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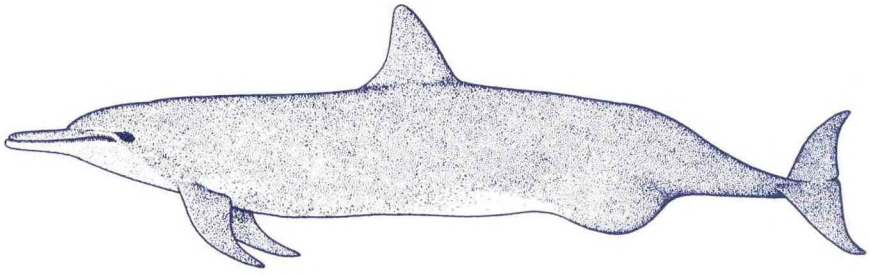
U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southwest Region
300 S. Ferry Street
Terminal Island, CA 90731

Report on the First Annual Meeting to Review the Performance of the International Fleets in Reducing Dolphin Mortality

December 12-13, 1989



Contributors: Maryann A. Rodriguez, Editor
Norman A. Mendes
Kenneth Hollingshead

Administrative Report
October 1990

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EXECUTIVE SUMMARY

The Southwest Region of the National Marine Fisheries Service (NMFS) conducted a meeting on December 12-13, 1989, in San Pedro, California, to review the results of efforts to reduce the killing and serious injury of dolphins and other marine mammals incidental to tuna purse seine fishing operations in the eastern tropical Pacific Ocean (ETP).

Seventy-four persons attended the meeting, among them U.S. government officials, congressional staff and aides, and representatives from the National Academy of Sciences, Marine Mammal Commission, environmental and conservation organizations, U.S. tuna industry, and foreign tuna harvesting nations (Appendix 1). Speakers from the NMFS, Inter-American Tropical Tuna Commission, and Porpoise Rescue Foundation gave presentations concerning the status of dolphin population research, recent technological developments to reduce mortality, and the performance of the domestic and international tuna purse seine fleets (proposed agenda, Appendix 2; pertinent publications, Appendix 3).

The consensus of the meeting was: 1) ETP dolphin stocks are not in danger of extinction or depletion; 2) efforts should continue to reduce dolphin mortality; and 3) although substantial progress has been made in reducing dolphin mortality, foreign nations may require more time to meet U.S. import standards for yellowfin tuna.

NMFS will conduct similar reviews in 1990 and 1991, as required under the 1988 amendments to the Marine Mammal Protection Act, and will present a report to the U.S. Congress in 1992 concerning progress made in reducing dolphin mortality in the ETP tuna fishery.

REPORT ON THE FIRST ANNUAL MEETING TO REVIEW THE PERFORMANCE OF THE INTERNATIONAL FLEETS IN REDUCING DOLPHIN MORTALITY

INTRODUCTION

Fishermen in the eastern tropical Pacific Ocean (ETP) search for schools of dolphins and encircle them with large purse seine nets to capture yellowfin tuna that swim beneath the dolphins. Before the U.S. Marine Mammal Protection Act (MMPA) was enacted in 1972, dolphin mortality reached 400,000 animals annually. The U.S. fleet was responsible for nearly 90 percent of the annual dolphin mortality at that time.

Since passage of the MMPA, annual quotas, regulations, and industry cooperation have resulted in improved U.S. fleet performance and the safe release of 99 percent of the dolphins encircled in U.S. purse seine nets. The level of dolphin mortality in the international fleets, however, remains a major concern.

Amendments to the MMPA in 1984 and 1988 imposed additional marine mammal protection requirements on nations that harvest yellowfin tuna in the ETP. These nations must reduce the average rate of dolphin mortality during their fleets' purse seine fishing operations in order to continue exporting yellowfin tuna to the United States.

Individual nations are required to demonstrate a fleet dolphin mortality rate no higher than 2.0 times the kill rate for the U.S. fleet in 1989 and no higher than 1.25 times in subsequent years based on data from observers placed aboard their vessels by the Inter-American Tropical Tuna Commission (IATTC). In addition, each nation must adopt a regulatory program comparable to that of the U.S. fleet and must provide annual reports to the United States about their past year's progress in reducing dolphin mortalities.

Requirements for the U.S. fleet include a prohibition on sundown sets, implementation of skipper performance standards, 100 percent observer coverage through 1991, and submission of a report by the National Academy of Sciences on research, development, and implementation of methods for finding and catching yellowfin tuna without the aid of dolphins.

OVERVIEW OF TUNA-DOLPHIN PROGRAMS

Domestic Program -
Mr. E. Charles Fullerton, Southwest Regional Director, National Marine Fisheries Service (NMFS).

The U.S. tuna-dolphin program began shortly after the passage of the MMPA in 1972. At that time, 185 purse seine vessels from various nations fished yellowfin tuna in the ETP and annual dolphin mortality in the fishery reached 400,000. The U.S. purse seine fleet, which then numbered about 125 vessels, harvested about 70 percent of the yellowfin tuna taken from the ETP and was responsible for almost 90 percent of the annual dolphin mortality. However, by the time the first mandatory observer program for the U.S. fleet was established in 1976, the annual U.S. dolphin mortality had dropped to about 125,000 animals. An annual dolphin mortality quota was implemented in 1981, and the annual dolphin mortality in the U.S. fleet since then has averaged about 17,000 animals.

During the period after passage of the MMPA, there was intense population research on dolphin stocks, development of a gear technology program, and a dedicated vessel program that responded to various MMPA amendments, court decisions, and voluntary efforts by the tuna industry to reduce dolphin mortality. An

Expert Skippers Panel was established to provide peer advice concerning dolphin-saving fishing techniques. The U.S. fleet also began to explore new fishing areas in the western Pacific.

By the mid-1980s, the combined effects of an El Niño event (an oceanographic phenomenon characterized by increased sea temperatures) and general economic conditions resulted in a major shift of the U.S. fleet to the western Pacific. Today, the international fleets dominate the yellowfin tuna fishery in the ETP, with the U.S. fleet representing only about 30 percent of the harvesting capacity. The majority of dolphin mortalities today result from the activities of the international fleets.

The U.S. tuna-dolphin program currently centers on a 100-percent observer program to implement and enforce new domestic regulations to ban sundown sets, limitations on the use of explosives, and establishment of a skipper performance program to deal with substandard performance. Another area of major emphasis is the reduction of dolphin mortality by non-U.S. fleets through import regulations. A major research effort is underway to determine trends in populations of ETP dolphin stocks. In all, the U.S. government has committed 70 professional and technical support staff, at an annual cost of over $3.6 million, to the U.S. tuna-dolphin program.

International Program -
Dr. James Joseph, Director, IATTC.

Prior to the 1960s, most tuna was caught by baitboat fishermen. With the development of purse seine gear, a much more efficient method for catching tuna, a shift from baitboats to purse seiners began in 1958-60. The association between tuna and dolphins was known, and tuna purse seine fishermen also used dolphins to find tuna. Dolphin mortality increased as tuna purse seine fishing operations expanded. The dominance of the tuna catch began to shift from the U.S. fleet to other fleets in 1975. International dolphin mortality became a concern.

In 1976, the IATTC defined its management objectives with regard to dolphins: 1) to maintain high tuna production; 2) to maintain dolphin stocks at levels that would ensure their survival; and 3) to avoid needless and careless killing of dolphins. IATTC research objectives included studies of dolphin mortality and abundance, the impact of fishing on dolphin stocks, the biology and behavior of dolphins, gear designed to reduce dolphin mortality, and extension of work to develop and transfer to the international fleets technology proven to be effective in reducing dolphin mortality.

At the urging of the United States, IATTC agreed in 1977 to establish an international tuna-dolphin program, through which considerable progress has been made in reducing the overall dolphin mortality in the ETP. All nations that fish for tuna associated with dolphins participate in the IATTC's programs, which include: 1) an international observer program begun in 1979 with which all nations have been involved since 1986; 2) estimates of dolphin mortality; 3) analysis of changes in mortality; 4) mortality reduction program; 5) estimates of dolphin abundance to determine if populations are increasing or decreasing; 6) biology and ecology of dolphin populations; and 7) a joint program by the IATTC and United Nations Environmental Programme (UNEP) to train foreign observers and provide tuna- dolphin awareness information. The annual cost of the IATTC's programs is about $800,000.

REVIEW OF RESEARCH PROGRAMS

Status of Trends Analysis of Dolphin Stock Abundance

NMFS Analysis -
Dr. Douglas DeMaster, Chief, Fishery-Marine Mammal Interactions Division, Southwest Fisheries Center, NMFS.

The requirements of the 1988 MMPA amendments mandate NMFS to monitor trends in dolphin stocks to determine whether they are increasing or decreasing. NMFS must "...undertake a scientific research program to monitor for at least five consecutive years...the indices of abundance and trends of marine mammal population stocks which are incidentally taken

in the course of commercial purse seine fishing for yellowfin tuna in the eastern tropical Pacific Ocean..." (MMPA, section 104(h)(3)(A)).

The Southwest Fisheries Center's dolphin monitoring program includes analyzing sightings data from research vessels and tuna vessels, trends in various life history parameters, and studying the stock structure of ETP dolphins. In July 1986, the NMFS initiated the first of six research vessel surveys to estimate trends in the relative abundance of certain stocks of dolphins. The experimental design for the research vessel survey includes traversing the five-million-square-mile study area with two research vessels each year for 120 days. The vessels will follow the same tracklines (or as close as is logistically possible) each year and will utilize line transect methodology. One of the vessels will support a helicopter, from which aerial photographs of dolphin schools will be taken to calibrate the estimates of dolphin school size made by observers on the research vessels.

Four surveys have been completed to date, and the results from the first three surveys have been published. Considering only the first three surveys, there are no significant trends in population size for any dolphin stocks. Because the statistical power of the trends experiment was such that a population change of 40 percent or more over six years was the minimum change that would be detectable, the fact that there are no significant trends after just three years was expected.

International Analysis -

Dr. Martin Hall, Chief Scientist of the Tuna-Dolphin Program, IATTC.

There are three main dolphin species involved with the tuna fishery, but there are 40 species worldwide which are made up of several stocks. These species occur in most tropical oceans of the world, so there is no threat of any of these species becoming extinct. The species are subdivided into geographic subunits called stocks. It is these stocks that are the object of management, because it is important to preserve the genetic diversity contained in all these units. The IATTC's objective is to ensure the survival of all the stocks present in the fishery.

The three basic requirements for estimating dolphin abundance are: a) define the area occupied by each stock; b) estimate the density of dolphin herds; and c) estimate the average size of the herds. The objective of the use of line transect methodology is to provide a statistically valid answer to b) and c) above. The main disadvantage of using data from observers aboard tuna vessels is the non-random search patterns of the fishing boats and how to correct for this. The main advantage of using tuna vessel observer data is that a very large number of observations is collected at little additional cost to the observer program. With research vessel data, it is possible to choose the trackline of the vessel according to a statistical design, but a major disadvantage is the small number of observations produced. The best procedure probably is a combination of the two approaches, trying to calibrate one against the other. The resulting estimates are relative abundance estimates. That is to say, they indicate only whether or not the size of a population is stable and whether the change is up or down.

In analyzing the trends observed for all stocks, two of the stocks (northern offshore spotted dolphin and central common dolphin) show a decline in the late 1970s and no significant change in recent years. Only one stock (southern offshore spotted dolphin) shows a significant decline in the 1980s. It is quite obvious that the stock boundaries used are not adequate, as many sightings are made outside the study area. Comparing the average level of the early years of this study (1975-80) with the most recent period (1981-87), the stocks of spinner dolphins (eastern, northern, and southern whitebelly) and two of the three common dolphin stocks (northern and southern) do not show any significant change in their average levels in the two periods. The stocks of spotted dolphins (northern and southern offshore) and the central stock of common dolphins showed a decline in the late 1970s but appear quite stable in the 1980s if we eliminate the abnormality of the strong El Niño in 1983.

Public Comments

***Mr. Franklin G. Alverson**, Porpoise Rescue Foundation:* NMFS research cruises show dol-

phin sightings outside defined areas, well beyond the range of tuna fishing. Dolphin sightings outside those areas could be overlooked if the IATTC studies only tuna vessel data.

Dr. Robert J. Hofman, *Marine Mammal Commission:* What percentage of change is necessary to detect a trend in dolphin abundance? ***Dr. DeMaster:*** A 10 percent change per year on research cruises is detectable, or 40 percent over the six survey cruises.

Mr. Jeffrey Pike, *House Committee on Merchant Marine and Fisheries:* Why do IATTC surveys omit population estimates for 1983 for the northern offshore spotted dolphins but not for eastern spinner dolphins? ***Dr. Hall:*** In 1983, the area was under the influence of an El Ni˜no event, and fishing effort was low in the areas of concentration of those stocks. Although the reasons for the difference in behavior are not clear, it is possible that the narrower geographical distribution of the eastern spinner dolphins tends to keep them within the study area. The distribution of the spotted dolphins may be more variable, spreading into areas not visited by the fishing boats, thus giving the impression of a decline in numbers.

Dr. Robert J. Hofman, *Marine Mammal Commission:* Why do the data on relative abundance begin in 1975? ***Dr. Hall:*** The quality of data before 1975 was poor and gave a gross idea of range only. More data on oceanography are needed for a better understanding of the results, the key questions being what to ask for and the scale needed (macro, meso, or micro).

Ms. Lesley Scheele, *Greenpeace International:* What is the status of eastern spinner dolphin stocks relative to their maximum carrying capacity? ***Dr. DeMaster:*** The population index from the research vessel surveys for eastern spinner dolphins over the last three years was consistent with a stable population; however, the statistical power of the analysis after only three years was very low. IATTC's analysis of tuna vessel observer data also indicates that the population of eastern spinner dolphins has been constant over the last five years. The preliminary analysis of the life history data from eastern spinner dolphins over the last 14 years indicates that the population has declined, based on an increasing trend in the percentage of mature females that are simultaneously pregnant and lactating. Concerning status relative to maximum carrying capacity, without data on the incidental take of the non-U.S. fleet in early years and better data on the relationship between net recruitment and population size, back-calculated estimates of historic abundance are unreliable.

