

Quick consideration toward future Scientific Research Program under the CCSBT and preferable management actions under low recruitments.

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Summary This document summarizes miscellaneous points required further consideration in the next few years to shifting to MP-based management. As for TAC adjusting schedule, it will be better to give options for managers and industries as long as effects are comparable. TAC adjustments directly changes fishing pattern, which impacts especially on CPUE need to be examined urgently. Surface fishery is capable to remove large fraction of recruitment and risk to stock should be noted. CPUE interpretation and recruitment monitoring will be the highest priority in the SRP.

要約:MPに基づく管理に移行する今後数年間に検討を要する項目をまとめた。TAC調整のスケジュールについては、効果が同じであれば、行政・業界に選択の余地を残すのが望ましい。TACを調整すれば直接漁業パターンが変化することになり、特にCPUEへの影響について早急に検討する必要がある。表層漁業は加入の大半を漁獲することが可能であり、そのリスクを認識しておくべきである。SRPの中ではCPUE解釈と加入量モニタリングがもっとも重要度が高い。

Introduction:

The CCSBT decided at the second part of its sixth meeting of March 2000 to engage independent scientists as the Advisory Panel and independent chairs in order to resolve impasse caused by conflict among national scientists. Since then, under strong leadership by the Panel and independent chairs, the Scientific Committee (SC) worked hard to move toward stock management scheme based on Management Procedures (MP). During the same time, many other improvement have been made under the CCSBT Scientific Research Program (SRP) which include an establishment of CCSBT catch and effort database with employment of a database manager, the CCSBT coordinated tagging program, establishment of standards for scientific observer program and direct aging technique. Now five years have been passed. Having Korea and Taiwan as additional members, the CCSBT is now entering into another era hopefully by successfully adopting the final MP with new set of management objectives and specific implementation schedule of MP at this forthcoming Commission Meeting.

The last five years were the maturing time for the CCSBT to be a truly efficient, capable and transparent Regional Fisheries Management Organizations with many improvements. Now, MP is close to ready for actual implementation. Otolith direct aging will be incorporated into assessment soon. Tagging program will complete its first five-year phase in the next fiscal year and waiting for review to determine whether to continue or not. I believe this is a good opportunity to re-examine overall requirements

and roles of the Scientific Committee for further improvement of its activity. This document summarizes my initial thoughts on management and research requirement issues for SBT.

Schedule for TAC reduction and shift to MP based management:

The CCSBT10 at October 2003 developed time schedule for MP implementation. It was decided that the first TAC determined with MP would be applied from 2008 fishing year that starts from October 2007 for the earliest. As one year was requested for warning, 2008 TAC must be determined at 2006 SAG/SC based on data up to 2005 fishing year. At that time, the SC considered the stock as a stable level but noting the sign of markedly low recruitments for 1999 cohort and onwards. As additional information obtained through 2003 to 2005 intensified the view of markedly low recruitments at least for two cohorts and possibly more, the SC considers an extent of need for immediate and additional TAC reduction in 2006 before shifting to MP-based management. Corresponding to that, Japan requested at the MP consultation held in May 2005 to examine the effects when shifting to MP-based management starting from 2007 fishing year with two-year interval for the first three TAC changes (i.e. 2007, 2009 and 2011) then back to three-year intervals.

The recruitment level of 2000 and 2001 cohorts at least to longline fisheries are at historically lowest and with acoustic indices indicating continuous low recruitments up to 2004 cohorts, we considers the immediate management action is critical. At the same time, any management action does work effectively without collaboration and good understandings from industries. Japan's request to examine alternative TAC schedule was originated from their need to develop a good understandings and preparation with its industry. The scenarios of ad-hoc TAC reduction in 2007 with three two-year interval TAC adjustment seems to achieve similar effects as the scenarios of ad-hoc TAC reduction and 2008 MP implementation. I believe it important for managers and industries to have some options as long as proposed options achieving the same effects.

In any case, the critical thing of this year is for the CCSBT to commit to the agreed level of TAC reduction at 2007 as the latest, as well as to adopt and commit MP implementation with specific schedule. Although general procedure of the CCSBT is only to decide on the next TAC, i.e. 2006 TAC for the CCSBT12, as a responsible RFMO, the CCSBT should commit to longer management scheme under this critical situation. It is needless to say that all efforts should be made not to increase the current catch level.

Minimum requirement for successful implementation of MP:

One advantage of MP is that once agreed on decision rules, MP will indicate appropriate

actions supported feedback systems evaluated through simulations. So, in normal situation, MP should be easier and better. However, although we try to cover various uncertainties as reasonably as possible, MP evaluation process makes many assumptions especially for future behaviors of fisheries and MP implementation. Generally speaking, MP should be robust to violation in most of those assumptions such as consistent gear allocation and misreporting of catches. But in these cases, the others in fact subsidize the loss caused by violators in order to keep stock on expected track, which is definitely not a happy situation for the others.

