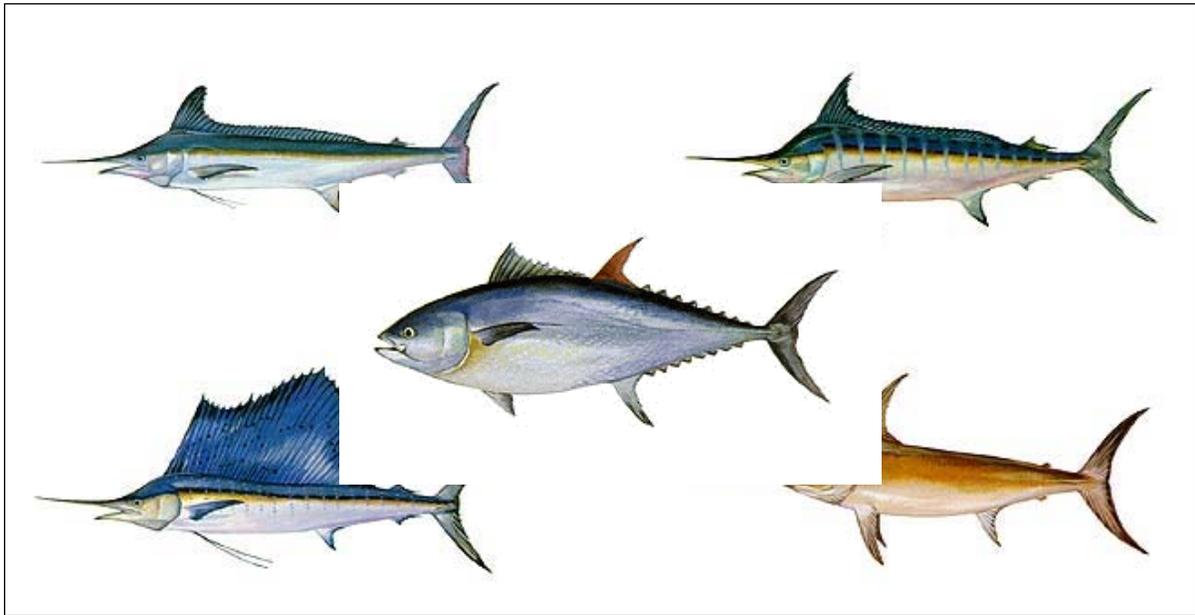


NORTH CAROLINA HIGHLY MIGRATORY SPECIES PROGRAM

DATA COLLECTION FOR RECREATIONAL FISHERIES



North Carolina Department of Environment and Natural Resources
Division of Marine Fisheries
Morehead City, NC

January 8, 2006

ACKNOWLEDGEMENTS

The North Carolina Division of Marine Fisheries (DMF) would like to thank all anglers, private and charter captains, marinas, tackle shops, convenience stores, and all other individuals and businesses that assisted in the tagging and reporting process. Bob Eakes and Steve (Creature) Coulter were helpful in the initial program design and program implementation. Randy Gregory, Carole Yoder, Brian Melott, Stacey Miller, William Hatfield, Suzanne Hill, Mitch Millard, Joanna Croom, Richard Davis, Chris Wilson, and the DMF Marine Patrol communication operators are appreciated for contributing the technical skills and support needed to complete project objectives. Special thanks go to Katy West for programming and analytical support and to Dee Lupton for administrative support.

Project leader: Douglas G. Mumford, Marine Biologist II

Administrative contact: Dee Lupton, Chief, License and Statistics Section

EXECUTIVE SUMMARY

The North Carolina Division of Marine Fisheries implemented a carcass tagging program for Atlantic bluefin tuna in 1998 to accurately assess recreational landings within the state. In 2003, billfishes (blue marlin, white marlin, and swordfish) were included in reporting requirements to meet international agreements. The Highly Migratory Species (HMS) Reporting Program has since recorded 1,665 bluefin tuna and 52 billfish landings. Recreational landings reached a record low in 2006, with only 25 HMS reports. The decrease can be attributed to a shift in effort to the commercial fishery. Continued monitoring and evaluation of HMS is recommended to establish necessary time series and information for management purposes.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	ii
EXECUTIVE SUMMARY	iii
TABLE OF CONTENTS.....	iv
LIST OF TABLES, FIGURES, AND APPENDICES	iv
INTRODUCTION	1
METHODS	2
Census	2
Reporting stations	3
Catch cards and landing tags.....	3
Outreach.....	4
RESULTS	4
DISCUSSION AND RECOMMENDATIONS.....	5

