

AGREEMENT ON THE INTERNATIONAL DOLPHIN CONSERVATION PROGRAM

9TH MEETING OF THE PARTIES

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REPORT ON THE INTERNATIONAL DOLPHIN CONSERVATION PROGRAM

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1. INTRODUCTION

In the eastern Pacific Ocean (EPO), schools of yellowfin tuna frequently associate with marine mammals, especially spotted, spinner, and common dolphins. When the purse-seine fishery for tunas in the EPO began around 1960, the fishermen found that their catches of yellowfin in the EPO could be maximized by setting these nets around the herd of dolphins and the associated school of tunas. However, releasing the dolphins caught without losing the tuna proved more difficult, and in the early years of the fishery many dolphins became entangled in the nets and died during this process. As techniques and equipment to solve this problem were developed, this mortality fell, gradually at first and dramatically in the 1990s, thanks to the combined efforts of the fishing industry, governments, the IATTC, environmental organizations, and other interested parties.

The 1992 La Jolla Agreement provided a framework for the international efforts to reduce this mortality, and introduced such novel and effective measures as Dolphin Mortality Limits (DMLs) for individual vessels, an observer program for vessels fishing tunas associated with dolphins, and the International Review Panel to monitor the performance and compliance of the fishing fleet. The Agreement on the International Dolphin Conservation Program (AIDCP), which built on and formalized the provisions of the La Jolla Agreement, was signed in May 1998 and entered into force in February 1999. The Parties to this agreement committed to “ensure the sustainability of tuna stocks in the eastern Pacific Ocean and to progressively reduce the incidental dolphin mortalities in the tuna fishery of the eastern Pacific Ocean to levels approaching zero; to avoid, reduce and minimize the incidental catch and the discard of juvenile tuna and the incidental catch of non-target species, taking into consideration the interrelationship among species in the ecosystem.”

The IATTC provides the Secretariat for the IDCP and its various bodies and coordinates the On-Board Observer Program and the Tuna Tracking and Verification System.

2. THE ON-BOARD OBSERVER PROGRAM

The IATTC’s international observer program and the national observer programs of Ecuador (Programa Nacional de Observadores Pesqueros de Ecuador; PROBECUADOR), Mexico (Programa Nacional de Aprovechamiento del Atún y Protección de Delfines; PNAAPD) and Venezuela (Programa Nacional de Observadores de Venezuela; PNOV) constitute the AIDCP On-Board Observer Program. In addition, observers from the international observer program of the Forum Fisheries Agency (FFA) are approved by

the Parties to collect information for the On-Board Observer Program on vessels that fish in the Agreement Area without setting on dolphins if the Secretariat determines that the placement of an IDCP observer is not practical.

2.1. Observer coverage

The AIDCP mandates 100% coverage by observers of fishing trips by purse seiners of carrying capacity greater than 363 metric tons (T) (IATTC Class 6) in the Agreement Area. In 2002 the Ecuadorean program had a goal of sampling approximately one-third of the trips by its fleet, and the Mexican and Venezuelan programs each had a goal of sampling approximately half of the trips by their respective fleets. The IATTC program covered the remainder of the trips by the fleets of those three countries, plus all trips by vessels of other fleets, except as noted below.

During 2002, observers from the On-Board Observer Program departed on 755 fishing trips (Table 1). In addition, 68 vessels whose last trip of 2001 carried over into 2002 had observers aboard, bringing the total to 823 trips observed in 2002 by the Program. The Program covered vessels operating under the jurisdictions of Belize, Bolivia, Colombia, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, Spain, the United States, Vanuatu, and Venezuela. Five of these trips, one which began in 2001 and carried over into 2002, were made by a vessel flying the flag of a non-Party to the AIDCP.

The Program sampled 99.3% of trips by vessels covered by the AIDCP, and the IATTC program sampled over 68% of all trips. One vessel that should have participated in the Program made 6 trips without an observer (1 trip under unknown flag and 5 trips under Bolivian flag) as vessel management refused to participate, despite several communications from the Bolivian government that the vessel's capacity requires it to do so.

There was some doubt about whether one vessel which is close to the size required by the AIDCP to carry an observer should have carried an observer. In the event, the flag government determined that the vessel was of less than 363 T carrying capacity and was not required to carry an observer.

2.2. Observer training

In October 2002 the European Union's new observer program, the Programa Nacional de Observadores de Túnidos, Océano Pacífico (PNOT), conducted its first observer training course in Santa Cruz de Tenerife, Spain, with the assistance of an IATTC staff member. The course was attended by 12 trainees. Placement of EU observers on vessels operating in the Agreement Area began in 2003.

In November-December 2002 a training course for IATTC observers was held in Manta, Ecuador. It was attended by 18 trainees, 9 from Ecuador, 5 from Venezuela, and 2 each from El Salvador and Panama.

3. DOLPHIN MORTALITY IN 2002

3.1. Dolphin Mortality Limits (DMLs)

The overall dolphin mortality limit (DML) established for the international fleet in 2002 was 5,000 animals, and the unreserved portion of 4,900 was allocated to 90 vessels that requested and were qualified to receive DMLs. The average individual-vessel DML (ADML) was 53.846 dolphins. The ADML was calculated based on 91 DML requests, but one vessel did not qualify. Of the 19 vessels that did not utilize their DMLs prior to April 1, 7 forfeited their DMLs, and the other 12 were allowed to keep them for the remainder of the year under the *force majeure* exemption allowed by the AIDCP. A total of 77 vessels utilized their DMLs during the year. One vessel was allocated a second-semester DML of 17 animals which was utilized. The distribution of the mortality caused in 2002 by vessels with full-year DMLs is shown in Figure 1.

3.2. Preliminary estimates of the mortality of dolphins in 2002 due to fishing

The preliminary estimate of the incidental mortality of dolphins in the fishery in 2002 is 1,514 animals (Table 2), a 29% decrease over the 2,133 mortalities recorded in 2001. The mortalities for 1979-2002, by species and stock, are shown in Table 3, and the standard errors of these estimates are shown in Table 4. The mortalities of the principal dolphin species affected by the fishery show declines in the last decade (Figure 2) similar to that for the mortalities of all dolphins combined (Figure 3). Estimates of the abundances of the various stocks of dolphins for 1986-1990 and the relative mortalities (mortality/abundance) are also shown in Table 2. The stocks with the highest levels of relative mortality were northeastern spotted dolphins and eastern spinner dolphins (0.06%).

The number of sets on dolphin-associated schools of tuna made by Class-6 vessels increased by 26%, from 9,847 in 2001 to 12,433 in 2002, and this type of set accounted for 57.5% of the total number of sets made in 2002, compared to 52.9% in 2001. The average mortality per set decreased from 0.22 dolphins in 2001 to 0.12 dolphins in 2002. The estimated spatial distribution of the average mortalities per set during 2002 is shown in Figure 4. Typically, patches of relatively high mortalities per set were found throughout the fishing area, but in 2002 the higher-mortality areas were centered around 10°N and east of 115°W. The trends in the numbers of sets on dolphin-associated fish, mortality per set, and total mortality in recent years are shown in Figure 3.

