

Appendix 5b: Analysis of the 2005-2006 Striped Bass Coastwide Weight-at-Age

Prepared for the Striped Bass Stock Assessment Sub-Committee

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FINAL

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Introduction

This report presents the results of the 2005-2006 update of the Atlantic coastwide weight-at-age (WAA) analysis for striped bass. This analysis followed the procedure outlined in “Analysis and Discussion of the 1998-2002 Striped Bass Coastwide Weight-at-Age”, prepared for the Striped Bass Stock Assessment Sub-Committee meeting August 9 – 11, 2005 by Linda S. Barker of Maryland DNR Fisheries Service. The data for these calculations were provided through the annual compliance report’s catch-at-age (CAA) spreadsheet. This standardized template has been in use since 2004.

Methods

It should be noted that although these calculations were performed exactly the same as those in 2005, the equation provided in the 2005 document was incorrect. The coastwide WAA was calculated as the ratio of (total weight of fish caught) to (total number of fish caught) for each age.

Subsequent analyses were performed on the WAA for the individual state fishery elements. WAA for a fishery element was calculated as the ratio of the total weight of fish harvested or discarded by that fishery element to the total number of fish harvested or discarded by that fishery element for each age. The following fishery elements were included in the calculation of the 2005 and 2006 coastwide WAA:

- Maine recreational harvest and discards,
- New Hampshire recreational harvest and discards,
- Massachusetts recreational harvest and discards and commercial harvest and discards,
- Rhode Island recreational harvest and discards and commercial harvest and discards,
- Connecticut recreational harvest and discards,
- New York recreational catch and commercial landings,
- New Jersey recreational harvest and discards,
- Delaware recreational harvest and discards and commercial harvest and discards,
- Maryland recreational harvest and discards and commercial harvest and discards,
- PRFC recreational harvest and commercial harvest,
- Virginia recreational harvest and discards and commercial harvest and discards, and
- North Carolina recreational harvest and discards and commercial harvest and discards.

Results and Discussion

Summary information for the coastwide CAA and WAA are shown in the attached tables and figures. Tables 1 - 4 provide the values used in the calculation of coastwide WAA – the total catch at age, the total weight of catch at age, and the ratio WAA value. The 2006 and 2005 coastwide values are provided in both pounds (Tables 1 and 3) and kilograms (Tables 2 and 4). The distributions of the 2005 and 2006 coastwide mean CAA are presented in both numbers of fish (Fig 1) and pounds (Fig 2). The distributions of the 2005 and 2006 coastwide mean WAA are presented in both pounds (Fig 3) and kg (Fig 4).

The WAA time series is provided in Table 5, but the 2003 and 2004 values are missing. These values need to be checked and updated and will be added later.

The 2005 and 2006 fishery-based tables demonstrate details of analysis. The coastwide CAA is divided into the fishery elements (recreational harvest, recreational discards, and commercial harvest in each state) in Tables 6A and 6B (numbers of fish) and Tables 7A and 7B (pounds of fish). Commercial discard data were not included in this analysis. Tables 8A and 8B present the proportional contribution of each fishery element to the coastwide CAA in 2006 and 2005.

The 2006 coastwide CAA by fishery (Table 8A) shows a shift in the proportional contribution to the coastwide catch at approximately age 6. The catch of younger fish (ages 2-6) was dominated by recreational discards. The ranges of contribution to the coastwide catch for ages 2-6 were: MD (2-51%), VA (0-36%), MA (14-25%) and ME (9-18%). The range in recreational harvest of the Bay states was also significant: MD (0-17%) and VA (0-14%). MD's commercial harvest (8-24%) was the third significant contributor to the catch for the younger ages. The catch of older fish (ages 6+) was dominated by recreational harvest. Most of the recreational harvest at each of the older ages was in the northern states: MA (13-18%), NY and NJ (both 10-13%) and CT (8-10%). The exception was MD (8-26%). 2005 numbers are shown in Table 8B.

These shifts in proportional contribution to the coastwide catch show a differential effect on the coastwide WAA. This emphasizes the importance of the accuracy of age assignments and age-length keys (ALK) among the states. In addition, some states use the ALK from a neighboring state, so the coastwide effect of those states' information is compounded. The tools and information supplied by MD, MA, NY and NJ account for the greatest overall contribution to the WAA calculations.

Figures 5A-5L show mean WAA (2-13+ years) by state and fishery element. These figures clearly show that most fisheries reported similar WAA for each age, but there were exceptions. Some fishery values were not biologically reasonable (Appendix A). Because the growth equations supplied in the state spreadsheets indicated that striped bass all along the coast are growing at similar rates, these outliers indicate possible age-related errors.

There was an apparent difference in WAA for coastal and Chesapeake Bay states in 2005 and 2006, but this did not appear to be a biological difference. 2006 WAA show wide ranges among the younger ages: age 3 (1.4 – 4.8 lbs., Figure 5B), age 4 (1.9 - 10.2 lbs., Figure 5C) and age 5 (3.1 - 11.1 lbs., Figure 5D), between states and years. This does not appear to be due to an actual difference in growth rates (i.e., females on the coast growing much faster) because growth curves indicate similar growth patterns between all states. A specific example using age 4 fish in 2006 illustrates the difference: mean weight of a NY recreational harvest fish is 10 lbs., while a ME fish of the same age weighs 2.9 lbs., and a fish from MD or VA weighs approximately 2.5 lbs. (Figure 5C). A comparison was made of coastal ALKs for recreational discards against the

MD spring ALK. The MD spring ALK should represent the complete stock on the spawning ground and should therefore contain the majority of the coastal fish. The WAA for DE, CT, NY and NJ were shifted outside of the MD minimum and maximum values for younger ages. While the young females are not encountered on the MD spawning grounds, they are sampled during a spring/early summer recreational creel survey. Mean WAAs from these data are much lower than those seen on the coast. Again, since each state's growth curves show similar patterns, these large differences in mean weight at age may be due to ageing error and should be further evaluated to provide an explanation of the differences between states.

These differences in WAA among fisheries prompted further investigation into the compliance report spreadsheets. Several errors were discovered in age-length keys and cell entries that required adjustment. Even after these corrections, the final results indicate that there may be some effects from ageing errors. See Appendix A for further details.

Appendix 5b Tables

Table 1. 2006 Atlantic coastwide striped bass weights at age (pounds). * calculated from total numbers and total weights

2006 AGE	0	1	2	3	4	5	6	7	8	9	10	11	12	13+	COAST WIDE TOTAL
Total Harvest (Fish) 2006	15	33,806	226,091	1,142,739	632,900	1,052,055	670,060	341,169	333,025	332,892	424,426	288,268	169,550	182,478	5,829,474
Total Wt. (Lbs.) 2006	0	16,522	242,467	2,079,375	1,965,837	4,877,206	4,155,669	3,083,536	3,613,561	4,570,353	6,588,685	5,163,478	3,356,854	4,463,092	44,176,635
WAA (Lbs.) 2006	0.01	0.49	1.07	1.82	3.11	4.64	6.20	9.04	10.85	13.73	15.52	17.91	19.80	24.46	

Table 2. 2006 Atlantic coastwide striped bass weights at age (kg). * calculated from total numbers and total weights

2006 AGE	0	1	2	3	4	5	6	7	8	9	10	11	12	13+	COAST WIDE TOTAL
Total Catch (Fish) 2006	15	33,806	226,091	1,142,739	632,900	1,052,055	670,060	341,169	333,025	332,892	424,426	288,268	169,550	182,478	5,829,474
Total Wt. (K.gs.) 2006	0	7,494	109,981	943,189	891,689	2,212,263	1,884,980	1,398,668	1,639,084	2,073,077	2,988,577	2,342,114	1,522,643	2,024,425	20,038,185
WAA (K.gs.) 2006	0.01	0.22	0.49	0.83	1.33	2.02	2.80	4.10	4.91	6.22	7.03	8.12	8.98	11.09	

Table 3. 2005 Atlantic coastwide striped bass weights at age (pounds).

2005 AGE	0	1	2	3	4	5	6	7	8	9	10	11	12	13+	COAST WIDE TOTAL
Total Catch (Fish) 2005	75	18,261	446,254	317,592	859,555	787,390	444,234	361,636	328,166	412,818	296,104	248,357	115,046	132,895	4,768,383
Total Wt. (Lbs.) 2005	8	5,815	572,054	727,494	2,911,356	3,691,836	3,034,246	3,119,694	3,897,877	5,600,426	4,376,674	4,350,654	2,260,358	3,436,972	37,985,465
WAA (Lbs.) 2005	0.09	0.30	1.13	2.31	3.29	4.52	6.78	8.63	11.73	14.17	16.40	19.13	21.72	24.56	

Table 4. 2005 Atlantic coastwide striped bass weights at age (kg).

2005 AGE	0	1	2	3	4	5	6	7	8	9	10	11	12	13+	COAST WIDE TOTAL
Total Catch (Fish) 2005	75	18,261	446,254	317,592	845,159	760,655	429,839	352,587	317,883	407,471	295,693	248,357	115,046	132,895	4,687,768
Total Wt. (K.gs.) 2005	4	2,637	259,479	329,986	1,320,569	1,674,589	1,376,311	1,415,069	1,768,047	2,540,310	1,985,226	1,973,424	1,025,281	1,558,984	17,229,917
WAA (K.gs.) 2005	0.05	0.14	0.58	1.04	1.56	2.20	3.20	4.01	5.56	6.23	6.71	7.95	8.91	11.73	

Table 5. 1982-2006 striped bass Atlantic coastwide weights at age (kg) time series (less 2003 and 2004).

