








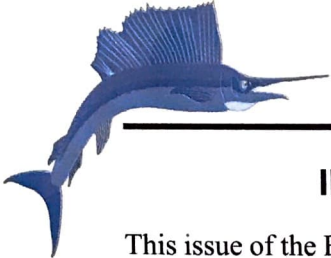
# *The Southwest Fisheries Science Center's* **2005 Billfish Newsletter**



-  2004 Billfish Tagging and Recoveries
-  Trends in 2004 Billfish Angler Catch Rates
-  Top Anglers and Captains Acknowledged
-  Adopt-A-Billfish Program
-  4<sup>th</sup> International Billfish Symposium
-  Swordfish
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## INTRODUCTION

This issue of the Billfish Newsletter marks the 43rd year that National Oceanic and Atmospheric Administration (NOAA) Fisheries Service and billfish angling community have combined efforts to conserve billfish stocks, investigate their behavior patterns and identify their physical habitat. These efforts have created one of the longest time series available for recreational billfishing effort and provide important data on their biology for conservation needs. Management concerns for all highly migratory billfish are being addressed in international treaties in both the eastern and western Pacific. Data series such as these are essential to assessing the health of the stocks. The Southwest Fisheries Science Center (SWFSC) remains committed to monitoring recreational billfishing success.

The Billfish Newsletter is an annual publication describing billfish research programs conducted at the SWFSC. Emphasis is on billfish angling in the Pacific, Indo-Pacific and Indian oceans. The results of the 2004 International Billfish Angling Survey and the Cooperative Marine Game Fish Tagging Program for the Pacific are described in this issue. The data presented are the result of cooperation with billfish anglers, sport fishing clubs, commercial fishers and agencies affiliated with the SWFSC. We express our sincere appreciation to all anglers completing the angler survey forms and to all those who tag and release billfish. We welcome comments concerning both the Survey and Tagging programs as well as the contents of this newsletter.

## THE INTERNATIONAL BILLFISH ANGLER SURVEY

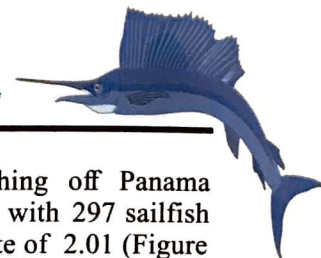
The Billfish Angler Survey provides the only estimates of billfish angling activities for the Pacific and Indian Oceans. This collection of recreational billfish catch and effort data began in 1969 and now provides a 37 year index of fishing success in many areas of the Pacific. Catch per unit of effort (CPUE) is measured in catch of billfish per angler fishing day. This time series of angler success provides a measure of relative abundance and is the only survey independent of commercial fisheries in the Pacific. Trends tracked over time indicate changes in the health and size of billfish stocks. This index of relative abundance is used in stock assessments, developing management options and monitoring domestic and international fishery interactions.

In 2004, 761 billfish anglers reported catching 3,409 Pacific billfish during 4,988 fishing days. Fishing effort, in angler fishing days, and catch per days fishing are shown in Table 1 for all billfish reported by location in 2004. The mean catch per unit effort in the Pacific for 2004 was 0.66 and 0.68 for all oceans in the 2004 angler survey. The current mean catch rate of 0.66 is lower than

**Table 1.** Results of all billfish catches reported for the 2004 Billfish Angler Survey. Numbers indicate total days fished by location and catch-per-fishing day. Data in parentheses are values recorded in 2003. Major species in each location are indicated; striped marlin (SM), blue marlin (BLM), black marlin (BLK) and sailfish (SF).

LOCATION	ANGLER FISHING DAYS	BILLFISH PER FISHING DAY (CPUE)	MAJOR SPECIES
<b>PACIFIC OCEAN</b>			
Hawaii, U.S.A.	2,423 (3,309)	0.44 (0.50)	BLM
Southern California, U.S.A.	850 (1,065)	0.16 (0.12)	SM
Baja California, Mexico	703 (959)	0.75 (0.81)	SM
Acapulco, Ixtapa, Zihuatanejo, Mexico	237 (147)	1.70 (0.81)	SF
Panama	198 (275)	2.25 (4.92)	SF
Costa Rica	134 (120)	2.57 (5.90)	SF
Australia	133 (168)	0.74 (0.80)	BLK
Tahiti	86 (80)	0.22 (0.20)	BLM
Manzanillo, Mexico	39 (112)	0.62 (0.46)	SF
Puerto Vallarta, Mexico	28 (33)	0.96 (0.61)	SF
Fiji	29 (20)	0.50 (0.00)	BLM
Guatemala	23 (22)	5.83 (7.05)	SF
New Zealand	21 (6)	0.00 (1.17)	N/A
Japan	14 (18)	0.14 (0.44)	BLM
Marshall Islands	13 (12)	0.85 (0.25)	BLM
Mazatlan, Mexico	12 (34)	0.67 (1.06)	SM
Tonga	8 (0)	0.25 (0.00)	BLM
Guaymas, Mexico	4 (63)	0.25 (0.08)	SF
Kiribati	0 (4)	0.00 (0.25)	SF
Ecuador	0 (3)	0.00 (2.33)	SF
French Polynesia	0 (2)	0.00 (0.50)	BLM
<b>INDIAN OCEAN</b>			
Dubai / United Arab Emirates	0 (235)	0.00 (2.26)	SF
<b>ATLANTIC OCEAN</b>			
Atlantic Total	60 (139)	1.05 (1.78)	BLM





the record set in 2003 of 0.87, but well above the prior five-year average of 0.62 (2000 - 2004). This is a new high five year average catch rate. The lowest catch rates (0.33) resulted from large international commercial fisheries operating in the late 1970s.

Survey respondents reported catching 481 blue marlin off Hawaii in 2,423 days of fishing in 2004 or 0.20 blue marlin per day. This catch rate is the second highest since 1997 but just lower than the near record catch rate of 0.23 in 2003 (Figure 1a). Blue marlin are tropical and subtropical in habitat and in the eastern Pacific rarely extend north of Magdalena Bay, Baja California Sur. The reported catch off Baja totaled 34 blue marlin in 703 days fishing (0.05 per day), and is the lowest rate in the past 20 years. Thirteen (13) additional blue marlin were reported caught from Manzanillo to Acapulco, Mexico, in 308 fishing days. In Panama, 27 blue marlin were caught in 198 angler days giving a rate of 0.14. Blue marlin catches were also reported off Costa Rica, Tahiti, Fiji, Australia and Japan.

