







*The Southwest Fisheries
Science Center's*



2004 Billfish Newsletter



-  2003 Billfish Tagging and Recoveries
-  Trends in 2003 Billfish Angler Catch Rates
-  Adopt-A-Billfish Program
-  Top Anglers and Captains Acknowledged
-  AFTCO Tag-Flag Results
-  Fourth International Billfish Symposium, Fall 2005

PROLOGUE

This issue of the Billfish Newsletter marks the 40th year that NOAA Fisheries and the billfish angling community have combined efforts to measure angler success for billfishing. Our efforts have created one of the longest-time series available for recreational billfishing, charting trends in relative abundance for key species. With highly migratory species management unfolding in both the eastern and western Pacific, data series such as this one are key to assessing the health of the stocks. The Southwest Fisheries Science Center remains committed to monitoring recreational billfishing success.

William Fox, Ph.D.
Science Director

INTRODUCTION

The Billfish Newsletter is an annual publication describing several billfish research programs conducted at the Southwest Fisheries Science Center (SWFSC). Our emphasis is on billfish angling in the Pacific, Indo-Pacific and Indian Oceans. The results of the 2003 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, sportfishing clubs and affiliated agencies 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 in the Pacific and Indian Oceans. This collection of recreational billfish catch and effort data began in 1969 and now provides a 40-year index of fishing success in many key Pacific tourist locations. Catch per unit of effort (CPUE) is measured in catch of billfish per angler fishing day. This measure of angler success, tracked over time, can indicate changes in stock size caused by over fishing, changing environmental conditions, or local economic and political events. This index of CPUE is important in stock assessments and in developing management options.

In 2003, 832 billfish anglers reported catching 5,845 Pacific billfish during 6,732 fishing days. Table I indicates fishing effort, in angler days, and catch-per-day-fishing for all billfish reported by location for the year 2003. The annual mean catch-per-effort for all billfish was 0.87 billfish per day in 2003, up from, 0.50 in 2002. The current mean catch rate of 0.87 is a new record

Table 1. Results of all billfish catches reported for the 2003 Billfish Angler Survey. Numbers indicate total days fished by location and catch-per-fishing day. Data in parentheses are values recorded in 2002. 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
PACIFIC OCEAN	-	-	-
Hawaii, U.S.A.	3,309 (2,960)	0.50 (0.37)	BLM
Southern California, U.S.A.	1,065 (1,314)	0.12 (0.04)	SM
Baja California, Mexico	959 (903)	0.81 (0.82)	SM
Panama	275 (120)	4.92 (3.33)	SF
Australia	168 (94)	0.80 (1.06)	BKM
Acapulco, Ixtapa, Zihuatanejo Mexico	147 (44)	1.65 (1.66)	SF
Costa Rica	120 (56)	5.90 (3.04)	SF
Manzanillo, Mexico	112 (21)	0.46 (1.14)	SF
Tahiti	80 (21)	0.20 (0.19)	BLM
Guaymas, Mexico	63 (175)	0.079 (0.33)	SF
Mazatlan, Mexico	34 (24)	1.059 (0.96)	SF
Puerto Vallarta, Mexico	33 (2)	0.61 (1.00)	SF
Guatemala	22 (21)	7.05 (7.14)	SF
Fiji	20 (12)	0.00 (0.08)	NA
Japan	18 (42)	0.44 (0.02)	BLM
Galapagos Islands	12 (0)	0.25 (0.00)	SM
Marshall Islands	12 (11)	0.25 (0.09)	SF
New Zealand	6 (32)	1.167 (0.09)	SM
New Guinea	5 (0)	0.2 (0.00)	BLM
Kiribati	4 (8)	0.25 (.50)	SF
Ecuador	3 (0)	2.33 (0.00)	SF
French Polynesia	2 (0)	0.50 (0.00)	BLM
Guam, U.S.A.	1 (0)	1.00 (0.00)	BLM
INDIAN OCEAN	-	-	-
Dubai / United Arab Emirates	235 (180)	2.26 (3.47)	SF
ATLANTIC OCEAN	-	-	-
Atlantic Total	139 (21)	1.78 (1.05)	SF

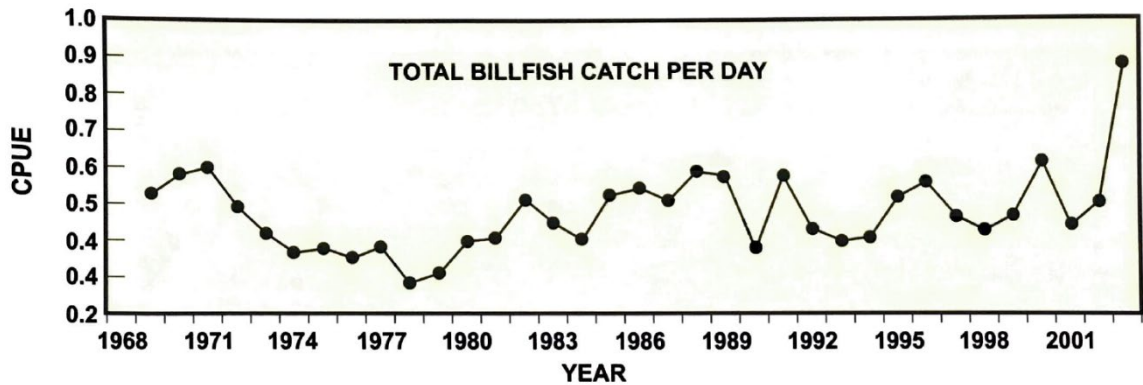


Figure 1. Catch per unit effort for all billfish 1968 to 2003

high and well above the prior five-year average of 0.58 (1999 - 2003). The second highest rate in CPUE occurred in 2000. This is a new all-time mean high catch rate and slightly greater than during the first years of this survey (1969 to 1971). The lowest catch rates (0.33) resulted from large international fisheries during the late 1970s (Figure 1).

Reported catch rates of blue marlin off Hawaii totaled 776 blue marlin in 3,309 days of fishing or 0.24 blue marlin per day. This catch rate is the highest since 1989 and at the top of the 20-year range (Figure 2a). Blue marlin are tropical and subtropical in habitat and rarely extend north of Magdalena Bay, Baja California Sur. The reported catch off Baja totaled 60 blue marlin in 959 days fishing (0.06 per day), which is at the lowest point over the past 20 years. Fifteen (15) additional blue marlin were reported caught from Manzanillo to Acapulco, Mexico, in 293 fishing days. In Panama, 20 blue marlin were caught in 275 angler days giving a rate of 0.07. Blue marlin catches were also reported off Costa Rica, Tahiti, Fiji, Australia, and Japan.