The catches reported by observers of dolphin-associated yellowfin increased by 28% in 2002 as compared to 2001. The percentage of the catch of yellowfin taken in sets on dolphins increased from 68.1% of the total catch by Class-6 vessels in 2001 to 79.2% of that catch in 2002, and the average catch of yellowfin per set on dolphins increased from 24.9 to 25.2 metric tons. The mortality of dolphins per metric ton of yellowfin caught decreased from 0.009 in 2001 to 0.005 in 2002.

The above figures are based on data from trips covered by observers from all components of the On-Board Observer Program. The comparisons in the next paragraph are based on the IATTC data bases for 1986-2002 only.

The decrease in the mortality per set is the result of actions by the fishermen to better manage the factors that bring about incidental mortalities of dolphins. Indicative of this effort is the number of sets in which no mortalities occurred, which has risen from 38% in 1986 to 94% in 2002 and the average number of animals left in the net after backdown, which has decreased from 6.0 in 1986 to 0.1 in 2002 (Table 5). The factors under the control of the fishermen which are likely to affect the mortality of dolphins per set include the occurrence of malfunctions, especially those which lead to net canopies and net collapses, and the time it takes to complete the backdown maneuver (Table 5). The percentage of sets with major mechanical malfunctions has decreased from an average of approximately 11% during the late 1980s to less than 7% during 1997-2002; in the same period the percentage of sets with net collapses decreased from about 30% to about 6%, and that of net canopies from about 20% to 5%. Although the chance of dolphin mortality increases with the duration of the backdown maneuver, the average backdown time has changed little since 1986. Also, the mortality of dolphins per set increases with the number of animals in the encircled herd, in part because the backdown maneuver takes longer to complete when larger herds are encircled. The fishermen can reduce the mortalities per set by encircling schools of fish associated with fewer dolphins.

3.3. Reports of dolphin mortality by observers at sea

The AIDCP requires the Parties to establish a system, based on real-time observer reporting, to ensure effective implementation and compliance with per-stock, per-year dolphin mortality caps. This requirement was complied with by requiring all observers aboard tuna purse seiners with a DML to report dolphin mortality by stock weekly via e-mail, fax, or radio. However, for various reasons the Secretariat has been receiving only about 50% of the required reports.

Since January 1, 2001, the Secretariat has been reporting weekly to the Parties the cumulative mortality for the seven stocks of dolphins most frequently associated with the fishery. The most recent reported mortalities for 2003 are shown in Table 6.

4. INTERNATIONAL REVIEW PANEL

The International Review Panel (IRP) follows a general procedure for reporting the compliance by vessels with measures established by the AIDCP for minimizing the mortalities of dolphins during fishing operations to the governments concerned. After each fishing trip the observer prepares a summary of information pertinent to dolphin mortalities, and this is sent to the government with jurisdiction over the vessel by the Secretariat. Certain possible infractions are automatically reported to the government with jurisdiction over the vessel in question; the IRP reviews the observer data for other cases at its meetings, and any cases identified as possible infractions are likewise reported to the relevant government. The governments report back to the IRP on actions taken regarding these possible infractions.

The IRP held the following meetings during 2002:

Meeting	Venue	Dates
29	La Jolla, California	January 31-February 2
30	Manzanillo, Mexico	June 19-20
31	La Jolla, California	October 8-9

The minutes of these meetings are available on the IATTC's website (www.iattc.org). The IRP also publishes an annual report, presented to the Meeting of the Parties, which summarizes the activities, actions and decisions of the Panel and lists the possible infractions identified for the various national fleets.

5. SYSTEM FOR TRACKING AND VERIFYING TUNA

Article V.1.f of the AIDCP calls for the establishment of a system for the tracking and verification of tuna caught with and without mortality or serious injury of dolphins. The Parties developed a tracking and verification system and a standard Tuna Tracking Form (TTF) to be completed at sea by observers. There are two versions of the TTF, which, except for the headings, are identical; Form 'A' documents tuna caught in sets without mortality or serious injury of dolphins ("dolphin safe"), and Form 'B' documents tuna caught in sets with mortality or serious injury of dolphins ("non-dolphin safe"). Within this framework each Party establishes its own tracking and verification program, implemented and operated by a designated national authority, which includes periodic audits and spot checks for caught, landed, and processed tuna products, mechanisms for communication and cooperation between and among national authorities, and timely access to relevant data. Each Party is required to provide the Secretariat with a report detailing its tracking and verification program.

All trips by vessels that departed in 2002 with an IDCP observer aboard were issued TTFs.

6. OTHER FUNCTIONS PERFORMED BY THE SECRETARIAT

6.1. Dolphin safety panel alignments

During 2002, the IATTC staff conducted alignments of dolphin-safety panels (DSPs) and inspections of dolphin rescue gear aboard 24 vessels, all registered in Mexico. A trial set, during which an IATTC technician observes the performance of the net from an inflatable raft during backdown, is made to check the alignment of the DSP. The technician transmits his observations, comments, and suggestions to the captain of the vessel, and attempts are made to resolve any problems that may arise. Afterward a report is prepared for the vessel owner or manager. This report contains a summary of the technician's observations and, if necessary, suggestions for improving the vessel's dolphin-safety gear and/or

procedures.

6.2. Training and certification of fishing captains

The IATTC has conducted dolphin mortality reduction seminars for tuna fishermen since 1980. Article V of the AIDCP calls for the establishment, within the framework of the IATTC, of a system of technical training and certification of fishing captains. Under the system, the IATTC staff is responsible for maintaining a list of all captains qualified to fish for tunas associated with dolphins in the EPO. The names of the captains who meet the requirements are to be supplied to the IRP for approval and circulation to the Parties to the AIDCP.

The requirements for new captains, which were amended in 2002, are (1) attending a training seminar organized by the IATTC staff or by the pertinent national program in coordination with the IATTC staff, and (2) having practical experience relevant to making sets on tunas associated with dolphins, including a letter of reference from a captain currently on the List, the owner or manager of a vessel with a DML, or a pertinent industry association. These seminars are intended not only for captains, who are directly in charge of fishing operations, but also for other crew members and for administrative personnel responsible for vessel equipment and maintenance. The fishermen and others who attend the seminars are presented with certificates of attendance.

During 2002 the IATTC staff conducted two seminars, both in Panama City, Panama, and the staff of Venezuela's national program conducted five seminars; two in Cartagena, Colombia, and the others in Punto Fijo and Cumana, Venezuela, and Panama City, Panama. A total of 145 fishermen attended the seven seminars.

6.3. Statements of Participation

Statements of Participation are issued by the Secretariat on request to vessels that carry observers from the On-Board Observer Program. There are two types: the first, issued to vessels of Parties to the AIDCP only, certifies that the vessel has been participating in the IDCP, and that all its trips have been covered by observers; the second, issued to vessels of non-Parties, certifies only that all the vessel's trips have been covered by observers. During 2002 statements of the first type were issued for 179 fishing trips by vessels of Bolivia, Colombia, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, Spain, Vanuatu, and Venezuela, and of the second type for 5 fishing trips by a Belize vessel.

6.4. Other services

The IATTC also offers other services to help governments and fleet managers and operators of individual vessels to reduce dolphin mortality. Publications and videotapes on the subject are available at IATTC field offices

7. RESEARCH

7.1. Distribution of fishing effort

Figures 5-7 compare the spatial distributions of the fishing effort by vessels carrying observers, in numbers of sets, by type, in 2001 and 2002.

