

**Estimated Gray Triggerfish (*Balistes capriscus*) Landings
From the Gulf of Mexico Headboat Fishery**

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SEDAR 9-DW-12

Preliminary Draft

National Marine Fisheries Service
Sustainable Fisheries Division
Contribution Number SFD-2005-21

Introduction

The Southeast Region Headboat Survey, facilitated by the NOAA Beaufort Laboratory collects fisheries and biological data to support stock management activities. The program monitors about 165 vessels in the Southeast. Landings information collected for gray triggerfish (*Balistes capriscus*) is preliminarily analyzed in order to better understand patterns occurring within this fishery (SEFSC Website). Headboat catch estimates include only those fish landed, where the fish are typically counted on stringers. The landings information does not include those fish that were returned alive or dead, nor does it include those fish that were not on stringers (such as if they were used for bait or filleted). That which may be landed and retained, while not on stringers is assumed to be extremely small. Large fish used as bait could be included in a trip report. The number of individuals released dead or alive is unknown, but also assumed to be close to zero.

Methods

The family and genus of the species were both included in the extraction of the data, however the number of individuals not defined at the species level was very small (Table 1). Consequently, it was assumed that all individuals listed as belonging to the triggerfish family were most likely gray triggerfish and were thus included in the analysis. The area of analysis in the Gulf of Mexico was defined as ranging from the Dry Tortugas and West Coast of Florida, to Southern Texas, not including those vessels in the Florida Keys that fish in the Atlantic. Area in the Headboat Survey is defined by a unique set of numeric codes (described in Table 7). In the Southern Florida Keys, these codes differentiate Atlantic, and Keys based vessels as belonging to the Atlantic region from those fishing in the Gulf.

Landings were calculated for various strata including year, state, region, and area, as well as the interactions between year and the aforementioned stratum. No gear information is available in this dataset. Comparisons between and among strata assume that sampling was random and even both temporally and spatially. Variances in the estimated number of fish captured are not available in the Headboat Survey because the survey is intended to be a census and are not statistically based. 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 One illustrates the annual number of gray triggerfish estimated each year, signaling a decline to an all time low in 2000. Alabama and Texas captured the highest number of gray triggerfish (Figure 2). Assuming the possibility that two stocks could exist within the Gulf of Mexico, landings were stratified into east and west, where west refers to Areas 18 through 23 and the east refers to Areas 24 through 27 (Table 4 and Figure 2). More gray triggerfish were sampled in the east (Figure 3). Across the different areas as defined by Table 4, the highest number of gray triggerfish appears to have been captured in Northwest Florida and Alabama (Area 23), and in Northeastern

Texas (Area 25) (Figure 5). Stratification of catch annually across the time series by area is illustrated in Appendix C.

Literature Cited

SEFSC Website. 2005. "Headboat Survey." Southeast Fisheries Science Center, National Marine Fisheries Service, National Oceanic Atmospheric Administration. Accessed 13 June 2005.

<http://www.sefsc.noaa.gov/headboatsurveyprogram.jsp>.

Appendix A: Charts and Tables

Year	Number of Gray Triggerfish	Number of Triggerfish sp.	% Gray Trigger	Total Number Gray and Unclassified
1986	45042	0	100.00%	45042
1987	38730	0	100.00%	38730
1988	68561	4	99.99%	68565
1989	80509	13	99.98%	80522
1990	131380	1	100.00%	131381
1991	89247	12	99.99%	89259
1992	110676	1	100.00%	110677
1993	102971		100.00%	102971
1994	110179	6	99.99%	110185
1995	97666		100.00%	97666
1996	76524	2	100.00%	76526
1997	63685		100.00%	63685
1998	53188		100.00%	53188
1999	40979	2	100.00%	40981
2000	32223		100.00%	32223
2001	40055	2	100.00%	40057
2002	53854		100.00%	53854
2003	63481	2	100.00%	63483

Table 1: The number of gray triggerfish and individuals classified under triggerfish family surveyed each year by headboats in the Gulf of Mexico.

Year	Texas	Louisiana	Alabama and Florida
1986	15611	407	29024
1987	16085	612	22033
1988	39513	1927	27125
1989	23537	1355	55630
1990	21650	3915	105816
1991	24110	7028	58121
1992	35890	5862	68925
1993	38226	5958	58787
1994	50039	6678	53468
1995	47925	3916	45825
1996	37503	2828	36195
1997	28731	496	34458
1998	15222	881	37085
1999	5854	984	34143
2000	5721	257	26245
2001	7315	179	32563
2002	8817	179	44858
2003	12782	4233	46468
Sum	434531	47695	816769

Table 2: The number of gray triggerfish surveyed in each state by year.