Year	Age												
	1	2	3	4	5	6	7	8	9	10	11	12	13+
1982	0.1	0.6	1.1	1.5	2.4	3.7	4.8	5.8	6.2	8.7	10.8	11.2	14.0
1983	0.2	0.6	0.9	1.4	2.4	3.3	3.8	5.4	6.0	8.1	9.6	10.4	11.1
1984	0.2	0.6	1.7	1.6	2.7	3.4	5.1	5.7	6.8	7.8	8.4	12.7	12.4
1985	0.1	0.6	1.1	1.7	2.2	3.6	4.9	5.5	6.8	7.4	9.0	10.7	13.9
1986	0.1	0.6	1.3	2.4	2.4	3.1	4.0	5.0	5.4	6.1	7.8	9.2	12.8
1987	0.2	0.8	1.4	2.1	2.5	2.9	3.6	4.7	5.5	6.5	7.8	9.8	13.2
1988	0.3	0.9	1.1	2.0	3.1	4.0	4.4	4.7	5.2	5.6	8.6	10.4	13.3
1989	0.2	0.8	1.2	2.2	3.1	4.5	5.4	6.2	6.0	8.7	8.9	9.7	13.4
1990	0.1	0.9	1.1	2.1	2.4	3.8	4.9	6.0	5.7	6.0	7.4	9.1	12.6
1991	0.2	0.9	1.3	2.2	2.6	3.2	4.8	5.6	6.5	6.2	9.5	8.3	14.2
1992	0.1	0.7	1.3	1.9	2.8	3.7	4.9	5.8	7.0	8.2	9.8	12.4	14.0
1993	0.1	0.8	1.3	2.0	2.8	3.6	4.8	6.1	7.0	8.0	9.5	10.8	14.6
1994	0.2	1.1	1.7	2.2	2.9	3.5	4.9	6.2	6.8	7.5	9.7	10.7	12.7
1995	0.3	0.7	1.3	2.2	2.8	3.7	5.4	6.2	7.3	8.9	7.6	9.7	16.7
1996	0.1	1.0	1.5	2.3	3.2	4.5	6.4	7.1	7.8	9.2	9.3	10.1	13.7
1997	0.1	0.6	1.2	2.5	2.8	3.6	4.5	5.1	6.7	9.2	9.9	10.2	14.8
1998	0.4	0.8	1.2	1.6	2.2	2.9	4.7	5.7	6.8	7.0	7.8	9.9	11.9
1999	0.6	0.9	1.1	1.4	1.9	2.5	3.4	5.0	6.6	7.8	8.7	9.8	12.0
2000	0.4	0.6	1.1	1.5	2.0	2.8	3.9	5.1	7.1	7.4	9.7	10.7	13.6
2001	0.2	0.4	1.1	1.8	2.2	3.2	4.1	5.0	6.4	7.8	8.6	8.3	10.9
2002	0.1	0.3	1.1	1.5	2.2	3.2	4.2	5.5	6.0	7.6	9.1	9.7	11.5
2005	0.1	.6	1.0	1.6	2.2	3.2	4.0	5.6	6.2	6.7	8.0	8.9	11.7
2006	0.2	.5	.8	1.3	2.0	2.8	4.1	4.9	6.2	7.0	8.1	9.0	11.1

Table 6A. 2006 striped bass catch at age (numbers of fish) by state and fishery.

2006 STATE FISHERY	0	1	2	3	4	5	6	7	8	9	10	11	12	13+	TOTAL
ME RECREATIONAL HARVEST	0	0	0	8,709	11,722	35,478	14,798	1,760	0	13	13	275	186	430	73,385
ME RECREATIONAL DISCARDS	0	0	19,839	200,717	42,932	16,820	16,820	2,959	1,849	1,147	1,184	771	342	379	325,624
NEW HAMPSHIRE RECREATIONAL HARVEST	0	0	0	0	0	1,467	3,114	1,799	2,199	1,528	1,969	1,250	664	770	14,760
NEW HAMPSHIRE RECREATIONAL DISCARDS	0	0	3,407	26,485	5,138	3,006	3,006	476	229	165	184	117	63	86	45,434
MASS RECREATIONAL HARVEST	0	0	0	0	0	11,558	32,235	26,771	43,404	44,581	69,177	50,245	30,376	36,757	345,104
MASS RECREATIONAL DISCARDS	0	0	30,649	291,125	79,370	89,946	89,946	18,457	12,147	9,464	11,359	6,486	3,330	2,594	693,021
MASS COMMERCIAL HARVEST	0	0	0	0	0	0	0	460	2,868	11,125	19,766	15,563	9,697	10,506	69,985
RI RECREATIONAL HARVEST	0	0	0	0	806	9,085	11,997	9,364	12,382	8,657	9,750	7,099	3,452	2,688	75,279
RI RECREATIONAL DISCARDS	0	852	17,704	53,907	7,680	6,798	6,798	2,529	1,431	743	388	250	104	97	108,567
RI COMMERCIAL HARVEST	0	0	0	0	0	50	46	1,319	3,325	4,016	2,832	1,878	970	993	15,429
CON RECREATIONAL HARVEST	0	0	0	0	658	4,616	10,937	15,151	6,345	15,676	11,860	9,306	3,163	6,064	83,776
CON RECREATIONAL DISCARDS	0	3,050	25,993	62,401	8,039	15,567	7,408	3,028	2,776	1,984	1,136	1,227	693	1,360	134,659
NY RECREATIONAL HARVEST	0	0	0	0	7,530	55,500	64,912	37,289	42,998	26,998	34,832	21,297	13,128	5,955	310,441
NY RECREATIONAL DISCARDS	0	213	8,757	58,721	12,237	23,589	8,374	3,827	3,236	1,940	2,411	1,481	903	554	126,246
NY COMMERCIAL HARVEST	0	0	0	127	1,411	18,155	14,102	9,681	8,671	6,587	7,623	4,568	1,186	1,418	73,528
NJ RECREATIONAL HARVEST	0	0	0	0	4,615	25,037	51,241	82,538	71,059	68,644	76,010	53,236	32,312	24,818	489,510
NJ RECREATIONAL DISCARDS	15	340	6,632	44,840	25,896	49,021	19,584	7,049	4,371	3,061	3,293	2,006	1,150	788	168,045
DEL RECREATIONAL HARVEST	0	0	0	0	406	2,044	2,284	2,895	2,190	2,016	2,884	1,786	1,361	815	18,680
DEL RECREATIONAL DISCARDS	0	65	1,023	5,455	3,716	5,560	1,760	719	397	225	268	193	112	132	19,624
DEL COMMERCIAL HARVEST	0	0	0	0	13	4,755	14,373	4,281	2,548	1,157	1,099	332	840	813	30,212
MD RECREATIONAL HARVEST	0	0	0	69,790	102,755	174,591	68,894	28,592	31,184	40,461	49,265	34,615	23,490	36,825	660,462
MD RECREATIONAL DISCARDS	0	17,232	65,843	131,574	26,917	16,711	12,000	7,257	8,698	8,630	9,672	3,998	2,300	1,584	312,417
MD COMMERCIAL HARVEST	0	0	0	90,171	154,029	254,656	104,954	25,365	14,508	5,655	3,488	2,194	187	743	655,951
PRFC COMMERCIAL HARVEST				185	35,808	49,282	4,522	369	1,015	554	554	0	0	0	92,288
VA RECREATIONAL HARVEST	0	0	9,430	33,943	88,366	86,000	90,715	37,697	31,866	30,416	50,052	28,442	15,383	25,882	528,191
VA RECREATIONAL DISCARDS	0	12,003	36,426	62,893	11,219	3,244	3,718	1,411	1,236	795	1,301	664	512	253	135,677
VA COMMERCIAL HARVEST	0	0	81	336	1,303	8,694	11,275	6,097	9,713	16,389	25,124	14,064	9,195	7,123	109,395
NC RECREATIONAL HARVEST	0	0	0	0	0	0	0	1,959	10,309	20,137	26,562	24,214	13,780	11,007	107,966
NC RECREATIONAL DISCARDS	0	51	307	1,360	333	454	247	70	54	43	47	27	14	12	3,019
NC COMMERCIAL HARVEST	0	0	0	0	0	0	0	0	17	85	326	684	656	1,031	2,798
TOTAL AT AGE	15	33,806	226,091	1,142,739	632,900	1,052,055	670,060	341,169	333,025	332,892	424,426	288,268	169,550	182,478	5,829,474

Table 6B. 2005 striped bass catch at age (numbers of fish) by state and fishery.

2005 STATE FISHERY	0	1	2	3	4	5	6	7	8	9	10	11	12	13+	TOTAL
ME RECREATIONAL HARVEST	0	0	0	9,872	30,581	19,338	3,666	647	323	45	136	207	176	190	65,179
ME RECREATIONAL DISCARDS	0	0	43,368	65,239	78,653	33,280	9,269	4,165	3,756	2,367	1,005	435	208	198	241,943
NEW HAMPSHIRE RECREATIONAL HARVEST	0	0	0	0	312	3,129	5,875	6,599	6,415	3,751	1,182	162	42	8	27,476
NEW HAMPSHIRE RECREATIONAL DISCARDS	0	0	13,278	7,133	10,027	2,038	715	715	551	342	184	104	66	99	41,022
MASS RECREATIONAL HARVEST	0	0	0	0	2,505	36,790	56,750	61,896	80,240	67,697	34,916	22,525	11,932	17,533	392,784
MASS RECREATIONAL DISCARDS	0	0	63,042	58,533	99,799	31,005	15,771	16,133	11,524	11,524	5,517	2,857	1,657	2,253	387,180
MASS COMMERCIAL HARVEST	0	0	0	0	0	0	2,888	12,372	15,613	9,585	7,073	4,281	4,281	5,915	57,728
RI RECREATIONAL HARVEST	0	0	0	0	442	3,669	8,086	11,401	17,730	20,884	14,023	11,978	7,714	11,365	107,293
RI RECREATIONAL DISCARDS	0	182	25,261	4,806	9,788	7,837	3,982	2,514	1,649	1,315	694	512	267	477	59,282
RI COMMERCIAL HARVEST	0	0	0	0	27	172	632	1,337	3,019	2,896	2,790	1,880	1,002	1,194	14,949
CON RECREATIONAL HARVEST	0	0	0	0	814	5,929	14,327	19,341	9,041	18,146	13,849	11,439	3,233	6,957	103,075
CON RECREATIONAL DISCARDS	69	2,310	47,579	12,246	32,133	14,856	7,454	5,992	2,419	4,826	3,365	2,544	703	589	137,083
NY RECREATIONAL HARVEST	0	0	0	0	3,103	18,287	33,787	40,845	20,598	40,406	31,489	27,666	13,925	10,014	240,119
NY RECREATIONAL DISCARDS	0	110	34,834	10,287	30,485	13,421	4,691	3,569	1,672	3,049	2,321	2,040	1,027	365	107,870
NY COMMERCIAL HARVEST	0	0	0	417	6,635	11,375	12,764	11,959	4,124	10,307	7,814	2,786	2,061	317	70,560
NJ RECREATIONAL HARVEST	0	0	0	0	28,734	67,361	49,101	30,180	33,573	34,238	21,829	33,239	3,587	17,600	319,444
NJ RECREATIONAL DISCARDS	6	208	7,975	11,409	25,597	19,483	7,635	7,991	5,767	5,153	1,797	1,969	122	682	95,795
DEL RECREATIONAL HARVEST	0	0	0	0	137	1,120	1,925	3,184	1,619	2,227	2,720	4,755	572	237	18,496
DEL RECREATIONAL DISCARDS	0	8,132	580	1,488	1,692	2,823	410	580	544	591	595	270	179	104	17,987
DEL COMMERCIAL HARVEST	0	0	0	0	525	4,332	5,395	4,096	4,726	4,143	2,690	280	150	0	26,336
MD RECREATIONAL HARVEST	0	0	326	25,251	96,875	107,248	45,922	38,932	26,339	42,500	34,665	36,337	21,909	17,660	493,964
MD RECREATIONAL DISCARDS	0	7,193	135,950	48,116	58,836	23,165	5,573	4,906	3,760	4,742	3,039	2,539	1,738	708	300,266
MD COMMERCIAL HARVEST	0	0	144	42,952	214,726	203,839	62,171	21,599	11,773	7,424	2,928	2,164	105	139	569,964
PRFC COMMERCIAL HARVEST	0	0	0	0	14,396	26,735	14,396	9,049	10,283	5,347	411	0	0	0	80,615
VA RECREATIONAL HARVEST	0	0	0	3,738	86,193	65,312	49,664	41,334	26,665	37,613	25,939	18,078	8,433	8,882	371,853
VA RECREATIONAL DISCARDS	0	0	70,853	14,396	20,607	5,813	1,447	1,541	823	1,101	566	875	544	197	118,763
VA COMMERCIAL HARVEST	0	0	0	90	3,387	5,078	5,710	6,791	8,975	24,725	19,079	19,509	12,624	13,277	119,244
NC RECREATIONAL HARVEST	0	0	0	0	0	0	0	1,481	12,260	36,963	47,240	27,291	10,857	8,892	144,983
NC RECREATIONAL DISCARDS	1	126	3,066	1,618	2,546	1,428	509	331	257	242	132	98	45	39	10,437
NC COMMERCIAL HARVEST	0	0	0	0	0	0	51	0	761	2,639	3,603	6,749	5,887	7,003	26,693
TOTAL AT AGE	75	18,261	446,254	317,592	859,555	787,390	444,234	361,636	328,166	412,818	296,104	248,357	115,046	132,895	4,768,383

Table 7A. 2006 striped bass catch at age (pounds of fish) by state and fishery.

