AGREEMENT ON THE INTERNATIONAL DOLPHIN CONSERVATION PROGRAM

WORKING GROUP ON PER-STOCK PER-YEAR DOLPHIN MORTALITY CAPS

MINUTES OF THE 3RD MEETING

La Jolla, California (USA)
October 28, 2000

AGENDA

1. Opening of the meeting
2. Adoption of the agenda
3. Review of background paper
4. Discussion of the system to be used for 2001 and beyond
5. Adjournment

APPENDICES

1. List of attendees
2. Review of dolphin stocks in the eastern Pacific and implementation of per-stock, per-year limits under the AIDCP

Opening of the meeting

The meeting was called to order by Dr. Robin Allen, Director of the IATTC, on October 28, 2000 at 10:00 a.m. Mr. William Gibbons-Fly of the United States was elected Chairman. The attendees are listed in Appendix 1.

1. Adoption of the agenda

The provisional agenda was adopted as presented. Mexico commented that once agenda item 4, *Discussion of the system to be used for 2001 and beyond*, was addressed, it would have to be passed to the Meeting of the Parties for discussion.

2. Review of background paper

Dr. Allen reviewed the background paper prepared by the Secretariat (Appendix 2).

3. Discussion of the system to be used for 2001 and beyond

Dr. Allen presented a summary of the system the Meeting of the Parties adopted for 2000.

The United States proposed that the per-stock per-year mortality limits for 2001 should be implemented on a global basis, as in 2000.

An extensive discussion took place, and most participants eventually agreed that a global system should continue to apply for 2001 and that the per-stock mortality limit should be set at 0.1 N_{min}. Mexico preferred a system that would allocate dolphin mortality caps among the Parties on a per-stock basis, and expressed a reservation with respect to the application of a global system for 2001.

Mexico also expressed its view that, if the global system was to continue in 2001, the mortality limit should also continue at 0.2 $N_{min.}$ Mexico proposed that a meeting of the Scientific Working Group should be scheduled in the near future to look at a new allocation system and also to examine new dolphin abundance estimates.

4. Adjournment

The meeting was adjourned at 12:00 p.m.

Appendix 1.

ACUERDO SOBRE EL PROGRAMA INTERNACIONAL PARA LA CONSERVACION DE LOS DELFINES
AGREEMENT ON THE INTERNATIONAL DOLPHIN CONSERVATION PROGRAM

WORKING GROUP ON PER-STOCK PER-YEAR DOLPHIN MORTALITY CAPS

3ª REUNIÓN – 3rd MEETING

28 de octubre de 2000– October 28, 2000
La Jolla, California, USA

ASISTENTES - ATTENDEES

PARTES—PARTIES

COLOMBIA

CLARA GAVIRIA AGUDELO
Ministerio de Comercio Exterior
ARMANDO HERNANDEZ RODRIGUEZ
Cámara de Pesca – ANDI
GABRIEL E. CABRALES PAFFEN
Servicios Atuneros Sal para Atún (SALTUN)
DIEGO CANELOS
ATUNAMAR, LTDA.

COSTA RICA

HERBERT NANNE ECHANDI
RICARDO GUTIERREZ VARGAS
GEORGE HEIGOLD
INCOPESCA
ASDRUBAL VAZQUEZ
SARDIMAR

ECUADOR

RAFAEL TRUJILLO BEJARANO
LUIS TORRES NAVARRETE
Ministerio de Comercio, Industria y Pesca
BERNARDO BUEHS
Asociación de Atuneros del Ecuador (ATUNEC)

EL SALVADOR

MARIO GONZALEZ RECINOS
Centro de Desarrollo Pesquero (CENDEPESCA)
MARGARITA S. DE JURADO
Sistema de Integración Centroamericana (SICA)
ABDON ENRIQUE AGUILLON
Ministerio de Economía

EUROPEAN COMMUNITY– COMUNIDAD EUROPEA

ALAN GRAY
European Commission

MEXICO

CARLOS CAMACHO GAOS
MARA MURILLO CORREA
GUILLERMO COMPEAN JIMENEZ
Secretaría de Recursos Naturales y Medio Ambiente
JOSE JUAN VELAZQUEZ CARDENAS
JOSE JUAN VELAZQUEZ MACOSHAY
Supremos del Golfo y del Pacifico, S.A. de C.V.
ALFONSO ROSIÑOL
CANAINPESCA
JOSE CARRANZA
ERNESTO ESCOBAR
Pesca Azteca, S.A. de C.V.
MARK ROBERTSON
Janus-Merritt Strategies, L.L.C.

NICARAGUA

MIGUEL ANGEL MARENCO
ADPESCA/MEDEPESCA

PERU

GLADYS CARDENAS
Ministerio de Pesquería

UNITED STATES OF AMERICA - ESTADOS UNIDOS DE AMERICA

WILLIAM GIBBONS-FLY
DAVID HOGAN
Department of State
REBECCA LENT
JAMES LECKY
SVEIN FOUGNER
ALLISON ROUTT
PATRICIA DONLEY
STEVE REILLY
NICOLE LEBOEUF
National Marine Fisheries Service
PAUL KRAMPE
United Tuna Cooperative
EDWARD GANN
ARNOLD FREITAS
Caribbean Marine Service, Co. Inc.
GEORGE SOUSA
JIM SOUSA
G.S. Fisheries
JULIUS ZOLEZZI
Zolezzi Enterprises, Inc.
MARY MARKUS

VANUATU

EDWARD WEISSMAN
Jorge Fishing, Inc.