Year	East Stock	West Stock
1986	30014	16018
1987	23835	16697
1988	28457	41440
1989	57865	24892
1990	107706	25565
1991	59057	31138
1992	70376	41752
1993	59845	44184
1994	54884	56717
1995	46681	51841
1996	37416	40331
1997	35523	29227
1998	37684	16103
1999	34703	6838
2000	26977	5978
2001	34432	7494
2002	46978	8996
2003	52200	17015

Table 3: The number of gray triggerfish surveyed in each region by year, assuming the existence of two stocks.

Area Code	# fish	Area Description
18	326	Dry Tortugas (Gulf based vessels)
21	83940	SW Florida - Naples to Crystal River
22	14175	Florida Middle Grounds (west coast and Panhandle)
23	717849	NW Florida and Alabama (Panama City to Orange Beach)
24	47695	Louisiana
25	345309	NE Texas (Sabine to Freeport)
26	76634	Central Texas (Port Aransas)
27	12588	South Texas (Port Isabel and Brownsville)

Table 4: Gray triggerfish fish surveyed in each area of the Gulf of Mexico, where the area refers to the areas assigned by the headboat survey, NOT the NMFS shrimp codes. A description of each headboat area within the Gulf of Mexico is given.

Year	Area 18	Area 21	Area 22	Area 23	Area 24	Area 25	Area 26	Area 27
1988	10	2143	3662	23209	407	14807	747	57
1989		4080	1351	16602	612	15012	1024	49
1990		4347	167	22611	1927	37410	1986	117
1991	65	14644	1888	39033	1355	21810	1689	38
1992	660	10929	567	93660	3915	16644	4952	54
1993	28	4363	715	53015	7028	15973	8010	127
1994		6067	449	62409	5862	26230	8550	1110
1995	42	5174	549	53022	5958	28778	8287	1161
1996		3113	1095	49260	6678	39508	8454	2077
1997		3218	420	42187	3916	39974	7199	752
1998		3179		33016	2828	29311	5538	2654
1999		7148	15	27295	496	22710	4823	1198
2000		6659	1102	29324	881	10699	3789	734
2001		5323	1019	27801	984	4874	638	342
2002		1511	432	24302	257	4694	957	70
2003		1027	227	31309	179	4052	3242	21
Sum	805	82925	13658	628055	43283	332486	69885	10561

Table 5: Gray triggerfish surveyed in each area by year.

