

**Estimated Gray Triggerfish (*Balistes capriscus*) Recreational
Landings For the State of Texas**

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Introduction

The Texas Parks and Wildlife Department (TPWD) has conducted their own survey of marine recreational fisheries since 1974 (SEFSC Website). Landings data for records listed as gray triggerfish specifically, starting in 1983 from the Parks and Wildlife Department is analyzed across various strata temporally and spatially. Catch estimates used in this paper are not final and subject to change. Estimates for the years 1998 to 2003 were replaced by the TPWD in January 2005 and the updated information for those years is included in these analyses. Estimates for 1983 through 1997 are likely to be replaced in the future in order to ensure consistence in methodology and fix errors in the files. No timeline has been determined for the replacement at this time. Data in years 1995 and later uses new methodology to reduce outliers in the estimates caused by the inclusion of low-pressure sites. Years 1998 and later have some additional differences in computation methods. One of these differences is the fact that years 1998 to the present has a larger target species list in order to obtain more species-specific estimates for the bay and Gulf of Mexico. Comparison of this dataset to Texas data available in GulfFIN may or may not match. Years 1985 and earlier are considered incomplete, however have been included in the analysis (Phares 2005).

Methods

Data were stratified across the following: year, fishing mode, area, wave, and the interactions between year and fishing mode, year and area, mode and area, area*mode*year, wave and year, wave and mode, and wave and area. Fishing mode classifies the type of fishing trip that was taken, and designates that the survey was done on catch from headboat, private boat, or charter boat. Area designates the distance the trip fished from shore, and includes fishing over ten miles from shore, fishing within ten miles of shore, or fishing inshore. Inshore fishing in the data indicates that the fishing was done in the bay, while the other two area designations refer to trips that took place in the Gulf of Mexico. Wave refers to bimonthly periods within a year. Wave one is January and February, wave two March and April, wave three May and June, wave four July and August, wave five September and October, and wave six November and December. The software JMP IN (Copyright 2004 SAS Institute, version 5.1.2) and Microsoft Office (Copyright 2000 Microsoft Corporation) were used to perform the calculations.

Results and Discussion

Figure 1 illustrates the Texas gray triggerfish recreational landings across the years during which gray triggerfish is specified in the data. Landings by fishing mode shows that most gray triggerfish are sampled by private boat (Figure 2). It is important to note here that beginning in 1986, only bay headboats are surveyed by the TPWD (Phares 2005). This is evident in Figure 3. Data from headboats fishing out in the Gulf of Mexico for the year 1986 and later is collected by the NMFS Headboat Survey and analyzed by Saul (2005) in document SEDAR 9-DW12. Figure 4 shows that most gray triggerfish sampled by the TPWD survey were captured in the Gulf of Mexico, greater

than ten miles from shore (Figures 4 and 5). The majority of the gray triggerfish observations were taken from private boats; according to the data, headboats are only sampled inshore (for years prior to 1986 as described above) or in areas greater than 10 miles offshore (Figure 6-9). During a year, most gray triggerfish are sampled during waves three and four, during the late summer and fall (Figures 10 and 11). According to the data charter trips capturing gray triggerfish are found only in waves three through five, the summer months (Figure 12). More gray triggerfish are landed in the summer months for the Gulf of Mexico, while the inshore bay waters (Figure 13).

Literature Cited

SEFSC Website. 2005. "Marine Recreational Fisheries Statistics Survey (MRFSS)." Southeast Fisheries Science Center, National Marine Fisheries Service, National Oceanic Atmospheric Administration. Accessed 15 June 2005.
<http://www.st.nmfs.gov/st1/recreational/queries/caveat.html>

Phares, Patty. Personal Communication. Statistition, Southeast Fisheries Science Center, National Marine Fisheries Service, National Oceanic Atmospheric Administration. 75 Virginia Beach Drive, Miami, Florida. 15 June 2005.

Appendix A: Tables

Year	All Landings (# fish)
1983	27889
1984	36599
1985	7237
1986	4425
1987	6522
1988	14058
1989	32744
1990	9190
1991	8930
1992	72429
1993	39204
1994	6302
1995	4439
1996	2317
1997	4965
1998	4852
1999	2973
2000	6741
2001	4460
2002	2767
2003	1885

Table 1: Annual Texas gray triggerfish landings in number of gray triggerfish.

Mode	Landings (# fish)
Headboat	57830
Charter	7735
Private	235363

Table 2: Texas gray triggerfish landings by mode.

Year	Headboat Landings (# fish)	Charter Landings (# fish)	Private Landings (# fish)
1983	23897	152	3840
1984	33679		2920
1985		80	7157
1986	31		4394
1987		1388	5134
1988	58	203	13797
1989	53	102	32589
1990	112	315	8763
1991		137	8793
1992		1870	70559
1993			39204
1994		30	6272
1995			4439
1996		26	2291
1997		815	4150
1998		559	4293
1999		510	2463
2000			6741
2001		792	3668
2002		307	2460
2003		449	1436

Table 3: Annual gray triggerfish Texas landings by mode.

Area	Landings (# fish)
Less Than 10	90052
Greater Than 10	181629
Inshore	29247

Table 4: Texas gray triggerfish landings by area, where area represents the distance from shore in miles.

Year	Less Than 10	Greater Than 10	Inshore
1983	181	27070	638
1984	901	34085	1613
1985	1340	2790	3107
1986	209	3861	355
1987	3420	1781	1321
1988	3541	8310	2207
1989	22782	4995	4967
1990	5519	2782	889
1991	5110	2699	1121
1992	18624	51576	2229
1993	18965	12756	7483
1994	1010	3425	1867
1995	253	3737	449
1996	155	1963	199
1997	2256	2515	194
1998	1403	3423	26
1999	915	2058	
2000	2336	4358	47
2001	358	4044	58
2002	536	2216	15
2003	238	1185	462

Table 5: Texas gray triggerfish landings by area and year, where area represents the distance from shore in miles.

