



CCSBT-CC/1310/17

Options for strengthening the CCSBT's Scientific Observer Program Standards

Background

The Seventh meeting of the Compliance Committee (CC) agreed that the Executive Secretary would consult with Members on their objectives and requirements in relation to a Regional Observer Program (ROP), analyse the requirements, and report back to the CC in 2013 with options on how to move forward.

The Secretariat distributed Circular #2013/011 on 1 March 2013 to obtain Members' initial views in relation to a ROP. The Secretariat then prepared a paper (CCSBT-CCWG/1305/06) for the 14-16 May 2013 meeting of the Compliance Committee Work Group (CCWG) containing these views together with potential options for Members' consideration. This CCWG paper is provided to the CC meeting as CCSBT-CC/1305/BGD01.

Participants at the CCWG meeting supported the concept of strengthening the current CCSBT Scientific Observer Program Standards (SOPS) and requested that the Executive Secretary finalise the paper taking Members' comments into account and including a clear set of options for Member's consideration.

At the CCWG meeting, there was strong support for strengthening the existing CCSBT SOPS instead of having a centralised regional scientific observer program. This means that Members and Cooperating Non-Members (CNMs) would continue to operate their own scientific observer programs in accordance with the SOPS. The options below are based on the assumption that the existing CCSBT SOPS will be strengthened instead of having a centralised regional scientific observer program.

Proposed Options for Strengthening the SOPS

During 2013, CCSBT Members expressed a wide range of differing opinions regarding options for strengthening the SOPS. Paper CCSBT-CC/1305/BGD01 provides a summary of Members' views on the different options together with compromise options previously suggested by the Secretariat and the reasons for those compromises. That discussion is not repeated in the present paper. The present paper presents a series of options for strengthening the SOPS which are based on the previous (BGD01) paper, but with slight refinements. Options are presented in relation to

- Overall SOPS objectives;
- Refinement of the scientific observer coverage level;
- Data collection requirements; and
- Provision of data.

The current SOPS, including changes suggested by ERSWG 10¹, is provided at Attachment A. Assuming that agreement is obtained on which of the proposed options below should be supported, it is suggested that the Secretariat revise the attached SOPS to incorporate those options. It is further suggested that the revision be subject to intersessional discussion during 2014, including being submitted to meetings of the Ecologically Related Species Working Group (ERSWG) and the Extended Scientific Committee (ESC) as appropriate for further comment. Depending on the nature of comments received, it should be possible to have a revised SOPS ready for consideration and adoption at CCSBT 21.

1. Overall SOPS objectives

The current SOPS was developed as part of the Scientific Research Program (SRP), which had an overall objective of improving the quality of the data and information used as input to the stock assessment for Southern Bluefin Tuna (SBT), contributing to the development of reliable indices to monitor future trends in SBT stock size and identifying directions for further scientific research. Since the SRP was developed, the requirements of CCSBT observer programs have expanded such that the overall objectives of the SOPS have grown beyond those for SBT stock assessment and monitoring. Consequently, the overall objectives of the SOPS should be altered to reflect the current situation. The following overall objectives for the SOPS are proposed.

- To improve the verification, quality and availability of data and information collected and used:
 - as input to stock assessments² for Southern Bluefin Tuna (SBT);
 - for the assessment of the impact of fishing for SBT on Ecologically Related Species; and
- To collect and provide information for verifying compliance with relevant CCSBT conservation and management measures.

2. Refinement of the scientific observer coverage level

A number of issues exist in relation to the coverage level, including whether the coverage level should be a target or a binding level, an appropriate definition to use for coverage and the actual level of coverage. It is proposed that:

- The observer coverage level remain a target coverage, but that the SOPS be revised to make it clear that there is an expectation that all Members and CNMs will achieve the target and that failure to reach the target would be questioned by the Compliance Committee. In the event that the target is not achieved in any year, an explanation of the reason(s) for the failure, together with plans for improvement to achieve the target in the next year would also need to be provided to the Compliance Committee³.
- The target observer coverage level (and reporting against that target) should be defined (by default) as being the percentage of the SBT catch observed from all vessels that either target SBT or have a significant bycatch of SBT. This is essentially what the current SOPS specifies⁴. As part of this definition, the term “significant bycatch” should also be defined and it is recommended that Members and CNMs conduct analyses of their observer data to suggest a suitable definition for this term for consideration at the next meeting of the Compliance Committee.

¹ The changes suggested by ERSWG 10 are shown in tracked changes mode. Most (but not all) of the ERSWG’s suggestions relate to data collection requirements. It should also be noted that the ERSWG has not finished its revision of the SOPS. For example, the details of seabird mitigation measures to record for each set are subject further to consideration and further work is required on life status definitions to use with discards.

