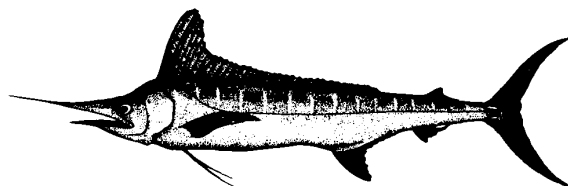
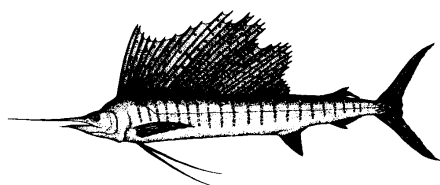




Big Game Tournament Fishing in the Northwestern Atlantic Ocean from 1972-2002

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INTRODUCTION

NOAA Fisheries has been monitoring billfish tournaments in U.S. Atlantic waters since 1971. The Recreational Billfish Survey (RBS) began as a program for monitoring fishing success and average weights of billfish landed in the the Gulf of Mexico recreational fishery, and evolved into an important source of scientific information on northwestern Atlantic populations of blue marlin (*Makaira nigricans*), white marlin (*Tetrapturus albidus*), and sailfish (*Istiophorus platypterus*). Today, the RBS is a primary source of recreational billfish catch and fishing effort data that are used by fishery scientists, both domestically and internationally, for analysis and application to conservation and management measures. Biological sampling conducted at tournaments has also enabled RBS scientists to gather data for age and growth studies, gender and maturity determination, population structuring, and other research that facilitates effective management decisions.

This paper updates previous catch and effort data collected by the RBS from 1998 through 2002 from tournaments taking place along the U.S. Atlantic coast, Puerto Rico, U.S. Virgin Islands and the Bahamas. Historical RBS data is also presented for the entire RBS coverage area, including the Gulf of Mexico.

DATA COLLECTION

A billfish tournament is defined as any organized fishing event for which there is a reward category for billfish. Rewards can be points, plaques, prizes, money or other awards. Federal regulations require that each billfish tournament director submit the following information to the RBS at least one month before the tournament takes place: 1) tournament name, 2) tournament location, 3) fishing dates and, 4) the name, telephone number and email address of the tournament director. Within one week after the event takes place, billfish tournament organizers are required to submit a summary of the tournament's fishing results. For each species caught, the tournament director of record must provide the RBS with, 1) the number boated, 2) the number tagged and released, 3) the number released without a tag and, 4) the number released dead, such as undersized or otherwise disqualified fish that died during the capture process. Often these fish are disposed of offshore. Directors are requestd to include this information in their summary reports as documented billfish mortalities.

While tournaments covered by the RBS target blue marlin, white marlin, sailfish or swordfish (*Xiphias gladius*), data on other highly migratory species such as longbill spearfish, tunas, king mackerel, wahoo and dolphin are also submitted on a voluntary basis by billfish tournament directors.

CATCH AND EFFORT

Data on catch and effort provide information on fishing success and the relative abundance of a stock. An index often used to quantify catch relative to the total number of hours fished is catch-per-unit effort (CPUE). Catch is defined as the number of billfish (by species) that are boated, caught and released, or discarded dead. Gross fishing effort is the number of boats fishing multiplied by the total fishing hours (lines in, lines out) (Figure 1). The 100-hour CPUE is obtained by dividing gross fishing effort by catch (for each species) and multiplying the result by 100. The CPUEs reported in this paper indicate the number of billfish per species that were caught per 100 hours of fishing effort in each area per year. With over 30 years of RBS data available, trends in CPUE provide information on the abundance of the stock relative to previous years.

Tables 1 through 6 provide catch and fishing effort data collected by the RBS from 1998 through 2002 for blue marlin, white marlin and sailfish in the following areas: (1) New England (Rhode Island and Massachusetts), (2) the Northeast (New York, New Jersey, and Maryland), (3) the mid-Atlantic states (Virginia, North Carolina, South Carolina and Georgia), (4) the east coast of Florida, (5) U.S. territories in the Caribbean (U.S. Virgin Islands and Puerto Rico) and, (6) the Bahamas. Data from Bahamian tournaments are included in the RBS because, historically, participants in billfish tournaments that take place in the Bahamas are U.S. citizens using U.S. flagged vessels and fishing in close proximity to the U.S. coast. Catch and effort data from the Gulf of Mexico for this period were covered in a separate publication (NOAA Technical Memorandum NMFS-SEFSC-495) and are not included in these tables.

