

Committee on Resources

Witness Testimony

STATEMENT OF NINA M. YOUNG, MARINE MAMMALOGIST, CENTER FOR MARINE CONSERVATION

**Before the
Subcommittee on Fisheries, Wildlife, and Oceans
U.S. House of Representatives, Committee on Resources
April 9, 1997**

Mr. Chairman and Members of the Subcommittee, thank you for the opportunity to present our views on the International Dolphin Conservation Program Act, H.R. 408. My name is Nina M. Young; I am the Marine Mammalogist for the Center for Marine Conservation. Our statement today is endorsed by the Environmental Defense Fund, Greenpeace, National Wildlife Federation, and World Wildlife Fund.

Our organizations strongly support H.R. 408 for one simple reason: H.R. 408 will strengthen protection for dolphins, tuna and other marine life in the Eastern Tropical Pacific (ETP) ocean ecosystem. H.R. 408 is the only legislation that fully implements the Panama Declaration. The Panama Declaration is the basis for a binding legal agreement under the Inter-American Tropical Tuna Commission (IATTC). In implementing the Panama Declaration, H.R. 408 will:

- I. set a goal of eliminating dolphin mortality by progressively reducing mortality through the setting of annual limits;
- II. cap total dolphin mortality at low levels;
- III. establish species/stock mortality limits which, by the year 2001, will meet the Marine Mammal Protection Act (MMPA) goal of a zero mortality rate for all dolphins and for each species or stock taken in the tuna fishery;
- IV. establish a system that provides incentives to vessel captains to reduce and eventually eliminate dolphin mortality;
- V. call for reductions in bycatch of marine life taken in the fishery;
- VI. require that the fishery be managed using a precautionary approach;
- VII. establish scientific advisory groups to advise their national government and the IATTC on research and the conservation and management of the fishery and the ecosystem;
- VIII. strengthen the International Dolphin Conservation Program under the existing La Jolla Agreement by requiring membership in the IATTC;

IX. strengthen enforcement by imposing trade embargoes on countries that fail to comply with the new agreement;

X. provide a vehicle to continue research into methods of capturing tuna that do not require setting on dolphins; and

XI. provide, through a strengthened labeling system, a strong economic incentive for fishers to fish for tuna without killing a single dolphin.

Substantial progress has been made under the MMPA, but more must be done to reduce and eventually eliminate dolphin mortality and ensure the health and stability of the ETP marine ecosystem. These goals can only be achieved internationally through a legally binding international regime based on sound scientific principles and tied to strong enforcement provisions. In our testimony we will review the progress made under the MMPA, examine the status of dolphin stocks, describe from a scientific standpoint why we believe H.R. 408 is the best means to allow

dolphin stocks to recover, discuss concerns that have been raised about stress on dolphins from encirclement, and explain how H.R. 408 will provide a vehicle to reduce the bycatch of juvenile yellowfin tuna and other marine life.

PROGRESS MADE UNDER THE MARINE MAMMAL PROTECTION ACT

The National Marine Fisheries Service (NMFS) estimates that approximately 6.3 million⁽¹⁾

dolphins have been killed in the course of tuna purse seine operations by U.S. and foreign fleets in the Eastern Tropical Pacific since 1959.⁽²⁾

The MMPA was enacted in 1972 to protect marine mammals, including dolphins, from the adverse effects of human activities. Reducing dolphin deaths in the ETP yellowfin tuna purse seine fishery was among the driving factors behind the passage of the MMPA in 1972.

The MMPA has been remarkably successful. The MMPA's international comparability requirements and standards, improvements in gear design and fishing operations, improved dolphin release methods, and implementation of the voluntary multilateral program to reduce dolphin mortalities, known as the La Jolla Agreement, have resulted in significant reductions in dolphin mortality from 423,678 in 1972 to less than 3,000 in 1996--a 99% reduction.⁽³⁾

Despite the dramatic progress made under the MMPA, dolphins have continued to die in the ETP and, at the individual species or stock level the fishery has not met the MMPA's zero mortality rate goal. Therefore, more needs to be done to protect dolphins and other marine wildlife, including sharks, billfish, sea turtles, and tuna in the ETP ecosystem.

MMPA'S "DOLPHIN SAFE" LABEL HAS NOT CHANGED FISHING PRACTICES IN THE ETP.

