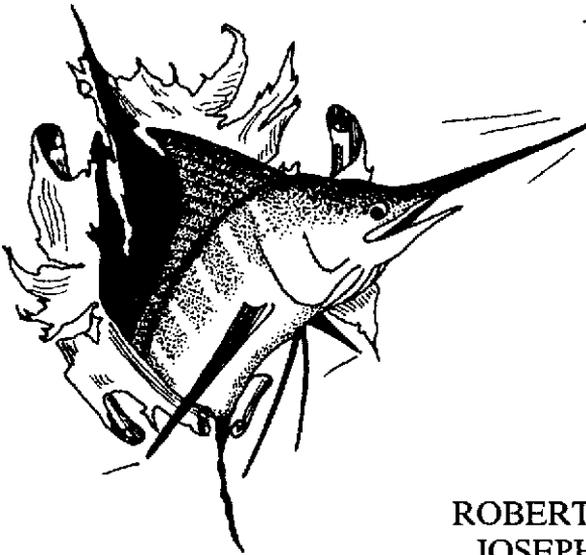


NOAA Technical Memorandum NMFS-SEFSC-314



**COOPERATIVE GAME FISH
TAGGING PROGRAM
ANNUAL NEWSLETTER
1991**



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National Marine Fisheries Service
Southeast Fisheries Science Center
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COOPERATIVE GAME FISH TAGGING PROGRAM ANNUAL NEWSLETTER 1991¹

U.S. DEPARTMENT OF COMMERCE
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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
John A. Knauss, Under Secretary for Oceans and Atmosphere

NATIONAL MARINE FISHERIES SERVICE
William W. Fox, Jr., Assistant Administrator for Fisheries

December 1992

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¹Contribution MIA-92/93-25 from the Southeast Fisheries Science Center, Miami Laboratory, Migratory Fishery Biology Division

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The Cooperative Game Fish Tagging Program (CGFTP) is a joint research effort by scientists and recreational and commercial fishermen. It is designed to provide information on the movements and biology of marine fish species in the Atlantic Ocean, Gulf of Mexico, and the Caribbean Sea through the direct participation of the public in scientific research. In 1991, program cooperators and scientists tagged and released 15,977 fish of 61 species, a 46% increase over 1990 figures.

Sailfish

In 1991, 3,206 sailfish were tagged and released, 3,143 by recreational fishermen, and 63 by commercial fishermen. As in previous years, a majority of sailfish taggings (1,530) took place off the southeast coast of Florida. Other areas where large numbers of sailfish were tagged include: Cancun/Cozumel, Mexico (859), the northeast coast of Florida (290), and La Guaira, Venezuela (243). Program cooperators also tagged sailfish in the mid-U.S. east coast (Cape Hatteras to Long Island, New York), the northern Bahamas, off Puerto Rico, the Virgin Islands, along the Florida panhandle, and off southern Texas.

There were 66 tagged sailfish recaptured in 1991, 55 by recreational fishermen, 6 by commercial fishermen, and 1 by scientists (in 4 cases the type of fisherman was not reported). The locations of 1991 sailfish recaptures are given in Table 1.

The longest distance traveled by a sailfish recaptured in 1991 was about 1,650 nautical miles (estimated straight-line distance). This fish was tagged by a U.S. longliner northwest of the Dry Tortugas in August, 1989, and recaptured by a Grenadan artisanal fisherman in early February, 1991, having been at large for 544 days, and gaining about 23 pounds. The longest time-at-large was 7.3 years, for a fish released off Cancun in April, 1984, and recaptured by a U.S. longliner in August, 1991, south of Louisiana (the recreational fisherman who tagged this fish did not report a length or weight, so no growth information is available). Figure 1 gives a summary of the times at large for 1991 sailfish recaptures. Selected 1991 release-recapture movements are shown in Figure 2.

Table 1. Release and recapture areas for sailfish recaptured in 1991.

<u>Release Area</u>	<u>Recapture Area</u>	<u>Total</u>
S.E. Florida	S.E. Florida	31
	Florida Keys	3
	N. Florida	2
	Gulf of Campeche	1
	north of Cuba	1
	Cozumel	1
Florida Keys	Florida Keys	8
	S.E. Florida	4
	Cancun/Cozumel	1
Cancun/Cozumel	Cancun	1
	S.E. Florida	1
	S. of Louisiana	1
	Venezuela	2
North Bahamas	S.E. Florida	1
	Cuba	1
	south of Hispaniola	1
N. Florida	S.E. Florida	1
Dry Tortugas	Grenada	1
La Guaira	northwest Venezuela	1
(No release data)	S.E. Florida	3
	Florida Keys	1
Total:		66

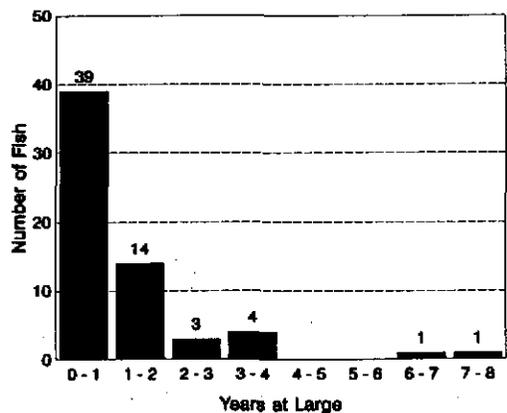


Figure 1. Years at large for 1991 sailfish recaptures (N = 62; 4 recaptures without release information are not included).

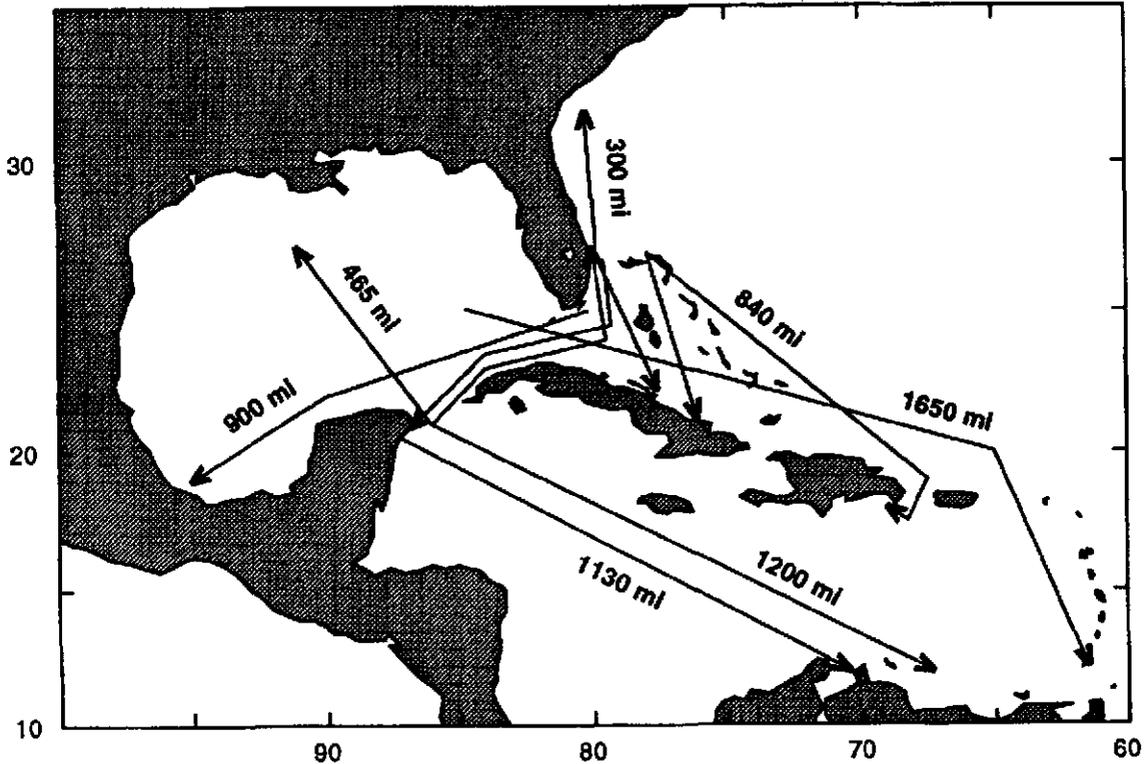


Figure 2. Movements of selected 1991 tag-recaptured sailfish.

Blue Marlin

There were 1,792 tag-releases of blue marlin in 1991, 1,723 by recreational fishermen, 68 by commercial fishermen, and 1 where the gear was not specified. Most taggings took place off the U.S. Virgin Islands (where 428 blue marlin were tagged) and off Puerto Rico (421). Other areas of frequent blue marlin tagging were: the northern Bahamas (119), Hispaniola (119), northern Florida's east coast (112), and La Guaira (111). Blue marlin were also tagged and released in smaller numbers off the coast of southeast Florida, off the middle U.S. east coast, along the Yucatan Peninsula (Cozumel and Belize), and in the northern Gulf of Mexico.