- a. Sets on floating objects: The diffuse distribution of sets seen in 2001 became more concentrated, particularly off Baja California, the coast between 10°N and 10°S, and offshore to the west of 130°W
- b. Sets on unassociated schools: A broad band of sets between 10°N and 10°S was apparent in both 2001 and 2002, but concentrated closer to the coast in 2002.
- c. Sets on dolphins: The traditional dolphin fishing areas have had a clear east-west axis, centered on 10°N, with two areas of high density, one closer inshore and the other around 120°W to 140°W. In

recent years the axis has moved south, and the fishery is operating less in the offshore areas than before. This tendency to operate closer inshore was accentuated in 2001 and 2002, but the number of dolphin sets has clearly increased in 2002.

7.2. Analysis of evasive behavior in spotted dolphins

Spotted dolphins that often associate with yellowfin tuna, and that have interacted with the purse-seine fishery, have learned to evade encirclement, usually by breaking into small groups and swimming between speedboats. Observers report evasive behavior at different times during the setting process; in this study the average proportion of dolphins that evaded during encirclement was used as an indicator of evasive behavior. Behavioral data on pure herds of offshore spotted dolphins collected by IATTC and Venezuelan observers were used to determine the prevalence of evasion over the last two decades, by comparing the average proportion of spotted dolphins that evaded during encirclement to the cumulative fishing effort by 5° square. The number of sets on tunas associated with dolphins by purse-seine vessels of all size classes since 1959 was used as the measure of fishing effort. Preliminary analyses found temporal variability in the number of dolphins that evaded or were cut out during the chase, which was consistent with changes in fishing strategies by the fishermen.

Evasive response was found to vary spatially, both in terms of magnitude and its relationship to cumulative fishing effort. The relationship between evasion and cumulative fishing effort defines three distinct regions in the eastern Pacific Ocean. Coastal areas first exploited by the fishery in the early 1960s have high evasion with limited response to cumulative effort; areas farther offshore that were largely first exploited in the mid- to late 1960s have high evasion and a significant positive relationship between fishing effort and evasive response; and far-western and southern areas, first exploited in the late 1960s to early 1970s, have low evasion and little relationship between fishing effort and evasion. This spatial pattern suggests that two types of pressure from fishing are acting on dolphin populations. In offshore areas where there is substantial effort, the relationship between evasion and effort suggests that learning occurs with increased experience with the fishery. In coastal areas, high levels of evasion may be indicative of great pressure exerted by the fishery in the early 1960s, when purse seines were replacing poles and lines as the predominant tuna-fishing gear, and when fishing procedures and gear for releasing dolphins alive from the net were still new to many fishermen, and thus incidental mortality was high.

MORTALIDAD CAUSADA POR BARCOS CON LMD - 2002
MORTALITY CAUSED BY DML VESSELS - 2002

(Uso de LMD = 1 o más lances intencionales sobre delfines; mortalidad en lances experimentales excluida
DML use = 1 or more intentional sets on dolphins; experimental set mortality excluded)

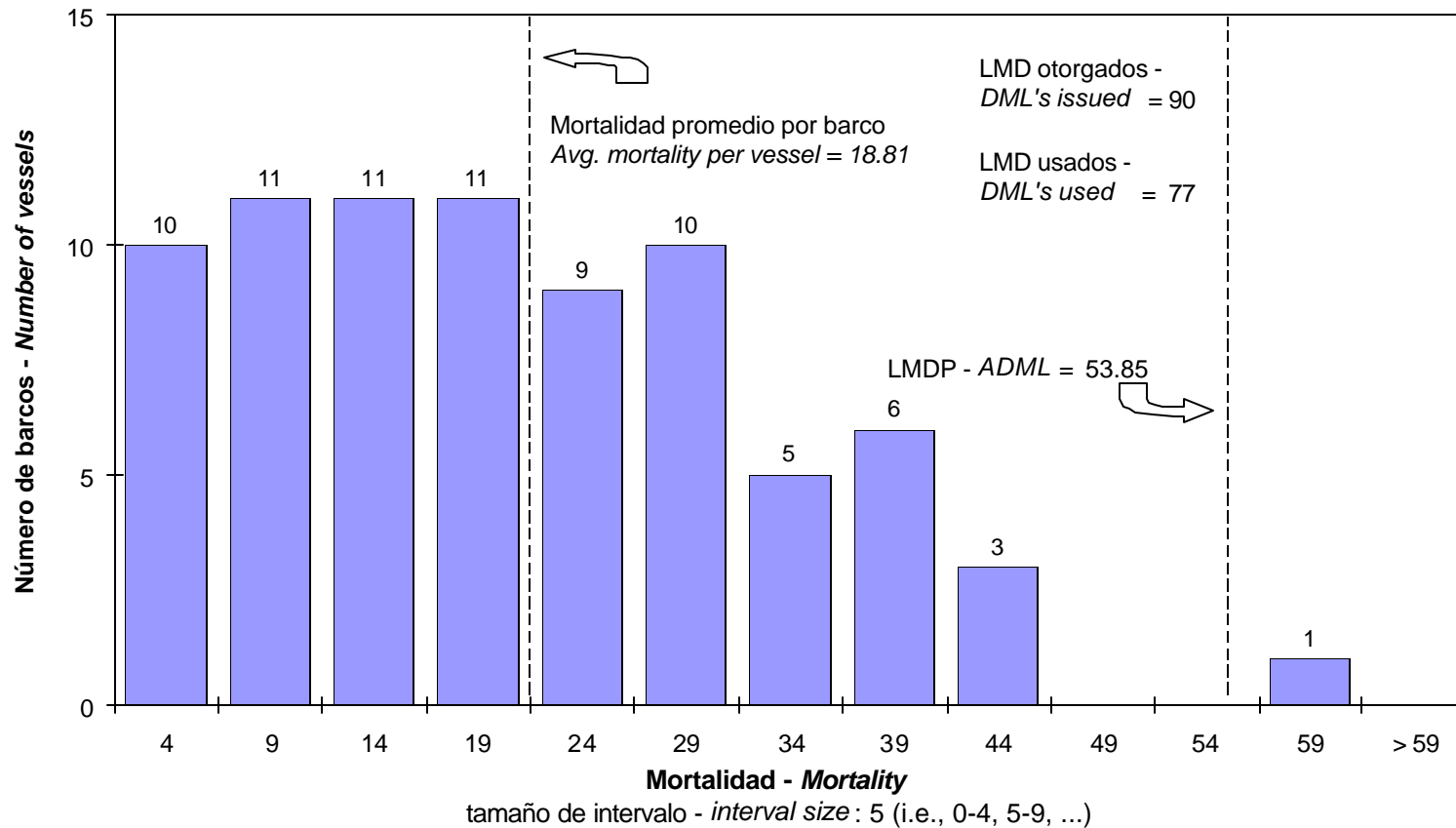


FIGURE 1. Distribution of dolphin mortality caused by vessels with full-year DMLs during 2002.

FIGURA 1. Distribución de la mortalidad de delfines causada por buques con LMD de año completo durante 2002.