Certain types of constraints can help to avoid large deviation from consistency assumptions. Simplest way is introduction of quota allocation by gears or time/area quota. Catch number capping in addition to current quota based on catch in weight constraints shifting target toward young fish. However, it should be noted that excessive constraints introduce biases in selectivity and if those constraints conflict economical efficiency, fishermen will not follow. When quota allocation reduced, it is quite natural for fishermen to concentrate into more economical time/area. This may alter reliability and representativeness of LL1 CPUE as abundance indices. The consistency in CPUE is the most important assumption since all of CMPs heavily rely on LL1 CPUE to calculate TAC. Possible impacts of TAC reduction to CPUE reliability should be examined intensively before the actual implementation of MP. This should be considered as key component of the next few years' SRP.

Indication of surface catch:

Fig. 1 shows how much of recruitments were harvested by surface fisheries by cohorts calculated from OM data. There are two blocks of cohorts showing high removal of over 60%, the early 1980s' cohorts and the recent two, 2000 and 2001 cohorts. The heavy harvest on the early 1980s' cohorts almost fished down these cohorts and the big dip among size composition of longline catch could be traced at least until mid 1990s. The 2000 and 2001 cohorts were harvested mainly in the last two fishing seasons, i.e. 2002/2003 and 2003/2004 as age 3 in the GAB and surface fishery did not experience any specific hardness to find and catch fish for these cohorts. Some interpret this as evidence against low recruitment claim. With the circumstances that many other indicators consistently suggest markedly low level of these cohorts, it is important to note the capability of surface fishery to remove very high proportion of fish without any pain and difficulty. Mechanisms to enable this are still unknown, though MacCall's basin model can give some explanation.

Fig. 2 shows relative changes of population by cohorts at age 0, age 4, age 10, and age 20, respectively corresponding to recruitment, recruitment to longline fisheries, recruitment to central mature stock, and rough representation of old animals. This also uses OM data and each trend was standardized with the cohorts that all four data available, i.e. from 1971 to 1983 cohorts. The cohorts covered with this figure

experienced different phases of harvesting histories. Still, figure shows that the relative strengths among cohorts were already fixed at age 4 before recruiting to longline fisheries and reserved probably until the end, i.e. longline fishery does not have a power to alter relative cohort strengths. In contrast, cohort strength trends at recruitment and at age 4 differed substantially and indicated the power of surface fishery to alter cohort strength. This is partly due to a nature harvesting aggregated stock and partly due to difference in number of age classes targeted.

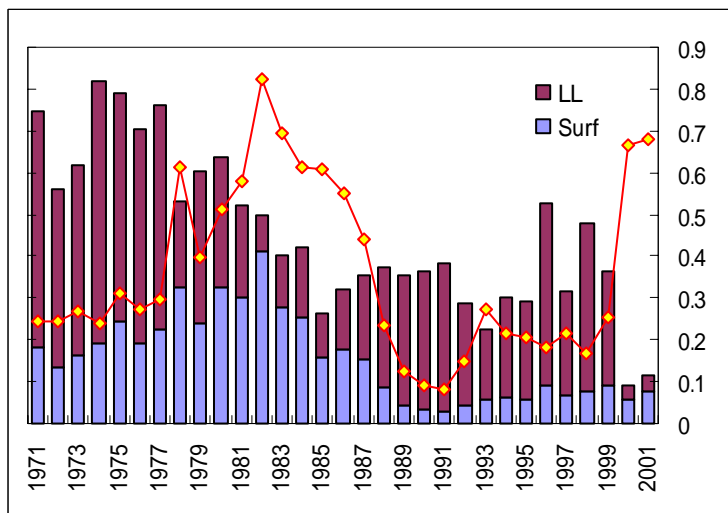


Fig. 1. Proportion of recruitment removed with surface fishery.

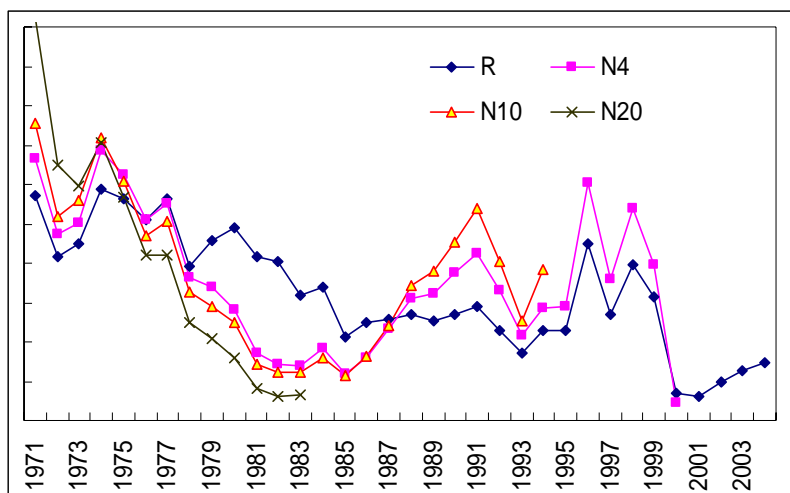


Fig. 2. Relative changes in cohort strength at age 0 (recruitment), age 4, age 10 and age 20.