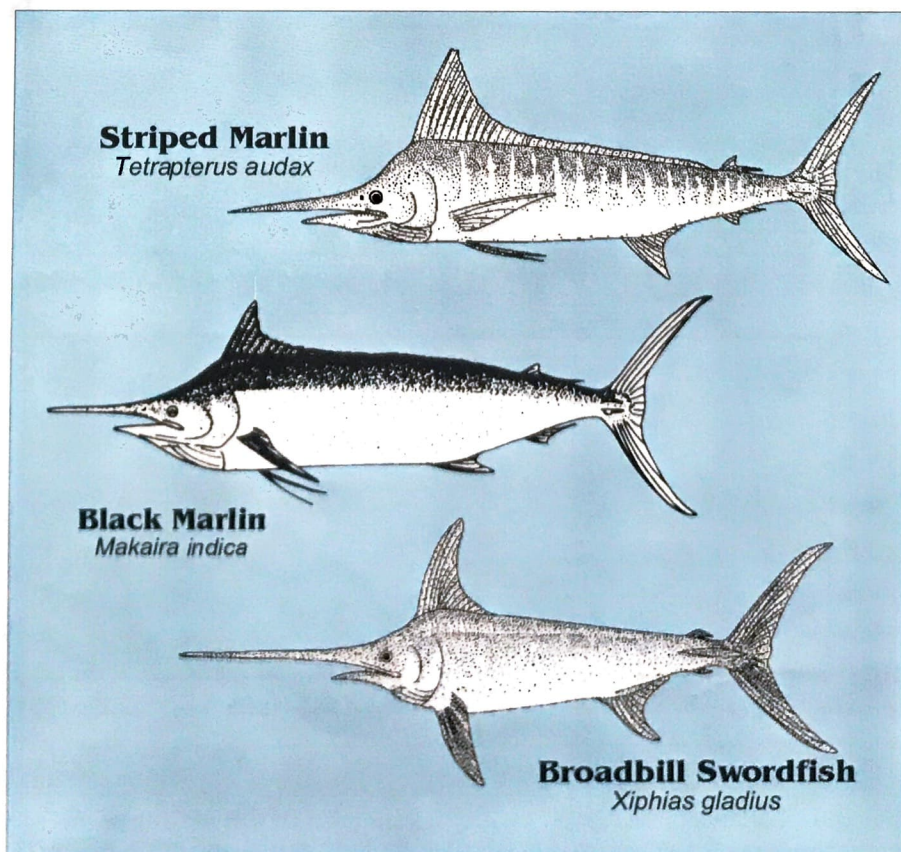
Trends in mean angler catch rates for striped marlin are shown graphically in (Figure 1b). Southern California anglers reported catching 137 striped marlin in 850 angler days (0.16). This is the highest reported catch rate since 1996. In Hawaii, anglers reported catching 293 stripers in 2,423 fishing days (0.12) which is the second highest catch rate reported in that area for striped marlin. The area around the tip of Baja California Sur, Mexico, always produces good catch rates of striped marlin. In 2004, anglers reported catching 412 striped marlin in 703 days of fishing. This catch rate of 0.59 striped marlin per angler day was greater than for all combined fishing localities in Mexico (0.43). No catches south of Puerto Vallarta were reported in 2004. Striped marlin tend to be less abundant south of Manzanillo where sailfish are the more abundant billfish.

Sailfish prefer tropical habitat and are abundant in the coastal and offshore waters from Mexico to Ecuador. Catch rates of sailfish throughout all Mexico (0.49) did not reflect the greater success off the central coast from Manzanillo to Zihuatanejo and Acapulco (1.67). Anglers in Guatemala reported great catch rates with 134 sails in 23 days of fishing. Costa Rica also reported a good catch rate with 337 sailfish reported in

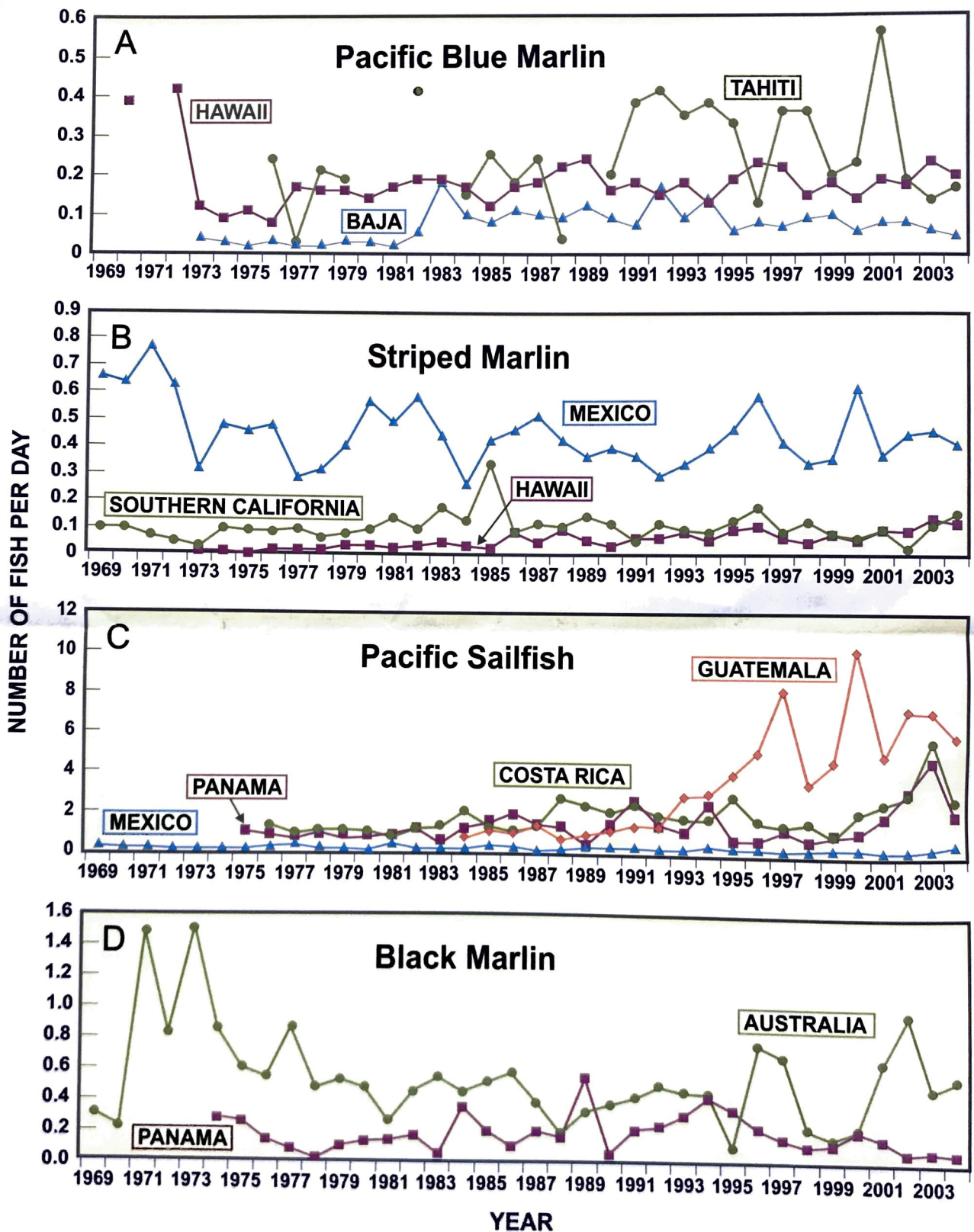
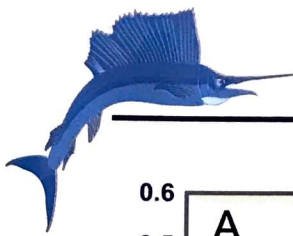
134 fishing days (2.52) and fishing off Panama continues to see improved catches with 297 sailfish reported in 198 fishing days for a rate of 2.01 (Figure 1c).

Black marlin are common in tropical waters and occasionally frequent temperate areas. Australia's anglers reported catching 72 black marlin in 133 fishing days (0.54 per angler day) slightly higher than last year (0.49) but considerably lower than in 2002 (0.97). Anglers in Panama reported 16 black marlin captured in 198 days (0.08) which continues the lowest 5 year mean in the 37 year history of the survey (Figure 1d). Black marlin are often reported off Puerto Vallarta and around the tip of Baja California Sur, Mexico, but rarely occur off southern California. Fifteen (15) black marlin were reported taken off Mexico in 731 fishing days (0.02). Only 2 black marlin taken off southern California have ever been positively identified. The first was caught by angler Robert Murcell on September 13, 1936 off Catalina that weighed 588 pounds. The second was taken in September 1972 by a commercial fisher who harpooned it 20 miles southeast of Catalina. It weighed 638 pounds.

Anglers in Hawaii reported catching 269 short-billed spearfish in 2,427 fishing days for a catch rate of 0.11. The short-billed spearfish is an oceanic species with only limited abundance near the west coasts of the U.S., Mexico and Central America.







**Figure 1.** Catch per unit of effort (CPUE) in number of fish per angler day reported by region from 1969 to 2004, for blue marlin (A), striped marlin (B), Pacific sailfish (C), and black marlin (D).