LIST OF TABLES, FIGURES, AND APPENDICES

Table 1. Data elements included on HMS catch cards.	7
Table 2. Number of HMS recreational landings by species and year, 1999-2006.	7
Table 3. Number and descriptive statistics of HMS landings by species, 1999-2006.....	7
Table 4. Number of recreational bluefin tuna landings by region and year, 1999-2006.	8
Table 5. List of reporting stations by frequency of landings, 1999-2006.....	8
Figure 1. Current HMS reporting stations.	9
Figure 2. Highly Migratory Species catch card, 2006.	10
Figure 3. Recreational bluefin tuna landings (percent of annual total) by region and year.....	10
Figure 4. Recreational Atlantic bluefin tuna landings (percent of annual total) by month and year, 2002-2006.....	11
Figure 5. Size distribution (fork length, 5-inch size classes) of recreational Atlantic bluefin tuna, 2002-2006. Values are shown as a percent frequency of total annual observations.....	12
Appendix 1. 2005 North Carolina Governor’s Cup participating tournaments.....	13
Appendix 2. DMF staff participating as mobile reporting stations.	14

INTRODUCTION

The North Carolina Division of Marine Fisheries (DMF) has been involved in sampling recreational fisheries through participation in the Marine Recreational Fisheries Statistics Survey (MRFSS) since 1987. The MRFSS has been conducted annually by the National Oceanographic and Atmospheric Administration (NOAA) in each coastal state since 1979. The primary purpose is to produce reliable estimates of catch, effort, and participation for finfish species at the regional level (Gulf, South Atlantic, etc.). Due to the survey's inability to provide reliable catch statistics for fisheries management at the state level, DMF increased the annual number of people interviewed by approximately ten times beginning in 1987. However, even with increased sample sizes, certain species occur so infrequently in angler catches that creel surveys such as MRFSS are unable to provide precise estimates of catch for these rare event species.

DMF along with NOAA attempted to monitor the Atlantic bluefin tuna (ABT) fishery in North Carolina using creel survey methodology in 1996. The 1996 and 1997 survey design incorporated the use of stratified random dockside sampling from a permit and license frame to obtain catch data and telephone contacts for effort information. The estimates of harvest produced using this methodology lacked industry support and generated a great deal of controversy among fishermen. DMF initiated a carcass tagging program in 1998 to provide a census of the recreational ABT harvest aimed at improving the quality of data and promoting fisherman participation.

Recently, the International Commission for the Conservation of Atlantic Tunas (ICCAT) recommended a rebuilding program for blue marlin (*Makaira nigricans*) and white marlin (*Tetrapturus albidus*). The United States agreed to continue the prohibition on retention of billfish on board commercial fishing vessels and to limit annual recreational landings to 250 blue and white marlin. This measure was implemented in January 2007 as the United States codified the ICCAT recommendation. Managers are now faced with monitoring the United States recreational billfish catch in an accurate and precise manner.

Billfish and swordfish are considered rare events species in nearly all state and federal surveys designed to broadly monitor harvest of recreational catch. Estimates of recreational harvest for these species from these surveys are highly variable and lack acceptable levels of precision. Given this reality, an alternate method of monitoring recreational harvest of these

species needed to be examined. At the April 2002 Billfish Advisory Panel meeting the majority of the members agreed that a landing tag program would be the preferred method for monitoring recreational fisheries for billfish.

The ABT landing tag program (originally designed by anglers, charterboat captains and DMF staff) has been supported and favorably received by all user groups. In 2003, DMF along with NOAA expanded the existing ABT landing tag program in North Carolina to include mandatory reporting of billfish and swordfish species. The all-inclusive program is referred to as the Highly Migratory Species (HMS) program.

METHODS

Census

The basic design required mandatory reporting of all HMS landed recreationally in North Carolina during the year. Highly Migratory Species include bluefin tuna (*Thunnus thynnus*), blue marlin, white marlin, sailfish (*Istiophorus platypterus*), and swordfish (*Xiphias gladius*). To ensure collection of census data, the following measures were utilized:

- 1) Captains or operators of NOAA HMS permitted vessels were required to complete a catch card to be submitted at an HMS reporting station in exchange for a landing tag. Catch cards were widely available from marinas, DMF staff, fishing tournaments, tackle shops, and convenience stores.
- 2) All HMS harvested recreationally in North Carolina were required to have a landing tag attached prior to removal from the vessel. Trailered vessels with HMS on board could not be removed from the water until the fish were tagged.
- 3) Any off-loaded HMS observed without an attached landing tag indicated a violation.
- 4) NOAA established appropriate rules or processes to implement the procedures noted above and further described below.
- 5) The DMF and NOAA implemented cooperative outreach activities to ensure that affected fisherman and businesses were aware of this project and its potential benefits.
- 6) HMS catch cards were collected, summarized, and reported monthly to NOAA.