Appendix B: Graphs and Figures

Annual Gray Triggerfish Headboat Landings

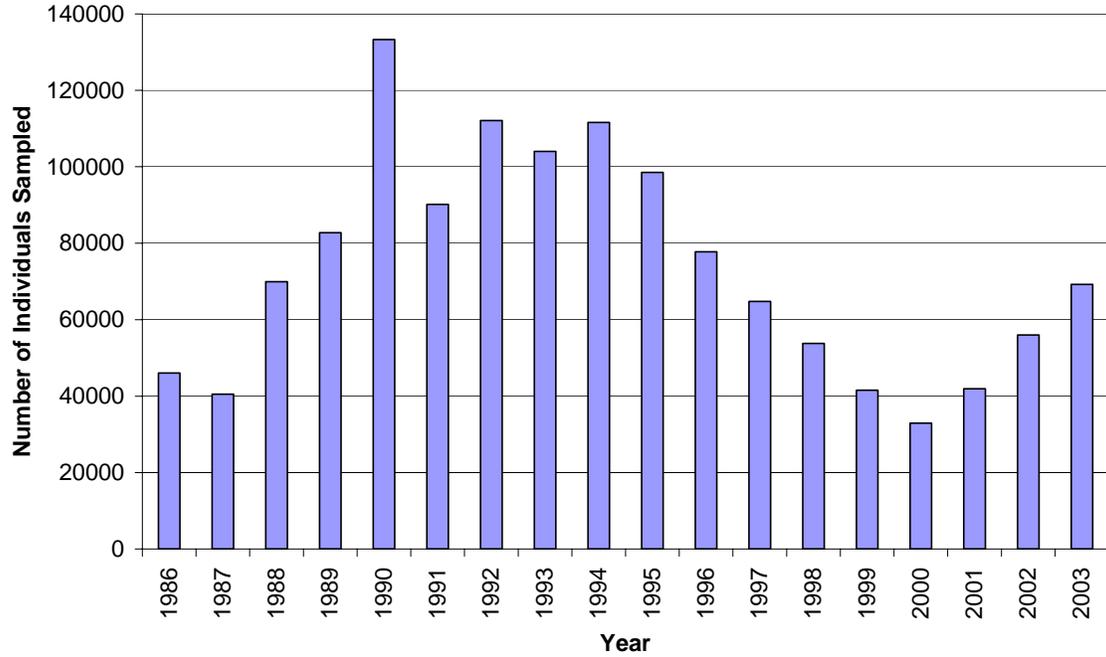


Figure 1: Annual number of gray triggerfish surveyed.

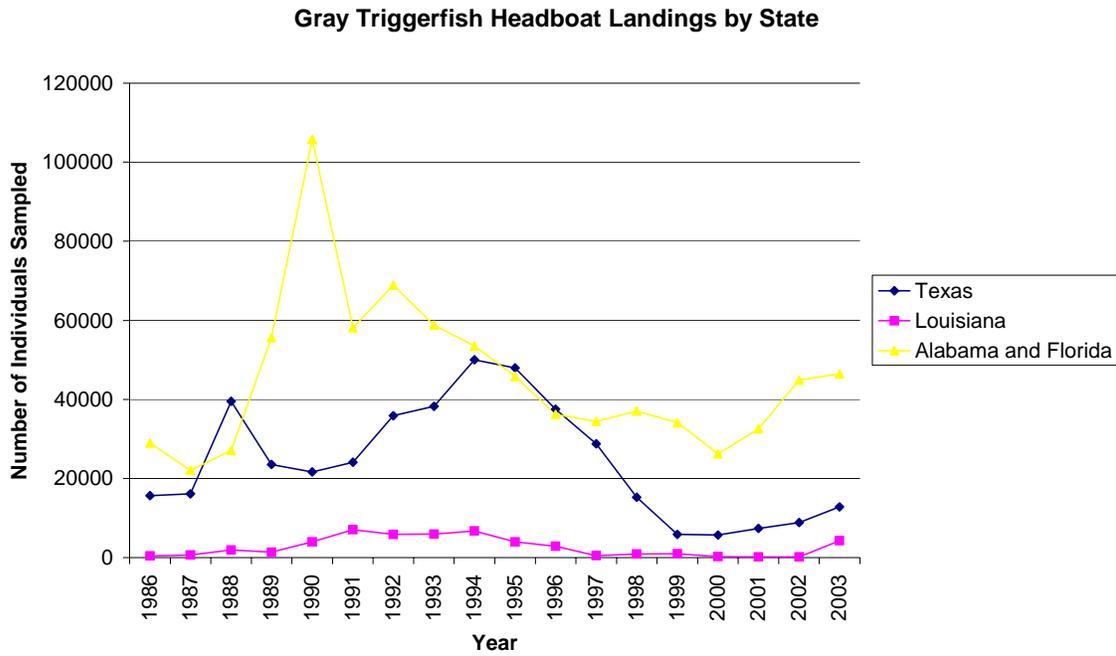


Figure 2: The number of gray triggerfish surveyed in each state by year.

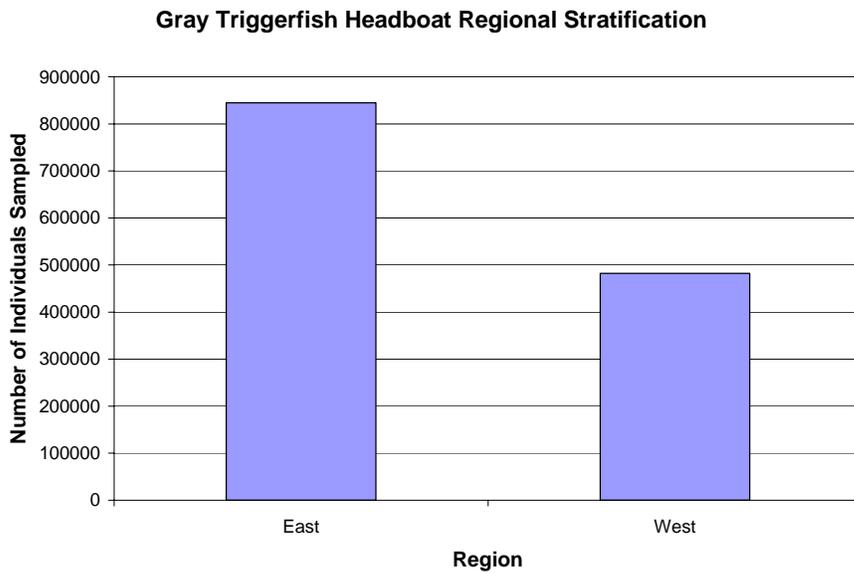


Figure 3: The number of gray triggerfish surveyed in each region, assuming the presence of two distinct stocks.

