CCSBT-EC/0310/19

16. Research Mortality Allowance

Purpose

(i) To advise members of the mortalities associated with scientific surveys and the Scientific Research Program (SRP) in 2002 and 2003.

(ii) For the Extended Commission to consider proposals for Research Mortality Allowance (RMA) and SRP mortalities in 2003-2004.

Background

The frameworks for approving RMA and SRP mortality are at **Attachments A** and **B**.

Mortalities in 2002-2003.

At CCSBT9 the Extended Commission agreed to a RMA of 6.5 tonnes for planned research by Japan. The Extended Commission also agreed to a total of 40 tonnes for mortalities associated with the CCSBT surface fishery tagging program, the pilot program being conducted in the western Indian Ocean by Japan, the pilot tagging program being conducted in the Australian east coast fishery and a possible new tagging exercise in New Zealand. Within this total Japan and Australia worked with mortality allowances of 10 and 15 tonnes respectively.

The following mortalities have been reported (in tonnes) against these allowances in 2002-2003.

RMA	
- Japanese acoustic survey	
- Japanese spawning ground survey	
▪ Total mortalities	0.80 tonnes
SRP	
- CCSBT surface fishery	2.46 tonnes
- Japanese pilot – Indian Ocean	3.85 tonnes
- Australian pilot – East Coast	6.97 tonnes[1]
▪ Total mortalities	13.28 tonnes
Total Research Mortalities	14.08 tonnes

[1] Latest report at time of preparing this paper. Australia advises there will be a small additional amount but total mortalities will be significantly less than the 15 tonne approved limit.

Proposals for Mortalities in 2003-2004

RMA

Japan has proposed one research survey using two vessels on the spawning ground and has sought RMA coverage of 10 tonnes. Details of the Japanese proposals are set out in **Attachment C.**

SRP

The CCSBT tagging program in the surface fishery will continue in its third year at the same level as in 2002-2003 and a mortality allowance of 4 tonnes is required.

Japan will conduct a third tagging pilot in the western Indian Ocean and has estimated mortalities at 10 tonnes.

Australia will continue with the tagging pilot in the east coast fishery and extend coverage to the eastern Indian Ocean to gather data in relation to the spawning ground and has sought a mortality allowance of 15 tonnes. Australia will also commence a global archival tagging program deploying 400-500 archival tags over three-year period. A mortality allowance of 6 tonnes is sought for this project in 2004.

New Zealand proposes to conduct a longline tagging program in the western Pacific Ocean during the 2004 fishing season and has indicated a mortality allowance of 5 tonnes would be sufficient.

In total 40 tonnes in SRP research mortality is being sought for 2004. The requested mortalities are endorsed by the Extended Scientific Committee.

Discussion

The Extended Commission needs to consider and agree to the Japanese proposals for RMA in 2003-2004.

For the SRP, if the proposed programs are to proceed, the Extended Commission needs to agree to the specific mortalities proposed by members and endorsed by the Extended Scientific Committee.

Prepared by the Secretariat

Attachment A

(Attachment M)

Research Mortality Allowance (RMA) within the Framework of CCSBT

It is essential for Contracting Parties to gather sufficient scientific information in order to improve knowledge on the biology, stock situation and ecology of southern bluefin tuna (SBT) for conservation and optimum utilization thereof. To facilitate gathering such information, it is appropriate to establish an "Research Mortality Allowance (RMA)".

Criteria which designate scientific research activities which can utilize RMA will be as follows:

1. Research activities which do not include "commercial type operations," such as:
   (1) Larvae and juvenile sampling with scientific research vessels (e.g. Shoyo-maru)
   (2) Fish taken for experiments such as TS measurement in a cage or pinger tracking

2. Incidental death during research activities whose objectives are not to catch SBT, such as:
   (1) Tagging research (fish which die during dedicated tagging activity)
   (2) Fish taken for confirmation of species during operation of acoustic survey.

3. Research feasibility studies on a limited experimental scale.
   The study to assist formulation of planning of a full scale program.

The total level of RMA shall not exceed 10 tonnes each year and will comprise part of the agreed CCSBT Scientific Research Program.