Mr. David Phillips, *Earth Island Institute:* Could common units, such as blue whale units, be used for comparing stocks? The data on estimated dolphin abundance could be submitted to the International Whaling Commission for analysis. ***Dr. Hall:*** Mortality figures as well as population sizes are needed to assess the impact of a fishery. The figures available on abundance are only relative and show changes in this parameter but not its absolute value. Mortality estimates cannot be related directly to relative population values.

Mr. Daniel Novoa R., *Ministerio de Agricultura y Cria, Venezuela:* Do the data indicate that northern offshore dolphins stocks are endangered? ***Dr. DeMaster:*** There are no data to support that northern offshore dolphin stocks are declining.

Mr. Frank Alverson, *Porpoise Rescue Foundation:* Do any dolphin stocks face extinction? ***Dr. DeMaster:*** There are no data to suggest that.

Mr. David Phillips, *Earth Island Institute:* How significant is a population estimate indicating an 8% decline in a stock per year? ***Dr. DeMaster:*** Using sightings data from research vessels only, an 8 percent decline per year over a six-year period would be found statistically indistinguishable from the null hypothesis (i.e., zero percent change over six years) more than 10 percent of the time. That is, a type II error (i.e., accepting the null hypothesis when it was actually false) would be made more than 10 percent of the time.

Dr. Luis Fleischer, *National Institute of Fisheries, Mexico:* Does NMFS change the research vessel tracklines over the survey? ***Dr. DeMaster:*** The tracklines remain as constant as possible, given logistical constraints.

Mr. David G. Burney, *U.S. Tuna Foundation:* An administrative law judge determined in 1979 that eastern spinner dolphins were above their optimum sustainable population (OSP) level and were not depleted. ***Dr. DeMaster:*** A 1984 NMFS environmental impact statement for the modified import rule listed the status of eastern spinner dolphins as 55 percent of the original population size. In 1984, NMFS discontinued managing dolphin populations in the ETP based on status relative to historical abundance.

Dr. Robert J. Hofman, *Marine Mammal Commission:* Would it be useful if the tuna fleet contributed a half day each year to a cooperative research effort? ***Dr. DeMaster:*** One alternative for future trend analyses might be for purse seiners to do research vessel-type work one day each month (i.e., they would follow predetermined tracklines). ***Dr. Hofman:*** Can the time of first set be used as a measurement for trends and abundance? ***Dr. Hall:*** Type of encounter rate is questionable because the fleet is not in the same area every year. There are many confounding factors, and also the changes may affect the size of the dolphin herds without changing the encounter rates. A correlation by overlapping research vessel and observed tuna vessel cruise tracks would be very useful.

Status of Dolphin Stock Identity

NMFS Analysis -
Dr. Douglas DeMaster, Chief, Fishery-Marine Mammal Interactions Division, Southwest Fisheries Center, NMFS.

A stock, as defined in the MMPA, is a group of animals that share a common space and interbreed. That is, populations that are spatially distinct should be managed as separate stocks, even if their members could interbreed if brought together. The basic goal of management is to define stocks in such a way that, when combined with the management of incidental take, the probability of irreversibly extirpating a species from a given area or causing fundamental changes in the species composition of an ecosystem is near zero.

At present, the stock structure of dolphins in the ETP is based on modal differences in morphological characters between animals from different geographic areas and the observed distribution of animals in the ETP. Because the latter is highly variable between years and because the former reflects both selection pressure and random drift in morphological characters, additional studies were designed to address the question of whether gene flow was occurring between putative stocks.

If gene flow is occurring between what we are presently calling stocks, then our current definition of stocks should be reconsidered. Unfortunately, the genetic techniques applied to date are of little use in estimating exchange rates that are meaningful in the management of dolphins. For this purpose, we need to be able to estimate exchange rates on the order of 1 percent per year. Rather, current genetic techniques can only be used to separate stocks where gene flow is essentially nonexistent. Therefore, if genetic differences are found between two populations, they should be managed as separate stocks.

The reverse (i.e., in the absence of genetic differences, two populations should be managed as one stock), however, is not necessarily true. NMFS genetic studies on spinner dolphins in the ETP indicate rates of gene flow greater than 1 percent per generation. We are proposing to continue refining the genetic studies in future years as well as using differences in vocalization patterns to test various hypotheses about stock structure. In the future, when satellite transmitters are of such a size and configuration that they can be safely applied to ETP dolphins, a much better data source will be available for defining the stock structure of these animals.

Public Comments

Mr. Frank Alverson, *Porpoise Rescue Foundation:* A published research paper indicates that there are three subspecies of spinner dolphins: eastern spinner dolphins, Costa Rican spinner dolphins, and a hybrid intergrade referred to as a whitebelly spinner dolphin. The occupied range of the eastern spinner dolphins is considerably larger than originally thought.

Dr. Douglas G. Chapman, *Marine Mammal Commission:* What are the genetics of the northern and southern spotted dolphin stocks relative to morphology? ***Dr. DeMaster:*** Genetic studies on spotted dolphins have not been done at this time. It is unlikely that genetic studies would be definitive; studies involving satellite telemetry would be necessary.

Dr. Luis Fleischer, *National Institute of Fisheries, Government of Mexico:* Does the MMPA define specificity of stocks? ***Dr. DeMaster:*** The MMPA does not operationally define a stock; this is left to the agencies. Although we are sure that individual northern spotted dolphins and southern spotted dolphins interbreed and share a common space in some years, they are managed as separate stocks because they are morphologically and physiologically distinct. Whether this separation is indicative of two populations, where rates of exchange would remain less than 1 percent per year if one of those populations were significantly reduced, is not known.

Statistical Methodology for Estimating Dolphin Mortality and Mortality Rates

Domestic Program -
Mr. J. Gary Smith, Deputy Regional Director, Southwest Region, NMFS.

By Federal Register notice (since published in 54 FR 242, December 19, 1989), NMFS proposes to accept 50 percent observer coverage on foreign tuna purse seine fleets with five to nine vessels and 33 percent observer coverage on fleets of 10 or more vessels in 1990. Fleets with fewer than five vessels would require 100 percent observer coverage. Comments are being requested on the methodology to estimate mortality rates. The dolphin mortality rate for foreign fleets must be less than 2.0 times the U.S. rate for 1989 and less than 1.25 times the U.S. rate for 1990 and thereafter. Eastern spinner dolphins must be no more than 15 percent of the total dolphin kill and coastal spotted dolphins must be no more than 2 percent of the total dolphin kill.

Domestic Program -
Dr. Douglas DeMaster, Chief, Fishery-Marine Mammal Interactions Division, Southwest Fisheries Center, NMFS.

Mortality estimates for the U.S. fleet are based on the product of the average number of dolphins killed per day and the total number of fleet-days fished for a given year. Estimates are made in real time (i.e., every two weeks) by updating mortality estimates with reports received via radio from observers at sea. When the overall quota is reached (20,500 animals), no additional dolphin fishing is allowed. When stock quotas are reached, the fleet may not set on those stocks of dolphins. Total and stock specific mortality is projected forward to determine whether a particular quota will be reached within the next 14 days. If a quota is projected to be reached during that period, NMFS publishes a notice stating when fishing on a particular stock or all dolphins must stop. The quota for eastern spinner dolphins was unexpectedly exceeded in the last week of December 1988, when an above-average kill of eastern spinner dolphins occurred in a single set. At that late date, there was not enough time to inform the U.S. fleet to stop setting on eastern spinner dolphins.

The estimated dolphin mortality currently is 11,348 for 1989. The projected total for the entire calendar year is 13,000 to 15,000 animals. The total take of eastern spinner dolphins in 1989 currently is about 1,400 animals, and it is unlikely that the quota of 2,750 will be reached.

Over the past nine years, the proportion of dolphin sets for the U.S. fleet that resulted in zero kill has been constant at approximately 60 percent (Figure 1). Sixty to 80 percent of all dolphin mortality occurs in 20 to 30 percent of all sets. NMFS data indicate that since 1981, 5 to 10 percent of the sets have mortalities of 15 or greater (these are referred to as problem sets). Since 1981, there have been no significant trends in the total number of dolphins killed, the number of dolphin sets per year, and the mortality rate (kill per set) (Figure 2). During this same time period, the number of vessels in the U.S. fleet decreased from 93 to 29.

NMFS would like to minimize the number of false determinations that a particular country's

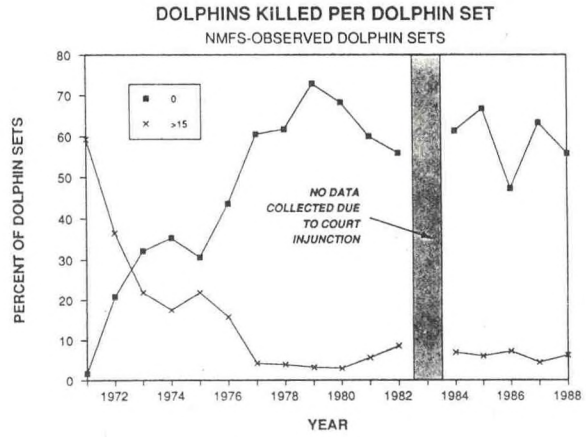


Figure 1.

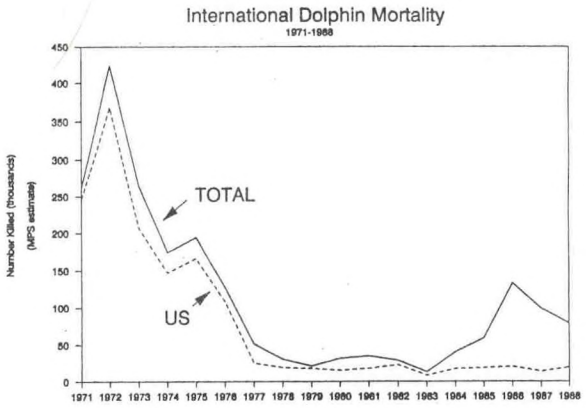


Figure 2.

mortality rate is too high when, in fact, it is not (type I statistical error), as well as the number of false determinations that a particular nation's mortality rate is acceptable when, in fact, it is not (type II statistical error). Unfortunately, because of the way these two types of errors are mathematically related, for a specific difference to be detected, reducing one type of error necessarily increases the other type of error. If the MMPA, as amended in 1988, is literally followed, and if a foreign nation with a five-vessel fleet had a mortality rate identical to the U.S. fleet's and the observer coverage was 33 percent, we estimate that there would be an 18 percent chance that the nation would fail the 2.0 times comparability test. This rate of incorrectly failing a nation's mortality rate is only slightly improved by increasing observer coverage to 100 percent.

To address this issue, NMFS has proposed a series of alternative comparability tests for testing a foreign nation's mortality rate against the U.S. rate. One of these alternatives (referred to as the point-estimate alternative) is a literal interpretation of Congress's intent and also the most conservative. It also is the least statistically defensible alternative. The other proposed methods all explicitly incorporate specific levels of type I and type II errors. Comments solicited by NMFS regarding these proposals are due in January 1990.

There is another problem related to comparing the mortality rate of the U.S. fleet with that of a foreign nation. In the amended MMPA, the percentage of coastal spotted dolphins in the total take must be less than 2 percent and the percentage of eastern spinner dolphins must be less than 15 percent. These numbers were derived by dividing the stock specific quota for each stock for the U.S. fleet by the total quota for the U.S. fleet. Unfortunately, the U.S. fleet is not restricted in this manner and, in fact, has legally exceeded the 15 percent rule in some years. This occurs when the U.S. fleet is close to its quota for eastern spinner dolphins (say 2,600 animals), but is not close to the total quota (say 10,000 animals). In this case, the percentage of eastern spinner dolphins in the U.S. take would be 26 percent.

Because of this perceived inequity between the U.S. fleet and a foreign fleet, NMFS also has proposed incorporating statistics in the determination process concerning the 15 percent and 2 percent rule. Admittedly, this is not an acceptable way to test whether the rate of taking eastern spinner dolphins (or coastal spotted dolphins) by the U.S. fleet is different from that of another fleet, but the existing legislation leaves little room to correct this deficiency. At this point, testing the statistical significance between the proportion of eastern spinner dolphins and coastal spotted dolphins killed by a particular fleet with 15 percent and 2 percent, respectively, is the best that we can do. The proposed statistical test will require information on dolphin mortality on a trip-by-trip basis for each foreign country.

International Program -

Dr. Martin Hall, Chief Scientist of the Tuna-Dolphin Program, IATTC.

The IATTC is interested in a sampling level that gives the best result without high costs.

Simulation of sample size shows that, as coverage increases, error decreases. Above 25 to 30 percent coverage, the increase in precision becomes very small, even for considerably larger (and more costly) increases in coverage. That is why 33 percent coverage was selected and one out of every three trips is sampled.

An NMFS study comparing the mortality rates of NMFS and IATTC observers in the U.S. fleet indicates that, in the 1979-82 period, NMFS observers, with a higher level of enforcement, showed lower dolphin mortality rates than IATTC observers. In recent years, however, that position has reversed, which shows that there is no statistical difference between the two groups, regardless of the level of enforcement. There is no direct evidence of the existence of an observer effect, and the indirect evidence does not show any clear trend.

The IATTC has fielded observers since 1979. Currently, all countries participating in the fishery cooperate in the IATTC observer program. In 1988, the level of coverage was close to the target level of 33 percent for all countries. The level of coverage for the whole international fleet was 40 percent.

There are two components in the estimation of total mortality: 1) total effort, measured as sets on dolphins or tonnage caught on them, which is in part determined by economic factors such as the price paid for the different sizes of tunas; and 2) average mortality per set or per ton, which is controlled by natural and human factors, such as currents, crew motivation, etc. Because estimation differs by area, stratification is necessary, which reduces variance considerably. For the international fleet, more than 50 percent of the dolphin sets have a zero mortality and only 3 percent of sets on dolphin have more than 30 animals killed in them. Estimation methodology was set in 1984. Estimates of mortality obtained using the two ratios mentioned (mortality per set and per ton) have been quite close from 1979 to 1988, and there are no clear differences with regard to precision.

The number of sets on dolphins in recent years is considerably greater than in the early 1980s. The tonnage of tuna caught in sets on dolphins also increased. The average catch per dolphin set rose from 10-11 tons in the early 1980s to 20 tons per set in recent years. Key factors that will reduce dolphin mortality in sets are: 1) individually removing the last dolphins from the net by raft or similar rescue, and 2) reducing the number of disaster sets, which are infrequent but cause a very large part of the total mortality.