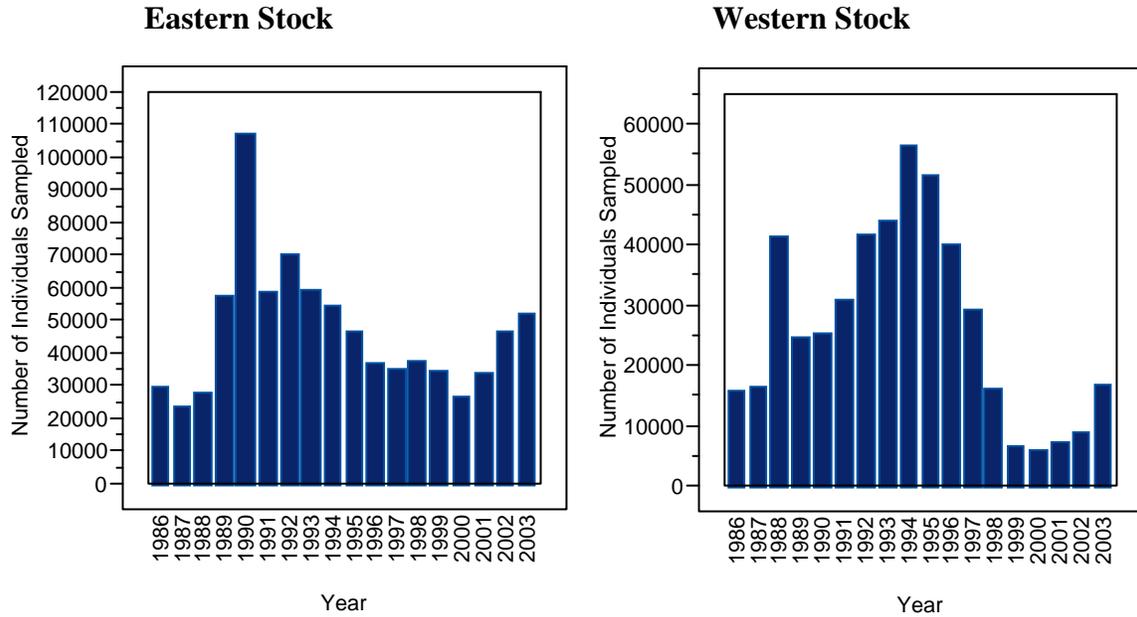


Figure 4: The number of gray triggerfish surveyed in each region by year, assuming the presence of two distinct stocks