Mode	Less Than 10	Greater Than 10	Inshore
Headboat	0	57576	254
Charter	1955	5548	232
Private	88097	118505	28761

Table 6: Texas gray triggerfish landings by area and fishing mode, where area represents the distance from shore in miles.

Area Year	Less Than 10		Greater Than 10			Inshore		
	Charter	Private	Headboat	Charter	Private	Headboat	Charter	Private
1983		181	23897		3173		152	486
1984		901	33679		406			1613
1985		1340			2790		80	3027
1986		209			3861	31		324
1987	1388	2032			1781			1321
1988		3541		203	8107	58		2149
1989		22782		102	4893	53		4914
1990	56	5463		259	2523	112		777
1991	52	5058		85	2614			1121
1992	278	18346		1592	49984			2229
1993		18965			12756			7483
1994		1010		30	3395			1867
1995		253			3737			449
1996		155		26	1937			199
1997		2256		815	1700			194
1998	158	1245		401	3022			26
1999		915		510	1548			
2000		2336			4358			47
2001	18	340		774	3270			58
2002		536		307	1909			15
2003	5	233		444	741			462

Table 7: Texas gray triggerfish landings by area, fishing mode and year, where area represents the distance from shore in miles.

Wave	Landings (# fish)
1	12460
2	21422
3	71537
4	124024
5	42964
6	28521

Table 8: Texas gray triggerfish landings by wave, where the wave represents a bimonthly period of time with 1 = January and February, 2 = March and April, 3 = May and June, 4 = July and August, 5 = September and October, and 6 = November and December.

Year	1	2	3	4	5	6
1983			7876	8467	9572	1974
1984	2315	2906	14532	15945	581	320
1985		1884	1090	1760	1694	809
1986		1568	134	2508	215	
1987			920	4445	1075	82
1988	131	314	1240	6939	4986	448
1989	382	173	1012	8555	3379	19243
1990	130		339	5187	2621	913
1991		101	740	2740	5349	
1992		11458	33291	22769	4359	552
1993	7551	99	5021	21551	4049	933
1994	350	8	206	3543	1353	842
1995	115	364	254	3150	517	39
1996			301	1478	354	184
1997		1825	1118	1634	388	
1998	1260	94	551	2601	346	
1999	83	47	871	1500	234	238
2000		366	119	5657	599	
2001		80	675	1669	448	1588
2002	117	135	649	1422	429	15
2003	26		598	504	416	341

Table 9: Texas gray triggerfish landings by wave and year, where wave represents a bimonthly period of time with 1 = January and February, 2 = March and April, 3 = May and June, 4 = July and August, 5 = September and October, and 6 = November and December.

Mode	1	2	3	4	5	6
Headboat	2315	2906	22199	20472	8182	1756
Charter			559	4799	2377	
Private	10145	18516	48779	98753	32405	26765

Table 10: Texas gray triggerfish landings by mode and wave, where wave represents a bimonthly period of time with 1 = January and February, 2 = March and April, 3 = May and June, 4 = July and August, 5 = September and October, and 6 = November and December.

Wave	Less Than 10	Greater Than 10	Inshore
1	1193	4564	6703
2	1823	19235	364
3	6980	62414	2143
4	53375	64158	6491
5	6802	26697	9465
6	19879	4561	4081

Table 11: Texas gray triggerfish landings by area fished and wave, where the area fished represents the distance in miles from shore and the wave represents a bimonthly period of time with 1 = January and February, 2 = March and April, 3 = May and June, 4 = July and August, 5 = September and October, and 6 = November and December.

Appendix B: Figures and Charts

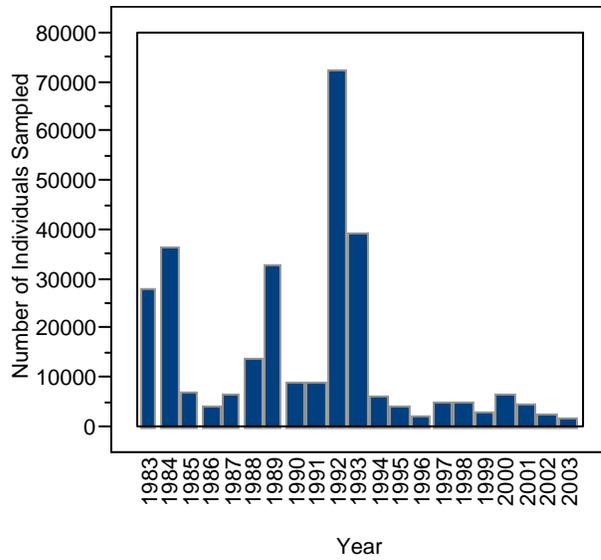


Figure 1: Annual Texas gray triggerfish landings in number of gray triggerfish.

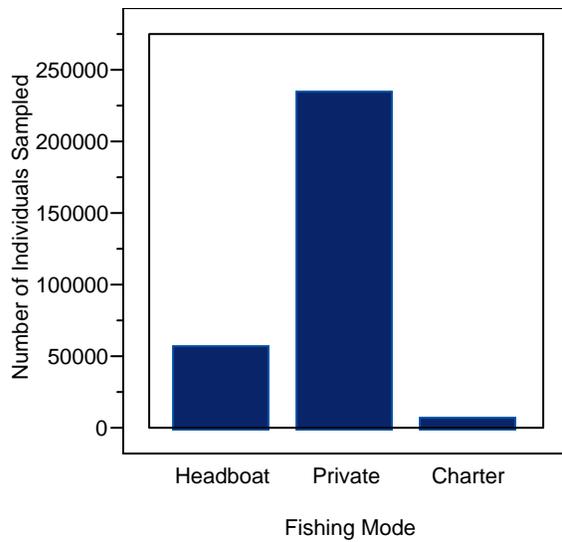


Figure 2: Texas gray triggerfish landings by mode.