² Including the CCSBT’s Operating Model and Management Procedure.

³ This is consistent with the “Resolution on action plans to ensure compliance with Conservation and Management Measures” that was adopted by CCSBT 16 in 2009.

⁴ This is because the current SOPS “cover the fishing activity of CCSBT members and cooperating non-members wherever southern bluefin tuna are targeted or are a significant bycatch”. Furthermore, while the SOPS specifies that “The Program will have target observer coverage of 10% for catch and effort monitoring for each fishery”, the SOPS further specifies that “This level of coverage is relative to actual fishing operations, which, if randomly distributed, should result in about 10% of the catch”.

- In addition to the above “default definition” for observer coverage levels, individual Members and CNMs should be allowed to develop an effort based definition for their specific fishery. This would cater for those Members and CNMs that prefer to define the target observer coverage level in terms of effort instead of catch⁵. Any effort based definitions should be based on rigorous analyses of the Member’s or CNM’s scientific observer data. Furthermore, before the effort definition is used, the analysis should be presented to the ESC and receive the ESC’s endorsement that the proposed definition would result in an equivalent observer coverage as the catch based definition.
- The 10% target coverage level specified in the SOPS should remain as the default target coverage level for the next 3 years (i.e. until CCSBT 23) unless the CCSBT agrees otherwise. However:
 - A set of achievable interim targets should be established for Indonesia while Indonesia is establishing its observer program. These might be 5% for 2014, 7.5% for 2015, and 10% thereafter (unless the default target changes).
 - Options should be considered by each Member and CNM for increasing the coverage level for ERS purposes in high risk areas identified by the ERSWG, including through remote monitoring techniques. Members and CNMs should report annually on their progress in investigation and implementation of such options.
 - CCSBT 23 (in October 2016) request that its subsidiary bodies (ERSWG, ESC, CC) review the default target observer coverage level and provide advice on the impact of differing levels of observer coverage on their ability to provide robust management advice to the Extended Commission.

3. Data collection requirements

Data collection requirements for the SOPS should be subject to review as needs change. However, revised data collection requirements may require changes to each Member’s and CNM’s observer program and additional training of observers. Therefore, revisions need to be carefully considered before these aspects of the SOPS are changed. It should be noted that the ERSWG has already commenced a process to develop a set of minimum requirements for observer data. It is proposed that:

- CCSBT support the current work of the ERSWG to the review/develop minimum observer ERS data collection requirements and that the CCSBT also support any review work that the ESC or CC may decide to conduct in this area in relation to SBT data or compliance requirements.
- Revised data collection requirements recommended by ERSWG 10 be included in the revised SOPS that is proposed for development in 2014 and that they be subject to the intersessional discussion process proposed for 2014. This will give greater opportunity to further review ERSWG 10’s recommendations before implementation.

4. Provision of data

The current SOPS focuses on data collection, but it does anticipate that scientific observer data would be provided to the CCSBT at some stage⁶. A variety of confidentiality issues exist with provision scientific observer data, so it is proposed that a two-step approach be taken.

- Firstly, during 2014:
 - Modify the SOPS to specify that aggregated observer data should be provided in accordance with specifications to be recommended by the ESC and ERSWG for the use of those groups⁷.

⁵ One reason for using an effort target instead of a catch target is because it may be easier to predict a vessel’s fishing effort than to predict its SBT catch when preparing to dispatch observers.

⁶ Section 1 of the SOPS states that “- data collected would become part of the CCSBT database as subsequently agreed in CCSBT protocols ...”

- Task the ESC to develop specifications for provision of aggregated observer data that it considers should be provided⁸.
- Modify the SOPS to include specifications and requirements for analyses⁹ that are considered necessary on an ongoing basis, but for which data is not provided. Members and CNMs would be required to conduct these analyses with their own observer data and report the outcomes of such analyses to the ESC and ERSWG.
- Task the ESC and ERSWG with developing specifications and requirements for such analyses.
- Secondly, that CCSBT 23 (in October 2016), request that the ERSWG and ESC evaluate the limitations of these data provision arrangements and recommend to the Extended Commission areas where a finer scale of data provision or analysis is required to further improve the quality of management advice.

Prepared by the Secretariat

⁷ Noting that the ERSWG has already agreed specifications for provision of highly aggregated ERSWG data, but that the ESC has not developed such specifications.

⁸ It is envisaged that these data will need to be aggregated to a high level (e.g. by gear, quarter and CCSBT statistical area) to minimise the number of cells that contain data from a small number of vessels.

⁹ The current SOPS does not specify any requirements for analysis of data collected.

