

Proposal for an SBT Recruitment Monitoring Review Workshop

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Summary: This is an announcement of the Recruitment Monitoring Program Review Workshop. The workshop aims to review progress made over the last 11 years towards development of a fishery-independent index of recruitment, the advantages of fishery-independent stock monitoring, the relationship between cost and expected accuracy, and to seek for ways in establishing a long-term monitoring system.

要約: この文書は加入量モニタリング事業レビューワークショップの案内である。ワークショップでは漁業とは独立の資源モニター手法の問題点と利点の整理、経費と期待される精度との関係、現実的な長期モニタリングを確立する方法などについて検討する。

BACKGROUND:

Southern Bluefin Tuna (SBT) is long-lived species with a high age-at-first-maturity. The SBT stock has been reduced significantly over its 50 years of exploitation and the majority of SBT catches are now of immature fish. Management of this kind of fish stock generally requires careful monitoring of trends in recruitment and promptly regulating fisheries corresponding to recruitment level. The Scientific Meetings of Tri-lateral SBT management scheme (the informal management arrangement of SBT prior to the CCSBT) had repeatedly emphasized the importance of reliable recruitment indices and especially the development of fishery independent estimates of recruitment.

In 1990, Japan and Australia initiated efforts to develop and establish fishery-independent indices of SBT recruitment. Since 1993, these efforts have been conducted as the collaborative SBT Recruitment Monitoring Program (RMP). Over the last 11 years the RMP has developed and evaluated four indices of juvenile abundance in Southern Australian waters based on different approaches : line transect troll and acoustic surveys of 1 year old fish, line transect aerial surveys of 2-4 year old fish, and conventional tagging of 1-4 year old fish. In addition a number of supporting studies have been conducted to aid in the interpretation and analysis of survey and conventional tagging data : archival and sonic tagging, acoustic monitoring using listening stations, GIS analyses, and integrated analyses. The primary objective of these ancillary studies has been to develop an understanding of the influence of fish behavior and migration, oceanographic and environmental factors and climate on observed abundance.

The RMP has sought to quantify the reliability and precision of each of the indices. This has been a subject of annual reviews of progress and project planning, an intensive reviews on survey designs, estimation procedures, and evaluations for the whole program in 1998-1999, and, in 2000, an external review was conducted with special emphasis on the aerial and acoustic

surveys respectively.

These reviews agreed on the theoretical and statistical robustness of survey designs, but identified inherent difficulties from logistical standpoints. A general conclusion reached by the RMP has been that the accuracy and precision of indices are influenced (often significantly) by factors that are inherently variable (e.g. climate, oceanography) or beyond the control of the survey design (availability of planes, spotters etc) . A major challenge of the RMP has been to identify and account for these extraneous influences.

In 2002, the CCSBT took over the conventional tagging component of the RMP, effectively reducing to two the abundance indices being developed by the RMP (the troll survey having ceased in the mid 1990's) – an aerial survey and an acoustic survey. Pending full analyses of the data collected between 1990-2000 the aerial survey was scaled down in 2001 and has run since then as a reduced line transect supplemented by monitoring of commercial aerial spotting. Analyses of the aerial survey data collected 1990-2000 are now complete, and show that an index of abundance with a CV of around 30% can be achieved with a well-designed survey. The acoustic survey was suspended in 2003/2004 season pending full analysis of the data collected over the previous 7 years.

Aerial survey indices and F and M values estimated from conventional tagging have been used in the SBT stock assessment and acoustic indices used as indicators of recruitment to the SBT stock. The 2004 SAG report on markedly lower recruitment in the SBT stock used RMP data. Although RMP data have played a significant role in SBT stock assessments in the past, there is a view among funding agencies that the cost versus benefits of the RMP require critical review before and further investment can be made in recruitment monitoring

It is our view that we are now at the turning point in SBT recruitment monitoring where it is necessary to shift from a research phase developing techniques to a practical phase establishing and ground-truthing a long-term monitoring system. Advantages and limitations learnt for RMP should be common in developing fishery-independent abundance monitoring indices.