AGE	0	1	2	3	4	5	6	7	8	9	10	11	12	13+	TOTAL
ME RECREATIONAL HARVEST	0.0	0	0	21,514	34,430	124,619	56,994	7,287	0	256	256	5,785	3,917	10,170	265,227
ME RECREATIONAL DISCARDS	0.0	0	16,928	287,155	101,295	152,002	80,923	20,355	18,061	13,222	17,469	12,183	6,221	8,216	734,033
NEW HAMPSHIRE RECREATIONAL HARVEST	0.0	0	0	0	0	12,271	28,162	18,332	24,336	20,814	31,917	22,707	13,974	19,808	192,321
NEW HAMPSHIRE RECREATIONAL DISCARDS	0.0	0	3,381	40,432	11,945	24,735	14,593	3,416	2,455	2,105	2,975	2,147	1,327	2,323	111,834
MASS RECREATIONAL HARVEST	0.0	0	0	0	0	87,267	288,770	259,791	470,642	575,749	1,045,473	868,369	575,194	838,651	4,989,907
MASS RECREATIONAL DISCARDS	0.0	0	26,152	416,497	187,269	572,171	432,744	126,965	118,655	109,118	167,563	102,537	60,535	54,741	2,374,948
MASS COMMERCIAL HARVEST	0.0	0	0	0	0	0	0	5,980	43,574	171,426	342,627	285,253	191,736	265,034	1,305,631
RI RECREATIONAL HARVEST	0.0	0	0	0	0	68,592	100,033	90,870	134,261	111,801	147,347	122,690	65,358	59,420	900,372
RI RECREATIONAL DISCARDS	0.0	0	15,107	77,122	18,120	66,635	32,706	17,398	13,983	8,571	5,721	3,948	1,898	2,040	263,250
RI COMMERCIAL HARVEST	0.0	0	0	0	0	0	0	17,149	50,515	61,886	49,089	34,414	19,177	24,130	256,359
CON RECREATIONAL HARVEST	0.0	0	0	0	5,722	42,234	116,914	176,163	86,894	239,270	198,417	178,130	62,165	57,990	1,163,889
CON RECREATIONAL DISCARDS	0.0	1,725	38,477	182,118	47,061	121,239	77,352	35,824	39,896	37,599	22,320	29,659	16,840	25,334	675,443
NY RECREATIONAL HARVEST	0.0	0	0	0	76,886	571,442	729,836	462,657	671,208	524,172	717,637	530,507	319,763	164,165	4,768,272
NY RECREATIONAL DISCARDS	0.0	121	11,287	131,011	48,048	122,448	55,178	29,132	34,210	26,114	35,200	26,226	15,576	7,910	542,461
NY COMMERCIAL HARVEST	0.0	0	0	612	8,340	117,620	105,681	84,683	89,114	76,415	104,220	64,925	15,952	20,883	688,446
NJ RECREATIONAL HARVEST	0.0	0	0	0	44,528	277,502	525,181	990,231	865,097	1,058,911	1,311,301	1,089,025	754,127	759,239	7,675,201
NJ RECREATIONAL DISCARDS	0.2	207	12,186	145,044	144,991	307,580	132,238	63,825	47,473	44,638	54,318	39,949	26,222	24,119	1,042,790
DEL RECREATIONAL HARVEST	0.0	0	0	0	3,353	17,620	22,498	34,129	26,588	31,214	48,433	36,361	32,440	25,522	278,159
DEL RECREATIONAL DISCARDS	0.0	40	1,783	19,460	20,629	34,521	13,547	7,004	4,252	3,487	4,745	4,152	2,975	4,104	120,700
DEL COMMERCIAL HARVEST	0.0	0	0	0	110	24,597	85,863	29,926	21,088	13,049	15,738	5,308	13,166	17,804	226,660
MD RECREATIONAL HARVEST	0.0	0	0	152,714	259,006	543,865	298,811	179,661	260,756	556,947	770,982	570,715	482,536	903,855	4,979,847
MD RECREATIONAL DISCARDS	0.0	6,746	42,037	183,660	51,909	54,419	61,867	61,324	80,373	99,760	118,252	54,404	34,655	17,977	867,382
MD COMMERCIAL HARVEST	0.0	0	0	216,857	408,321	790,627	410,439	105,075	68,639	45,124	27,669	23,729	2,265	11,257	2,110,003
PFC COMMERCIAL HARVEST	0.0	0	0	1,081	209,717	355,599	44,141	4,684	18,233	13,513	16,540	0	0	0	673,508
VA RECREATIONAL HARVEST	0.0	0	23,868	80,076	242,820	313,674	362,632	180,648	242,468	348,852	672,590	517,157	284,023	812,252	4,081,059
VA RECREATIONAL DISCARDS	0.0	7,663	50,846	121,288	36,535	16,725	31,419	13,036	14,287	9,721	17,708	10,002	5,812	0	335,042
VA COMMERCIAL HARVEST	0.0	0	218	837	4,159	45,723	65,868	44,977	92,462	202,844	389,193	247,526	171,510	148,201	1,413,518
NC RECREATIONAL HARVEST	0.0	0	0	0	0	0	0	12,424	73,299	161,988	246,621	261,607	162,211	150,380	1,068,530
NC RECREATIONAL DISCARDS	0.0	20	196	1,898	643	1,478	1,275	588	502	492	572	363	217	140	8,384
NC COMMERCIAL HARVEST	0.0	0	0	0	0	0	0	0	229	1,296	5,792	13,701	15,062	27,378	63,458
TOTAL POUNDS AT AGE	0.169	16,522	242,467	2,079,375	1,965,837	4,877,206	4,155,669	3,083,536	3,613,561	4,570,353	6,588,685	5,163,478	3,356,854	4,463,092	44,176,635

Table 7B. 2005 striped bass catch at age (pounds of fish) by state and fishery.

AGE	0	1	2	3	4	5	6	7	8	9	10	11	12	13+	TOTAL
ME RECREATIONAL HARVEST	0	0	0	28,592	95,495	76,799	16,651	3,270	1,534	880	2,831	4,352	3,918	4,560	238,883
ME RECREATIONAL DISCARDS	0	0	40,424	146,586	255,392	161,151	61,405	36,327	42,288	31,327	15,014	8,303	4,501	5,189	807,917
NEW HAMPSHIRE RECREATIONAL HARVEST	0	0	0	0	2,413	28,254	56,804	70,167	76,736	48,886	15,374	2,730	735	159	302,258
NEW HAMPSHIRE RECREATIONAL DISCARDS	0	0	11,807	15,187	33,377	32,780	13,263	6,156	6,302	5,010	3,138	2,243	1,574	2,934	133,771
MASS RECREATIONAL HARVEST	0	0	0	0	18,994	324,730	532,423	653,862	1,032,335	985,776	596,283	486,984	271,713	503,136	5,386,226
MASS RECREATIONAL DISCARDS	0	0	64,497	144,362	355,676	420,342	225,433	150,995	199,363	167,409	90,448	59,895	39,349	65,169	1,982,939
MASS COMMERCIAL HARVEST	0	0	0	0	0	0	0	36,831	200,321	254,870	189,264	156,587	109,818	223,114	1,170,806
RI RECREATIONAL HARVEST	0	0	0	0	3,355	32,386	75,863	120,442	228,103	304,109	239,485	248,328	175,650	322,897	1,750,619
RI RECREATIONAL DISCARDS	0	78	50,326	16,265	47,131	55,769	40,231	31,261	23,369	20,672	12,070	10,672	5,994	26,619	340,458
RI COMMERCIAL HARVEST	0	0	0	0	0	0	0	17,055	48,886	47,278	55,084	41,614	25,705	26,331	261,953
CON RECREATIONAL HARVEST	0	0	0	0	7,198	55,114	157,122	224,791	116,294	270,406	217,411	239,601	65,616	191,465	1,545,018
CON RECREATIONAL DISCARDS	8	994	94,789	41,444	154,730	105,708	75,314	74,519	34,287	75,870	58,481	53,063	15,799	32,910	817,916
NY RECREATIONAL HARVEST	0	0	0	0	23,156	138,541	283,382	384,562	234,458	557,434	477,337	467,642	253,232	198,906	3,018,651
NY RECREATIONAL DISCARDS	0	70	63,062	28,050	122,449	77,364	36,628	34,911	20,100	45,867	38,935	38,145	20,656	16,224	542,460
NY COMMERCIAL HARVEST	0	0	0	2,363	39,509	76,375	100,414	113,736	43,041	134,493	98,810	38,261	37,241	5,577	689,821
NJ RECREATIONAL HARVEST	0	0	0	0	185,861	450,300	395,262	239,208	499,724	560,852	404,665	649,690	86,392	481,640	3,953,594
NJ RECREATIONAL DISCARDS	0	68	10,893	27,233	101,935	103,587	54,006	72,232	69,705	68,449	26,322	35,450	2,240	18,352	590,472
DEL RECREATIONAL HARVEST	0	0	0	0	1,385	10,252	24,088	34,787	21,131	32,990	49,991	76,570	8,320	3,040	262,553
DEL RECREATIONAL DISCARDS	0	2,679	792	3,552	6,739	15,008	2,901	5,242	6,569	7,855	8,707	4,851	3,289	2,795	70,979
DEL COMMERCIAL HARVEST	0	0	0	0	2,164	23,076	31,796	30,634	41,335	41,255	30,549	4,139	2,034	0	206,981
MD RECREATIONAL HARVEST	0	0	514	54,397	280,066	329,920	200,112	233,241	263,227	586,891	548,640	689,157	480,651	448,705	4,095,520
MD RECREATIONAL DISCARDS	0	1,799	152,281	75,991	127,063	61,616	27,198	29,645	34,573	63,822	47,213	45,267	34,245	18,370	719,083
MD COMMERCIAL HARVEST	0	0	237	106,830	663,723	680,922	264,326	138,359	106,082	75,947	33,308	27,446	1,749	2,656	2,101,586
PRFC COMMERCIAL HARVEST	0	0	0	0	49,536	123,467	89,947	81,120	118,253	65,849	5,289	0	0	0	533,461
VA RECREATIONAL HARVEST	0	0	0	11,954	294,362	265,298	226,062	219,113	227,754	458,439	353,368	282,691	167,681	191,024	2,697,747
VA RECREATIONAL DISCARDS	0	0	79,364	22,736	44,503	15,463	7,062	9,309	7,563	14,816	8,787	15,610	10,721	5,116	241,050
VA COMMERCIAL HARVEST	0	0	0	322	12,595	26,179	35,774	59,484	104,930	363,931	303,556	334,141	235,075	420,771	1,896,757
NC RECREATIONAL HARVEST	0	0	0	0	0	0	0	8,107	84,857	291,930	417,063	283,549	132,425	130,500	1,348,432
NC RECREATIONAL DISCARDS	1	126	3,067	1,620	2,550	1,434	516	340	269	256	147	116	63	66	10,570
NC COMMERCIAL HARVEST	0	0	0	0	0	0	262	0	4,488	16,858	29,103	63,556	63,972	88,746	266,985
TOTAL POUNDS AT AGE	8,150	5,815	572,054	727,494	2,911,356	3,691,836	3,034,246	3,119,694	3,897,877	5,600,426	4,376,674	4,350,654	2,260,358	3,436,972	37,985,465

Table 8A. Proportional contributions by fishery to the 2006 coastwide CAA (by numbers of fish).