## THE BILLFISH TAGGING PROGRAM

The SWFSC's angler based Billfish Tagging Program began in 1963 and has provided tagging supplies to billfish anglers for 43 continuous years. Tag release and recapture data are used to determine movement and migration patterns, species distribution, and age and growth patterns of billfish. This volunteer tagging program depends on the participation and cooperation of recreational anglers, sportfishing organizations, and commercial fishers. Since inception, nearly 53,013 fish of 75 different species have been tagged and released (Table 2). Our emphasis continues to focus only on the skillful tagging of all billfish and bluefin tuna. Other species tagged over the years for special research projects are reported here as general interest. While we consider tag and release, including catch and release, vital to billfish conservation, we do not encourage the use of our billfish tags for other non-billfish sportfishing.

Billfish Tagging Report cards received for 2004 indicate a total of 1,047 billfish and 285 other fish were tagged and

**Table 2.** Summary of all fish tagged in 2004 with releases and recoveries for 1963-2004.

Species Name	Release 2004	Release Total	Return Total	Rate %
Striped Marlin	149	21,784	336	1.54
Sailfish	217	8,684	49	0.56
Pacific Blue Marlin	525	7,322	74	1.01
Marlin, unid.	8	4,303	3	0.07
Black Marlin	6	3,356	69	2.06
Mako Shark	131	1,597	52	3.26
Short-billed Spearfish	137	1,584	2	0.13
Broadbill Swordfish	0	520	17	3.27
Blue Shark	38	374	6	1.60
Yellowfin Tuna	0	347	24	6.92
Com. Thresher Shark	89	169	9	5.33
Skipjack Tuna	0	97	2	2.06
Albacore Tuna	0	87	1	1.15
Thresher Shark	7	63	2	3.17
Bluefin Tuna	0	57	8	14.04
Hammerhead Shark	0	53	2	3.77
Whitetip Shark	3	43	1	2.33
Marlin, Atlantic Blue	0	41	0	0.00
Salmon Shark	0	27	0	0.00
Billfish, unid.	1	24	2	8.33
Silky Shark	18	18	0	0.00
Tiger Shark	0	15	0	13.33
White Marlin	0	13	1	7.69
White Shark	0	9	0	0.00
Shark, Basking	0	7	0	0.00
Whale Shark	0	4	1	25.00
Longbill Spearfish	0	3	0	0.00
Pelag. Thresher Shark	2	3	0	0.00
Other Tunas	0	94	3	3.19
All Others	1	2,315	84	3.63
<b>Totals</b>	<b>1,332</b>	<b>53,013</b>	<b>748</b>	<b>1.41</b>

released by 761 anglers and 190 fishing captains. In all, 525 blue marlin, 149 striped marlin, 217 sailfish, 137 spearfish, 6 black marlin and 9 unknown billfish were reported tagged and released in 2004 (Table 2). We also use billfish tags in our juvenile shark surveys and report the release of those tags here as general interest and so anglers will know to keep a look out for them as well as for tagged billfish.

Twenty-nine striped marlin, 2 unidentified marlin and one blue marlin were reported tagged off Southern California in 2004 (Table 3). In Hawaii, 489 blue marlin, 86 striped marlin and 135 short-billed spearfish were reported tagged and released. Tagging effort off Mexico remained strong along the Baja peninsula with 52 billfish tagged from Magdalena Bay south to La Paz and 188 more tagged from Mazatlan to Zihuatanejo and Acapulco. Another 32 billfish were tagged off Central America.

**Table 3.** Summary of all billfish tagged in 2004 by region.

AREA	SPECIES	TOTAL
<b>PACIFIC OCEAN</b>		
Hawaii, U.S.A.	Pacific Blue Marlin	489
	Short-Billed Spearfish	135
	Striped Marlin	86
	Marlin, unidentified	6
	Black Marlin	1
	Sailfish	1
Southern California, U.S.A.	Striped Marlin	29
	Marlin, unidentified	2
	Pacific Blue Marlin	1
Baja California, Mexico	Striped Marlin	32
	Sailfish	12
	Pacific Blue Marlin	8
Acapulco / Ixtapa / Zihuatanejo, Mexico	Sailfish	150
	Billfish, unid.	1
	Pacific Blue Marlin	1
Manzanillo, Mexico	Sailfish	26
	Pacific Blue Marlin	4
	Striped Marlin	2
Mazatlan, Mexico	Pacific Blue Marlin	2
	Sailfish	2
	Sailfish	13
Panama	Pacific Blue Marlin	7
	Black Marlin	5
	Striped Marlin	2
Guatemala	Sailfish	6
Costa Rica	Pacific Blue Marlin	3
	Striped Marlin	1
Tahiti	Pacific Blue Marlin	4
French Polynesia	Pacific Blue Marlin	3
	Striped Marlin	1
Marshall Islands	Pacific Blue Marlin	3
Eastern Tropical Pacific	Sailfish	2
	Striped Marlin	1
<b>INDIAN OCEAN</b>		
Kenya	Short-Billed Spearfish	1
<b>ATLANTIC OCEAN</b>		
Miami or Keys	Sailfish	1
<b>UNKNOWN OCEAN</b>		
Unknown Location	Sailfish	2
	Pacific Blue Marlin	1
	Short-Billed Spearfish	1
<b>TOTAL</b>		<b>1,047</b>





## CAPTAIN AND ANGLER ACKNOWLEDGMENTS

We are proud to recognize the cooperating anglers and captains who tag and release billfish. In 2004, 761 anglers reported tagging at least one billfish. Individual recognition of each angler who reported tagging two or more billfish in 2004 is presented in Table 4. We regret limited space prevents listing all 761 taggers. Don Anderson tagged 6 and Larry Peabody 4 along Baja. Howard Bond and Richard Pietila tagged 30 and 12 respectively between Mazatlan to Acapulco, Mexico. George Handgis tagged 6 and Brad Damasco tagged 5 marlin in Hawaii. Lynn Jasper released 4 tagged striped marlin in Southern California.

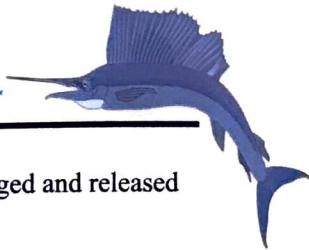
Charter and private boat captains who support billfish tag and release (including catch and release) play an

important roll by supporting ethical angling and conservation stewardship of the marine environment. They set an example by demonstrating skillful release of their billfish catch. This year 190 captains reported tagging 811 billfish with their anglers and clients. We gladly acknowledge those captains who released significant numbers of billfish in specific regions (Table 5). This year 26 captains tagged 10 or more billfish. Captains Peter Hoogs, Guy Terwilliger, John Bagwell, Charles Hauptert and Dennis Cintas all tagged 30 or more billfish in Hawaii. Pepino and Martin Cortez tagged 68 and 41 billfish in Mexico and Alberto tagged 13 in Panama. Continued interest and cooperation by all captains have greatly enhanced the Billfish Tagging Program, and their efforts and conservation ethic are truly appreciated.

**Table 4.** Names of anglers tagging substantial numbers of billfish, and the number of billfish tagged and released during the 2004 calendar year.