Fourteen tagged blue marlin were recaptured in 1991, 6 by recreational fishermen, 7 by commercial fishermen, and 1 where the gear type was not

specified. The locations of the 1991 blue marlin recaptures are given in Table 2.

Table 2. Release and recapture areas for blue marlin recaptured in 1991.

<u>Release Area</u>	<u>Recapture Area</u>	<u>Total</u>
Virgin Islands	Virgin Islands	1
	Puerto Rico	1
	Venezuela	2
	Barbados	1
	Venezuela	1
Puerto Rico	S.E. of Nantucket	1
Hispaniola	Grenada	1
Florida panhandle	South of Louisiana	1
La Guaira	La Guaira	1
Northern Bahamas	Northern Bahamas	1
Azores	Azores	2
South Carolina	Hatteras	1
Total:		14

The longest distance traveled by a blue marlin recaptured in 1991 was about 1,290 nautical miles,

by a fish released by a recreational fisherman off San Juan, Puerto Rico, in September of 1990, and recaptured by a longliner off Nantucket in August of 1991. This fish had been tagged with both a NMFS and a Billfish Foundation tag. Both tags were recovered, and the fish was re-released with a new NMFS tag.

The longest time at large for a 1991 blue marlin recapture was 2,199 days (just over 6 years). This fish was released and recaptured in La Guaira, gaining about 25 pounds and 34 inches. A summary of the times at large for 1991 blue marlin recaptures is given in Figure 3. Selected movements for 1991 release-recaptures are shown in Figure 4.

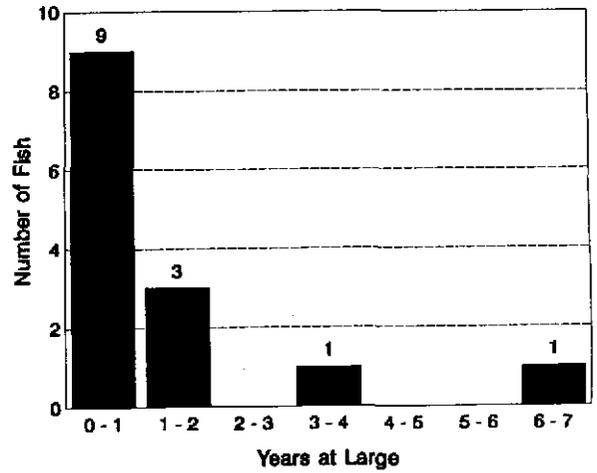


Figure 3. Years at large for 1991 blue marlin recaptures (N = 14).

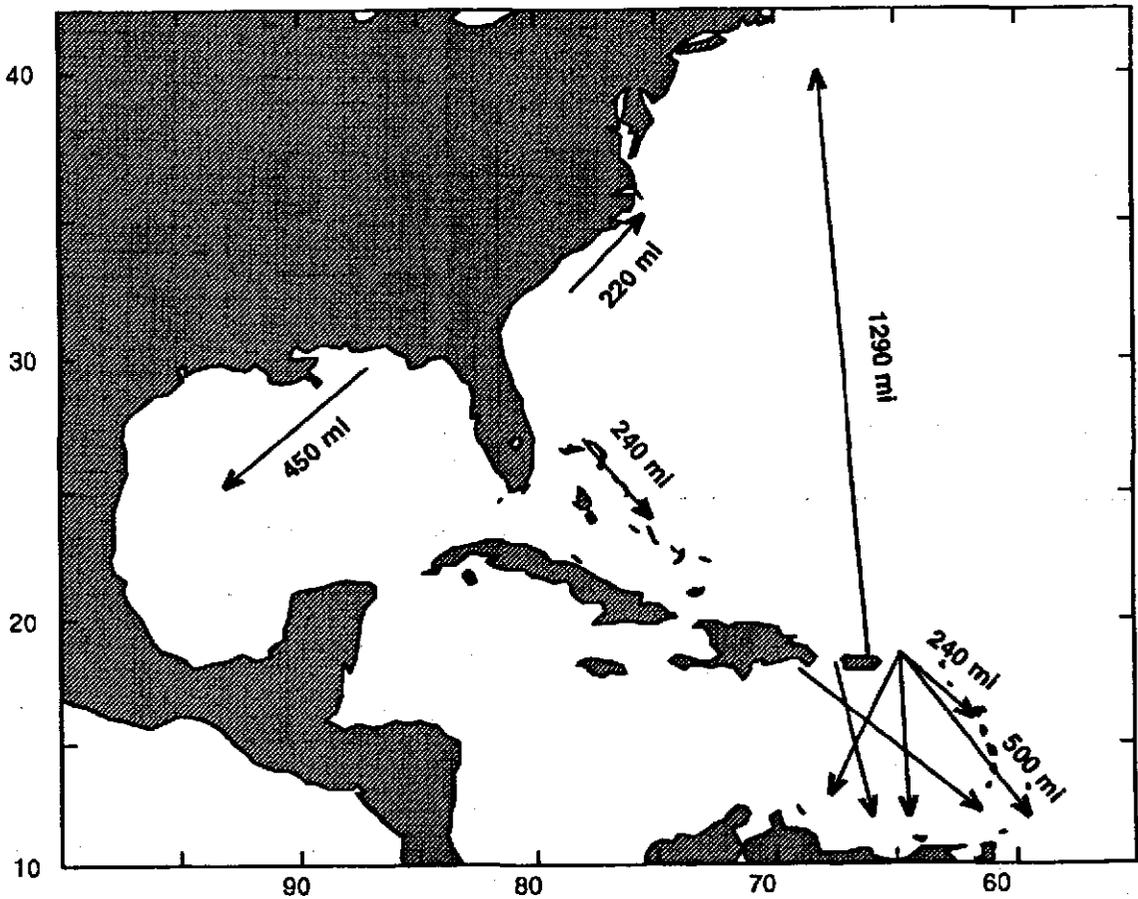


Figure 4. Movements of selected 1991 tag-recaptured blue marlin.

White Marlin

In 1991, 1,450 white marlin were tagged and released, 1,283 by recreational fishermen, 166 by commercial fishermen, and 11 by other fishermen. As in previous years, most white marlin taggings were in two areas—off the mid-Atlantic states (Cape Hatteras to Cape Cod), where 538 were tagged, and north of La Guaira, where 428 were tagged. White marlin were also tagged and released off the Florida panhandle, in other northern Gulf of Mexico waters, in the northern Bahamas, off the New England states, along the Yucatan Peninsula, and in Puerto Rico and U.S. Virgin Islands waters.

Twenty-three tagged white marlin were recaptured in 1991, 8 by recreational fishermen and 15 by commercial fishermen. The locations of 1991 white marlin recaptures are given in Table 3.

Table 3. Release and recapture areas for white marlin recaptured in 1991.

Release Area	Recapture Area	Total
La Guaira	La Guaira	3
	other Venezuelan coast	7
Mid-U.S. east coast	Mid-U.S. east coast	6
	off Cape Cod	2
	Venezuela	1
Florida panhandle	Florida panhandle	1
	Mid-U.S. east coast	1
S.E. Florida	Mid-U.S. east coast	1
off Cape Cod	Northern Bahamas	1
	Total:	23

The longest distance traveled by a white marlin recaptured in 1991 was about 1,620 nautical miles for a fish at large only 132 days. This fish was tagged and released in Baltimore Canyon, off New Jersey, in July, 1991, by recreational fishermen, and recaptured in mid-November by a Venezuelan longliner, off La Guaira. The longest time at large for a white marlin recaptured in 1991 was 2,229 days (6.1 years), for a fish tagged and released by a U.S. longliner in the northeast Gulf of Mexico and recaptured by recreational fishermen south of Pensacola. A summary of the times at large for

1991 white marlin recaptures is given in Figure 5. Selected 1991 release-recapture movements are shown in Figure 6.

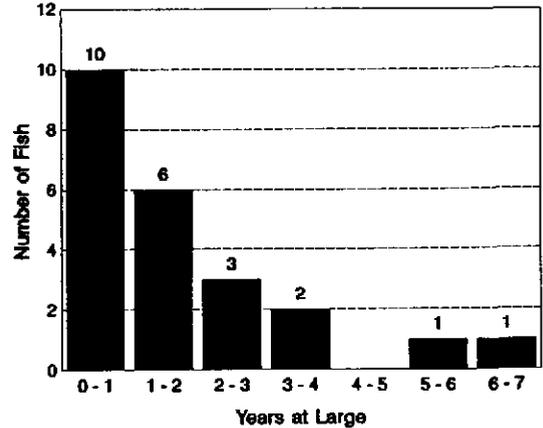


Figure 5. Years at large for 1991 white marlin recaptures (N = 23).