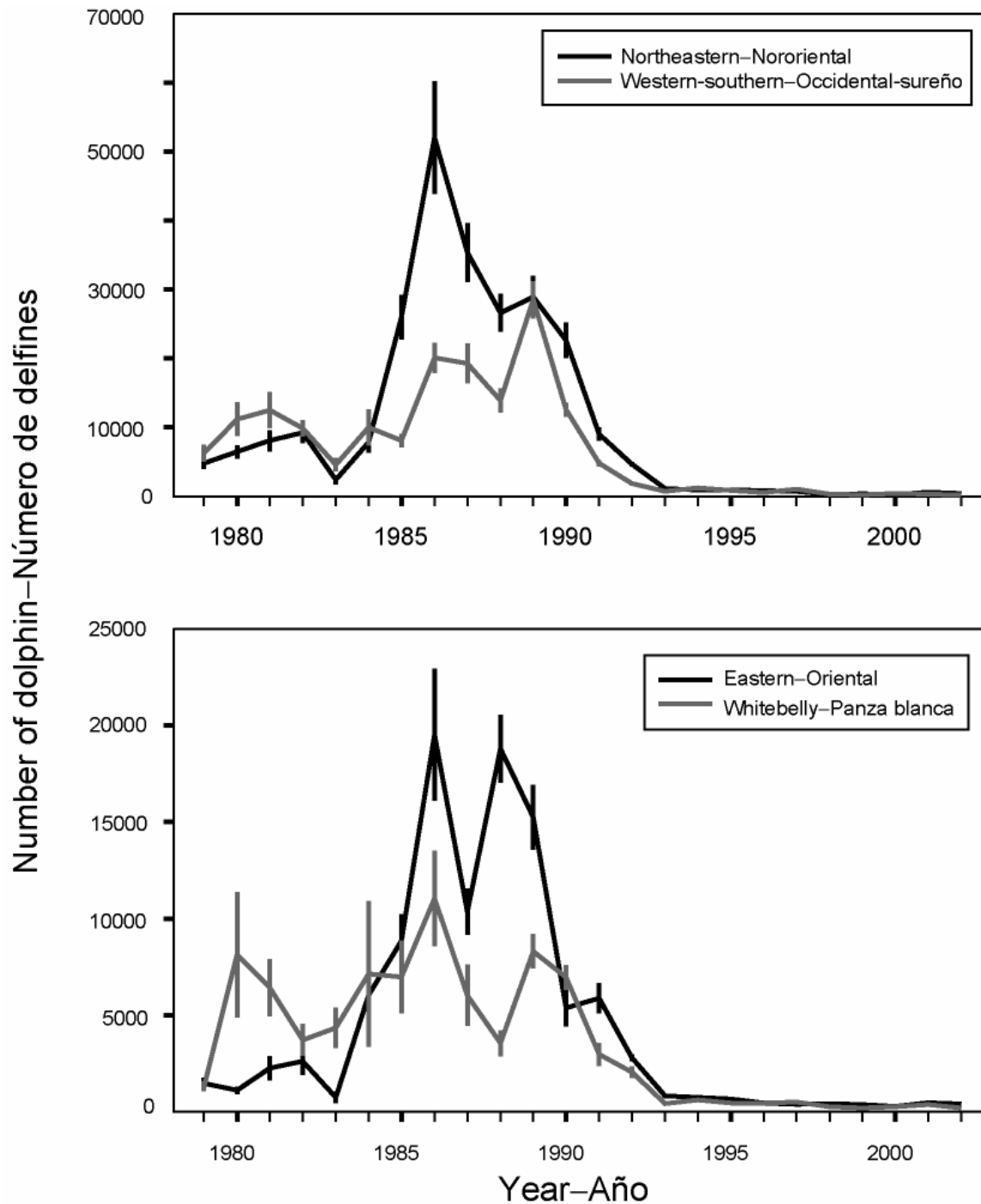


FIGURE 2. Estimated mortalities for the stocks of spotted (upper panel) and spinner (lower panel) dolphins in the eastern Pacific Ocean, 1979-2002. Each vertical line represents one positive and one negative standard error.

FIGURA 2. Mortalidad estimada de las poblaciones de delfines manchados (panel superior) y tornillo (panel inferior) en el Océano Pacífico oriental, 1979-2002. Cada línea vertical representa un error estándar positivo y un error estándar negativo.