In response to school children and concerned citizens, Congress enacted the "Dolphin Protection Consumer Information Act" (DPCIA) in 1990. The DPCIA established criteria for labeling canned tuna products as "dolphin safe." Under the current requirements of the DPCIA, to label tuna caught in the ETP as "dolphin safe," it must have been caught without encircling dolphins during an entire trip on which the tuna was caught. In order to eliminate dolphin mortality in the ETP, the goal of the DPCIA was to end the practice of intentionally deploying nets to encircle dolphins. [\(4\)](#)

In adopting the DPCIA, however, Congress recognized that "a major obstacle to such a change [the end of encirclement] has been the difficulty of imposing it [DPCIA] upon the fishing fleets of nations other than the United States." [\(5\)](#)

Consumers are unaware of the real truth behind the label. Since the time the dolphin-safe tuna label was implemented, consumers have been under the false impression that dolphins were no longer being encircled or drowned in tuna nets in the ETP. Nothing is further from the truth--dolphins were and are still dying in tuna nets. The dolphin safe label does not guarantee that no dolphins died because, under the current law, fishing methods deemed "dolphin safe" such as school and log sets can still result in dolphin deaths and be labeled as "dolphin safe." A consequence of the dolphin safe requirement, was that the U.S. fleet moved to the western Pacific to fish for tuna not in association with dolphins and the major canneries all but stopped purchasing tuna from the ETP. As a result, the U.S. has lost most of its leverage to end either dolphin mortality or dolphin encirclement in the ETP tuna fishery. Consequently, today, the "dolphin safe" label does nothing to stop dolphin mortality in the ETP.

Thus, the "dolphin safe" label neither banned nor stopped the encirclement of dolphins in the ETP tuna fishery. In fact, the DPCIA did little to change the fishing practices of international fishers in the ETP. Since 1990, Latin American fishers have reduced both their total dolphin mortality by 97% and their dolphin mortality per set by 93%. However, they continue to encircle dolphins in the ETP at relatively the same rate. For example, between 1980 to 1996, as a percentage of total sets, sets encircling dolphins represent 52% of the total sets made between 1980 and 1990, and 54% between 1990 and 1996. [\(6\)](#)

Overall, tuna caught in association with dolphins accounted for about 60 to 70% of the yellowfin catch during 1986-1994 in the ETP.

On the other hand, although the relative *rate of sets* made on dolphins did not decrease significantly after the passage of the DPCIA, dolphin mortality *per set* did decrease from 5.0 in 1990 to 0.33 in 1996. Moreover, the percentage of sets that involved *no* dolphin mortality increased from 54% to 85% during that same time period. [\(7\)](#)

Both of these measures demonstrate that fishers are rescuing greater numbers of dolphins and fishing with less mortality.

In conclusion, the DPCIA did not eliminate or ban the practice of encirclement. Fishers continue to set on dolphins in the ETP. The MMPA and the DPCIA were, however, influential in achieving the substantial decrease in dolphin mortality in the ETP, but now the effectiveness of the "dolphin safe" label in the ETP is limited because it has not resulted in an end to setting on dolphins nor has it eliminated dolphin mortality. The challenge, then, is to find a way to preserve the substantial progress that has been made in reducing dolphin mortality and to strengthen the influence of the label in such a way as to provide incentives for further progress toward eliminating dolphin mortality. We strongly believe H.R. 408 will accomplish these objectives. To understand how H.R. 408 will accomplish these goals, it is useful to review the status of dolphin stocks in the ETP and discuss the impact of passage of H.R. 408 on dolphins, marine life, and the ETP ecosystem.

THE STATUS OF THE DOLPHIN POPULATIONS IN THE ETP HAS IMPROVED.