VENEZUELA

LUIS MARRERO
Ministerio de la Producción y el Comercio
ALVIN DELGADO
FUNDATUN
FRANCISCO ORTISI, JR.
AVENCASA

OBSERVADORES – OBSERVERS

ESPAÑA - SPAIN

J. IGNACIO ARRIBAS
Ministerio de Agricultura, Pesca y Alimentación
JAVIER ARIZ
Instituto Español de Oceanografía

GUATEMALA

MAURICIO MEJIA ESCALANTE
LUIS ARAGON
Ministerio de Agricultura, Ganadería y Alimentación
MARIA OLGA MENENDEZ
AGEXPRONT

NON-GOVERNMENTAL ORGANIZATIONS - ORGANIZACIONES NO GUBERNAMENTALES

CRISTOBEL BLOCK
Humane Society of the United States
KATHLEEN O'CONNELL
Whale & Dolphin Conservation Society
ANDY OLIVER
World Wildlife Fund
MARK PALMER
Earth Island Institute

IATTC - CIAT

ROBIN ALLEN, Director
PABLO ARENAS
MARCELA CAMPA
MARTHA GOMEZ
MARTIN HALL
BRIAN HALLMAN
BERTA JUAREZ
MICHAEL SCOTT
NICK WEBB

Appendix 2.

AGREEMENT ON THE INTERNATIONAL DOLPHIN CONSERVATION PROGRAM

WORKING GROUP ON PER-STOCK PER-YEAR DOLPHIN MORTALITY CAPS

3RD MEETING

La Jolla, California (USA)
October 28, 2000

REVIEW OF DOLPHIN STOCKS IN THE EASTERN PACIFIC AND IMPLEMENTATION OF PER-STOCK, PER-YEAR LIMITS UNDER THE AGREEMENT ON THE INTERNATIONAL DOLPHIN CONSERVATION PROGRAM

Introduction

The stocks of dolphin species taken by the tuna purse-seine fishery in the eastern Pacific Ocean (EPO) have been defined in a series of papers written primarily by the staff of the U.S. National Marine Fisheries Service (NMFS) since the 1970s. These papers have generally been based on the proceedings of workshops, and, as more information has been collected over the years, the stocks have been redefined. The most recent definitions were published by Dizon *et al*. (1994), and the stock boundaries are illustrated in Figures 1-4. The present paper updates a paper initially prepared for the 37th Intergovernmental Meeting in response to a request from the Working Group on Per Stock, Per-Year Mortality Limits at its meeting on July 6-7, 1998, in La Jolla, California.

Dolphin stocks

Spotted dolphin

The pantropical spotted dolphin (*Stenella attenuata*) is distributed worldwide in tropical waters. There are currently three stocks of spotted dolphins recommended as EPO management units by the NMFS: **Northeastern**, **Western/Southern**, and **Coastal** (Figure 1).

The morphological differences between the **Northeastern** and the **Western/Southern** stocks are either subtle or internal, and it is difficult for an observer at sea to distinguish the two forms. Accordingly, stock boundaries are used to differentiate them in the field. The morphological differences are in 1) skull measurements, 2) length of the body (the western/southern form is slightly shorter), and 3) coloration (the western/southern form is slightly less spotted). There are also differences in reproductive seasonality between the two forms.

Previously, the distinction between these two stocks (then called the Northern and Southern spotted dolphins) was based on a gap in distribution that extended mainly along 1°S (Perrin *et al*., 1985). This boundary was changed and the stocks renamed (Dizon *et al*., 1994) after a study of skull morphology (Perrin *et al*., 1994) suggested that the spotted dolphins found north of the equator and west of 120°W were more similar to the southern form than to the northern spotted dolphins living east of 120°W. The new boundaries (Figure 1) were based on gaps in distribution and differences in skull morphologies. More-recent work by Dr. Steven Buckland and Ms. Fernanda Marques suggests that the gap in distribution coincides with a gap in fishing effort. When dolphin densities (sightings per unit of searching effort) are plotted for this boundary area, it appears that the boundary is less distinct.

The **Coastal** form is considered a separate subspecies, *S. a. graffmani*, by Perrin (1975). It is recognized

in the field by 1) longer and more robust body, 2) the heavier spotting in adults, and, 3) to some extent, its geographic distribution. The observers are trained not to base their identifications only on proximity to the shore or islands because the ranges of the coastal and the two offshore stocks overlap: the range of the coastal stock extends to about 100 nm offshore, and those of the offshore stocks as close as 16 nm from the shore. Spotted dolphins further than 100 nm offshore are assumed to belong to one of the two offshore forms unless this is contradicted by morphological evidence. In the laboratory, coastal spotted dolphins can be distinguished from the two offshore forms by skull and tooth characteristics.

In general, there appears to a radial cline in morphological characteristics (Figure 5), suggesting some limited gene flow among the stocks (Perrin *et al*., 1985). (Because they are not considered separate species, limited gene flow between stocks would be expected.) Observers are instructed to make their identifications based on the modal characteristics of the whole herd, rather than on the characteristics of a particular individual.

