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Salvaged pearls: lessons learned from a floundering attempt to develop a management procedure for Southern Bluefin Tuna

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ABSTRACT

During 2002–2006, the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) engaged in a multilateral process to develop and simulation test a Management Procedure (MP) for the international SBT (*Thunnus maccoyi*) fishery. The CCSBT Scientific Committee reached consensus in 2005, and recommended an MP to the Commission (including both the pre-specified data collection methods and decision rule for recommending a Total Allowable Catch (TAC)). The MP was adopted, in principle, by the Commission. However, revelations of substantial, long-term under-reported catches undermined confidence that the MP was likely to achieve the intended management objectives. Consequently, it has not been implemented, pending further work to determine the implications of the historical data problems, and the progression of compliance measures to improve future data collection. This is a discouraging outcome of a lengthy and resource intensive process that had been recognized as a promising solution to a difficult management impasse. However, the CCSBT did become aware of the serious catch under-reporting problem, and reached a consensus agreement on the first substantive TAC change since 1989, and the MP process may have contributed to this progress. We outline a range of lessons from the CCSBT MP experience that we would expect to be relevant to other fisheries engaging in a similar process. Foremost among the lessons: formal Management Procedures cannot be expected to resolve all of the hard problems faced by fisheries managers, and agreement on data monitoring, sharing and verification standards should be established before MP development is pursued.

1. Introduction

In 2000, the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) agreed to embark upon a process to develop a Management Procedure for the SBT (*Thunnus maccoyi*) fishery (Anon., 2000), with a target adoption date of 2004. A Management Procedure (MP), is defined as a simulation-tested decision rule (or Harvest Control Rule), and the requisite methods of data collection and analysis, which together are used to calculate a management recommendation (e.g. Total Allowable Catch (TAC)) for a fishery (e.g. de la Mare, 1986; Butterworth et al., 1997; Smith et al., 1999). At the outset, considerable optimism existed within the CCSBT that a jointly developed MP could break the dysfunctional cycle of contested stock assessments and failure to reach consensus on management decisions that had prevailed since the mid-1990s. The development process suffered from a number of setbacks, culminating in revelations of substantial data problems in 2005–2006 that undermined confidence in the agreed MP. As a result, MP implementation was suspended until the implications of the data problems can be formally admitted within the simulation testing process. MP implementation is now expected to begin in 2011 at the earliest (Anon., 2007a).

In this paper, we identify the positive outcomes from the process, and share a number of lessons that are likely to be relevant for other (particularly international) fishery management organizations. While many of the details are specific to the CCSBT, we note that similar general lessons have been described in other fisheries. As one set of contributors among many participants in the CCSBT MP process, we are not the sole originators of the methods and ideas described. We do, however, take responsibility for the opinions expressed herein, and recognize that other CCSBT participants may have different views.

1.1. Background to SBT fishery assessment and management

SBT are long-lived, migratory, high-value fish, found throughout most of the southern temperate oceans, except for the more easterly regions of the South Pacific. Surface and longline commercial fisheries for SBT began in the 1950s, with peak catches occurring around 1960 (Fig. 1). The stock has been very heavily fished

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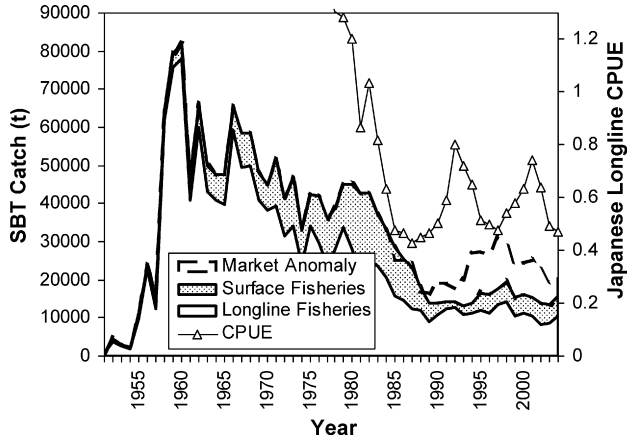

Fig. 1. Catch history of the SBT fishery by gear type. The longline catch under-reporting estimates derived from the Japanese market review have been included as a separate category (extracted from Fig. 2 of attachment 4 of Anon., 2006c). Surface fisheries include purse seine, pole and line, gillnet and handline. The Japanese longline CPUE is the nominal catch rate for SBT aged >4 in months April–September, normalized to mean of unity (observations from 1969 to 1979 are off the scale).