Absolute abundance estimates for dolphins taken in the ETP tuna fishery, obtained from research vessel cruises conducted between 1986 and 1990, are summarized in Table 1. Table 1 shows the nine dolphin stocks (or populations) from four dolphin species that are frequently taken as bycatch in the yellowfin tuna fishery. Spotted (*Stenella attenuata*), spinner (*S. longirostris orientalis*), and common (*Delphinus delphis*) dolphins account for over 95% of the mortality. [\(8\)](#)

More than 85%, perhaps as high as 95%, of all of the sets made on dolphins in any given year involve either spotted or spinner dolphins or both. [\(9\)](#)

Consequently, while the mortality of the 1970s and 1980s resulted in a decline in all stocks, two, the northeastern offshore spotted and the eastern spinner, have declined to approximately 23% [\(10\)](#)

and 44% [\(11\)](#)

respectively of their pre-fishery abundance, and are listed as "depleted" under the MMPA. [\(12\)](#)

Until the implementation of the 1988 amendments to the MMPA and, subsequently, the La Jolla agreement, the annual mortality of these two stocks was high enough to hamper or retard recovery of these populations. However, recent data, based on relative indices of abundance, [\(13\)](#)

indicate that all of these stocks (including the depleted eastern spinner stock and northeastern offshore spotted stock) are now stable. [\(14\)](#)

Moreover, because mortality levels for all species have declined in recent years some dolphin stocks may actually be starting to increase. But, the low estimated rates of increase for these stocks (2-4%), combined with our inability to detect increases of less than 5%, means we cannot reliably state that these stocks are recovering. *Nevertheless, based on the conclusions of the National Research Council, with the annual incidental mortality for all stocks now below 0.2% of the population abundance, these dolphin populations*

should be able to recover. [\(15\)](#)

H.R. 408 WILL PROMOTE THE CONTINUED RECOVERY OF DOLPHIN POPULATIONS.

In 1992, the National Research Council (NRC) stated that "A kill rate of 40,000 animals per year would thus represent a kill rate of 25% or less of recruitment, almost certainly low enough to permit current dolphin populations to be stable and perhaps to increase. An annual kill of 20,000 (12.5% or less of recruitment) would probably result in substantial increases in dolphin populations." [\(16\)](#)

By the end of the 1992 fishing season, incidental mortality levels for all of the dolphin stocks had declined to less than 1 percent of the estimated population. Once again, scientists stated that at these levels the stocks would eventually increase and recover. [\(17\)](#)

At present, the annual incidental mortality in the ETP fishery is less than 0.2% and, in all but two cases (northeastern offshore spotted and eastern spinner), is less than 0.1% of the minimum population estimate for all dolphin stocks. While any human-caused dolphin mortality is undesirable and recognizing that our objective is to eliminate dolphin mortality, the great majority of independent and government marine mammal scientists consider mortality levels of less than 0.1% to have a "negligible impact" on the dolphin stocks and to meet the MMPA's zero mortality rate goal. [\(18\)](#)

H.R. 408 caps stock-specific mortality at the 0.2% level and requires that the fishery be at or below the 0.1% level by the year 2001. According to the NRC, "the committee notes that a complete ban on dolphin fishing or the purchase of tuna caught on dolphins is not required to ensure the survival and even the increase of dolphin populations." [\(19\)](#)

Clearly, we want dolphins populations to do more than merely survive. H.R. 408 will achieve much more. *By providing overall and stock specific mortality levels more than four times lower than that recommended by the NRC panel, (absent other environmental and anthropogenic perturbations) H.R. 408 will permit the recovery of these stocks to their former abundance.*

CHANGING THE DEFINITION OF "DOLPHIN SAFE" SHOULD NOT RESULT IN STRESS LEVELS THAT WILL RETARD THE RECOVERY OF THESE POPULATIONS.

Just like humans, dolphins are adapted to cope with many natural and human-related stressors in their environment. [\(20\)](#)

Stress is a body's physiological response to any demand made upon it--a response that can consist of three phases. The first phase, the **Alarm Phase**, is where the animal perceives a threat and the body initiates a rapid physiological response involving the nervous system and the endocrine system. The **Adaptation or Compensation Phase**, the second phase, occurs when, after prolonged exposure to the stressors, the animal adapts to, or compensates for, the altered conditions causing the stress. The third phase, the **Maladaptation Phase** occurs when the stress is of sufficient intensity and duration that compensation or adaptation is impossible. In this phase, if the stress is severe or persistent, the body may fail to compensate for the stress and, under the worst circumstances, develop a pathological condition (e.g. illness, infection, immune suppression, death).