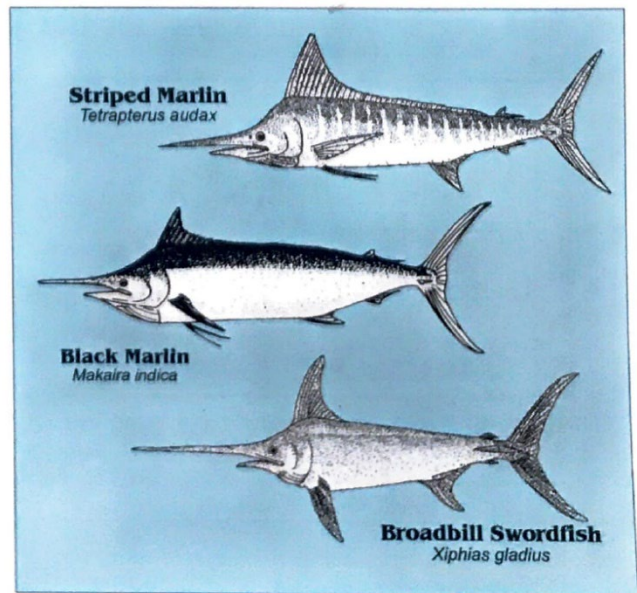
Trends in mean angler catch rates for striped marlin are shown graphically in (Figure 2b). Southern California anglers reported catching 121 striped marlin in 1,065 angler days (0.11). This is the highest reported catch rate since 1998. In Hawaii, anglers reported catching 471 stripers in 3,309 fishing days (0.14). This is another new high in reported catch rate for striped marlin in Hawaii. The area around the tip of Baja California Sur always produces good catch rates of striped marlin. In 2003, anglers reported catching 639 striped marlin in 959 days of fishing. This catch rate of 0.64 striped marlin per angler day was greater than for all combined fishing localities in Mexico (0.46). No catches south of Puerto Vallarta were reported in 2003. Striped marlin tend to be less abundant south of Manzanillo where sailfish are the more abundant billfish.

Sailfish are more tropical in habitat and are abundant in the coastal and offshore waters from Mexico to Ecuador. Catch rates of sailfish throughout all of Mexico (0.31) did not reflect the greater success off the central coast from Manzanillo to

Zihuatanejo and Acapulco (1.62). Costa Rica reported the highest catch rate with 682 sailfish reported in 120 fishing days (5.69) and fishing off Guatemala continues to see improved catches of 155 sailfish in 22 days (Figure 2c).

Black marlin are common in tropical waters and occasionally frequent temperate areas. Reported catch of black marlin in Australia of 82 in 168 fishing days (0.97 per angler day) continued to improve over prior years. The catch rate off Panama (0.09) again declined and is at lows not seen since the early 1980s (Figure 2d). Black marlin are often reported around the tip of Baja California but rarely occur off southern California.

Short-billed spearfish continued a strong run off Hawaii where anglers reported catching 386 and 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.



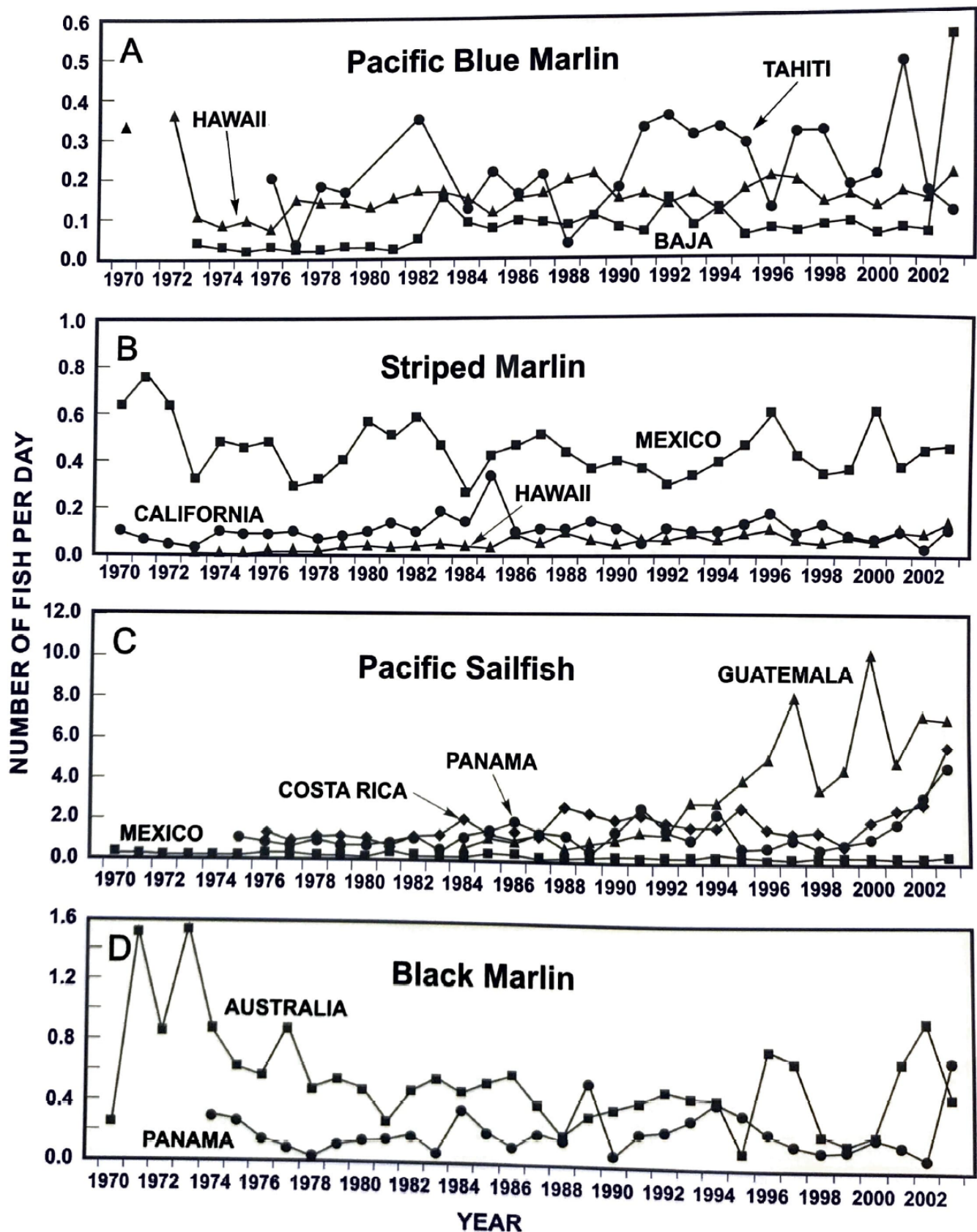


Figure 2. Catch per unit of effort (CPUE) in number of fish per angler day reported by region from 1969 to 2003 for blue marlin (A), striped marlin (B), Pacific sailfish (C), and black marlin (D).