This species is involved in a large majority of dolphin sets. The percentages of dolphin sets that involved this species in 1992-1999 ranged between 55-74% for northeastern, 11-35% for western/southern, and 0.4-5% for coastal spotted dolphins. The United States considers the Northeastern stock to be depleted under the Marine Mammal Protection Act (MMPA), and has also, in the past, forbidden intentional sets on the coastal stock.

Spinner dolphin

The pantropical spinner dolphin (*Stenella longirostris*) is distributed worldwide in tropical waters. There are currently three stocks of spinner dolphins recommended as EPO management units by the NMFS: **Eastern**, **Whitebelly**, and **Central American** (Figure 2).

The **Eastern** spinner is considered a separate subspecies, *S. l. orientalis*, by Perrin (1990). Even though its distribution overlaps widely with that of the whitebelly stock, it is distinguished in the field by 1) its uniform grey color on the back and sides, and 2) the forward-canted dorsal fin in adult males. In the laboratory, they may be distinguished by skull measurements and average size of the adults. There may also be differences in reproductive seasonality.

Previously, the **Whitebelly** stock was split into a northern and a southern stock (Perrin *et al*., 1985), based on slight differences in length and skull morphology, but more recent analyses indicate that such a split is not warranted (Dizon *et al.*, 1994). Perrin considers the whitebelly spinner a hybrid or an intergrade (*S. l. longirostris* x *S. l. orientalis)* between the Hawaiian spinner and the eastern spinner (Perrin, 1990; Perrin *et al*., 1991). Mitochondrial DNA analyses did not have sufficient resolution to separate the eastern and whitebelly stocks, despite the distinct differences in external morphology (Dizon *et al*., 1991). It is possible that other genetic techniques, using chromosomal DNA or DNA microsatellites, could differentiate between these two stocks. The results are consistent with a hypothesis put forward by Perrin *et al.* (1985) that the eastern form became differentiated from the Hawaiian form due to isolation by cold-water barriers during the last ice age or to adaptation to selection pressures in the eastern Pacific sufficient to cause differentiation without physical barriers. According to these hypotheses, the whitebelly form represents either a hybrid or an intergrade caused by recent gene flow into the eastern Pacific from the west.

The **Central American** spinner, formerly called the **Costa Rican** spinner, is considered a subspecies, *S. l. centroamericanus*, by Perrin (1990). It is similar to the eastern form, but is distinguishable in the field by: 1) its longer and more slender body, 2) its longer snout, and 3) its distribution within a coastal strip 50 nm wide between 7 and 13°N that is thought not to overlap with the ranges of the other two stocks (Perrin *et al*., 1991). Again, observers are trained to base their identifications mainly on morphology, and not to rely solely on proximity to the shore.

Again, there is a radial cline in morphological characteristics (Figure 5). Both the radial cline and NMFS

genetics analyses indicate gene flow, particularly between the eastern and whitebelly spinner stocks.

Photogrammetric length data suggest that an additional stock, the **Tres Marias** spinner dolphin, may exist (Perryman and Westlake, 1998; n = 609 individuals from 4 herds), but the NMFS has not recommended separate management of these dolphins.

Spinner dolphins are typically set on while in mixed-species herds with spotted dolphins. The percentages of dolphin sets that involved this species in 1992-1999 ranged between 21-34% for eastern, 10-21% for whitebelly, 0-0.8% for Central American, and 0.3-1.6 unidentified spinner dolphins. The United States considers the Eastern stock to be depleted under the MMPA, and has also, in the past, forbidden intentional sets on the Central American stock.

Common Dolphins

Common dolphins (*Delphinus delphis* and *D. capensis*) are distributed worldwide in temperate, subtropical, and tropical waters. There are three geographically-separated stocks of common dolphins recommended as EPO management units by the NMFS: **Northern**, **Central**, and **Southern** (Figure 4). (A California/Oregon/Washington stock north of the U.S.-Mexico border is managed separately by the NMFS). The **Northern** stock is a management unit composed of two different species: the **Short-snouted common dolphin** (*D. delphis*) and the **Long-snouted common dolphin** (*D. capensis*), formerly called the **Baja neritic** common dolphin (Heyning and Perrin, 1994). (The NMFS currently manages these two species separately north of the U.S.-Mexico border.) These species have been grouped into a single management unit because it is difficult for observers to distinguish them in the field and because the coastal distribution of *D. capensis* overlaps that of the more pelagic *D. delphis*. Observers are asked to identify the species based on 1) body length (*D. capensis* is longer), 2) snout length (*D. capensis* has a longer rostrum), and 3) coloration (there are subtle differences in color and striping patterns). In practice, it has proved difficult for observers to distinguish the two species.

The three stocks are separated by gaps in distribution, and the stock boundaries are based on these gaps. The **Northern** and **Central** forms also differ in size: **Central** common dolphins are longer.

An additional stock, the **Guerrero** common dolphin, has been provisionally proposed based on lengths of a small sample (Perrin *et al*. 1985; n = 5), but the NMFS has not recommended separate management of these common dolphins.

Common dolphins are only occasionally set on by tuna purse seiners. The percentages of dolphin sets that involved this species in 1992-1999 ranged between 0.08-3% for northern, 0.9-6% for central, 0-0.7% for southern common dolphins.