For nearly 20 years, U.S. vessels obtained a general permit under the MMPA and its regulations to annually chase and encircle hundreds of thousands of dolphins in yellowfin tuna fishery in the ETP. [\(21\)](#)

Dolphins have been chased and encircled in this fishery for more than thirty-five years and have displayed adaptive behaviors in the nets since the 1970s (e.g. fewer displays of panicky dashing about the net). [\(22\)](#)

In 1992, the NRC noted that: "no specific information is available concerning the effects of the chase on the biology of dolphins. The chase is likely to result in stress. Some herds have developed strategies to avoid capture; others seem to have habituated to encirclement and seem to have developed behavioral patterns that reduce their risks once in the net." [\(23\)](#)

Some have argued that the chase and encirclement of dolphins causes stress of a duration and magnitude that severely impedes dolphin reproduction or even results in post-release dolphin deaths. Available peer-reviewed scientific data provides no indication that mortality occurs after the dolphins are released from tuna purse seine nets. Furthermore, no scientific data demonstrate a preponderance of stress-related diseases or injuries in these dolphin stocks. In addition, speculative claims of reproductive complications or depressed reproductive capacity caused by stress related to chase and encirclement also are without evidence. There has been no evidence of spontaneous abortions, muscle degradation, or stress-related reproductive inhibition in the reproductive tracts examined from dolphins that had died in the tuna fishery." [\(24\)](#)

In addition, researchers investigating serum calcium levels (serum calcium is thought to decline in response to the release of stress-related hormones) actually showed that the serum calcium levels of dolphins that had been chased for approximately 45 minutes and held prior to release for an additional two hours, measured 7.3 to 8.7 mg/dl [\(25\)](#)

--well within the published normal ranges for dolphins of 4 - 11 mg/dl. [\(26\)](#)

Finally, Myrick and Perkins,⁽²⁷⁾

postulate that dolphin adrenal gland color changes could be used as an indicator of stress. However, due to problems in experimental design, their study did not

prove this hypothesis.⁽²⁸⁾

The comments of other scientists (See Appendix B) point out some of the problems with this study.

The available scientific evidence indicates that the chase, capture, and release of dolphins in the yellowfin tuna fishery is likely to result in an Alarm Phase and an Adaptation Phase of stress. Dolphins experience the Alarm Phase of stress (or "fight or flight" response) when they hear the distinctive sound of the helicopters, speedboats, or the purse seiner. During chase, capture, confinement, and release, the body's reaction to stress in the Adaptation Phase is individual, but may be influenced by the dolphins past experience in the fishery. *Nevertheless, the best available published scientific literature does not indicate that the stress of encirclement results in death after release or impedes the long-term recovery of dolphin stocks nor is it likely that dolphin experience the Maladaptation Phase.*

Notwithstanding all of the available research, this issue merits further scientific investigation and H.R. 408 contains provisions requiring further investigation into the impact of chase and encirclement on dolphin biology and health. This research is vitally important and we strongly recommend that the Committee convey to NMFS that this research be undertaken as expeditiously as possible. We will work closely with NMFS to ensure that these studies are fully funded in the appropriation process, are identified as a research priority, and are undertaken and completed within one to two years of implementation of H.R. 408.

If further research shows that stress resulting from encirclement is likely to cause populations to decline and adversely impact dolphin populations, we will demand an immediate end to encirclement under the "Emergency" provisions of H.R. 408. In the absence of such research findings, however, we support the approach taken by H.R. 408, which seeks to protect dolphins while addressing the equally important and scientifically demonstrated need to reduce the ecologically-damaging bycatch of endangered sea turtles, juvenile tuna, sharks, and billfish resulting from fishing methods other than setting on dolphins.

"DOLPHIN SAFE" ISN'T "DOLPHIN SAFE" IF IT IS NOT "ECOSYSTEM SAFE"--H.R. 408 WILL PROTECT ENDANGERED SEA TURTLES, JUVENILE TUNA, SHARKS, AND BILLFISH, IN ADDITION TO DOLPHINS, BY REDUCING BYCATCH IN THE ETP TUNA FISHERY.

In the MMPA, Congress stated: "...it is the sense of the Congress that they [dolphins] should be protected and encouraged to develop to the greatest extent feasible commensurate with sound policies of resource management and that the primary objective of their management should be to maintain the health and stability of the marine ecosystem."⁽²⁹⁾

To date, not much attention has been given to maintaining the health and stability of the marine ecosystem in the ETP. H.R. 408 will, for the first time, require measures to protect the ETP ecosystem.