Contracting Parties, which intend to use the RMA will provide a proposal of their objectives and expected level of research mortality through the Commission to all Contracting Parties for consideration prior to undertaking the research activities. The Contracting Party will provide a report to the Scientific Committee on the exact number and size of fish at the conclusion of the research activities.

Attachment B

(Attachment L)

DEVELOPMENT OF A SBT SCIENTIFIC RESEARCH PROGRAM INCLUDING A SCIENTIFIC FISHING COMPONENT BY THE CCSBT EXTERNAL SCIENTISTS

Introduction

Commission Members have agreed to engage the External Scientific Advisory Panel to design an SBT Scientific Research Program (SRP). The SRP will complement the recent initiatives introduced in CCSBT for improving stock assessments and developing a management strategy/procedure by providing improved data and information inputs for conducting all future stock assessments. In the first instance the SRP will run for a period of two years (2001-2002) after which the effectiveness of the program will be considered in light of future research requirements.

Results of the SRP are expected to improve the Commission's ability to set future TACs in order to achieve the objectives of the Commission as outlined in the Convention, which are the conservation and optimum utilisation of SBT, and meet the currently agreed management objective of recovery of the parental biomass to 1980 levels by 2020. The overall objective of the SRP, including any scientific fishing component (SFC), is to provide statistically significant data for reducing the levels of uncertainty in stock assessments made by the Commission and to identify directions for further research.

The SRP can include a catch component of up to 1,500 tonnes in each year. The per annum tonnage used for the SRP would be catch in addition to national catch and will be managed by the Commission. The three Member countries should consider and devise an equitable means of resourcing/funding the research activities in a timely fashion.

In designing the SRP consideration should be given to where potential improvements can be made in the three basic input components to the stock assessment:

1. The basic fishery data (e.g. size and age distribution);
2. SBT biological parameters (e.g. natural mortality, age of maturity, growth rates, length/weight relationships, stock structure and spatial dynamics); and
3. Absolute and/or relative measures of abundance (e.g. CPUE, fishery independent surveys, tagging experiments).

The proposal is for a SRP to be developed by the external scientists following consultation with national scientists, managers and industries. The participating external scientists are asked to attend a meeting with the Commission's national scientists in November 2000 to

discuss the SRP and receive input in relation to the design, content and potential objectives of the overall Program, as well as the scientific components of the Program. The external scientists should develop a cooperative working arrangement and, if appropriate, are encouraged to convene a separate meeting, at their convenience, in either December 2000 or January 2001 before submitting in mid February 2001 a draft proposal to the Secretariat for dissemination among Parties and for discussion at the Scientific Committee. The external scientists can seek input from other scientists, including national scientists and other external scientists, in developing the SRP. The Secretariat will distribute any comments provided to the external scientists from other sources among the Parties. External scientists, if they desire, can submit additional information individually.

Terms of Reference

The report on the proposed SRP should address to the extent considered appropriate, but is not limited to, the following:

- Identification, and basis for selection, of key uncertainties in the Commission stock assessment to be addressed by the SRP
- Identification and evaluation of individual research sub-programs and the uncertainties they address
- Reporting requirements for each component of the SRP
- Procedures for revision based on results obtained in the first year
- Criteria and a process for evaluation of the SRP at the end of two years

Individual research projects within the SRP should address, to the extent considered appropriate, aspects such as, but not be limited to, the following:

- Research/experimental design
- The data to be collected including sample size requirements
- The proposed methods for analysing the data including, where pertinent, expected levels of precision (i.e. CVs)
- How the results would be incorporated into the stock assessment and their likely contribution to that process
- Resource and implementation requirements (including areas, time period, data collection procedures and vessel deployment requirements, etc.)
- Estimated tonnage and number of fish required, where applicable (e.g. capture and/or tagging)
- Verification procedures including level of observer coverage
- Personnel required to implement field and data collection components
- Process for analysing and review of the results (e.g. workshop)

External scientists, national scientists, managers and industry will meet at the end of each year/season to review progress and provide a report to the Commission recommending the implementation of any changes deemed necessary.

Reporting

The external scientists are to submit a draft version of their report to the CCSBT Secretariat by mid February 2001 for immediate dissemination among Parties and for discussion at the Scientific Committee (SC), which will be held in March 2001.