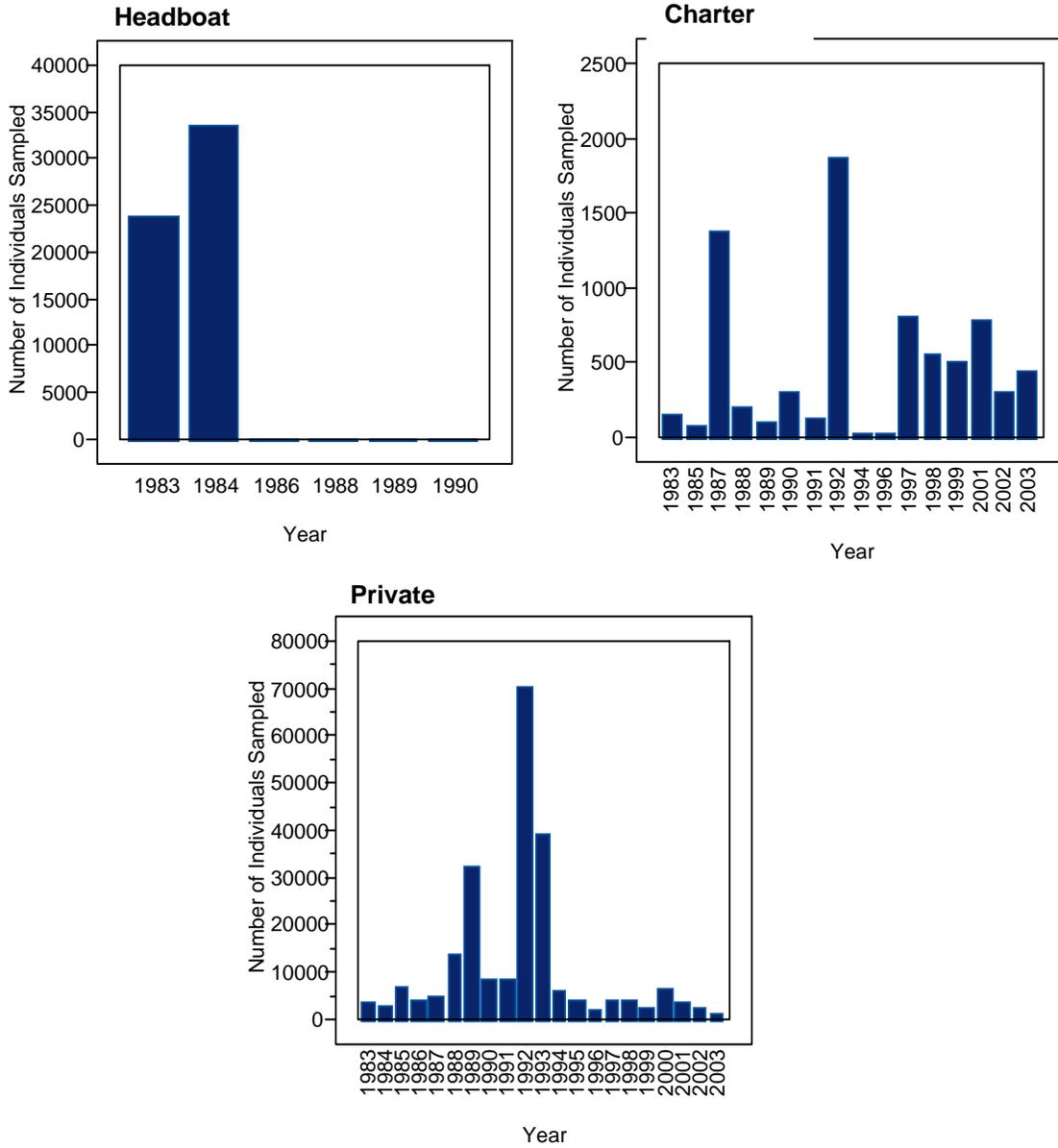


Figure 3: Annual gray triggerfish Texas landings by mode.

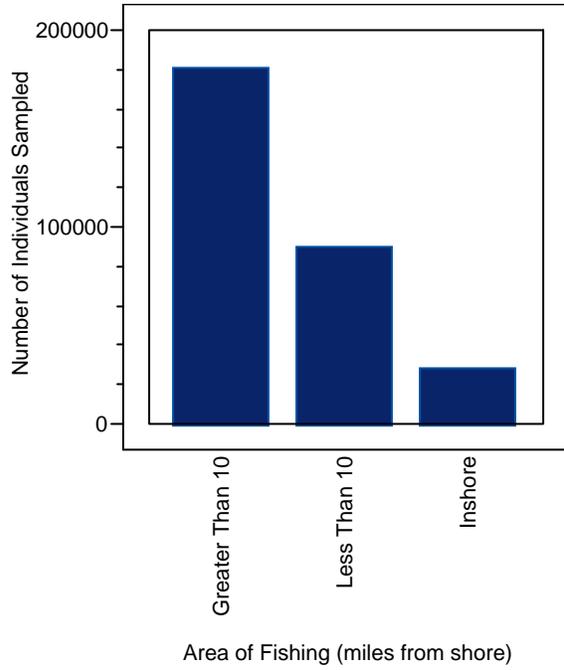


Figure 4: Texas gray triggerfish landings by area, where area represents the distance from shore in miles.