"Dolphin safe" isn't "dolphin safe" if it is not "ecosystem safe." IATTC and NMFS data indicate that fishing methods for yellowfin tuna--such as sets on pure schools of juvenile tuna or sets on logs, floating objects, or debris--that do not involve setting nets around dolphins have 10 to 100 times greater bycatch of marine species and juvenile tuna. These bycatch data are alarming especially for species that reproduce more slowly than other marine life and fish species--sharks, billfish, and sea turtles. The cost of saving one dolphin statistically means the killing of: 15,620 small tunas, 382 mahi-mahi, 190 wahoo, 8 rainbow runners, 11 blacktip sharks, 4 silky sharks, 2 whitetip sharks, 2 other sharks and rays, 1 marlin, 428 triggerfishes, 800 other small fish, and approximately 1 sea turtle. [\(30\)](#)

Moreover, there is also growing concern about the discard of dead juvenile yellowfin tuna. This discard of dead juvenile yellowfin tuna could drastically affect the tuna fishery. These levels are high enough to potentially cause the fishery to decline. Purse seine tuna fishermen throw away 7.0-15.0 tons of juvenile yellowfin tuna per set on logs and 1.0-1.2 tons of juvenile yellowfin tuna per set on schoolfish, versus 0.06 tons of juvenile yellowfin tuna per set on dolphins. [\(31\)](#)

According to IATTC reports, for 1993 and 1994, the total tons of yellowfin discarded by the international fleet was 449-917 tons from dolphin sets, 606-2,108 tons from school sets, and 3,802-4,150 tons from log sets. [\(32\)](#)

Further, the IATTC estimates that, overall, 7.4% of all species of tuna caught in the fishery during 1993 and 1994 were discarded--this is 31,660 tons of discarded tuna from all species. [\(33\)](#)

Finally, the IATTC estimates that, if fishermen replaced sets on dolphin with school and log sets, they would discard 10 to 25 million juvenile yellowfin tuna-- thereby removing between 13 and 32 percent of the total recruitment of the species and potentially causing a 25 - 60% decline in the catch of yellowfin tuna. [\(34\)](#)

Clearly, we cannot save dolphins in the long run if at the same time we are encouraging the destruction of the ecosystem upon which they depend. A panel of scientific experts reviewed the bycatch data and concluded that "dolphin safe" fishing methods resulted in greater bycatch. [\(35\)](#)

While the peer review could not ascertain the overall quantitative impact, or the impact of shifts to school or log sets on a particular species, the data qualitatively indicated that current "dolphin safe" fishing methods (school and log sets) resulted in greater bycatch. [\(36\)](#)

Moreover, any shift to these methods that may be caused by statutory requirements to end the encirclement of dolphins would likely increase the bycatch [\(37\)](#)

of vulnerable marine species, including sea turtles threatened with extinction. We believe that not only is it important to conserve dolphins, but that we cannot conserve dolphins at the expense of other ocean wildlife. Banning encirclement, without having developed a new ecologically responsible method of catching tuna, would shift the mortality problem, harming other ocean creatures, the ecosystem, and the dolphins that rely on that ecosystem. In this regard, as the International program takes effect, we expect the IATTC member states, through that regime's new scientific committee, to take on, as a priority, the task of developing or promoting the development of alternative methods of catching large yellowfin tuna that do not involve encirclement.

Opponents of H.R. 408 have asserted that bycatch considerations are not so important. They claim that in the 1970s and 1980s, when the fishery was larger, bycatch was probably greater because the number of school and log sets was larger and, furthermore, compared to other commercial fisheries, the ETP tuna fishery has relatively little bycatch. But the data indicate that bycatch is greater now in the ETP than in the 1980s and that bycatch *is* a problem, [\(38\)](#)

and that prohibiting sets on dolphins will exacerbate the problem. H.R. 408 will focus on eliminating bycatch. Domestic and international fisheries conservation and management efforts clearly have made bycatch reduction a priority. IATTC's extensive database on bycatch in the ETP tuna fishery will enable us to develop clear, effective, and, in some cases, immediate measures for bycatch reduction. H.R. 408 provides the vehicle that enables us to work with the IATTC to develop these measures to "avoid, reduce, and minimize bycatch of juvenile yellowfin tuna and bycatch of non-target species." [\(39\)](#)

Finally, we cannot condone the catch and discard of juvenile tuna, given our belief that commercial fisheries should be managed using a precautionary approach. Every effort should be made to avoid and reduce the catch and discard of juvenile tuna, to further promote the long-term sustainability and health of tuna stocks in the ETP. H.R. 408 provides a mechanism to further advance the precautionary approach adopted in the Sustainable Fisheries Act of 1996 and the United Nations Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks.