Swordfish

There were 1,213 swordfish tagged and released in 1991, mostly (1,200) by commercial fishermen, with recreational fishermen tagging and releasing 12 (1 release had no gear type specified). Most of the swordfish tag-releases (944) were off the middle and northern U.S. east coast, 131 were off the Florida east coast, and 112 were in the central and northern Gulf of Mexico. A few swordfish were also tagged and released in the Virgin Islands, off the coasts of Colombia and Venezuela, off Cozumel, and in the Bahamas.

Nine tagged swordfish were recaptured in 1991, 4 by recreational fishermen and 5 by commercial fishermen. Selected 1991 release-recapture movements are shown in Figure 7. The locations of 1991 swordfish recaptures are given in Table 4.

The longest distance traveled by a 1991 tag-recaptured swordfish was over 2,070 nautical miles, by a fish released by a U.S. longliner 300 miles off Vero Beach, Florida in February, 1990, and recaptured 592 days (1.6 years) later near the

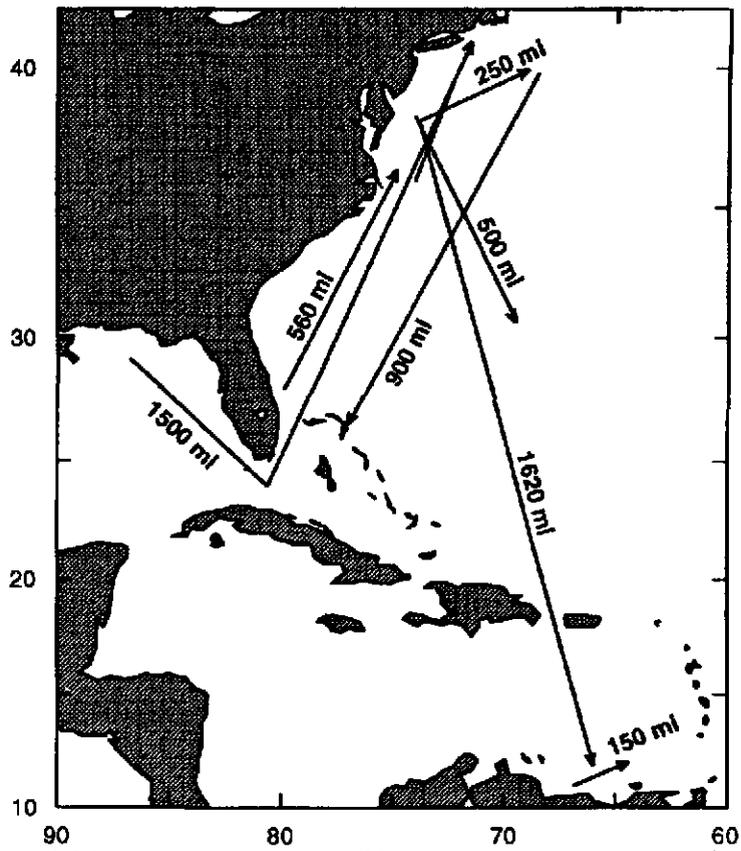


Figure 6. Movements of selected 1991 tag-recaptured white marlin.

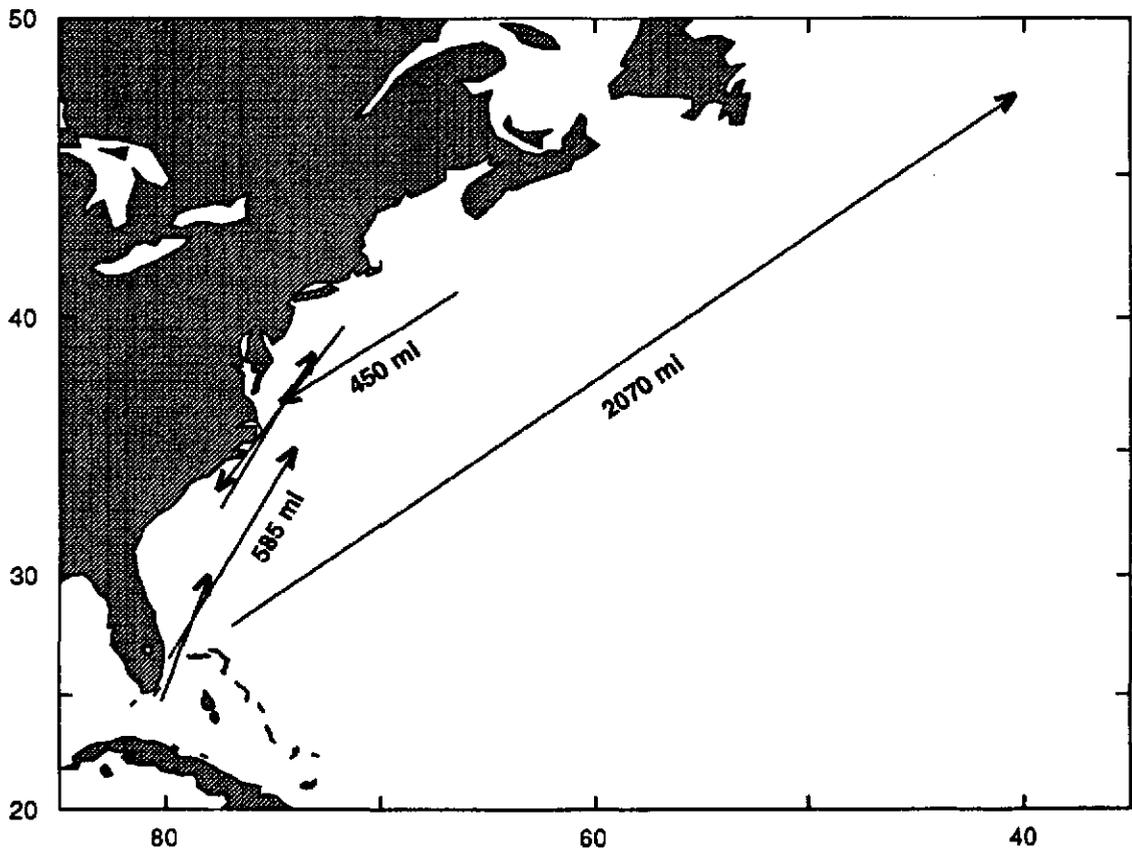


Figure 7. Movements of selected 1991 tag-recaptured swordfish.

Grand Banks 500 miles east of Newfoundland by a U.S. longliner. This is the longest distance traveled by a swordfish in the history of our tagging program. While no hard parts were kept for age and growth analyses, both length and weight data were reported by both captains, showing, among other things, that this fish more than quadrupled its weight, from an estimated 15 pounds to 70 pounds.

Table 4. Release and recapture areas for swordfish recaptured in 1991.

Release Area	Recapture Area	Total
Mid-U.S. east coast	Mid-U.S. east coast	4
	Northeast Florida	1
Northeast Florida	Mid-U.S. east coast	1
S.E. Florida	Mid-U.S. east coast	1
Florida Keys	Mid-U.S. east coast	1
Northern Bahamas	Mid-U.S. east coast	1
	Total:	9

The longest time at large for a 1991 swordfish recapture was 3,700 days (10.1 years) by a fish tagged in December, 1980, by a NMFS observer on a longline vessel, and recaptured in February of 1991 by a U.S. longliner. This fish was released and recaptured near Cape Cod, and gained nearly 300 pounds while at large. The times-at-large for 1991 tag-recaptured swordfish are summarized in Figure 8.

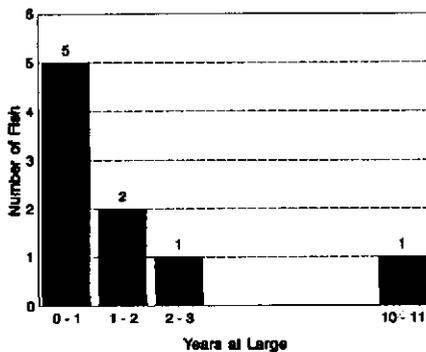


Figure 8. Years at large for 1991 swordfish tag-recaptures (N = 9).

Bluefin Tuna

There were 1,110 bluefin tuna tagged and released in 1991, 1,023 by recreational fishermen and 87 by commercial fishermen. Nearly all bluefin tagged (1,099) were released off the mid-U.S. east coast or off New England.

Twenty-two tagged bluefin were recaptured in 1991, 18 by recreational fishermen and 4 by commercial fishermen. Twenty of the recaptures were in waters of the mid-U.S. east coast, while 2 were recaptured just north of Cape Cod--all had been released in that same general area.

Both the longest distance traveled and the longest time at large were by the same bluefin tuna, which was released on June 28, 1980 and recaptured on September 18, 1991. This fish was tagged and released off Oregon Inlet, North Carolina, and recaptured north of Cape Cod, Massachusetts, a distance of almost 440 miles. The 4,099 days (11¼ years) this fish was at large is not the record for bluefin tuna in our program, but it is the longest time at large for any fish recaptured in 1991. Unfortunately, no hard parts were saved for analysis, so potentially important information was lost.

Of the other 1991 bluefin recaptures, 15 were at large less than one year, and 6 were at large between one and two years.