Public Comments

Mr. J. Gary Smith, *NMFS:* I would like to make a clarification regarding foreign performance. NMFS is looking for two comments, one for statistical comparisons and one for point estimates.

Mr. David Phillips, *Earth Island Institute:* I am concerned about the level of compliance with the sundown set ban among foreign vessels when only 33 percent observer coverage is required. ***Dr. DeMaster:*** In the absence of an international quota, the purpose of an observer program is to monitor the performance of the non-U.S. fleet in releasing dolphins that are encircled in the pursuit of tuna. A 33 percent coverage rate provides statistically reliable estimates of the rate of dolphin mortality on an annual basis. It is true that, to extrapolate the observed mortality to the total mortality for the non-U.S. fleet, it is necessary to assume that unobserved boats have a mortality rate that is the same as observed boats. Unfortunately, there is no objective way to test this assumption.

Mr. Jeffrey Pike, *House Committee on Merchant Marine and Fisheries:* Does the presence or absence of an observer have an effect on the dolphin kill rate or degree of enforcement? What about foreign compliance? ***Mr. Martin B. Hochman,*** *NOAA Office of General, Southwest Region:* There is no proof for or against an observer effect. ***Dr. Hall:*** Until recently there was no proof of compliance with U.S. regulations without an observer on board.

Dr. Louis Fleischer, *Mexico:* What are the differences between usage of kill per ton and kill per set and the effect on foreign certification? ***Dr. DeMaster:*** Kill per set information is more precise than kill per ton information because the precision of the former is not affected by

variability in estimating the number of tons caught on a particular set. Therefore, in comparing mortality rates between the U.S. fleet and another country's fleet, the kill per set estimator is statistically more powerful, everything else being equal.

Mr. Frank Alverson, *Porpoise Rescue Foundation:* Kill per ton is a better measure than kill per set. PRF has always preferred kill per ton as a performance statistic over kill per set. Kill per ton information can be obtained by counting the number of brails loaded or determining the number of fish wells filled. ***Dr. DeMaster:*** The number of dolphins killed in a set is less variable and easier for the observer to estimate than the number of dolphins killed in a set per ton of tuna landed.

Dr. James Joseph, *IATTC:* Regarding 100 percent observer coverage on foreign fleets, there is a need to know how many dolphins are being killed, the impact of this kill on the stocks of dolphins, and how the kill can be reduced. Thirty-three percent observer coverage is adequate for estimating the total mortality caused by the international fleet. A comparison of observer data and vessel logbooks suggests that unobserved trips are similar to observed trips. Increasing coverage will depend on the availability of funds, which can only be decided by the respective governments. The IATTC's budget is insufficient for 100 percent coverage. If 100 percent coverage were adopted for the international fleet, the IATTC would need several months of lead time to train observers and staff, etc.

Ms. Priscilla Feral, *Friends of Animals:* How are reports of intimidation of observers and logbooks thrown overboard handled? ***Mr. E. Charles Fullerton,*** *NMFS:* Observer problems are investigated (Appendix 4). There have been no logbooks thrown overboard.

Dr. Luis Fleischer, *Mexico:* How are areas chosen for the stratification? ***Dr. Hall:*** Areas with different mortality rates are identified and different stratification schemes are compared to select the one producing the lowest variance.

Mr. David Phillips, *Earth Island Institute:* Dolphin kill is reduced because of the prohibition on sundowns sets for U.S. boats. Without those same steps, sundown sets are likely to continue in foreign fleets. ***Mr. David G. Burney,*** *U.S. Tuna Foundation:* Sundown sets will be eliminated through enforcement.

Direction of Future Research

NMFS Research Program -
Dr. Douglas DeMaster, Chief, Fishery-Marine Mammal Interactions Division, Southwest Fisheries Center, NMFS.

The NMFS dolphin monitoring program will use sightings data and life history data collected by observers on tuna vessels from 1974-91 and sightings data collected by observers on research vessels from 1986-91. Oceanographic data from the research vessel cruises will be used to standardize the number of dolphin sightings by calibrating rates of sightings under different environmental conditions. The NMFS Southwest Fisheries Center will sponsor a series of scientific panels in the summer and fall of 1991 to review and comment on reports about the NMFS dolphin monitoring program. A panel review of a summary document reporting on the findings of the dolphin monitoring program is scheduled for publication in the spring of 1992. In addition, NMFS will continue studies on stock structure of dolphins in the ETP. The findings from those studies will be reviewed in the summer of 1991.

IATTC Research Program - *Dr. Martin Hall, Chief Scientist of the Tuna-Dolphin Program, IATTC.*

The IATTC's main areas of emphasis for future research are: 1) tuna-dolphin interaction (why tuna and dolphins associate); 2) the association of tunas with floating objects and its potential value for fish aggregation device (FAD) projects; 3) research on dolphin schooling behavior, with special emphasis on what happens to the tuna-dolphin bond during the night; and 4) oceanographic research to help understand spatial patterns, the results of surveys, etc.

Public Comments

Mr. Jeffrey Pike, *House Committee on Merchant Marine and Fisheries:* What is being done regarding alternative gear to prevent dolphin kill? ***Dr. Hall:*** The National Academy of Sciences has established a committee to study the issue. ***Mr. Pike:*** Has there been any change in current fishing technology? ***Dr. Hall:*** Previous workshops have not identified alternatives to purse-seining that could yield similar quantities of fish at similar cost under the current economic and technological conditions. The quickest way to reduce dolphin mortality would be through managing skipper performance. Some small additions to the equipment currently in use could help to reduce mortality in the short-term (3-6 months). Other major technological changes, involving considerable modification of the purse seine or replacing it with other (new) types of gear, could take from 3-5 years to implement. Funding for gear research has been secondary to the observer program, although research on gear could produce definite solutions to the dolphin morality problem.

Dr. James Joseph, *IATTC:* It is not probable that an effective ban on purse-seining on dolphins could be applied in the ETP; there may be just too many nations to control. A massive effort to modify the purse-seining process to ensure that few or no dolphins are killed should be undertaken. Engineering talent should be applied to the problem, with input from marine mammal behaviorists and fishermen. This will take time and money but, considering the alternative of continued dolphin mortality at current levels, the cost seems justifiable.

Ms. Lesley Scheele, *Greenpeace International:* In assessing the status of ETP dolphins, NMFS should make stock specific assessments relative to OSP levels. ***Dr. DeMaster:*** Research on stock identification is being expanded, and the results of these studies will be included in a report to Congress on the status of the ETP dolphin stocks. The only method available for doing assessments relative to OSP for these populations at this time, however, involves back-calculating historic (pre-fishery) abundances. This methodology requires reliable data on current abundance of a stock, annual take, and rates of increase and population regulation. At this time, data on the foreign take between 1978 and 1986 are considered unreliable, and data on rates of increase and population regulation for these populations do not exist. Therefore, estimates of historic abundance are of little use in evaluating the status of a population. A detailed analysis of trends in relative abundance and various life history parameters currently is the best that can be done as far as assessing the status of ETP dolphin populations.

STATUS OF IMPORT REQUIREMENTS

Mr. J. Gary Smith, Deputy Regional Director, Southwest Region, NMFS.

An interim rule was published March 7, 1989, with requirements about U.S. comparability, observers, sundown sets, and performance. The comparable mortality rates for foreign nations must not exceed 2.0 times the U.S. rate in 1989 nor 1.25 times in 1990 and thereafter. Amendments affecting intermediary nations have been made. Notices about the rule and amendments were sent to the governments of 60 to 65 intermediary nations and to 124 exporters.

A final rule, expected within 30 days, will include three changes not in the interim final rule currently in effect: 1) use of kill per set for dolphin mortality rates; 2) redefinition of the term transshipment; and 3) provision of a mechanism to remove a nation's embargo if its dolphin mortality rate improves.

The NMFS has made importation determinations for Ecuador, Mexico, Panama, Vanuatu, and Venezuela. Findings show that these nations have observers and enforcement programs in place and have provided required dolphin mortality rates. El Salvador was embargoed, but now has no tuna vessels.

Public Comments

Ms. Lesley Scheele, *Greenpeace International:* What is the status of the Spanish and Korean fleets in the ETP? ***Mr. Smith:*** Spain has a certified charter agreement wherein its vessel is

subject to the marine mammal laws of Ecuador. The Korean vessel was sold and no longer operates in the ETP.

REVIEW OF TECHNOLOGICAL DEVELOPMENTS

Review of Use of Explosives Study

Dr. Douglas DeMaster, Chief, Fishery-Marine Mammal Interactions Division, Southwest Fisheries Center, NMFS.

The MMPA amendments require a study of the effects of the use of class C explosives (seal bombs) on dolphins. The results of the study will be used as the basis for any modifications to current regulations on the use of explosives in the tuna purse seine fishery that must be in effect by April 1, 1990. NMFS convened a workshop panel on November 27-29, 1989, in La Jolla, Calif., at which papers on the chemistry, effects, and use of seal bombs were reviewed. The minutes from that workshop currently are out for public comment.

The paper on the use of seal bombs reported no correlation between seal bomb usage and dolphin mortality. Several reasons for this finding are discussed in the report and include: 1) there may be no correlation; 2) the data on seal bomb usage per set are not specific enough (i.e., the number of seal bombs used per set was not recorded because the observers could not accurately estimate the number of seal bombs that were used in a set); and 3) the variability in kill per set may be large enough to reduce the power of the test statistic such that significant correlations would not be found, even if there was a significant underlying effect.

Other findings reported in the paper on seal bomb usage were: 1) there was no significant difference between the kill per set for sets where seal bombs were used and for sets where seal bombs were not used; 2) there was no significant difference in the number of animals captured per set for sets where seal bombs were used and for sets where seal bombs were not used; and 3) there was no significant difference in the tonnage of tuna landed for sets where seal bombs were used and for sets where seal bombs were not used. Finally, it was reported that seal bombs were used in 38 percent of the dolphin sets in 1989 for which there are data. Also, of the 20 captains interviewed, five (25 percent) indicated that they never used seal bombs during dolphin sets. It was noted that seal bombs are normally used in dolphin sets during chase and backdown.

The paper on the chemistry of seal bombs reported on the chemical composition of seven different types of seal bombs currently in use. It was reported that seal bombs manufactured outside the United States did not meet U.S. Department of Transportation specifications for class C explosives. In general, foreign-made seal bombs were found to be more powerful than U.S.-made seal bombs.

The paper on the effects of seal bombs on dolphins reported that a seal bomb exploded within 0.5 meters of a dolphin will likely cause physical injury to that animal. This report concluded that data to evaluate the effects of seal bomb use on dolphin hearing are inadequate; however, the potential for damage was recognized.

Public Comments

Dr. Douglas G. Chapman, *Marine Mammal Commission:* Are there data to support that seal bombs reduce the dolphin herd size at capture? ***Dr. DeMaster:*** No, but some members of the workshop did report that seal bombs may reduce dolphin herd size at capture.

Mr. Jeffrey Pike, *House Committee on Merchant Marine and Fisheries:* Are interviews with the captains random? ***Dr. DeMaster:*** The interviews are non-selective; they are not random.

Mr. David Phillips, *Earth Island Institute:* What is the status of the use of non-class C explosives? ***Mr. Fullerton,*** *NMFS:* There will be prosecutions for any violations.

Mr. August Felando, *American Tunaboat Association:* Does NMFS plan to look into the

positive use of seal bombs? ***Dr. DeMaster:*** NMFS will pursue interviewing captains.

Review of Tuna-Log vs. Tuna-Dolphin Fishing Methods

Dr. Martin Hall, Chief Scientist of the Tuna-Dolphin Program, IATTC.

As tuna associate with dolphins, they also associate with floating objects. Larger tuna (90 cm in length) associate with dolphins, whereas smaller tuna associate with logs. Studies of floating objects may lead to information on tuna association with dolphins. IATTC observers collect data on floating objects (their size, shape, materials, position, time spent in the water, etc.) and what is associated with them (tunas, billfishes, sharks, sea turtles, other fishes, birds, epibiota, etc.).

For past two years, the IATTC has been working on a research program to understand the association between tunas and logs and to use that information for the possible development of alternative fishing techniques based on attracting yellowfin tuna to anchored or drifting structures (FADs). We have studied the sources of logs on the continent, their drift patterns, the influence of hydrological conditions, the log characteristics, the composition of the communities associated with them, the catches under logs, and several other factors of ecological significance. All geographical and temporal variations have to be described in order to identify the best time and place for FAD deployment.

Public Comments

Ms. Barbara Britten, *American Cetacean Society:* Why do smaller tunas associate with logs while larger fish associate with dolphins? ***Dr. Hall:*** Only large yellowfin tuna are fast enough to keep up with the dolphins. It also is possible that higher metabolic requirements for either food or oxygen may prevent large tuna from spending prolonged periods of time drifting.

Mr. E. Charles Fullerton, *NMFS:* FAD information from Hawaii indicates that tuna range at night and feed during the day. ***Dr. Hall:*** Tuna go through series of forage locations, some of which may be islands or anchored rafts, but the pattern of their association with drifting objects seems to be different.

Mr. David G. Burney, *U.S. Tuna Foundation:* Is it known how long it takes for a group of dolphins to form a new school after a set? ***Dr. Hall:*** There is not much data available. Dolphins are seen regrouping after a set, but it is not possible to identify exactly the composition of the full group or whether it stays together or divides into subunits.

Mr. August Felando, *American Tunaboat Association:* A 1978 radio tagging study indicated that dolphin herds break up and reform into new groups.

Status of Alternative Fishing Methods

Ms. Ann Terbush, Chief, Permits and Documents Division, Office of Protected Species, NMFS.

Under a contract initiated on September 11, 1989, the National Academy of Sciences has formed a committee of technical experts to begin a study to evaluate alternatives to fishing for tuna in association with dolphins, as mandated by the 1988 MMPA amendments. The committee will review information on the biology and ecology of yellowfin tuna and the dolphins with which they commonly associate, as well as the nature of the tuna-dolphin bond. The committee also will identify currently available and promising new techniques for reducing the incidental drowning of dolphins in nets. The resulting report will be used by the Secretary of Commerce as a basis for a proposed plan for research, development, and implementation of alternative fishing techniques.