In summary, all species in an ecosystem are connected. We cannot call a tuna product "dolphin safe" that results in the carnage of other marine life, since we cannot expect dolphin populations to thrive when we are harming the ecosystem upon which they depend. We can increase protection for dolphins without shifting to ecologically damaging school and log sets. At this time, the best strategy is one that allows the fishery to operate within its existing proportion of log, school, and dolphin sets while requiring bycatch reduction measures for dolphin and non-target species. We believe H.R. 408 will enable the fishery to achieve this goal.

CONCLUSION:

In conclusion, "dolphin safe" as currently defined and enforced will not stop dolphins from drowning in

tuna nets in the ETP and will certainly not protect the ETP ecosystem and its marine life. By assuring the successful implementation of the Panama Declaration, H.R. 408 helps secure lasting, effective protection for dolphins and other marine life in the ETP. It does this by preserving and building on the unprecedented progress of the La Jolla Agreement in reducing dolphin mortality.

International problems demand international solutions. The Panama Declaration set the stage for achieving such an international solution. The NRC panel recognized this when they stated that "any policy designed to reduce dolphin mortality or prevent it absolutely will be effective only if it is based on sound information and if most or all nations that fish for dolphin-associated tuna anywhere in the world participate in its implementation."⁽⁴⁰⁾

We can no longer protect marine life in international waters solely through unilateral mandates. We must cement the international cooperation manifested in the Panama Declaration. Failure to enact this legislation this year means we risk losing the world's most ambitious international fisheries management agreement and with it, the ability to eliminate dolphin mortality; reduce bycatch of marine life; conserve tuna populations; conduct additional research; and use U.S. markets to strengthen enforcement of this international agreement. And in doing so, we will once again place dolphins at much greater risk.

The Panama Declaration and H.R. 408 represent strong consensus among leading conservation groups, the Clinton Administration, the U.S. tuna fishing industry, fish worker trade unions, and eleven foreign fishing nations--all of which fully support H.R. 408. Now is the time for U.S. leadership in charting a new course that strengthens international protection for dolphins and marine ecosystems. For these reasons we urge speedy passage of H.R. 408.

TABLE 1. DOLPHIN POPULATION ABUNDANCE AND MORTALITY ESTIMATES FOR SPECIES TAKEN IN THE YELLOWFIN TUNA PURSE SEINE FISHERY.

}

}DOLPHIN SPECIESPOP. EST.

(MEAN and 95 % CL)MIN. POP. EST.

N_{MIN}MORT.EST. ('93)MORT.EST. ('94)MORT.

EST. ('95)MORT.

EST.

('96)AVE MORT.MORTAL. LEVELS @ 0.1% OF POP.CURRENT MORTAL. AS % OF POP.

<u>Northeastern spotted</u>	730,900	648,900	1,143	<u>934</u>	1,060	1,046	<u>649</u>	<u>0.16%</u>
	(588,700 - 970,400)							
Western/Southern	1,298,400	1,145,100	759	1,226	708	898	1,145	0.08%

spotted

(918,700 -
1,654,100)Eastern spinner

631,800

518,500

824

743

664

744

5190.12%(389,500 -
938,300)

Whitebelly spinner

1,019,300

872,000

412

619

422

484

872

0.06%

(694,400 -
1,456,200)

Northern common

476,300

353,100

82

101

9

64

353

0.02%

(200,600 -
807,300)

Central common

406,100

297,400

230

151

192

191

297

0.04%

(200,300 -
766,000)

Southern common

2,210,900

1,845,600

-

-

-

-

1,846 0.01%

(1,536,600 -
3,488,200)

Other dolphins

2,802,300

155

321

219

238

-

-

(2,055,200 -
3,850,300)

TOTAL

9,576,000

3,605

4,095

3,274

<3,000 0.00

5,681

APPENDIX A

LETTER FROM CONCERNED SCIENTISTS ON THE TUNA/DOLPHIN PROBLEM.

