

INTER-AMERICAN TROPICAL TUNA COMMISSION

**81<sup>ST</sup> MEETING**

ANTIGUA, GUATEMALA  
27 SEPTEMBER-1 OCTOBER 2010

**DOCUMENT IATTC-81 INF-B**

**SUBMITTED BY CANADA**

**DEVELOPMENT OF A MANAGEMENT REGIME FOR STOCKS  
MANAGED BY THE INTER-AMERICAN TROPICAL TUNA COMMISSION**

The goal of a responsible fishery management regime requires controlling fishing mortality rates to achieve management objectives and maintaining the fishery within predetermined management constraints.<sup>1</sup> Planned management efforts should ensure a sufficient reaction time to prevent the possibility of overfishing, primarily recruitment overfishing<sup>2</sup>, or rebuild the population if overfishing occurs. Management objectives that respect biological constraints are fundamental to the Precautionary Approach (PA).

Generally speaking, the PA is about being cautious when scientific knowledge is uncertain, and not using the absence of adequate scientific information as a reason to postpone, or fail to take action, to avoid serious harm to fish stocks or their ecosystem. This approach is widely accepted internationally as an essential part of sustainable fisheries management.

The Inter-American Tropical Tuna Commission's (IATTC) Antigua Convention commits members to apply the PA in accordance with the 1995 United Nations Fish Stocks Agreement (UNFSA) in the conservation, management and sustainable use of fish stocks covered in the Convention Area.

One way to establish a precautionary management regime is through the establishment of control rules. A control rule describes a variable over which management has some direct control (e.g., fishing mortality) as a function of some other variable(s) (e.g., spawning biomass) related to the status of the stock.<sup>3</sup> The identification of reference points is part of the development of a control rule because they serve as triggers for pre-determined actions when thresholds relating to overfishing rates and stock status are crossed.<sup>1</sup>

A common approach to developing a PA management framework involves the establishment of control rules or a harvest strategy that:

- identifies three stock status zones based on scientific advice and recommendations – healthy, cautious, and critical – according to pre-determined reference points;
- sets the removal rate at which fish may be harvested within each stock status zone; and,

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<sup>1</sup> FAO, 2001. Research implications of adopting the precautionary approach to management of tuna fisheries. FAO Fisheries Circular. No. 963. Rome, FAO. 2001. 74p.

<sup>2</sup> Recruitment overfishing is the excessive fishing on the adult population such that the reduction in number and size of the spawning portion reaches the point that the remaining reproductive capacity is insufficient to replenish the stock.

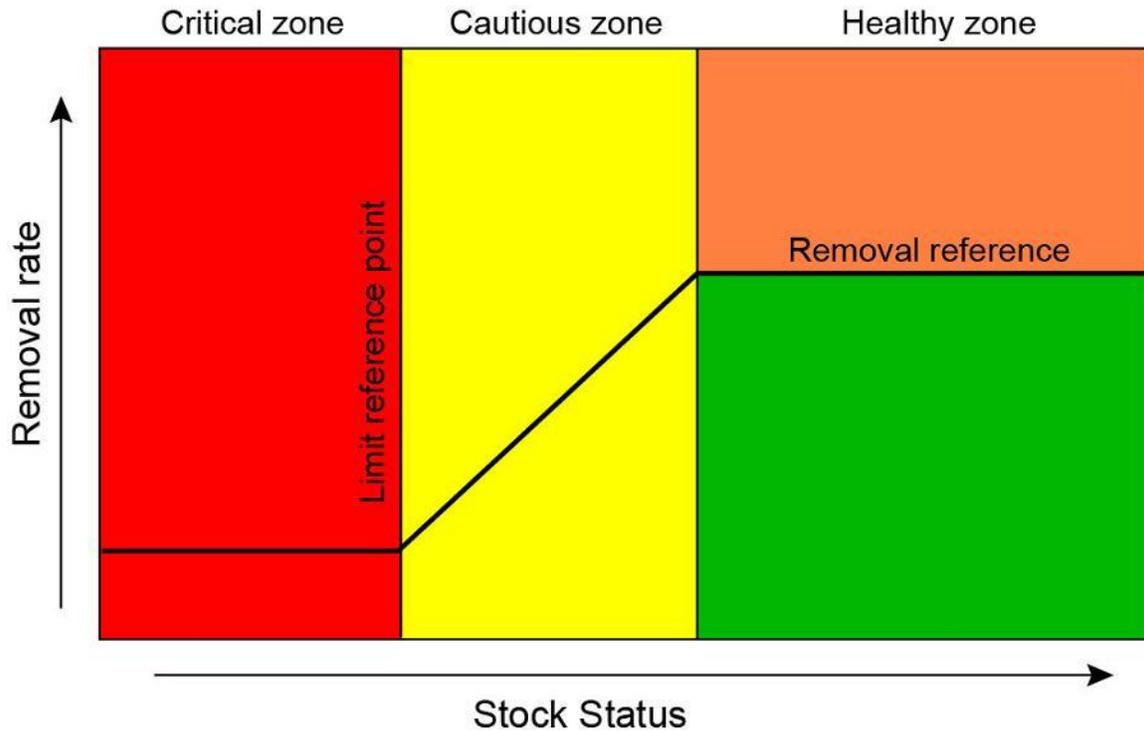
<sup>3</sup> Restrepo, V. R. and J. E. Powers. 1999. Precautionary control rules in US fisheries management: specification and performance. ICES J. Mar. Sci. 56:846-852.