Yellowfin Tuna

In 1991, 969 yellowfin tuna were tagged and released, 708 by recreational fishermen and 260 by commercial fishermen. Most (874) were released off the middle and northern U.S. east coast, 22 off the northeast Florida coast, 16 off Louisiana, and 15 in Bermudan waters. Tagged yellowfin tuna were also released off Texas, Cancun, La Guaira, the Virgin Islands and Puerto Rico, and in the Bahamas.

There were 29 recaptures of tagged yellowfin tuna in 1991, 17 by recreational fishermen, 10 by commercial fishermen, and 2 where the gear type was not reported. The locations of 1991 yellowfin tuna tag-recaptures are given in Table 5.

Table 5. Release and recapture areas for yellowfin tuna recaptured in 1991.

Release Area	Recapture Area	Total
Mid-U.S. east coast	Mid-U.S. east coast	19
	off African coast	7
Bermuda	Bermuda	2
Northern Bahamas	Northern Bahamas	1
	Total:	29

The longest time at large for a 1991 tag-recaptured yellowfin tuna was 1,017 days (2.8 years) by one of the trans-Atlantic movements. This fish was tagged and released off Nantucket in June, 1988, by recreational fishermen, and recaptured in March, 1991, southwest of Sierra Leone, Africa, by a purse seine vessel. While at large, this fish gained an estimated 125 pounds, having been tagged at a relatively small size (7 pounds). A summary of the times at large for 1991 tag-recaptured yellowfin tuna is given in Figure 9.

Seven of the tagged yellowfin tuna recaptured in 1991 covered more than 3,500 nautical miles while at large. The longest distance traveled was over

4,200 miles, by a yellowfin at large 1½ years, having traveled from the "Bacardi" wreck off New Jersey in August, 1989, to the Gulf of Guinea, in February, 1991. This was one of 7 yellowfin recaptured in 1991 which crossed the Atlantic (all west to east), and one of two which crossed the equator (Figure 10).

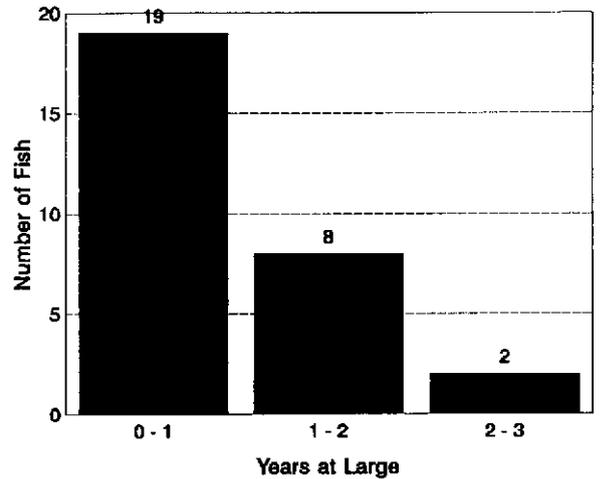


Figure 9. Years at large for 1991 yellowfin tuna recaptures (N = 29).

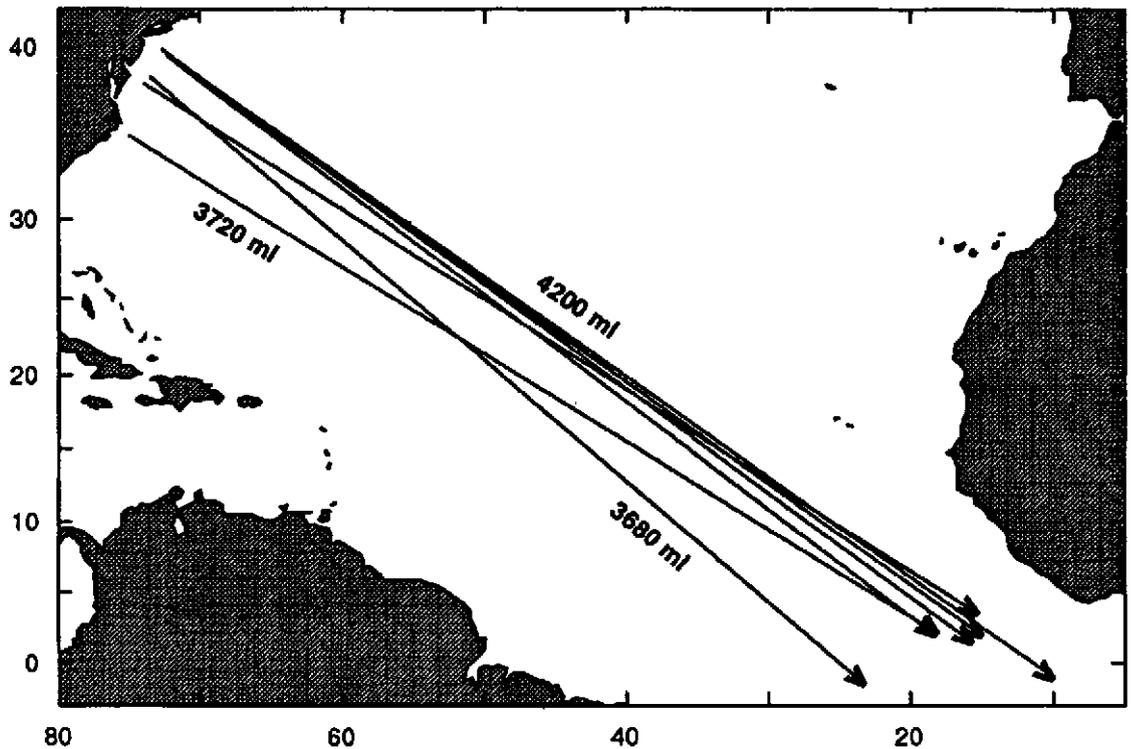


Figure 10. Trans-atlantic movements of 1991 yellowfin tuna tag-recaptures.

Other Species

While many species are tagged by program cooperators, there are several species in addition to billfish and tunas which we encourage taggers to target. Summaries of results for these species for 1991 are given below:

Amberjack: There were 1,039 amberjack tagged in 1991, mostly (563) in the Panama City, Florida area, though 213 were tagged off S.E. Florida and the Keys, and 171 off the mid-U.S. east coast. There were more amberjack tag-recaptures in 1991 than for any other species in our program--79 tagged amberjack were reported recaptured, of which 66 were at large less than 1 year, 9 between 1 and 2 years, and 4 between 2 and 3 years. The longest time at large for an amberjack recaptured in 1991 was 1,010 days (2.75 years); the longest distance traveled was 765 miles. An amberjack recaptured after almost 2 years was re-tagged, re-released, and recaptured again 19 days later, all near Islamorada. A summary of the locations of the 1991 amberjack recaptures is given in Table 6.

Table 6. Release and recapture areas for amberjack recaptured in 1991.

Release Area	Recapture Area	Total
Florida panhandle	Florida panhandle	40
Florida Keys	Florida Keys	10
	N. Florida & Carolinas	2
	S.E. Florida	1
S.E. Florida	S.E. Florida	8
	Florida Keys	1
	N. Florida & Carolinas	1
mid-U.S. east coast	Florida Keys	6
	mid-U.S. east coast	2
	S.E. Florida	1
N. Florida & Carolinas	N. Florida & Carolinas	2
	Florida Keys	2
Louisiana	Louisiana	1
	Florida panhandle	1
Azores	Azores	1
	Total:	79

Cobia: In 1991, 269 cobia were tagged and released, 81 in S.E. Florida, 59 off the mid-U.S. east coast, 32 between N. Florida and Cape Hatteras, and 97 in the northern Gulf of Mexico. There were 13 recaptures of tagged cobia, 10 having been at large less than 1 year, and 3

between 1 and 2 years--their locations of release and recapture are summarized in Table 7.

Table 7. Release and recapture areas for cobia recaptured in 1991.

Release Area	Recapture Area	Total
Florida panhandle	Florida panhandle	3
	Florida Keys	2
Florida Keys	Florida Keys	3
mid-U.S. east coast	mid-U.S. east coast	2
	N. Florida & Carolinas	1
N. Florida & Carolinas	N. Florida & Carolinas	1
	Louisiana	1
	Total:	13

The longest time at large and the longest distance traveled for a tagged cobia recaptured in 1991 were 459 days and over 1,000 miles, for a fish which traveled from Cape Canaveral to the Gulf of Mexico off western Louisiana.

King Mackerel: There were 1,947 king mackerel tagged and released in 1991, most off S.E. Florida (1,092 releases), Texas (339), and the Florida panhandle (260). There were 37 recaptures in 1991 of tagged king mackerel; the areas of release and recapture for these fish are summarized in Table 8. While most (32) tagged king mackerel recaptured in 1991 were at large less than 1 year, 2 had been released 4 years earlier. The longest distance traveled was over 900 miles by a fish released off Islamorada in January and recaptured 8 months later off Port Aransas, Texas.