ANGLER NAME	BILLFISH TAGGED	ANGLER NAME	BILLFISH TAGGED	ANGLER NAME	BILLFISH TAGGED
<b>ACAPULCO-IXTAPA-ZIHUATANEJO-GUERRERO, MEXICO</b>		<b>MAZATLAN-SINALOA, MEX.</b>		<b>HAWAII, U.S.A., Cont.</b>	
Richard Pietila	12	Clarke Smith	3	Dennis Stanfill	2
John Phipps	6	<b>HAWAII, U.S.A.</b>		Chris Canaan	2
Jim A. Collins	6	George Handgis	6	Rick L. Raich	2
Johnnie W. Gibbs	5	Brad Damasco	5	Mary Kymila	2
Darrell Smith	5	Laura Oko	4	John Thorson	2
Andrew Bukacek	4	Bob Creedon	4	Tom Terzeni	2
Marge Ziegler	3	James Karamouzis	4	Pamela Schrick	2
Tom Pace	3	Jack Gilliam	4	Jared Davis	2
Zach Poole	3	Mike Scarfia	4	Brice Karsh	2
Monty Pedilla	3	Robert Daniels	3	Gary Dicks	2
Joan Vernon	3	Don Brandt	3	Doug Lanterman	2
Jon Cappon	3	William N. Jardine	3	Barton Hoey	2
Chris Pietila	3	Linda Lanterman	3	Samuel Baldwin	2
Scott Schafer	2	Kyle Woodhead	3	Ben L. Sparks	2
Matt Maring	2	John Scott Seamens	3	Amber Bullington	2
Joe Innaotre	2	Mark Yang	3	Richard A. Speer	2
Joyce Mead	2	Jeff Oko	3	Guy Rose	2
Dwight Morgan	2	Hiroshi Ogawa	3	John C. Bullo	2
Frank Nowag	2	Pete Lege	3	Joy Painter	2
Hunt Buckley	2	Mark Thompson	3	Donald H. Frederickson	2
Maria Paredes	2	Steve Turner	3	Paul Brockbank	2
Tony Wenham	2	Brian Korosec	3	Greg Plaskett	2
Michelle Wise	2	Preston A. Stofer, II	3	Randy Evans	2
Robert Hennessy	2	Fred Cameron	3	Gary Wojciechowicz	2
Steve Talbot	2	Kiichiro Nagashiki	3	Matt White	2
Heath Mayer	2	Michael Adams	3	Akira Kobayakawa	2
Robert Baratka	2	John R. McLean	3	Heather Wilson	2
Furman Sheppard	2	W. Michael Carter	3	<b>SOUTHERN CALIFORNIA, U.S.A.</b>	
<b>BAJA CALIFORNIA, MEXICO</b>		John Schlieper	3	Lynn Jasper	4
Don Anderson	6	Andy Powers	3	Douglas A. Daniels	3
Larry Peabody	4	Bill Henson	3	Jack Rainwater	2
Wolfgang Kotzur	3	Richard M. Devine	2	Mary Kaitlin Roney	2
John Nugent	2	Jody Bright	2	Stanley R. Eckland, Jr.	2
Robert Woodard, Jr.	2	Roger C. Christman	2	<b>PANAMA</b>	
Wayne Mills	2	Hugh M. Pattinson	2	Richard Orlandi	2
Mike Shrosbree	2	Dave Tanner	2	Thorsten Ritter	2
Ed Puente	2	Bart Hory	2	<b>GUATEMALA</b>	
Gary Rodger	2	Philip G. Leboutillier	2	Don Anderson	4
<b>MANZANILLO-COLIMA, MEX.</b>		H. Jay Gilleece	2	James Gowans	2
Howard Bond	30	Tavish Lynch	2	<b>TAHITI</b>	
		Patrick Alan Strader	2	Joel Allain	2
		John Longmire	2	<b>UNKNOWN LOCATION</b>	
		Keith Chapman	2	D. Brent Nelson	2
		Rick Benitez	2		





**Table 5.** Names of captains tagging substantial numbers of billfish, and the number of billfish tagged and released during the 2004 calendar year.

CAPTAIN NAME	BILLFISH TAGGED	CAPTAIN NAME	BILLFISH TAGGED	CAPTAIN NAME	BILLFISH TAGGED
<b>ACAPULCO-IXTAPA-ZIHUATANEJO-GUERRERO, MEXICO</b>		<b>HAWAII, U.S.A., Cont.</b>		<b>HAWAII, U.S.A., Cont.</b>	
Jose Luis "Pepino" Servin Hernandez	68	Alan Bakke	22	F. McGrew Rice	3
Martin G. Cortez	41	Steven D. Kaiser	18	Tom Siebler	3
Armando Arciniega	10	Jeff Fay	17	Ryan Foster	3
Allen Spirits Torres	4	Bill Crawford	17	Fred Thibault	2
German Portilla	2	McGrew Rice	15	Steven R. Fassbender	2
Bob Woodard	2	Tim E. Hicks	15	Linda Lanterman	2
<b>BAJA CALIFORNIA, MEXICO</b>		Tom Casey	11	Lyle Yeck	2
Michael Arujo	8	Brian Wargo	11	Preston A. Stofer, II	2
Harold Schram	6	Robert McGuckin	10	Bobby Dobson	2
Martin Verdugo Collins	6	Chuck Wigzell	10	Doug Pattengill	2
Martin Herrera	6	James Dean	10	Sam Thies	2
Jesus Araiza, Jr.	4	John Jordan	10	John Jordan	2
Juan Carlos Smith	3	David Crawford	9	Chip Van Mols	2
Eric A. Wahrenbrock	3	Bob Dorigo	8	Javier Vargas	2
John Algeo	3	Steve Cravens	8	Orlando Hernandez	
Mike Shrosbree	2	Tim D. Cox	8	Aguilera	2
Paulino Martinez	3	Mike Holtz	7	Scotty Pruner	2
<b>MANZANILLO-COLIMA, MEX.</b>		Tony Clark	7	Jim Patterson	2
Howard Bond	19	Chris Armstrong	7	Chris Mckenzie	2
<b>MAZATLAN-SINALOA, MEX.</b>		Robert Hudson	7	Bert Byrd	2
Michael "Mouse" Libby	4	Kevin Nakamaru	7	<b>SOUTHERN CALIFORNIA, U.S.A.</b>	
<b>HAWAII, U.S.A.</b>		William Dorr	6	Kenny Knight	4
Peter Hoogs	69	Mike Hasbrouck	6	Richard Hamilton	3
Guy Terwilliger	52	Mike Derego	6	Stan Ecklund, Sr.	3
John Bagwell	45	Rennie Boyd	6	Thomas A. Shanahan	3
Charles E. Haupt	31	Jerry Allen	6	Martin L. Morris	2
Dennis R. Cintas	30	Doug Armfield	6	<b>PANAMA</b>	
Marlin Parker	27	Marty L. Sands	5	Alberto	13
Scott M. Fuller	22	Doug Barna	4	Adolfo	6
William Dorr	22	Robert Dobson	4	<b>GUATEMALA</b>	
		Bill Casey	4	Fred Scialuna	4
		Neal Isaacs	4	Chris Shreeder	2
		Kevin M. Hogan	4	<b>TAHITI</b>	
		Chris Kam	4	Francis Blais	4
		Allan Ayano	4	<b>FRENCH POLYNESIA</b>	
		Mark Shultz	4	Chris Lilley	4
		Doug Lanterman	3	<b>COSTA RICA</b>	
		Al Gustavson	3	Daniel Espinoza	4
		Martin Romero	3		
		Kevin Hibbard	3		

### Shark Tagging

The SWFSC's Large Pelagics group has a significant shark research program. Tagged and recaptured sharks in that program are mentioned here as general interest and because we need your support to look for bright yellow and or white tags on the dorsal fin of shortfin mako and thresher sharks. These specially tagged sharks are part of our age and growth studies and are very important. These mako and thresher sharks were tagged with oxytetracycline which leaves a growth mark in the shark's vertebrae. We offer a \$100.00 (U.S.) reward for the return of the tag with a 4-inch section of the vertebrae. Please notify this office as soon as possible if you catch one of these tagged sharks.



**Common Thresher Shark**

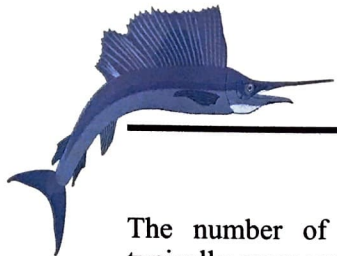
*Alopias vulpinus*



**Shortfin Mako Shark**

*Isurus oxyrinchus*





## TAG RECOVERIES IN 2004

The number of tag recoveries reported each year typically averages 9-10 billfish and one or two bluefin tuna. In 2004, we only received recapture information for one blue marlin, one sailfish, one bluefin tuna and 2 unidentified billfish (Table 6). The sailfish was tagged near Zihuatanejo and recaptured 47 days later off Manzanillo, Mexico. It had moved 932 nautical miles (nmi) to the southeast. The bluefin tuna was tagged off Mexico in 1999 and moved 5,116 nmi west and recaptured 5 years later near Japan. We have not received the release data for the blue marlin and the unidentified billfish that were tagged and recaptured off Hawaii. We have calculated that

nearly 17% of all billfish tagged in this program have NOT been reported. It is important that all Billfish Tagging Report cards be sent in as soon as possible. This would be a great time to check your tackle boxes and ensure all Billfish Tagging Report cards have been sent to our office.