This process improved compliance and provided federal law enforcement officers with a tangible means of determining if the reporting requirements were met.

Reporting stations

Twenty-five HMS reporting stations had previously been established throughout coastal North Carolina in close proximity to the HMS fleet landing areas. Additional stations were needed to provide optimal access for angler reporting of all HMS. Stations included marinas, tackle shops, and other fishing centers (Figure 1). Billfish Tournaments (including Governor's Cup Conservation Series) also participated (Appendix 1). The DMF port agents functioned as mobile reporting stations (Appendix 2) and also kept reporting stations supplied with catch cards and landing tags. The reporting stations were responsible for collecting catch cards and distributing tags for compliance purposes. All of the key marinas were contacted to participate in the HMS tagging program.

Catch cards and landing tags

Catch cards (Figure 2) were used by vessel operators to report their landings. The catch card design was user-friendly and required minimal time for completion. Only those data relative to reporting compliance with the program were included (Table 1). Additional elements could have affected compliance. Catch cards were made available to vessel operators in advance or obtained from the reporting stations and other authorized agents. Catch cards were submitted for each individual HMS landed. The operator of the HMS permitted vessel was responsible for the proper completion of the catch card.

The HMS catch cards were collected, summarized and submitted monthly to NOAA. Data was key-entered into a spreadsheet by DMF. The DMF mailed completed catch cards to NMFS Gloucester, MA office on a monthly basis. Spreadsheets summarizing recreational HMS activity and catch were forwarded to all interested parties. HMS landing tags were non-reusable and similar to those used previously to identify Atlantic bluefin tuna landed recreationally in North Carolina. The DMF supplied and distributed the landing tags to reporting stations, accounted for each tag distributed, and completed an inventory of tags/cards used at the end of the season.

Outreach

Information delivery and education were critical components for the success of this project. The DMF worked with all project participants and used a variety of outreach mechanisms to inform HMS fishery participants of the reporting requirements contained in this proposal.

Under this project, DMF initiated the following steps:

- 1) Coordinate with NOAA on a program description for public distribution;
- 2) Utilized the DMF news release process;
- 3) Developed and maintained a list of billfish reporting stations;
- 4) Utilized DMF port agents to inform fishing industry members about the program;
- 5) Placed program information and landings results on the DMF website;
- 6) Developed and distributed informational posters with reporting requirements, reporting station locations, and the process for obtaining additional information.

RESULTS

One thousand seven hundred seventeen (1,717) HMS, including 1,665 bluefin tuna (97.0 %), 49 blue marlin (2.8 %), two white marlin (0.1%), and one swordfish (< 0.1%) have been reported since 1999 (Table 2). Blue marlin averaged 111" fork length (FL), bluefin tuna averaged 66" FL, white marlin averaged 68" FL, and the swordfish was 58" FL (Table 3). Twenty-five of these HMS were reported during the most recent year (2006), including 14 bluefin tuna and 11 blue marlin. This number is lower than in previous years, mostly due to the decline in bluefin tuna landings beginning in 2004. Twelve of the 14 bluefin tuna reported were captured in the northern region. This is unusual considering the recent shift in landings from the northern to central region (Table 4, Figure 3). Similarly, it is unusual that most bluefin tuna were landed in March. Landings have typically peaked in December and January during previous years (Figure 4). Fork lengths of these fish ranged from the 50" to 80" size class, though the low number of observations (n = 14) failed to reveal the typical size distribution noticed in previous years (Figure 5). Eleven bluefin tuna were reported at Hatteras Harbor Marina, and one each at Town Creek Marina, Ocean Isle Fishing Center, and mobile DMF agents. Ten blue marlin were reported to mobile DMF agents and one at Gulf Dock. These reporting stations typically account

for a large proportion of landing reports, especially Gulf Dock, mobile DMF agents, Hatteras Harbor Marina, and Oden's Dock (Table 5).

A mid-season evaluation was conducted to determine public perception of the tagging project. Reporting station agents and selected charterboat and private boat captains were contacted to identify any problems associated with the reporting process and to solicit suggestions for improvement. The comments received were positive and reflected a desire for continued participation. Monthly summary reports were distributed to anglers, reporting stations, NOAA, and other interested parties.

