

COMISION INTERAMERICANA DEL ATUN TROPICAL INTER-AMERICAN TROPICAL TUNA COMMISSION

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Consultancy Announcement

Design of an Eastern Tropical Pacific Ocean dolphin survey for the Inter-American Tropical Tuna Commission

The Inter-American Tropical Tuna Commission (IATTC) invites applications of individuals/entities to a consultancy for designing a survey of dolphin stocks in the eastern tropical Pacific Ocean.

The Inter-American Tropical Tuna Commission (IATTC) is the regional fisheries management organization responsible for the implementation of the 2003 Antigua Convention, the objective of which is to ensure the long-term conservation and sustainable use of the stocks of tunas and tuna-like species and other species of fish taken by vessels fishing for tunas and tuna like species in the eastern Pacific Ocean. The functions of the scientific staff are defined in article XIII of the Convention and include, among others, conducting scientific research, providing information and scientific advice and collecting statistical data. More information about the IATTC can be found at www.iattc.org.

The contract for the consultancy is for 8 months, from January 1 to August 30, 2018.

It should be taken into account however that funds are currently being raised for a second phase of the project, which will consist of the actual implementation of the survey. If these funds are secured, special consideration will be given to those applicants (individuals or entities) that would also be available for a 2-3 year period beginning in September 2018, to lead a survey and to produce estimates of abundance from the survey data.

The scope of the work to be completed during the 8-month consultancy contract, including expected deliverables, are outlined in the Terms of Reference below.

Selection Criteria

The applicants (individuals or entities) must possess extensive experience in conducting ship-based line-transect surveys for marine mammals and in distance based methods for estimation of absolute abundance, including strong proficiency with double-platform methods and model-based methods for estimation of encounter rate and of the detection function. Other important attributes of the key individual(s) involved in the contract include: excellent communication skills, both oral and written, in either English or Spanish; and, availability to travel, including to La Jolla California in May 2018 and Guatemala in August 2018.

Availability

The selected candidate (individual or /entity) must be available to begin work on January 1, 2018.

Applications

Applications may be submitted in either English or Spanish and should be sent no later than November 27, 2017, in electronic format to tmusano@iattc.org, or to the following address:

Teresa Musano
Inter-American Tropical Tuna Commission
8901 La Jolla Shores Drive,
La Jolla CA 92037-1509
USA

Applications should include the following:

- A cover letter containing a statement of purpose of the application and succinct descriptions of the relevant experiences and abilities.
- Curriculum Vitae of the key individual(s) to be involved in the contract work – preferably completing, electronically or in hardcopy, the IATTC personal history form that can be accessed at <http://www.iattc.org/StaffVacancies/IATTCPersonalHistoryForm.pdf>
- A list of references with recent knowledge of the applicant's (individual or entity) qualifications and experience that may be contacted by IATTC staff.

Terms of reference

Design of ship-based line-transect survey for ETP dolphins

BACKGROUND

Population dynamics modeling has been the preferred approach for evaluating the stock status of dolphins in the eastern tropical Pacific Ocean (ETP), and those models have relied on estimates of abundance from fishery-independent surveys that were conducted by the National Marine Fisheries Service (NMFS) periodically between 1979 and 2006. As a result of a hiatus in the NMFS surveys since 2006, there are currently no reliable indicators with which to monitor the status of ETP dolphin populations. This lack of information poses obvious problems for management. For example, the Antigua Convention of the Inter-American Tropical Tuna Commission (IATTC) requires that the status of all species potentially impacted by the tuna fisheries in the eastern Pacific Ocean be monitored. In addition, abundance estimates are needed to ensure that incidental dolphin mortalities are both sustainable and insignificant because the stock mortality limits are based on estimates of abundance. These needs provide impetus for a new ship-based line-transect survey to obtain new estimates of absolute abundance so that population trends can be updated.