Table 8. Release and recapture areas for king mackerel recaptured in 1991.

Release Area	Recapture Area	Total
Florida Keys	Florida Keys	14
	S.E. Florida	2
	Texas	1
Texas	Texas	3
	S. Yucatan (Gulf side)	2
	Florida panhandle	1
Louisiana	Florida panhandle	1
Florida panhandle	Florida panhandle	6
S.E. Florida	S.E. Florida	3
N. Florida & Carolinas	N. Florida & Carolinas	1
	S.E. Florida	1
mid-U.S. east coast	mid-U.S. east coast	1
<no release data>	S.E. Florida	1
	Total:	37

Red Drum: There were 884 releases of tagged red drum in 1991, with most releases being in waters of the Florida panhandle (268), the northern east coast of Florida (217), Louisiana (116), and Texas (108). Twenty-two tagged red drum were recaptured in 1991, nearly all in the same areas in which they had been released (the longest distance traveled was 220 miles, from Jupiter, Florida to the mouth of the St. Johns River). All but one tagged red drum recaptured in 1991 had been at large less than 1 year--the exception was a fish released and recaptured at the Galveston Bay jetties, at large for 381 days.

Tarpon: The purchasing and distribution of tags for tarpon is now being managed by the Florida League of Anglers. They provide tags to those people who request them, purchasing the tags with donations made to them by clubs and individuals. If you would like to assist them by tagging or by sending a donation, please contact:

Florida League of Anglers
c/o Norma Stoppelbein
P.O. Box 1109
Sanibel, Florida 33957

There were 960 tarpon tagged and released in 1991, most along the west (380 releases) and southeast (230) coasts of Florida, and in Louisiana (319). There were 13 recaptures in 1991 of tagged tarpon. Very little movement was shown, with the longest distance traveled being 250 miles, from Captiva Island (near Ft. Myers, Florida) to Cape San Blas (south of Panama City, Florida). The same fish had the longest time at large, 2,208 days (6 years); 5 of the 1991 tag-recaptured tarpon had been at large 3 years or more.

Measuring Age and Growth with Tag-Recapture Data

The study of age and growth plays a central role in fishery biology. We cannot fully understand many life history changes or biological events without age and growth information. Growth rates are necessary in many fisheries models and can help form the basis of important decisions in resource management, such as setting limits, quotas, and fishing seasons.

A measurement of growth can be achieved by relating age (obtained from vertebra, earbones,

scales, or other hard parts) to length for several specimens. However, determining age using these methods in the tropics and with highly migratory species can be difficult or impossible on a large scale. This is due, in part, to the fact that the effects of a changing season are less pronounced in the tropics, and without these seasonality effects, the yearly bands counted to estimate age are difficult to determine or absent altogether. In addition, validating the accuracy of aging methods in highly migratory tropical fish is very difficult. The use of tag-recapture information is one way to accomplish this. Here, all that is required is a size at release, a size at recapture, and a sufficiently long time at large.

It has been generally accepted that fish growth can be expressed in terms of three descriptors or *parameters*. These relate to the maximum size a fish can attain, the rate at which it gets there, and a component relating these two parameters to time or age. Growth parameters change according to species, population, and time. Fortunately, there are some consistent patterns that can be observed within a stock of fish. As with humans, fish grow quickly at first, then more slowly as they approach their maximum length (though weight may continue to increase). These changes in growth are what allows tagging information to be useful for studying this problem.

Growth can be measure directly based on the change in size from release and recapture data. If the length of time a tag-recaptured fish has been at large is substantial, then we can compare age-estimates from its hard parts to age we compute from our tagging records. This procedure can validate the accuracy of our aging techniques. If we have several fish of known age and length, we can then assign ages to sampled fish. With a large number of tag-recapture data points, we start to see clear patterns of age and growth emerge for a particular species. The tagging information which has been collected through participants of the CGFTP is used to study age and growth for a number of species for which no other method is currently practical.

What Information Is Needed?

The usefulness of tag-recapture data can vary widely, depending on the quality of the information provided to the tagging program. Movement and

stock management studies can be done more accurately if complete information is reported for the locations and dates of release and recapture. The quality of growth information derived from tagging studies--as described earlier--is directly related to the accuracy of the length and weight measurements and the length of time the fish has been at large. If the estimate of length at release is too high, then there is the potential that the reported length at recapture will show "negative growth." Thus, these data may not be useful in a growth study. Lengths and weights should be estimated or measured as precisely as possible.

In the past, tagging programs have not been as successful as they could be in getting all the important data from people who release or recapture tagged fish. The main reason for this is that people don't always know what information we need. We are trying two ways to improve the quality of data reported to us. First, we have developed a **Tag Recapture Card** (Figure 11). It is printed on fluorescent orange paper, so that no matter how much time passes before you recapture a tagged fish, you will be able to find it easily among your boat papers. All of the information we would like to have from a recaptured fish is listed on the card, so you can fill in everything immediately after the recapture. The **Tag Recapture Card** is available in English and Spanish.

Second, we are considering changes to the **Fish Tagging Report card** (Figure 12) that would clarify the following points:

When you fill out your **Fish Tagging Report card**, please keep these items in mind:

- Fill in the exact date.
- Give the location in degrees and minutes of latitude and longitude, if possible (if not, try to give us the Loran position). If this is not possible, tell us how far you were offshore, or the distance from some landmark.
- The length and weight boxes on the tagging card specify estimated size. If you measure the fish instead, please either

cross out the (*est*) on the card or write in "measured." Also let us know if the length was *Total* (from the tip of the nose or bill to the end of the tail) or *Lower Jaw to Fork Length (LJFL)* (from the end of the lower jaw to the fork of the tail).

We send acknowledgement cards to tagging participants to confirm that we received the release card(s). If you do not receive an acknowledgement card, please inform us as soon as possible. It is also a good idea to keep a log of tagging information so that you can provide us with accurate information in case the data are lost. Tag-release cards are occasionally lost in the mail, but if we can find out about the loss before too much time passes, there is a chance that we can work together to recover the data. We usually send acknowledgement cards to the captain only, so if you would like one sent to the angler, please note this on the release card.

With the number of participants in the CGFTP growing every year, and the quality of the data improving as well, we can expect to see tag-recapture information playing an increasingly greater role in the study and management of fisheries.

Other New Developments in the Program

In our continuing efforts to improve the tagging program and its equipment, several changes have been made in the last year. The \$5⁰⁰ reward given in the past will only be available by special request. Instead, we are now offering a CGFTP hat as a reward to the person reporting the capture of a tagged fish. These embroidered corduroy hats are available in gray and black. Gray hats are reserved exclusively for fishermen reporting tag-recaptures. The black hat can be purchased by anyone sending a check or money order for \$10⁰⁰ to:

National Embroidery Company
P.O. Box 870
Portsmouth, RI 02871

OMB Approved No. 0648-0259 Expires 09/30/94

TAG RECAPTURE CARD

1. SPECIES: _____
2. TAG NUMBER: _____
3. DATE RECAPTURED: _____
4. LOCATION/COUNTRY RECAPTURED: _____
5. LENGTH (inches/centimeters): _____ (lower jaw fork length)
6. WEIGHT (pounds/kilograms): _____ SEX: Male Female
7. FISHING GEAR: _____
8. NAMES OF BOAT AND CAPTAIN/ANGLER: _____
9. ADDRESS OF (8) ABOVE: _____
10. PHONE OF (8) ABOVE: _____
11. HAS FISH BEEN SAVED (PRESSING) SO IT CAN BE SAMPLED?
 YES NO

THERE IS AN EXTRA REWARD FOR A FROZEN FISH. CALL COLLECT
 (305) 361-4248 (Daytime)
 (305) 598-0944 (Night/Weekends)

12. COMMENTS: _____

Figure 11: Tag Recapture Card. Printed on fluorescent orange card stock.

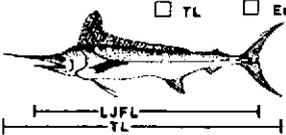
Fish Tagging Report <small>(PLEASE PRINT)</small>		<small>NOAA FORM 00-000 F.SEC U.S. DEPARTMENT OF COMMERCE (7-92) OMB Approved No. 0000-0000 NOAA-NMFS</small>	
<i>Please complete and return card as soon as possible</i>			
Tagging Date	Species	Tag No.	
Tagging Location (Lat. and Long. Preferred)		Length (in.) <input type="checkbox"/> LJFL <input type="checkbox"/> Meas. <input type="checkbox"/> TL <input type="checkbox"/> Est.	
Fish Condition/Remarks			
Hooks Removed <input type="checkbox"/> Yes <input type="checkbox"/> No, leader out	Fighting Time	Weight (lbs.) <input type="checkbox"/> Meas. <input type="checkbox"/> Est.	
Angler		Captain	
Address		Address	
City/State/Zip		City/State/Zip	
Send more tags to <input type="checkbox"/> Captain <input type="checkbox"/> Angler Quantity: _____		This report is authorized by law U.S.C.P.L. 00-000. While you are not required to respond, your cooperation is needed to make the results of this survey comprehensive, accurate, and timely. Thank you for your contribution.	