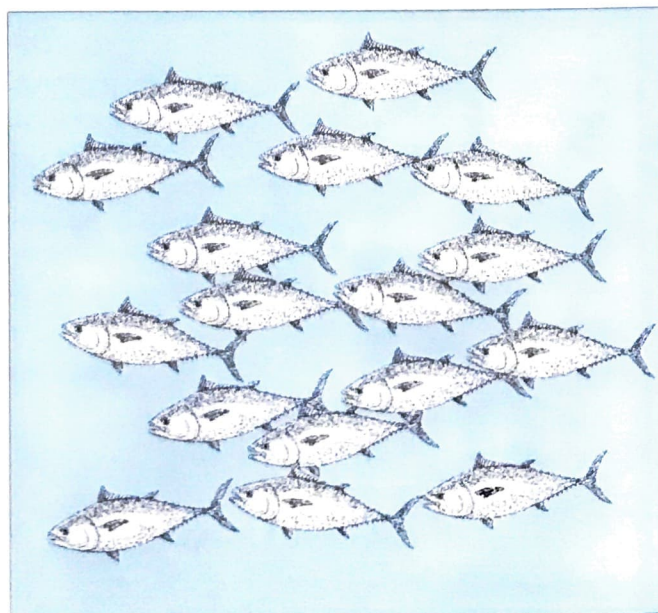
Over the years we have seen some remarkable long distance movements and time at liberty. Table 7 provides the maximum distance traveled and maximum time at liberty of some of the large pelagic fish in our data base. This year's bluefin tuna recovery was a new record for distance traveled and time at liberty.

**Table 6.** Tag recovery information for 2004.

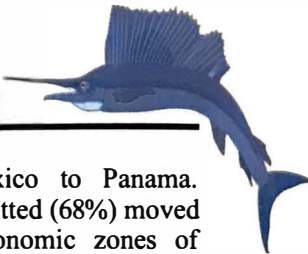
TAGGER/CAPTAIN	RELEASE DATE	RELEASE LOCATION	RECOVERY DATE	RECOVERY LOCATION	DAYS FREE	MILES/DIRECTION TRAVELED
<b>Pacific Blue Marlin</b>						
Release card not received	?	?	Stephen Yen Kai Sun 4/6/2004	16°51'S 146°22'W French Polynesia	?	?
<b>Sailfish</b>						
Jesus Araiza Larry Peabody	10/28/2004	23°25'N 118°09'W East Cape, BCS, Mexico	Roberto J. Ceja Lopez 12/14/2004	17°25'N 104°48'W Punta San Telmo, BCS, Mexico	47	932 - SE
<b>Unknown Billfish</b>						
Release card not received	?	?	Max Smith 2/22/2004	19°18'N 155°59'W Kailua-Kona, Hawaii, U.S.A.	?	?
Release card not received	?	?	Jason Degraff 2/15/2004	19°46'N 156°02'W Honokahau Harbor, Kona, Hawaii, U.S.A.	?	?
<b>Bluefin Tuna</b>						
Norm Kagawa John Polovick	07/09/1999	28°17'N 116°47'W Cedros Island, BCS, Mexico	Mike Ogura 07/11/2004	36°N 133°E Sea of Japan, Japan	1,829	5,116 - NW

**Table 7.** Maximum net distance traveled and longest time at liberty for billfish, tunas and pelagic sharks tagged in conjunction with the Southwest Fisheries Science Center's Billfish Tagging Program, 1963-2004.

Species Name	Days at Liberty	Net Movement (nmi)
Blue Marlin	1,503	4,450
Striped Marlin	1,585	3,693
Black Marlin	1,454	5,763
Sailfish	1,717	932
Short-billed Spearfish	34	173
Swordfish	1,681	2,573
Albacore	3,565	5,587
Yellowfin Tuna	324	850
Bluefin Tuna	1,829	5,116
Skipjack Tuna	290	575
Shortfin Mako Shark	1,859	2,856
Thresher Shark	950	896
Blue Shark	52	1,469







ADOPT-A-BILLFISH PROGRAM

The Adopt-A-Billfish tagging program began in 2002 to determine the survival rate of large billfish caught and released during international tournaments and to evaluate site fidelity off Central America and Mexico. NMFS scientists from Southwest and Southeast Fisheries Science Centers joined forces with Joan Vernon and the Presidential Challenge tournament series conducted off the coasts of Central America and Mexico. The team deployed 41 satellite archival tags on sailfish in Mexico, Guatemala, Costa Rica and Panama. The satellite tags were programmed to record depth, temperature and light level data for periods of 30 to 120 days and then detach from the fish and transmit the data via satellites to the research team.

Results show sailfish survive being caught and released when proper tagging protocols are followed. Three of the 41 tagged sailfish died but only after being at liberty for 28, 63 and 70 days after being tagged. Clearly these mortalities were caused by events other than tagging. The data also showed significant movement across

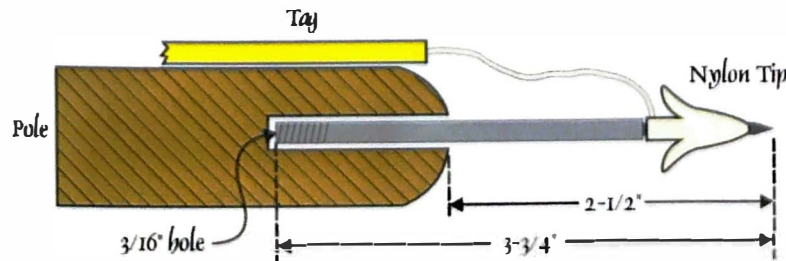
international boundaries from Mexico to Panama. Twenty-two of the 32 tags that transmitted (68%) moved along shore into the exclusive economic zones of adjacent countries or moved off shore into international waters. Deployments ranged from 5 to 118 days and net movements ranged to 574 nmi. These sailfish spent up to 80% of their time above 25 meters and rarely descended to depths greater than 100 meters. Over 75% of their time was in water 28° to 30° C. Results show that the number of times sailfish pass across national boundaries are influenced by 1) the location of the country of release relative to adjacent countries, 2) length of the shoreline of the country of release, and 3) monitoring duration. The conclusion is that sailfish populations off the coasts of Mexico and Central America are making transboundary crossings every 10 to 20 days and therefore need to be managed by international management bodies.

The Adopt-A-Billfish program plans to expand sailfish satellite tagging operations into the mouth of the Sea of Cortez, Mexico in the summer of 2006. With the aid of Dr. Oscar Sosa-Nishizaki of Centro de Investigacion Cientifica y de Educacion Superior de Ensenada (CICESE), Ensenada, BC, Mexico, we intend to deploy an additional 25 to 30 tags.