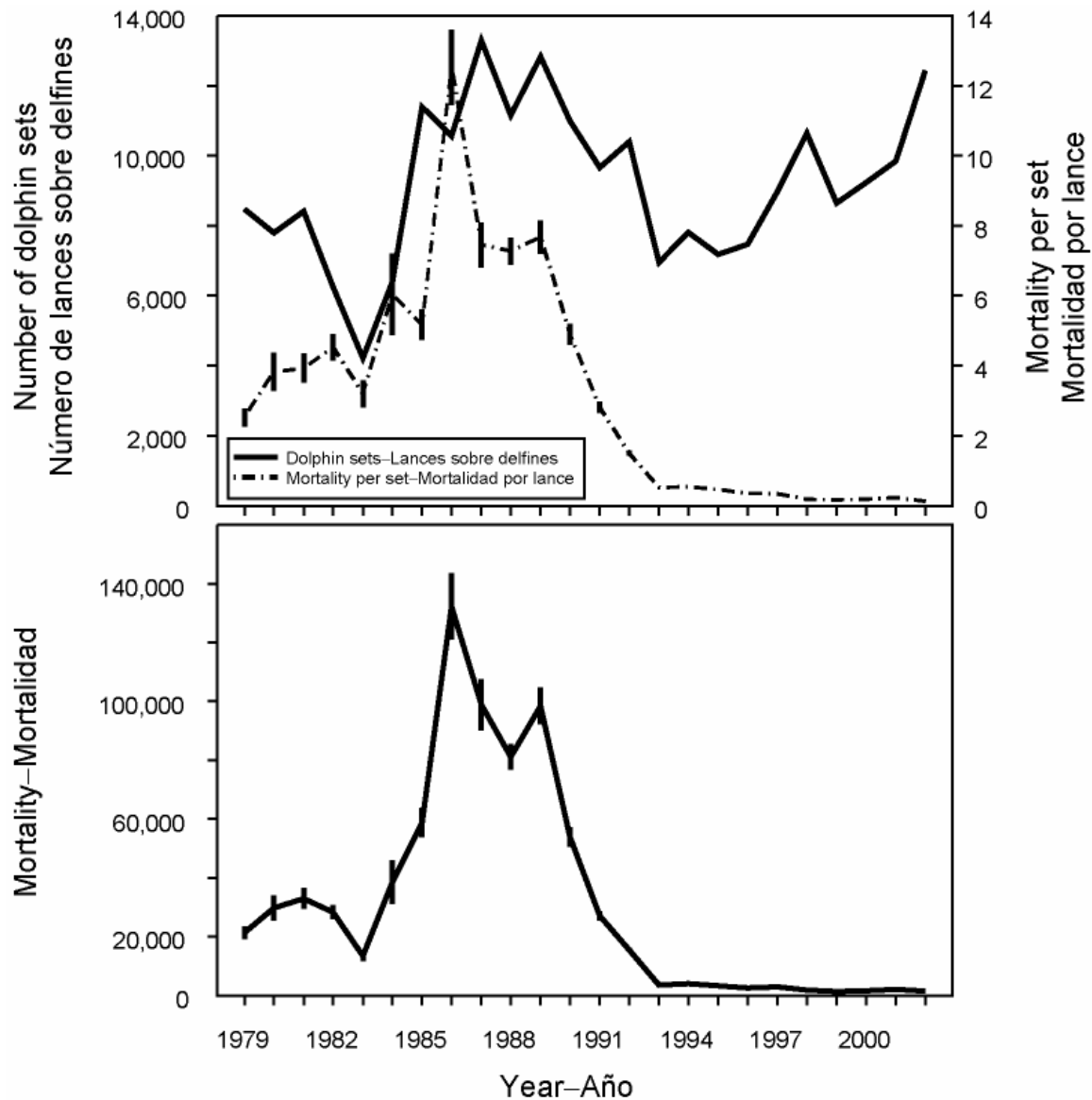


FIGURE 3. Total number of dolphin sets and average mortality per set (upper panel) and estimated total mortality (lower panel) for all dolphins in the EPO, 1979-2002. Each vertical line represents one positive and one negative standard error.

FIGURA 3.: Número total de lances sobre delfines y mortalidad media por lance (panel superior) y mortalidad total estimada (panel inferior) para todas especies de delfines en el OPO, 1979-2002. Cada línea vertical representa un error estándar positivo y un error estándar negativo.

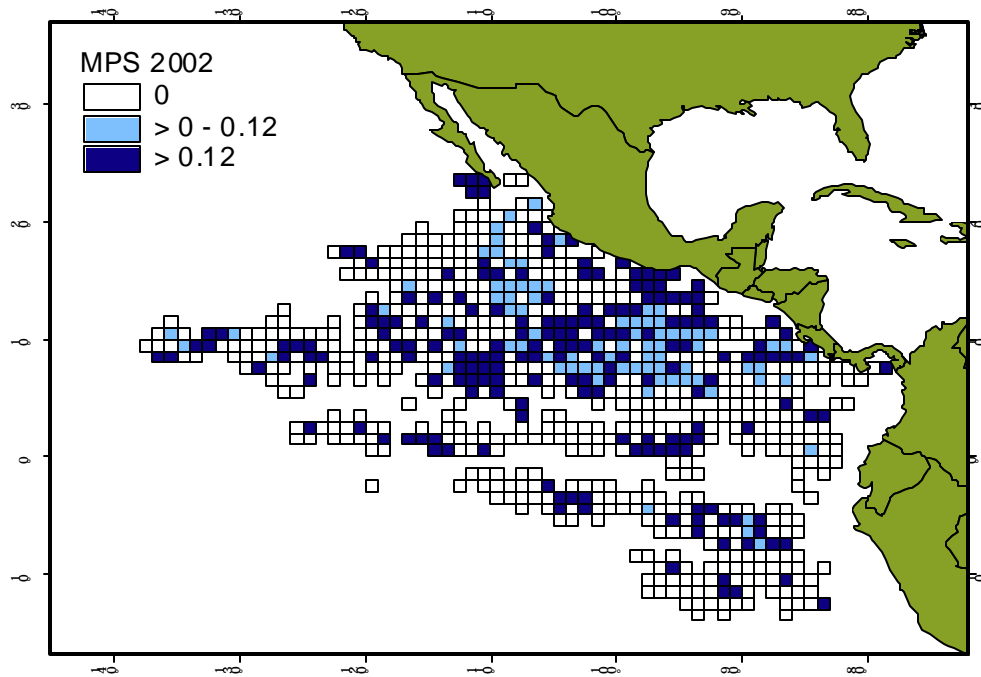


FIGURE 4. Spatial distribution of the average mortality of dolphins per set for all stocks combined, 2002.

FIGURA 4. Distribución de la mortalidad media de delfines por lance para todas las poblaciones combinadas, 2002.

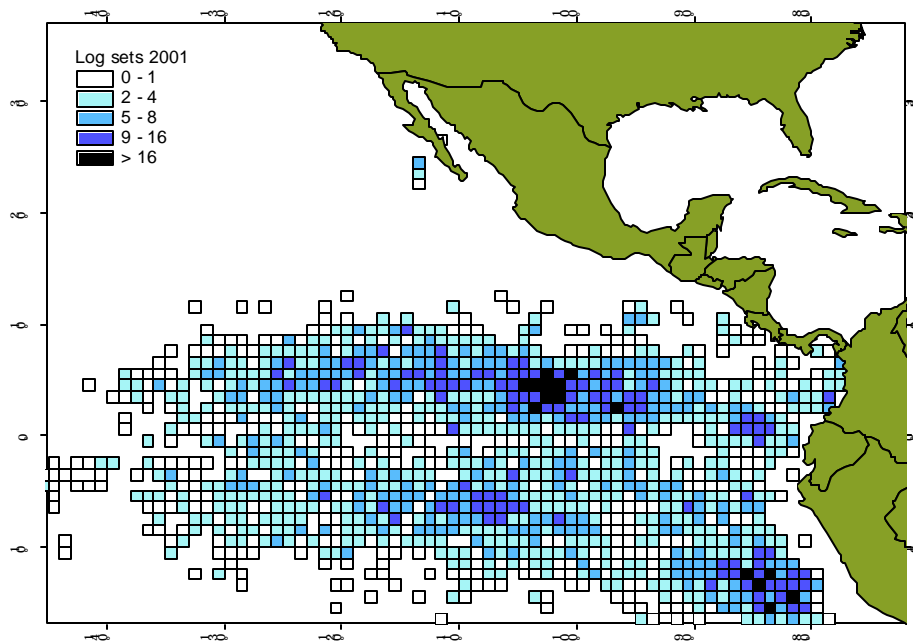


FIGURE 5a. Spatial distribution of sets on floating objects, 2001.
FIGURA 5a. Distribución espacial de lances sobre objetos flotantes, 2001.

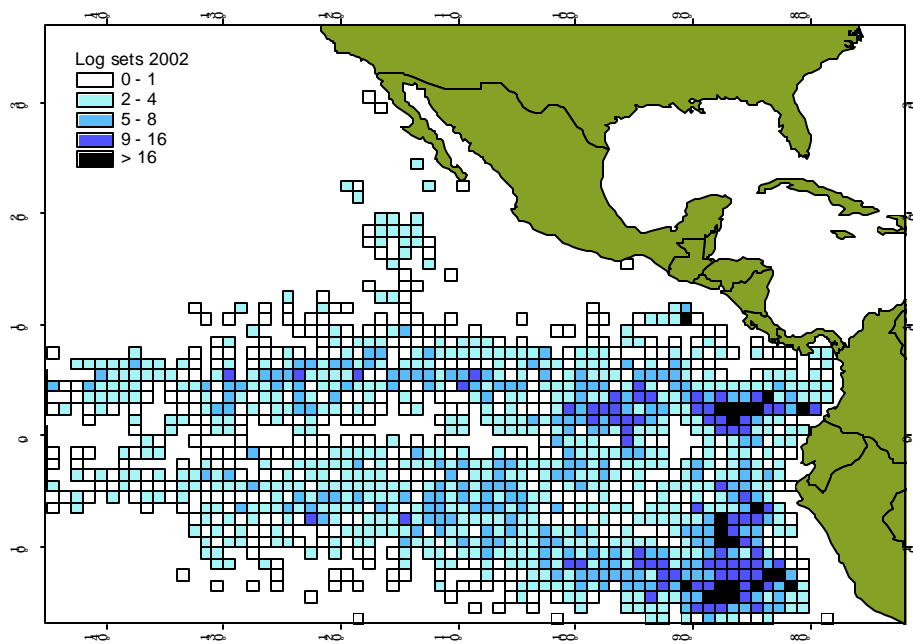


FIGURE 5b. Spatial distribution of sets on floating objects, 2002.
FIGURA 5b. Distribución espacial de lances sobre objetos flotantes, 2002.