Some observations suggest a certain level of site fidelity of juvenile fish. For example, archival tags released from off Cape waters tend to stay in the western half of Indian Ocean. While the 2000 and 2001 cohorts are almost completely disappearing from New

Zealand fishery and Japanese longline operating around Australian waters, those cohorts occurs in catch, even low, of Taiwanese and Japanese longline operating off Cape and middle Indian Ocean. However, judging from the fact that the surface fishery can remove more than 60 % of stock, it should be considered that an extent of site fidelity is quite limited or that a proportion of stock held in western Australia is negligible.

For stock recovery, it is essential to secure adequate number of recruitments to reach maturity ages. Under the current low level of parental stock, there is always a risk of markedly low recruitments again in near future. Ideally and purely from stock reservation points, the surface fishery should be banned unless it has a mechanism to adjust catch amount precisely in proportion to recruited cohort strengths. If the CCSBT chooses to maintain the current level of surface harvest, it should note the corresponding high risk of possible stock collapse in ten years' time.

Priority researches required for MP-based stock management:

CPUE Interpretation:

Since all CMPs heavily rely on LL1 CPUE, maintaining the reliability and representativeness of LL1 CPUE as consistent as historical status becomes essential for successful implementation of MP. At the same time, it is almost inevitable that reduction of TAC would alter effort distribution and fishing patterns substantially. Urgent and intensive analysis in collaboration with managers and industries will be needed to understand a range of potential impacts of TAC adjustment to CPUE errors and biases and to develop indicators robust to fishing pattern changes.

Recruitment Monitoring:

Under the current stock situation, careful monitoring of recruitments, especially early detection of markedly low recruitments, is extremely important to prevent hyper-harvest by surface fishery. Aerial survey index is not appropriate for this purpose from two reasons: 1) tend to be insensitive to low recruitments due to the nature of monitoring in the middle of aggregation (i.e. GAB), and 2) incapable to provide information prior to surface harvest. We considers that the indices obtained from Western Australia are more suited to this purpose, though they tends to exaggerate low recruitments and are disputable on its reliability as quantitative indicators. Also, if those information to be used to trigger management action, it is preferable for the CCSBT Secretariat to operate the survey program, as is the case of CCSBT tagging.

The experiences of the survey in Western Australia indicate that fish are almost completely disappeared from the survey area except several hot spots when recruitment level going down to the level of 2000 and 2001 cohorts. So, if objective is only to detect low recruitment equivalent to 2000 and 2001 cohorts level, even very simplified survey with sighting and/or trolling can do the job. We are interested in combining sighting/trolling recruitment monitoring survey with the current CCSBT tagging for

more efficient utilization of survey resources. To examine a feasibility of this idea as well as to develop draft survey plan, Japan would like to request to the CCSBT Secretariat to provide detailed catch and effort logbook information of all tagging activities in the past.

All CMPs utilize age 4 CPUE to identify low recruitments, partly due to age 4 CPUE is the earliest year class information available from OM. There is some advantage to replace age 4 CPUE with other recruitment index in the future implementation.

Quick consideration on other component of Scientific Research Program:

Archival tagging:

Archival tags are powerful tools to examine migration and behaviors in relation to environments. However, they will not provide information directly usable to stock management and it will be more appropriate to rely on research efforts by individual Members.

At the same time, due to high cost required for purchase and deployment of tags, number of tags can be released by each Member by year are limited and coordination among Members efforts has advantage. Currently, Australia develops collaboration with New Zealand and Taiwan in tag deployment. Japan prefers to develop more thorough collaboration through the CCSBT, not a combination of several bilateral collaborations, including all processes from planning for deployment, tag purchase and deployment, and data sharing under common database. When developing collaboration, all required costs should be shared in even bases. It should be noted that attempt to release fish from open sea often requires more cost than tag deployment from coastal waters.

CCSBT conventional tagging:

Conventional tagging program will be the only way to obtain absolute abundance estimates and direct F estimate for surface fishery. This program has been operated by the CCSBT Secretariat with the fund provided by Members and the next fishing year will be the last of 5-year program of tag deployment. We appreciate the Secretariat's efforts in program operations and database establishment and maintenance. In principle, we hope to see this program to continue but only after reviewing program designs and implementation problems and revising them to improve efficiency. Also, there is some complaint that majority of project money goes to Australia by hiring field technicians, deployment boats and large bulk of rewards for tag recovery.