DISCUSSION AND RECOMMENDATIONS

A noticeable change in the Atlantic bluefin tuna recreational fishery has occurred over the past five years. There has been a decrease in the proportion of annual landings from northern stations since 2000. Landings occurred more frequently in areas further south, while northern landings have been practically absent in recent years (Figure 3). This observation did not occur in 2006, though these fish were landed outside the normal winter harvest (March and April) and considered atypical harvests. The southern shift in landings brings to attention the lack of HMS monitoring in South Carolina and Georgia. Anecdotal evidence suggests that landings in these areas are increasing. We recommend investigating ways to expand coverage to include these states.

Another obvious change in the bluefin tuna recreational fishery is the drastic reduction in landings since 2000. From 2001 to 2004 harvest dropped anywhere from 20 to 80 % of the previous year's landings. Landings in 2006 were only 2 % of those reported in 2000, and the last three years account for less than 6 % of the program's reports over the eight-year history. Some of this decline may be attributed to the commercial quota established in 2000. Commercial landings since then have increased dramatically. It is suspected that charterboat captains who typically solicit recreational trips have switched their efforts to the more profitable commercial bluefin tuna fishery. Further, it is simple for part-time commercial fisherman to gain access to the commercial quota. Regulations only require a federal permit in the general or charter/headboat category and a DMF standard commercial fishing license (SCFL) to harvest/sell bluefin tuna. North Carolina also has a provision that allows reassignment of SCFLs, providing even more access to the commercial bluefin tuna fishery. Continued monitoring and evaluation

of HMS is recommended to identify these changes and establish necessary time series and information for management purposes.

Confusion existed in regard to proper catch reporting requirements. Documentation specific to North Carolina reporting requirements should continue in all new and renewal permit application information. The DMF reporting requirements should also be included on the NMFS online reporting page (<http://www.nmfspermits.com/PermitIDLandings.asp>) with a link to the DMF website.

Lastly, a procedure to validate harvests would be beneficial to the program. Based on anecdotal evidence compliance rates in North Carolina are generally high. The recreational ABT fishery within the state is highly visible, with substantial dockside attention. This trait, along with 11 full-time DMF port agents assisting in the process, and the general enthusiasm of anglers to report harvests all contribute to increased compliance rates. However, development of methods to substantiate these assumptions would be valuable to current ABT and HMS data collection programs.

Table 1. Data elements included on HMS catch cards.

Data Element	Requirement
Date of landing	Mandatory
HMS permit number	Mandatory
Landing tag number	Mandatory
Length of bluefin tuna or billfish landed (curved fork and fork length in inches)	Mandatory
Reporting station identification	Mandatory
Species landed	Mandatory
Tournament participation	Mandatory
Vessel name and type (Charter/Private/Headboat)	Mandatory
Weight of bluefin tuna or billfish landed (total weight in pounds)	Optional

Table 2. Number of HMS recreational landings by species and year, 1999-2006.

Species	Year								Total
	1999	2000	2001	2002	2003	2004	2005	2006	
Blue Marlin	-	-	-	-	16	8	14	11	49
Bluefin Tuna	275	590	351	284	100	20	31	14	1,665
Swordfish	-	-	-	-	1	0	0	0	1
White Marlin	-	-	-	-	2	0	0	0	2
Total	275	590	351	284	119	28	45	25	1,717

Table 3. Number and descriptive statistics of HMS landings by species, 1999-2006.

Species	Variable	N	Mean	Std Dev	Minimum	Maximum
Blue Marlin	Fork Length	46	111.4	7.0	93.8	130.0
	Weight	47	524.8	124.7	244.0	913.0
Bluefin Tuna	Fork Length	1,665	66.2	8.4	36.0	101.0
	Weight	0	.	.	.	.
Sailfish	Fork Length	1	58.0	.	58.0	58.0
	Weight	0	.	.	.	.
White Marlin	Fork Length	2	68.3	0.4	68.0	68.5
	Weight	0	.	.	.	.

Table 4. Number of recreational bluefin tuna landings by region and year, 1999-2006.

Region	Year								Total
	1999	2000	2001	2002	2003	2004	2005	2006	
Northern	184	432	72	97	10	0	1	12	808
Column Percent	67	73	21	34	10	0	3	86	
Central	76	147	255	178	85	19	30	1	791
Column Percent	28	25	73	63	85	95	97	7	
Southern	12	3	21	9	5	0	0	1	51
Column Percent	4	1	6	3	5	0	0	7	
Unknown	3	8	3	0	0	1	0	0	15
Column Percent	1	1	1	0	0	5	0	0	
Total	275	590	351	284	100	20	31	14	1,665

Table 5. List of reporting stations by frequency of landings, 1999-2006.