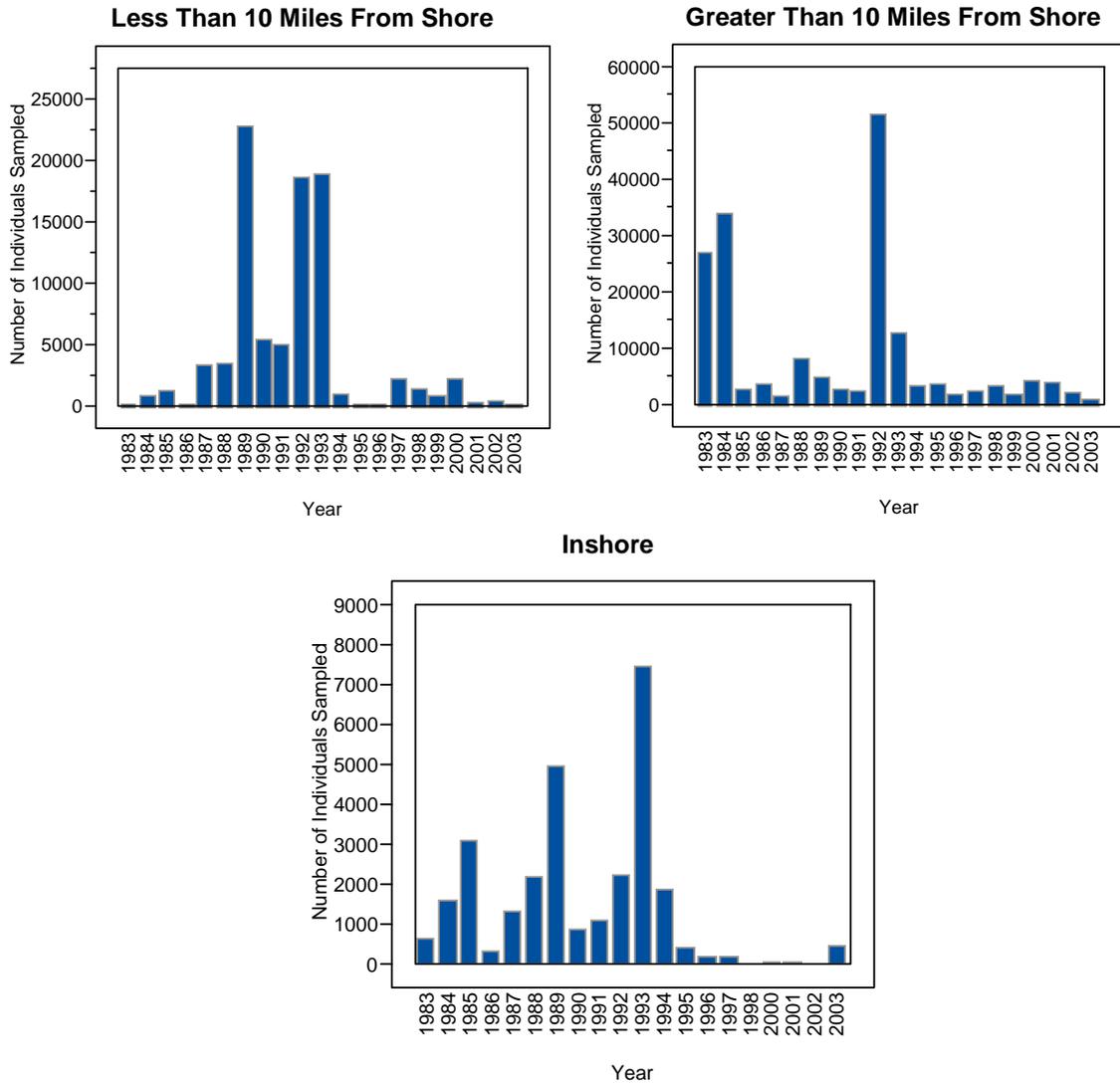


Figure 5: Texas gray triggerfish landings by area and year, where area represents the distance from shore in miles.