Attachment A

Commission for the Conservation of
Southern Bluefin Tuna



みなまぐろ保存委員会

**DRAFT REVISED CCSBT Scientific Observer Program
Standards**

*from Attachment 6 of the
Report of the 10th Meeting of the Ecologically Related Species Working Group*

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1. BACKGROUND

The Commission for the Conservation of Southern Bluefin Tuna (CCSBT) has adopted a Scientific Research Program (SRP) with an overall objective of improving the quality of the data and information used as input to the stock assessment for Southern Bluefin Tuna (SBT), contributing to the development of reliable indices to monitor future trends in SBT stock size and identifying directions for further scientific research.

At CCSBT7 in April 2001 the Commission adopted the report of the Fifth Meeting of Scientific Committee, which recommended a SRP incorporating a Scientific Observer Program as one of four priority elements. The Observer Program endorsed by the Commission comprised the following features:-

- an observer coverage of 10% for catch and effort as a target level
- the level of observer coverage for estimation of tag reporting rates will depend on the scale of the tagging program subsequently agreed by the Commission and the tag recapture rate.
- standards for training of observers, operation of observer programs and the data to be collected including the forms to be used will be prepared
- data collected would become part of the CCSBT database as subsequently agreed in CCSBT protocols
- member countries will be responsible for operation of observers in high seas and domestic EEZ fisheries on their flag vessels
- all fleet components should be observed and target levels of observer coverage should be the same for all fleet components
- an exchange of observers between countries on a regular basis should be encouraged to maintain consistency and increase mutual trust in the results of the observer program
- recruitment of some observers from non-member nations would be encouraged

To facilitate implementation, the 6th Scientific Committee agreed that:-

- there would be an exchange of data sheets and standards for longline fleets between member countries through the Secretariat
- Australia would develop proposed program standards and data forms for the surface fisheries, taking note of the characteristics of observer programs administered by other fisheries management organizations
- the information gathered would be exchanged through the Secretariat
- proposals on draft CCSBT observer program standards will be presented and finalized at the 7th Scientific Committee meeting in 2002

Dr. Ianelli of the Advisory Panel together with the SC chair developed an initial draft of proposed outline of a CCSBT scientific observer program at the 6th Scientific Committee to serve as a basis for further discussion (See the Attachment F of the 6th SC Report.).

CCSBT8 endorsed the 6th Scientific Committee's proposals in October 2001.

The standards set out in this document reflect these decisions of the Commission and were developed in consultation with national observer program coordinators. A target level of observer coverage to meet tag reporting rate objectives has not yet been determined. When determined, the standards will be updated.

In developing the standards, the Secretariat has prepared a generic document for both surface and longline fisheries. Where the natures of the two types of fishery are differentiated in terms of observer activity, this is identified.

The tasks and record keeping requirements have been formulated to gather only that information, which is relevant to the objectives of the SRP. Consideration was also given to the practical limitations on the ability of observers to complete tasks in the fishing environment they would be operating in.

In order to facilitate implementation of the standards, the term “member” in this document means any Member of the Extended Commission of the CCSBT.

Reference to the acronym CCSBT is inclusive of the Commission and Extended Commission.

2. OBJECTIVES

The standards set out below provide the framework for the operation of the CCSBT Scientific Observer Program by members.

The objectives of the standards are:

1. To provide a framework for the alignment of members’ scientific observer programs with the objectives of the SRP.
2. To standardize scientific observer programs across fleets and fisheries among members.
3. To specify minimum standards for the development of a scientific observer program for members without a program.
4. To provide a minimum set of standards for collection of bycatch data, consistent with international recommendations, and where appropriate to assist in harmonization of bycatch data collection across tuna Regional Fisheries Management Organisations.

All members are expected to adapt their respective programs ~~taking into account~~ to, at a minimum, meet these standards but recognizing-noting that members may have additional-are encouraged to implement further requirements they wish to maintain in their respective programs.

3. RESPONSIBILITY FOR PROGRAM OPERATION

Responsibility for the operation of the CCSBT Scientific Observer Program on the high seas and in domestic EEZ fisheries will lie with the member whose flag is flown on the vessel.

Each member’s Scientific Observer Program will be managed taking into account these standards.

Where there is an external observer exchanged under agreements concluded between members or an observer recruited from a non-member nation, that observer shall comply with the laws and regulations of the member which exercises jurisdiction over the vessel to which the observer is assigned.

4. COVERAGE

The CCSBT Scientific Observer Program will cover the fishing activity of CCSBT members and cooperating non-members wherever southern bluefin tuna are targeted or are a significant bycatch.

5. LEVELS OF SCIENTIFIC OBSERVER COVERAGE

The Program will have a minimum target observer coverage of 10% for catch and effort monitoring for each fishery.