To evaluate the costs versus benefits of recruitment monitoring, and review the progress made over the last 11 years, we are proposing an international Review Workshop of the SBT Recruitment Monitoring Program. The Workshop is organized in order to share experiences and borrow wisdoms from wide areas to establish a long-term, feasible, cost-efficient monitoring system, using SBT RMP case as an example. The intended outcome of the review, should participants agree, would be the development of proposals to conduct robust acoustic and aerial scientific line transect surveys similar to those conducted during the 1990s to enable monitoring of recruitment of 1-4 year olds.

**SBT Recruitment Monitoring Review Workshop:
The role and constraints of scientific monitoring for stock management –using southern
bluefin tuna experiences as an example (tentative)**

VANUE: National Research Institute of Fisheries Science, Fisheries Research Agency
Yokohama, JAPAN

DATE: 15-17 December 2004 (tentative)

OBJECTIVES:

- 1) To identify and review advantages and limitation of fishery-independent stock monitorings and their causes,
- 2) To explore how stock indices can be used if certain level of accuracy secured,
- 3) To develop general rules when developing effective fishery-independent stock monitoring surveys, and
- 4) To develop a specific recommendation for SBT case.

Overall structures of Workshop:

The Workshop will be open to the public. Limited funds may be available for key speakers and/or coordinators traveling from outside Japan. English and Japanese will be used and simultaneous translation will be available.

Each session will have a keynote presentation by appointed coordinator, presentation of called papers, general discussion, and summary notes by coordinator. Agenda Item 5 is considered as a final wrap-up session with panel discussion followed by open-floor discussion. Then, panel members are requested to develop a summary conclusion and recommendation of the Workshop.

All speakers including coordinators are requested to submit abstract either in English or Japanese no later than 15 November 2004 and submit a full document before the end of the Workshop. Documents submitted, summary notes by coordinators, records of discussion, and summary conclusion and recommendation will be printed after review for distribution. Possibility of group submission to scientific journals is also under consideration.

PROGRAM: (tentative)

1. What have we learnt from historical experiences of SBT Recruitment Monitoring Program? – Review of survey and results, pros and cons, technical limitation, logistic limitation, and impacts of environmental factors:

- 1) Aerial survey
- 2) Acoustic survey
- 3) Tagging
- 4) Troll survey

現在までのミナマガロ加入量モニタリングの手法と成果の再整理。特にモニタリング指標の信頼性と手法・調査デザインの問題点とを整理

Coordinator: *

2. Evaluation of accuracy and precision of historical recruitment indices:

- 1) Review of available information on SBT recruitments:
 - ① Recruitment fluctuation obtained from stock analyses
 - ② Direct observation of recruitment fluctuation – LL CPUE and surface catches, data extracted from direct aging
 - ③ Information obtained from tagging
- 2) Consistencies and discrepancies among indices and evaluation of historical SBT recruitment indices.
- 3) Impacts of oceanographic conditions on recruitment and uncertainties of monitoring indices

ミナマガロ加入量変動に関する情報の整理。特に資源評価結果、標識放流事業の結果、直接年齢査定情報から得られる情報等を再整理する。その上で各加入量モニタリング指標精度と正確さを評価する

Coordinator: *

3. How can recruitment indices be used in stock assessment and management, depending on level of accuracy and precision of indices? -- Quality requirement of recruitment indices useful for stock assessment and management points:

- 1) Need for recruitment indices, and minimum requirements for usable index
- 2) Priority between accuracy and precision from assessment and management view points
- 3) How can indices be used if indices satisfy XX? – Consideration of feasible scenarios

資源評価の立場から要求される加入量情報の精度と、現状のモニタリング手法の限界との関係の整理

Coordinator: *

3. Overall conclusion and recommendation for future SBT Recruitment Monitoring Program (Panel Discussion)

- 1) Keys in establishing long-term recruitment monitoring system (inc. balance between accuracy and precision of indices and required cost)

長期モニタリングに必要な条件の整理、具体的な提案・勧告の作成、及び今後の研究協力体制の確立

Coordinator: *

* Co-ordinators will be nominated once full details of the workshop are complete.