Reporting station	Frequency of landings	Reporting station	Frequency of landings
Gulf Dock	431	Bridge Tender Marina	13
Mobile DMF	328	Bahama Bob's	9
Hatteras Harbor Marina	157	Seagull Bait and Tackle	9
Oden's Dock	150	Nancy Lee Fishing Center	8
Teach's Lair Marina	137	Ocean Isle Fishing Center	8
Hatteras Landing Marina	117	Oregon Inlet Fishing Center	8
Anchorage Marina	105	Pirates Cove	7
Captain Stacy's Fishing Center	62	Harkers Island Fishing Center	3
Olde Towne Yacht Club	54	Holden Beach Marina	3
Seawater Marina	42	Southport Fishing Center	3
Town Creek Marina	31	Island Harbor Marina	1
Call-in	15	Unknown	1
Portside	15		

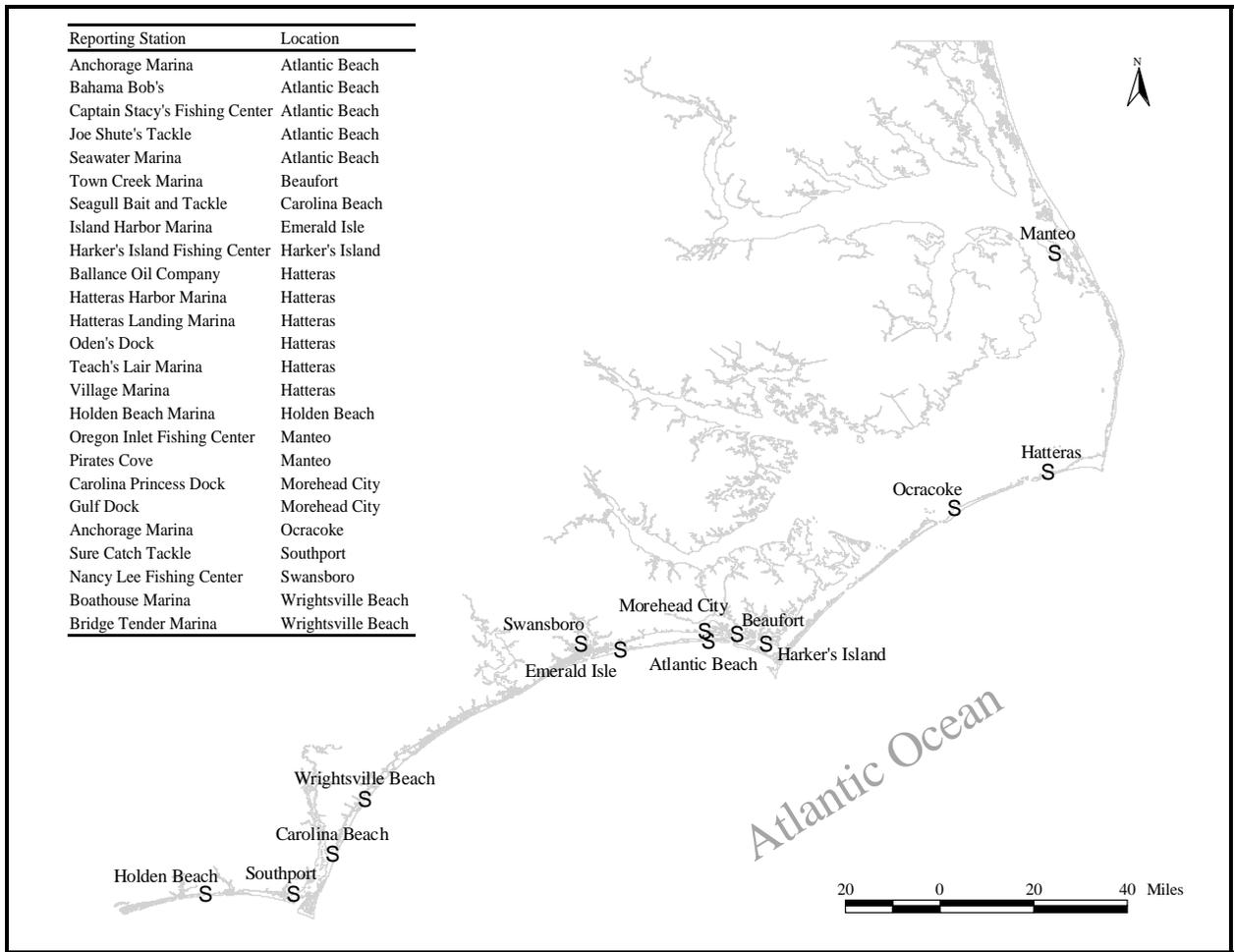


Figure 1. Current HMS reporting stations.