Figure 12: Proposed tagging release card.

We are also changing the design of the "E" tag, the nylon dart tag currently used on red drum, king mackerel, and tunas. The new tag is designed to combine the piercing quality of stainless steel with the biological compatibility of medical-grade nylon. The streamer will no longer be attached to the head with glue, but mechanically by a loop of monofilament and shrink-tubing, so tag shedding should be significantly decreased. Fishermen will no longer be forced to spread the barbs open by hand, since the new design has the barbs molded open. Expect to see this new tag sometime early in 1993--until then, continue to use the current nylon dart tags.

What To Do If You Recapture a Tagged Fish

Persons catching a tagged fish should understand that, to maximize the value of the information we obtain from tag-recaptures, the whole fish needs to be saved for scientific examination. If the fish is a billfish or tuna, we recommend that you *save* the whole fish (by freezing, if possible) and contact the CGFTP immediately at (800) 437-3936 for further instructions. On weekends or at night, call Dr. Eric Prince at (305) 598-0944.

Commercial Participation

Commercial fishermen contribute significantly to our tag-release efforts. More blue and white marlin were recaptured by commercial fishermen in 1991 than by recreational fishermen. The largest group of commercial fishermen involved in our program is the *Blue Water's Fisherman's Association (BWA)* (Table 9). These longliners accounted for over 12% of the tag-releases in 1991. Their efforts are especially apparent among swordfish and yellowfin tuna releases--1,028 swordfish (84.7% of swordfish tagged) and 238 yellowfin (24.6% of yellowfin tagged) were released by *BWA* members, and we sincerely appreciate their efforts.

Table 9. *Blue Waters Fishermen's Association* members tagging 50 or more fish in 1991.

<u>Captain</u>	<u>Number of Fish Tagged</u>
Larry Horne	304
T. Baker Dunn	222
Richard Mears	221
Nelson Beideman	217
Keith Larson	128
Larry Thompson	128
Rick Ross	102
A. J. Surrey	99
James Mears	84
Eric Burcaw	69
Tom Barrie	57
Dan Mears	52
Brigham Enck	50

Tagging Awards

The CGFTP and Axelson Fishing Tackle Company (AFTCO) first started a cooperative effort to recognize contributors to conservation of our marine fish resources in 1989. Several other tagging programs also back the effort, including The Billfish Foundation, Fish Trackers, Inc., Gulf Coast Conservation Association, and the South Carolina Marine Game Fish Tagging Program. Anglers and captains compete for handsome trophies for those tagging the most of each of the nine designated species. All fish must have been tagged in the Atlantic, Gulf of Mexico, or Caribbean Sea. Anglers and captains who tagged a certain number of the species received an AFTCO Tag Flag award. The designated species, and the number required to qualify (in parentheses) for the AFTCO Tag Flag for each species, are: albacore (5), amberjack (10), bigeye and/or yellowfin tuna (5), bluefin tuna (5), blue marlin (3), white marlin (5), sailfish (10), and cobia (10) (note: cobia and amberjack have been dropped from future Tag/Flag tournaments). For further information about the AFTCO Tag/Flag Tournament, contact the CGFTP or the AFTCO Manufacturing Co., 17351 Murphy Ave., Irvine, CA 92714. The winners of the 1991 individual are listed in Table 10.

AFTCO also awards trophies to the angler and captain who tagged the most billfish overall. The winners for 1991 were angler Rus Hensley, who

tagged 157 billfish, and captain Luis Suarez, who tagged 311.

Because of changes in the way data are communicated to AFTCO, Captain Brad Simonds was inadvertently denied the AFTCO Captain's Trophy for 1990. To help resolve this error, The Billfish Foundation and the Islamorada Charter Boat Association have co-sponsored a special 1990 Captain's Trophy for Capt. Simonds, making him the co-winner for 1990 of that trophy, with Captain Randy Jendersee.

We began to acknowledge participants of the CGFTP in 1976. We cannot give taggers credit for fish tagged and released unless we receive the tag-release cards. Please make sure the addresses on the cards are correct and complete. Program participants for 1991 are listed in Appendices 1 and 2.

The CGFTP extends its congratulations to the winning anglers and captains, and to the sponsoring organizations for their effort and cooperation in the conservation of our marine game fish resources.

Table 10. Winners of the 1991 individual trophies (both anglers and captains tagging the most fish in the designated species) for the AFTCO Tag/Flag tournament.

Species	Winners	
	Angler (number tagged)	Captain (number tagged)
Albacore Donated by:	Art Long (11) New York Sportfishing Federation	Fred Rushin (23) American Fishing Tackle Manufacturers Assoc.
Bluefin Tuna Donated by:	Lee Pepin (43) International Game Fish Assoc. (IGFA)	Al Anderson (192) International Game Fish Assoc. (IGFA)
Bigeye and Yellowfin Tuna Donated by:	Stanley Klimek (34) American Fishing Tackle Manufacturers Assoc.	Bob Crowwait (113) American Fishing Tackle Manufacturers Assoc.
Blue Marlin Donated by:	Jim Edmiston (69) National Coalition for Marine Conservation	Billy Borer (95) National Coalition for Marine Conservation
White Marlin Donated by:	Rus Hensley (44) The Billfish Foundation	Luis Suarez (183) The Billfish Foundation
Sailfish Donated by:	Hal Prewitt (120) Sport Fishing Institute	Paul Ivey (125) Sport Fishing Institute
Amberjack Donated by:	Jeff Hendrix (113) Florida Conservation Assoc.	Bob Zales (238) (no trophy sponsored)
Cobia Donated by:	Buddy Schultz (148) Atlantic Coastal Conservation Assoc.	Ben Fairey (135) Florida Conservation Assoc.

EXPANSION OF THE PROGRAM

The CGFTP was initiated in 1954 to encourage public participation in tagging bluefin tuna to gain information on their movements and biology. The Program quickly expanded to include billfishes, and over the years other species of fish were added to the list of target species as need to conserve our marine resources increased. The number and variety of participants in CGFTP also increased proportionately in size and complexity. Today, over 10,000 participants contribute to the program from virtually every segment of the recreational and commercial fishing communities. We are now not only involved with our traditional efforts but also in cooperative programs with other groups for whom we keep records, such as the Florida League of Anglers (tarpon), Billfish Foundation (billfish), AFTCO (Tag a Tuna), Blue Water Fishermen's Association (tuna, swordfish, billfish), and NMFS' Marine Turtle Tagging Program. In addition, attempts by various domestic and international agencies in the last few years to manage many fish stocks over large geographical areas has pointed out the need for a regional central depository for all tagging data in the Atlantic Ocean. In response to this need, the Southeast Fisheries Science Center has recently developed computer software so that state, international, and private fisheries agencies who have their own tagging programs can store and have access to all these data in one location.

Agencies indicating that they will participate in this program include: The International Commission for Conservation of Atlantic Tunas (ICCAT); ICCAT member countries such as Côte d'Ivoires, Senegal, and Brazil; Fishery Resource Assessment and Management Program of the Caribbean Community (CARICOM); Government of Fisheries and Ocean of Canada; most coastal state agencies along the U.S. east coast; and private tagging agencies like the Littoral Society, Fish Trackers Inc., and The Billfish Foundation.

The sum total of all these changes to the Program have greatly expanded the functions and role of what was originally a tagging program comparatively narrow in scope to one that now includes many more target species and greatly increased volunteer participation by all segments of the fishing community, as well as cooperative data storage and data manipulation by state, international and private tagging agencies in the Atlantic. For this reason, starting in 1993, the name of the umbrella program for all functions will be called the COOPERATIVE TAGGING CENTER (CTC). Since the original functions of the CGFTP will remain intact, we will continue to use this name for the activities for which it was originally intended. However, keep in mind that your tagging efforts are now part of a larger regional tagging effort involving many different marine resources.

IN MEMORIAM

Edwin L. Scott, long-time manager of the Cooperative Game Fish Tagging Program, passed away January 11, 1992. Ed was on his way to play golf, one of his favorite pastimes, when he suffered a fatal heart attack. Ed graduated from the University of Miami in 1964 and came to work for the National Marine Fisheries Service on Virginia Key as a biologist the same year. In 1966, he temporarily joined the staff at the Rosenstiel School of Marine and Atmospheric Sciences (University of Miami) and spent one year working out of fishing ports in the Côte d'Ivoires, Angola, and Congo sampling the catches of purse seiners and bait boats in the newly-developing tuna fishery in the Gulf of Guinea (Africa). Ed became manager of the tagging program in 1978, when NMFS took over responsibility of the program from Woods Hole Oceanographic Institute. Since



part of Ed's job was to interact with participants in the tagging program, Ed had contact with virtually thousands of anglers over the years. Ed's congenial personality was well suited to his job, and enabled him to acquire a very large circle of friends and personal acquaintances. Ed was also interested in the biology of juvenile pelagic fish. In cooperation with his colleagues, he developed, tested, and published on the design of a circular aquarium for shipboard use that allowed extended observations on these life stages. In addition to golf, Ed was an avid orchid grower and an accomplished bagpipe player. In fact, Ed played the bagpipes at the inauguration of the late President John F. Kennedy. Ed is survived by his wife, Aida. We will all miss Ed's good nature, humor, and friendship.