The external scientists in their report to the SC will make every effort to present to the SC a report agreed by consensus.

Decision Procedure

When the external scientists' report is discussed at the SC the following decision procedure regarding the report to be submitted to the Commission will apply:

(a) If the external scientists present a consensus report to the SC or a report adopted by a majority of 4 to 1:

(i) The members of the SC and the external scientists shall seek to reach consensus on the report or its modification after discussion so that the report can be passed to the Commission as a report of the SC.

(ii) If consensus is not reached among the SC members and the external scientists, then the consensus report or majority report of the external scientists, as the case may be, will be passed to the Commission as a report of the SC with dissenting opinions attached.

(b) If the external scientists present a report that cannot be dealt with under (a):

(i) The members of the SC and the external scientists shall seek to reach consensus on a report to be passed to the Commission as a report of the SC.

(ii) If consensus cannot be achieved at the meeting of the SC, then the Scientific Committee of the IATTC or ICCAT will be asked to examine and decide on the final content of the SRP report, in accordance with the terms of reference given to the external scientists. Nationals of a CCSBT Party who are members of the Scientific Committee carrying out the work on the SRP shall not participate in that work. The report of the relevant Scientific Committee will then be presented to the Commission as the report of the SC.

The report of the SC, presented in accordance with the procedure above, will be discussed at the Commission for the final decision on the SRP. If the Commission cannot reach a consensus, the report presented by the SC will become the decision of the Commission.

Report of 2002/2003 results and proposal for 2003/2004 activities on CCSBT tagging by Japan.

日本によるミナミマグロ標識放流の 2002/2003 調査活動報告および 2003/2004 調査申請

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要約

2001 年にも実施したケープ沖からの延縄船による標識放流試験を 2002 年 10 月から 12 月に実施した。2-5 歳魚を主体とした合計 318 個体に通常標識を付けて放流し、そのうち 5 個体と 40 個体にはそれぞれポップアップアーカイバルタグとアーカイバルタグも装着した。航海を通じて取り込んだ魚の合計重量は 3,848.8kg と推定された。2001 年放流魚のうち、通常標識装着魚 1 尾およびアーカイバルタグ装着魚 2 尾が 2002 年に再捕された。本文書には次回の標識放流計画も含めてある。

Summary

The pilot longline tagging program was conducted between October and December 2002 off Cape in the same way as in 2001. Total of 318 fish, mainly age 2-5, were released with conventional tags. Five and 40 of them were also attached with pop-up archival tags and archival tags, respectively. Estimated total weight of fish retained during the cruise is 3,848.8kg. One fish with conventional tags and two fish with archival tags released in 2001 were recaptured. Proposal for the next tagging cruise is also included in this paper.

1. Japanese activity for the CCSBT Tagging Program (SRP) in 2002/2003.

【Pilot longline tagging program】

No33 Fukuseki -maru (411 ton), a commercial longline vessel usually working for southern bluefin tuna (SBT) fishery, was chartered. Total of 61 longline operations was conducted off Cape from 20 October to 27 December 2002. The operated area was 33-40S, 30-44E (Fig. 1). The number of hooks used in each operation was reduced to 1500 hooks, roughly a half of commercial operations in order to increase a survival rate of fish caught by reducing total gear soaking time. Two field technicians were on board to place tags on SBT. They also collected data on size and species caught and some biological samples including otoliths.

Tagging procedure followed to those developed and agreed at the Tagging Workshop held in Canberra, October 2001. The standard CCSBT tags were used. Two tags were inserted in between pterygiophore at the base of the second dorsal fin from both side of fish. Fork length,

date and time of capture, the side where the first tag to be placed, the side where the odd number tag to be placed, the tagger's name, and condition of fish including bleeding were recorded. The odd tag ID number was the smallest between the two tags placed on one fish.

All tag placements were conducted on deck. In the other words, all SBT caught were pulled up on deck before tagging. Usually, small size fish (roughly <90cmFL, 15 kg) were pulled up by grabbing a branch line by hand, and middle size fish (<130cm FL, 50kg) were pulled up with a help of a scooping net. The scooping net was developed during the cruise last year (CCSBT-SC/0209/21) and further improved during this cruise. It was quite difficult to pull up (and release) large size fish (roughly >130cmFL, 50kg) on deck even with the scooping net. However, it was decided not to use a tagging technique with harpoon from deck side which was used for tagging of large pelagic fish. The main reasons were rough sea conditions and difficulty in controlling an exact position of tag placement.