North Carolina Highly Migratory Species Catch Card




Date: Year Month Day

Reporting Station _____

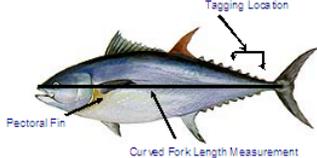
Atlantic Tuna/Billfish Permit Number _____

Vessel Name _____

Trip Type (check one):
 Charter
 Private
 Headboat

Tournament: Yes No

Tag Number _____ (obtained at reporting station)



Tagging Location

Pectoral Fin

Curved Fork Length Measurement

Curved Fork Length (inches) _____

Pounds (optional) _____

Bluefin tuna should be measured from the tip of upper jaw, over the top side of the pectoral fin to the fork of the tail.



Tagging Location

Tail Fork

Lower Jaw

Fork Length

Fork Length (inches) _____ (any billfish species)

Pounds (optional) _____

Billfishes should be measured from the tip of the lower jaw to middle of the fork of the caudal (tail) fin.

Check Billfish Species Landed



Blue Marlin



White Marlin



Sailfish



Swordfish

All the above Highly Migratory Species (HMS) landed in North Carolina must have a Landing Tag affixed before removal from the vessel. Tags are available at all HMS Reporting Stations. To obtain a Landing Tag, Captains or operators of permitted vessel must complete and submit a catch card for every HMS landed. This information collection is approved under OMB Control #0328 (expires 09/30/2006).

Figure 2. Highly Migratory Species catch card, 2006.

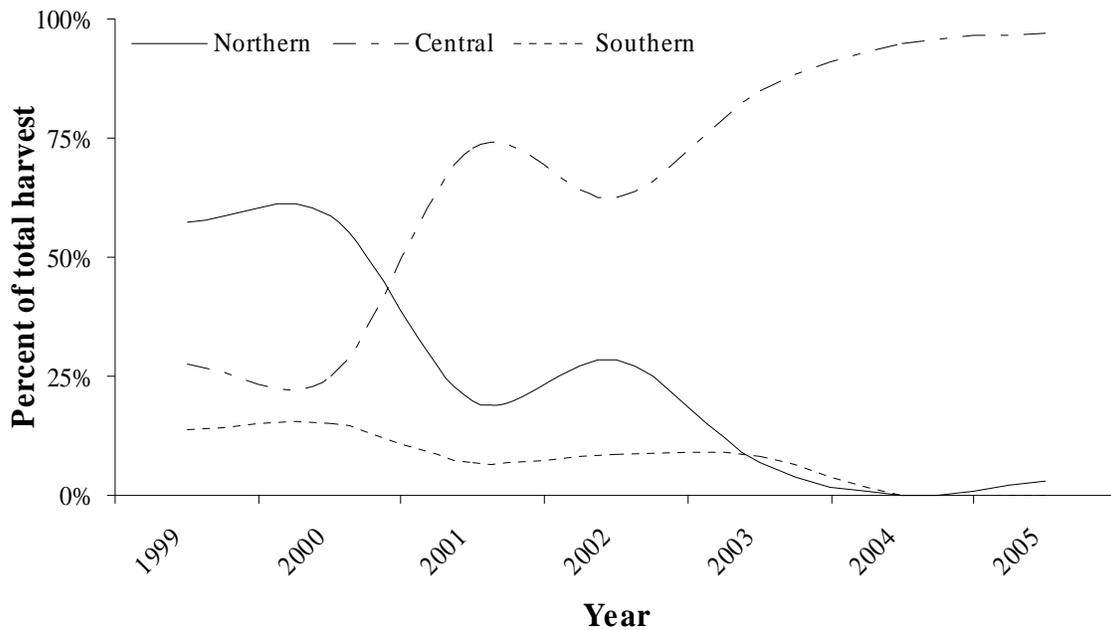


Figure 3. Recreational bluefin tuna landings (percent of annual total) by region and year.