Observer coverage should therefore be representative of different vessel-types in distinct areas and times.¹

¹ For the purpose of this standard, it is recognized that there are many ways in which catch and effort can be stratified including vessels, areas and times. This level of coverage is relative to actual fishing operations, which, if randomly distributed, should result in about 10% of the catch.

In order to approach 10% coverage in some strata (e.g., specific vessel-types in certain areas and times) it may be necessary to have higher than 10% coverage in other strata.²

The exact level of observer placement will require periodic assessment to determine if the target level of coverage is achieved.

Consideration should also be given to higher levels of coverage in some stratas from time to time to address specific fisheries management questions (e.g. to better quantify non-fish and protected species bycatch where this is identified as a risk).

6. ASSIGNMENT OF SCIENTIFIC OBSERVERS TO VESSELS

From the scientific perspective, it is important to ensure that the data collected through the scientific observer programs provide representative information and sampling for the entire fleet. Ideally, each individual operation should have an equal and independent probability of being observed. In practice, this ideal may not be possible to achieve. Nevertheless, the basic principle of representative sampling should underlie the assignment of scientific observers to vessels.

It is the responsibility of each member when implementing an observer program, to assign observers to its vessels and cruises based on a carefully considered and appropriately designed sampling scheme that has a high likelihood of ensuring reasonably representative coverage. The program should ensure that, within the main fishing areas and seasons and to the extent possible, all representative vessels, areas, and time periods have an approximately equal probability of being sampled.³

Each member should evaluate and analyse the sampling scheme used for the assignment of observers against the principles outlined above. Each member should document the scheme used for the observer assignments actually implemented and make this information and data collected available to the Commission in the manner described in Section 11 to enable review within the Commission of whether or not the standards are being met.

The placement of observers should also encompass arrangements to ensure the independence and scientific integrity of the data.

7. TAGGING PROGRAM

Observer programs make a very valuable contribution to the direct recording of recaptured tags, and to the estimation of non-reporting rates. Failure to adequately quantify the uncertainty associated with estimates of tag reporting rates will substantially degrade the value of any resultant mortality estimates for use in stock assessments.

Observer plans and training programs should include specific provision for the role and responsibilities of observers for tag recapture reporting. A supplemental level of observer coverage may be required to take into account the results of the CCSBT tagging program.

² While it might be possible to observe 10% of the catch from a single vessel (if a hypothetical fleet consisted of 10 vessels with equal catch allocations), this would not achieve the objective of sampling fishing operations with approximately equal probability, particularly if the vessels fish in different areas using different techniques. Clearly there are logistical difficulties in achieving random observations of fishing operations.

³ To achieve a desired target coverage level may require a higher observer placement level. For example, it may take 150 observed vessel days out of a hypothetical 1,000 vessel-day year to achieve a target of 10% coverage for all important strata. In part, this may be due to the fact that the ability of observers to transfer among vessels on the fishing grounds is limited. The factors affecting this include the heterogeneity of the fleet and fishing behaviour.

8. RECRUITMENT AND TRAINING

Each member is responsible for the recruitment and training of observers for placement on their flagged vessels. Details of the processes maintained for this responsibility are for members to manage consistent with the domestic environment in which they operate.

Training schemes should be constructed to impart the skills necessary to adequately collect the scientific data and should take account of the following principles.

Qualifications of Observers

Scientific Observers for the program should have the following attributes:

- Technically trained or experienced personnel for the fleets concerned, with interests related to fisheries.
- Ability to work at sea in difficult conditions.
- Ability to work under stressful psychological and physical situations.
- Ability to work with a boat's crew on a cooperative and team basis over long and continuous periods at sea.
- Soundness of mind and body.

Independence / Integrity

Observers should not have current financial or beneficial interests in the fisheries in which they will be required to operate as observers.

Observers should not have been found guilty of a serious criminal offence for five years prior to appointment as an observer.

Scientific Observer Training

Members should establish and maintain a structured training program for the CCSBT Scientific Observer Program. Manuals should be developed for this purpose and courses operated, which would allow for observers to exchange approaches and experiences to improve the data collection process.

A Scientific Observer Training program of each Member should include, at least, the following items.

- Briefing on the CCSBT SRP, particularly the CCSBT Scientific Observer and Tagging Program elements to promote a full understanding of the rationale for the Programs.
- Fishery management and biological field collection programs including species identification, data collection and sampling procedures. This should also include identification of bycatch species, such as seabirds, sharks, marine reptiles, other ERS and knowledge of current mitigation measures that are used in the CCSBT.
- Monitoring tag recovery.
- Training on safety at sea and first aid.
- Protocols for dealing with difficult situations (personal conflicts and physical hazards).
- Preparation of cruise/trip reports
- De-briefing with observers to provide feedback on improvement.
- Any additional technical training required for special project such as tagging fish, when necessary

Recruitment of Observers

Scientific observers could be recruited from a variety of related fishery sectors to widen the knowledge and experience base of the observer cohort.