The first committee meeting was held December 4-5, 1989, at the National Academy of Sciences building in Washington, D.C. The committee reviewed the statement of task, scope of the work, project plans, and schedule for the study. The committee produced a working outline for its report, assigned tasks to gather information, addressed issues relating to the study, and developed a tentative schedule

for subsequent committee meetings and a work plan. A final report is scheduled to be completed by September 1990.

Public Comments

Ms. Lesley Scheele, *Greenpeace International:* Who are members on the committee of technical advisors? ***Dr. Hall,*** *IATTC:* There are 10 people on the committee, including Dr. Robert Francis, chairman; Cliff Goudey, a gear expert from the Massachusetts Institute of Technology; Dr. Ken Norris on biology; Dr. Dennis King on economics; Dr. Michael Orbach; Dr. Ellen Pikitch, a fishery biologist from the University of Washington; Dr. Roger Payne, a whale biologist; and Captain Harold Medina, in addition to administrative staff from the Academy. I do not know what criteria or procedures were followed in the selection of members. ***Ms. Scheele:*** Many of us here are surprised to learn that few committee members have technical experience concerning gear problems. Could the panels be expanded to include more engineers and Latin American representatives? ***Mr. E. Charles Fullerton,*** *NMFS:* It will be a recommendation from this meeting that more engineers and Latin American representatives are needed on the panel.

REVIEW OF TUNA FLEET PERFORMANCE

Review of Education-Extension Efforts

Domestic Fleet -

Mr. Robert Salomons, Database Manager, Porpoise Rescue Foundation (PRF).

Observed coverage of the U.S. certificated fleet has changed over time and significantly increased in recent years following implementation in 1981 of an annual dolphin mortality quota of 20,500 (Figure 3). The PRF keeps all historical NMFS and IATTC observer data from the U.S. certificated fleet, including fishing effort on dolphins and catch rates on dolphin sets (Figures 4 and 5).

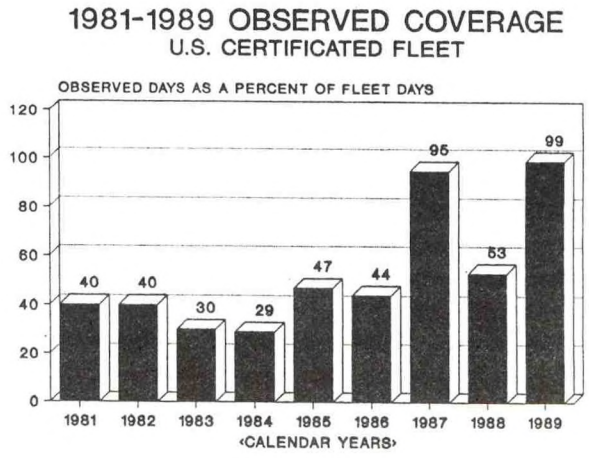


Figure 3.

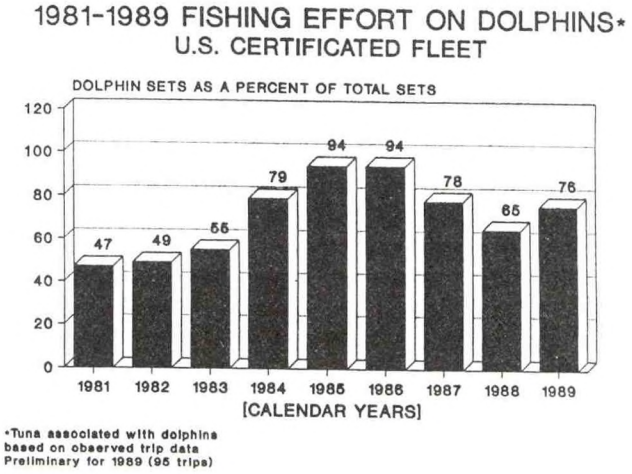


Figure 4.

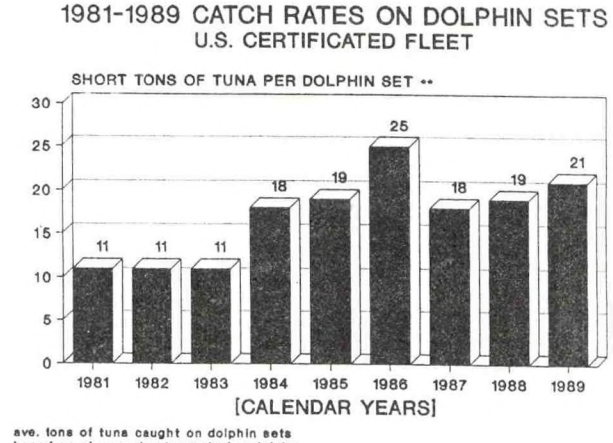
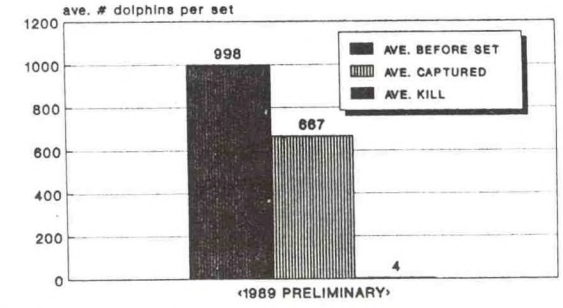


Figure 5.

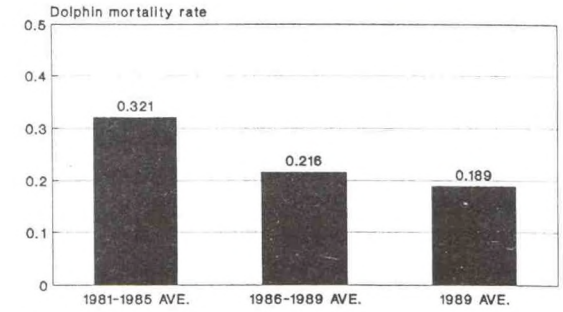
AVE. # DOLPHINS BEFORE SET, CAPTURED AND KILLED
U.S. CERTIFICATED FLEET



based on observers' estimates of the # of dolphins before the set, captured and kill count/2,988 observed sets

Figure 6.

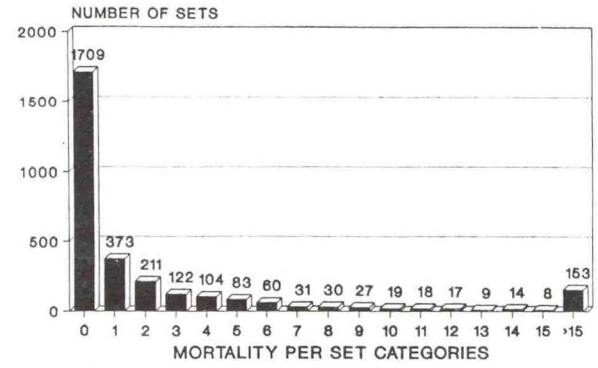
DOLPHIN MORTALITY PER TON OF TUNA
1981-1985 vs. 1986-1989 vs. 1989
U.S. CERTIFICATED FLEET



* 1989 data is preliminary/95 trips based on tuna caught on dolphin sets

Figure 7.

DISTRIBUTION OF MORTALITY BY KILL/SET
1989 U.S. CERTIFICATED FLEET



Based on 2,988 sets capturing dolphins preliminary for 1989

Figure 8.

An overview of data from 1989 to date shows 11,557 dolphin mortalities. About 12,500 mortalities are projected for the year, with 99 percent observer coverage. Preliminary figures based on observer data for 1989 show that the average dolphin school size before a set was 998, of which 667 were captured and four were killed (Figure 6). Catch rates on dolphins have been excellent. The kill per ton for 1981-85 was 0.321 but has dropped to 0.189 (Figure 7). For 95 cruises and 2,703 sets capturing dolphins, almost 60 percent were zero mortality sets (Figure 8).

On U.S. vessels, the use of the backdown procedure and the porpoise safety panel are very important to lowering dolphin mortality. The backdown procedure has been in use since 1958. The porpoise safety panel, developed by Captain Harold Medina in 1970, is constructed of 1.25-inch stretch mesh netting; 4.25-inch mesh is used elsewhere in the net.

Anything that shortens the period of time from the point the net is released to backdown will improve dolphin protection. For instance, the old ring system, where the purse cable was released from the rings, has been replaced with a system of snap rings that accomplish the same task in less time. Snap rings save about 10 minutes in reaching the start of backdown and cost $50 apiece.

PRF interviews captains with the best dolphin records for their ideas on how to improve dolphin protection. One captain has suggested using three strips of porpoise safety panel instead of only two as now required. Safety panels of that size will be installed on two boats in 1990.

International Fleet -
Mr. David A. Bratten, Tuna-Dolphin Program, IATTC.

Currently, the IATTC tuna-dolphin staff performs both observer-related and gear-related activities that include observer training and placement, data processing and analysis, skipper workshops, and dolphin safety gear inspection and net alignments.

In 1982, the IATTC introduced the use of high-intensity floodlights to aid dolphin rescue during sets in which the backdown procedure

is performed in darkness. In 1985, as part of a joint program with the UNEP, IATTC purchased 40 floodlights for distribution to vessels of the non-U.S. fleet. To date, with additional floodlights obtained after the IATTC/UNEP program, 56 floodlights have been given to non-U.S. vessels (Table 1). It became mandatory in 1986 for U.S. vessels to use high-intensity floodlights during dark backdown sets. Currently, all fleets that fish in the ETP are required by national regulations to use floodlights.

SOME ACTIVITIES OF THE IATTC NON-U.S. TUNA-DOLPHIN PROGRAM, 1985-1989

Year	High-Intensity Floodlights Issued	Safety Panel Alignments/ Gear Inspections	Observer Training Sessions[a]
1985	6	1	1
1986	22	4	3
1987	8	4	2
1988	15	29	6
1989	5	37	3
Totals	56	75	15

a Conducted in Ensenada and Mexico City, Mexico; Manta, Ecuador; Panama City, Panama; and Cumana, Venezuela.

Table 1.

Dolphin safety gear inspections and dolphin safety panel (DSP) net alignments during trial net sets are another of the extension services available to the fleet (Table 2). The IATTC staff has provided this service to 75 non-U.S. vessels over the past five years (Table 1). The DSP alignment procedure is done to ensure that the fine-mesh panel is properly aligned in the backdown channel for efficient dolphin release. There are two types of DSPs employed in current purse seines. One is the standard panel that is approximately 180 fathoms in length (prior to installation), two standard net-strips deep (~12 fathoms), and constructed of 1.25-inch mesh webbing. The other panel is called a superapron, which is the standard panel with a triangular extension panel on top that is

IATTC DOLPHIN SAFETY PANEL ALIGNMENT AND GEAR INSPECTION SERVICE

Purpose:

To determine if vessel's dolphin safety gear meets minimum standards, and to determine if the dolphin safety panel is properly aligned in the backdown channel for efficient dolphin release.

Dolphin Safety Panel Alignment:

Backdown maneuver performed during a trial set. In-water observations to locate or verify proper tie-down points for backdown. Type, dimensions, and condition of dolphin safety panel determined.

Safety Gear Inspection:

The presence and condition of the following equipment is verified during the trial set:

- Inflatable raft
- High-intensity floodlight
- Speedboats with stern towing bridles and towlines
- Masks and snorkels

Report to Vessel Owner:

- Summary of net and safety panel dimensions
- Results of panel alignment
- Comments on deficiencies in gear, if any, and recommendations
- Diagram of vessel's dolphin safety panel

Table 2.

approximately 90 fathoms in length along the base, 1.3 net-strips deep (~8 fathoms) at the triangle apex, and also is constructed of 1.25-inch mesh. Previous studies indicate no difference in mortality rates between vessels equipped with superaprons and those equipped with standard panels.

The dolphin safety gear inspection includes checking the condition of the DSP, such as making sure that all corkline handholds and cork hangings are laced tight and that there are no holes in the fine-mesh panel, and checking for the presence of a raft for use as a dolphin rescue platform, a floodlight for use during dark backdowns, masks and snorkels for crew use during dolphin rescues, and stern towing bridles on all operable speedboats to allow towing on the net to restrict dolphin- endangering net collapses (Table 2).

After a vessel's dolphin safety gear has been inspected and its DSP aligned, a report is sent to the vessel manager that: 1) summarizes the dimensions of the net and the DSP; 2) describes

the results of the DSP alignment procedure; 3) provides comments on any gear deficiencies and recommendations for improvement; and 4) provides a schematic diagram of the vessel's DSP (Table 2).

IATTC staff activities also include the training of sea-going scientific technicians. Fifteen training sessions for non-U.S. technicians were held during the five-year period, in Ensenada and Mexico City, Mexico; Guayaquil, Ecuador; Panama City, Panama; and Cumana, Venezuela (Table 1). Training includes marine mammal and tuna identification, marine mammal herd size estimation, dolphin behavior, IATTC data collection procedures, and vessel gear and safety. U.S. technicians, who are NMFS employees, also receive IATTC data collection training for one week after their four-week NMFS training course.

In 1989, the IATTC held 11 dolphin mortality workshops for fishermen and industry personnel in five different countries. There was a total of 157 attendees at the workshops, and 68 of the fishermen participating were active fishing captains (Tables 3 and 4).

Another service available to the international fleet is data analyses for individual fishing captains and for IATTC-sampled trips. These analyses are available after signed data

IATTC DOLPHIN MORTALITY WORKSHOPS HELD DURING 1989 FOR FISHERMEN OF NON-U.S. FLEETS

Date	Location	No. of attendees	No. of certificates issued to fishermen
April 23-24	CARTAGENA, Colombia	17	12
June 15-16	LA JOLLA, California	1	1
July 6	ENSENADA, Mexico	17	14
July 20	ENSENADA, Mexico	19	18
Sept 1-2	MANTA, Ecuador	9	6
Sept 9-10	CUMANA, Venezuela	20	9
Sept 21	ENSENADA, Mexico	27	19
Sept 29	SAN DIEGO, California	6	6
Oct 2	ENSENADA, Mexico	13	12
Oct 10	SAN DIEGO, California	6	6
Oct 24	ENSENADA, Mexico	22	21
TOTALS	11 WORKSHOPS	157	127 [a]

a Total includes 3 fishermen who were issued certificates after attending the IATTC Tuna-Dolphin Workshop in San José, Costa Rica, in March 1989.