PROP OF HARVEST BY NUMBER	0	1	2	3	4	5	6	7	8	9	10	11	12	13+
ME RECREATIONAL HARVEST	0.000	0.000	0.000	0.008	0.019	0.034	0.022	0.005	0.000	0.000	0.000	0.001	0.001	0.002
ME RECREATIONAL DISCARDS	0.000	0.000	0.088	0.176	0.068	0.035	0.025	0.009	0.006	0.003	0.003	0.003	0.002	0.002
NEW HAMPSHIRE RECREATIONAL HARVEST	0.000	0.000	0.000	0.000	0.000	0.001	0.005	0.005	0.007	0.005	0.005	0.004	0.004	0.004
NEW HAMPSHIRE RECREATIONAL DISCARDS	0.000	0.000	0.015	0.023	0.008	0.006	0.004	0.001	0.001	0.000	0.000	0.000	0.000	0.000
MASS RECREATIONAL HARVEST	0.000	0.000	0.000	0.000	0.000	0.011	0.048	0.078	0.130	0.134	0.163	0.174	0.179	0.201
MASS RECREATIONAL DISCARDS	0.000	0.000	0.136	0.255	0.125	0.131	0.134	0.054	0.036	0.028	0.027	0.022	0.020	0.014
MASS COMMERCIAL HARVEST	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.009	0.033	0.047	0.054	0.057	0.068
RI RECREATIONAL HARVEST	0.000	0.000	0.000	0.000	0.001	0.009	0.018	0.027	0.037	0.026	0.023	0.025	0.020	0.015
RI RECREATIONAL DISCARDS	0.000	0.025	0.078	0.047	0.012	0.015	0.010	0.007	0.004	0.002	0.001	0.001	0.001	0.001
RI COMMERCIAL HARVEST	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.010	0.012	0.007	0.007	0.006	0.005
CON RECREATIONAL HARVEST	0.000	0.000	0.000	0.000	0.001	0.004	0.016	0.044	0.019	0.047	0.028	0.032	0.019	0.033
CON RECREATIONAL DISCARDS	0.000	0.090	0.115	0.055	0.013	0.015	0.011	0.009	0.008	0.006	0.003	0.004	0.004	0.007
NY RECREATIONAL HARVEST	0.000	0.000	0.000	0.000	0.012	0.053	0.097	0.109	0.129	0.081	0.082	0.074	0.077	0.063
NY RECREATIONAL DISCARDS	0.000	0.006	0.039	0.051	0.019	0.022	0.012	0.011	0.010	0.006	0.006	0.005	0.005	0.003
NY COMMERCIAL HARVEST	0.000	0.000	0.000	0.000	0.002	0.017	0.021	0.028	0.026	0.020	0.018	0.016	0.007	0.008
NJ RECREATIONAL HARVEST	0.000	0.000	0.000	0.000	0.007	0.024	0.076	0.242	0.213	0.206	0.179	0.185	0.191	0.136
NJ RECREATIONAL DISCARDS	0.998	0.010	0.029	0.039	0.041	0.047	0.029	0.021	0.013	0.009	0.008	0.007	0.007	0.004
DEL RECREATIONAL HARVEST	0.000	0.000	0.000	0.000	0.001	0.002	0.003	0.008	0.007	0.006	0.007	0.006	0.008	0.004
DEL RECREATIONAL DISCARDS	0.000	0.002	0.005	0.005	0.006	0.005	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001
DEL COMMERCIAL HARVEST	0.000	0.000	0.000	0.000	0.000	0.005	0.021	0.013	0.008	0.003	0.003	0.001	0.005	0.004
MD RECREATIONAL HARVEST	0.000	0.000	0.000	0.061	0.162	0.166	0.103	0.064	0.094	0.122	0.116	0.120	0.139	0.202
MD RECREATIONAL DISCARDS	0.000	0.510	0.291	0.115	0.043	0.016	0.018	0.021	0.026	0.026	0.023	0.014	0.014	0.009
MD COMMERCIAL HARVEST	0.000	0.000	0.000	0.079	0.243	0.242	0.157	0.074	0.044	0.017	0.008	0.008	0.001	0.004
PRFC COMMERCIAL HARVEST	0.000	0.000	0.000	0.000	0.057	0.047	0.007	0.001	0.003	0.002	0.001	0.000	0.000	0.000
VA RECREATIONAL HARVEST	0.000	0.000	0.042	0.030	0.140	0.082	0.135	0.110	0.096	0.091	0.118	0.099	0.091	0.142
VA RECREATIONAL DISCARDS	0.000	0.355	0.161	0.055	0.018	0.003	0.006	0.004	0.004	0.002	0.003	0.002	0.003	0.001
VA COMMERCIAL HARVEST	0.000	0.000	0.000	0.000	0.002	0.008	0.017	0.018	0.029	0.049	0.059	0.049	0.054	0.039
NC RECREATIONAL HARVEST	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.031	0.060	0.063	0.084	0.081	0.060
NC RECREATIONAL DISCARDS	0.002	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC COMMERCIAL HARVEST	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.004	0.006
PROP OF HARVEST BY #	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Table 8B. Proportional contributions by fishery to the 2005 coastwide CAA (by numbers of fish).

	0	1	2	3	4	5	6	7	8	9	10	11	12	13+
ME RECREATIONAL HARVEST	0.000	0.000	0.000	0.031	0.036	0.025	0.008	0.002	0.001	0.000	0.000	0.001	0.002	0.001
ME RECREATIONAL DISCARDS	0.000	0.000	0.097	0.205	0.092	0.042	0.021	0.012	0.011	0.006	0.003	0.002	0.002	0.001
NEW HAMPSHIRE RECREATIONAL HARVEST	0.000	0.000	0.000	0.000	0.000	0.004	0.013	0.018	0.020	0.009	0.004	0.001	0.000	0.000
NEW HAMPSHIRE RECREATIONAL DISCARDS	0.000	0.000	0.030	0.022	0.012	0.008	0.005	0.002	0.002	0.001	0.001	0.000	0.001	0.001
MASS RECREATIONAL HARVEST	0.000	0.000	0.000	0.000	0.003	0.047	0.128	0.171	0.245	0.164	0.118	0.091	0.104	0.132
MASS RECREATIONAL DISCARDS	0.000	0.000	0.141	0.184	0.116	0.100	0.070	0.044	0.049	0.028	0.019	0.012	0.014	0.017
MASS COMMERCIAL HARVEST	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.008	0.038	0.038	0.032	0.028	0.037	0.045
RI RECREATIONAL HARVEST	0.000	0.000	0.000	0.000	0.001	0.005	0.018	0.032	0.054	0.051	0.047	0.048	0.067	0.086
RI RECREATIONAL DISCARDS	0.000	0.010	0.057	0.015	0.011	0.010	0.009	0.007	0.005	0.003	0.002	0.002	0.002	0.004
RI COMMERCIAL HARVEST	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.004	0.009	0.007	0.009	0.008	0.009	0.009
CON RECREATIONAL HARVEST	0.000	0.000	0.000	0.000	0.001	0.008	0.032	0.053	0.028	0.044	0.047	0.046	0.028	0.052
CON RECREATIONAL DISCARDS	0.919	0.126	0.107	0.039	0.037	0.019	0.017	0.017	0.007	0.012	0.011	0.010	0.006	0.004
NY RECREATIONAL HARVEST	0.000	0.000	0.000	0.000	0.004	0.023	0.076	0.113	0.063	0.098	0.106	0.111	0.121	0.075
NY RECREATIONAL DISCARDS	0.000	0.006	0.078	0.032	0.035	0.017	0.011	0.010	0.005	0.007	0.008	0.008	0.009	0.003
NY COMMERCIAL HARVEST	0.000	0.000	0.000	0.001	0.008	0.014	0.029	0.033	0.013	0.025	0.026	0.011	0.018	0.002
NJ RECREATIONAL HARVEST	0.000	0.000	0.000	0.000	0.033	0.086	0.111	0.083	0.102	0.083	0.074	0.134	0.031	0.132
NJ RECREATIONAL DISCARDS	0.074	0.011	0.018	0.036	0.030	0.025	0.017	0.022	0.018	0.012	0.006	0.008	0.001	0.005
DEL RECREATIONAL HARVEST	0.000	0.000	0.000	0.000	0.000	0.001	0.004	0.009	0.005	0.005	0.009	0.019	0.005	0.002
DEL RECREATIONAL DISCARDS	0.000	0.445	0.001	0.005	0.002	0.004	0.001	0.002	0.002	0.001	0.002	0.001	0.002	0.001
DEL COMMERCIAL HARVEST	0.000	0.000	0.000	0.000	0.001	0.006	0.012	0.011	0.014	0.010	0.009	0.001	0.001	0.000
MD RECREATIONAL HARVEST	0.000	0.000	0.001	0.080	0.113	0.136	0.103	0.108	0.080	0.103	0.117	0.146	0.190	0.133
MD RECREATIONAL DISCARDS	0.000	0.394	0.305	0.152	0.088	0.029	0.013	0.014	0.011	0.011	0.010	0.010	0.015	0.005
MD COMMERCIAL HARVEST	0.000	0.000	0.000	0.135	0.250	0.259	0.140	0.060	0.036	0.018	0.010	0.009	0.001	0.001
PRFC COMMERCIAL HARVEST	0.000	0.000	0.000	0.000	0.017	0.034	0.032	0.025	0.031	0.013	0.001	0.000	0.000	0.000
VA RECREATIONAL HARVEST	0.000	0.000	0.000	0.012	0.100	0.083	0.112	0.114	0.081	0.091	0.088	0.073	0.073	0.067
VA RECREATIONAL DISCARDS	0.000	0.000	0.159	0.045	0.024	0.007	0.003	0.004	0.003	0.003	0.002	0.004	0.005	0.001
VA COMMERCIAL HARVEST	0.000	0.000	0.000	0.000	0.004	0.006	0.013	0.019	0.027	0.060	0.064	0.079	0.110	0.100
NC RECREATIONAL HARVEST	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.037	0.090	0.160	0.110	0.094	0.067
NC RECREATIONAL DISCARDS	0.007	0.007	0.007	0.005	0.003	0.002	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000
NC COMMERCIAL HARVEST	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.006	0.012	0.027	0.051	0.053
PROP OF HARVEST BY #	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Appendix 5b Figures