Exchange of observers between members and recruiting some observers from non-members should be encouraged to improve consistency and transparency in the program. Responsibility for

implementing observer exchanges would reside with members and the exchanges would be organised between relevant members and non-members as appropriate

9. THE OBSERVED VESSEL

Any vessel selected for an observation should be capable of meeting the minimum requirements for accommodation, sanitary facilities, meals, equipments and communication systems equivalent to those of the crew (junior officer when possible) so that the observer's duties are not compromised.

A selected vessel should be advised of its responsibility for the observer while they are on board.

10. INFORMATION AND DATA

Scientific data to be collected should include the following categories of information:

- A. Details of the observed vessel, including its size, capacity and equipment.
- B. Summary of the observed trip, which will include information such as the observer name and identification number, degree of experience, dates of embarkation and disembarkation.
- C. Comprehensive catch, effort and environmental information for each set that occurred while the observer was on-board the vessel, regardless of whether the set/haul was actually observed. This includes the target species, location fished and quantity of gear used.
- ~~C-D.~~ Fishing methods and gear, including mitigation measures in use while fishing. The observer should record/describe mitigation measures, including the configurations, that were in use during the observed period. This includes the details of mitigation measures and their use as described in Attachment 1. Where applicable, the absence of mitigation equipment should also be noted.
- ~~D-E.~~ Observed catch information for each period of observation, including the time at start and end of observation, the number of hooks observed, the observed catch in number and weight for SBT and all other species caught to the extent possible.
- F. Biological measurements taken of individual SBT, as much as possible, including its condition, length, weight, sex and details of samples (otoliths, scales, gonads, etc.) that were taken from the SBT for later analysis.
- ~~E-G.~~ Information on SBT and ERS not retained should include counts by species and their life status (using the relevant codes as detailed in Attachment 1).
- ~~F-H.~~ SBT tag recovery information, including, both tag numbers (actual tags also to be provided), date, location, length, weight, sex, details of samples taken (e.g. otoliths), and whether or not the tags were spotted during a period of fishing that was being observed.

Most of the above categories of information are related to each other in a hierarchical relationship. So, the biological details of a fish (E) relates to a particular observed period (D) from a specific set (C) for a trip (B) on a particular vessel (A).

A detailed description of the proposed information to be collected for each of the above categories is provided in Attachment 1. Hierarchies for prioritising the collection of data by species caught and SBT data are at Annex 1. In severe weather conditions, data collection should only be conducted to the extent that is it safe for the observer to do so.

11. REPORTING

Each member ~~should~~ shall provide a report to the Extended Scientific Committee and the Ecologically Related Species Working Group on the sampling scheme and arrangements for collecting data of its observer program as a separate section in the member's annual fishery report. Attachment 2 documents the information that should be provided.

Each member shall include in National Reports to the Compliance Committee and Commission, a summary of the levels of compliance in relation to the implementation of mandatory mitigation measures.

12. CONFIDENTIALITY OF DATA AND INFORMATION

All data and information obtained through an observer program belongs to the flag country of the observed vessel. An observer should not disclose any information without the permission of the flag country.

Type and Format of Scientific Observer Data

A) Details of the observed vessel and gear

The vessel details are recorded only once for an entire trip

All fishing:

- Vessel's Name
- Vessel's Call-sign
- Vessel's Flag Country
- Name of the Captain
- Name of the fishing master
- Year vessel built
- Engine brake power (kw/hp)
- Overall length (metres)
- Gross tonnage (tonnes)
- Number of people in crew (all staff, excluding observers)
- Total freezer capacity (cubic metres)
- Fuel capacity (tonnes)
- Instrumentation and electronic fishing equipment

Instrumentation	Yes/No (or code)
NNSS	
GPS	
Omega	
Radio direction finder	
Radar	
Weather Fax	
Track plotter	
NOAA receiver	
Sounder (1=colour monitor, 2=monochrome monitor, 3=printer)	
Sonar (1=scanning, 2=PPI)	
Doppler current monitor	
Sea surface temperature recorder	
Bathy-thermograph	
Bird radar	

Longliners only:

- Material of mainlines (Nylon, Cotton thread, Other)
- Material of branchlines (Nylon, Cotton thread, Type of trace, Other)
- Material of buoylines (Nylon, Cotton thread, Other)
- Details of mitigation measures used
 - For seabirds
 - Tori Pole/Bird scaring line used (Y/N)
 - Line weights used (Y/N)
 - Night setting with minimal deck lighting (Y/N)
 - Bait thrower/line shooter used (Y/N)
 - Dyed Bait (Y/N)
 - Details about management of offal
 - Underwater setting chute (Y/N)
 - Side setting (Y/N)
 - Haul mitigation (Y/N)
 - Branch line/snood haulers
 - Brickle curtain
 - Water cannon
 - Other mitigation measures used