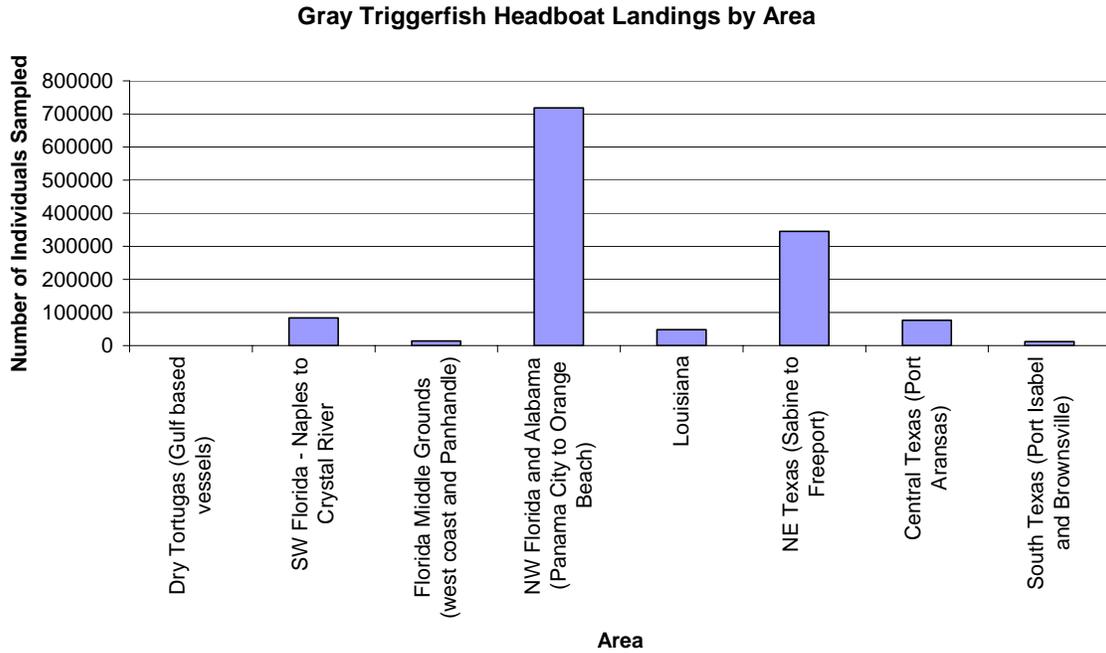
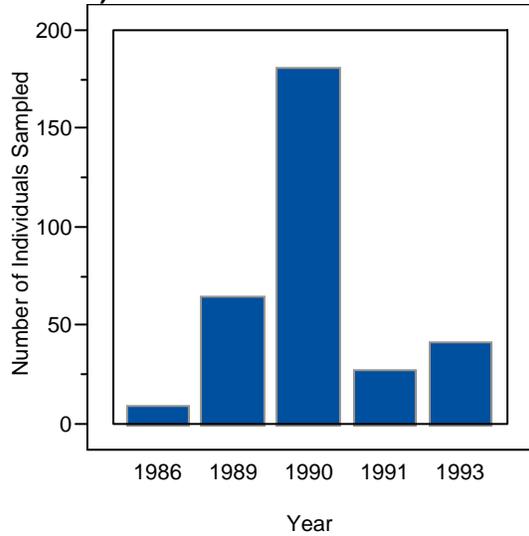


Figure 5: The number of gray triggerfish surveyed in each area, where the area refers to the areas assigned by the headboat survey, NOT the NMFS shrimp codes. A description of each headboat area within the Gulf of Mexico is given in Table 7.

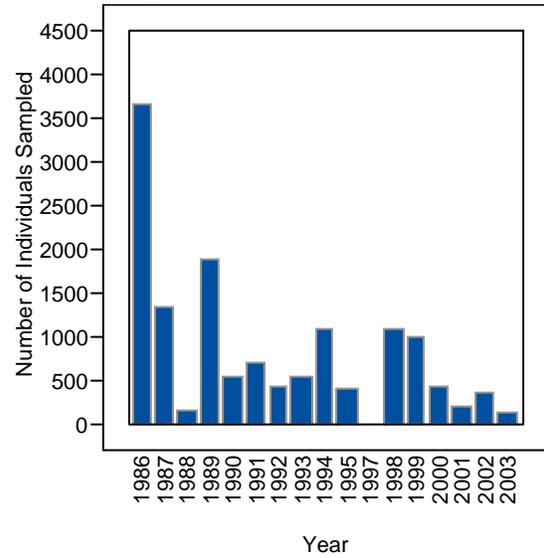
Appendix C

Stratification of headboat gray triggerfish by area. Area designation defined by headboat data set and described in Table 7

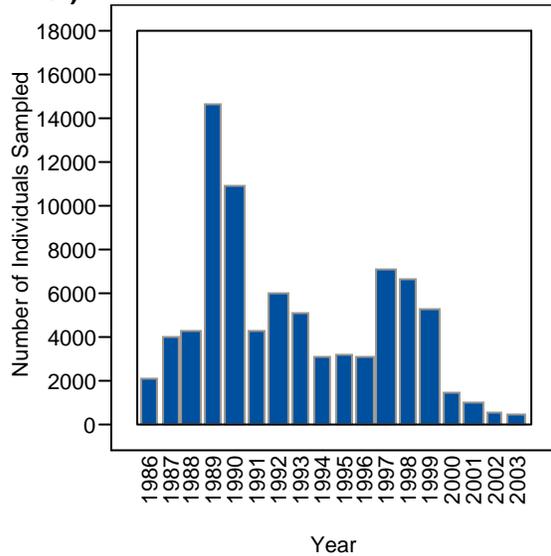
Area 18: Dry Tortugas (Gulf based vessels)