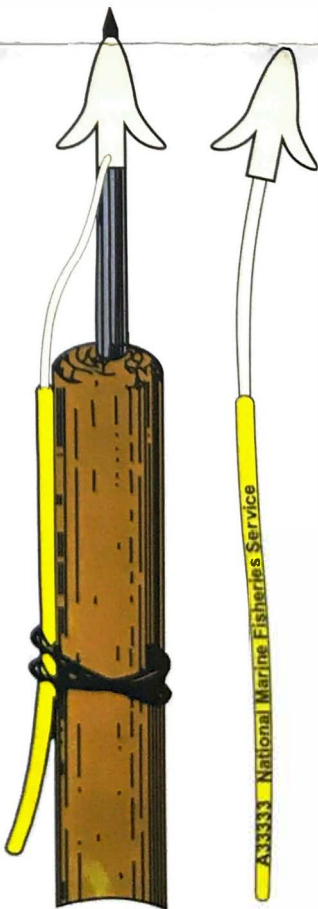
SUCCESSFUL CATCH, TAG AND RELEASE

It is important that the billfish tag be applied properly. Tag location, angle, and depth are critical to successful tagging. For striped marlin 100 to 200 lbs. the tag should be inserted 2.5 inches just below the tallest part of the dorsal fin. For larger fish such as blue and black marlin the tagging applicator pin may be 3.5 inches. Conversely, if you are tagging small narrow fish like sailfish and short billed spearfish then it would be better to shorten the pin. Manufactured tagging poles are available at most retail sportfishing stores. It is important to check the length of the applicator pin installed on these poles to ensure the length of the tip matches the fish you are seeking. Some manufacturers have tagging poles that have pin lengths that are adjustable by moving the stopper.

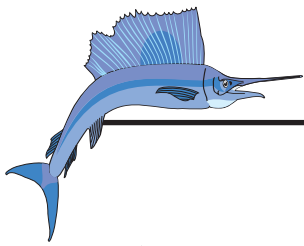
If you construct your own tagging pole, an old wooden broom or mop handle about five feet long works very well. A hole should be drilled with a 3/16 inch or No. 16 drill bit to a depth of 1.25 inches for the applicator tip (see diagram below). Use a good grade epoxy to secure the applicator pin and seal out saltwater.



Survival of tagged and released billfish depends on several decisions you, the angler, must make prior to and during fishing. Following on page 10 is a guide that will enhance post-release survival of your billfish.







# Tagging Guide

## 1. BEFORE YOU CATCH YOUR FISH:

First decide if you plan to tag and release any fish caught. If so, circle hooks are preferred because they reduce deep or foul hooking when bait fishing. We recommend that you do not use double rigged J hooks if you plan to release your catch.

## 2. WHILE FISHING:

Never attempt to tag a fish while it is jumping or thrashing about. Bring your fish to leader as quickly as possible but wait until the fish is calm and swimming beside the boat before tagging. **Check for previous tags!**

## 3. TAGGING:

Tag the fish as it is being towed alongside the boat by inserting the tag in the back muscle below the tallest part of the dorsal fin. Avoid the gills, head, and stomach. Take care not to allow your fish to injure itself on the vessel's transom or hull.

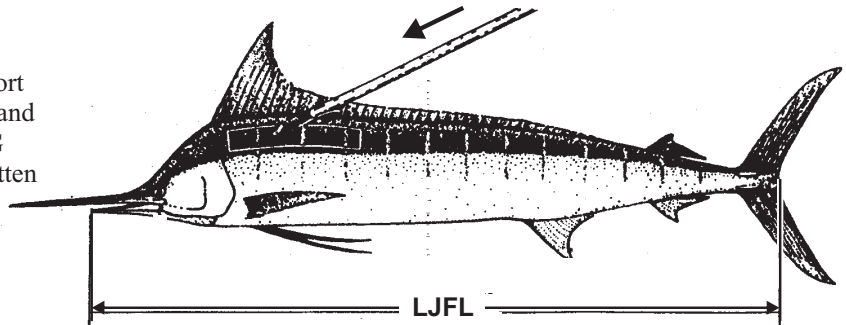
## 4. RELEASING:

Revive the fish by slowly towing it through the water, allowing water to flow over the gills until its normal color returns and it begins to swim on its own. Remove the hook with a good pair of pliers, or if deeply hooked in the throat or stomach, release it by cutting the leader as close to the hook as possible.

## 5. COMPLETE THE BILLFISH TAGGING REPORT CARD:

Fill out the yellow Billfish Tagging Report card completely and as accurately as possible indicating latitude and longitude, date of release, estimated length (lower jaw-to-fork length; LJFL) and estimated weight of the fish. Include name and mailing address of the angler and boat captain and other remarks as appropriate. Return cards promptly to us at the Southwest Fisheries Science Center.

**PLEASE NOTE:** Make your tagging effort count. Tag and release your fish skilfully and return the yellow **BILLFISH TAGGING REPORT** promptly. Though easily forgotten in the heat of battle and glow of success, returning the card is the most critical and final step in tagging your fish.



## COMPLETING THE BILLFISH TAGGING REPORT CARD

- Fill out the card completely and as accurately as possible.
- Indicate latitude, longitude and locally known fishing area.
- Estimate the length of the fish as "tip of lower jaw-to-fork" length (LJFL).
- Estimate weight of the fish.
- Include any remarks, club name and complete address of the angler and the boat captain.
- Return cards promptly to the Southwest Fisheries Science Center. Tagging is of no value unless this Billfish Tagging Report card is returned. Postage is paid if mailed in the U.S.A.

NOAA, National Marine Fisheries Service		If mailing outside USA, postage must be affixed	
BILLFISH TAGGING REPORT		Please return card, Otherwise tagging is of no value	
PLEASE FILL IN DETAILS AND MAIL TODAY.		TAG #: <b>A33333</b>	
Latitude: <b>33° 14' N</b>	Longitude: <b>118° 14' W</b>		
Locality: <b>East End Catalina Is. CA</b>			
Species: <b>Striped Marlin</b>	Date: <b>6/10/98</b>		
Estimate length (tip of jaw to fork of tail): <b>72</b> inches.	Weight: <b>140</b> lbs.		
Fish Condition: <b>Good</b>	Bait type: <b>Plastic Lure</b>		
Angler: <b>Bill Fish</b>	Fight time (minutes): <b>23</b>		
Address: <b>P.O. Box 271 La Jolla, CA</b>	Zip: <b>92038</b>		
Club: <b>Anglers Club</b>			
Captain: <b>Capt. Joe Dew</b>	Boat name: <b>Good Grief</b>		
Address: <b>P.O. Box 271 La Jolla, CA</b>	Zip: <b>92038</b>		
<small>Response to this form is voluntary. OMB 0648-0009, expiration date 08/31/2001 NOAA 88-162, 2/99</small>			





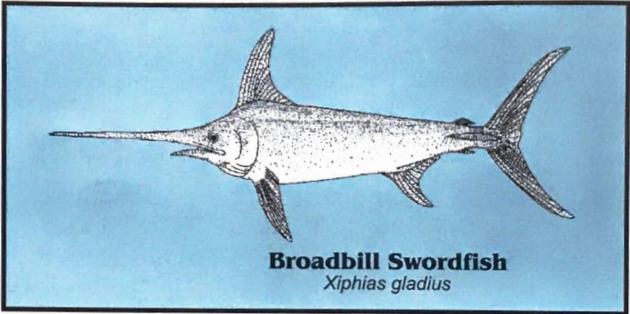
BROADBILL SWORDFISH

The broadbill swordfish (*Xiphias gladius*) is an epipelagic (upper open ocean) billfish widely distributed in all tropical and temperate oceans. It is differentiated from other billfish by its broadly flattened bill, a dorsal fin that does not recline into a dorsal sheath and the lack of external scales in adults. It is found from about 50° north latitude in the Pacific and Atlantic oceans and to at least 45° south in the Pacific, Atlantic and Indian oceans. It is also common in the Mediterranean Sea.

Being a predominately warm water species its migrations to higher latitudes tend to follow seasonal warming. Spring time warming sees movement into temperate waters for feeding through the summer and then returning to more tropical waters in the autumn for spawning. In the Pacific, tagging data indicate swordfish move eastward from Hawaii toward the west coasts of the U.S. and Mexico. One swordfish acoustically tracked off southern California spent 75% of its time in the mixed water layer above 50 meters. More recent electronic tag data indicate swordfish may descend to at least 1,000 m where water temperature is 4° to 5° C (39°F).