OBJECTIVE

Design, in consultation with the IATTC staff and other relevant scientists, a ship-based line-transect survey for eastern tropical Pacific Ocean (ETP) dolphin species, including development of a comprehensive budget for implementation of the survey and analysis of survey results. The purpose of the survey is to generate unbiased estimates of absolute abundance for key ETP dolphin stocks/species. Those estimates will be combined with estimates from previous surveys (the 10 most recent, beginning in 1986) to obtain updated estimates of population trends.

SPECIFIC SURVEY DESIGN CONSIDERATIONS

Key stocks/species

As has been done previously, the survey design should put emphasis on obtaining unbiased estimates of absolute abundance for those dolphin stocks and species most impacted by the purse-seine fishery on dolphins associated with yellowfin tuna (*i.e.*, the northeastern stock of the offshore spotted dolphin (*Stenella attenuata*) and the eastern spinner dolphin (*S. longirostris*).

Compatibility with previous surveys

Because the purpose of the survey is to update estimated population trends for key ETP dolphin stocks and species, the survey should be designed so as to be back-compatible with previous surveys (those beginning in 1986). Therefore, unless there is a strong scientific reason to do otherwise, the survey design should include the following:

- Two survey vessels, each for at least 120 survey (sea) days, to take place during the same time of the year as previous surveys (*i.e.*, late July to early December) and achieving the same (or higher) level of survey effort as past surveys. The survey design needs to consider three possible combinations of survey vessel types: two research vessels, two commercial purse-seine vessels, and one commercial purse-seiner and one research

vessel. The purse-seine vessels would be dedicated to the survey for the entire survey period. The advantages and disadvantages of the use of each of these three options need to be discussed in the report on the survey design and in the survey budget. For example, consideration should be given to the size and design of the sighting platforms, relative to sighting platform characteristics from previous surveys. And, for purse-seine vessels, the potential for dolphin evasive behavior should be given consideration.

- Survey vessels are to be outfitted with all required survey equipment necessary to conduct the survey (*e.g.*, 25X pedestal-mounted binoculars).
- Special training of observers in marine mammal species identification and methods for estimating dolphin group size. It is left to the discretion of the contractor whether the marine mammal observers should be specially trained tuna purse-seine observers or professional marine mammal observers.
- Calibration of observers for estimation of group size using high-resolution aerial imagery data collected during or just prior to the start of the survey. Ideally, the survey design should allow for collection of observer-specific school size calibration data during the full range of environmental conditions in which survey data will be collected (*e.g.*, Beaufort sea states 0-5). The best aerial platform(s) (*e.g.*, helicopter, ship-based drone, land-based small airplane) with which to conduct this photogrammetry study is left to the discretion of the contractor.
- Vessel calibration, in the event that the same vessels as used previously do not take part in the new survey (*e.g.*, if one research vessel and one tuna vessel were to be used).

Improvements to previous survey protocol

The survey design developed by the contractor also should be able to address the following points, bearing in mind the need for back-compatibility with previous surveys (noted above):

- *Reducing bias*
Collect data to evaluate whether imperfect detection on the trackline occurs (*i.e.*, whether $g(0) < 1$; previously perfect detection on the trackline has been assumed) during Beaufort sea state ranging from 0-5. If it is established from this survey that $g(0) < 1$, then adjustments to the abundance estimation methodology for the new survey, as well as for previous surveys will need to be undertaken, and this should be born in mind when planning the new survey. In particular, data to estimate $g(0)$ would need to be collected during Beaufort sea state conditions of 0-5, and for a range of any other environmental factors that are considered to have the potential to strongly impact detection on the trackline. Collection of data for this evaluation would presumably involve some form of a double platform design, be it two observers at different locations on the survey vessel, one observer on the survey vessel and on one observer in a helicopter, or one observer on the survey vessel and the other “observer” a mid-range drone launched from the survey vessel. Also to be decided as part of the design is whether evaluation of $g(0)$ should take place during the main survey or during a pre-survey trial cruise.
- *Improving precision*
 - Collect data on covariates that may prove useful for modeling dolphin group encounter rate, if there are other covariates not already collected as part of previous survey protocol.
 - Collect data with which to quantify variance due sources other than encounter rate, effective strip width (including $g(0)$ uncertainty) and group size, that are

considered important, for example: measurement error (*e.g.*, for perpendicular distances) .