THE BILLFISH TAGGING PROGRAM

The SWFSC's constituent-based Billfish Tagging Program began in 1963 and has provided tagging supplies to billfish anglers for 40 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 52,000 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. The tagging of any other sport fish is not encouraged by this program.

Billfish Tagging Report cards received for 2003 indicate a total of 1,369 billfish and 91 other fish were tagged and released by 1,297 anglers and 265 fishing captains. In all, 534 blue marlin, 363 striped marlin, 296 sailfish, 151 spearfish, 7 black marlin, 2 swordfish and 16 unknown billfish were reported tagged and released in 2003.

Table 2. Summary of all fish tagged in 2003 with releases and recoveries for 1963-2003.

Species Name	Release 2003	Release Total	Return Total	Rate %
Striped Marlin	363	21,666	335	1.55
Sailfish	296	8,467	48	0.57
Pacific Blue Marlin	534	6,816	72	1.06
Billfish, unid.	16	4,322	5	0.12
Black Marlin	7	3,355	69	2.06
Mako Shark	52	1,467	42	2.86
Short-billed Spearfish	151	1,447	2	0.14
Broadbill Swordfish	2	521	17	3.26
Dolphinfish	5	413	3	0.73
Yellowfin Tuna	0	347	24	6.92
Blue Shark	3	334	5	1.5
Thresher Shark	1	136	14	10.29
Skipjack Tuna	0	97	2	2.06
Albacore Tuna	0	87	0	0.00
Bigeye Tuna	0	79	2	2.53
Bluefin Tuna	0	56	7	12.5
Hammerhead Shark	0	53	2	3.77
Bronze Whaler	0	50	1	2.00
Atlantic Blue Marlin	0	42	0	0.00
Whitetip Shark	0	40	1	2.50
Wahoo	1	39	3	7.69
Leopard Shark	0	39	1	2.56
All Others	29	2,047	87	4.25
TOTALS	1,460	51,920	742	1.43

Twenty-eight striped marlin, 3 unidentified marlin and one swordfish were reported tagged off southern California in 2003 (Table 3). In Hawaii, 503 blue marlin, 246 striped marlin and 150 short-billed spearfish were reported tagged and released. Tagging off Mexico remained good along the Baja peninsula with 99 billfish tagged from Magdalena Bay south to La Paz and 199 more tagged from Mazatlán to Zihuatanejo and Acapulco. Another 111 billfish were tagged off Central America.

Table 3. Summary of all billfish tagged in 2003.

Area- Pacific Ocean	Species	Total
Hawaii, U.S.A.	Pacific Blue Marlin	503
Hawaii, U.S.A.	Striped Marlin	246
Hawaii, U.S.A.	Short-Billed Spearfish	150
Hawaii, U.S.A.	Marlin, unidentified	11
Hawaii, U.S.A.	Black Marlin	2
Hawaii, U.S.A.	Sailfish	2
Hawaii, U.S.A.	Billfish, unidentified	1
Southern California, U.S.A.	Striped Marlin	28
Southern California, U.S.A.	Marlin, unidentified	3
Southern California, U.S.A.	Broadbill Swordfish	1
Baja California, Mexico	Striped Marlin	81
Baja California, Mexico	Sailfish	10
Baja California, Mexico	Pacific Blue Marlin	5
Baja California, Mexico	Broadbill Swordfish	1
Baja California, Mexico	Marlin, unidentified	1
Baja California, Mexico	Short-Billed Spearfish	1
Acapulco / Ixtapa /	Sailfish	144
Acapulco / Ixtapa /	Pacific Blue Marlin	2
Zihuatanejo, Mexico	Striped Marlin	1
Manzanillo, Mexico	Sailfish	38
Manzanillo, Mexico	Pacific Blue Marlin	5
Manzanillo, Mexico	Striped Marlin	3
Puerto Vallarta, Mexico	Black Marlin	3
Puerto Vallarta, Mexico	Pacific Blue Marlin	1
Puerto Vallarta, Mexico	Sailfish	1
Mazatlan, Mexico	Striped Marlin	1
Costa Rica	Sailfish	89
Costa Rica	Pacific Blue Marlin	5
Costa Rica	Black Marlin	1
Guatemala	Sailfish	12
Guatemala	Pacific Blue Marlin	1
Tahiti	Pacific Blue Marlin	5
Tahiti	Striped Marlin	1
Panama	Black Marlin	1
Panama	Striped Marlin	1
Caroline Islands - Atlantic Ocean	Blue Marlin	1
TOTAL	-	1,362

Table 4. Names of anglers tagging substantial numbers of billfish, and the number of billfish tagged and released during the 2003 calendar year.