Spawning occurs in the central Pacific from about July to December where surface waters are at least 20° to 24° C. Spawning occurs throughout the year in parts of the Atlantic, Caribbean and Mediterranean. Age of maturity is not known precisely although first spawning is thought to occur at about 5 to 6 years of age and at 21 kg for males and 74 kg for females (70 to 100 cm eye-fork length). Females grow faster and larger than males and most swordfish over 140 kg are female. Maximum size can exceed 500 kg although commercial catches tend to be 100 to 170 kg. Maximum age for males is estimated at 10 years and up to 15 years for females. The IGFA all tackle record of 536 kg (1,182 lbs) was taken off Chile in 1953.

Swordfish tend to feed opportunistically from the surface waters to the bottom in depths less than 500 meters where



temperatures may drop to 7 or 8° C. Adults forage on tunas, dolphin fish, flying fish, barracuda, and pelagic squid in the open ocean and on smaller pelagic species such as mackerel, herring, sardine, anchovy and sauries, etc. Over shallow areas they are known to forage on the bottom for hake, cod, rockfish, etc.

Dr. Heidi Dewar (Tagging Of Pacific Pelagics) has been studying swordfish behavior and habitat for over a decade. She has deployed 22 satellite archival tags on swordfish with the help of southern California harpoon fishers. Nine of these were deployed in 2005 and have not yet transmitted archived data. The tags that have reported have provided a detailed record of swordfish movements and report water temperature, depth and light level. These records show that swordfish dive just before sunrise and come back to the surface after sunset (Figure 2). The maximum depths during the day average about 400 m but can range down to over 1,000 m. At night swordfish usually stay in the mixed water layer above 50 m. Occasionally the diurnal movement pattern is interrupted by a basking event (Figure 2) where the fish comes to the surface where it can be seen finning for an hour or two. Dr. Dewar believes these basking events are associated with feeding because most swordfish taken while basking at the surface have full stomachs. Her studies also show that swordfish swim deeper during periods around a full moon.

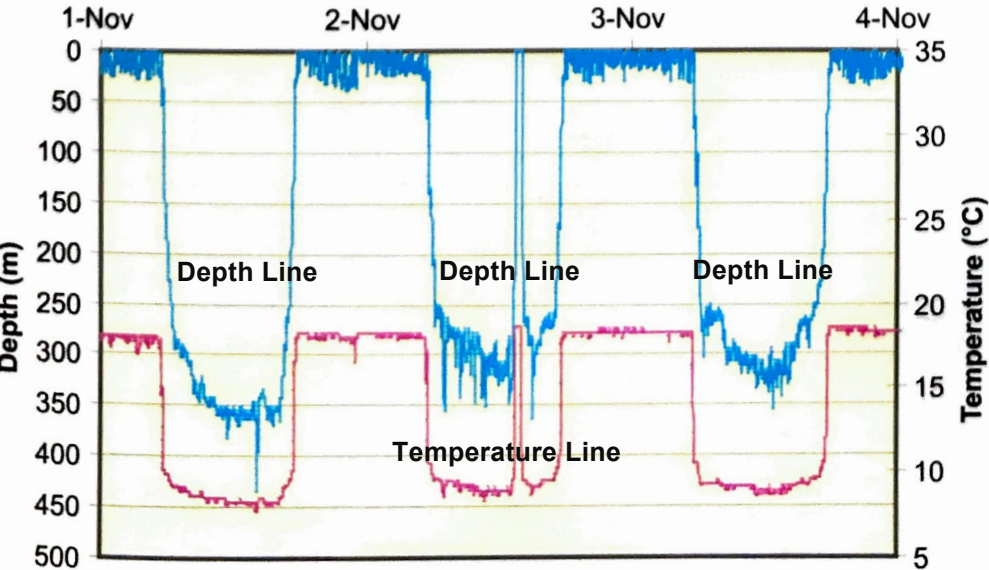


Figure 2. Three days in the life of a swordfish tracked with a satellite archival tag. The blue line represents depth and the red line is water temperature. Note the period of basking on the afternoon of November 2.

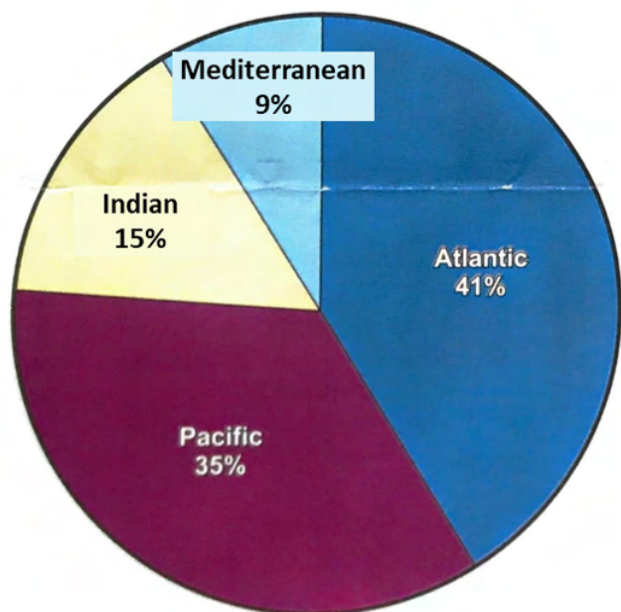




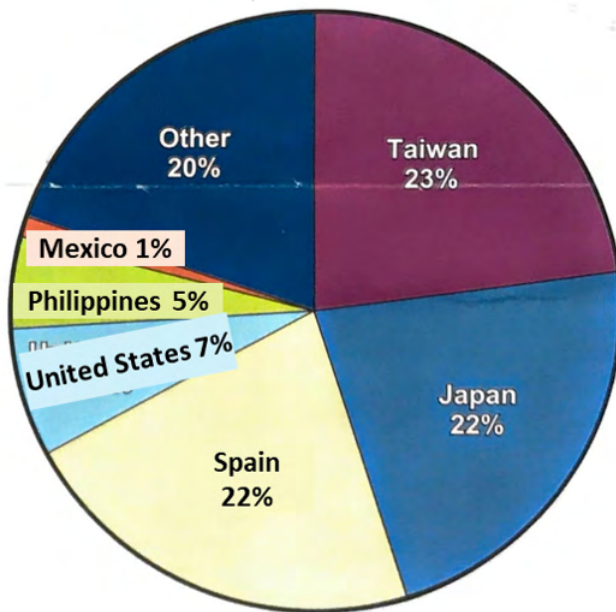
Wherever they occur, swordfish support major commercial fisheries. Catches are primarily from high seas longliners targeting tunas and swordfish and from smaller, regional longline, drift gillnet and harpoon fisheries. Although incomplete, FAO records indicate global catches for swordfish are nearly 90,000 metric tons. Over 40% of the global catch is from the Atlantic while 34% comes from the Pacific (Fig. 3). At least 12 countries have large industrial fleets that ply the world's oceans for this valuable resource (Fig. 4). Other countries have fleets of smaller vessels ranging from one- or two-man artisanal boats to vessels 10 to 20 m long fishing the coastal waters within their own or adjacent borders.

The major sportfishing areas for swordfish are off the east coast from New York to Florida and Texas, the west coast from California to Ecuador and Peru and off the east coast of Australia and around New Zealand. Recreational catches reported by southern California sportfishing clubs show about 6 swordfish taken per year averaging about 100-110 kg (220-242 lbs).

The status of the Pacific swordfish stock is unclear. Genetic evidence indicates a Pacific wide distribution with regional areas of marked differentiation between the southern and northern hemisphere. Catches have been mostly stable since about 1989, averaging 3,700 mt in the north and 8,400 mt in the south. Current stock assessments indicate Pacific swordfish are being fished at below the current maximum sustainable level, meaning overfishing is not occurring. Catches and CPUE trends of domestic and international swordfish fisheries are being monitored by international conventions. In both the Pacific and Atlantic U.S. swordfish are managed under fishery management plans authorized by the Magnuson-Stevens Fishery Conservation and Management Act. The U.S. also promotes science-based conservation and management as a member in International management bodies such as the International Commission for the Conservation of Atlantic Tunas (ICCAT), the Inter-American Tropical Tuna Commission (IATTC) and the International Scientific Committee for Tuna and Tuna-like species (ISC).