Table 3.

DISCUSSION TOPICS DURING AN IATTC DOLPHIN MORTALITY-REDUCTION WORKSHOP

- Activities of the IATTC International Tuna-Dolphin Program
- Historical review of the purse-seine fishery in the EPO
- Historical review of dolphin mortality in the purse-seine fishery for tunas in the EPO; fleet sampling and mortality estimation
- The international controversy over the tuna-dolphin problem; videotape of news broadcasts
- Factors affecting dolphin mortality; responsibilities of the fishing captain and vessel owner
- Review of yellowfin tuna trade regulations; current and future requirements
- U.S. and national fleets: comparison of dolphin mortality rates
- IATTC gear program and services (safety panel alignments/gear inspections), and recent gear innovations
- Review of recommended dolphin safety gear
- Individual meetings with attending fish captains to discuss performance

Table 4.

releases are received from the vessel operator and manager. The trip analysis is a computer-generated summary of the trip data, including mortality per set and mortality per ton of yellowfin tuna loaded, and individual set data, such as number of animals captured, dolphin mortality and causes, and yellowfin tonnage.

Public Comments

Mr. August Felando, *American Tunaboat Association:* When did IATTC begin offering data analyses to individual captains? ***Mr. Bratten:*** Just this year.

Mr. David Phillips, *Earth Island Institute:* What are the effects on mortality from fewer boats, sundown sets, and fewer sets on dolphins? ***Mr. Salomons:*** The data show a lower kill per ton. ***Mr. Phillips:*** Has there been a reduction in the number of dolphin sets as a percentage of total sets this year compared to last year? ***Mr. Salomons:*** We expect 3,300 to 3,500 dolphin sets in 1989, when all the data are compiled.

Mr. Chris Croft, *Humane Society of the United States:* Where do the majority of sets take

place? ***Mr. Salomons:*** Most sets for the U.S. fleet occur east of 130° W. longitude and north of the equator. However, west of the 130° W. longitude line the mortality rates are higher. In 1989, there were more sets west of 130° W. longitude than in 1987, the first year of high coverage.

Mr. Jeffrey Pike, *House Committee on Merchant Marine and Fisheries:* The information seems to indicate that a low percentage of sets cause a disproportionately high dolphin kill. Can this be attributed to the same captains? ***Mr. Salomons:*** About 5 to 6 percent of sets in 1989 had more than 15 kills and only about 1 percent had 50 or more mortalities. Sets with more than 15 kills account for over 60 percent of the total observed mortality. Any captain can have a problem set caused by any combination of factors, such as school size and type of dolphins, weather conditions, dolphin behavior, equipment malfunctions, and whether backdown occurs in daylight or after sundown.

Dr. Luis Fleischer, *Mexico:* Do dolphins sometimes swim up the backdown channel? ***Mr. Salomons:*** In the western areas of the fishery or south of the equator, spinner dolphins are more likely to come up the backdown channel.

Mr. Zephyr Carlyle, *Friends of Animals:* Are seal bombs marked on data forms? ***Mr. Salomons:*** Yes.

Dr. Martin Hall, *IATTC:* Concerning other IATTC research, we also are exploring the usefulness of a remote vehicle with a video camera for underwater observations and data collection and a Doppler current meter, which provides a detailed profile of subsurface currents and can have an significant impact in reducing dolphin mortality due to net collapses caused by strong currents. The cost of the prototypes is about $70,000, but with some research and development, a sturdier, less sophisticated version could be adapted for tuna vessels.

Review of Sundown Set Prohibition

Mr. Rodney R. McInnis, Chief, Fisheries Conservation and Management Division, Southwest Region, NMFS.

Sets in which dolphin release extends beyond sundown cause higher mortality (Figure 9). In 10 percent of sets on dolphin, some part of backdown occurs after sundown. These sets produce 10 percent of the tuna catch but cause 30 percent of the dolphin mortality. Since 1986, high-intensity floodlights have been required to assist with dolphin rescue during sundown sets. The IATTC and PRF have assisted vessels to ensure lights were installed. For the period 1986-88, NMFS looked at light data and found dolphin mortality reduced but still higher than for daylight sets (Figure 10).

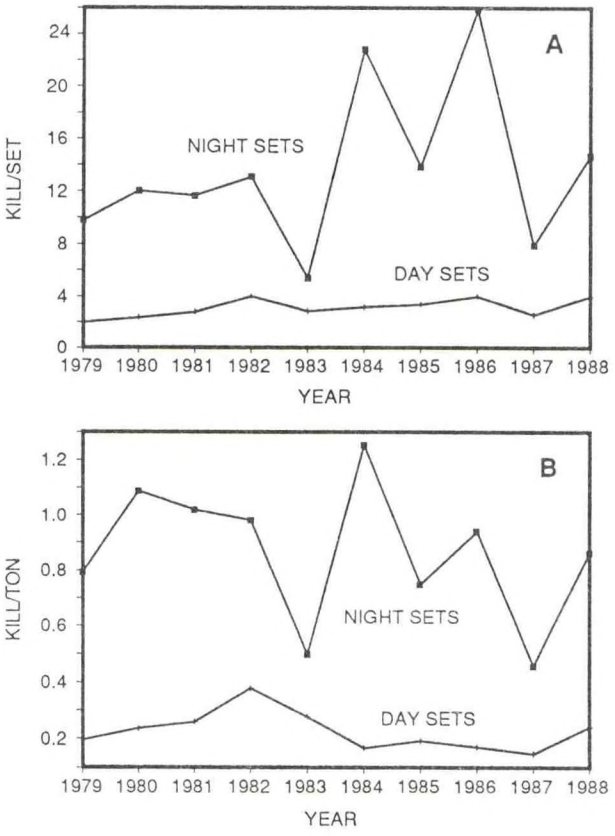


Figure 9. Annual observed dolphin mortality rates in kill/set (A) and kill/ton of yellowfin tuna caught (B) for day and night sets. (From Coan et al., 1988.)

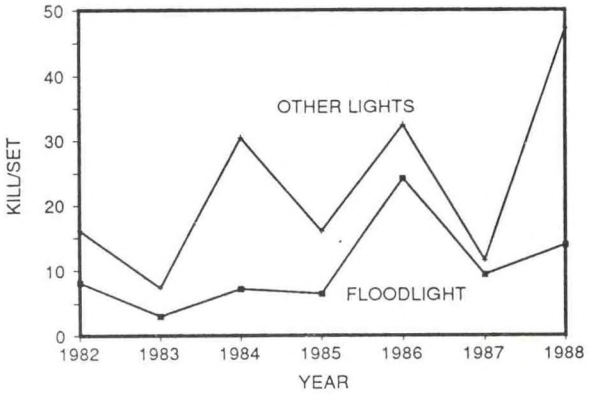


Figure 10. Annual dolphin kill/set in night sets where 140,000 lumen floodlights were used and where other types of lights were used. (From Coan, et al., 1988)

The MMPA amendments called for a prohibition of sundown sets with an exception for an individual operator whose mortality rate is no greater than the fleet average rate for daylight sets. A 1989 interim rule requires all sets be completed through backdown within a half an hour after sundown. All release procedures must be followed, including light use to assist dolphin release regardless of the time of the set. An operator who maintains a sundown set mortality no greater than the fleet's daylight average may apply for an annual exemption, which allows sundown sets on observed fishing trips.

Nine of 80 operators applied for sundown set exemptions in 1989. Two of those operators were qualified, and six requested malfunction sets to be excluded. The two qualified operators had no malfunction sets excluded. The sundown set rule has no provision for a new operator to demonstrate proficiency on a sundown set, nor can an operator re-qualify if an exemption is lost. With the sundown set rule, the number of dolphins killed per ton is expected to drop 20 percent, and the average number of vessel days at sea is expected to increase up to five days. In 1989, there was a decline in the dolphin kill per ton.

NMFS is considering several changes for the final rule: 1) using kill per set instead of kill per ton as a performance indicator, and 2) possibly establishing a time before sundown at which a set is prohibited. The two exemptions now in effect also probably will be extended for 1990.

Public Comments

Mr. David Phillips, *Earth Island Institute:* Does decreased fleet size affect reduced dolphin kill? How much is due to sundown sets? ***Mr. McInnis:*** The expected 20 percent reduction in dolphin mortality rate due to the sundown set prohibition is independent of the number of vessels in the fleet.

Ms. Lesley Scheele, *Greenpeace International:* Why is the sundown set exemption given on an annual basis rather than a cruise-by- cruise basis? ***Mr. McInnis:*** The exemption is tied to the operator's certificate of inclusion, which is issued annually.

Mr. David Phillips, *Earth Island Institute:* What is the value of tuna versus the cost of a sundown set violation? ***Mr. Martin B. Hochman,*** *NOAA General Counsel:* Penalties are assessed on a case- by-case basis. If a violation is repeated, the penalty increases. An operator's record over a period of time is examined. The agency attempts to set penalties high enough to deter future violations. If a person continues to violate a regulation, then the penalty for the violation is increased.

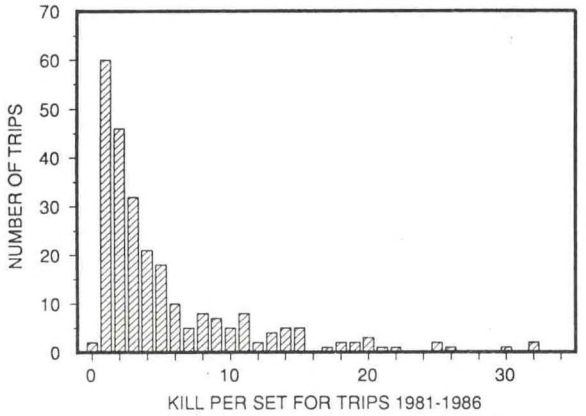
Review of Skipper Performance System

Domestic Fleet -

Mr. Rodney R. McInnis, Chief, Fisheries Conservation and Management Division, Southwest Region, NMFS.

A few vessel operators are responsible for most of the dolphin mortality, as indicated by the few trips with very high dolphin kill per set during the period 1981-86 (Figure 11). Kill per ton demonstrates a similar pattern (Figure 12).

The 1988 MMPA amendments require operator performance standards to identify and correct operators with high kill rates. The NMFS has developed a performance standards system which is intended to maintain operator diligence and proficiency and to provide training and supplemental observations unless a certifi-



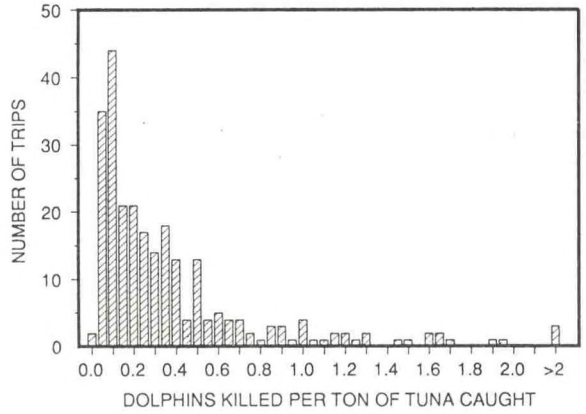


Figure 11. Top and **Figure 12.** Bottom.

cate is revoked. An operator's certificate will be revoked for mortality performance that is consistently and substantially high despite remedial actions.

The proposed mortality performance system was published in November 1989 and has been out for public comment. The system is based on comparing the kill per set fleet average from the previous five years to the performance of an individual captain. The individual performance is not to exceed 1.5 times the fleet average. If the performance standard is exceeded, the NMFS Southwest Regional Director and Expert Skippers Panel will review the situation and recommend guidance. After two performance failures by an individual operator, there may be a need to take an expert captain along on the next cruise to provide instructional help. After three failures, an operator's certificate will be suspended for one year. If an operator's average kill per set on a trip is 5.0 times or greater than the fleet average, there will be an immediate certificate suspension for six months. There is a petition provision if a malfunction is involved. Vessel certificate holders are responsible for required dolphin safety gear and are accountable for such gear under current gear inspections.

In the U.S. fleet alone, about 2,000 dolphins per year could be saved under a skipper performance system. If a system had been in effect for 1987-88, 12 operators would have exceeded the 1.5 times standard using kill per ton data, eight would have exceeded the standard on the second trip, and one operator would have exceeded the 5.0 times standard (Table 5). Using kill per set data, 17 operators would have exceeded the 1.5 times standard, 13 would have exceeded the standard on the second trip, and two operators would have exceeded the 5.0 times standard (Table 6).

Table 5. Number of operators exceeding various kill-per-ton standards.

	No. of Operators Exceeding		
	1-Trip	2-Trips	3-Trips
5-Year average	23	5	0
1.5X the average	12	2	0
2X the average	8	0	0
5X the average	1	–	–

Table 6. Number of operators exceeding various kill-per-set standards.

	No. of Operators Exceeding		
	1-Trip	2-Trips	3-Trips
5-Year average	28	5	1
1.5X the average	17	4	1
2X the average	13	2	0
5X the average	2	–	–

During the public comment period on the proposed mortality performance system, which closed December 1, 1989, NMFS received three comments. The requirements will be revised for all trips beginning January 1, 1990.

International Fleet -
Dr. Martin Hall, Chief Scientist of the Tuna-Dolphin Program, IATTC.

Several factors affect dolphin mortality in a set: dolphin species/stock, area, amount of

catch, size of herd, day or night, currents, malfunctions, and use of dolphin rescue gear and procedures. A performance system should be simple and fair and should separate skipper performance from company responsibility. Vessel owners have responsibility for proper gear, vessel condition, net condition, vessel maintenance, and crew selection and motivation. Skippers have responsibility for dolphin safety procedures, crew training, gear maintenance during trips, and risk assessment during sets. Any performance system should allow comparisons between years and should have an objective statistical basis.

IATTC has developed a proposed performance system that would: 1) get information on all dolphin sets; 2) separate out malfunction sets; 3) separate sets on common and other dolphins and for each of those classes subdivide them into three areas; 4) calculate the mortality per set in each cell and transform the results to natural logarithms; 5) estimate the standard deviation for the distribution of ratios in each cell; 6) compute a standardized score for each ratio; and 7) combine those scores, weighted by the number of sets for each year or for a group of years. Such a system could be used for any country.