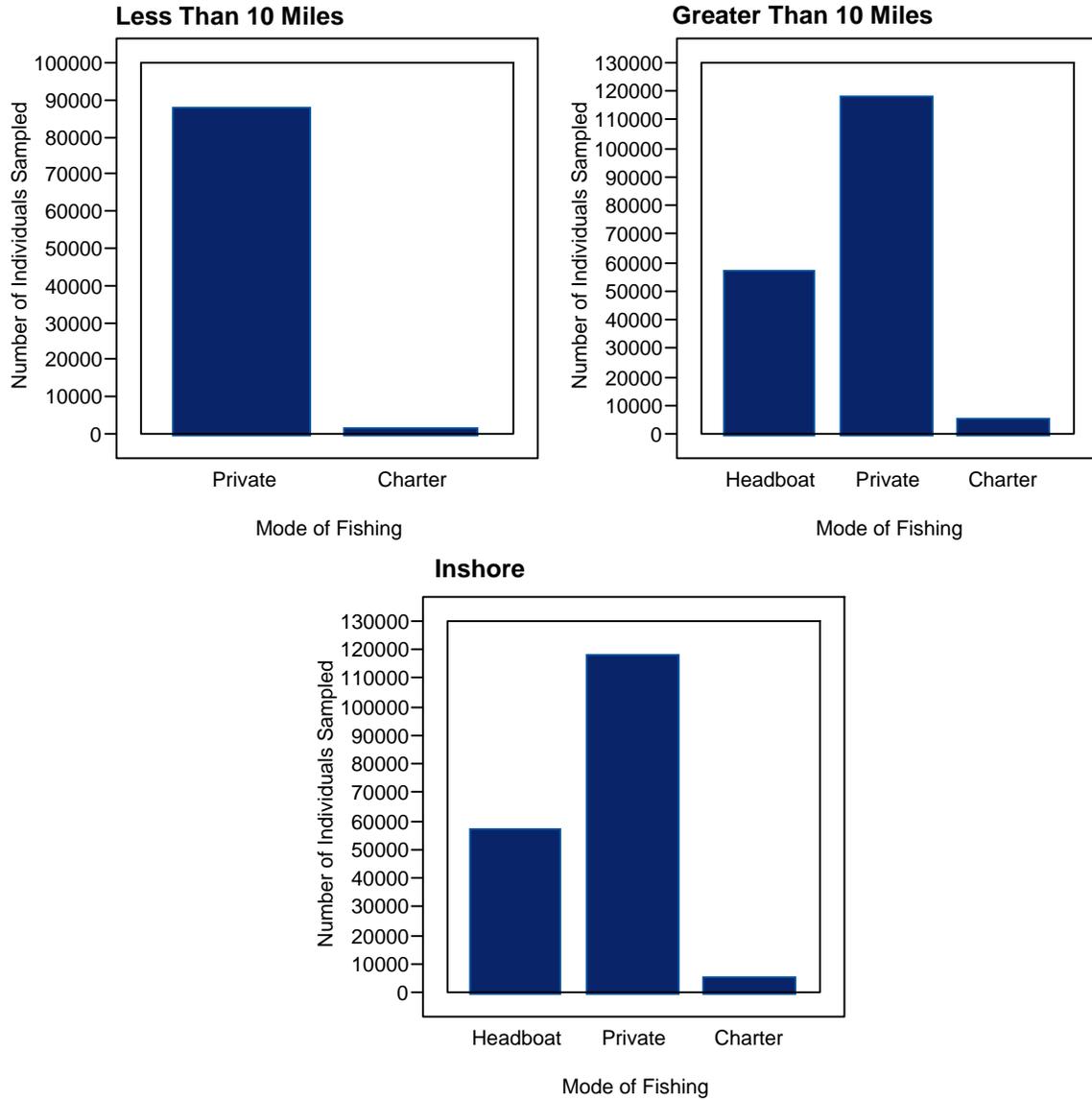


Figure 6: Texas gray triggerfish landings by area and fishing mode, where area represents the distance from shore in miles.

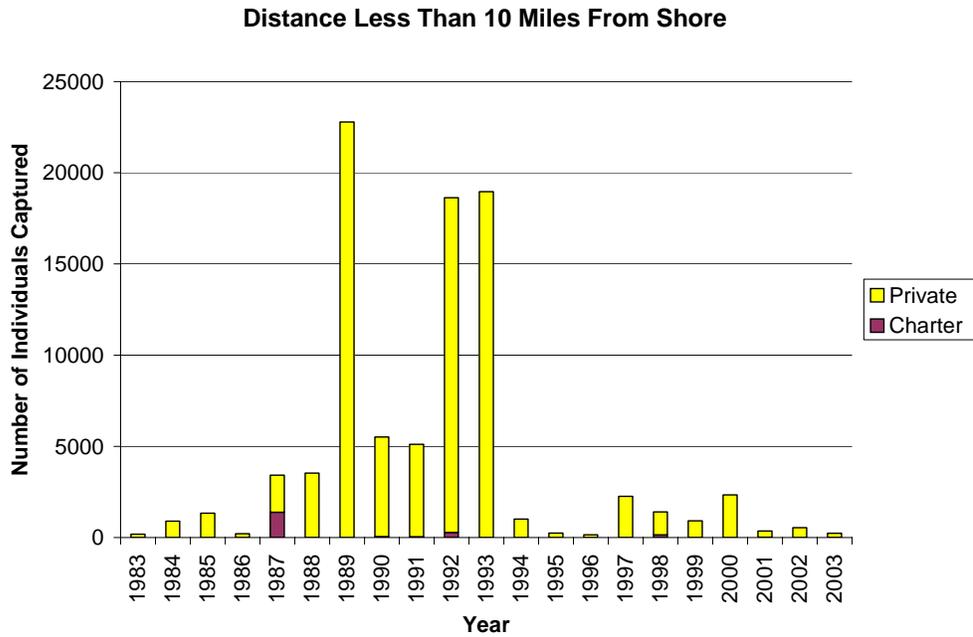


Figure 7: Texas gray triggerfish landings by area less than 10 miles from shore, fishing mode and year.

