

INTER-AMERICAN TROPICAL TUNA COMMISSION
SCIENTIFIC ADVISORY COMMITTEE
SIXTH MEETING

La Jolla, California (USA)
11-15 May 2015

DOCUMENT SAC-06-10e

EXTRA-BUDGETARY FUNDED RESEARCH PROJECTS

1. SIMULATION TESTING OF REFERENCE POINTS.

Objective: Assess the effectiveness and performance of the IATTC's target and limit interim reference points with regard to the principal sources of uncertainty.

Available budget: 60,000 € + 20% matching funds

The IATTC has recently adopted interim target (TRP) and limit (LRP) reference points (see [minutes of the 87th IATTC meeting](#), October 2014). The target reference points are B_{MSY} and F_{MSY} (the biomass (B) and fishing mortality rate (F) corresponding to the maximum sustainable yield (MSY)), which have traditionally been the informal target reference points used in managing tuna in the eastern Pacific Ocean (EPO). The limit reference points are those associated with a 50% reduction in recruitment under a conservative assumption about the stock-recruitment relationship (steepness = 0.75; see Maunder and Deriso 2014, [SAC-05-14](#)), which is based on biological grounds to protect a stock from serious, slowly reversible, or irreversible fishing impacts. In general, this is interpreted as ensuring that recruitment is not substantially impacted.

The IATTC has operated under the informal harvest control rule (HCR) of fishing at F_{MSY} , or more accurately, reducing the fishing mortality to F_{MSY} if the fishing mortality of bigeye or yellowfin exceeds their respective F_{MSY} as estimated by the base case stock assessments.

This project will develop simulation analyses to test the RPs under different sources of uncertainty. Given that the funding is inadequate to conduct a comprehensive MSE, the project will be limited to describing the sources of uncertainty and conducting a simulation analysis to evaluate a simplistic interpretation of the interim RPs and the informal HCR for a single species. The project will be contracted out, but with guidance and supervision by the IATTC staff. The tools developed in this project will be the basis for future MSE research.

Time frame: For final presentation at the 2017 SAC. Update given at the 2016 SAC.

Deliverables: Project report.

2. DOLPHIN POPULATION ASSESSMENT

Objective: Organization of a workshop.

Available budget: 60,000 € + 20% matching funds

In the eastern Pacific Ocean (EPO), purse-seine vessels catch yellowfin tuna found in association with dolphins. Historically, it was estimated that a large number of dolphins were killed in this process, and the populations were considered depleted. Modifications of the fishing process and the implementation of mortality limits has reduced the dolphin mortality to levels close to zero. However, there is uncertainty as to whether the dolphin populations have rebuilt and about the current impact of the fishery. Assessments of the status of dolphin populations have been based primarily on simple population dynamics models

fitted to a time series of estimates of absolute abundance based on line transect surveys, but the most recent estimates date back to 2006. Data collected by onboard observers since the late 1970s have been used to develop indices of relative abundance for dolphins, but these were discontinued in 2000 due to concerns about changes in reporting rates with the increased use of helicopters and radar. Therefore, alternatives for dolphin abundance estimation are required; these could include the use of purse-seine vessels for dedicated line-transect surveys during fishery closures, and as platforms for tagging (using visual tags, radio tags and PIT (Passive Integrated Transponder) tags) and genetics sampling, for mark-recapture modeling.

Under the ecosystem approach to fisheries management, it is important to monitor bycatch species as well as target species. Therefore, evaluation of the dolphin populations is an important part of the management of the purse-seine fishery in the EPO. The lack of recent data for these populations is an impediment to good management. We propose conducting a workshop, with invited experts in the relevant fields, to discuss data collection and assessment methodology to improve these evaluations. The work will start with the development of three background papers with the following themes:

1. Review of historic and potential data sources including fisheries data, tagging and genetics;
2. Review of data analysis methodology including line-transect and mark recapture;
3. Review of population assessment modelling methodology.

These papers will form the basis for discussions at the workshop,, which will be summarized in a report.

Time frame: Workshop held in 2016. Report presented at the 2017 SAC.

Deliverables: 1. Reports reviewing: a) historic and potential data sources; b) data analysis methodology; and c) population assessment modelling methodology. 2. Report of the workshop

3. ESTIMATION OF THE POST-RELEASE SURVIVAL RATES OF SENSITIVE SHARK SPECIES CAPTURED BY PURSE-SEINE AND LONGLINE FISHERIES IN THE EASTERN PACIFIC OCEAN

Objective: *Estimate the post-release survival rate of the oceanic whitetip shark (Carcharhinus longimanus) following capture by commercial longline fisheries in the eastern tropical Pacific*

Available budget: 150,000 € + 20% matching funds

Considering IATTC resolution [C-11-10](#) on the conservation of oceanic whitetip sharks (*Carcharhinus longimanus*) and concerns about recent declining trends in catches of the species in both the purse-seine and longline fisheries, experiments to estimate the post-release survival rate of individuals caught in the commercial tuna fisheries in the eastern Pacific Ocean (EPO) should be a high priority. These estimates are necessary for evaluating the extent to which releasing captured individuals protects the parental biomass of the species in the EPO and aids in rebuilding the stock. Since catches of the species in the purse-seine fishery have been extremely rare in recent years, we propose attaching pop-up satellite archival tags (PSATs) to a random sample of oceanic whitetip sharks (both injured and healthy) caught by longline vessels, in order to estimate their post-release survival and determine movement patterns. In collaboration with IATTC member countries, observers from national longline observer programs will be trained to attach the PSATs just prior to releasing the sharks, record their morphometric characteristics and condition, and photograph them at capture and release. Survival will be determined from the depth and temperature data recorded by the PSATs, which will be programmed to “pop up” 6 to 12 months after deployment.

Time frame: Status reports presented at the 2016 and 2017 SAC meetings.

Deliverables: Final project report. Manuscript prepared and submitted for publication in a peer-reviewed scientific journal.

4. TESTING OF NON-ENTANGLING AND BIODEGRADABLE FISH AGGREGATING DEVICES (FADS).

Objective: *Identifying non-entangling and biodegradable components that could be used in FAD construction, while still providing similar or improved function in terms of tuna aggregation*

Available budget: 180,000 € + 20% matching funds

Turtles, sharks and other non-target species can be found in association with FADs that are used in the tuna purse-seine fishery, and in some instances may become entangled in the FADs and perish. Additionally, there are concerns about the fate of FAD components that may become lost at sea or that are otherwise not retrieved- particularly if these components include plastics or other materials that are not readily degradable in seawater and may persist for years or decades in the environment. Therefore, there is an interest in identifying non-entangling and biodegradable components that could be used in FAD construction, while still providing similar or improved function in terms of tuna aggregation. The aim of this project is to identify means of constructing non-entangling FADs from biodegradable materials so as to decrease mortality of non-target species, while also minimizing contributions to ocean debris and pollution from commercial tuna fishing. The project will proceed in two phases: 1) Testing of the durability of biodegradable materials and the aggregating effectiveness of non-entangling configurations in a coastal environment, in order to identify the best prototypes for use in phase 2, and 2) Deployment of FAD prototypes from tuna purse-seine vessels to examine their effectiveness and viability under real fishing conditions. These experiments will be based in a port country with high FAD fishing activity, and logistically convenient for accessing realistic, low-cost, biodegradable FAD components.

Time frame: Status reports presented at the 2016 and 2017 SAC meetings.

Deliverables: Final project report. Manuscript prepared and submitted for publication in a peer-reviewed scientific journal.