

# INTERNATIONAL DOLPHIN CONSERVATION PROGRAM

## INTERNATIONAL REVIEW PANEL

### 33<sup>RD</sup> MEETING

ANTIGUA (GUATEMALA)

18-19 JUNE 2003

#### DOCUMENT IRP-33-11a

### PROPOSED TERMS OF REFERENCE FOR THE SCIENTIFIC ADVISORY BOARD

During the 32<sup>nd</sup> meeting of the IRP, a Plan of Action for enhancing the success of the Agreement was proposed. *Inter alia*, the plan envisaged that the Secretariat would draft Terms of Reference for the Scientific Advisory Board and convene a meeting of the Board.

The Secretariat proposes that a meeting of the Scientific Advisory Board (SAB) be convened as soon as practical to consider the following general issues, annotated below:

1. Prevalence and significance of cow-calf separation;
2. Stress effects;
3. Review of currently available estimates of abundance for dolphin stocks;
4. Ecosystem effects;
5. Mortality estimates;
6. Life history studies;
7. Stock assessment of coastal spotted dolphins;
8. Population modeling;
9. Developments in gear technology and fishing techniques to improve dolphin release;
10. Capture of mature tunas not in association with dolphins;
11. Any other research the SAB believes is important to enhance the Agreement.

The meeting should build upon IATTC scientific reports and analyses and such other science as may be available to the Secretariat, to address areas of uncertainty and design research proposals. The SAB should also design sampling programs and options/protocols for such long-term research as it deems necessary to meet the objectives of the Agreement. The SAB should be creative in exploring low-cost options as well as more traditional, large-scale research projects. The SAB may consider the development of topics through workshops involving other scientists or technical experts, including fishing captains.

#### 1. COW-CALF SEPARATION

It has been shown that there may be unobserved mortality of dolphin calves associated with females that are killed in sets. The SAB should design a field study to determine whether, due to fishing operations, temporary or permanent separation of mothers and calves does occur, whether separation results in unobserved mortalities of calves, and the significance of these potential mortalities.

#### 2. STRESS EFFECTS

The SAB should consider the value of repeating the NMFS CHESS study, that was conducted in cooperation with the IATTC, to increase the sample size of blood analyses and other indicators of stress from repeatedly captured dolphins.

### **3. ABUNDANCE OF DOLPHIN STOCKS**

The SAB should review the history of abundance estimates for dolphin stocks and investigate how estimates changed with different methods and authors, and review the current NMFS abundance calculations, particularly how environmental factors were integrated into the estimates and inter-annual variability. The SAB (or an expert sub-panel) could also discuss whether the existing marine mammal sightings data from observers on tuna vessels can be combined with sightings data from research vessels to improve estimates of abundance, and what improvements in these data sources would be needed to estimate annual absolute abundance more accurately.

### **4. ECOSYSTEM EFFECTS**

It is not known whether the environmental changes during the history of the fishery have had significant effects on the carrying capacity of dolphin populations. The SAB should:

1. Examine population trends of other EPO cetaceans;
2. Model effects of population increases of potential competitors and predators on the populations of northeastern spotted and eastern spinner dolphins;
3. Examine in detail the effects on trends in dolphin populations of large-scale ecosystem changes that occurred in the mid-1970s;
4. Examine the issues of the carrying capacities and maximum growth rates of dolphin populations.

### **5. MORTALITY ESTIMATES**

Much of the modeling of dolphin populations has depended heavily on estimates of mortality from the early years of the purse-seine fishery on dolphins that are based on a small sample size of observed trips. The SAB should review these estimates and decide whether they are reliable enough to be used as a basis for conclusions regarding population recovery; this should include a review of the estimation of the type of set in cases where the set type was not recorded in the vessel logbook.