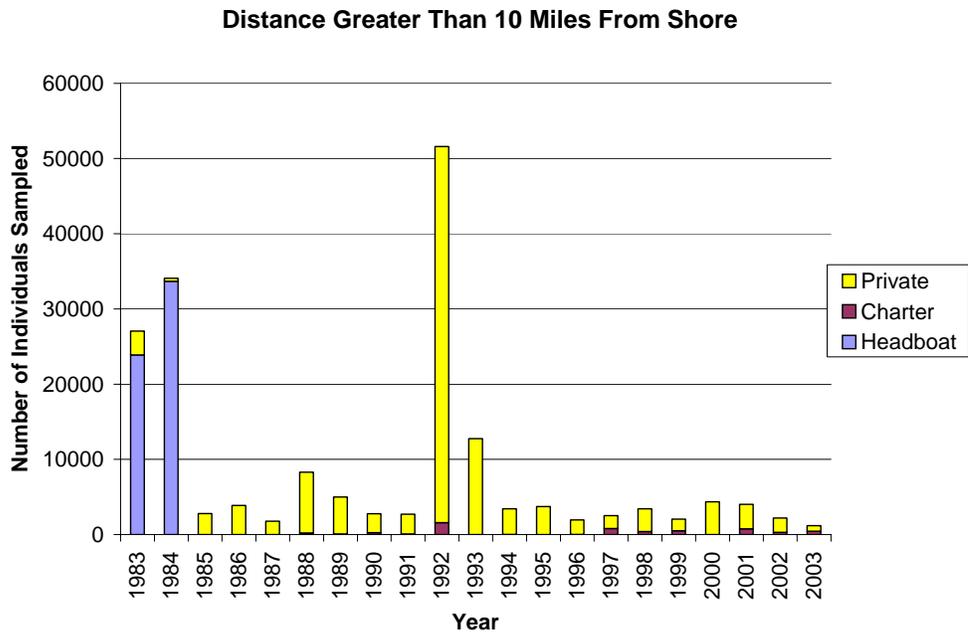


Figure 8: Texas gray triggerfish landings by area greater than 10 miles from shore, fishing mode and year.

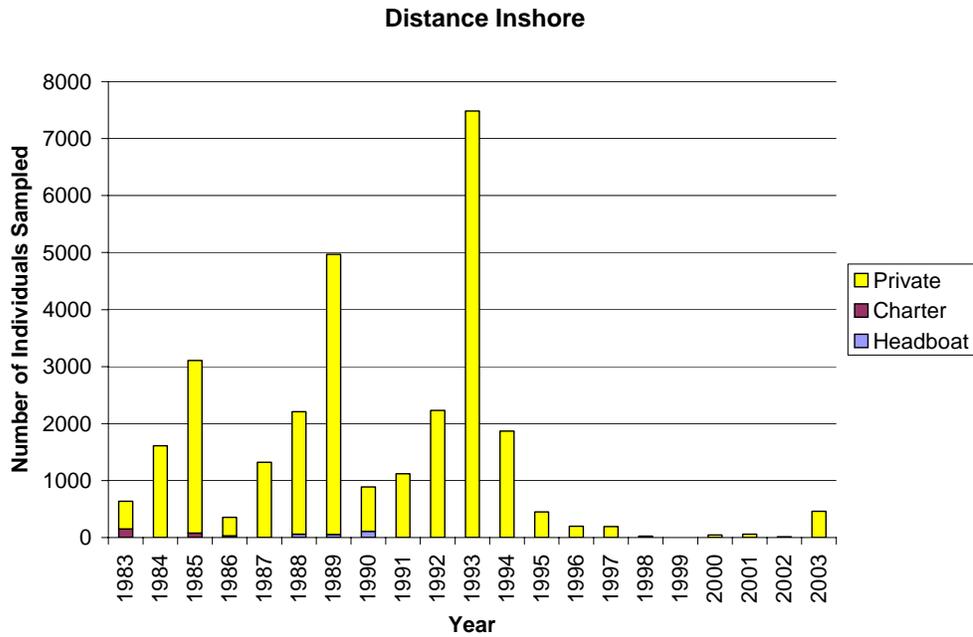


Figure 9: Texas gray triggerfish landings by inshore area, fishing mode and year.

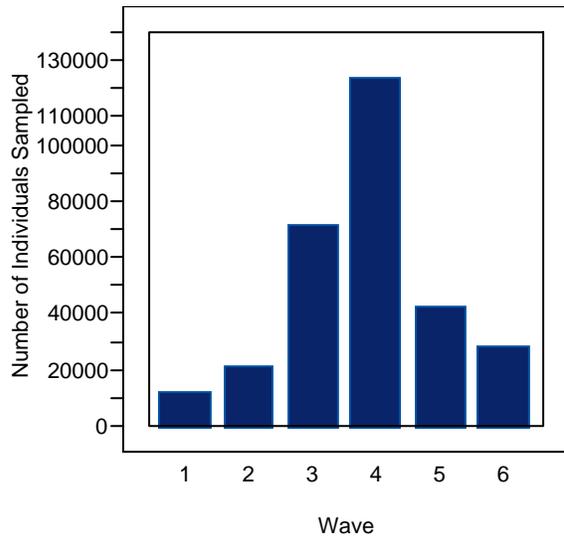


Figure 10: Texas gray triggerfish landings by wave, where the wave represents a bimonthly period of time with 1 = January and February, 2 = March and April, 3 = May and June, 4 = July and August, 5 = September and October, and 6 = November and December.