Public Comments

Mr. August Felando, *American Tunaboat Association:* Have you discussed the proposed performance system with NMFS? ***Dr. Hall:*** We have not formally discussed it with NMFS.

Ms. Penny Dalton, *Senate Committee on Commerce, Science and Transportation:* What is the data basis for the proposal? ***Dr. Hall:*** It is based on dolphin sets, not trips; at least 10 sets are required. This proposal is a research study on how to develop a system. IATTC is not making suggestions on management; that is up to countries and companies.

Mr. Bernie Fink, *Van Camp Seafood Company:* Is the span of a reading a year or entire career? ***Dr. Hall:*** Both.

Mr. David Phillips, *Earth Island Institute:* The proposed U.S. skipper performance system will not remove poor captains from the fleet. ***Mr. McInnis:*** Any performance system will have an effect on an operator and improvement could be expected. The requirements are intended to improve skipper performance.

Mr. August Felando, *American Tunaboat Association:* Using performance from only a single cruise is not a fair basis to judge an operator. ***Mr. McInnis:*** NMFS has an obligation to take quick action in cases of extremely high dolphin kills.

COMMENTS BY FOREIGN FISHING NATIONS

Lic. Margarita Rosa Rosado Matos, *International Affairs Director, Secretaria de Pesca, Mexico:* Mexico, which lands about 134,000 tons of tuna a year, is concerned about protecting marine species, including marine mammals. Mexico established procedural and gear regulations for dolphin safety in 1977 and joined the international observer effort in 1986. We currently are involved in promoting research on marine mammals. In 1988, dolphin mortality for Mexico was 20 percent less than in previous years. Workshops held in Mexico for fish captains to help reduce dolphin mortality involved 39 vessels. Mexico has concerns about U.S. importation regulations as to their basis with research findings and sees conflicts with Law of the Sea agreements.

Mr. Felipe Charat, *private sector, Mexico:* Since March, Mexico has accelerated its tuna-dolphin program. The Mexican fishing industry is actively pursuing dolphin safety. Eighty-seven fisherman from 33 of 40 vessels have gone to workshops. Net alignments have been made on 39 vessels. Other safety gear will be up to standards by the first of the year. The tuna industry has 5,000 jobs in Mexico which support 30,000 other jobs, representing an economic value $70 million. The industry's presence at these types of meetings shows our interest in the tuna-dolphin issue, and we have demonstrated that we have improved our performance concerning dolphin mortality. Mexico has had tuna purse seiners for less than 10 years, but the objective to reduce dolphin mortality has been ongoing, and our performance is improving. It is unreasonable to ask the

Mexican fleet to accomplish so quickly what the U.S. fleet has taken 29 years to accomplish. The U.S. importation legislation's embargo provisions are unreasonable and put an unfair burden on Mexico.

Mr. Daniel Novoa R., *Director General Sectorial de Pesca y Acucultura, Ministerio de Agricultura y Cria, Venezuela:* Venezuela is active with several tuna-dolphin activities: 1) the annual report submitted to the United States for 1988 shows a substantial reduction in dolphin mortality; 2) workshops have been held to improve the awareness of captains; 3) documentation has been provided to the United States for our importation finding; 4) sundown sets were banned in 1988; and 5) an agreement to increase observer coverage has been established. Venezuela is doing as much as possible to comply with U.S. regulations, but we need more time and flexibility. There will be serious social and economic consequences if Venezuela is embargoed under the U.S. importation provisions.

Mr. Jose Antonio Isaza, *Asociacion Panamena de La Industria del Atun, Panama:* Our goal is to improve laws to protect dolphins, but we believe that the U.S. importation law is too one-sided. Panama is a country of service; vessels from many nations are registered in Panama. An embargo on Panama also would affect service to other countries.

Mr. Michael Riepen, *Fisheries Economic Advisor, Department of Fisheries, Ministry of Agriculture, Forestry and Fisheries, Vanuatu:* Vanuatu supports the concept of minimizing dolphin mortality. It, however, believes that the only practical and effective management regime is through an international program, specifically the IATTC. We request that the U.S. Government and environmental community acknowledge the major steps Vanuatu and other fishing nations have made to reduce dolphin mortality and, finally, that we be given a reasonable timeframe to meet standards similar to the U.S. fleet. (See Appendix 5 for complete statement.)

Mr. Carlos Arbelaez, *private sector, Vanuatu:* Environmental groups have been effective in getting the kind of legislation that they want. However, we need to take away the confrontational aspect of the tuna-dolphin issue. This is a time for understanding, not confrontation. We believe that the U.S. importation legislation is inflexible and could cause a crisis unless some changes are made.

Mr. Daniel Novoa R., *Venezuela:* There will be a meeting in Venezuela in January to define a regional effort for the conservation of dolphins. A new foundation of seven countries will be developed.

A statement provided by ***Dr. Luis Herreria Bonnet,*** *Subsecretary for Fisheries Resources, Ecuador,* is appended to this report (Appendix 6).

OTHER COMMENTS

Dr. James Joseph, *IATTC:* I am concerned that the possibility of embargoes on nations exporting tunas to the United States may have a serious effect on the future of the IATTC's international program. It seems probable that the comparison rate of 2.0 will lead to some embargoes during 1990, and that the 1.25 rate will result in many more in 1991, perhaps even most of the countries now fishing tunas associated with dolphins. The embargoed nations will almost certainly leave the international program, and this will mean no transfer of technology to reduce the kill, no observer program to quantify it, and probably an increase in the dolphin mortality. The result will be just the opposite of what the U.S. Congress had intended to achieve with the MMPA amendments. More dolphins will be killed, no estimate of the kill will be available, and relations with Latin American nations will be strained.

Mr. Zephyr Carlyle, *Friends of Animals:* My organization represents millions of people who are concerned about purse seining because of dolphin deaths. We are concerned that, 17 years after the MMPA, there still is no alternative fishing method. A total tuna boycott is one avenue to bring about a change.

Mr. Chris Croft, *Humane Society of the United States:* The American people want a canned tuna product made from tuna that is not caught by killing dolphins. The proposed U.S. tuna labeling legislation is important be-

cause it will allow consumers a choice. We must have dolphin-safe fishing technologies, rather than perpetuating the tuna-dolphin problem.

Mr. Don White, *Earthtrust:* I know and have worked with many fishermen. I believe that fishermen have the right to catch tuna. However, to set nets on dolphins is an obscene act.

Mr. David Phillips, *Earth Island Institute:* There are now data from 100 percent observer coverage, and there are IATTC cruises for enforcement. However, we want zero dolphin kill and no purse seine technology. Small steps are not the way to solve the tuna-dolphin problem. The only fishing alternative must be an end to tuna purse seining.

Mr. David G. Burney, *U.S. Tuna Foundation:* There are many dedicated people at this conference who want to see the tuna- dolphin issue resolved. What is needed most at this time is a rational approach to the problem and a focus on alternatives. It is simply not true that the U.S. tuna industry has done nothing about the problem. The NMFS film about porpoise safety showed a zero kill set, which is representative, as 60 percent of sets by the U.S. fleet have no dolphin kill. The industry will continue efforts to reduce dolphin mortality.

CONCLUSION

The consensus of the meeting was: **1)** ETP dolphin stocks are not in danger of extinction or depletion; **2)** efforts should continue to reduce dolphin mortality; and **3)** although substantial progress has been made in reducing dolphin mortality, foreign nations may require more time to meet U.S. import standards for yellowfin tuna.

NMFS will hold two further annual meetings, in 1990 and 1991, to review progress made toward reducing the killing and serious injury of dolphins and other marine mammals incidental to tuna purse seine fishing operations in the ETP, and will present a progress report to the U.S. Congress in 1992.

APPENDIX 1

List of Attendees

Annual Meeting to Review the Performance of the International Fleets in Reducing Dolphin Mortality

December 12-13, 1989

Commissions

Dr. James Joseph
Director
Inter-American Tropical Tuna Commission
c/o Scripps Institution of Oceanography
La Jolla, CA 92093

Dr. Martin Hall
Chief Scientist
Tuna-Dolphin Program
Inter-American Tropical Tuna Commission
c/o Scripps Institution of Oceanography
La Jolla, CA 92093

Mr. David A. Bratten
Research Scientist
Inter-American Tropical Tuna Commission
c/o Scripps Institution of Oceanography
La Jolla, CA 92093

Mr. Pablo Arenas
Research Scientist
Inter-American Tropical Tuna Commission
c/o Scripps Institution of Oceanography
La Jolla, CA 92093

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Dr. Douglas G. Chapman
Chairman
Scientific Advisory Committee
Marine Mammal Commission
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Professional Staff Member
Senate Committee on Commerce, Science, and Transportation
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Ms. Sarah Seymour
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Friends of Animals, Inc.
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Greenpeace Action
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Mr. Domenico Pinto
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D.H.A. Karachi 46 India

APPENDIX 2

PROPOSED AGENDA

ANNUAL TUNA-DOLPHIN REVIEW MEETING

National Marine Fisheries Service
Compri Hotel
2800 Via Cabrillo Marina
San Pedro, CA 90731
(213) 514-3344
December 12-13, 1989

Tuesday, December 12, 1989

9:00 A.M. **A. Call to Order** ..... Fullerton

1. Welcome ..... Fullerton

2. Introductions ..... Fullerton

3. Proposed Agenda ..... Fullerton

4. Overview of Tuna-Dolphin Program
   a. Domestic Program ..... Fullerton
   b. International Program ..... Joseph

B. Review of Research Programs ..... Smith

1. Status of Trends Analysis of Dolphin Stock Abundance
   a. NMFS Analysis ..... DeMaster
   b. IATTC Analysis ..... Hall

2. Status of Dolphin Stock Identity ..... DeMaster

3. Statistical Methodology for Estimating Dolphin Mortality and Mortality Rates
   a. Domestic Program ..... DeMaster
   b. International Program ..... Hall

4. Direction of Future Research
   a. NMFS Research Program ..... DeMaster
   b. IATTC Research Program ..... Hall

5. Public Comments

5:00 P.M. **Adjournment** ..... Fullerton

Wednesday, December 13, 1989

8:30 A.M. **C. Call to Order** . . . . . Fullerton

1. Status of Import Requirements . . . . . Smith

2. NMFS Film: Tuna Seining and Porpoise Safety

D. Review of Technological Developments . . . . . Smith

1. Introduction of New Dolphin Saving Technology in Domestic Fleet . . . . . Salomons

2. Review of Use of Explosives Study . . . . . DeMaster

3. Review of Tuna-Log vs. Tuna-Dolphin Fishing Methods . . . . . Hall

4. Status of Alternative Fishing Methods Study . . . . . Terbush

5. Future Developments in Domestic Fleet . . . . . Salomons

6. Public Comments

E. Review of Tuna Fleet Performance . . . . . Smith

1. Review of Education-Extension Efforts
   a. Domestic Fleet . . . . . Salomons
   b. International Fleet . . . . . Bratten

2. Review of Sundown Set Prohibition . . . . . McInnis

3. Review of Skipper Performance System
   a. Domestic Fleet . . . . . McInnis
   b. International Fleet . . . . . Hall

4. Trends in Dolphin Mortality
   a. Domestic Fleet . . . . . DeMaster
   b. International Fleet . . . . . Hall

5. Comments by Foreign Fishing Nations

6. Public Comments

F. Outlook for the Future
   a. Domestic Program . . . . . Fullerton
   b. International Program . . . . . Joseph

G. Concluding Remarks . . . . . Fullerton

5:00 P.M. **Adjournment** . . . . . Fullerton

APPENDIX 3

Publications

Annual Meeting to Review the Performance of the International Fleets in Reducing Dolphin Mortality

December 12-13, 1989

Review of Research Programs

A Guide to Shipboard Identification of Spinner and Spotted Dolphin Schools (Genus *Stenella*) in the Eastern and Central Tropical Pacific Ocean. By Southwest Fisheries Center, National Marine Fisheries Service and Inter-American Tropical Tuna Commission. December 1986. Administrative Report LJ-86-30. 23 p.

A Power Analysis for Detecting Trends. By Tim Gerrodette, Southwest Fisheries Center, National Marine Fisheries Service. 1987. Ecology. 68(5). 9 p.

A Workshop to Identify new Research that Might Contribute to the Solution of the Tuna Porpoise Problem. By R.J. Hofman, Marine Mammal Commission. December 8-9, 1975. 23 p.

An Assessment of the Performance of Line Transect Models for Fitting IWC/IDCR Cruise Data, 1978/79 to 1984/85. By Stephen T. Buckland, Inter-American Tropical Tuna Commission. 1987. Rep. Int. Whal. Comm. 37. SC/38/Mi22. 3 p.

Dynamic Response Analysis. III. A Consistency Filter and Application to Four Northern Elephant Seal Colonies. By Peter Boveng, Montana State University, Douglas P. DeMaster, Southwest Fisheries Center, National Marine Fisheries Service, and Brent S. Stewart, Sea World Research Institute. July 1988. Marine Mammal Science, 4(3):210-222. 7 p.

Effects of Including Dolphins Seriously Injured and of Unknown Status in Mortality Estimates. By Charles W. Oliver and Elizabeth F. Edwards, Southwest Fisheries Center, National Marine Fisheries Service. January 1989. Administrative Report LJ-89-04. 39 p.

Effects of Noise on Animals: Implications for Dolphins Exposed to Seal Bombs in the Eastern Tropical Pacific Purse-Seine Fishery, an Annotated Bibliography. By Anthony P. Majors and Albert C. Myrick, Jr., Southwest Fisheries Center, National Marine Fisheries Service. March 1990. Administrative Report LJ-90-06. 55 p.

Effects of Percent Coverage on Estimates of Cumulative Mortality: Results from Subsampling the 1987 Data Base. By Elizabeth F. Edwards, Bruce E. Wahlen and Christina Perrin, Southwest Fisheries Center, National Marine Fisheries Service. January 1989. Administrative Report LJ-89-05. 37 p.

Effects of the 1982-83 El Niño on Several Population Parameters and Diet of California Sea Lions on the California Channel Islands. IN: 1982-1984 El Niño and Pinnipeds. (in press)

Estimated Trends in Abundance of Dolphins Associated with Tuna in the Eastern Tropical Pacific. By S.T. Buckland and A.A. Anganuzzi, Inter-American Tropical Tuna Commission. 1988. Rep. Int. Whal. Comm. 38. SC/39/SM9. 27 p.