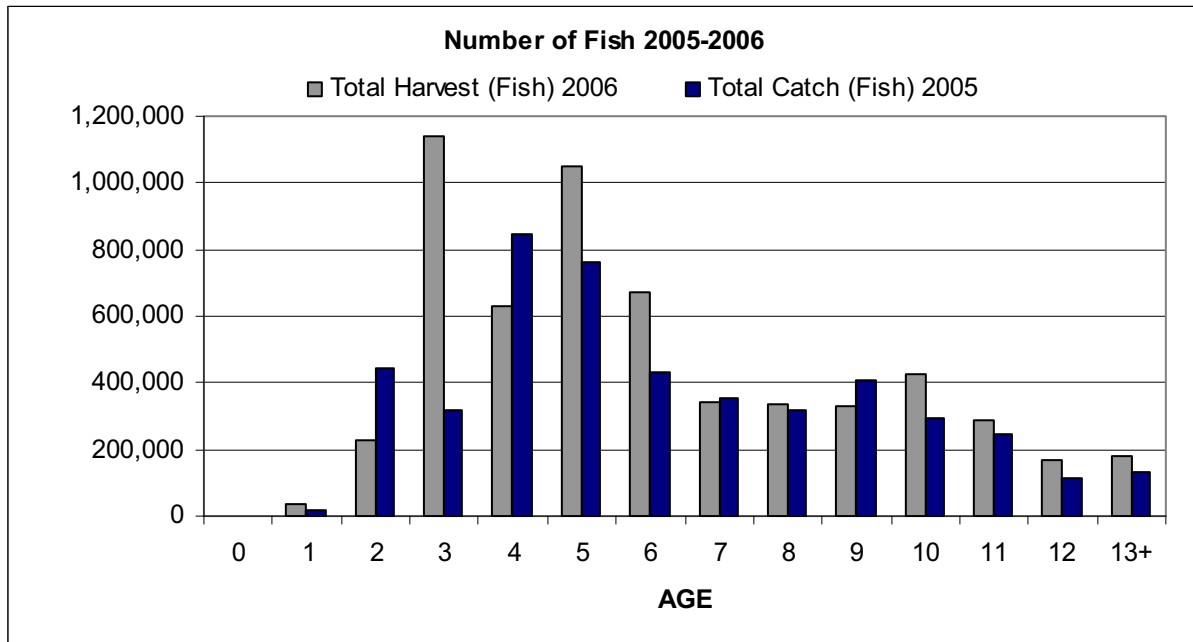


Figure 1. 2005-2006 Atlantic coastwide mean catch-at-age in numbers of striped bass.

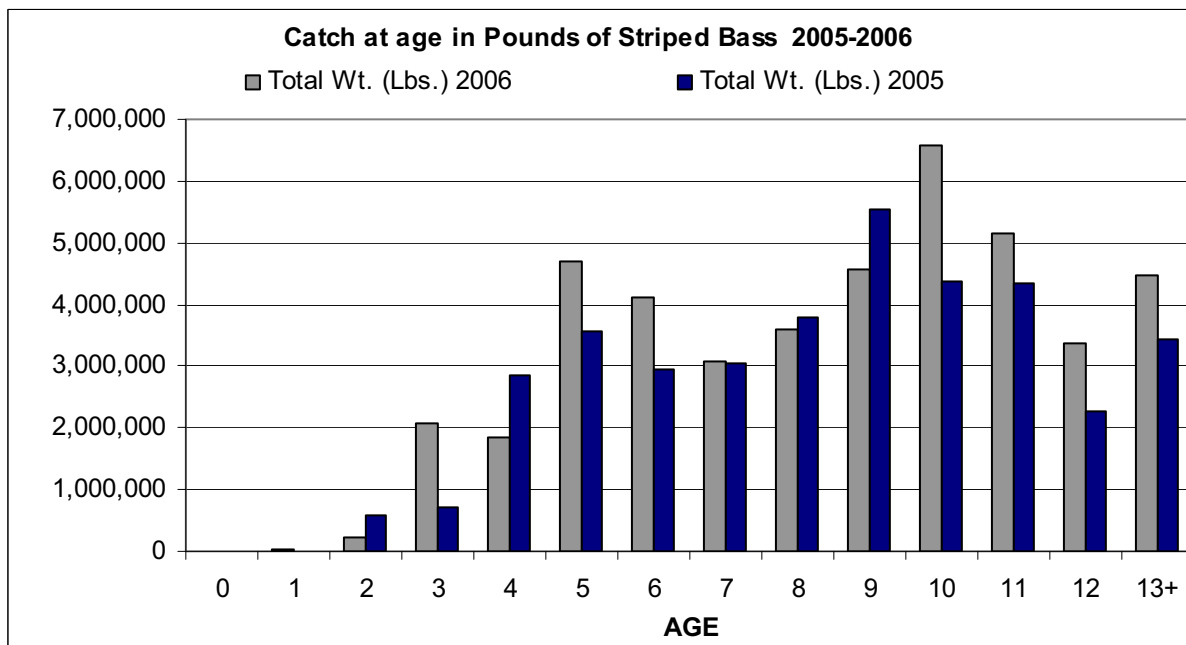


Figure 2. 2005-2006 Atlantic coastwide mean catch-at-age in pounds of striped bass.

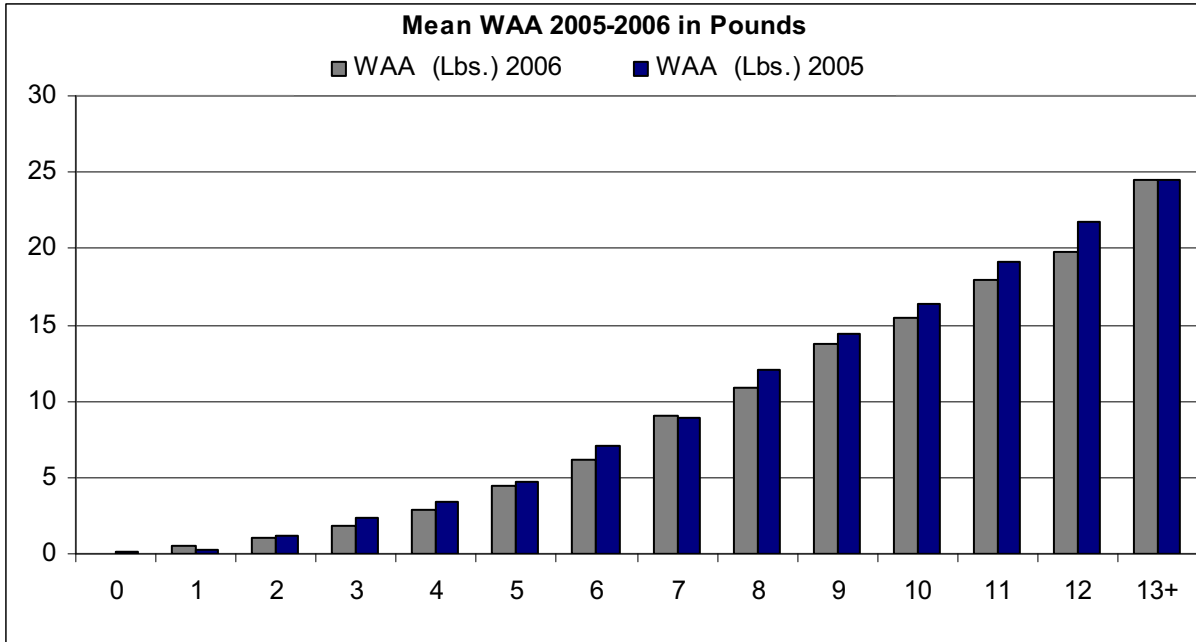


Figure 3. 2005 and 2006 Atlantic coastwide mean weight-at-age in pounds.

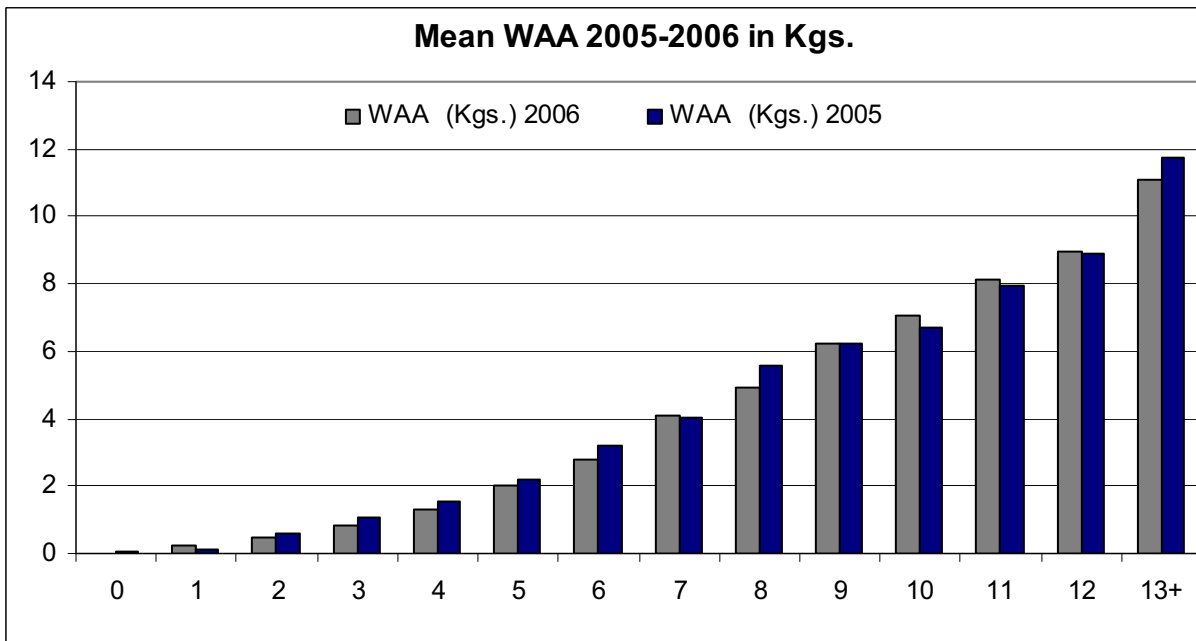


Figure 4. 2005 and 2006 Atlantic coastwide mean weight-at-age in kilograms.