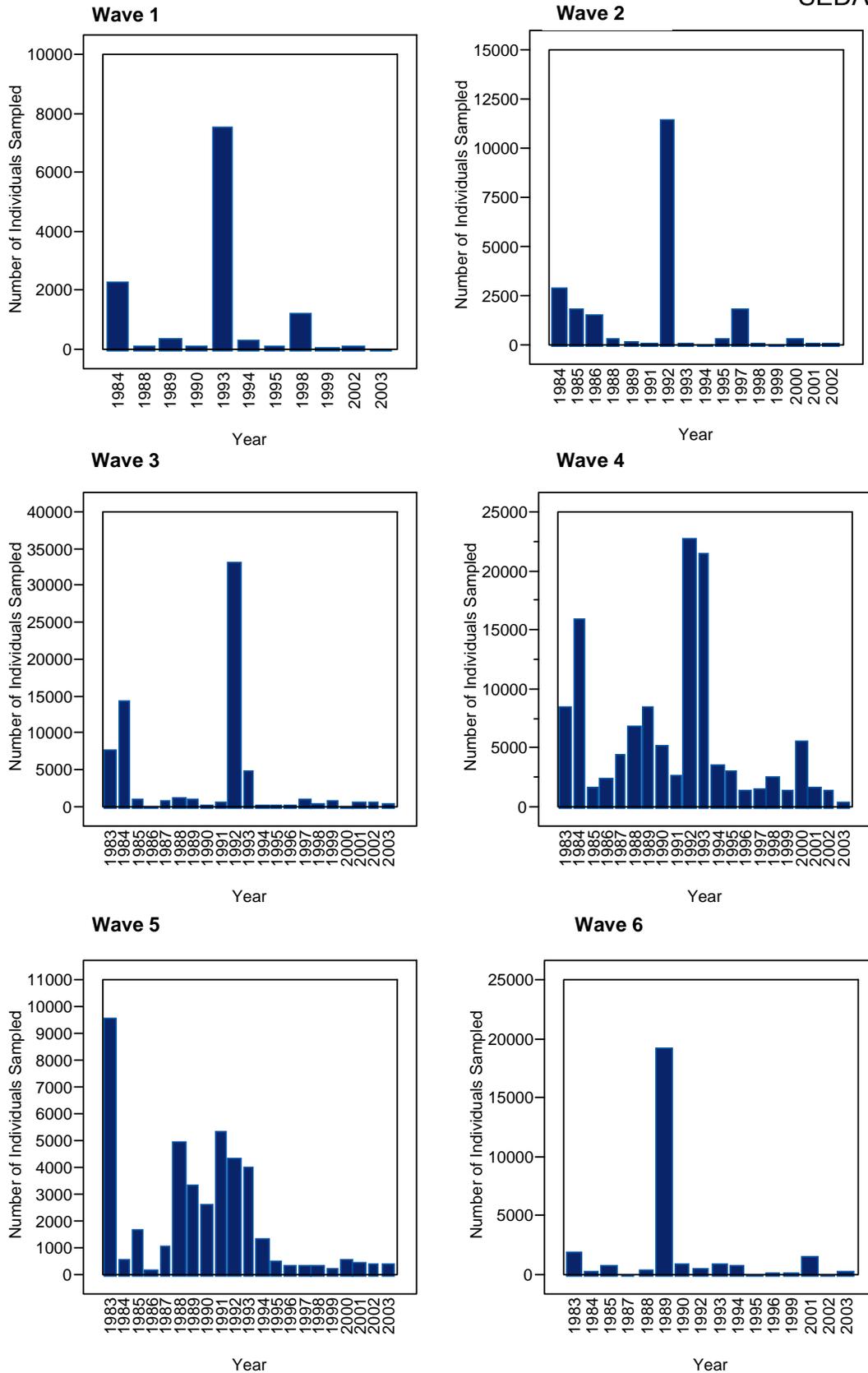


Figure 11: Texas gray triggerfish landings by wave and year, where wave represents a bimonthly period of time with 1 = January and February, 2 = March and April, 3 = May and June, 4 = July and August, 5 = September and October, and 6 = November and December.