APPENDIX B

SUMMARY OF REVIEWER'S COMMENTS ON ADRENAL COLOR PAPER BY MYRICK AND REVIEWERS' RECOMMENDATIONS FOR FUTURE RESEARCH.

1. Gerrodette, T., and Wade P.R. 1995. Status of Dolphin Stocks Affected by the Tuna Purse-Seine Fishery in the Eastern Tropical Pacific: A 36-Year Summary. Abstract, Eleventh Biennial Conference on the Biology of Marine Mammals. Orlando, FL. December 1995.
2. Federal Register, Vol. 57, No. 117, pg. 27010, June 17, 1992
3. Marine Mammal Commission Annual Report to Congress 1995, Marine Mammal Commission, 1825 Connecticut Avenue, N.W., Washington, D.C. 20009, January 31, 1996. *See also* Pers. comm. by Martin Hall, Inter-American Tropical Tuna Commission, estimate of 1996 dolphin mortality.
4. *See* H.R. Rept. No. 579, 101st Cong., 2nd Sess. 5 (1990) .
5. Id.
6. Hall, M.A. and Boyer, S.D. 1992. Estimates of incidental mortality of dolphins in the purse-seine fishery for tunas in the eastern tropical Pacific Ocean in 1990. Rep. Int. Whal. Commn. 41. 1992. pp. 529-531. *See also*: Pers. comm. by Martin Hall, Inter-American Tropical Tuna Commission, estimate of 1995 dolphin set data.
7. Inter-American Tropical Tuna Commission, Tuna-Dolphin Investigations, Background Paper 6; 57th meeting of the IATTC, October 21-23, 1996, La Jolla, CA.
8. *See supra* note 1

9. Hall, M.A., Lennert, C. and Arenas, P. 1992. The association of tunas with floating objects and dolphins in the eastern tropical Pacific Ocean. II: The purse-seine fishery for tunas in the eastern tropical Pacific Ocean. Presented at the Inter-American Tropical Tuna Commission, International Workshop on the Ecology and Fisheries for Tunas Associated with Floating Objects and On Assessment Issues Arising from the Association of Tunas with Floating Objects. February 11-14, 1992, Scripps Institution of Oceanography, La Jolla, CA.
10. Federal Register, Vol 57. No 117, p. 27010, June 17, 1992.
11. Federal Register, Vol 57. No 118, p. 27207, June 18, 1992.
12. Recent unpublished analyses suggest that the eastern spinner stock may be below one-fourth of its pre-fishery abundance--See: Gerrodette, T., and Wade P.R. 1995. Status of Dolphin Stocks Affected by the Tuna Purse-Seine Fishery in the Eastern Tropical Pacific: A 36-Year Summary. Abstract, Eleventh Biennial Conference on the Biology of Marine Mammals. Orlando, FL. December 1995.
13. Relative indices of abundance are estimates derived from tuna vessel observer data, because these data are potentially biased, they cannot provide an accurate estimate of the absolute number of dolphin in a population (absolute abundance). Any relative index of abundance must be used in combination with absolute abundance estimates obtained from research vessel surveys to accurately determine the actual abundance of a dolphin stock. Relative indices of abundance can provide a rough approximation of population trends.
14. Inter-American Tropical Tuna Commission, Tuna-Dolphin Investigations, Background Paper 6; 57th meeting of the IATTC, October 21-23, 1996, La Jolla, CA..
15. National Research Council. 1992. Dolphins and the Tuna Industry. National Academy Press, Washington, D.C.
16. Id.
17. Wade, P. 1994. Abundance and Population Dynamics of Two Eastern Pacific Dolphins, *Stenella attenuata* and *Stenella longirostris orientalis*. Doctoral Dissertation, University of California, San Diego.
18. 50 C.F.R. 228.3. *See also*, Report of the PBR (Potential Biological Removal) Workshop. 1994. National Marine Fisheries Service. Office of Protected Resources. Silver Spring, MD.
19. *See supra* note 15 at 71.
20. Dierauf, L.A. 1990. CRC Handbook of Marine Mammal Medicine: Health, Disease, and Rehabilitation. 295, 296 (1990)..
21. 50 C.F.R. 216.24 (d)(2)(i)(A)(2)
22. Pryor, K. and Shallenberger, I.K. 1991. Social structure in spotted dolphins (*Stenella attenuata*) in the tuna purse seine fishery in the eastern tropical Pacific. In Pryor, K. and Norris, K.S. (Eds), Dolphin Societies: Discoveries and Puzzles, Univ. Calif. Press, Berkeley, pp. 161-196.