ANGLER NAME	BILLFISH	ANGLER NAME	BILLFISH	ANGLER NAME	BILLFISH	ANGLER NAME	BILLFISH
HAWAII U.S.A.	-	HAWAII U.S.A.	-	HAWAII U.S.A.	-	MANZANILLO-ACAPULCO, MX.	-
Sam Thies	11	Chaz Donovan	2	Robert Mccracken	2	John Ryan	2
Bob Creedon	8	Chris Carson	2	Robert McKinney	2	Joseph Koppen	2
Richard B. Richardson Jr.	6	Dallas Bond	2	Robert Myers	2	Judy Thoma	2
Larry Smith	6	Dar DeBella	2	Robert Shaner	2	Kyle Landskroner	2
Ellen Kawata	6	Darien Moran	2	Ron Balducci	2	Michael Hofstetter	2
Skip Hayward	6	Dylan Malmberg	2	Ronald A. Rameson	2	Mike Thornton	2
Koichi Kasamatsu	6	Edward F. Haskin	2	Scott Clements	2	Nikkie Welton	2
Jeff Smith	5	Edwin Fabio	2	Scott Ekenberg	2	Scott Martinson	2
Keishi Shiohata	5	Felix Rodriguez	2	Steve Sabalaske	2	BAJA CALIFORNIA, MX.	-
Chris Whittingham	5	Garrett Goodwin	2	Thomas Irizarry	2	Don Anderson	7
Adam Cohen	4	Gary Furness	2	Tom. Schumacher	2	Mary Kaitlin Roney	5
Carol Fuller	4	Glen Williams	2	Vincent Tona	2	Mike Fitzgerald	5
Eiji So	4	Heath Rosa	2	W. W. Carlson	2	Bobby Brown	4
Jeff Stafford	4	Herb Lencharko	2	Walter Hester	2	Scott Hubler	4
Matt Losasso	4	Hironao Ishii	2	Yasuo Saito	2	Shera Grant	4
Pat Brian	4	Jack Hetherington	2	MANZANILLO-ACAPULCO, MX.	-	Troy Fitzgerald	4
Robert Esser	4	James Hogan	2	Howard Bond	37	Eric Canella	3
Sam Allen	4	Jennifer Stephens	2	Ken Ellis	10	Rob Gruwell	3
Allen Sullivan	3	Joe A. Walker	2	Bud Keeney	9	Walter Hamilton	3
Anden Finnegan	3	Joel Webb	2	Bob Nelson	8	Anna Hamilton	2
Barton Hoey	3	John Brandt	2	Roland Ramirez	5	Brandon Gruwell	2
Charles Spreeman	3	John Wakamatsu	2	Marie Johnson	5	Clarke A. Smith	2
Dan Nowlin	3	Jonathon Harrel	2	Jeff Handley	5	Ed Seidlinger	2
George Kirkham	3	Joseph Dougherty	2	Cristine Evans	5	John Gailey	2
Hubert Starker	3	Kari Shipman	2	Corey Reynolds	4	Kim Sage	2
JamesMcRee	3	Keith Morton	2	David A. Miller	4	Mark Fitzgerald Gruwell	2
Jennifer Wu	3	Ken Cleveland	3	Alan Skram	3	Randy Rozell	2
John M. Hasko	3	Ken Fare	2	Cristin Evans	3	Richard B. Richardson Jr.	2
Jordan Berg	3	Kiichiro Nagashiki	2	Jeff Pedersen	3	SOUTHERN CALIFORNIA, U.S.A.	-
Kathy Bakke	3	Kimio Saito	2	PJ Cunningham	3	Lynn Jasper	5
Kenny Krueger	3	Koichino Sagusa	2	Roger Hyndman	3	Douglas A. Oaneils	3
Kevin Dowell	3	Kosuke Mori	2	Thomas Guerin	3	Eric Grennan	3
Kyle Stephens	3	Kristan Wilson	2	Prescott	3	Steve Behrens	3
Mark Spangler	3	Kristin P. Wilson	3	Bill Berg	3	William H. MacCorkell	3
Mike Ward	3	Lynette Butler	3	Clarke Smith	2	Mark Warner	2
Pati Dever	3	Mark Diver	2	Dave Routzahn	2	COSTA RICA	-
Randy Wright	3	Masahiko	2	David Kropuenske	2	Lisa Maloni	6
Rod LaHodny	3	Matt Ricker	2	Don Ryan	2	Joan Vernon	5
Tom Berry	3	Matthew Sogameli	2	Don Ryan	2	Bryan Freeman	3
Will Webb	3	Michael Kehoe	2	Dwayne Unger	2	Allen Robins	2
William N. Jardine	3	Michael Tokunaga	3	Ed Keefer	2	Deam Richards	2
Al Sullivan	2	Mike Jacobsen	2	Eileen Hofstetter	2	John Clonninger	2
Allen Branner	2	Patricia Dever	2	Eric Himmelreigh	2	GUATEMALA	-
Bill Carpenter	2	Patrick Alan	2	Flip Himmelreigh	2	Joan Vernon	6
Bill G raha	2	Phil Rosenbaum	2	James Cook	2	Larry Oliver	4
Bob Hode	2	Philip Fleck Jr.	2	James Hughes	2	Bill Easum	3
Bob Nelson	2	Preston A. Stofer	3	John Evans	2	-	-
Brent Pollock	2	Rob Jiracek	2	John Gonsalves	2	-	-

2004 Billfish Newsletter

Each year we recognize the anglers and captains who tag and release billfish (Table 4). In 2003, individual anglers numbering 1,297 reported tagging at least one billfish. Individual recognition of each angler who reported tagging two or more billfish in 2003 is presented in Table 4. We regret limited space prevents listing all 1,297 taggers. Don Anderson tagged 7 off Baja, Howard Bond, Ken Ellis and Bud Keeney tagged 3, 7, 10, and 9 respectively between Mazatlán to Acapulco, Mexico. Sam Thies, Bob Creedon tagged 9 and 8 marlin in Hawaii, Lynn Jasper released 5 in southern California, and Joan Veman tagged 11 in Costa Rica and Guatemala.

We also acknowledge the captains of charter and private boats who support tag and release (and catch and release) of billfish. Charter captains play an important conservation roll by recommending that their anglers tag and release their catch. They play a particularly important role by promoting skillful release of their catch. We list those captains who released significant numbers of billfish in specific regions (Table 5). This year 32 captains tagged 12

or more billfish. Captains Peter Hoogs, Guy Terwilliger; Scott Fuller and John Bagwell tagged more than 40 each in Hawaii. Rich Hamilton, Pepino, and Martin Cortez tagged over 20 in Mexico and Daniel Espinoza released 83 sailfish in Costa Rica. Continued interest and cooperation by all captains have greatly enhanced the Billfish Tagging Program, and their efforts and conservation ethic are truly appreciated.



Table 5. Names of captains tagging substantial numbers of billfish, and the number of billfish tagged and released during the 2003 calendar year.

Captain Name	Billfish Tagged	Captain Name	Billfish Tagged	Captain Name	Billfish Tagged	Captain Name	Billfish Tagged
HAWAII U.S.A.	-	HAWAII U.S.A.	-	HAWAII U.S.A.	-	MANZANILLO-ACAPULCO, MEX.	-
Peter Hoogs	60	Terry Kellam	9	Sean Cleaver	3	Jose Luis "Pepino" Servin Hernandez	76
Guy Terwilliger	57	Bert Byrd	8	Brian Wargo	2	Martin G. Cortez	40
Scott M. Fuller	42	F. McGrew Rice	8	Chip Van Mols	2	Javier Vargas	14
John Bagwell	40	Robert Dobson	8	Cyndee Hudson	2	Rich Johnson	10
Charles E. Hauptert	39	Bill Casey	7	Jeff Kahl	2	Armando Arciniega	9
Tom Casey	37	Bruce Evans	7	Jim Patterson	2	Cali	3
Bill Crawford	35	Bruce Matson	7	Kevin Masunaga	2	Cipricino Stoelo R.	3
Dennis R. Cintas	35	Kim Miyaki	7	Lance Gelman	2	David M. Denholm	3
Mark Shultz	28	Chip Fischer	6	Mike Hasbrouck	2	Hernando Arciniega	3
McGrew Rice	26	Kevin M. Hogan	6	Rick White	2	Orlando Hernandez Aguilera	3
Marlin Parker	25	Chris Armstrong	5	Ryan Foster	2	Alberto Reyes	2
William Dorr	23	Jim Scanlon	5	Steven R. Fassbender	2	Ed Kunze	2
James Dean	22	Kevin Hibbard	5	Tad Luckey	2	Luis Maciel	2
Tim E. Hicks	22	Mike Derego	5	BAJA CALIFORNIA, MEXICO	-	SOUTHERN CALIFORNIA, U.S.A.	-
Alan Bakke	20	Doug Barna	4	Richard Hamilton	40	Thomas A. Shanahan	8
John Jordan	20	Lloyd Lowry	4	Martin Collins	7	Ken Brookins	5
Mike Holtz	18	Terry Dahl	4	Bob Woodard, Jr.	5	Kendall W. Knight, Jr.	3
Steve Cravens	18	Allen Ayano	3	Jose Verdusco	5	Stan Ecklund, Sr.	2
Steven D. Kaiser	18	Bill Benbow	3	Michael Arujo	5	COSTA RICA	-
Marty L. Sands	17	Del Dykes	3	Randy Rozell	4	Daniel Espinoza	83
Tony Clark	16	Fran O'Brien	3	Troy Grant	4	Chip Shafer	11
Jerry Allen	14	Geoff Peck	3	Bonnie Siemser	3	GUATEMALA	-
Bob Dorigo	12	J.J. Trevino	3	David M Denholm	3	Brad Phillips	8
Neal Isaacs	12	John Uhr	3	Robert Woodard, Sr.	3	Cris VanLeeuwen	5
Jeff Fay	11	Pat Crackel	3	Andy Crean	2	-	-
Robert McGuckin	11	Rennie Boyd	3	Dan Loros	2	-	-
Doug Armfield	10	Robert Hudson	3	Harold Schram	2	-	-
Kent Mongreig	9	Scanlon	3	Michael (Mouse) Libby	2	-	-