Purse seiners only:

- Capacity of power block
- Capacity of purse winch
- Lengths and depths of all nets on board including expanded figure
- Mesh sizes of nets on board
- Number of net skiffs on board

B) Summary of the observed trip

- Observer's name
- Observer's organisation
- Date observer embarked (translatable to 24 hour clock, UTC to the day)
- Date observer disembarked (translatable to 24 hour clock, UTC to the day)

C) Comprehensive catch, effort and environmental information for each set

This information is recorded for each set while the observer is on-board a vessel, regardless of whether the set/haul was actually observed.

All fishing:

- Date and time at start of Set (translatable to 24 hour clock, UTC)
- Date and time at end of Set (translatable to 24 hour clock, UTC)
- Date and time at start of Retrieval (translatable to 24 hour clock, UTC)
- Date and time at end of Retrieval (translatable to 24 hour clock, UTC)
- Location at start of Set (latitude+N/S and longitude+E/W to a minute of accuracy)
- Wind speed (with unit) and direction (N, NNE, NE, etc.) of the operation
- ~~At the period of the wind measured~~ Time of wind measurement for operation (e.g. Noon, start of set etc.)
- Sea surface temperature (degrees Celsius, to 1 decimal place) at start of Set⁴
- Intended target species⁵

Longlining:

- Location at end of Set (latitude+N/S and longitude+E/W to a minute of accuracy)
- Direction of line set (eg straight, curved)⁶
- ~~• Wind speed (with unit) and direction (N, NNE, NE, etc.)~~
- ~~• (Comment: It is enough to collect the temperature at the start of set) At the period of the location and wind are measured for the operation (e.g. noon, start of set etc.)~~
- Direction of line set (straight, curved)
- Actually used mainline length (km)
- Actually used branchline length (m)
- Actually used buoyline length (m)
- Intended depth of the shallowest hook (m)
- Intended depth of the deepest hook (m)
- Type of hooks
- Number of hooks
- Number of baskets
- Seabird mitigation measure used:
 - Mass of added line weight (where applicable)
 - Distance between weight and hook (where applicable)
 - Number of tori lines used (where applicable)
 - Estimate of the aerial coverage achieved by tori lines (m)

⁴ It is sufficient to collect the temperature at the start of a set – i.e at the time the location and wind are measured (eg. Noon, start of set, etc)

⁵ All species should be reported with FAO species codes, or using National codes and providing a translation table to FAO species codes. Individuals should be identified as far as possible to species level

⁶ Codes will be used to describe the type of line set, eg. S=straight, C=curved, U=u-shaped.

Distance between baskets, beacons, buoys, or floats as is appropriate to the operation (m)

- Percentage of bait by bait categories that were Fish, Squid, Artificial, and Other
- Bait status (live or dead)
- Total number by species⁵ of SBT, and other tuna and tuna-like species caught, retained or discarded.
- Total processed weight (kg) and Processed State⁷ by species⁵ of SBT, and all other species caught. (~~i.e. all fish, birds, turtles etc.~~)

Purse Seining:

- Spotter plane used (Y/N). If used:
 - Time (translatable to 24 hour clock, UTC) and location aircraft began search
 - Time (translatable to 24 hour clock, UTC) and location aircraft ended search
 - Number, location of schools spotted by aircraft
 - Estimated size of each school spotted by the aircraft
 - Total searched distance
- Bird Radar used (Y/N)
- Logbook number and type
- Start and end Time spent for searching (from xx:xx to yy:yy translatable to 24 hour clock, UTC), location and total searched distance
- School finder (plane/vessel)
- Chumming boat used (yes/no)
- Chum status (Alive/Dead)
- Amount of chum used
- Start and end time for chumming (translatable to 24 hour clock, UTC)
- Start and end time for net shooting (translatable to 24 hour clock, UTC)
- Start and end time for net hauling (translatable to 24 hour clock, UTC)
- Start and end location for net shooting
- Start and end location for net hauling
- Light attraction used (yes/no)
- Total of wattage of lights used
- Start and end time for light attraction
- School type (e.g., shoaling/surface, FAD/debris associated)
- Length (m) of net set
- Height (m) of the net
- Number of net skiffs used
- Date and time that transfer to tow cage commenced
- Identification number of the tow cage to which the SBT were transferred
- Name of Carrier Boat that received the fish
- Estimated catch per set, species composition
- Estimated weight (kg) and/or number by species of SBT and other species caught
- Estimated weight of SBT caught alive
- Estimated weight and/or number of SBT dead during operation

Cage Towing:

- Name of carrier boat
- Tow cage identification number
- Cage depth (metres)
- Cage ring diameter (metres)
- Cage mesh size (in centimetres)
- Cage has second or predator net (Y/N)
- Number of divers used
- Chute fitted in cage (Y/N)
- Effective tow speed (km/hour)

⁷ As per processing codes identified in the CCSBT CDS Resolution. RD=round/whole, GG=gilled and Guttled, DR=dressed etc., as per TIS codes.