23. *See supra* note 15 at 114.

24. Smith, T.D. (1983) Changes in size of three dolphin (*Stenella spp.*) populations in the eastern tropical Pacific. Fish. Bull. 81, 1-13. See also Chivers, S.J. and DeMaster, D.P. 1994. Evaluation of biological indices for three eastern tropical Pacific dolphin species. J. Wildl. Manage. 58(3):470-478.

25. Myrick, A.C., Jr., Stuntz, W.E., Ridgway, S.H. and Odell, D.K. 1987. Hypocalcemia in spotted dolphins (*Stenella attenuata*) chased and captured by purse seiners in the eastern tropical Pacific. Proc. Abstr., Seventh Biennial Conference on the Biology of Marine Mammals, Miami, 49 pp.

26. Dierauf, L.A. 1990. CRC Handbook of Marine Mammal Medicine: Health, Disease, and Rehabilitation. CRC Press. Boston, MA. p. 26. *See also*: Medway, W. and Geraci, J.R. 1978. Clinical Pathology of Marine Mammals. in Zoo and Wild Animal Medicine. (ed) M.E. Fowler. pp 604-610.

27. Myrick, A.C. and Perkins, P.C. 1995. Adrenocortical color darkness and correlates as indicators of continuous acute premortem stress in chased and purse-seine captured male dolphins. J. Pathophysiology 2: 191-204.

28. Myrick's hypothesis is not proven since the study lacks of controls (e.g. adrenal glands from unstressed dolphins of the same or similar species; sample collection of at various postmortem intervals to determine degradation; color differences between frozen versus formalin fixed tissue; color differences between entangled/asphyxiated animals verse stressed animals) and fails to examine the dolphins for other underlying diseases (e.g. pneumonia, parasitism, nutritional state) which could have caused discoloration in the adrenal cortex.

29. 16 U.S.C. 1361 (6)

30. Inter-American Tropical Tuna Commission, Presentation by Dr. Martin Hall at the 57th meeting of the IATTC, October 21-23, 1996, La Jolla, CA.

31. Statement of Dr. Elizabeth Edwards, National Marine Fisheries Service, Hearing on H.R. 2823 International Dolphin Conservation Act. Committee on Resources, Subcommittee on Fisheries, Wildlife, and Ocean. February 29, 1996.

32. IATTC Third Quarter Report. 1995. Table 10. Inter-American Tropical Tuna Commission, c/o Scripps Institute of Oceanography, 8604 La Jolla Shores Drive, La Jolla, CA 92038.

33. Id.

34. Statement of James Joseph, Ph.D., Inter-American Tropical Tuna Commission, Hearing on H.R. 2823 International Dolphin Conservation Act. Committee on Resources, Subcommittee on Fisheries, Wildlife, and Ocean. February 29, 1996. *See also*: Statement of James Joseph, Ph.D., Inter-American Tropical Tuna Commission, Hearing on International Dolphin Conservation Act. Committee on Resources, Subcommittee on Fisheries, Wildlife, and Ocean. June 22, 1995.

35. A scientific peer review of the IATTC bycatch data concluded "...that the various bycatch summaries allowed it to conclude that substantial differences in discard levels occurred for different set types [log, school, and dolphin sets]. On the other hand, the peer group did not believe there were adequate data or

statistical analyses provided to estimate the degree of these differences.... Nevertheless, the sheer magnitude of the rate differences by set type makes it difficult to dismiss the conclusion that a major shift in the proportion of each set category would likely lead to substantial differences in levels and species compositions of the bycatches and size categories of harvested target species. Based on the findings of the peer review panel, it would be prudent that any proposed major shifts in fishing modes take into account the implied ecological impacts." Inter-American Tropical Tuna Commission. 1995. A Peer Review of the IATTC Bycatch Data Base. La Jolla, CA.

36. Inter-American Tropical Tuna Commission. 1995. A Peer Review of the IATTC Bycatch Data Base. La Jolla, CA.

37. Id.

38. *See supra* note 30.

39. Panama Declaration. Signed October 4, 1995. Inter-American Tropical Tuna Commission. La Jolla, CA.

40. *See supra* note 15

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