TAG RECOVERIES IN 2003

Seven blue marlin, four striped marlin, one sailfish, two swordfish, one bluefin tuna and eight mako shark tag recaptures were reported in 2003 (Table 6). Tag release information for one of the striped marlin and the sailfish have not been reported. We estimate that the release of nearly 17% of billfish tagged in this program have NOT been reported. Please check your tackle boxes and ensure all Billfish Tagging Report cards are sent to our office.

Two of the striped marlin tagged off Oahu and Kailua- Kona were recaptured southeast of Hawaii after traveling over 300 nautical miles in 69 and 413 days, respectively. All Seven of the blue marlin were tagged off Kailua- Kona, Hawaii. Three of these were at liberty for over 600 days and two were recaptured in 4 days. One moved a net distance of 1,056 nautical miles in 671 days at liberty. The two at liberty for the longest time were recaptured just a short distance from the original tagging location. One swordfish tagged north of Hawaii was free for 2.3 years and recaptured 832 nmi to the east. The other was free one day and

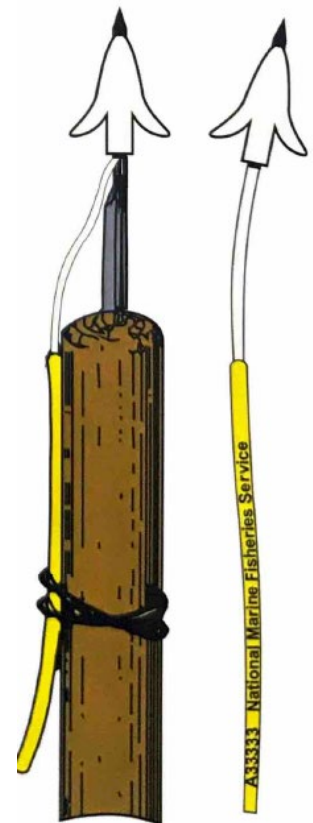
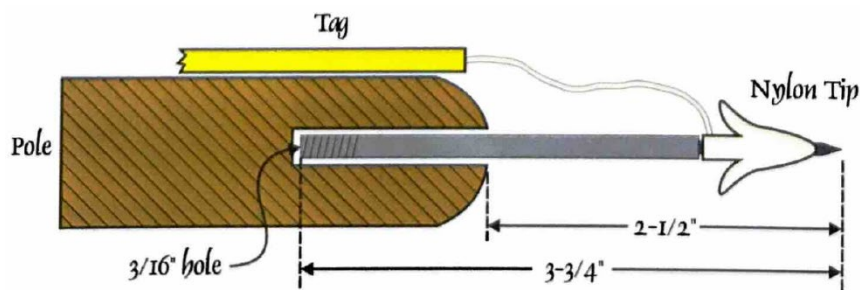
moved 24 nmi. The bluefin tuna was tagged at Cortez Bank, California and recovered northeast of Hawaii 4,468 nmi to the west after 3.7 years.

The eight shark tag recaptures are mentioned here as general interest and because they relate to the SWFSC's ongoing shark research. All were tagged in the Southern California Bight during the SWFSC's juvenile shark surveys. Days at liberty ranged from 66 to 1,013 days. Miles moved ranged from 39 to 2,648. These shortfin mako sharks were measured and tagged with tetracycline for age and growth studies. The return of these tags is valuable to our research and we ask your cooperation in returning the tag and a section of the shark's vertebrae should you catch one of these sharks. These specially tagged shortfin mako and common thresher sharks have a white and/or yellow Roto tag with a large 3- or 4- digit number attached to the dorsal fin indicating we need the vertebrae and tag. We offer a \$100 reward when returned to this office with a section of vertebrae.

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. The tag should be inserted 2.5 inches just below the tallest part of the dorsal fin. 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 tip extends only 2.5 inches. Some manufacturers have changed the overall length of the pins in which case the stopper must be adjusted to only allow the 2.5-inch penetration.

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). Insure the applicator protrudes exactly 2.5 inches. Use a good grade epoxy to secure the applicator pin and seal out saltwater.

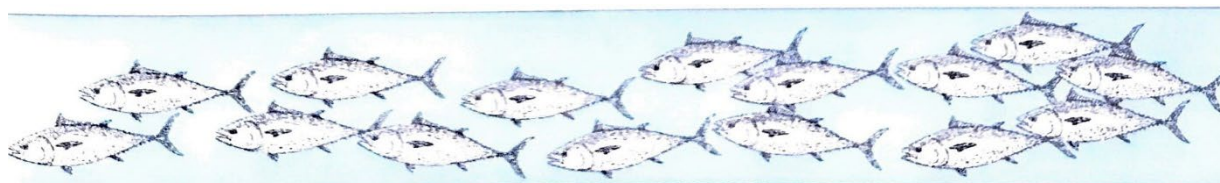


Survival of tagged and released billfish depends on several decisions you, the angler, must make prior to and during fishing. Following on page 12 is a guide that will enhance the post-release survival of your billfish.



Table 6. Tag recovery information for 2003.