- If the catch was received from fishing operations, then for each catcher boat from which SBT were transferred, record:
 - Name of catcher boat
 - Call sign of catcher boat
 - Date and time (translatable to 24 hour clock, UTC) transfer started
 - Estimated weight of SBT transferred (tonnes)/dead SBT before transfer
- If the catch was received from another tow cage, then, record:
 - Name of the carrier boat from which the SBT came
 - Identification number of the tow cage from which the SBT came
 - Date and time (translatable to 24 hour clock, UTC) transfer started.
 - Estimated weight of SBT transferred (tonnes)/dead SBT before transfer
- Date and time (translatable to 24 hour clock, UTC) and place that tow finished
- Total weight of SBT mortalities per day from commencement of towing to end of transfer to farm
- Total number of SBT mortalities per day from commencement of towing to end of transfer to farm

D) Observed catch information

This relates to that part of the catch that was actually observed by the observer during the hauling process. All information recorded here relates only to the period(s) that were observed. Annex 1 provides hierarchies for the collection of data. Observers should use these hierarchies to prioritise data collection as circumstances prevail on the observed vessel.

Longlining:

- Date and time at the start of the observation period (translatable to 24 hour clock, UTC)
- Date and time at the end of the observation period (translatable to 24 hour clock, UTC)
- Number of hooks observed
- Total number by species⁵ of all species caught and ~~retrieved~~ retained during the observed period⁸
- Total processed weight (kg) by species⁵ and Processed State⁷ of all species caught and retained during the observed period
- Total number and weight when possible (whole weight, in kilograms) by species⁵ of all species caught but discarded during the observed period and life status^{8,9}.

Purse Seining:

The entire purse seining shooting and hauling operation should be observed

- Date and time at the start of the observation period (translatable to 24 hour clock, UTC)
- Date and time at the end of the observation period (translatable to 24 hour clock, UTC)
- Estimated % of school caught
- Estimated weight (tonnes for SBT, kg for all other species⁵) and/or number by species of SBT, and all other species caught, retained or discarded including life status^{8,9}
- Weight of SBT mortalities from commencement of fishing to end of transfer to cage
- Number of SBT mortalities from commencement of fishing to end of transfer to cage
- Number of species identified as escaped from commencement of fishing to end of transfer to cage
- Number by species identified as discarded from commencement of fishing to end of net hauling

⁸ This includes target species (such as SBT) and all bycatch species such as seabirds, ~~and~~ sharks, marine reptiles etc.

⁹ Individuals that are discarded with significant injuries and are not considered likely to survive should be included in the number of dead individuals.

Cage Towing:

The observer must observe or conduct each mortality count during the period of the tow.

- Date and time at the start of the observation period (translatable to 24 hour clock, UTC)
- Date and time at the end of the observation period (translatable to 24 hour clock, UTC)
- Total weight of SBT mortalities per day from commencement of towing to end of transfer to farm
- Total number of SBT mortalities per day from commencement of towing to end of transfer to farm

E) Biological measurements of individual fish. Biological measurements are only required for SBT, but where possible, effort should be made to measure other species.

For the purposes of SBT analyses, accurate size measurements of SBT are required. SBT should be selected in a manner to ensure within strata randomness. For example, for large numbers of fish caught in a single operation (e.g., a purse seine vessel) a systematic sampling may be appropriate

The actual number of fish should be spread throughout as many separate fishing operations as possible. For example, it is nearly always the case that sampling 20 fish (randomly) from 10 operations is much better than sampling 200 fish from every 10th operation. The required actual number of samples should be re-evaluated from time to time and as needs change.

- Species⁵
- Life status category¹⁰
- Length (for SBT, fork length measured on straight length, rounded up to the centimetre¹¹)
- Length unit
- Length code (fork length, eye fork, etc.)
- Length, lower jaw-fork length
- Whole weight (kg), if possible. This is the measured weight before processing as opposed to a calculated whole weight.
- Processed weight (kg)
- Processed State⁷
- Sex (F=female, M=male, I=indeterminate, D= not examined)
- Samples taken, specifying:
 - A unique identification number given to the sample,
 - The type of samples taking, including: whole specimen, or samples of otoliths, scales, vertebrae, stomach, muscle, tissue, gonads, feathers, bird bands etc.)
 - Any additional details that may explain the capture of the sample (e.g. for seabirds the specific mitigation at the time of capture)

F) SBT Tag recovery information

Some of the data recorded here duplicates data that already exists in the previous categories of information. This is necessary because tag recovery information may be sent separately to other observer data.