Striped dolphins

The striped dolphin (*Stenella coeruleoalba*) is distributed worldwide in warm-temperate and tropical waters. There is currently only one stock of striped dolphins in the EPO. It was previously considered that there were two stocks, the **Northern** and **Southern** striped dolphins (Figure 4), based on a perceived distributional gap, but this gap was no longer apparent when more sightings were collected (Dizon *et al.*, 1994).

Striped dolphins are rarely set on by tuna purse seiners. The percentages of dolphin sets that involved this species in 1992-1999 ranged between 0.07-0.3%.Other dolphin species

Other dolphin species are known to be encircled, and sometimes killed, in tuna purse-seine nets. These delphinids are managed at the species level because no stock structure has been identified. Species known to have been encircled in tuna purse-seine nets in the EPO are listed in Table 1.

ESTIMATES OF ABUNDANCE AND N_{MIN}

Calculation of per-stock mortality limits requires estimates of the abundance of the stock and the coefficient of variation (CV) of the estimate. The most recent estimates of absolute abundance for most of the dolphin stocks in the EPO are based on a series of annual surveys during 1986-1990 (Wade and Gerrodette, 1993); estimates for northern and central common dolphins are based on surveys conducted in 1992-1993 (Wade and Gerrodette, unpublished data). A three-year series of surveys (1998-2000) is currently being conducted by the NMFS to produce more up-to-date abundance estimates. During the 2nd Meeting of the Parties to the AIDCP, it was decided to continue using the 1986-1993 abundance estimates to calculate N_{min}, at least until the current series of surveys are completed.

NMFS defines N_{min} as the 20th percentile of a log-normal distribution (Wade and Angliss, 1997), which is calculated from the abundance estimate (N) and the coefficient of variation of N (CV):

$$N_{min} = N/\exp(0.842(\ln(1+CV^2))^{1/2})$$

Currently, N_{min} (and hence, the per-stock, per-year dolphin mortality limit or cap, abbreviated here as the SML) can be calculated for all stocks except the Pacific white-sided dolphin (no abundance estimate) and the Central American spinner dolphin (only one herd was sighted during the 1986-1990 surveys, and no CV could be calculated). (If, however, the 1998 preliminary estimate for Central American spinner dolphins from the current NMFS surveys is used, the N_{min} would be 8,384 and the SML would be 17 dolphins in 2000 and 8 dolphins in 2001). The abundance estimates calculated by the NMFS and dolphin mortality limits set by the Declaration of Panama (0.2% and 0.1% of N_{min}) are listed in Table 1.

APPLICATION OF PER-STOCK MORTALITY LIMITS (SMLs)

During the discussions of the Working Group, much attention was focused on which stocks should be assigned SMLs. Article I of the AIDCP defines dolphins as "species of the family Delphinidae associated with the fishery for yellowfin tuna in the Agreement Area." In practice, the IATTC has counted toward the individual-vessel DMLs and the total mortality for the fleet all delphinids killed, regardless of the species or whether the mortalities occurred in intentional dolphin sets (*incidental* mortalities) or in sets on floating objects or unassociated schools of tuna (*accidental* mortalities). During the 1st meeting of the Parties to the AIDCP it was decided to report in real time the mortalities of the following seven stocks only, which have traditionally been the main focus of IATTC studies of mortality and relative abundance:

Northeastern spotted dolphin	Western/Southern spotted dolphin
Eastern spinner dolphin	Whitebelly spinner dolphin
Northern common dolphin	Central common dolphin
Southern common dolphin	

Other delphinid species would be monitored, although not on a real-time basis. It was also decided that the Working Group "shall examine the estimates of mortality for the coastal spotted and Central American spinner stocks and consider whether more frequent monitoring is required." This review could not be done in June 2000, as initially proposed, because the low reporting rate from vessels at sea made extrapolation to non-reporting vessels problematic.

Mixed-species herds

Once an SML is reached for one stock, setting on other stocks could be affected if they occur in mixed-species herds with the restricted stock. Mixed-species herds are common in the EPO, particularly with spotted and spinner dolphins. If, for example, the SML for eastern spinner dolphins had been reached for a given year, a captain would either have to forgo setting on approximately half of the northeastern spotted- herds because they are associated with eastern spinners or cut out all the eastern spinners from the herd before setting the net.

Accidental mortality

Applying an SML to accidental dolphins mortalities may be problematic. Several species that associate with floating objects may not be sighted prior to a set, or they may swim into the purse seine during a set on schoolfish or a floating object. Because these mortalities are, by definition, accidental, it would difficult to avoid encircling such species once an SML is reached. At its 2nd meeting, held in Ensenada in January 1999, the Working Group recommended that mortalities from accidental sets not be counted toward the SML.

IMPLEMENTATION

It was decided at the 1st Meeting of the Parties to the AIDCP, held in July 1999, that the SMLs will be allocated initially as a global limit, while the DMLs would continue to be allocated on a per-vessel basis. Observers are supposed to make weekly radio reports of per-stock mortalities, with more frequent reports when an SML is being closely approached. Once the SML for a particular stock is reached, the entire international fleet is prohibited from setting on dolphin herds containing that stock. Mortalities in excess of the SML are subtracted from the following year's limit. Any changes from the radio reports after review of the returning observer's data can be reflected in the current or next year's mortality. The weekly mortality estimates of these stocks are to be reported to the governments with vessels fishing in the Agreement Area. Notice would be provided to the governments when the mortality of a stock reaches 70% and 90% of the SML. To guard against exceeding the SML, 2% of the SML is placed in reserve.