Among total of 455 SBT hooked, 318 SBT were tagged and released with conventional tags (Table 1). The tag number used ranged from 535001 to 535708. One fish was released with only one tag because one of two tags was broken during tag placement. All the rest had two tags placed. In addition to two conventional tags, Pop-up archival tags (PAT: Wildlife Computers) were attached externally to dorsal muscle to five SBT, and archival tags (LTD2310: Lotek Wireless Inc.) were inserted into body cavities for 40 SBT. These additional tags are mainly placed on larger fish.

Length frequency distributions of SBT were shown in Table 2. Tagged fish ranged from 77 cmFL to 160 cmFL and more than 90% of tagged fish was in a range of 90-129 cmFL corresponding to age 2-5. No substantial differences in tagging rate (a proportion of number of tagged fish to total number of fish hooked) were found among different size classes.

Total 135 SBT were identified as not suitable for tagging. Although all fish retained were measured and weighted with whole weight in principle, four fish were retrieved as only head because of whale/shark bites and carried no size information. The average weight of those four fish was assumed to be the same as those caught and retained during the cruise. Estimated total weight for fish retained is 3,848.8 kg (Table 1). This is the amount utilized for this program from the quota assigned for the SRP (Scientific Research Program) of the CCSBT.

【Tagging in the Recruitment Monitoring Program】

In the acoustic survey of the Recruitment Monitoring Program, 36 SBT were released with conventional tags from 2 Taikei-maru and Shunyo-maru between December 2002 and February 2003 off southern Western Australia. Among the fish, eight and three individuals were also attached with archival tags and sonic tags. The fish ranged from 45 to 61 cmFL and estimated as

one year old.

During the cruises, a total of 22 tags with ID numbers of A07278-A07284 (7 tags), and A07286-A07300 (15 tags) have lost. They flew to the outside of the boat with a rapid wind.

【Tag recapture】

Three recapture of fish tagged under the CCSBT tagging program have been reported until 31 July, 2003. One report is for a fish with a conventional tag from a Taiwanese longline vessel. Two reports are for fish with archival tags from a Japanese longline vessel.

The total number of recaptured SBT released during the Experimental Fishing Program held between 1998 and 2000 is 21 (seven in 2000, seven in 2001, three in 2002, and four in 2003). Nineteen of them were recaptured by Australian purse seine vessels and those fish were farmed. Two fish were recaptured by Japanese longline vessels. The numbers of recaptured SBT released in the Recruitment Monitoring Program and reported via NRIFSF were 21 for conventional tags and two for archival tags since 1 January 2002.

All five PATs developed during the 2002/2003 Program popped up much earlier than the dates set for user defined pop-off and data were retrieved via satellite. Times of data acquisition from these PATs were 2, 20, 35, 39, and 40 days, respectively. To identify cause(s) of the premature pop-up, preliminary analysis of the data was done. “Premature release” function of PAT, which initiates data transmission when PAT detects constant depth for user defined period, worked in all tags. Possible causes are: 1) fish sank deeper than 1500m (due to dive or death?) and then an automatic tether cutting devise (RD1500) of PAT worked; 2) PAT came off from fish due to any reason after release (such as breaking the tether, breaking the attachment devise of PAT to the tether, or an anchor arrowhead coming out of fish). Obtained data of depth and temperature histograms, depth-temperature profiles, and location are being analyzed.

Of 45 SBT released with archival tags in 2001, 2 SBT were recaptured and the tags were returned to NRIFSF. Time at liberty of these SBT was approximately 6 months and 8 months, respectively. Data could be safely retrieved from the tags for the entire time at liberty. From preliminary analysis of these tag data, we found: 1) Diving behavior of fish varies with time and space; 2) Fish frequently dives closely to 500m depth; 3) Location estimates of one tag show that fish moved from 40E (off Cape) to around 100E (South Indian) over 4 months, and then returned to about 30E over 4 months. In contrast, data of the other tag show that fish did not move far from waters around 40E. Further analyses of depth and temperature data and errors in location estimates are being done.