**Figure 3.** Oceans of major commercial swordfish production.

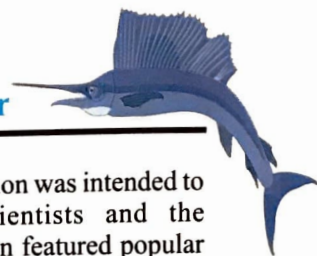


**Figure 4.** Countries supporting major commercial swordfish fleets with percent of total take.

#### PAPER REDUCTION ACT NOTIFICATION

The NMFS needs this information for the conservation and management of fishery resources. The information will be used for billfish research. Public reporting burden for the Billfish Angler Survey card is estimated to average 5 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. The reporting burden to complete the Billfish Tagging Report is estimated to average five minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate to the SWFSC, 8604 La Jolla Shores Drive, La Jolla, CA 92037. The information submitted will be a public record. Notwithstanding any other provision of the law, no person is required to, nor shall any person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act, unless that collection of information displays a currently valid OMB Control Number.





## FOURTH INTERNATIONAL BILLFISH SYMPOSIUM

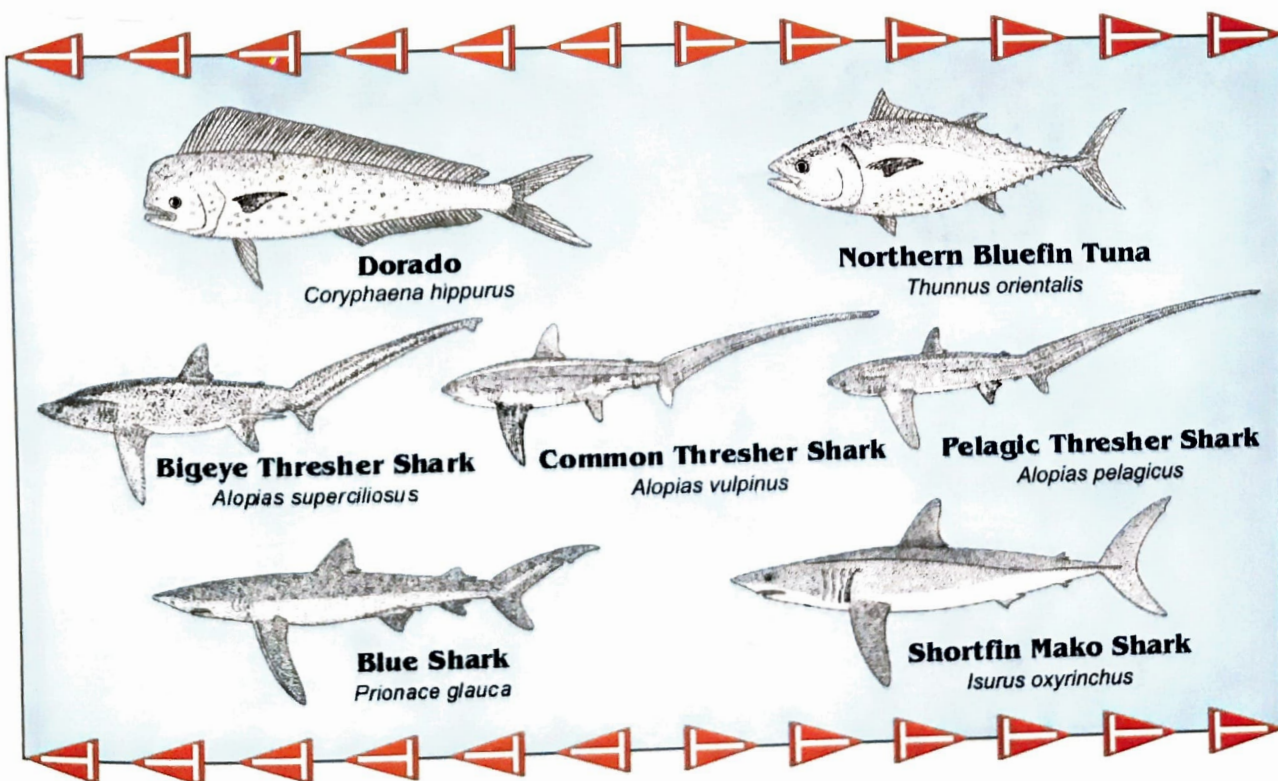
The Fourth International Billfish Symposium (FIBS) was held at the Avalon Casino on Santa Catalina Island on October 31 to November 3, 2005. The venue was particularly appropriate because Avalon was the birthplace of modern big game recreational fishing in the early 1900s. Over 200 billfish scientists and interested parties participated in the Symposium which highlighted a special session for the recreational angler

called Angling For Science. The session was intended to encourage dialogue between scientists and the sportfishing community. This session featured popular talks on the history of the Avalon Tuna Club, vision in billfish, tagging billfish, survival of tagged billfish and billfish movement patterns. The session ended with Bill Boyce and Guy Harvey presenting some of their best billfish photographs and videos in the Avalon Casino Theater. Formal presentations presented at the Symposium will be published in the Bulletin of Marine Science in 2006.



Striped Marlin

Photo: Bob Woodward







### SEND US YOUR PHOTOGRAPHS

This year's cover artwork is provided by Guy Harvey (Guy Harvey Research Institute; <http://www.guyharveyinc.com/>). Guy is a unique blend of marine biologist, marine fish conservationist, and marine animal artist. His art of billfish surrounding the Avalon Casino was a feature of the 4th International Billfish Symposium held at Catalina Island, California in November 2005. Guy's continuing support for our billfish research programs and billfish conservation worldwide is greatly appreciated and acknowledged.

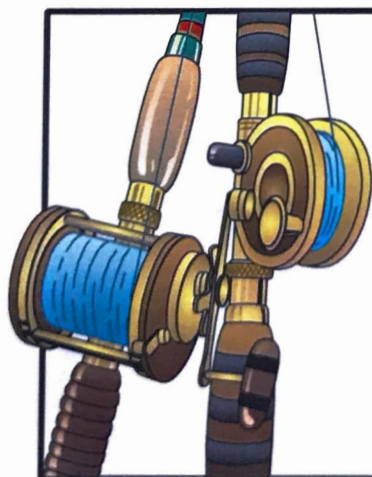
The Southwest Fisheries Science Center is looking for good photographs of billfish for the cover of next year's Billfish Newsletter. Color or black-and-white photos of billfish and/or fishing activities are appropriate. We would appreciate your sharing of photos and will give you full credit in the 2006 issue. A billfish baseball cap and plaque will be awarded to the winning photographer.

### SURVEY RESPONSE

BILLFISH ANGLER SURVEY cards for fishing in the 2005 calendar year are included with this Newsletter. Please complete the survey and return the post-paid survey form by February 2006. Additional 2005 Angler Survey cards will be available to all billfish anglers from this office. U.S. Government regulations require we purge our mailing list each year. If you wish to continue to receive the Billfish Newsletter but did not fish, please indicate "NO FISHING" on the Billfish Angler Survey form and return it to the Center. Your name will be retained. Your continued response to the Billfish Angler Survey is needed to index changes in abundance of billfish stocks important to recreational fisheries.

### ACKNOWLEDGEMENTS

The information reported here would not be possible without the cooperation of thousands of anglers and volunteers who support these investigations. Their efforts and assistance are greatly appreciated. We thank Dr. Heidi Dewar for sharing some of her results on Pacific swordfish behavior. We are grateful to Joan Vernon and the Presidential Challenge tournament series for her assistance with the Adopt-A-Billfish program. Roy Allen designed and produced the newsletter. The Billfish Newsletter can also be accessed on the Southwest Fisheries Science Center's home page at <http://swfsc.ucsd.edu/frd>. We welcome reader comments and suggestions concerning the content of the Billfish Newsletter.



*Smooth seas and good fishing,*

*David B. Holts, Fishery Biologist  
Randall Rasmussen, Computer Specialist*

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