- Observer's name
- Vessel's name
- Vessel's call sign
- Vessel flag
- Collect and provide the actual tags
- Tag colour
- Tag numbers (The tag number is to be provided for all tags when multiple tags were attached to one fish. If only one tag was recorded, a statement is required that specifies whether or not the other tag was missing)
- Date and time of capture (UTC)

¹⁰ The observer program will, as a minimum, distinguish the following life status categories: dead and damaged; dead and undamaged; alive and vigorous; and unknown.

¹¹ Length should be rounded (not truncated) to the nearest centimeter. For example, 62.4cm becomes 63cm and 62.5cm becomes 63cm (63 cm for both cases).

- Location of capture (latitude+N/S and longitude+E/W to 1 minute of accuracy)
- Length (fork length, rounded up to the nearest centimetre¹¹)
- Processed Weight (kg.)
- Processed State⁷
- Details of samples taken, specifying:
 - A unique identification number given to the sample,
 - The type of samples taking, including: whole specimen, or samples of otoliths, scales, vertebrae, stomach, muscle, tissue, gonads, etc.)
- Sex (F=female, M=male, I=indeterminate, D=not examined)
- Condition of recaptured fish and their life status
- Whether the tags were found during a period of fishing that was being observed (Y/N)
- Reward information (e.g., name and address where to send reward)

HIERARCHIES FOR DATA COLLECTED BY SPECIES AND SBT DATA

This annex provides a guideline for the collection of data by observers to enable prioritising of observer activities.

The flow of the main data collection activities are:

Fishing operation information

- All vessel and shot information

Monitoring of hauls

- Record time and species caught
- Record whether the specimen was retained or discarded (with life status)

Biological sampling

- Collect data on length and whole and/or processed weight (including processed state)
- Check for presence of tags
- Record sex
- Collect biological samples
- Take photos

Both the monitoring of hauls and the biological sampling procedures should be prioritised among species groups as follows:

Species	Priority (1 is the highest)
SBT	1
Other tunas, billfishes, Gasterochisma, and sharks	2
All other species	3

“tunas” means all *Thunnus* species except SBT

The allocation of observer effort among these activities will depend on the type of operation and setting. The size of sub-samples relative to unobserved quantities (e.g., number of hooks examined for species composition relative to the number of hooks set) should be explicitly recorded under the guidance of member country observer programs.

FORMAT OF NATIONAL REPORT SECTIONS ON DEVELOPMENT AND IMPLEMENTATION OF SCIENTIFIC OBSERVER PROGRAMS

REPORT COMPONENTS

The observer program implementation report should form a component of the annual National Reports submitted by members to the Scientific Committee. This report should provide a brief overview of observer programs for SBT fisheries, and is not intended to replace submitted papers containing proper analyses of collected observer data. This observer program report should include the following sections:

A. Observer Training

An overview of observer training conducted, including:

- Overview of training program provided to scientific observers.
- Number of observers trained.
- Summary of qualifications / training and years of experience of the observers deployed in SBT fisheries during the past year.
- A copy of the latest version of relevant manuals in their original language for reference

B. Scientific Observer Program Design and Coverage

Details of the design of the observer program, including:

- Which fleets, fleet components or fishery components were covered by the program.
- How vessels were selected to carry observers within the above fleets or components.
- How was observer coverage stratified: By fleets, fisheries components, vessel types, vessel sizes, vessel ages, fishing areas and seasons.

Details of observer coverage of the above fleets, including:

- Components, areas, seasons and proportion of total SBT catch, specifying units used to determine coverage.
- Total number of observer employment days, and number of actual days deployed on observation work.

C. Observer Data Collected

List of observer data collected against the agreed range of data set out in Attachment 1. In broad structure this would include:-

- Effort data: Amount of effort observed (vessel days, sets, hooks, etc), by area and season and % observed out of total by area and seasons
- Catch data: Amount of catch observed of SBT and other species (if collected), by area and season, and % observed out of total estimated SBT catch by area and seasons
- Length frequency data: Number of fish measured per species, by area and season.
- Biological data: Type and quantity of other biological data or samples (otoliths, sex, maturity, Gonosomatic index, etc) collected per species.
- The size of sub-samples relative to unobserved quantities.

D. Tag Return Monitoring

Number of tags returns observed, by fish size class and area.

E. Problems Experienced

- Summary of problems encountered by observers and observer managers that could affect the CCSBT Observer Program Standards and/or each member's national observer program developed in the light of the Standards.