

INTERNATIONAL DOLPHIN CONSERVATION PROGRAM

SCIENTIFIC ADVISORY BOARD

2ND MEETING

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***PIT* TAGGING OF DOLPHINS IN THE EASTERN PACIFIC OCEAN**

Despite years of study, many fundamental aspects of the interaction of the dolphins with the tuna fishery in the eastern Pacific Ocean (EPO) remain unknown or poorly known. The expense and difficulty of attaching tags to dolphins has limited our knowledge. For example, we do not know precisely how often individual dolphins are captured, and whether this rate varies with age, sex or area of the fishery. We also have only vague ideas of the structure of dolphin herds, and how far dolphins move in their lifetime.

To address these gaps in our knowledge of dolphin-fishery interactions and dolphin group dynamics, staff of the U.S. National Marine Fisheries Service (NMFS) and IATTC are proposing that the SAB support the following research project, and that the SAB agree to seek the participation of other governments and of tuna vessel owners.

The fishery is unique in that individual dolphins are repeatedly captured and released alive. We propose to utilize this feature of the fishery to study the dynamics of pelagic dolphin herds, using passively induced transponders (PIT tags). These are small cylinders placed under the skin of animals which, when activated by a detector, permit individual animals to be identified. In wildlife studies in general, and for dolphins in the EPO in particular, PIT tags have two big advantages: (1) they are internal, so tag loss and other tag effects are minimal; and (2) they do not require power, and thus are capable of identifying animals for long time periods. Tagged dolphins will be “resighted” using detectors mounted in the backdown channel of tuna purse-seines, which capture and release dolphins frequently. A PIT tagging study would potentially be able to address the following questions.

1. Interaction of dolphins with purse-seine tuna fishery

How frequently are dolphins captured by the fishery? Does the frequency of capture vary spatially or with the animals’ sex or age? Is dolphin interaction with the fishery relatively constant in time or is it concentrated in short, intense periods of fishing activity?

2. Herd fidelity

Are dolphin herds ephemeral or relatively permanent associations? Does the degree of herd fidelity vary with habitat quality, fishing activity, time of year or dolphin species (mixed herds and/or pure-species herds)? Does herd fidelity vary with the sex or age composition of the herd or original herd size? Are smaller herds cohesive units and large herds groups of smaller cohesive units, or are all herds equally ephemeral associations?

3. Home range and seasonal migration

How large is a dolphin’s home range? Does home range size vary seasonally, with habitat quality, fishery exposure or dolphin species? Do dolphins migrate seasonally within the EPO, and if so, what are the seasonal migration patterns? Does movement or migration vary by age or sex?

4. Survival rates

What are survival rates by age and sex? Do survival rates vary by area? By frequency of capture by the fishery? Given the life span of PIT tags relative to that of dolphins, tag resightings will provide invaluable information on survival rates.

5. Abundance and trends

How large are the dolphin populations? Is dolphin abundance increasing or decreasing? Tag resighting data may allow development of a mark-recapture index of abundance to complement abundance estimated with line-transect surveys.

PROJECT OUTLINE

This project will be implemented in three phases:

1. Design phase.

We propose to develop PIT tags and detection methods for use on dolphins interacting with the purse-seine fishery. PIT tags are widely used, for example to identify pets, and readily available. We need to investigate optimal tag insertion methods and tag position on the dolphin. The main design challenge will be the detector, which will be placed at the apex of the backdown channel of the purse-seine. The detector will have to be able to detect PITs at greater distances than usual, operate in salt water (which, being a conducting medium, affects the magnetic field), and be sufficiently rugged to be used during the fishing operation. Tag detection probability under field conditions needs to be evaluated. The number of tags required to achieve the objectives of the study, and the areas in which tags should be deployed for optimal return, need to be determined.

2. Deployment phase

We propose to tag spotted and spinner dolphins in the EPO by chartering a tuna purse-seine vessel to capture the dolphins. Fishermen fishing for tunas in the EPO routinely encircle dolphins with purse-seine nets as part of the process of catching tunas that are associated with spotted and spinner dolphins. Once within the pursed net, individual animals will be maneuvered into a floating sling, tagged, sex and length recorded, and then released. Tagged dolphins will be released out of the net over the corkline so that the functioning of each tag can be confirmed at the time the animal is released from the net. Tagging will take place throughout the area of the fishery, so that dolphin herd dynamics in coastal productive waters can be compared with offshore waters, heavily fished areas with lightly fished areas, within and between species.

3. Data collection and analysis phase

We propose to analyze PIT tag resighting data, in conjunction with fisheries observer data, to develop a better understanding of dolphin-fishery interactions and dolphin herd dynamics. Purse-seine nets of vessels that frequently make sets on tunas associated with dolphins will be outfitted with detectors on the corkline at the apex of the backdown channel. The presence of tagged animals in the net will be recorded by the detectors when the dolphins are released from the net during the backdown procedure. Location and association data for tagged animals will be collected by fisheries observers. At-sea observers record data on herd size, the number of encircled animals, the amount of tunas and other species associated with the dolphins, and environmental data, and date and location information, as part of their regular duties. These two data sets will provide a unique opportunity for studying the movement and association of pelagic dolphin species interacting with the purse-seine fishery.