By grouping the data by geographic area, the regional abundance of each species becomes apparent. For example, the blue marlin CPUEs in the Caribbean and the Bahamas are consistently high relative to other areas, while Florida has the highest sailfish catch. A decline in white marlin CPUEs can be seen over the five-year period (1998 – 2002), particularly in New England and the mid-Atlantic states. Along with the Northeast, these areas are considered the most abundant white marlin fishing grounds in the United States during the summer months. While the Northeast experienced a decline in white marlin CPUEs from 1998 to a low in 2000, the two most recent years indicate that abundance was again approaching earlier levels.

Figure 1 shows landings of each species by area from 1998 through 2002. Following CPUE trends, the highest number of blue marlin landings are reported from the Caribbean and Bahamas, the most white marlin landings occur in the Northeast and a small number of sailfish are landed at tournaments in Florida, the Caribbean and the Bahamas.

Figure 2 shows tournament CPUEs for blue marlin, white marlin and sailfish from 1972 through 2002 for the entire RBS coverage area, which includes the Gulf of Mexico. While blue marlin catch rates have remained fairly consistent over the 30-year period, sailfish and white marlin CPUEs have experienced notable fluctuations. White marlin

CPUEs increased to a high of 4.2 in 1980, followed by a dramatic drop over the next 5 years. Since then, catch rates have remained at moderate levels. Sailfish CPUEs dropped to a low of 0.5 in 1982 but returned to a relatively stable cycle of higher CPUEs every 3 to 5 years, followed by several years of more modest catch rates.

Figure 3 illustrates the number of fishing hours recorded during tournaments since 1972. Recreational fishing effort recorded by the RBS has increased five-fold since 1972. Technological advances in navigational equipment and fishing gear, coupled with a prospering economy, contributed to increased interest and investment in big game fishing activity. Some of the increase seen in Figure 3 can also be attributed to improved monitoring by the RBS, particularly after Federal regulations were enacted requiring tournament registration and reporting.

CATCH AND RELEASE

Since the implementation of minimum size limits for billfish in 1988, most billfish tournaments have incorporated release points into their scoring system. Many have shifted to a no-kill, release-only format.

Figure 4 illustrates the catch and release activity by species reported during billfish tournaments from 1972 through 2002 for the entire RBS coverage area. Blue marlin landings peaked in the early 1980's and have declined to less than 100 fish in 2001 and 2002. Tournament landings of white marlin have decreased from over 1,000 in 1980 to less than 50 since 1998. Sailfish landings have also declined from a peak of 306 tournament landings in 1983 to less than 50 in the last five years. These decreases in landings have occurred despite a sharp increase in tournament fishing effort in the last 2 decades (Figure 3). Figure 4 also indicates that tournaments in the U.S. were voluntarily promoting catch and release fishing practices even before regulations were implemented to encourage it.

Table 1: The number of blue marlin, white marlin and sailfish boated, released, and released dead during billfish tournaments taking place in Rhode Island and Massachusetts, 1998 to 2002. Catch-per-unit effort (CPUE) per 100 fishing hours and gross fishing effort are also shown for each year and species.

NEW ENGLAND						
1998	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	0	2	0	2	0.1
2,625	White marlin	1	213	0	214	8.2
	Sailfish	0	0	0	0	0
1999	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	1	8	0	9	0.2
3,645	White marlin	0	23	0	23	0.6
	Sailfish	0	0	0	0	0
2000	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	0	3	0	3	0.1
3,512	White marlin	0	11	0	11	0.3
	Sailfish	0	0	0	0	0
2001	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	0	5	0	5	0.1
3,925	White marlin	0	6	0	6	0.2
	Sailfish	0	0	0	0	0
2002	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	0	9	0	9	0.2
3,605	White marlin	0	25	0	25	0.7
	Sailfish	0	0	0	0	0

Table 2: The number of blue marlin, white marlin and sailfish boated, released, and released dead during billfish tournaments taking place in New York, New Jersey and Maryland, 1998 to 2002. Catch-per-unit effort (CPUE) per 100 fishing hours and gross fishing effort are also shown for each year and species.

NORTHEAST						
1998	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	15	38	0	53	0.4
12,074	White marlin	25	741	0	766	6.3
	Sailfish	0	2	0	2	0.0
1999	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	23	120	0	143	0.7
21,669	White marlin	30	801	0	831	3.8
	Sailfish	0	4	0	4	0.0
2000	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	9	63	0	72	0.4
18,056	White marlin	8	338	0	346	1.9
	Sailfish	0	3	0	3	0.0
2001	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	3	51	0	54	0.3
18,373	White marlin	20	695	0	715	3.9
	Sailfish	0	2	0	2	0.0
2002	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	10	80	0	90	0.3
27,327	White marlin	33	1556	0	1589	5.8
	Sailfish	0	3	0	3	0.0

Table 3: The number of blue marlin, white marlin and sailfish boated, released, and released dead during billfish tournaments taking place in Virginia, North Carolina, South Carolina and Georgia, 1998 to 2002. Catch-per-unit effort (CPUE) per 100 fishing hours and gross fishing effort are also shown for each year and species.