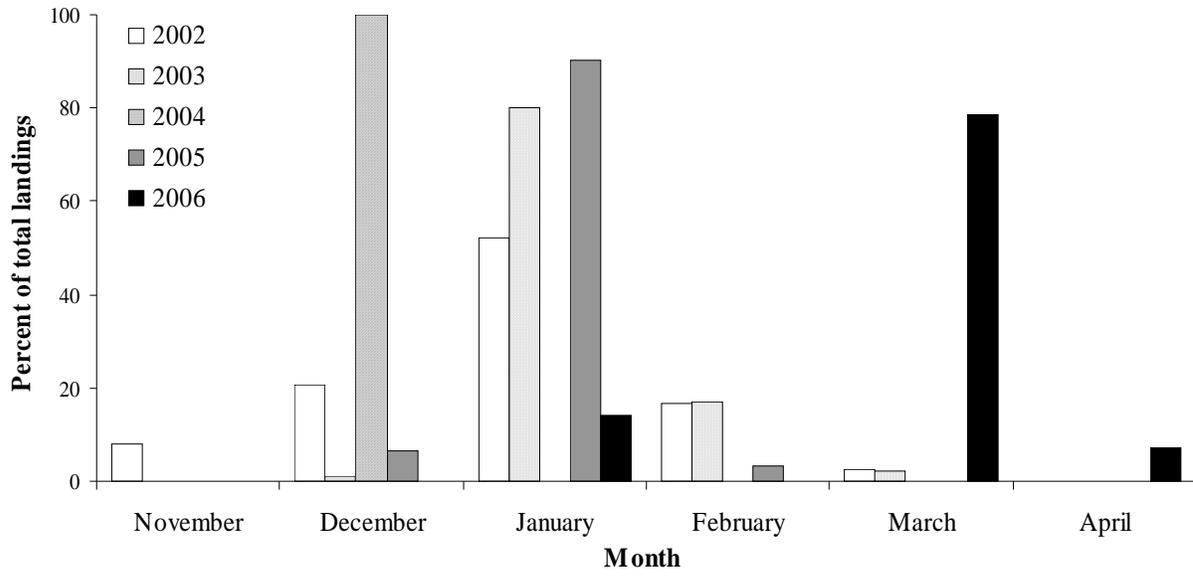


Figure 4. Recreational Atlantic bluefin tuna landings (percent of annual total) by month and year, 2002-2006.