(Caton, 1991) and is currently perceived to be at or near historical low levels (Anon., 2006b). A major component of the surface fishery (off the southeast coast of Australia) collapsed in the late 1970s, and tagging studies demonstrated very high exploitation rates on juveniles in the early 1980s. Informal international management arrangements involving Australia, Japan and New Zealand were initiated in the early 1980s, and were subsequently formalised with the establishment of the CCSBT in 1993 (Caton, 1991; Anon., 1994). Australia introduced catch limits on its fishery in 1984 and international TACs with member allocations were introduced in 1985 under the informal tri-nation arrangement. The TACs were progressively lowered with a major reduction of approximately 50% for the 1989 fishing year. TACs limited catches from the Australian (primarily surface) fishery beginning in 1984 (Caton, 1991). However, it was not until the 1989 fishing year that the catch limits became restrictive for the Japanese longline fleet (i.e. the Japanese longline fishery reported that it was not able to catch its limit prior to this year; Caton, 1991). Formal catch limits essentially remained fixed from 1989 to 2006 (sometimes by agreement and sometimes by voluntary consent in the absence of an agreement).

During the 1990s, managers from Australia, Japan and New Zealand consistently had diverging opinions about the interpretation of the scientific advice, and disagreement about the setting of the TAC (e.g. Anon., 1995a,b, 1996, 1997a,b, 1998, 1999a,b). Initially, the stock assessments tended to predict a high probability of rapid stock rebuilding. However, as the years passed, the projected rebuilding was not evident from the data and different assessments yielded divergent predictions (e.g. Klaer et al., 1996). This led to a number of initiatives to attempt to improve the stock assessment, including the development of a joint experimental fishing program (Polacheck, 2002 and references therein). When agreement on this failed, Japan undertook unilateral experimental fishing, which was viewed by other CCSBT members primarily as a means of increasing catches. This resulted in a legal dispute in the International Tribunal for the Law of the Sea (ITLOS) (Firestone and Polacheck, 2003). The ITLOS hearing resulted in a temporary suspension of Japanese experimental fishing in 2000, however, the Arbitral Panel subsequently ruled that it did not have legal jurisdiction to resolve the case.

During the 1990s, catches of SBT by non-CCSBT parties (principally Taiwan, Korea and Indonesia) increased to substantial levels, adding impetus for the Commission to resolve its problems. In 2000, the CCSBT members negotiated a settlement to the experimental fishing dispute. It also agreed to (i) the appointment of an independent scientific advisory panel, (ii) development of a Scientific Research Program aimed at improving data for stock assessments, and (iii) the development of an MP. The concept of a simulation-tested, management decision rule had been formally introduced into the CCSBT process in 1993 (Sainsbury and Polacheck, 1993) and the CCSBT agreed to hold a Management Strategy Workshop in 1996 (Anon., 1996). However, the first CCSBT Management Strategy Workshop was not held until 1999 (Anon., 2000). Prior to this, an in depth illustration of the applicability of an MP approach to the SBT stock had been completed (e.g. Polacheck et al., 1999). The Commission agreed to develop an MP in 2000 (Anon., 2000).

1.2. Development of the CCSBT management procedure

The MP approach is often promoted in terms of potential advantages relative to an iterative stock assessment and *ad hoc* decision-making process (we use this latter terminology to distinguish the traditional alternative to MP management, but recognize that the term *ad hoc* can imply an avoidance of long-term policy that is not relevant for all fisheries that fall into this category). We consider the most important MP advantages to be:

- The MP is evaluated in relation to attainment of management objectives using long-term projections, in which management decisions are simulated in a feedback loop along with the fishery dynamics.
- An MP can be designed to be reasonably robust to the uncertainties inherent in the system (e.g. current population status, future production dynamics, sampling errors).
- Since the decision rules have to be agreed in advance, industry should have confidence in a stable decision-making process that allows them to make strategic investment decisions, while it reduces the scope for controversial decisions to be contested on the basis of "political" arguments about short-term consequences.

Butterworth (2007) provides a more comprehensive description of advantages and disadvantages expected for MPs.

The first CCSBT workshop of the MP development process was held in 2002, and there was a target for the Commission to adopt the MP in 2004. The process was intended to cover the following steps (e.g. Anon., 2002):

1. Identification of management objectives and quantifiable performance measures.
2. Development of decision rules (candidate MPs to be developed by member scientists).
3. Development of a range of operating models conditioned (fit) to real SBT data and representing the plausible uncertainty in the fishery.
4. Simulation testing of candidate MPs with the operating models.
5. Selection of an MP on the basis of the performance measures calculated from the simulation testing.
6. Implementation of the MP.

These steps were all iteratively revisited, with the exception of the final selection and implementation.

Beginning in 2002, the CCSBT Scientific Committee, and Stock Assessment Group meetings dedicated less time to the traditional annual stock assessment process, and focused on MP development. In addition, MP workshops were held in 2002, 2003, and 2004 and inter-sessional technical working groups were also convened on an *ad hoc* basis. It was hoped that the process would be concluded in