MID-ATLANTIC						
1998	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort 15,117	Blue marlin	22	132	0	154	1.0
	White marlin	0	633	0	633	4.2
	Sailfish	0	48	0	48	0.3
1999	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort 18,460	Blue marlin	20	199	0	219	1.2
	White marlin	0	430	0	430	2.3
	Sailfish	0	187	0	187	1.0
2000	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort 20,328	Blue marlin	19	164	0	183	0.9
	White marlin	0	400	0	400	2.0
	Sailfish	0	85	0	85	0.4
2001	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort 21,370	Blue marlin	12	145	0	157	0.7
	White marlin	0	370	0	370	1.7
	Sailfish	0	70	0	70	0.3
2002	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort 25,920	Blue marlin	9	181	0	190	0.7
	White marlin	0	379	0	379	1.5
	Sailfish	0	123	0	123	0.5

Table 4: The number of blue marlin, white marlin and sailfish boated, released, and released dead during billfish tournaments taking place off the east coast of Florida, 1998 to 2002. Catch-per-unit effort (CPUE) per 100 fishing hours and gross fishing effort are also shown for each year and species.

EAST COAST OF FLORIDA						
1998	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort 7,036	Blue marlin	0	14	0	14	0.2
	White marlin	0	3	0	3	0
	Sailfish	0	838	0	838	11.9
1999	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort 17,477	Blue marlin	0	42	0	42	0.2
	White marlin	0	0	0	0	0
	Sailfish	3	1676	0	1679	9.6
2000	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort 32,158	Blue marlin	0	22	0	22	0.1
	White marlin	0	3	0	3	0
	Sailfish	3	1990	0	1993	6.2
2001	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort 24,846	Blue marlin	0	13	0	13	0.1
	White marlin	0	11	0	11	0
	Sailfish	4	2902	0	2906	11.7
2002	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort 23,307	Blue marlin	0	24	0	24	0.1
	White marlin	0	6	0	6	0
	Sailfish	1	2563	0	2564	11.0

Table 5: The number of blue marlin, white marlin and sailfish boated, released, and released dead during billfish tournaments taking place from US territories in the Caribbean (St. Croix, St. Thomas, and Puerto Rico), 1998 to 2002. Catch-per-unit effort (CPUE) per 100 fishing hours and gross fishing effort are also shown for each year and species.

CARIBBEAN						
1998	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	59	467	0	526	3.4
15,650	White marlin	1	2	0	3	0
	Sailfish	3	4	0	7	0
1999	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	27	501	0	528	4.3
12,258	White marlin	0	0	0	0	0
	Sailfish	0	1	0	1	0
2000	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	30	736	0	766	2.9
26,303	White marlin	0	6	0	6	0
	Sailfish	3	21	0	24	0.1
2001	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	12	402	0	414	2.5
16,346	White marlin	0	11	0	11	0.1
	Sailfish	0	1	0	1	0
2002	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	16	418	1	435	2.9
15,244	White marlin	0	12	0	12	0.1
	Sailfish	2	14	0	16	0.1

Table 6: The number of blue marlin, white marlin and sailfish boated, released, and released dead during billfish tournaments taking place in the Bahamas. Catch-per-unit effort (CPUE) per 100 fishing hours and gross fishing effort are also shown for each year and species.

BAHAMAS						
1998	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	45	282	0	327	2.0
16,554	White marlin	0	72	0	72	0.4
	Sailfish	1	99	0	100	0.6
1999	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	67	378	2	447	2.9
15,218	White marlin	0	62	0	62	0.4
	Sailfish	0	25	0	25	0.2
2000	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	36	227	0	263	1.4
19,038	White marlin	0	57	0	57	0.3
	Sailfish	1	0	31	32	0.2
2001	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	26	196	0	222	1.4
15,814	White marlin	0	63	0	63	0.4
	Sailfish	0	33	0	33	0.2
2002	Species	Boated	Released	Rel Dead	Total Catch	CPUE/100 hrs
gross effort (hrs)	Blue marlin	27	231	0	258	1.8
14,676	White marlin	0	61	0	61	0.4
	Sailfish	0	4	0	4	0