Implementation of the SML program has been hampered by the low reporting rate from vessels at sea. Weekly reporting rates are typically about 30%, with rates for individual flags ranging from 0-100%. With such low overall reporting rates and the consistently low reporting rates for some flags, it is problematic to extrapolate observed mortality to the rest of the non-reporting fleet and to the rest of the year.

LITERATURE CITED

Dizon, A.E., S.O. Southern, and W.F. Perrin. 1991. Molecular analysis of mtDNA types in exploited populations of spinner dolphins (*Stenella longirostris*). Rep. Int. Whal. Commn, Special Issue 13: 183-202.

Dizon, A.E., W.F. Perrin, and P.A. Akin. 1994. Stocks of dolphins (*Stenella* spp. and *Delphinus delphis*) in the eastern tropical Pacific: A phylogeographic classification. NOAA Tech. Rep. NMFS, 119. 20 pp.

Heyning, J.E., and W.F. Perrin. 1994. Evidence for two species of common dolphins (genus *Delphinus*) from the eastern north Pacific. Nat. Hist. Mus. Los Angeles County Contrib. in Science, 442. 35 pp.

Perrin, W.F. 1975. Variation of spotted and spinner porpoise (genus *Stenella*) in the eastern tropical Pacific and Hawaii. Bull. Scripps Inst. Oceanogr., 21: 1-206.

Perrin, W.F. 1990. Subspecies of *Stenella longirostris* (Mammalia: Cetacea: Delphinidae). Proc. Biol. Soc. Wash., 103(2): 453-463.

Perrin, W.F., M.D. Scott, G.J. Walker, and V.L. Cass. 1985. Review of geographical stocks of tropical dolphins (*Stenella* spp. and *Delphinus delphis*) in the eastern Pacific. NOAA Tech. Rep. NMFS, 28. 28 pp.

Perrin, W.F., P.A. Akin, and J.V. Kashiwada. 1991. Geographic variation in external morphology of the spinner dolphin *Stenella longirostris* in the eastern Pacific and implications for conservation. Fish. Bull., 89(3): 411-428.

Perrin, W.F., G.D. Schnell, D.J. Hough, J.G. Gilpatrick Jr., and J.V. Kashiwada. 1994. Reexamination of geographic variation in cranial morphology of the pantropical spotted dolphin, *Stenella attenuata*, in the eastern Pacific. Fish. Bull., (2) 92: 324-346.

Perryman W.L., and R.L.Westlake. 1998. A new geographic form of the spinner dolphin, *Stenella longirostris*, detected with aerial photogrammetry. Mar. Mamm. Sci., 14(1): 38-50.

Wade, P.R., and R.P. Angliss. 1997. Guidelines for assessing marine mammal stocks: Report of the GAMMS Workshop April 3-5, 1996, Seattle, Washington. NOAA Tech. Memo. NMFS-OPR-12. 93 pp.

Wade, P.R. and T. Gerrodette. 1993. Estimates of cetacean abundance and distribution in the eastern tropical Pacific. Rep. Int. Whal. Commn, 43: 477-493.

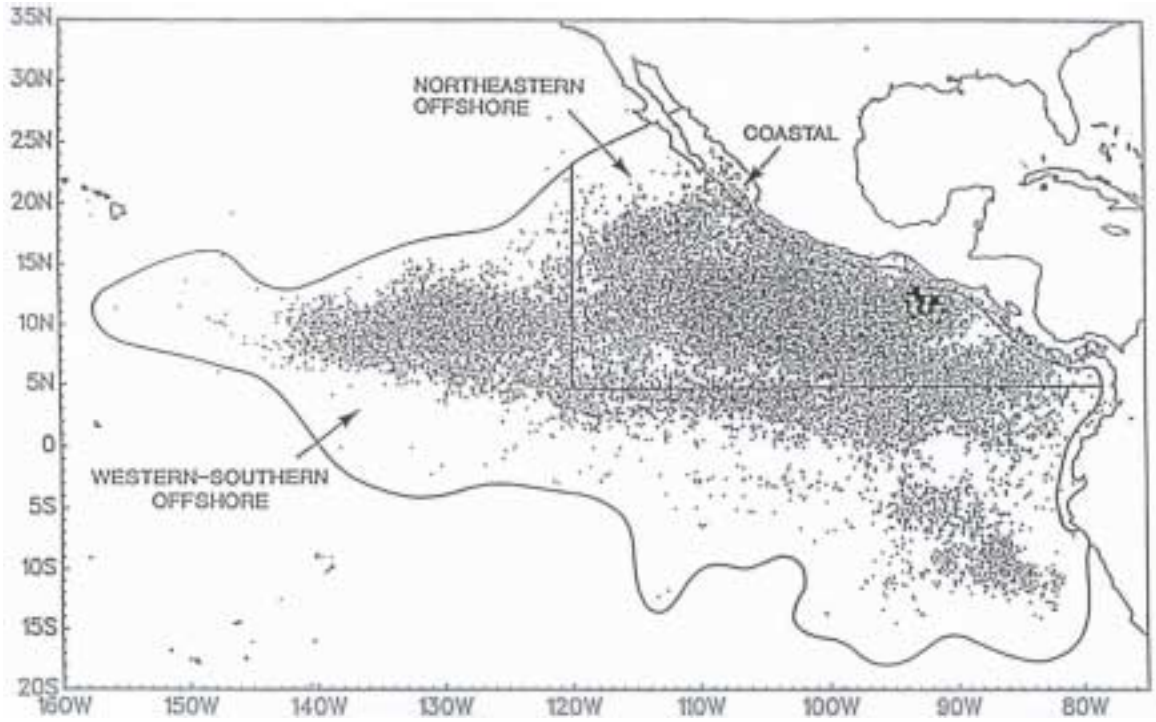

Figure 1. Distribution and stocks of spotted dolphins (*Stenella attenuata*) in the EPO (Figure taken from Perrin *et al.* 1985).