- is based on pre-agreed decision rules and management actions, which vary in relation to reference points, and is designed to achieve the desired outcome by affecting the removal rate.

## 1. REFERENCE POINTS

In order to identify three stock status zones, there first needs to be agreement on the appropriate set of reference points based on the best available scientific advice.

The **limit reference point** (LRP) for biomass marks the boundary between the cautious and critical zones (Figure 1). When a fish stock level falls below the LRP for biomass, there is a high probability that its productivity and resiliency will be so impaired that serious harm will occur. Used as illustrated, the LRP for biomass seeks to avoid recruitment overfishing of the stock, i.e., fishing the stock so heavily that the number and size of the spawning portion is reduced to the point that the remaining reproductive capacity is not sufficient to replenish the stock.



**FIGURE 1:** Key Components of a Precautionary Approach Framework

Under a Precautionary Approach regime, a suite of potential maximum sustainable yield (MSY) and MSY-proxy reference points can be estimated for each stock. The strengths and weaknesses of their applicability to each stock are examined and management adopts the most appropriate reference points. Once a management objective for maintaining the condition of the stock within these set limits is established, managers must then determine how certain they wish to be in maintaining a stock within the boundaries set by reference points, and the subsequent management actions that must be implemented to reverse the situation.

## 2. REMOVAL RATES

The **removal reference** establishes the maximum removal rate of fish stocks in each of the zones; progressively decreasing from the healthy to the critical zones. The removal reference is less than or equal to the MSY at which a fish stock can be harvested. An LRP for fishing mortality should be set and, much like the LRP for biomass, if crossed would trigger a pre-determined management action.

Pre-agreed, risk-based actions guide management decisions on harvest rates under various stock status

conditions. In the **healthy zone**, there are no conservation concerns, and fisheries management decisions and harvest strategies are designed to maintain fish stocks within this zone. In the **cautious zone**, fisheries management decisions and strategies promote stock rebuilding to the healthy zone. In the **critical zone**, there are strong concerns about the future viability of the stock and immediate actions to promote stock growth and reduce removals to the lowest possible level must be implemented.

### **3. RISK MANAGEMENT STRATEGY**

As part of a fishery management regime, there is a need to specify the level of certainty of exceeding the established reference points. These levels of certainty can be risk tolerant (shorter projection period, lower level of certainty) or risk adverse (longer projection period, higher level of certainty).

### **4. PRE-AGREED DECISION RULES**

If stock assessment results show stocks to be in either the cautious or the critical zone (assuming appropriate reference points have been adopted), control actions would be necessary in the form of reductions in fishing mortality ( $F$ ). Therefore, as part of the management regime, there is a need to identify pre-determined control actions.