Tagger/Captain	Release Date	Release Location	Recovery Date	Recovery Location	Days Free	Miles/Direction Traveled
Blue Marlin						
Marcus Kelekoma F. McGrew Rice	7/29/2001	19°39'N 156°00'W Kona, Hawaii	5/31/2003	Southwest of Hawaii	671	1,056- SW
Mike Tokanaga Robert McGuckin	7/15/2003	19°44'N 156°05'W Keahole Pt.-Kona, HI	7/19/2003	Kona, Hawaii	4	1-SW
Matt Terpstra Peter Hoogs	7/27/2003	19°50'N 156°04'W No. Grounds-Kona HI	7/31/2003	Loa Point, Hawaii	4	27-SW
Rory Gleadhill Jeff Fay	8/13/2001	19°30'N 156°00'W Kona, Hawaii	8/15/2003	Waikola, Hawaii	732	29-WNW
Chris Beccaria Scott M. Fuller	7/9/2001	19°30'N 156°00'W Kona, Hawaii	7/15/2003	Kona, Hawaii	736	14-NW
Joe A. Walker Guy Terwilliger	7/1/2003	19°37'N 156°02'W Kailua-Kona, Hawaii	10/3/2003	Kona, Hawaii	94	8-WSW
Matthew Sogameli Chris Armstrong	7/5/2003	19°36'N 156°01'W Kailua-Kona, Hawaii	11/1/2003	?	?	?
Sailfish						
?	?	Card Not Received	11/23/2003	?	?	?
Striped Marlin						
Matt Rucker Peter Hooqs	1/18/2003	19°38'N 155°59'W Kona, Hawaii	2/7/2003	South of Hawaii	20	272-SSW
Ron Kos Kevin M. Hogan	1/11/2002	20°39'N 156°07'W Lanai, Hawaii	3/1/2003	South of Hawaii	413	385-SW
Alexandra B. Napier Charles E. Hauptert	7/14/2003	19°30'N 156°00'W Oahu, Hawaii	9/21/2003	West of Hawaii	69	374 - NE
?	?	Card Not Received	1/31/2003	Cabo San Lucas	?	?
Bluefin Tuna						
David Brackmann	9/5/1999	31°50'N 118°30'W 60-Mile Bank, California	5/15/2003	Northeast of Hawaii	1,348	4,468 - WNW
Broadbill Swordfish						
John La Grange	3/16/2001	30°43'N 148°55'W Northeast of Hawaii	5/17/2003	Northwest of Hawaii	792	832-WSW
Michael Thomas Kendall W. Knight, Jr.	9/6/2003	32°59'N 117°59'W San Clemente Is. CA	9/7/2003	San Clemente Is., CA	1	24-WSW
Mako Shark						
NMFS Research	6/24/2002	33°32'N 118°34'W Santa Catalina Is. CA	1/6/2003	Southwest San Diego, CA	196	120-SSE
NMFS Research	7/6/2002	32°59'N 118°15'W San Clemente Is. CA	11/7/2002	Santa Catalina Is., CA	124	39-NW
NMFS Research	6/23/2002	33°17'N 118°09'W Santa Catalina Is., CA	1/3/2003	Punta Abrejos, Baja California Sur, Mex.	194	462-SSE
NMFS Research	6/30/2002	32°55'N 117°53'W San Clemente Is. CA	10/6/2003	Oceanside, CA	463	29-NE
NMFS Research	7/10/2000	33°35'N 118°35'W Santa Catalina Is., CA	4/19/2003	Northwest o	1,013	2,649-WSW
NMFS Research	6/23/2002	33°17'N 118°09'W Santa Catalina Is., CA	8/2/2003	9-Mile Bank, CA	405	50-ESE
NMFS Research	6/22/2002	33°03'N 118°26'W San Clemente Is., CA	7/18/2003	Bishop Rock, CA	382	46-ESE
NMFS Research	6/27/2003	33°49'N 118°59'W Santa Catalina Is., CA	9/1/2003	Dana Point, CA	66	66-ESE



ADOPT-A-BILLFISH PROGRAM

Adopt-A-Billfish tagging program seeks to determine the survival rate of large billfish caught and released during international tournaments and to evaluate site fidelity off Central America and Mexico. The program is coordinated by a team of NMFS scientists from Southwest and Southeast Fisheries Science Centers in cooperation with the University of Miami's Center for Sustainable Fisheries. In the Pacific, researchers are collaborating with the Presidential Challenge tournament series off the coast of Central America. From 2002 to 2004, Adopt-A-Billfish collaborators traveled to the Tropic Star Lodge in Panama, Los Suenos resort in Costa Rica, Fins & Feathers Lodge in Guatemala and to Ixtapa, Mexico, where they tagged 39 sailfish, 2 blue marlin and 1 black marlin with data archiving satellite tags.

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 SWFSC biologists. Results to date indicate that billfish survive being caught and released only when proper

tagging protocols are followed. Although 92.5% of these billfish survived the tagging event, the blue marlin and two sailfish died within one day of capture and release. Survival is greatest when the fish are revived (resuscitated) by slowly being towed through the water prior to release. This allows them to regain their energy and strength prior to release as indicated by the return of their normal color.

Satellite tag data showed significant movement across all international boundaries from Mexico to Panama (Figure 3). Nearly all tagged sailfish either moved along shore into the exclusive economic zones of adjacent countries or moved offshore into international waters. The time sailfish spent at depth, and temperature is still being analyzed but clearly shows that sailfish spend most of their time in the mixed layer above the thermocline. The black marlin moved west from Panama into Costa Rica in 28 days and spent 80% of its time above 50 m depth and in water temperatures ranging from 22° to 24°C. The longest time at liberty for a conventionally tagged Pacific sailfish was 1,717 days tagged and recaptured near Cabo San Lucas (BCS, Mexico)