Estimates of Incidental Mortality of Dolphins in the Eastern Pacific Fishery for Tropical Tunas in 1987. By M.A. Hall and S.D. Boyer, Inter-American Tropical Tuna Commission. 1989. Rep. Intl. Whal. Comm. 39. SC/40/SM2. 7 p.

Estimating Density of Dolphin Schools in the Eastern Tropical Pacific Ocean by Line Transect Methods. By Rennie S. Holt, Southwest Fisheries Center, National Marine Fisheries Service. 1987. Fishery Bulletin: Vol. 85, No. 3. 16 p.

Factors Affecting Line Transect Estimates of Dolphin School Density. By Rennie S. Holt and John Cologne, Southwest Fisheries Center, National Marine Fisheries Service. 1987. J. Wildl. Manage. 51(4):836-843. 8 p.

Identification, Chemistry, and Behavior of Seal Bombs Used to Control Dolphins in the Yellowfin Tuna Purse-Seine Fishery in the Eastern Tropical Pacific: Potential Hazards. By Albert C. Myrick, Jr. and Cheryl B. Glick, Southwest Fisheries Center, National Marine Fisheries Service and Martin Fink, San Diego County Sheriff's Department. March 1990. Administrative Report LJ-90-08. 25 p.

Incidental Mortality of Dolphins in the Eastern Tropical Pacific Tuna Fishery: Description of a New Method and Estimation 1984 Mortality. By M.A. Hall and S.D. Boyer, Inter-American Tropical Tuna Commission. 1986. Rep. Int. Whal. Comm. 36. SC/37/SM12. 7 p.

Incidental Mortality of Dolphins in the Eastern Tropical Pacific Tuna Fishery in 1986. By M.A. Hall and S.D. Boyer, Inter-American Tropical Tuna Commission. 1988. Rep. Int. Whal. Comm. 38. SC/39/SM12. 3 p.

Incidental Mortality of Dolphins in the Tuna Purse-Seine Fishery in the Eastern Pacific Ocean During 1988. By M.A. Hall and S.D. Boyer, Inter-American Tropical Tuna Commission. 1990. Rep. Int. Whal. Comm. 40. SC/41/SM6. 6 p.

Incidental Mortality of Dolphins in the Eastern Tropical Pacific Tuna Fishery, 1979-1988. By Inter-American Tropical Tuna Commission. March 14-16, 1989. Working Document 2. Tuna- Dolphin Workshop. 92 p.

Monitoring Trends in Dolphin Abundance in the Eastern Tropical Pacific Using Research Vessels Over a Long Sampling Period: Analyses of 1986 Data, the First Year. By Rennie S. Holt and Stephanie N. Sexton, Southwest Fisheries Center, National Marine Fisheries Service. 1990. Fishery Bulletin: Vol. 88, No. 1. 7 p.

Monitoring Trends in Dolphin Abundance in the Eastern Tropical Pacific Using Research Vessels Over a Long Sampling Period: Analyses of 1987 Data. By Rennie S. Holt and Stephanie N. Sexton, Southwest Fisheries Center, National Marine Fisheries Service. 1989. Rep. Int. Whal. Comm. 39. SC/40/SM12. 5 p.

Monitoring Trends in Dolphin Abundance in the Eastern Tropical Pacific Using Research Vessels Over a Long Sampling Period: Analyses of 1988 Data. By Rennie S. Holt and Stephanie N. Sexton, Southwest Fisheries Center, National Marine Fisheries Service. 1989. Rep. Int. Whal. Comm. 40. (in press)

Potential for Physical Injury, Other Than Hearing Damage, to Dolphins from Seal Bombs Used in the Yellowfin Tuna Purse-Seine Fishery: Results from Open-Water Tests. By Albert C. Myrick Jr., Edward R. Cassano and Charles W. Oliver, Southwest Fisheries Center, National Marine Fisheries Service. March 1990. Administrative Report LJ-90-07. 28 p.

Preliminary Estimates of Relative Dolphin Abundance for 1988. By Inter-American Tropical Tuna Commission. March 14-16, 1989. Working Document 3. Tuna-Dolphin Workshop. 8 p.

Procedures for Sampling Dolphins: A Handbook for Shipboard Observers. By Albert C. Myrick, Jr., Southwest Fisheries Center, National Marine Fisheries Service. July 1986. NOAA-TM-NMFS-SWFC-62. 69 p.

Reducing Bias in Trends in Dolphin Relative Abundance, Estimated from Tuna Vessel Data. By A.A. Anganuzzi and S.T. Buckland, Inter-American Tropical Tuna Commission. 1989. Rep. Int. Whal. Comm. 39. SC/40/SM3.

Report of a Marine Mammal Survey of the Eastern Tropical Pacific Aboard the Research Vessel *David Starr Jordan*, July 29-December 5, 1986. By Rennie S. Holt and Stephanie N. Sexton, Southwest Fisheries Center, National Marine Fisheries Service. August 1987. NOAA-TM-NMFS-SWFC-76. 171 p.

Report of a Marine Mammal Survey of the Eastern Tropical Pacific Aboard the Research Vessel *David Starr Jordan*, August 8-December 10, 1987. By Rennie S. Holt and Stephanie N. Sexton, Southwest Fisheries Center, National Marine Fisheries Service. July 1988. NOAA-TM-NMFS-SWFC-117. 137 p.

Report of a Marine Mammal Survey of the Eastern Tropical Pacific Aboard the Research Vessel *David Starr Jordan*, July 28-December 6, 1988. By Rennie S. Holt and Stephanie Sexton, Southwest Fisheries Center, National Marine Fisheries Service. June 1989. NOAA-TM-NMFS-SWFC-129. 129 p.

Report of a Marine Mammal Survey of the Eastern Tropical Pacific Aboard the Research Vessel *McArthur*, July 29-December 6, 1986. By Rennie S. Holt and Alan Jackson, Southwest Fisheries Center, National Marine Fisheries Service. August 1987. NOAA-TM-NMFS-SWFC-77. 161 p.

Report of a Marine Mammal Survey of the Eastern Tropical Pacific Aboard the Research Vessel *McArthur*, July 30-December 10, 1987. By Rennie S. Holt and Alan Jackson, Southwest Fisheries Center, National Marine Fisheries Service. July 1988. NOAA-TM-NMFS-SWFC-116. 143 p.

Report of a Workshop on Estimating Mortality of Dolphins in the Eastern Tropical Pacific U.S. Tuna Fishery. By Stephen B. Reilly, Southwest Fisheries Center, National Marine Fisheries Service. May 1989. Administrative Report LJ-89-12. 18 p.

Report of Ecosystem Studies Conducted During the 1988 Eastern Tropical Pacific Dolphin Survey on the Research Vessel *McArthur*. By Lisa J. Lierheimer, Paul C. Fiedler, Stephen B. Reilly, Robert L. Pitman and Lisa T. Ballance, Southwest Fisheries Center, National Marine Fisheries Service and David W. Behringer, Atlantic and Oceanographic and Meteorology Laboratory. June 1989. NOAA-TM-NMFS-SWFC-132. 121 p.

Reproductive Biology of Female Spotted Dolphins, *Stenella Attenuata*, from the Eastern Tropical Pacific. By A.C. Myrick, Jr., A.A. Hohn, J. Barlow and P.A. Sloan. Southwest Fisheries Center, National Marine Fisheries Service. 1986. Fishery Bulletin: Vol. 84, No. 2. 13 p.

Research Vessel Survey Design for Monitoring Dolphin Abundance in the Eastern Tropical Pacific. By Rennie S. Holt and Tim Gerrodette, Southwest Fisheries Center, National Marine Fisheries Service and John B. Cologne, University of Washington. 1987. Fishery Bulletin: Vol. 85, No. 3. 12 p.

Simulation Procedures for Investigating the Effects of Various Sample Sizes on Estimates of Incidental Dolphin Mortality. By Christina H. Perrin, Bruce E. Wahlen and Elizabeth F. Edwards, Southwest Fisheries Center, National Marine Fisheries Service. February 1990. Administrative Report LJ-90-05. 59 p.

The Fishery for Tunas in the Eastern Pacific Ocean. By Inter- American Tropical Tuna Commission. March 14-16, 1989. Working Document 1. Dolphin Workshop. 28 p.

The Use of Aerial Photographs for Estimating School Sizes of Cetaceans. By Michael D. Scott, Wayne L. Perryman, and William G. Clark, Inter-American Tropical Tuna Commission (IATTC). 1985. IATTC Bulletin Vol. 18, No. 5. 23 p.

The Use of Seal Bombs on Dolphin in the Yellowfin Tuna Purse- Seine Fishery. By Edward R. Cassano, Albert C. Myrick, Jr., Cheryl B. Glick, Robert C. Holland and Cleridy E. Lennert, Southwest Fisheries Center, National Marine Fisheries Service. April 1990. Administrative Report LJ-90-09. 31 p.

Tuna-Dolphin Investigations. By Inter-American Tropical Tuna Commission (IATTC). May 5-7, 1987. Background Paper 6, 44th Meeting of the IATTC. 35 p.

Tuna-Dolphin Investigations. By Inter-American Tropical Tuna Commission (IATTC). March 8-10, 1988. Background Paper 6, 45th Meeting of the IATTC. 20 p.

Tuna-Dolphin Investigations. By Inter-American Tropical Tuna Commission (IATTC). May 10-12, 1989. Background Paper 6, 46th Meeting of the IATTC. 118 p.

Tuna Vessel Observer Data Research Plan for FY 1987 and Beyond. By Stephen B. Reilly, Southwest Fisheries Center, National Marine Fisheries Service. May 1987. Administrative Report LJ-87-11. 47 p.

Unobservable Mortality of Dolphins Involved in the Eastern Tropical Pacific Tuna Fishery. By Warren E. Stuntz. August 27-31, 1979. Status of Porpoise Stocks Workshop. SOPS/79/22. 10 p.

Using Tuna-Vessel Observer Data to Detect Trends in Abundance of Dolphin Populations: History and Research to Date (1988). By Elizabeth F. Edwards, Southwest Fisheries Center, National Marine Fisheries Service. March 1989. NOAA-TM-NMFS-SWFC-122. 123 p.

U.S. Trade in Tuna for Canning, 1987. By Wes Parks and Sam Herrick (Southwest Center) and Pat Donley (Southwest Region) National Marine Fisheries Service. April 1989. Administrative Report SWR-89-01. 18 p.

U.S. Tuna Trade Summary, 1985. By Samuel F. Herrick, Jr. (Southwest Center) and Steven J. Koplin (Southwest Region) National Marine Fisheries Service. August 1986. Administrative Report, SWR-86-10. 39 p.

U.S. Tuna Trade Summary, 1986. By Samuel F. Herrick Jr. and Wesley W. Parks (Southwest Center) and Patricia Donley (Southwest Region) National Marine Fisheries Service. October 1988. Administrative Report SWR-88-3. 36 p.

Workshop to Assess the Effects of Using Seal-Control Devices to Herd Schools of Dolphins in the Eastern Tropical Pacific. By Douglas P. DeMaster, Southwest Fisheries Center, National Marine Fisheries Service. January 1990. Administrative Report LJ-90-01. 16 p.

Review of Fleet Performance

1988 NMFS Observer Data Collected from U.S. Purse Seiners Fishing in the Eastern Tropical Pacific. By Alan R. Jackson, Southwest Fisheries Center, National Marine Fisheries Service. November 1989. 7 p.

Comparisons of Dolphin Mortality Rates between Day and Night Sets for the U.S. Eastern Tropical Pacific Tuna Purse Seine Fishery. By Atilio L. Coan, Jr., Kenneth E. Wallace, and Alan R. Jackson, Southwest Fisheries Center, National Marine Fisheries Service. December 1988. Administrative Report, LJ-88-29. 23 p.

Composition of the 1987 Incidental Kill of Small Cetaceans in the US Purse-Seine Fishery for Tuna in the Eastern Tropical Pacific. By Susan J. Chivers, Aleta A. Hohn, and Ruth B. Miller, Southwest Fisheries Center, National Marine Fisheries Service. 1989. Rep. Int. Whal. Comm. 39. SC/40/SM1. 6 p.

Environmental Assessment on the Modification to the Marine Mammal Regulations Regarding the Importation of Yellowfin Tuna Caught with Purse Seines in the Eastern Tropical Pacific Ocean. By Southwest Region, National Marine Fisheries Service. November 1987. 167 p.

Environmental Assessment on the Modification to the Marine Mammal Regulations Regarding the Importation of Yellowfin Tuna Caught with Purse Seines in the Eastern Tropical Pacific Ocean to Reflect the Marine Mammal Protection Act Amendments of 1988. By Southwest Region, National Marine Fisheries Service. January 1989. 12 p.

Environmental Impact Statement on the Proposed Amendments to Regulations Governing the Taking of Marine Mammals Associated with Tuna Purse Seine Operations. By Southwest Region, National Marine Fisheries Service. December 27, 1985. 143 p.

Summary of the 1987 U.S. Tuna/Porpoise Observer Data. By Alan R. Jackson, Southwest Fisheries Center, National Marine Fisheries Service. October 1989. NOAA-TM-NMFS-SWFC-136. 30 p.

Tuna-Dolphin Workshop Report. By Inter-American Tropical Tuna Commission. April 1989. 29 p.

Review of Technological Developments

A Review on Procedures to Develop Alternatives to Tuna Purse Seining on Porpoise. By Southwest Region, National Marine Fisheries Service. November 1986. 11 p.

Background to Alternative Fishing Methods for Yellowfin/Porpoise Aggregations, October 11-12, 1988. By Franklin G. Alverson, LMR Fisheries Research, Inc. 4 p.

Identification and Assessment of Possible Alternative Methods for Catching Yellowfin Tuna. By Robert J. Hofman, Marine Mammal Commission. May 1981. 139 p.

The Gear Program. By Inter-American Tropical Tuna Commission. March 14-16, 1989. Working Document 4. Tuna-Dolphin Workshop. 13 p.

Protecting Porpoise - A Guide for Tuna Seiners. By Norman A. Mendes, J. Brent Norberg, John A. Young, David R. Cormany and Ben S. Meyer, Southwest Region, National Marine Fisheries Service. February 1986. 35 p.