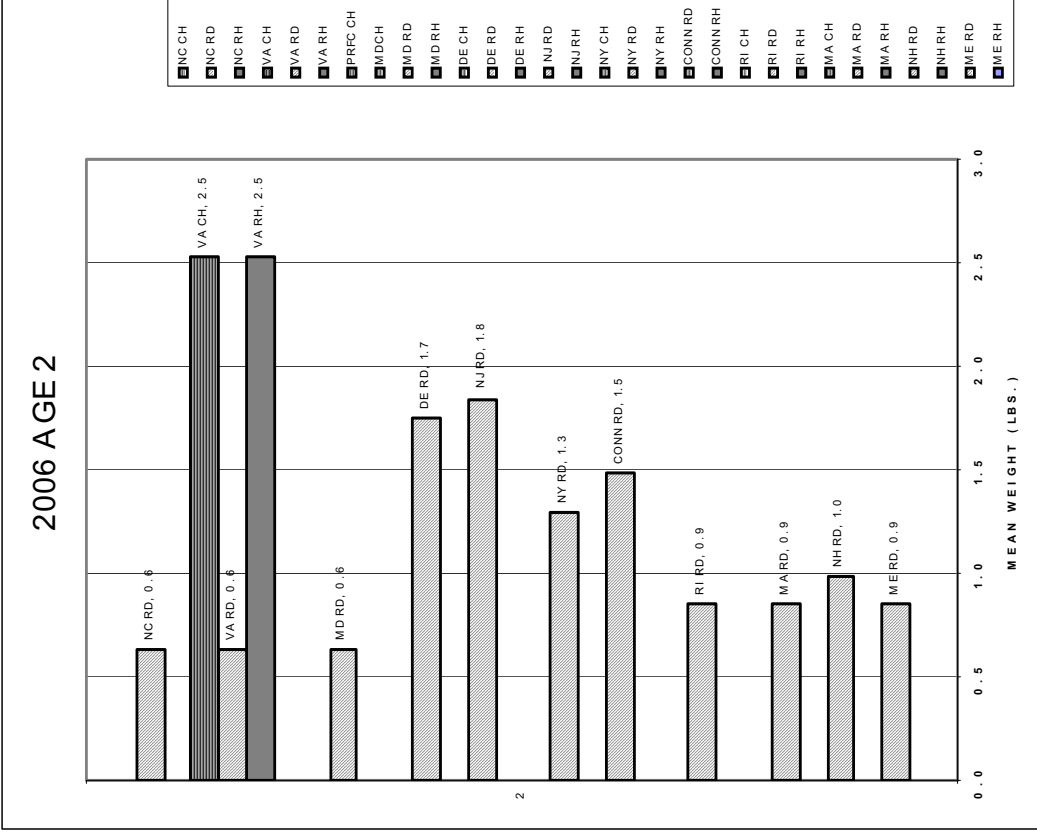
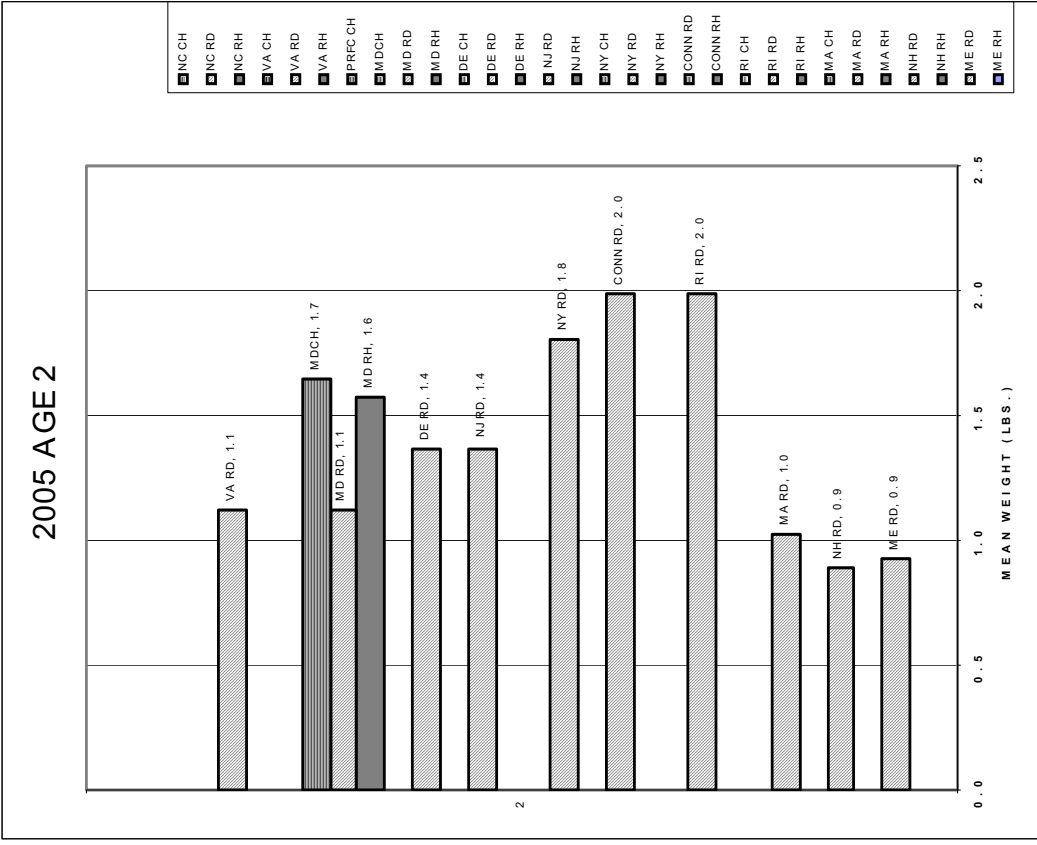


Figure 5A. 2005 and 2006 weight at age 2 by state and fishery.

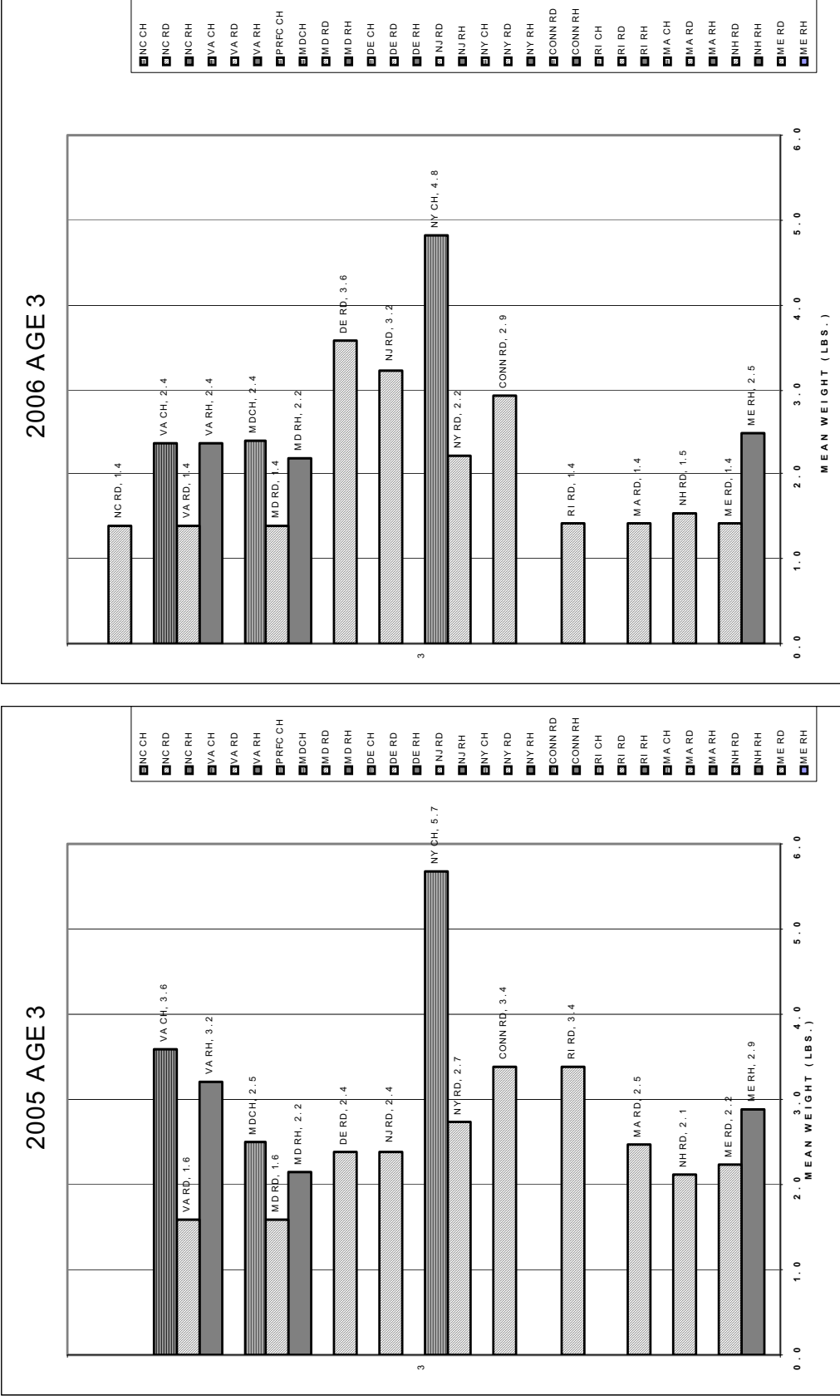


Figure 5B.2005 and 2006 weight at age 3 by state and fishery.