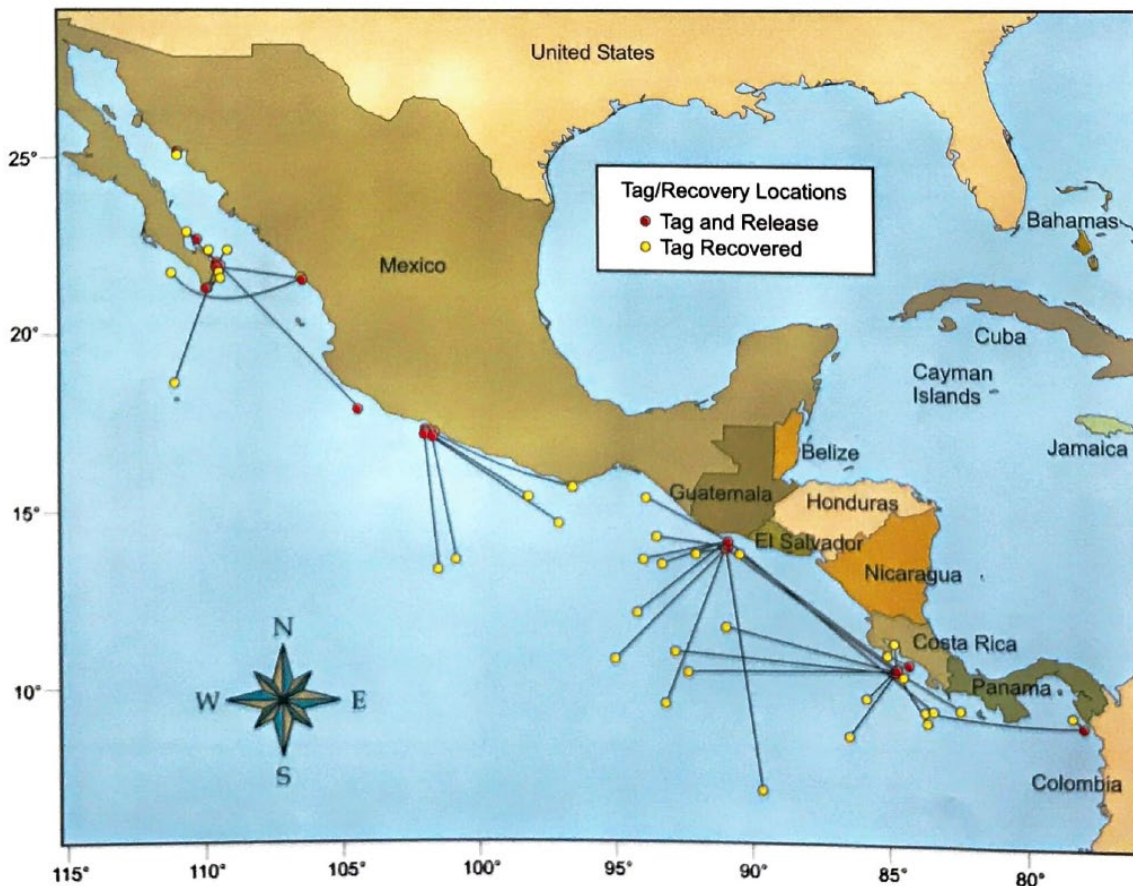


Figure 3. Movements of Pacific sailfish tagged and released in our billfish tagging program and from Adopt-A-Billfish Program. Movements show significant activity across international boundaries.

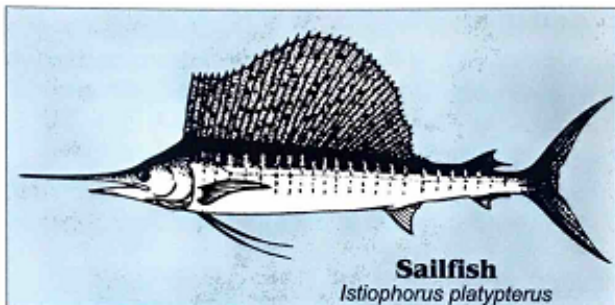
SAILFISH

Sailfish are found throughout the world's tropical and temperate oceans. In the eastern Pacific they range from Chile to central California, and in the western Pacific from the Sea of Japan south to Australia. In the Indian Ocean they are abundant from Western Australia to South Africa and in the Persian Gulf. Historical longline records show that sailfish have a strong tendency to inhabit the blue waters of the continental shelf and island areas. In Hawaii sailfish, though common, are less abundant than the marlins and short-billed spearfish. Off the coasts of Central America and Mexico they have a seasonal north-south movement approximately following the 28°C isotherm. Sailfish rarely move into Southern California except during periods of extended warm coastal waters. Our satellite tag data indicate they move extensively among the Central American countries and Mexico, and from the coast to beyond 200 nmi.

The main prey of sailfish are small pelagic schooling species including mackerel, sardines, anchovies and squid. There is evidence they use team-feeding behaviors to condense bait schools into tight balls, making feeding strikes more efficient. Sailfish also become prey to larger billfish, pelagic sharks and killer whales.

Pacific sailfish are generally larger than Atlantic sailfish. The IGFA all-tackle Pacific record for sailfish is 221 pounds, caught in Ecuador in February 1947, while the Atlantic record is 141 pounds, caught off Angola in 1994. Age at maturity and maximum age have not been determined. In the Pacific, spawning occurs during the local summer season. It has been reported that males will follow closely or chase females during actual spawning, as has been observed in certain species of tuna. Sailfish often school in loose aggregations covering fairly large areas. Within these aggregations, single individuals or small groups of up to 10 or 12 may move together. Large compact schools have been seen during feeding and/or spawning.

Fisheries take large numbers of sailfish as bycatch in longlines and gillnets. Catches in the eastern tropical Pacific are conservatively estimated at about 1,600 mt per year. Additional catches by artisanal fishers, who keep and sell sailfish to local markets, and larger commercial vessels that discard sailfish to save limited hold space for more valuable species are not documented.



Recreational fisheries rely on trolling the surface waters. Satellite archiving tag data indicate a good survival rate (92.5%) when using proper catch and release protocols. Current literature indicates as much as 35 to 40% of billfish probably die after tag and release when 'speed' tagging, unskilled or other improper tagging techniques are used. Several published studies using satellite archival tags have confirmed greater survival of released fish when fishing with circle hooks. One study indicates white marlin are 41 times more likely to be deep hooked in the throat or stomach when caught with straight shanked 'J' hooks than with equally sized circle hooks. Another study with 278 Pacific sailfish shows 'J' hooks resulting in 40% deep hooking locations and sailfish being 21 times more likely to suffer visible hook related bleeding. Our own Adopt-A-Billfish tagging used only circle hooks and achieved a 92.5% survival rate with only one deep hooked fish and no visible hook related injuries. We strongly urge all anglers to use circle hooks when releasing their catch. Please see the Successful Catch and Release section.

Status of the Stock

Currently there are no stock assessments for Pacific sailfish. Commercial records show catches peaked in the 1960s. While the Atlantic sailfish is considered over exploited, the Pacific sailfish stocks are not over fished. Insufficient data on current commercial and recreational catches make monitoring these stocks difficult. Several international agencies are attempting to improve these data.

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.

1. BEFORE YOU CATCH YOUR FISH:

First decide if this is a fish you want to tag and release. If so, use a circle hook which reduces deep or foul hooking when bait fishing or a single circle or single 'J' hook if trolling. Do not use double rigged 'J' hooks when releasing 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.

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.

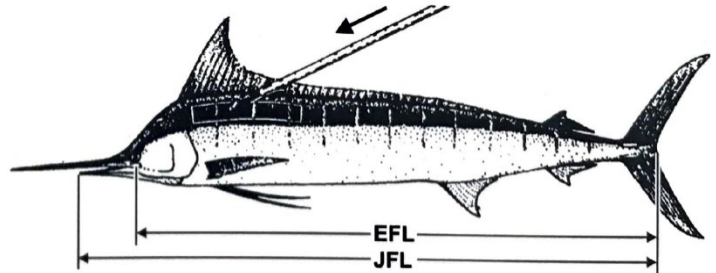
4. RELEASING:

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. Revive all 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.

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; JFL) and weight of the fish. Include name and mailing address of the angler and boat captain and other remarks as appropriate. Return cards promptly to the Southwest Fisheries Science Center.