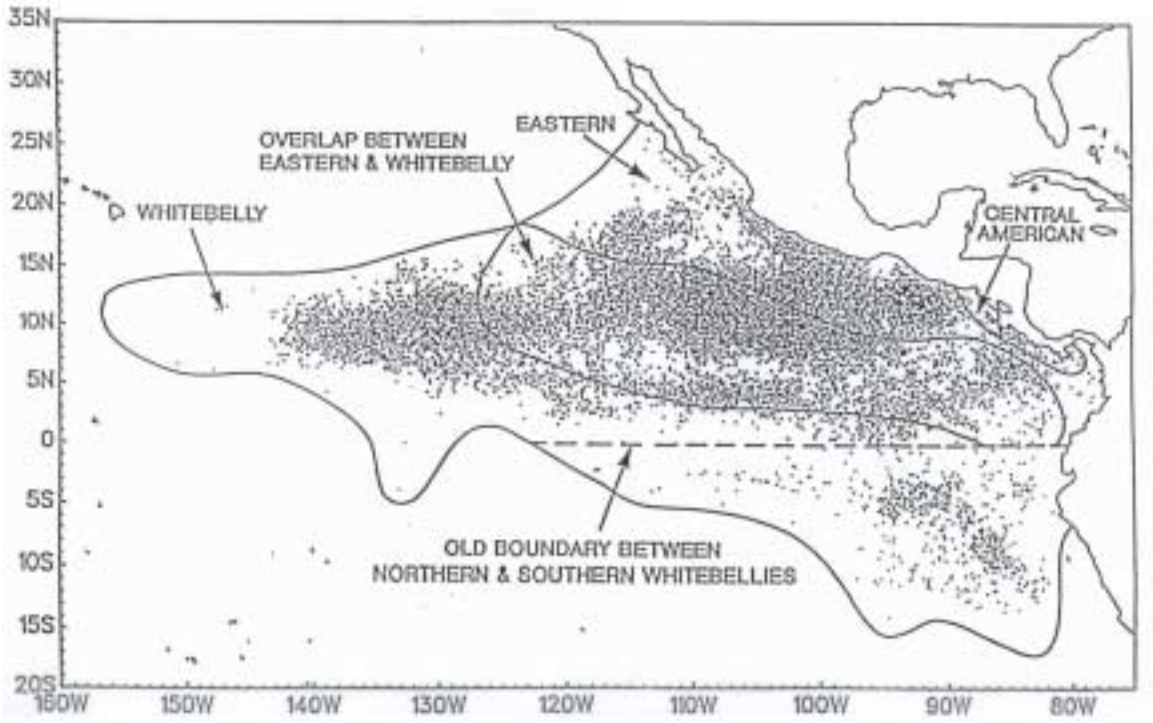

Figure 2. Distribution and stocks of spinner dolphins (*Stenella longirostris*) in the EPO (Figure taken from Perrin *et al.* 1985).