Workshop on Alternative Methods to Purse-Seining for Yellowfin Tunas in the Eastern Tropical Pacific. By Douglas P. DeMaster, Southwest Fisheries Center, National Marine Fisheries Service. March 1989. Administrative Report LJ-89-06. 21 p.

APPENDIX 4

Tuna/porpoise civil enforcement actions taken on 1988-1989 cases– NOAA Office of General Counsel, Southwest Region

Case No.	Summary of Charges	Penalty and Disposition
SW880010	Interference with Observer - radio use denied	$29,000 penalty assessed against captain; suspended for 24 months
SW880061	2 prohibited species sets (white-sided dolphins)	$49,375 penalty assessed against captain and boat owner
SW880436-A	Failing to retain biological specimens (2 counts)	$1,000 penalty assessed against captain; Count 1 settled for $250; Count 2 reduced to warning
SW880436-B	Gear violations	$2,200 assessed against boat owner; settled for $750
SW880505	Gear violations	$9,000 assessed against boat owner
SW880564	Set made on a whale	$4,000 assessed against captain
SW880595	Failure to position porpoise safety panel	$1,500 assessed against captain
SW880672	Gear violations	$2,450 assessed against boat owner; warning issued for other violations
SW880717-A	Pure school set	$10,000 assessed against captain and boat owner
SW880717-B	Gear violations	$3,550 assessed against boat owner; warning also issued
SW880720	Pure school set	$10,000 assessed against captain and boat owner
SW880722-A	5 pure school sets	$50,000 assessed against captain and boat owner

Case No.	Summary of Charges	Penalty and Disposition
SW880722-B	Gear violations	$2,250 assessed against boat owner; warning also issued
SW890009MM & SW890206-A	Interference with Observer–radio use denied and intimidation, attempted interference; failure to use lights during sundown set; brailing a live dolphin	$36,700 assessed against captain
SW890011	Set made on prohibited stock (Costa Rican spinner dolphins)	$10,050 assessed against captain
SW890046-A	Unlawful sundown set	$5,300 assessed against captain and boat owner
SW890046-B	Gear violations	$2,250 assessed against boat owner; warning also issued
SW890046-C	Failure to position porpoise safety panel	$2,250 assessed against captain
SW890066	2 unlawful sundown sets	$15,000 assessed against captain and boat owner
SW890081	3 unlawful sundown sets	$20,000 assessed against captain and boat owner; warning also issued
SW890096-A	3 unlawful sundown sets	$25,000 assessed against captain and boat owner
SW890096-B	Gear violations	$2,150 assessed against boat owner
SW890096-C	Failure to position porpoise safety panel	$2,150 assessed against captain
SW890200	Ortza retrieval with live marine mammals	$3,100 assessed against captain
SW890206-B	Gear violations	$1,200 assessed against boat owner
SW890206-C	2 unlawful sundown sets	$5,000 assessed against captain and boat owner for one set; warning issued for other set (crew injury)

Case No.	Summary of Charges	Penalty and Disposition
SW890237-A	Unlawful sundown set	$10,000 assessed against captain and boat owner
SW890237-B	Gear violations	Warning issued to boat owner
SW890246	Unlawful sundown set	$10,000 assessed against captain and boat owner

This list does not include cases under investigation or review.

Prepared by Ted Beuttler, Staff Attorney - NOAA/GCSW, 12 Dec. 1989

TUNA/PORPOISE PENALTY SCHEDULE FOR VIOLATIONS OF 50 C.F.R. 216.24

Category of Violations	Penalty Range
(a)(1) Taking marine mammals in the course of a commercial fishing operation without permits and certificates.	$10,000*
(a)(2) Carrying more than two speedboats (if not certified).	$10,000*
(d)(2)(i)(A) Encircling:	
(1) Pure schools of dolphin except offshore spotted dolphin, striped dolphin, and common dolphin;	$10,000*
(2) Any other species or stock that does not have an allowable take or whose allowable take has been exceeded.	$1,000-$10,000*
(d)(2)(ii)(A) Brailing or hoisting onto deck live marine mammals during ortza retrieval.	$1,500 + $150 for each related animal death or injury
(d)(2)(iii)(A) Failing to notify NMFS five days before departure.	$100-$1,000
(d)(2)(iii)(B) Refusing to allow an Observer to report data.	$1,000
(d)(2)(iv) Failing to equip a purse seine with a porpoise safety panel.	$10,000
(d)(2)(iv)(B) Using a non-conforming porpoise safety panel.	$50-$100 for each set made w/ non- conforming gear + $150 for each related animal death or injury
(d)(2)(iv)(C) Failing to identify each end of the porpoise apron.	"
(d)(2)(iv)(D) Using nonconforming hand holds on porpoise safety panels.	"
(d)(2)(iv)(E) Using nonconforming corkline hangings on porpoise safety panels.	"

* Catch may also be seized and forfeited or value added to penalty.

Category of Violations	Penalty Range
(d)(2)(iv)(F) Carrying fewer than two speedboats (if certified).	$1,000 + $150 for each related animal death or injury
(d)(2)(iv)(F) Carrying speedboats without proper rigging.	$500 + $150 for each related animal death or injury
(d)(2)(iv)(G) Failing to carry a suitable raft.	$500
(d)(2)(iv)(H) Failing to carry at least two face masks and snorkels, or viewboxes.	$500
(d)(2)(iv)(I) Failing to equip vessel with proper lights.	$10,000 + $150 for each related animal death or injury
(d)(2)(v)(A) Failing to make vessel and gear available for inspection.	$1,000
(d)(2)(v)(B) Failing to notify NMFS of net modification for reinspection purposes.	$500-$10,000
(d)(2)(v)(C) Engaging in fishing without correcting deficiencies in gear.	$500-$10,000
(d)(2)(vii)(A) Failing to conduct backdown or other release procedures.	$1,500 + $150 for each related animal death or injury.
(d)(2)(vii)(B) Using a sharp or pointed instrument to remove a marine mammal from net.	$1,500 + $150 for each related animal death or injury
(d)(2)(vii)(C) Making sundown set without waiver.	$10,000*
(d)(2)(vii)(C)(2) Failing to use lights on sundown set.	$10,000 + $150 for each related animal death or injury
(d)(2)(vii)(D) Failing to position porpoise safety panel or super apron properly.	$1,500 + $150 for each related animal death or injury
(d)(2)(vii)(E) Use of non-class C explosive devices.	$500-$5,000 + $150 for each related animal death or injury
(f)(1) Failing to take NMFS Observer.	$10,000*
(f)(2) Failing to provide vessel location to Observer.	$500
(f)(2) Interfering with Observer's research.	$500-$5,000

* Catch may be also seized and forfeited or value added to penalty.

Category of Violations	Penalty Range
(f)(3) Failing to retain dead marine mammals upon request of Observer.	$500
(f)(5) Forcibly assaulting Observer.	$10,000
(f)(5) Impeding, intimidating, interfering with, influencing or attempting to influence Observer.	$500-$5,000

* Catch may be also seized and forfeited or value added to penalty.

APPENDIX 5

VANUATU STATEMENT TO THE NMFS TUNA-DOLPHIN REVIEW MEETING

by

Mr. Michael Riepen, Fisheries Economic Advisor, Department of Fisheries, Ministry of Agriculture, Forestry and Fisheries, Vanuatu.

The Government of Vanuatu strongly supports the principle of protecting endangered species and marine mammals. Vanuatu recently became a party to the Convention on the International Trade of Endangered Species (CITES), and, in association with the United States, was a joint partner in developing a convention to the banning of gill net fishing for tuna in the South Pacific.

The Vanuatu Government's view of the fishery in the eastern tropical Pacific (ETP) and the tuna/dolphin issue is similar. The tuna/dolphin issue is international in nature and must be dealt with by all parties involved in the fishery on a multilateral basis and not by a single party by national legislation. Vanuatu has applied for membership in the Inter-American Tropical Tuna Commission (IATTC), as it considers that this is the appropriate international program to effectively control dolphin mortality.

Vanuatu has taken several measures to reduce the mortality of dolphins in the ETP. We have proceeded to ensure that all Vanuatu captains and vessels entering the fishery are appropriately trained and certified by the IATTC prior to the commencement of fishing. This is about to be introduced into our legislation and a system of evaluating captain performance is currently being developed with the IATTC.

I, therefore, submit that Vanuatu is doing its utmost to reduce dolphin mortality. I think that our kill per set over the last few years clearly demonstrates this fact. Vanuatu's kill rate per set in 1989 is one half that for 1988 and one third of that for 1986.

I must, however, express my government's concern that the U.S. legislation is restrictive, is not based on scientific evidence that dolphin populations are endangered, and was not done on a multilateral basis and/or without consultation with the fishing parties involved in the ETP.

The U.S. industry has had over 20 years to develop systems to reduce dolphin mortality. This legislation dictates that we must achieve similar results in two years. This timing is not considered to be equitable or reasonable. Although we believe that our industry will be able to achieve the 2.0 factor for 1989, I am not very confident that our fleet will be able to achieve the 1.25 factor for 1990. This is especially true as the U.S. fleet's kill rate is reducing and this moving target makes it all the more difficult for our fleet to achieve the desired result.

I, therefore, request that the U.S. Government and the environmental groups acknowledge that we have made considerable progress in reducing dolphin mortality and that we be given reasonable and sufficient time to reduce mortality to figures comparable to the U.S. fleet. I also urge all interested parties in the issue, government, industry and environmental groups, to work together to develop improved systems and better education and training of vessel operators rather than confront each other. I believe that, if we all concentrate our efforts and finance towards education and systems development, an improved outcome would result with much lower mortality for the dolphins. Pure regulatory action will not, in the long term, achieve the results desired.

In summary, Vanuatu supports the concept of minimizing dolphin mortality. It, however, believes that the only practical and effective management regime is through an international program, specifically the IATTC. We request that the U.S. Government and environmental community acknowledge the major steps Vanuatu and other fishing nations have made to reduce dolphin mortality and, finally, that we be given a reasonable timeframe to meet standards similar to the U.S. fleet.

APPENDIX 6

TO: MR. E.C. FULLERTON
REGIONAL DIRECTOR N.M.F.S.

FROM: DR. LUIS HERRERIA BONNET
SUBSECRETARY FOR FISHERIES RESOURCES
ECUADOR

DATE: DECEMBER 11TH, 1989

I regret to inform you, that due to flights' routes in our official airline Ecuatoriana de Aviacion, and even though we did our best to get a space, our representative won't be able to participate in the session to review efforts to reduce dolphin mortality in the purse seine fishery.

That is why we are sending, herewith, our commentaries which reflect our position on this particular matter.

May I wish you every success in your session and I kindly remain,

Yours sincerely,

Dr. Luis Herreria Bonnet
Subsecretary for Fisheries Resources

TUNA-DOLPHIN ANNUAL REVIEW NATIONAL MARINE FISHERIES SERVICE

SAN PEDRO - CALIFORNIA
Diciembre 12-13, 1989

Commentaries from Ecuador

Ecuador, in the same position as the other countries which make their tuna catches in the Eastern Pacific, recognizes the necessity to take care of the rational use of the marine resources as well as the dolphins; mainly the ones associated to tuna catches.

Ecuador's good disposition to fulfill with above purpose may be reflected as follows:

1.) To have put into force the regulations that impose conditions on tuna catches (regulations published in the Official Registration #30 on September 21st., 1988).

2.) To have implemented a fisheries logbook system on which the tuna vessel Captains must report every single activity that has been developed in each journey (trip) including: number of castings, fishing zones, species caught, systems that are normally using, etc.

3.) It has organized, with the whole aid of the IATTC, a Seminar for the Captains of tuna vessels (September, 1989) and wishes to continue counting with this valuable contribution beginning on the early months of 1990. Also, it is well known the valuable material that the technicians from IATTC give to all the participants on Seminars, trying to train the Captains so they are well aware and therefore can conceive the dolphins protection.

4.) The Sub-Secretary of Fisheries Resources has disposed that those enterprises that own vessels of more than 400 tonnes should request the IATTC, together with their Captains, the data of the reports from observers, in order to perform a better global control over

the small Ecuadorian tuna fleet, with the best understanding that a bad behaviour (conduct) of a Captain will jeopardize the total average of the country.

5.) It is in force a control programme undertaken by the fisheries inspectors with the aid of the National Marine Authorities that verifies the condition of the tuna vessels, their faster boats, balsas, lights (searchlights), etc., to guarantee that the sources to rescue the dolphins are available.

6.) Finally, staff from Sub-Secretary for Fisheries Resources are participating in the Workshop Sessions of the IATTC, organization that has an office in the tuna fishing port of Manta, and also it has the continuous support from the enterprises and the government itself.

Nevertheless, Ecuador has a big concern for the imminent possibility to be affected by the Marine Mammal Protection Act regulations that in spite of not having enough scientific basis it defines strict and accurate measures without evaluating the effort of the local possibilities undertaken, with the main purpose, not only to reduce but to avoid the marine dolphins mortality.

Fisheries in Ecuador is the main national economic factor after the petroleum, which is a non-renewable resource that easily runs out, in addition, at least 100,000 families depend upon this activity which incudes: artisanal fishermen, shrimp larvae collectors (poor individuals), canning enterprises, fish meal factories, packing companies, etc. The socio-economic effects of the sanctions will, in fact, be disastrous and therefore they will finally blow out the weak economy of the country, situation that up to this moment exasperate the population since most of the individuals do not count with the necessary survival means to feed the youngest.

It seems like the preservation group, who perform their own task in behalf of the animals, have forgotten their fellows who have fewer possibilities to choose a job since they are individuals who are fishermen and live under very poor conditions.

It is not true and it is not correct to tell the Americans that every time they consume tuna they are contributing to kill the dolphins. The dolphin populations are not in an extinction process albeit they do present a moderate curve of continuous growth.

Ecuador will continue undertaking all the necessary efforts to try to accomplish the American Law as it has been doing it with this best good will but we request that the Government of the United States of America should have a better flexibility for the fulfillment of the already known regulations.

Therefore we suggest that the Law should be changed based on scientific and human principles towards the IATTC experiences, and at the same time, simultaneously, and in the best possible way to gain the principles of an unified and correct America, consequently, Ecuador's rights could be respected having a source to survive.

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