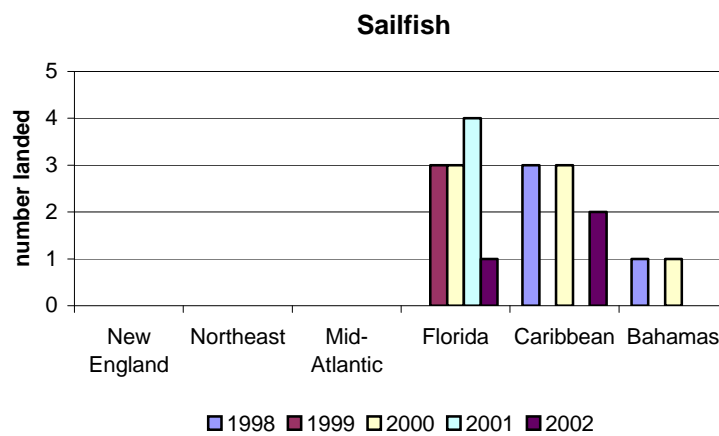
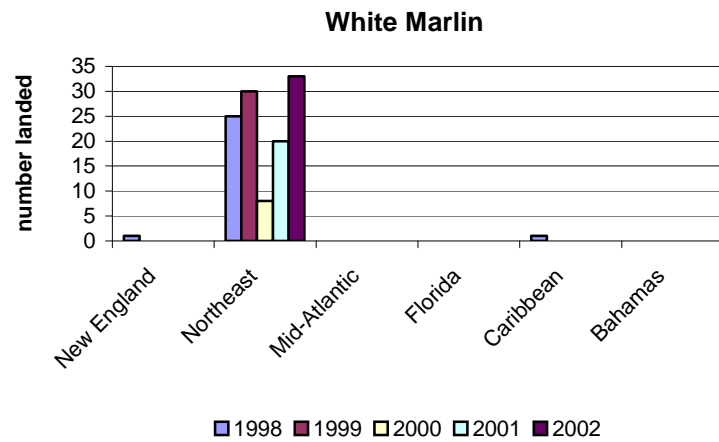
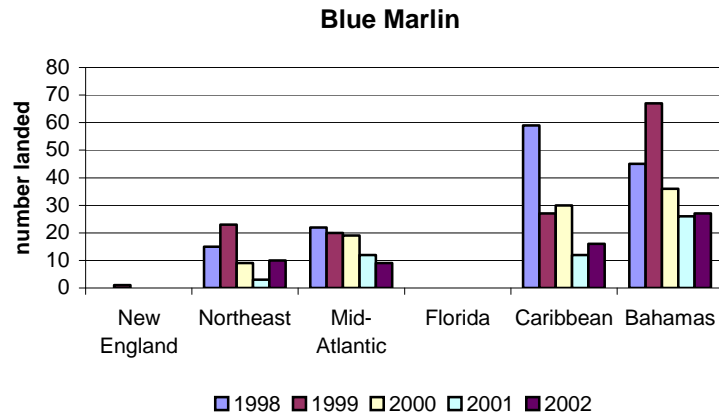


Figure 1: The number of blue marlin, white marlin and sailfish landed at billfish tournaments from 1998 through 2002 in New England, the Northeast, mid-Atlantic states, east coast of Florida, U.S. territories in the Caribbean, and the Bahamas.

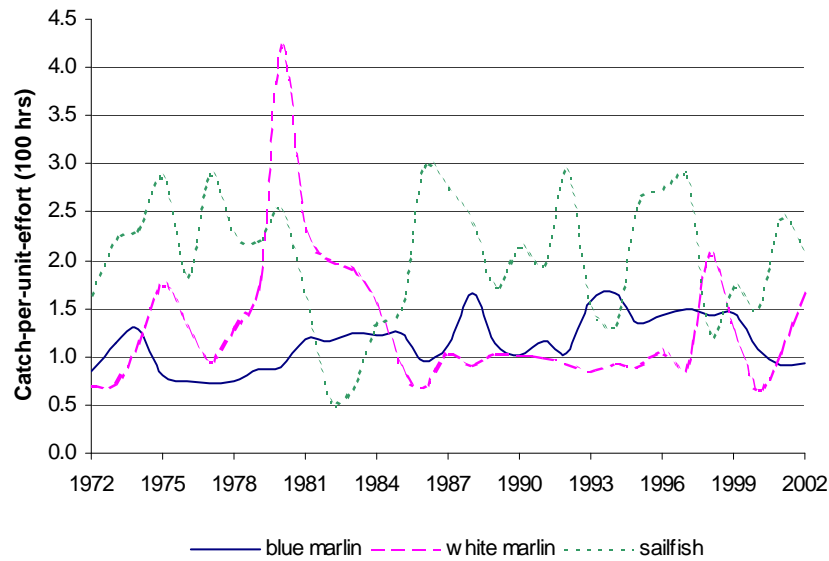


Figure 2: Catch-per-unit-effort per 100 fishing hours for blue marlin, white marlin and sailfish recorded by the RBS from tournaments along the U.S. East Coast, Gulf of Mexico, U.S. territories in the Caribbean, and the Bahamas.