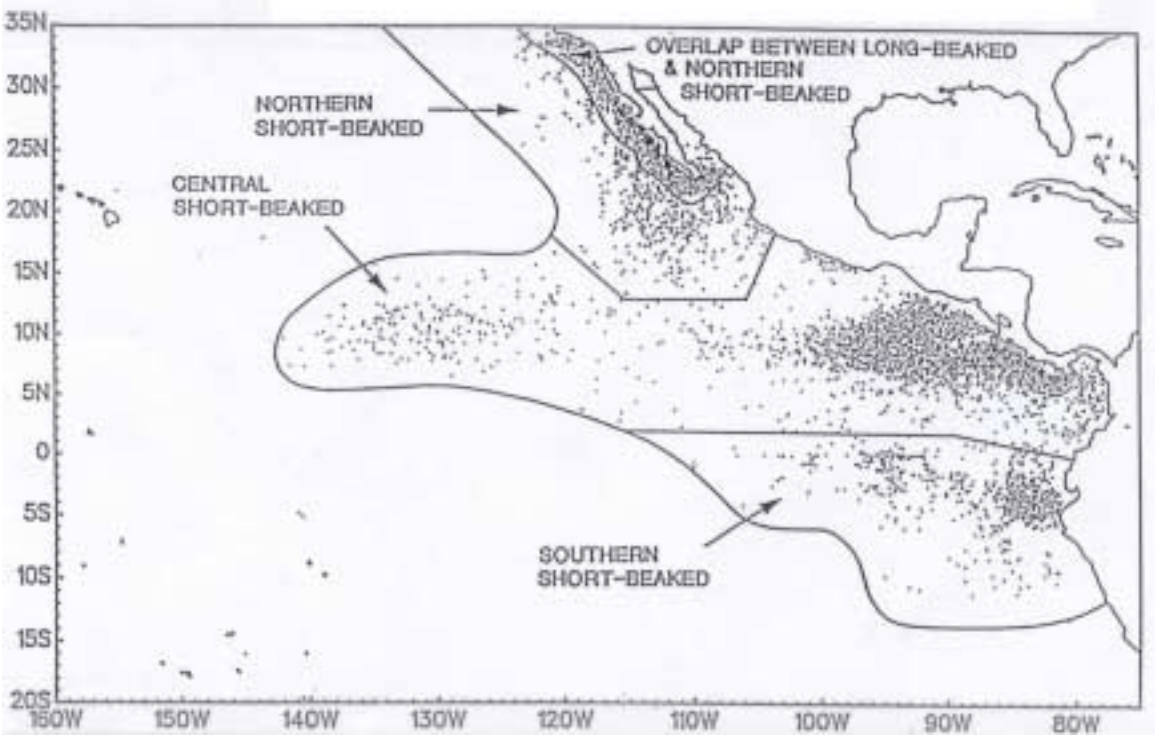

Figure 3. Distribution and stocks of common dolphins (*Delphinus delphis* and *D. capensis*) in the EPO (Figure taken from Perrin *et al.* 1985).

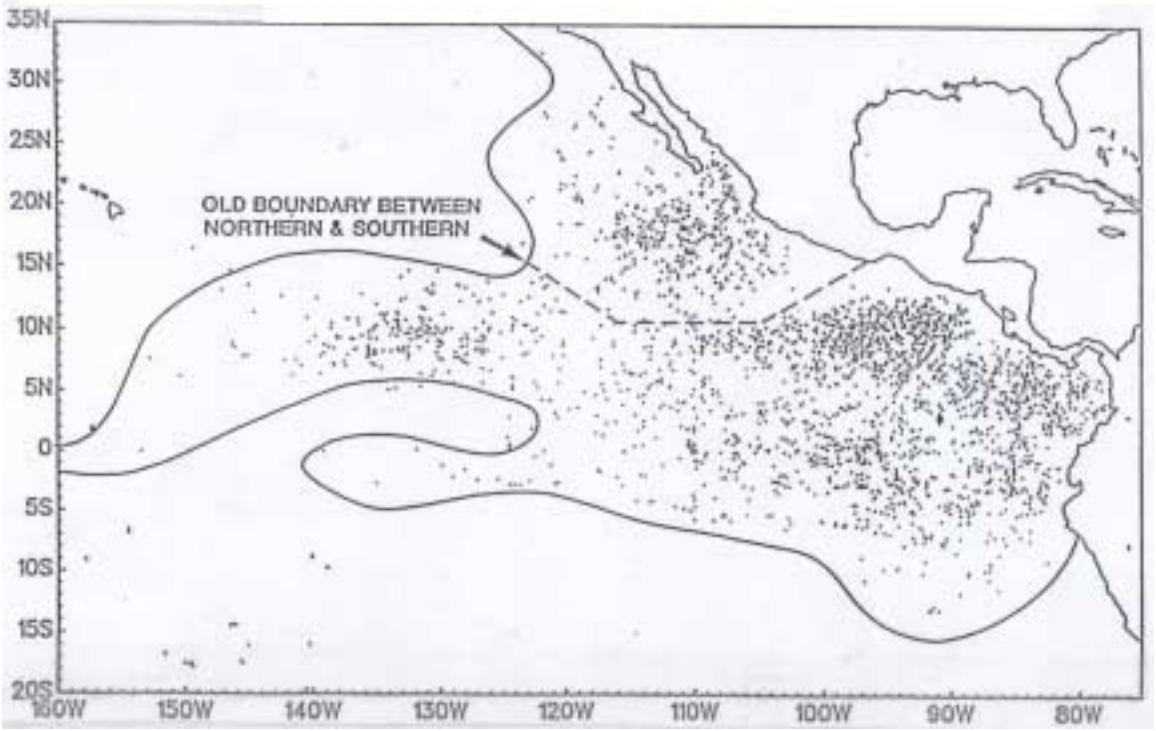

Figure 4. Distribution and stocks of striped dolphins (*Stenella coeruleoalba*) in the EPO (Figure taken from Perrin *et al.* 1985).