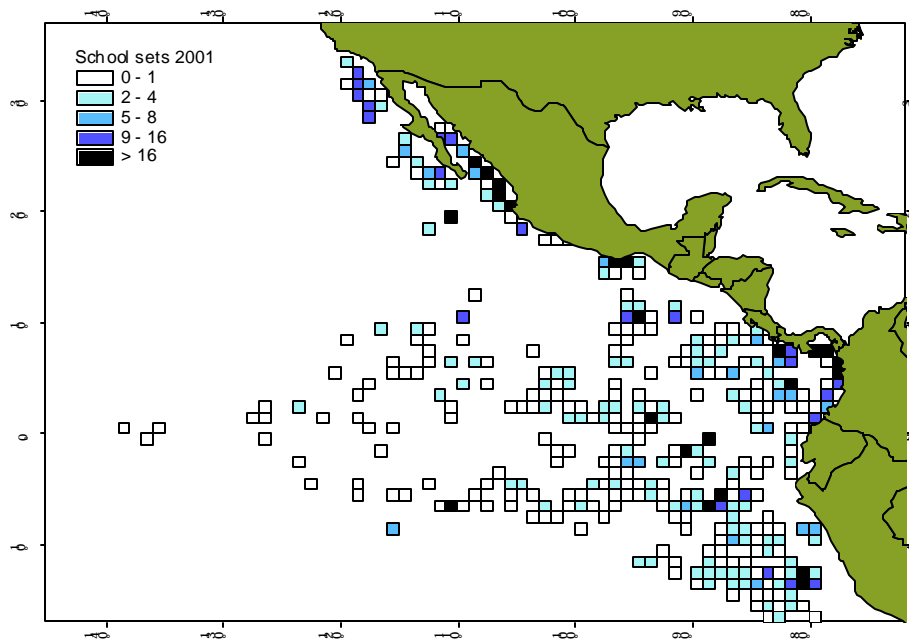


FIGURE 6a. Spatial distribution of sets on unassociated schools, 2001.
FIGURA 6a. Distribución espacial de lances sobre cardúmenes no asociados, 2001.

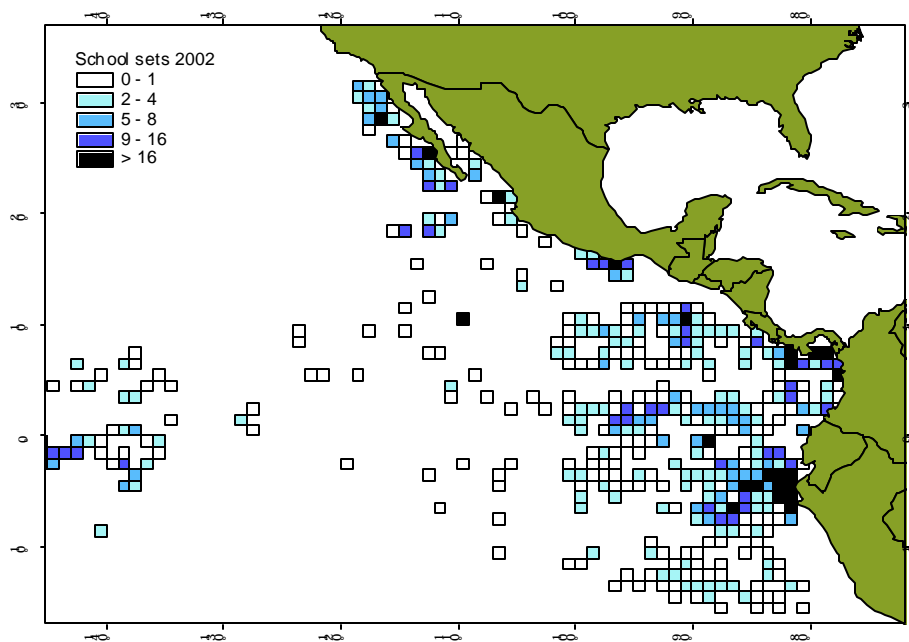


FIGURE 6b. Spatial distribution of sets on unassociated schools, 2002.
FIGURA 6b. Distribución espacial de lances sobre cardúmenes no asociados, 2002.

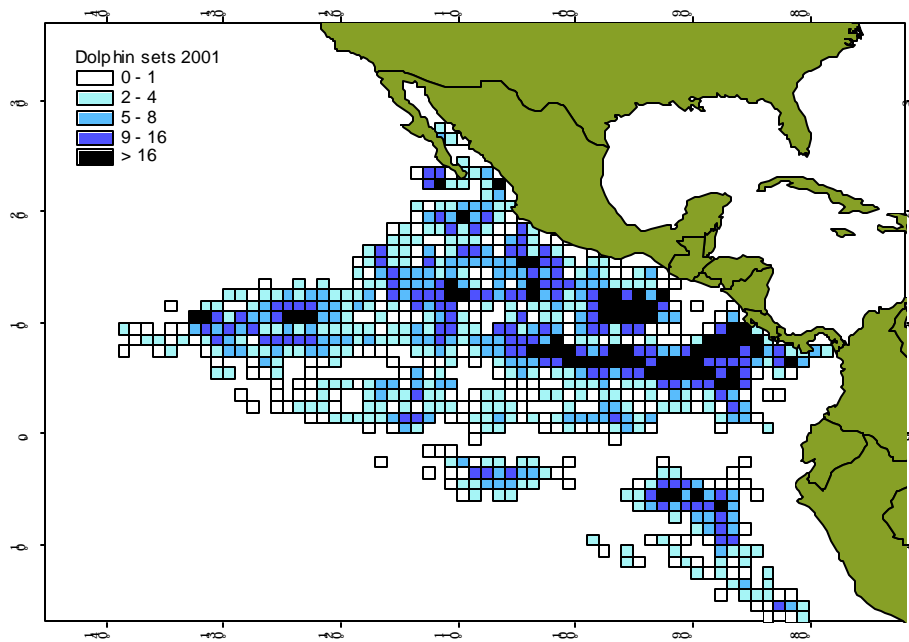


FIGURE 7a. Spatial distribution of sets on dolphins, 2001.
FIGURA 7a. Distribución espacial de lances sobre delfines, 2001.