PLEASE NOTE: Billfish recaptures without tag release information now stand at 13 percent. This equates to nearly 6,500 billfish that have been tagged without the release information being returned to the SWFSC. Make your tagging effort count. Tag and release your fish skillfully 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

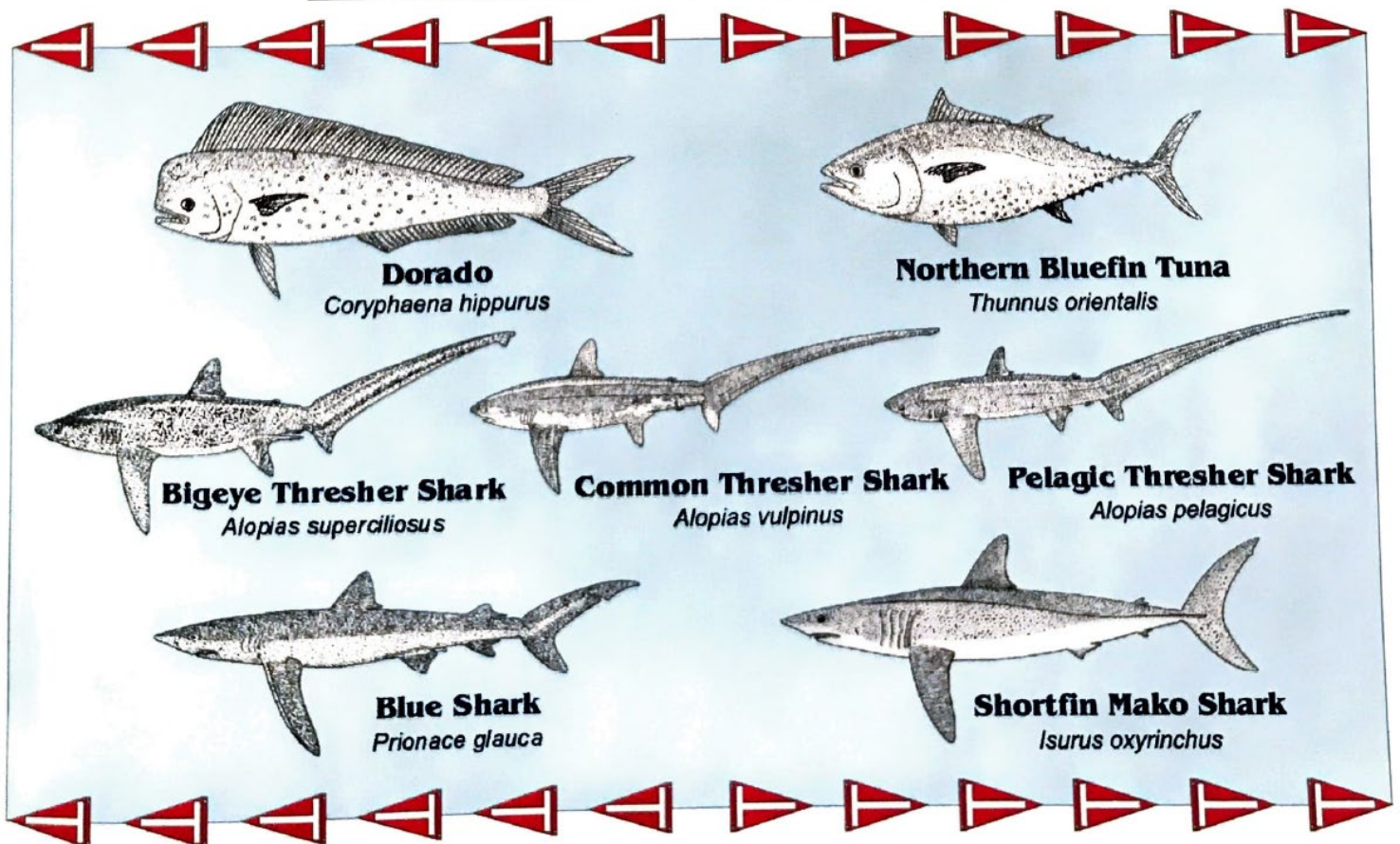
- Fill out the card completely and as accurately as possible.
- Indicate latitude, longitude and locally known fishing area.
- Estimate the length of the fish as
 - "eye-to-fork" length (EFL)
 - "tip of lower jaw-to-fork" length (JFL).
- Estimate weight of the fish.
 - Include any remarks, club name 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 #: A33333	
Latitude: 33° 14' N	Longitude: 118° 14' W		
Locality: East End Catalina Is. CA			
Species: Striped Marlin	Date: 6/10/98		
Estimate length (tip of jaw to fork of tail): 72 inches	Weight: 140 lbs.		
Fish Condition: Good	Bait type: Plastic Lure		
Angler: Bill Fish	Fight time (minutes): 23		
Address: P.O. Box 271 La Jolla, CA		Zip: 92038	
Club: Anglers Club			
Captain: Capt. Joe Dew	Boat name: Good Grief		
Address: P.O. Box 271 La Jolla, CA		Zip: 92038	
Response to this form is voluntary GMS 5948-0008, expiration date 06/31/2001 NOAA BS-162, 2/99			

FOURTH INTERNATIONAL BILLFISH SYMPOSIUM

The Fourth International Billfish Symposium (FIBS) will be held in Avalon, Santa Catalina Island, California, between 31 October through 3 November 2005. The setting for the Fourth Symposium is particularly appropriate because Avalon was the birthplace of modern big game recreational fishing in the early 1900s. We have been fortunate in securing the beautiful and historic Avalon Casino as the venue for the symposium

and we anticipate a well-attended conference that will emphasize rigorous scientific research into all aspects of the biology and management of billfishes. To encourage dialogue between scientists and the sportfishing community, one afternoon session of the Symposium will be entitled "Angling for Science - Biology for the Fisherman" and that evening the Symposium will feature a special film and multi-media session in the splendid Avalon Theater. Please check out the official FIBS web site for additional information at http://www.picr.org/billfish_symposium/



SEND US YOUR PHOTOGRAPHS

This year's cover photograph is of a Pacific sailfish taken by Bill Boyce. We thank Bill for the cover photo and the Pacific sailfish on page 13. His continuing support for our billfish research programs and billfish conservation is greatly appreciated and acknowledged. Additional pictures by Bill Boyce can be viewed on his website at <http://www.boyceimage.com/>.

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 2005 issue. A billfish baseball cap and plaque will be awarded to the winning photographer

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 welcome reader comments and suggestions concerning the content of the Billfish Newsletter.

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>.

SURVEY RESPONSE

BILLFISH ANGLER SURVEY cards for fishing in the 2004 calendar year are enclosed with this Newsletter. Please complete the survey and return the post-paid survey form as soon as possible. Additional 2004 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.



Smooth seas and good fishing,

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

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