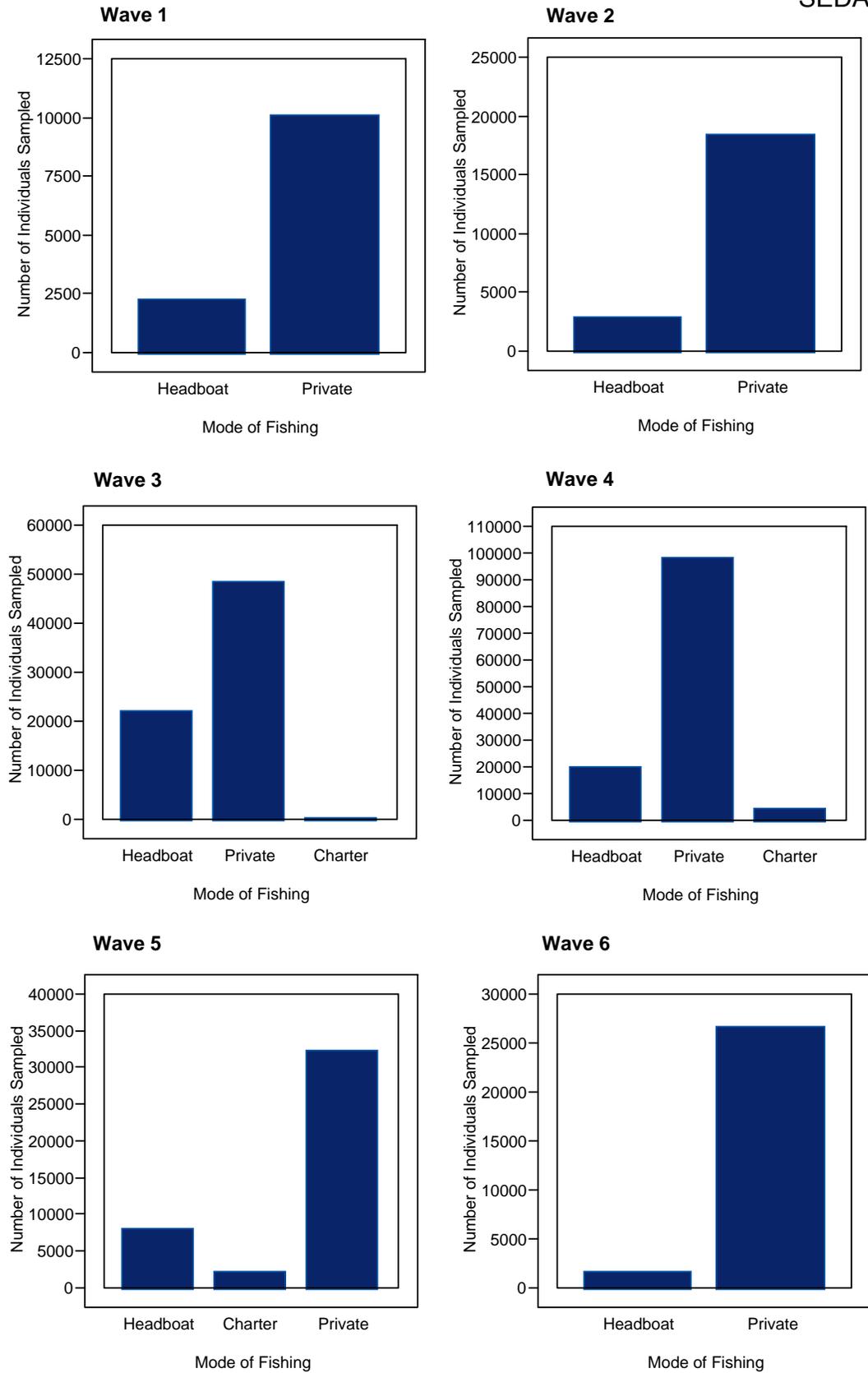


Figure 12: Texas gray triggerfish landings by mode and wave, where wave represents a bimonthly period of time with 1 = January and February, 2 = March and April, 3 = May and June, 4 = July and August, 5 = September and October, and 6 = November and December.

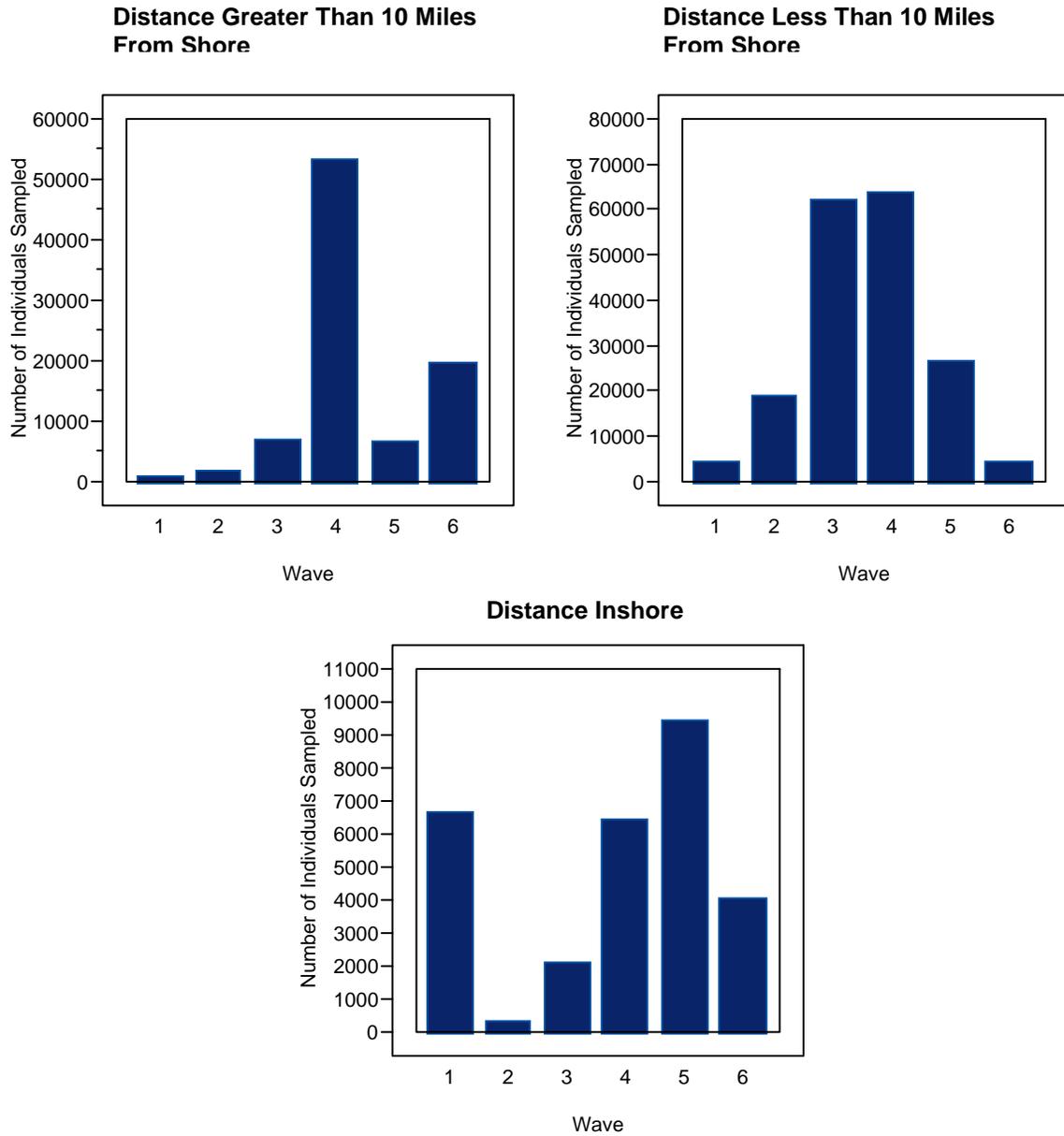


Figure 13: Texas gray triggerfish landings by area fished and wave, where the area fished represents the distance in miles from shore and the wave represents a bimonthly period of time with 1 = January and February, 2 = March and April, 3 = May and June, 4 = July and August, 5 = September and October, and 6 = November and December.