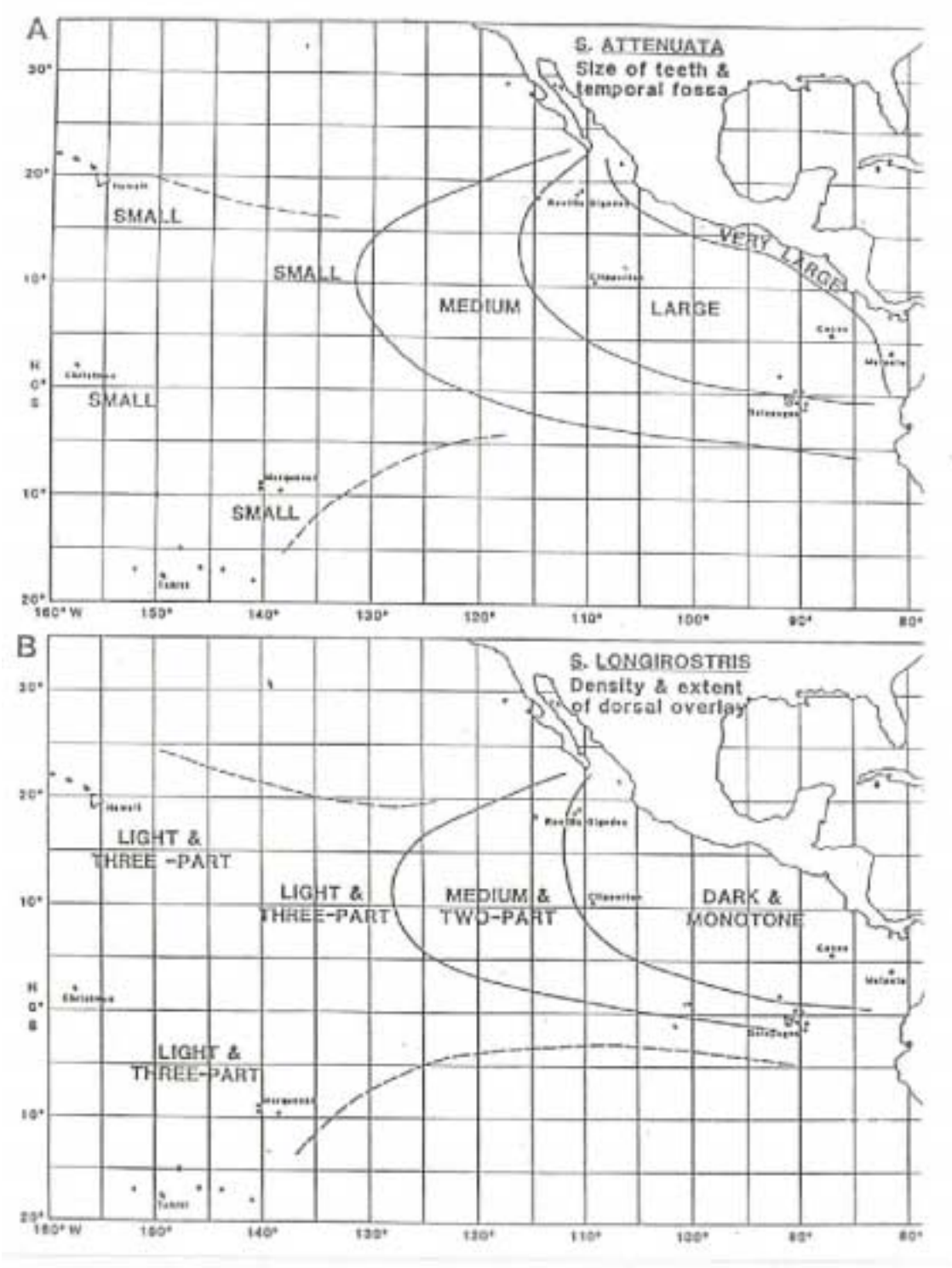

Figure 5. Radial clines in morphological characteristics of spotted dolphins (*Stenella attenuata*) and spinner dolphins (*Stenella longirostris*) in the EPO (Figure taken from Perrin *et al.*, 1985).

TABLE 1. Per-stock estimates of abundance (*N*) and minimum abundance (N_{min}), mortality limits (SMLs), and 1999 dolphin mortalities.

STOCK	N (x 1000)	N_{min} (x 1000)	0.2% N_{min}	0.1% N_{min}	1999 Mortality
Spotted dolphin (*Stenella attenuata*)					
Northeastern stock	730.9	648.9	1,298	649	345
Western/Southern stock	1,298.4	1,145.1	2,290	1,145	249
Coastal stock	29.8	22.5	45	22	17
Spinner dolphin (*Stenella longirostris*)					
Eastern stock	631.8	518.5	1,037	518	363
Whitebelly stock	1,019.3	871.9	1,744	872	192
Central American stock		-	-	-	13
Common dolphins (*Delphinus delphis & D. capensis*)					
Northern stock	713.7	562.7	1,125	563	85
Central stock	239.4	207.3	415	207	34
Southern stock	2,210.9	1,845.6	3,691	1,846	1
Striped dolphins (*Stenella coeruleoalba*)	1,918.0	1,745.9	3492	1,746	5
Fraser's dolphin (*Lagenodelphis hosei*)	289.3	219.8	440	220	0*
Bottlenose dolphin (*Tursiops truncatus*)	243.5	192.3	385	192	9
Risso's dolphin (*Grampus griseus*)	175.8	128.9	258	129	3
Rough-toothed dolphin (*Steno bredanensis*)	145.9	112.2	224	112	0*
Pilot whale (*Globicephala* spp.)	160.2	142.7	285	143	0*
Melon-headed whale (*Peponocephala electra*)	45.4	31.2	62	31	0*
Pacific white-sided dolphin (*Lagenorhynchus obliquidens*)					0*
Pygmy killer whale (*Feresa attenuata*)	38.9	30.3	61	30	0
False killer whale (*Pseudorca crassidens*)	39.8	24.4	49	24	0
Killer whale (*Orcinus orca*)	8.5	6.3	13	6	0

Abundance estimates (*N*) from Wade and Gerrodette (1993, and unpublished data for northern and central common dolphins). Estimates of minimum abundance (N_{min}) calculated from PBR guidelines in Wade and Angliss (1997).
* Mortality has occurred on this stock or species between 1986 and 1999.