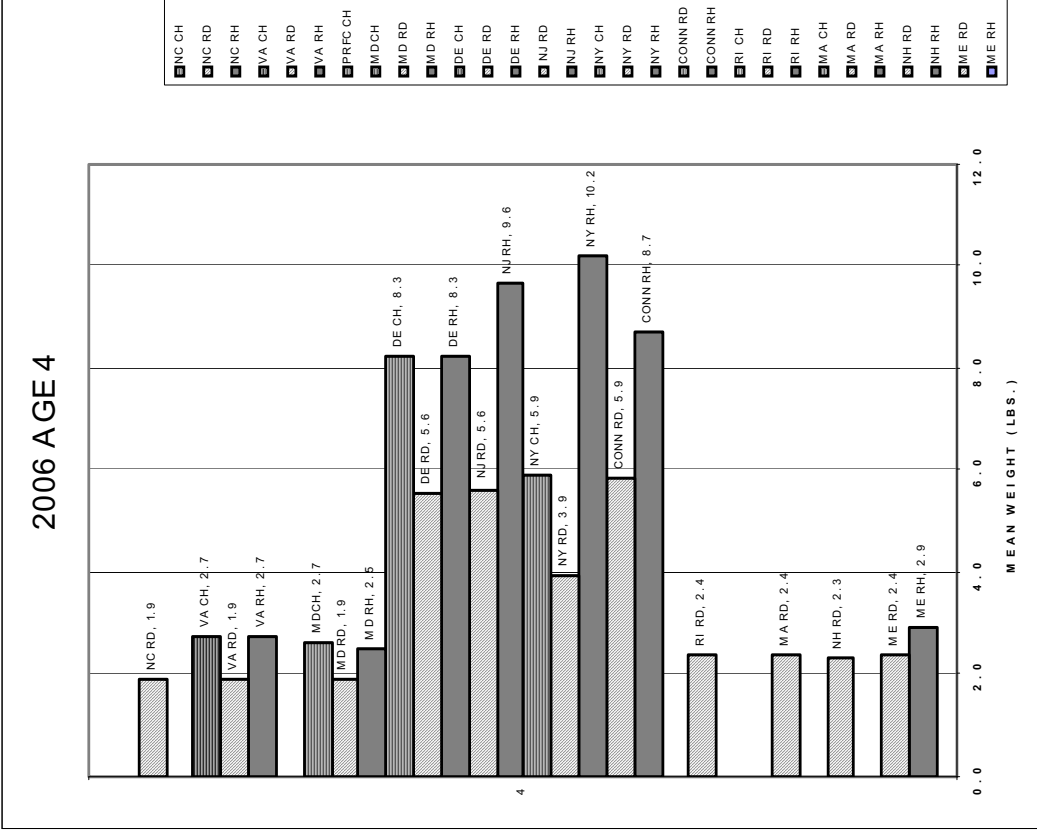
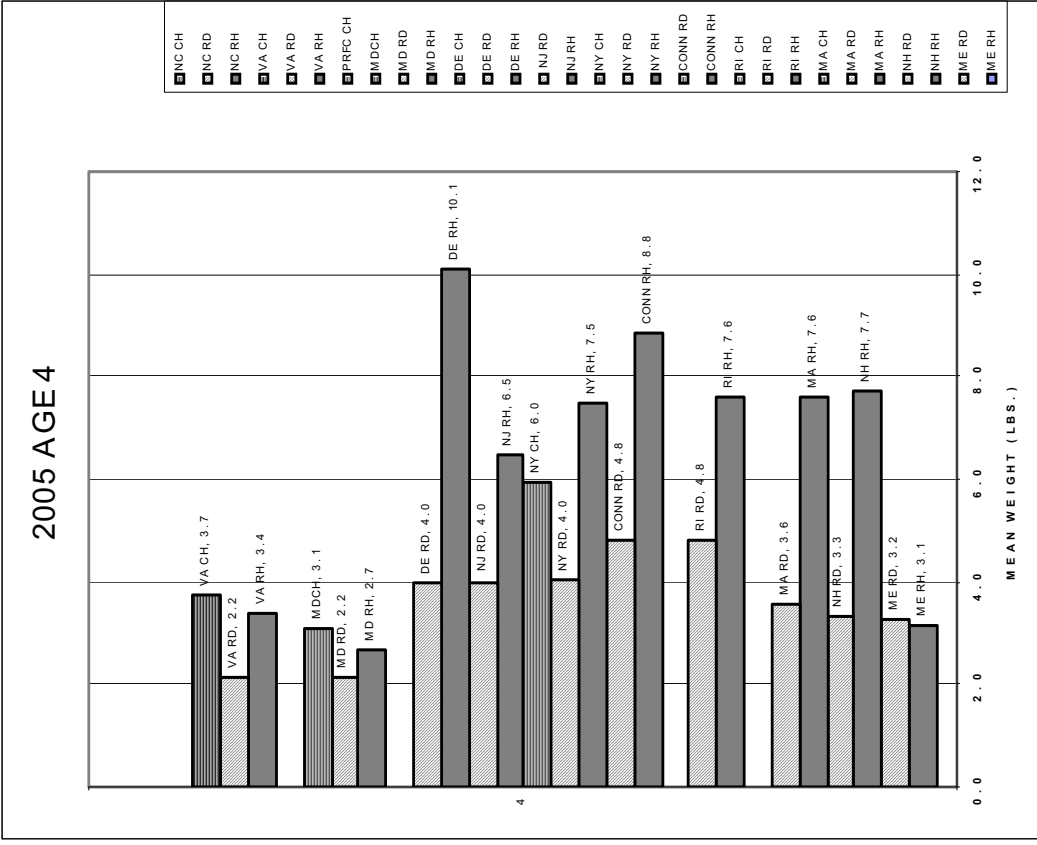


Figure 5C. 2005 and 2006 weight at age 4 by state and fishery.

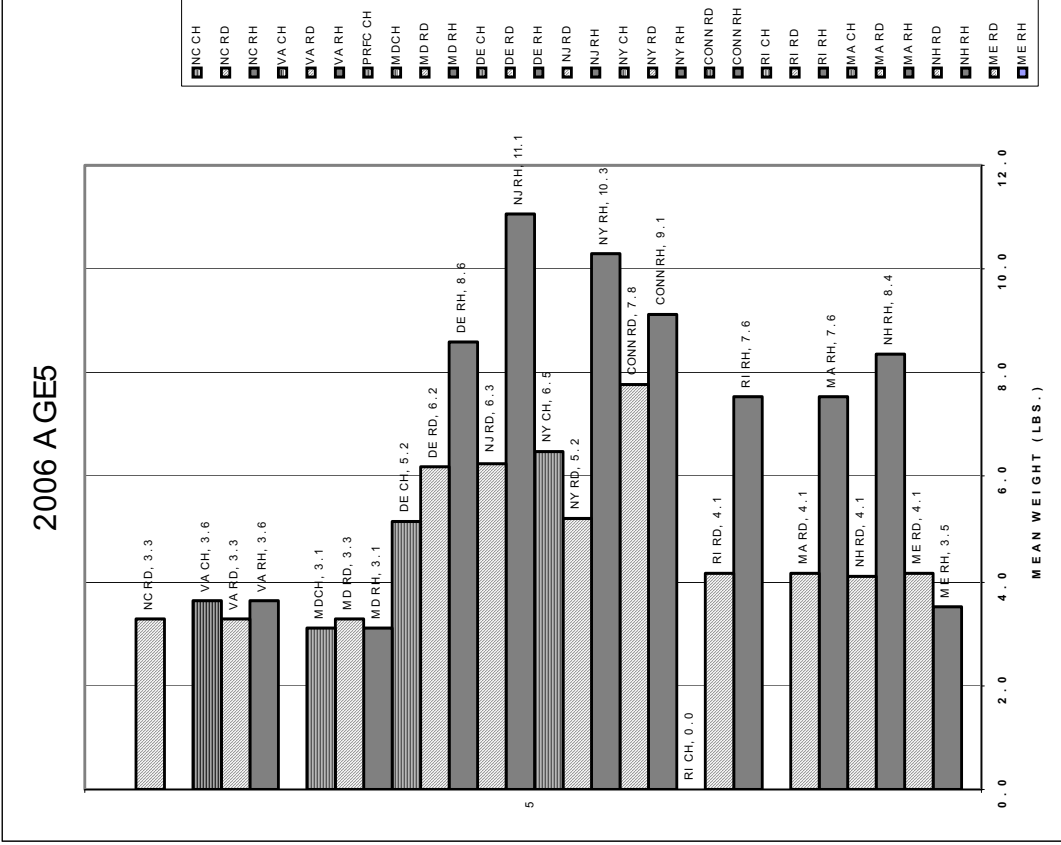
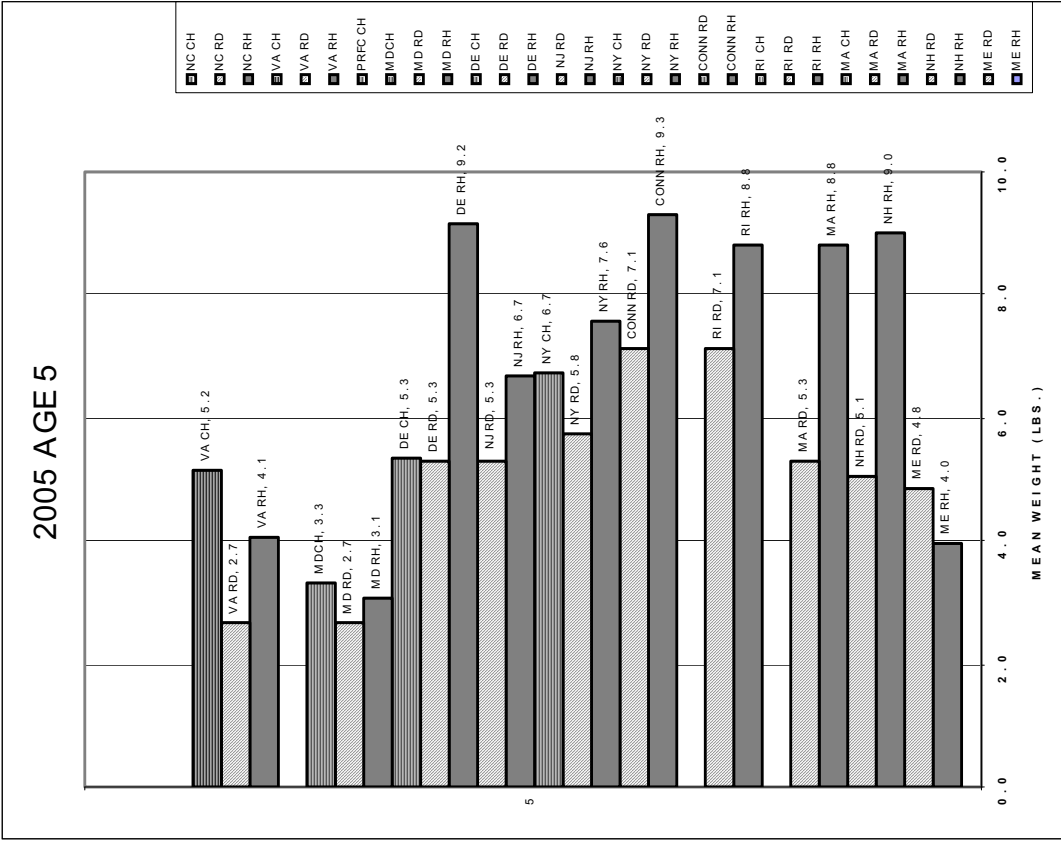


Figure 5D. 2005 and 2006 weight at age 5 by state and fishery.