Appendix 1. Captains who made outstanding contributions to the CGFTP in 1991 by assisting in the tagging of 10 or more blue marlin, white marlin, sailfish, bluefin tuna, yellowfin tuna, blackfin tuna, and miscellaneous tunas. "Tagged as Angler" columns signifies fish tagged by captains while fishing as anglers--these fish are included in the total. An asterisk (*) denotes a commercial longliner.

Captain	Species								Total Tagged	Tagged as Angler
	Sail Fish	Blue Marlin	White Marlin	Sword Fish	Bluefin Tuna	Yellowfin Tuna	Blackfin Tuna	Other Tunas		
Luis Suarez	65	63	183	0	0	0	0	0	311	0
Larry Horne*	3	9	10	178	6	65	0	2	273	0
T Baker Dunn*	39	11	14	108	0	50	0	0	222	0
James Barnes	105	38	65	1	0	0	0	0	209	0
Richard Mears*	3	6	28	81	20	58	0	0	196	0
Al H Anderson	0	0	0	0	192	0	0	0	192	0
Paul Ivey	124	14	43	0	0	0	0	0	181	1
Luis Millan	59	18	92	0	0	0	0	0	169	0
Brad Simonds	118	37	2	0	0	1	0	0	158	0
John Bayliss	3	3	12	0	0	107	5	0	130	0
Larry Thompson*	0	0	10	90	1	26	0	0	127	0
Bob Crowswait	4	2	4	0	0	113	1	1	125	0
Nelson Beideman*	0	5	9	33	12	46	0	17	122	0
Dick Deason	93	0	20	0	0	0	0	0	113	5
Keith Larson*	0	0	0	59	12	26	0	8	105	0
Bill Borer	17	65	15	0	0	4	0	0	101	0
Rick Ross*	0	2	17	39	1	39	0	1	99	0
A J Surrey*	1	1	9	67	2	10	0	7	97	0
Robert E Rowan	0	0	0	0	91	1	0	0	92	18
Dennis Merten	4	0	0	0	81	3	0	1	89	11
O B Vernon O'Bryan	56	15	12	0	0	0	0	0	83	4
James D Mears*	1	1	2	35	0	43	0	1	83	0
Salvadore San Martin	72	0	3	0	0	0	0	0	75	0
Fred Rushin	16	1	8	0	5	14	1	25	70	0
Eric Burcaw*	0	0	1	48	0	12	0	2	63	0
Steven Seaman	22	8	1	0	0	30	2	0	63	3
Jerry Shepherd	1	0	1	0	0	43	18	0	63	0
Hank Halliger*	3	3	12	31	0	5	6	2	62	0
Pete Barrett	0	0	0	0	18	30	0	10	58	17
Randy Rendssee	52	2	4	0	0	0	0	0	58	1
Ben Tribken	0	0	0	0	38	19	0	1	58	0
Tom Barrie*	0	1	0	48	4	2	0	1	56	0
William E Doersbacher	55	0	0	0	0	0	0	0	55	0
Donald Merten	0	41	10	0	0	0	0	0	51	0
Dan Mears*	0	1	2	23	3	21	0	0	50	0
Mike Patrick	40	5	4	0	0	0	0	0	49	0
Brigham Enck*	0	0	4	33	10	0	0	0	47	0
Tim McDonough*	3	3	11	23	0	5	0	2	47	0
Robert Reece	39	0	8	0	0	0	0	0	47	0
Joe Brodesser	43	2	0	0	0	0	0	0	45	18
Charles Peyton	41	0	2	0	0	0	0	0	43	0
Mike Benitez	1	35	5	0	0	0	0	0	41	5
John W Caldwell*	0	4	3	29	5	0	0	0	41	0
Barry Marx*	0	0	1	26	0	13	0	0	40	0
John Sabonis	1	33	3	0	2	0	0	0	39	0
Charles E Bouchard	38	0	0	0	0	0	0	0	38	14
Hector Lopez Flores	1	31	6	0	0	0	0	0	38	0
Everett A Petronio	0	0	0	0	38	0	0	0	38	0
Don Hamilton	1	33	2	0	0	0	0	0	36	0
F J Buzo	28	0	6	0	0	0	0	0	34	0
Alex Adler	32	0	0	0	0	0	1	0	33	0
Skip Nielsen	25	0	0	0	0	0	8	0	33	4
Rick Pagliuca	0	0	0	0	33	0	0	0	33	0
Jim Garrity	28	1	3	0	0	0	0	0	32	1
Dean Adler	22	7	2	0	0	0	0	0	31	6

Appendix 1. continued

Captain	Species								Total Tagged	Tagged as Angler
	Sail Fish	Blue Marlin	White Marlin	Sword Fish	Bluefin Tuna	Yellowfin Tuna	Blackfin Tuna	Other Tunas		
Scott Drabinowicz*	1	1	4	18	1	5	0	1	31	0
Alan Fields	0	1	7	0	0	23	0	0	31	0
Robert Rucky*	0	0	1	28	1	1	0	0	31	3
Michael Johnson*	0	1	1	13	5	8	0	2	30	0
Jim Sharpe	29	0	1	0	0	0	0	0	30	0
Everett Bassett	29	0	0	0	0	0	0	0	29	5
Alan J Card	0	15	4	0	0	5	5	0	29	0
Ed Dwyer	21	2	0	0	0	5	0	0	28	7
Clyde Upchurch	26	2	0	0	0	0	0	0	28	2
Peter Dubose	4	6	17	0	0	0	0	0	27	0
Bill Noll	27	0	0	0	0	0	0	0	27	2
Maurice Schaub*	0	2	6	14	0	4	0	0	26	0
Walter Van Koppen	1	0	0	0	0	25	0	0	26	0
Joseph "Spike" Herbert	2	21	2	0	0	0	0	0	25	0
Juan "Tito" Martinez	0	24	1	0	0	0	0	0	25	0
William McCauley	1	24	0	0	0	0	0	0	25	0
Michael Aikens	3	5	16	0	0	0	0	0	24	0
Christian Einselen*	0	0	1	23	0	0	0	0	24	0
Socko Gorenflo	24	0	0	0	0	0	0	0	24	1
James E Lambert	24	0	0	0	0	0	0	0	24	5
Gerald E Seaman	23	1	0	0	0	0	0	0	24	2
Paul D Motta	20	3	0	0	0	0	0	0	23	8
Paul Tagliavia	3	3	10	0	7	0	0	0	23	0
Christian Benazeth	22	0	0	0	0	0	0	0	22	0
Darren McClave*	2	3	1	16	0	0	0	0	22	1
Michael Neil*	0	3	3	13	2	1	0	0	22	0
Frances Ramella	0	0	0	0	22	0	0	0	22	9
Domingo Isaac	0	21	0	0	0	0	0	0	21	0
Joe Motta	2	17	2	0	0	0	0	0	21	0
Jack Plachter	21	0	0	0	0	0	0	0	21	0
Allen L Owen	0	0	3	0	1	16	0	0	20	0
Dorsey Prothman	11	7	2	0	0	0	0	0	20	1
Ray Blume	2	14	3	0	0	0	0	0	19	0
Robert Burcaw*	0	0	0	15	0	0	0	4	19	0
T Rich Templeton	0	0	0	0	19	0	0	0	19	1
Michael Wyden	19	0	0	0	0	0	0	0	19	8
José Eduardo Alcaide	2	12	4	0	0	0	0	0	18	0
Mike Lepree	15	0	3	0	0	0	0	0	18	0
Eugene "Geno" Miller	0	16	2	0	0	0	0	0	18	4
David Reilly	18	0	0	0	0	0	0	0	18	1
Russell Young	0	10	8	0	0	0	0	0	18	0
Frank Branch	0	17	0	0	0	0	0	0	17	0
Luis Brau	1	16	0	0	0	0	0	0	17	0
Bob Brown	16	0	1	0	0	0	0	0	17	0
Dave Purdo	16	1	0	0	0	0	0	0	17	0
Allan J Ristori	0	0	0	0	17	0	0	0	17	6
Jeff West	0	17	0	0	0	0	0	0	17	0
Abelardo Ariza	0	16	0	0	0	0	0	0	16	0
Raymond Fernandez	0	16	0	0	0	0	0	0	16	1
F E "Bubba" Gaston	16	0	0	0	0	0	0	0	16	0
Timothy J Hyde	15	0	1	0	0	0	0	0	16	2
Dan Lucy	0	0	16	0	0	0	0	0	16	0
Greg Martin	2	14	0	0	0	0	0	0	16	0
David Merrill	0	0	0	0	6	0	0	10	16	0
Mike Paloscio*	3	1	1	10	0	1	0	0	16	0
Jack Reece	0	13	3	0	0	0	0	0	16	1
Jody Cenac	9	1	5	0	0	0	0	0	15	5
Justin Conder	1	14	0	0	0	0	0	0	15	0