Potential sources of unobserved mortality include intentional or inadvertent non-reporting by observers, smaller purse seiners that do not carry observers, and other fisheries. The SAB should review comparisons of IATTC and national observer programs, and help design studies or monitoring techniques, using new technology, to estimate any mortality by Class-5 and smaller purse seiners, and identify other fisheries that operate in the EPO that could cause dolphin mortality.

### **6. LIFE HISTORY STUDIES**

Observers from the IATTC, Mexican, and US programs have collected life-history samples for various studies over the years, although none are being collected now for dolphins. Identification of age and reproductive status are prerequisites for many other studies and for monitoring trends in vital rates. Examination of food habits could help detect changes in carrying capacity. Genetic analyses might help determine the extent of potential unobserved mortality of calves under Item 1. The SAB should discuss the potential contribution of life history data to assessing the status of dolphin stocks.

### **7. STOCK ASSESSMENT OF COASTAL SPOTTED DOLPHINS**

The status and structure of the stock of coastal spotted dolphins requires further study. The SAB could examine new genetics data and make recommendations for a revised stock structure (if needed), use the revised stock structure to examine trends in abundance, and assess the status of the stock.

### **8. POPULATION MODELING**

Two techniques would be useful for modeling dolphin populations: the first relies on more traditional sin-

gle-species models, and the second on ecosystem models similar to those developed for the eastern Pacific using *Ecosim* software. The SAB should review previous applications of these techniques and propose any refinements it considers useful both in the techniques used and the data to be analyzed.

The ecosystem technique is useful for identifying potential interaction effects, but it is in the early stages of development and acceptance in the scientific community. It is too much to expect that it will lead to definitive or even strongly probabilistic statements about dolphin abundance and the causes and consequences of interactions with other populations in the eastern Pacific. However, it may provide further insight into possible interactions and may guide other research.

Both types of population modeling are useful for characterizing potential shifts in the carrying capacity of dolphin populations. Unfortunately, historical data of sufficient reliability on population abundance and changes in productivity are not available, and hence conclusions about such shifts cannot be definitive.

The SAB should consider possible time lags for the population to respond to changes in its environment or the fishery.

## **9. DEVELOPMENTS IN GEAR TECHNOLOGY AND FISHING TECHNIQUES TO IMPROVE DOLPHIN RELEASE**

Using the backdown maneuver results in no dolphin mortality in more than 93% of sets, and remains the best single technique for reducing mortality. However, other possibilities could be pursued, such as the recent experiments by the Mexican national program in which small panels were attached to the sides of the net; these act like the doors of a trawl net, increase resistance to the water flow, and help keep the net open.

Another simple addition that is probably worth exploring is Captain Dick Stephenson's *boleadoras*. This consists of three ropes tied together, two with weights attached and the third with a handle. The two weighted lines are dropped from a speedboat, one on each side of the corkline, causing it to sink; the third line is used to control the depth of the corkline.

Comments by fishermen indicate that the use of jet skis have enhanced the fishermen's ability to herd and rescue dolphins in the net. The SAB should consider this and other refinements and propose a research protocol for trials or other methods of evaluation to determine whether they can contribute to reducing dolphin mortality.

## **10. CAPTURE OF MATURE TUNAS NOT IN ASSOCIATION WITH DOLPHINS**

During a study conducted in 1992-1993, spotted dolphins and yellowfin tuna were simultaneously tracked to gather information about the tuna-dolphin bond. It was discovered that large yellowfin tuna are not always associated with the dolphins, and that they swim at about the depth of the thermocline. This study could be continued to determine under what circumstances the tuna-dolphin bond is formed and broken, and help predict where large yellowfin may be found when not in association with dolphins.

Acoustic studies with instruments capable of long-range detection of tuna schools could be used to find the unassociated aggregations. The possible use of active and passive devices has been mentioned over the years. A laser detection system (LIDAR) has been proposed for finding subsurface tunas, and has undergone limited testing.

The SAB should consider these and other options and, if they seem feasible, design trials to evaluate the most promising options.