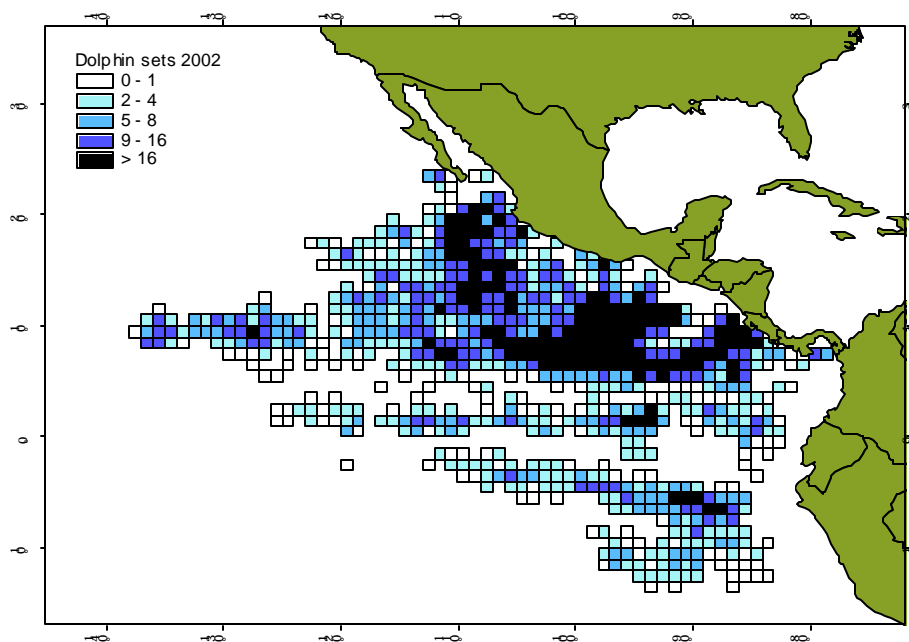


FIGURE 7b. Spatial distribution of sets on dolphins, 2002.
FIGURA 7b. Distribución espacial de lances sobre delfines, 2002.

TABLE 1. Sampling coverage by the On-Board Observer Program during 2002.**TABLA 1.** Cobertura por el Programa de Observadores a Bordo durante 2002.

Flota nacional	Viajes	Observado por programa:			% observado	
		CIAT	Nacional	Total		
National fleet	Trips	Observed by program:			% observed	
		IATTC	National	Total		
Belize	BLZ	5	5	-	5	100
Bolivia	BOL	38	33	-	33	86.8
Colombia	COL	33	33	-	33	100
Ecuador	ECU	229	153	76	229	100
España--Spain	ESP	32	32	-	32	100
Guatemala	GTM	22	22	-	22	100
Honduras	HON	12	12	-	12	100
México	MEX	188	94	94	188	100
Nicaragua	NIC	3	3	-	3	100
Panamá	PAN	36	36	-	36	100
Peru	PER	4	4	-	4	100
El Salvador	SLV	13	13	-	13	100
USA—EE.UU.	USA	21	16	5 ¹	21	100
Venezuela	VEN	165	85	80	165	100
Vanuatu	VUT	21	21	-	21	100
Unknown-- Desconocido	UNK	1	0	-	0	0
Total		823²	562	255	817²	99.3

¹ Observadores del FFA aprobados de conformidad con el Anexo II del APICD - FFA observers approved pursuant to Annex II of the AIDCP

² Incluye 68 viajes iniciados a fines de 2001 y terminados en 2002 - Includes 68 trips that began in late 2001 and ended in 2002

TABLE 2. Preliminary estimates of mortalities of dolphins in 2002, estimates of population abundance pooled for 1986-1990 (from Report of the International Whaling Commission, 43: 477-493), and estimates of relative mortality (with approximate 95% confidence intervals), by stock. Data for 2002 are preliminary.

TABLA 2. Mortalidades incidentales de delfines en 2001, estimaciones de abundancia de poblaciones agrupadas para 1986-1990 (del Informe de la Comisión Ballenera Internacional, 43: 477-493), y estimaciones de abundancia relativa (con intervalos de confianza de 95% aproximados), por población. Los datos de 2002 son preliminares.

Species and stock	Incidental mortality	Population abundance	Relative mortality (%)
Especie y población	Mortalidad incidental	Abundancia de la población	Mortalidad relativa (%)
Offshore spotted dolphin—Delfín manchado de altamar			
Northeastern—Nororiental	442	730,900	0.06 (0.046, 0.076)
Western/southern—Occidental y sureño	203	1,298,400	0.02 (0.012, 0.022)
Spinner dolphin—Delfín tornillo			
Eastern—Oriental	405	631,800	0.06 (0.040, 0.097)
Whitebelly—Panza blanca	186	1,019,300	0.02 (0.011, 0.024)
Common dolphin—Delfín común			
Northern—Norteño	69	476,300	0.01 (0.008, 0.031)
Central	155	406,100	0.04 (0.020, 0.075)
Southern—Sureño	4	2,210,900	<0.01 (0.001, 0.003)
Other dolphins—Otros delfines ¹	50	2,802,300	<0.01 (0.001, 0.002)
Total	1,514	9,576,000	0.02 (0.014, 0.018)

¹ "Other dolphins" includes the following species and stocks, whose observed mortalities were as follows: striped dolphins (*Stenella coeruleoalba*), 3; bottlenose dolphins (*Tursiops truncatus*), 1; and unidentified dolphins, 40.

¹ "Otros delfines" incluye las siguientes especies y poblaciones, con las mortalidades observadas correspondientes: delfín listado (*Stenella coeruleoalba*), 3; tonina (*Tursiops truncatus*), 1; y delfines no identificados, 40.

TABLE 3. Annual estimates of dolphin mortality, by species and stock. The data for 2002 are preliminary. The estimates for 1979-1992 are based on a mortality-per-set ratio. The estimates for 1993-1994 are based on the sums of the IATTC species and stock tallies and the total dolphin mortalities recorded by the Mexican program, prorated to species and stock. The mortalities for 1995-2002 represent the sums of the observed species and stock tallies recorded by the programs of the IATTC, Ecuador, Mexico, and Venezuela. Mortalities for 2001-2002 have been adjusted for unobserved trips of Class 6 vessels. The sums of the estimated mortalities for the northeastern and western-southern stocks of offshore spotted dolphins do not necessarily equal those for the previous stocks of northern and southern offshore spotted dolphins because the estimates for the two stock groups are based on different areal strata, and the mortalities per set and the total numbers of sets vary spatially.

TABLA 3. Estimaciones anuales de la mortalidad de delfines, por especie y población. Los datos de 2002 son preliminares. Las estimaciones de 1979-1992 se basan en una razón de mortalidad por lance. Las estimaciones de 1993-1994 se basan en las sumas de las mortalidades por especie y población registradas por la CIAT y las mortalidades totales registradas por el programa mexicano, prorrateadas a especies y poblaciones. Las mortalidades de 1995-2002 son las sumas de las mortalidades por especie y población registradas por los programas de la CIAT, Ecuador, México, y Venezuela. La mortalidad en 2001 y 2002 fue ajustada para viajes no observados de buques de Clase 6. Las sumas de las mortalidades estimadas para las poblaciones nororiental y occidental y sureño del delfín manchado de altamar no equivalen necesariamente a las sumas de aquéllas para las antiguas poblaciones de delfín manchado de altamar norteño y sureño porque las estimaciones para los dos grupos de poblaciones se basan en estratos espaciales diferentes, y las mortalidades por lance y el número total de lances varían espacialmente.