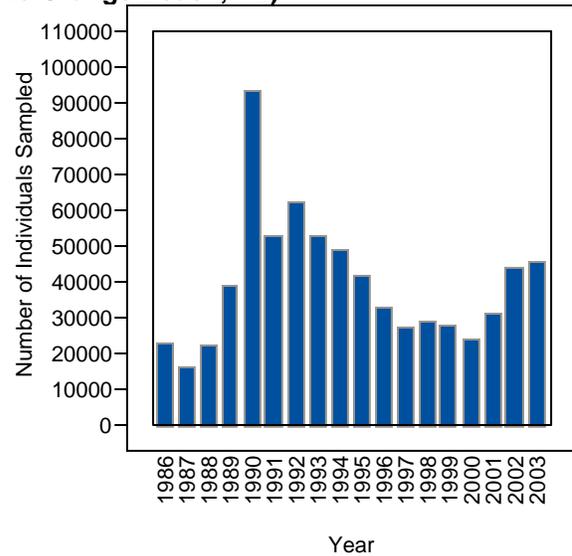
Area 22: FL Middle Grounds



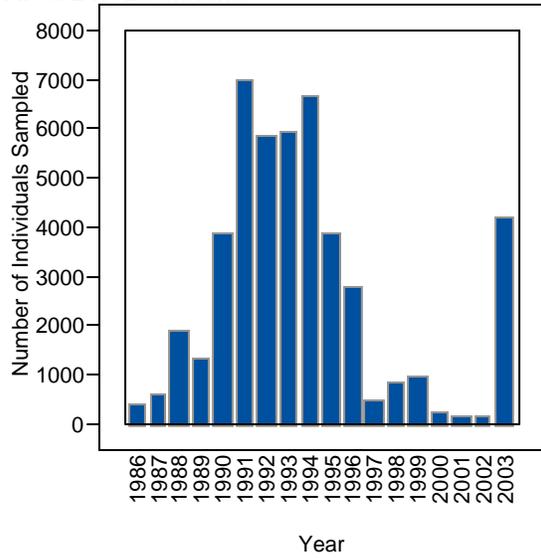
Area 21: SW Florida (Napes – Crystal River)



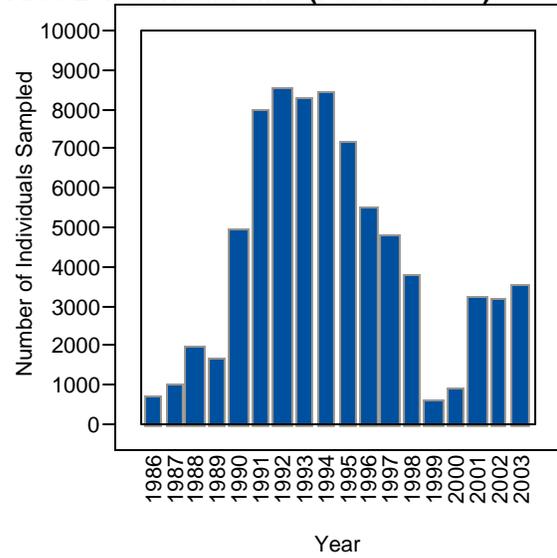
Area 23: NW FL and AL (Panama City, FL to Orange Beach, AL)



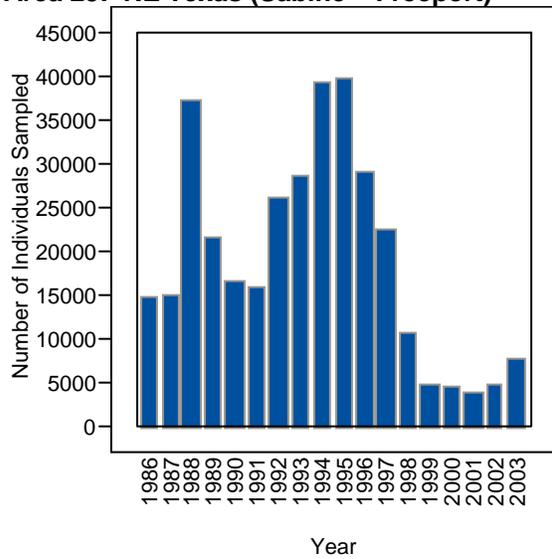
Area 24: Louisiana



Area 26: Central Texas (Port Aransas)



Area 25: NE Texas (Sabine – Freeport)



Area 27: South Texas (Port Isabel and Brownsville)