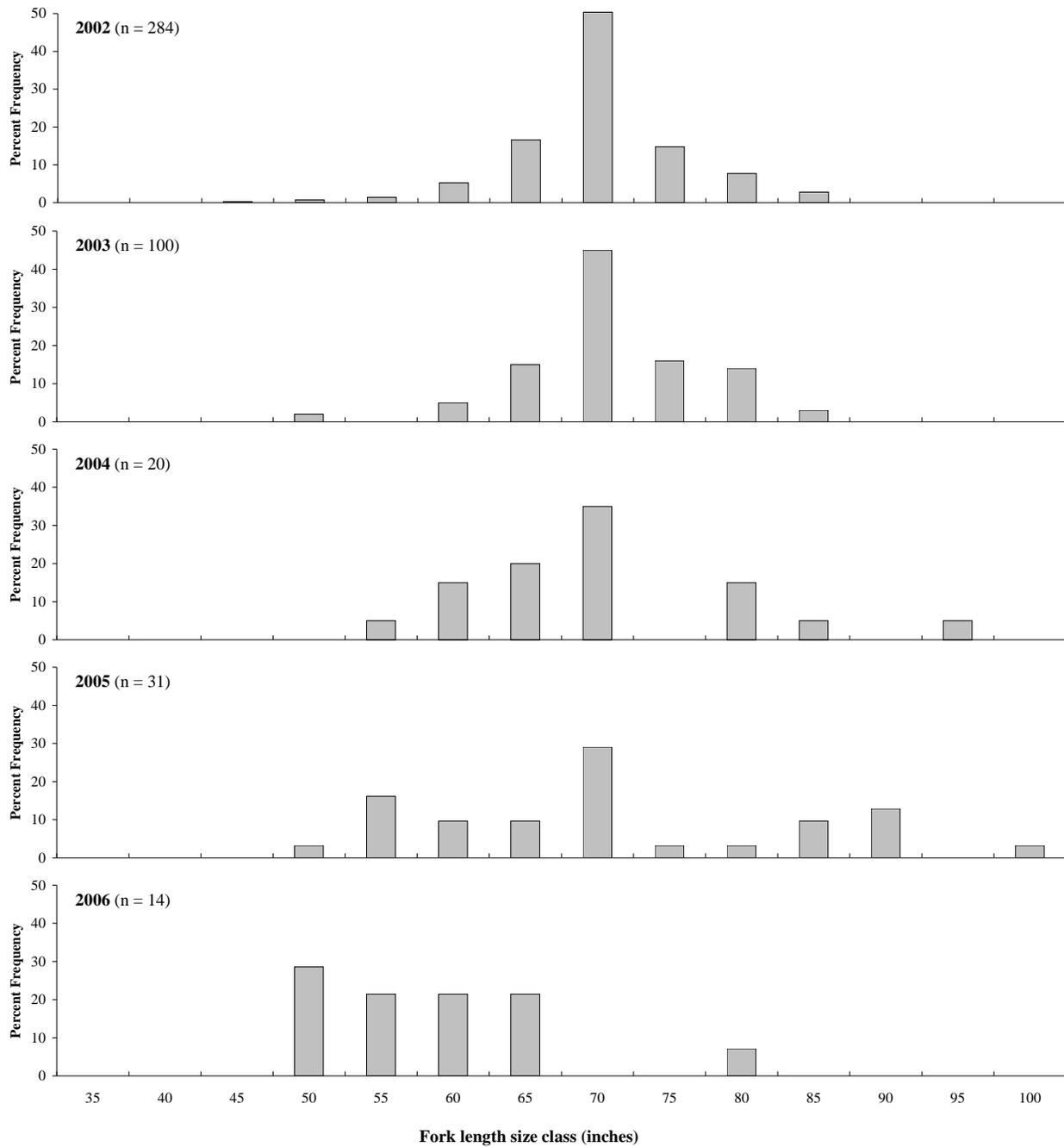


Figure 5. Size distribution (fork length, 5-inch size classes) of recreational Atlantic bluefin tuna, 2002-2006. Values are shown as a percent frequency of total annual observations.

APPENDICES

Appendix 1. 2005 North Carolina Governor's Cup participating tournaments.



2005 GOVERNOR'S CUP PARTICIPATING TOURNAMENTS

HATTERAS VILLAGE OFFSHORE OPEN

May 4 - 7
Hatteras Phone: 1-800-676-4939

**BARTA BOYS AND GIRLS CLUB
BILLFISH TOURNAMENT**

July 21 - 23
Beaufort Phone: 252-808-2286

**SWANSBORO ROTARY 2005 MEMORIAL
DAY BLUE WATER FISHING TOURNAMENT**

May 27 - 29
Swansboro Phone: 910-326-FISH (3474)

**17TH ANNUAL DUCKS UNLIMITED BILLFISH
TAG AND RELEASE TOURNAMENT**

July 28 - 30
Atlantic Beach Phone: 252-237-3717

BIG ROCK BLUE MARLIN TOURNAMENT

June 11 - 18
Morehead City Phone: 252-247-3575

**PIRATES COVE 22ND ANNUAL BILLFISH
TOURNAMENT**

August 16 - 19
Manteo Phone: 1-800-422-3610

CAPE FEAR BLUE MARLIN TOURNAMENT

July 7 - 10
Wrightsville Beach Phone: 910-686-9778 or
910-799-2895

FOR MORE INFORMATION:
NC Governor's Cup Billfishing Conservation Series
Randy Gregory, PO Box 769, Morehead City, NC 28557
E-Mail: Randy.Gregory@ncmail.net
252-726-7021 or 1-800-682-2632



Appendix 2. DMF staff participating as mobile reporting stations.

NORTHERN DISTRICT: Dare, Hyde (Ocracoke), Currituck, and Tyrrell County

Brian Melott
611 Kelly Court
Kill Devil Hills, NC 27948
(252) 480-3584

William Hatfield
1726 Soble Drive
Kill Devil Hills, NC 27948
(252) 480-2771

Sandra Entler
PO Box 91
Nags Head, NC 27959
(252) 202-3067

CENTRAL DISTRICT: Carteret, Craven, Pamlico, Onslow, Beaufort, and Hyde (mainland) County

Suzanne Hill
1507 Front Street
Beaufort, NC 28516
(252) 726-7021

Kim Worrell
142 Bayshore Drive
Wilmington, NC 28411
(252) 393-8977

Jack Poston
188 Wallace Road
Beaufort, NC 28516
(252) 728-6658

SOUTHERN DISTRICT: Pender, New Hanover, and Brunswick County.

Dennis Trowell
2711 Ashby Drive
Wilmington, NC 28409
910-392-6596

Robert (Bobby) K. Peterson
125 Lake Forest Parkway
Wilmington, NC 28401
910-762-6163
