated with a particular approach (i.e. the catch/cost/risk trade-offs) must be considered during the development process of a harvest strategy. This analysis should involve fishers and key stakeholders as it will allow choices to be made about the level of required investment in monitoring and assessment. In general, higher investment in monitoring and assessment will allow higher catch levels to be maintained because the biological stock status, and its response to management changes, will be monitored with greater precision.

## 5.9 Transparent, inclusive and easy to understand

The process used to develop a harvest strategy and the steps involved in their implementation and ongoing application must involve fishers and key stakeholders. Having a transparent and inclusive process to inform the development, implementation and application of a harvest strategy will give all stakeholders a better understanding and ownership of the harvest strategy and confidence in the decisions made. This is likely to result in harvest strategies that are respected and applied willingly by fishers and key stakeholders (Matic-Skoko et al. 2011; Sloan et al. 2014).

## 5.10 Unambiguous

Harvest strategies must avoid being ambiguous. This requires a thorough examination of the possible scenarios that may emerge so that they are factored into the design of the harvest strategy. 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. 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 event through a disease outbreak.

## 5.11 Adaptability

Harvest strategies must be adaptive enough to allow for improvements and to address deficiencies or exceptional circumstances. Periodic amendments to ensure optimal decisions are being made are necessary to accommodate for new information that changes the understanding of the fishery, problems identified in the application of the harvest strategy or when uncertainties that were not previously understood arise. Adaptability should not be confused with flexibility in interpreting the results of assessments and applying the harvest decision rules, which will undermine the application of the harvest strategy (Smith et al. 2008).

## 5.12 Technical evaluation of harvest strategy

All harvest strategies must be tested for their robustness prior to implementation in order to demonstrate that they are likely to meet the core principles of the policy. Methods such as management strategy evaluation can be used to test both model-based and empirical harvest strategies (Butterworth and Punt 1999). Such testing of management strategies is particularly important when information is incomplete and imprecise, and when the relationship between the decisions rules and management arrangements is complex.

## 5.13 Reporting and periodic review

All harvest strategies must be periodically reviewed, particularly in their early implementation, to ensure they are up to date and take into account the best available information, knowledge and understanding of a fish stock or fishery. The frequency of review must be stipulated in the management framework (regulations or management plan) for that 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).

## 6. Addressing resource recovery

Harvest strategies must incorporate recovery strategies that can be actioned rapidly to prevent unsustainable depletion. Recovery strategies are necessary to stop the depletion issue exacerbating and/or accelerating, as well as avoid prolonged uncertainty to stakeholders. A recovery strategy should form an integral part of the pre-determined management action of a decision rule linked to biological limit reference points within the harvest strategy.

## 7. Roles and responsibility

The Northern Territory Fisheries Division is the government agency responsible for the implementation of this policy. The commercial, recreational and indigenous fishing sectors, along with other key stakeholder groups, have a key role to play in implementing the policy, through co-management arrangements.

Fishery management advisory committees and advisory groups will be responsible for the provision of advice to the agency. The main avenue for engagement of key stakeholders will be through the existing peak sector bodies.

## 8. Implementation

The Northern Territory Fisheries Harvest Strategy Policy comes into effect from the time of its approval by the Director of Fisheries. Harvest strategies consistent with the policy will be implemented in all key NT fisheries through fishery regulations or management plans developed under the Fisheries Act.

The harvest strategies developed under the Fisheries Act will be refined over time to ensure they are consistent with the Northern Territory Fisheries Harvest Strategy Policy when their respective fishery regulations or management plan is next reviewed.

The *Guidelines for Implementation of the Northern Territory Fisheries Harvest Strategy Policy* and *National Guidelines to Develop Fishery Harvest Strategies* (Sloan et al. 2014) will provide direction on how to the implement the policy.

## 9. Review of this policy

A review of the Northern Territory Fisheries Harvest Strategy Policy will be conducted five years after its inception. Any new ideas or initiatives developed during this time will be considered for inclusion in the revised policy.

## 10. Glossary

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

**Biomass (B):** The 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 animals.

**Co-management arrangements:** An 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 trade or business.

**Decision rule:** 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 productivity of the environment is maintained or enhanced for the benefit of future generations
- the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making and
- improved valuation, pricing and incentive mechanisms should be promoted.

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

**Environmentally limited stock:** A state where spawning stock biomass has decreased to the point where average recruitment levels are significantly reduced, primarily as a result of substantial environmental changes or disease outbreaks (i.e. the stock is not recruitment overfished). Fisheries management has also responded appropriately to the environmental change in productivity.

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

**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.

**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 boats used.

**Harvest strategy:** A 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 (see Sloan et al. 2014).

**Limit reference point:** Defines the values of a performance indicator for a fish stock or fisheries management unit that are considered unacceptable.

**Management framework:** A framework that contains the broad set of controls needed to manage a fishery usually described in fisheries regulations, a fishery management plan or a fishery management policy.

**Management strategy evaluation:** A qualitative or quantitative procedure where alternative management strategies are evaluated and compared before implementation.

**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).

**Overfished stock:** A state where the stock is recruitment overfished and current management is not adequate to recover the stock, or where appropriate management measures have been implemented but have not yet resulted in measurable improvements.

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

**Precautionary principle:** A concept that asserts that where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing measures to prevent environmental degradation.

**Recreational fishing:** Fishing other than commercial fishing or traditional fishing, where the catch is either released or retained.

**Recruitment overfished:** A state where the spawning stock biomass for a stock or management unit has been reduced through catch, so that average recruitment levels are significantly reduced.

**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:** A state where stock biomass (or a biomass proxy) is at a level sufficient to ensure that, on average, future levels of recruitment are adequate (i.e. not recruitment overfished) and that fishing pressure is adequately controlled to avoid the stock becoming recruitment overfished.

**Target reference point:** 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.

**Total Allowable Catch (TAC):** In relation to a fishery, means the total quantity of aquatic resources of a particular class that may be taken from the waters of the fishery during a particular period.

**Traditional fishing:** Fishing for the purposes of satisfying personal, domestic or non-commercial communal needs, including ceremonial, spiritual and educational needs and utilising fish and other natural marine and freshwater products according to relevant Aboriginal custom.

**Transitional-depleting stock:** A state where stock biomass is not yet recruitment overfished, but fishing pressure is too high and moving the stock towards an overfished state.

**Transitional-recovering stock:** A state where stock biomass is recruitment overfished, but management measures are in place to promote stock recovery, and recovery is occurring.

**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. Undefined-indicates that insufficient information exists to determine stock status.

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