2. Proposal for 2002/2003 activity.

Although it is premature to draw any conclusion, the retrieved archival tags data and tag recapture pattern up to now suggested separation of fish between off Cape area and Australian coast in a higher level than expected. At the same time, the efforts to seed tags to middle to large size fish had initiated along the Australian coast. Simultaneous tag seeding from a wide area covering whole distributing area would be far more powerful to improve our understandings on global fish migration. Based on these two points, we propose to continue the same type of tagging cruise for the 2003/2004 season.

Commercial longline vessels will be chartered starting with late October or early November of 2003 and all SBT caught in an appropriate condition will be tagged and released. Actual period of cruises and number of vessels to be chartered will be decided by a level of funding available as well as an availability of vessels. For this activity, we would like to request 2000 CCSBT tags as a preliminary estimate of required number of tags. Expected SBT mortality is no larger than 10 tons.

Table 1 The number of catch and released and weight estimation for fish retained

	Number	Weight
Hooked	455	
Escaped	2	
Released with tags	318	
Retained and weighed[1]	131	3,734.8[3]
Retained but damaged[2]	4	114.0[4]
N of fish retained	135	
W of all fish retained		3,848.8

1: Weights are in whole weight.
2: Damaged by shark or killer whale.
3: Including one fish only its processed weight measured and converted to whole weight.
4: Total weight is estimated by (131+4) x 3,734.8/131.

Table 2 Length frequency distribution of SBT

FL(cm)	Conventional tags only	With archival tag	With popup archival tag	Retained	Total (Tag release rate)
75-79	1				1 (1.00)
80-84					
85-89	1				1 (1.00)
90-94	3			1	4 (0.75)
95-99	12	2		6	20 (0.70)
100-104	17			7	24 (0.71)
105-109	68	7		38	113 (0.66)
110-114	59	4		25	88 (0.72)
115-119	56	10		23	89 (0.74)
120-124	36	4		16	56 (0.71)
125-129	10	6		6	22 (0.73)
130-134	3	2	1	3	9 (0.67)
135-139	2	1		2	5 (0.60)
140-144	1	3	2		6 (1.00)
145-149	2	1		1	4 (0.75)
150-154			1	1	2 (0.50)
155-159	1		1		2 (1.00)
160-164	1				1 (1.00)
Total	273	40	5	129[1]	447[1] (0.71)

1: Length was not measured for six fish.

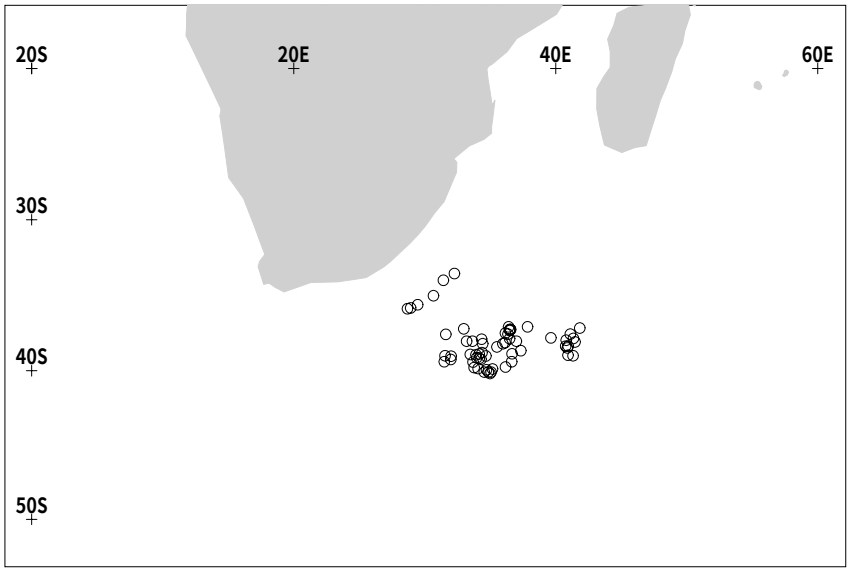

Fig. 1 Positions of the onset of line setting.