Appendix 1. continued

Captain	Species								Total Tagged	Tagged as Angler
	Sail Fish	Blue Marlin	White Marlin	Sword Fish	Bluefin Tuna	Yellowfin Tuna	Blackfin Tuna	Other Tunas		
Tom Davis*	0	0	0	11	4	0	0	0	15	0
Lawrence Festa	0	0	0	0	2	12	0	1	15	7
Richard R Hayes	14	1	0	0	0	0	0	0	15	0
Mark E Hill	10	1	1	0	1	2	0	0	15	0
Luis Pinales	1	2	12	0	0	0	0	0	15	0
Chet Rohrbach	2	1	12	0	0	0	0	0	15	0
Steve Venini	15	0	0	0	0	0	0	0	15	0
Rom Whitaker	6	6	3	0	0	0	0	0	15	0
Mike Adkins	0	0	12	0	2	0	0	0	14	1
Todd Baad	12	0	1	0	0	0	1	0	14	0
Tommy Baldwin	0	0	0	0	0	14	0	0	14	0
Carlos Lasia	8	0	6	0	0	0	0	0	14	0
Ed Mossbrook	10	2	2	0	0	0	0	0	14	1
Tom Byrne	0	0	7	0	0	6	0	0	13	2
Jimmy David	13	0	0	0	0	0	0	0	13	5
Ted D'Esposito	13	0	0	0	0	0	0	0	13	0
Jack Falcucci	3	0	10	0	0	0	0	0	13	0
Roddy Hays	0	5	1	0	0	5	0	2	13	0
Kenneth Hyman	0	0	0	0	8	5	0	0	13	3
Charles Johnson*	1	1	1	10	0	0	0	0	13	0
Ally Mercier*	0	0	0	12	0	1	0	0	13	0
Henry Otto	13	0	0	0	0	0	0	0	13	0
Alex Sutton*	0	1	1	4	0	7	0	0	13	0
Allen DeSilva	0	5	5	0	0	2	0	0	12	0
Rick Herishen	12	0	0	0	0	0	0	0	12	0
Esteban Irizarry	0	12	0	0	0	0	0	0	12	0
Arty Trager	0	12	0	0	0	0	0	0	12	1
Rufus Wakeman	12	0	0	0	0	0	0	0	12	3
Mel Walker	12	0	0	0	0	0	0	0	12	0
Jose C Baco	0	11	0	0	0	0	0	0	11	5
Mal Brown	0	0	0	0	0	11	0	0	11	3
Floyd Carrington	0	0	0	0	11	0	0	0	11	0
Robert Cassidy	0	0	0	0	9	2	0	0	11	3
Rick Elfvin	11	0	0	0	0	0	0	0	11	1
Dew Forbes	7	2	2	0	0	0	0	0	11	1
Harry Graves	4	7	0	0	0	0	0	0	11	0
George Hehner	0	0	0	0	11	0	0	0	11	5
Ronald Hofmann	0	0	10	0	0	1	0	0	11	1
Michael Laufle	11	0	0	0	0	0	0	0	11	0
Thomas Mechlin	11	0	0	0	0	0	0	0	11	0
Robert Richardson	11	0	0	0	0	0	0	0	11	0
Paul Roydhouse	7	1	3	0	0	0	0	0	11	0
Donald Sowers	0	1	10	0	0	0	0	0	11	1
Thomas Zsak	11	0	0	0	0	0	0	0	11	0
Joseph Barlia	1	9	0	0	0	0	0	0	10	0
Jim Bowman	7	2	1	0	0	0	0	0	10	0
Don Clark	10	0	0	0	0	0	0	0	10	0
Kevin Dillon	10	0	0	0	0	0	0	0	10	4
Mike Green*	0	0	0	10	0	0	0	0	10	0
Charles Johnson	0	0	1	0	9	0	0	0	10	3
Randy Jones	0	0	0	0	0	10	0	0	10	0
Keith Leonard	1	8	1	0	0	0	0	0	10	0
Isaias Mora	1	9	0	0	0	0	0	0	10	2
Lee Rosback	10	0	0	0	0	0	0	0	10	0
K Herman Schwarzkopf	9	1	0	0	0	0	0	0	10	0
Dan Stephano	0	0	4	0	0	4	0	2	10	0
Tony Tillet	0	0	10	0	0	0	0	0	10	0

Appendix 2. Anglers who made outstanding contributions to the CGFTP in 1991 by assisting in the tagging of 10 or more blue marlin, white marlin, sailfish, bluefin tuna, yellowfin tuna, blackfin tuna, and miscellaneous tunas. "Tagged as Captain" column signifies fish tagged by anglers while fishing as captains--these fish are included in the total.

Angler	Species								Total Tagged	Tagged as Captain
	Sail Fish	Blue Marlin	White Marlin	Sword Fish	Bluefin Tuna	Yellowfin Tuna	Blackfin Tuna	Other Tunas		
Hal Prewitt	118	8	42	0	0	0	0	0	168	0
Rus Hensley	85	28	47	1	0	0	0	0	161	0
Jim Edmiston	18	52	15	0	0	4	0	0	89	2
Frank J Braddick	0	0	0	0	65	0	0	21	86	14
Stanley Klimek	1	0	1	0	0	36	18	0	56	0
Sara Devine	36	0	11	0	0	0	0	0	47	0
Lee Pepin	0	0	0	0	44	0	0	0	44	1
Mel Immergut	3	0	0	0	33	3	0	1	40	0
Andrew D'Angelo	0	1	0	0	36	0	0	0	37	14
Art Long	11	0	4	0	5	2	1	12	35	0
Chris Gooch	25	1	8	0	0	0	0	0	34	0
J Richard Jeck	30	4	0	0	0	0	0	0	34	0
David Bregman	0	0	0	0	0	25	0	0	25	0
Edward Dickinson	3	5	16	0	0	0	0	0	24	0
Alan P Gelfuso	0	0	1	0	23	0	0	0	24	0
John Bassett	23	0	0	0	0	0	0	0	23	0
Glenn Helton	23	0	0	0	0	0	0	0	23	0
James Labar	20	0	3	0	0	0	0	0	23	0
Jack Lawton	16	4	1	0	0	0	0	0	21	0
Juan Torruella	1	19	0	0	0	0	0	0	20	9
John Wengler	0	14	3	0	0	0	0	0	17	0
Bud J Arwood	16	0	0	0	0	0	0	0	16	5
Linda Noll	16	0	0	0	0	0	0	0	16	0
Adrienne Sorg	16	0	0	0	0	0	0	0	16	0
Jackie Benazeth	15	0	0	0	0	0	0	0	15	0
Ralph Christiansen	0	14	1	0	0	0	0	0	15	0
Lyman B Dickerson	15	0	0	0	0	0	0	0	15	0
Raphael Rivera	0	15	0	0	0	0	0	0	15	4
Miguel Correa	0	13	1	0	0	0	0	0	14	0
Dave Coverdale	0	0	0	0	0	14	0	0	14	0
Henry S Urbaniak	8	0	6	0	0	0	0	0	14	0
Chris Broman	0	1	5	0	7	0	0	0	13	0
Lynn Rider	5	7	1	0	0	0	0	0	13	0
Debbie Schutzza	3	1	9	0	0	0	0	0	13	0
Jeff Sessa	13	0	0	0	0	0	0	0	13	6
Dave Baggett	12	0	0	0	0	0	0	0	12	3
Bucky Buchanan	0	0	0	0	0	12	0	0	12	0
Donald S Leas	9	1	2	0	0	0	0	0	12	0
Peter McKay	0	0	0	0	12	0	0	0	12	0
David Stine	0	0	0	0	12	0	0	0	12	0
Joseph M Zimmer	0	0	4	0	0	8	0	0	12	1
Miguel Barletta	0	3	8	0	0	0	0	0	11	1
Rich Barrett	0	0	0	0	0	11	0	0	11	0
Richard Carr	0	0	0	0	11	0	0	0	11	0
Paul Litt	0	0	0	0	11	0	0	0	11	0
James D Motta	2	7	2	0	0	0	0	0	11	0
Bob Abbruzzese	0	0	0	0	10	0	0	0	10	0
Gary Beaver	10	0	0	0	0	0	0	0	10	1
Rachel Forrest	10	0	0	0	0	0	0	0	10	0
Hugh Lambert	10	0	0	0	0	0	0	0	10	0
Agnes Leguehennec	0	0	10	0	0	0	0	0	10	0
Ron Lundquist	0	0	0	0	0	10	0	0	10	0
Christopher VanGriek	4	4	2	0	0	0	0	0	10	0