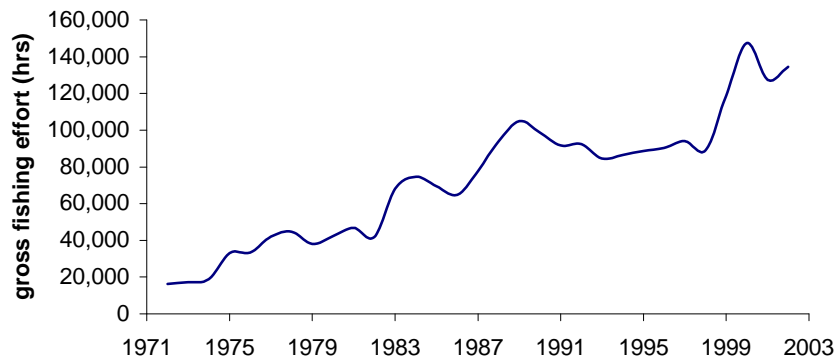


Figure 3: Gross fishing effort from billfish tournaments monitored by the RBS along the U.S. East Coast, Gulf of Mexico, U.S. territories in the Caribbean, and the Bahamas from 1972 through 2002.

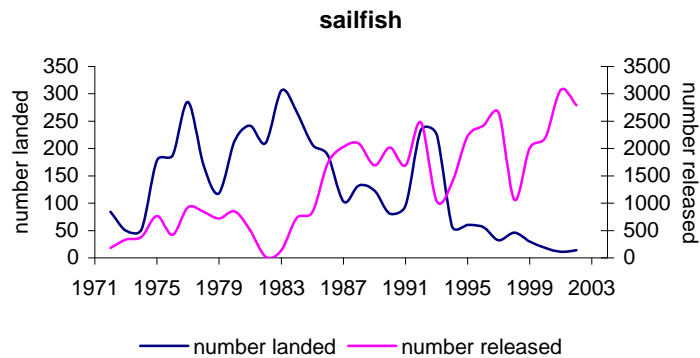
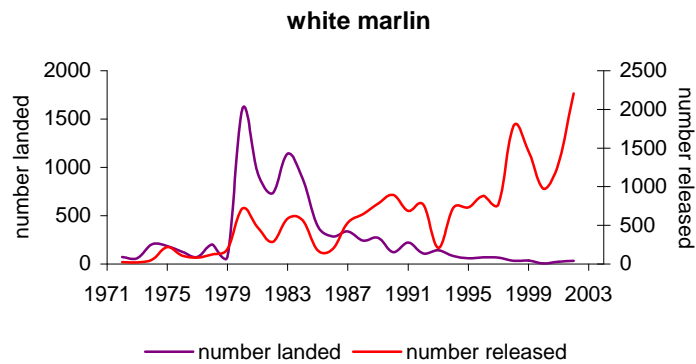
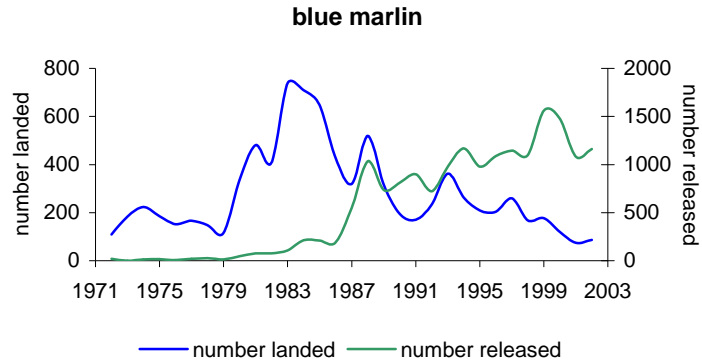


Figure 4: The number of blue marlin, white marlin and sailfish landed and released during billfish tournaments along the U.S. East Coast, Gulf of Mexico, U.S. territories in the Caribbean and the Bahamas from 1972 through 2002.