	Offshore spotted ¹		Spinner		Common			Others	Total
	North-eastern	Western-southern	Eastern	White belly	Northern	Central	Southern		
	Manchado de altamar ¹		Tornillo		Común			Otros	Total
	Nor-oriental	Occidental y sureño	Oriental	Panza blanca	Norteño	Central	Sureño		
1979	4,828	6,254	1,460	1,312	4,161	2,342	94	880	21,331
1980	6,468	11,200	1,108	8,132	1,060	963	188	633	29,752
1981	8,096	12,512	2,261	6,412	2,629	372	348	367	32,997
1982	9,254	9,869	2,606	3,716	989	487	28	1,347	28,296
1983	2,430	4,587	745	4,337	845	191	0	353	13,488
1984	7,836	10,018	6,033	7,132	0	7,403	6	156	38,584
1985	25,975	8,089	8,853	6,979	0	6,839	304	1,777	58,816
1986	52,035	20,074	19,526	11,042	13,289	10,884	134	5,185	132,169
1987	35,366	19,298	10,358	6,026	8,216	9,659	6,759	3,200	98,882
1988	26,625	13,916	18,793	3,545	4,829	7,128	4,219	2,074	81,129
1989	28,898	28,530	15,245	8,302	1,066	12,711	576	3,123	98,451
1990	22,616	12,578	5,378	6,952	704	4,053	272	1,321	53,874
1991	9,005	4,821	5,879	2,974	161	3,182	115	990	27,127
1992	4,657	1,874	2,794	2,044	1,773	1,815	64	518	15,539
1993	1,139	757	821	412	81	230	0	161	3,601
1994	935	1,226	743	619	101	151	0	321	4,096
1995	952	859	654	445	9	192	0	163	3,274
1996	818	545	450	447	77	51	30	129	2,547
1997	721	1,044	391	498	9	114	58	170	3,005
1998	298	341	422	249	261	172	33	101	1,877
1999	358	253	363	192	85	34	1	62	1,348
2000	303	428	272	262	56	222	9	84	1,636
2001	593	310	471	372	94	203	46	44	2,133
2002	442	203	405	186	69	155	4	50	1,514

¹ Estimates for offshore spotted dolphins include mortalities of coastal spotted dolphins.

¹ Las estimaciones de delfines manchados de altamar incluyen mortalidades de delfines manchados costeros.

TABLE 4. Standard errors of annual estimates of dolphin species and stock mortality for 1979-1994. There are no standard errors for 1995-2000 because the coverage was at or nearly at 100% during those years. Standard errors for 2001 and 2002 are not yet available.

TABLA 4. Errores estándar de las estimaciones anuales de la mortalidad de delfines por especie y población para 1979-1994. No hay errores estándar para 1995-2000 porque la cobertura fue de 100%, o casi, en esos años. No se dispone todavía de errores estándar para 2001 y 2002.

	Offshore spotted		Spinner		Common			Other
	North-eastern	Western-southern	Eastern	Whitebelly	Northern	Central	Southern	
	Manchado de altamar		Tornillo		Común			Otros
	Nor-oriental	Occidental y sureño	Oriental	Panza blanca	Norteño	Central	Sureño	
1979	817	1,229	276	255	1,432	560	115	204
1980	962	2,430	187	3,239	438	567	140	217
1981	1,508	2,629	616	1,477	645	167	230	76
1982	1,529	1,146	692	831	495	168	16	512
1983	659	928	284	1,043	349	87	-	171
1984	1,493	2,614	2,421	3,773	-	5,093	3	72
1985	3,210	951	1,362	1,882	-	2,776	247	570
1986	8,134	2,187	3,404	2,454	5,107	3,062	111	1,722
1987	4,272	2,899	1,199	1,589	4,954	2,507	3,323	1,140
1988	2,744	1,741	1,749	668	1,020	1,224	1,354	399
1989	3,108	2,675	1,674	883	325	4,168	295	430
1990	2,575	1,015	949	640	192	1,223	95	405
1991	956	454	771	598	57	442	30	182
1992	321	288	168	297	329	157	8	95
1993	89	52	98	33	27	-	-	29
1994	69	55	84	41	35	8	-	20

TABLE 5. Percentages of sets with no dolphin mortalities, with major gear malfunctions, with net collapses, with net canopies, average times of backdown (in minutes), and average number of live dolphins left in the net at the end of backdown.

TABLA 5. Porcentajes de lances sin mortalidad de delfines, con averías mayores, con colapso de la red, con abultamiento de la red, duración media del retroceso (en minutos), y número medio de delfines en la red después del retroceso.

	Sets with zero mortality (%)	Sets with major malfunctions (%)	Sets with net collapse (%)	Sets with net canopy (%)	Average duration of backdown (minutes)	Average number of live dolphins left in net after backdown
	Lances sin mortalidad (%)	Lances con averías mayores (%)	Lances con colapso de la red (%)	Lances con abultamiento de la red (%)	Duración media del retroceso (minutos)	Número medio de delfines en la red después del retroceso
1986	38.1	9.5	29.0	22.2	15.3	6.0
1987	46.1	10.9	32.9	18.9	14.6	4.4
1988	45.1	11.6	31.6	22.7	14.3	5.5
1989	44.9	10.3	29.7	18.3	15.1	5.0
1990	54.2	9.8	30.1	16.7	14.3	2.4
1991	61.9	10.6	25.2	13.2	14.2	1.6
1992	73.4	8.9	22.0	7.3	13.0	1.3
1993	84.3	9.4	12.9	5.7	13.2	0.7
1994	83.4	8.2	10.9	6.5	15.1	0.3
1995	85.0	7.7	10.3	6.0	14.0	0.4
1996	87.6	7.1	7.3	4.9	13.6	0.2
1997	87.7	6.6	6.1	4.6	14.3	0.2
1998	90.3	6.3	4.9	3.7	13.2	0.2
1999	91.0	6.6	5.9	4.6	14.0	0.1
2000	90.8	5.6	4.3	5.0	14.9	0.2
2001	91.6	6.5	3.9	4.6	15.6	0.1
2002	93.6	6.0	3.1	3.3	15.0	0.1

TABLE 6. Preliminary reports of the mortalities of dolphins in 2003, to May 18.

TABLA 6. Informes preliminares de las mortalidades de delfines en 2003, hasta el 18 de mayo.

Species and stock	Total mortality	Limit	Used (%)
Especie y población	Mortalidad total	Límite	Usado (%)
Offshore spotted dolphin – Delfín manchado de altamar			
Northeastern--Nororiental	156	648	24.1
Western-southern--Occidental-sureño	101	1,145	8.8
Spinner dolphin – Delfín tornillo			
Eastern--Oriental	81	518	15.6
Whitebelly--Panza blanca	45	871	5.2
Common dolphin – Delfín común			
Northern--Norteño	21	562	3.7
Central	62	207	30.0
Southern--Sureño	4	1,845	0.2
Others and unidentified--Otros y no identificados	77		
Total	547	5,000	10.9