Budget

The survey budget should include all costs necessary to implement a survey during late July to early December of 2019 or 2020 and analyze the survey data, including, but not limited to:

- Two survey vessels;
- All necessary marine mammal survey equipment (*e.g.*, 25X pedestal-mounted binoculars, computers for data entry);
- Outfitting of the survey vessels with marine mammal survey equipment and marine mammal observer accommodations;
- Marine mammal observer training;
- Equipment, ship time, and any other resources necessary to obtain data for calibration of observer dolphin school size estimates;
- All salaries of survey personnel and all travel of survey personnel to/from the survey ship.
- All travel associated with oversight of outfitting survey vessels with marine mammal survey equipment.
- All salaries of personnel needed to oversee and organize the survey and produce estimates of abundance and a final report of the survey results (*e.g.*, survey coordinator, personnel for data analysis).
- All equipment needed to analyze survey data and produce estimates of abundance and a final report of the survey results (*e.g.*, computers).

SCOPE AND TASKS

The contractor will:

- 1) Review the relevant literature on ETP dolphin surveys and abundance estimation.
- 2) Take into consideration the recommendations outlined in the report of the IATTC workshop held October 18-20, 2016 (<http://www.iattc.org/Meetings/Meetings2016/DolphinWorkshop/IATTC-Dolphin-Workshop-October-2016-Report-DRAFT.pdf>) and in the workshop background document on potential methodologies for estimating abundance of ETP dolphins (<http://www.iattc.org/Meetings/Meetings2016/DolphinWorkshop/IATTC-Dolphin-Workshop-October-2016-Background02.pdf>).
- 3) Take into consideration the latest NMFS survey budget, as a guide for quantities that must be funded.
- 4) Create a ship-based line-transect survey design for a one-time survey (late July to early December) to be conducted in 2019 or 2020, and a prepare a complete budget for this survey and analysis of the survey data. The survey design and budget are to be presented in a written report. The survey design is to cover all survey components, including transect placement, ship scheduling, search teams and search protocol, protocol for dolphin group size estimation (closing mode), and methods and protocol for calibration of observers estimates of dolphin group size. The survey budget is to be comprehensive, including all costs associated with implementation of the survey and obtaining estimates of abundance from the new survey data.
- 5) Attend the IATTC Scientific Advisory Committee meeting in La Jolla, in early May 2018 to present the draft survey design.

- 6) Prepare a draft report of the survey design and budget for external review by June 1, 2018. External reviewers will be selected by IATTC staff.
- 7) Prepare a final report of the survey design, timeline for the survey (to include data analysis and writing of the final report), and complete survey budget, taking into consideration comments from external reviewers, to be presented at the IATTC Annual Meeting in Guatemala in late August 2018.

OUTPUTS AND SCHEDULE

January 1, 2018: Contract begins.

May 1, 2018: Draft report on survey design to be provided to IATTC staff for review.

May 14-18, 2018: Present draft survey design at IATTC Scientific Advisory Committee (SAC) meeting in La Jolla, California, USA.

June 1, 2018: Provide a revised draft report on survey design and complete survey budget, that takes into consideration any comments from IATTC staff and SAC participants. This draft will be sent for external review.

July 15, 2018: Provide a final report on survey design and complete survey budget to IATTC staff that takes into consideration any comments from external reviewers (external reviews will be due by July 1, 2018).

Late August, 2018: Present the final survey design and complete survey budget at the IATTC Annual meeting in Guatemala.