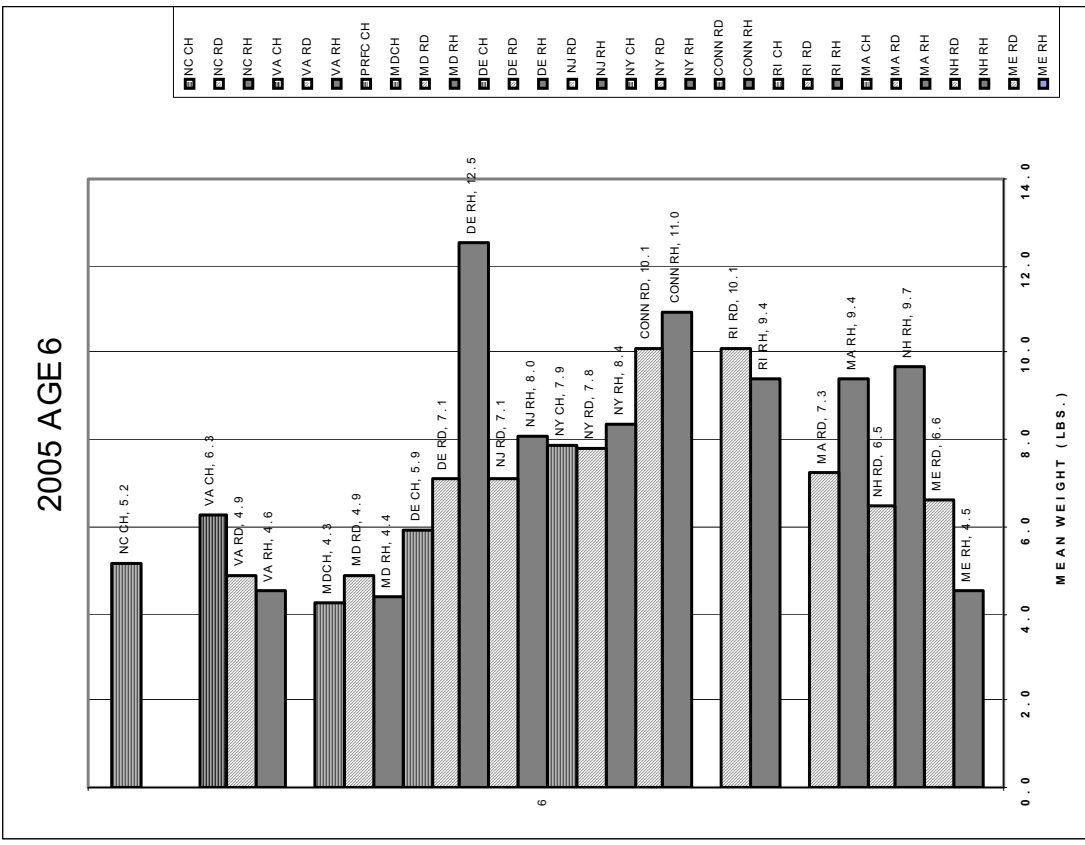
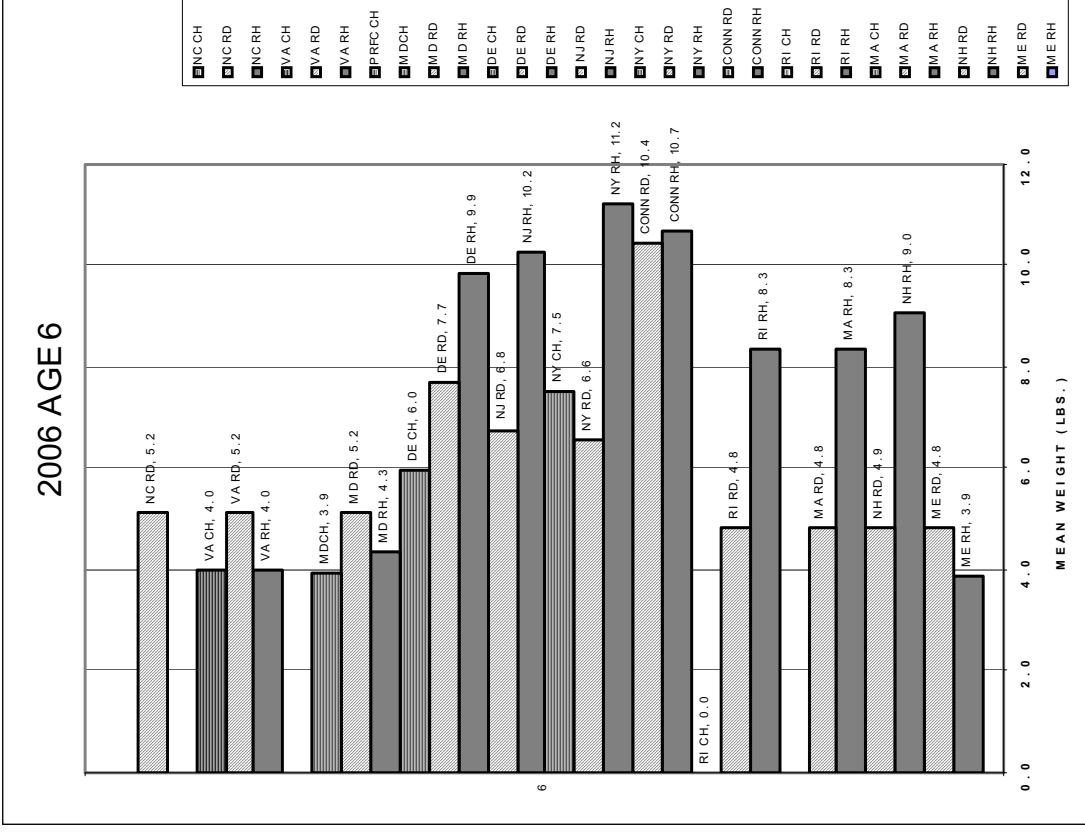


Figure 5E. 2005 and 2006 weight at age 6 by state and fishery.

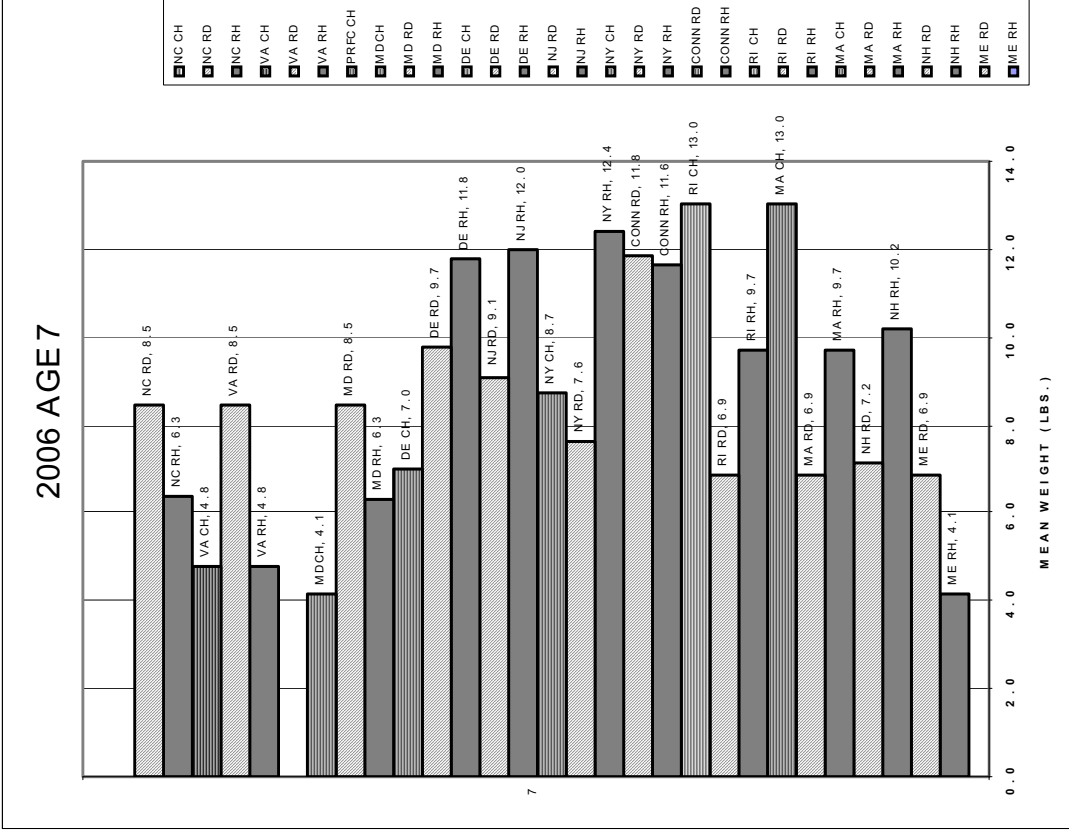
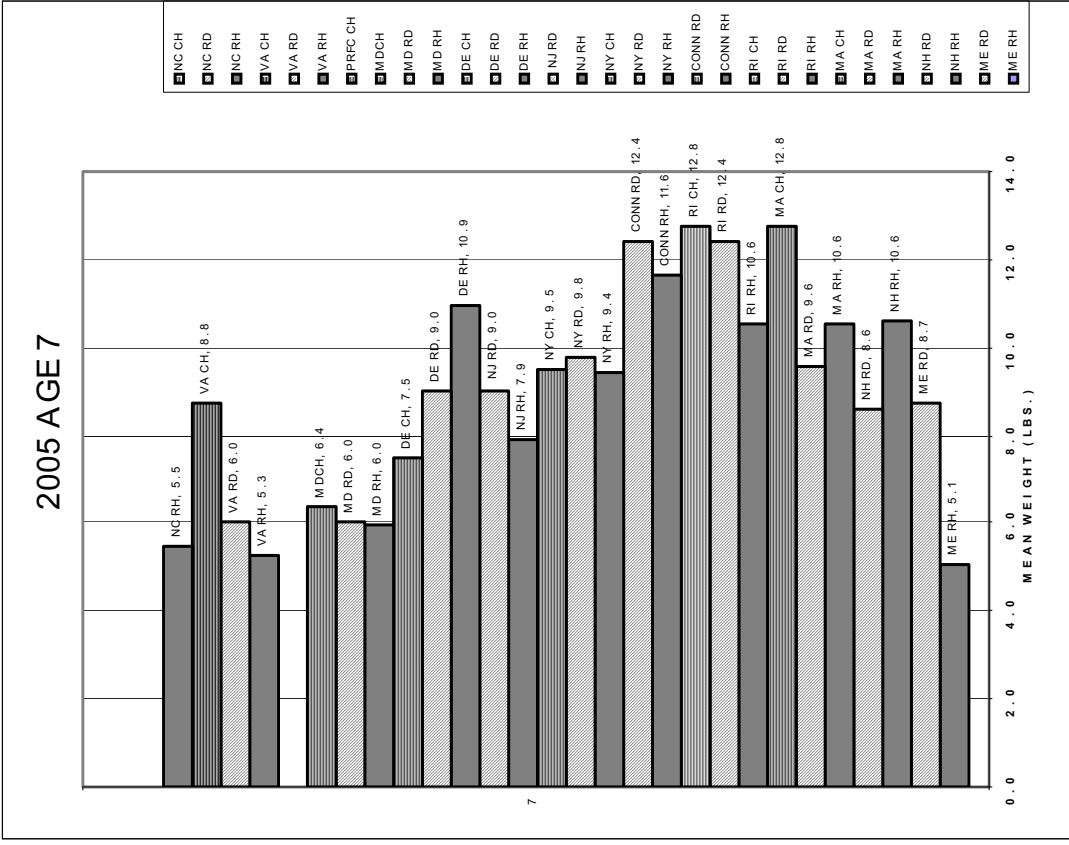


Figure 5F. 2005 and 2006 weight at age 7 by state and fishery.

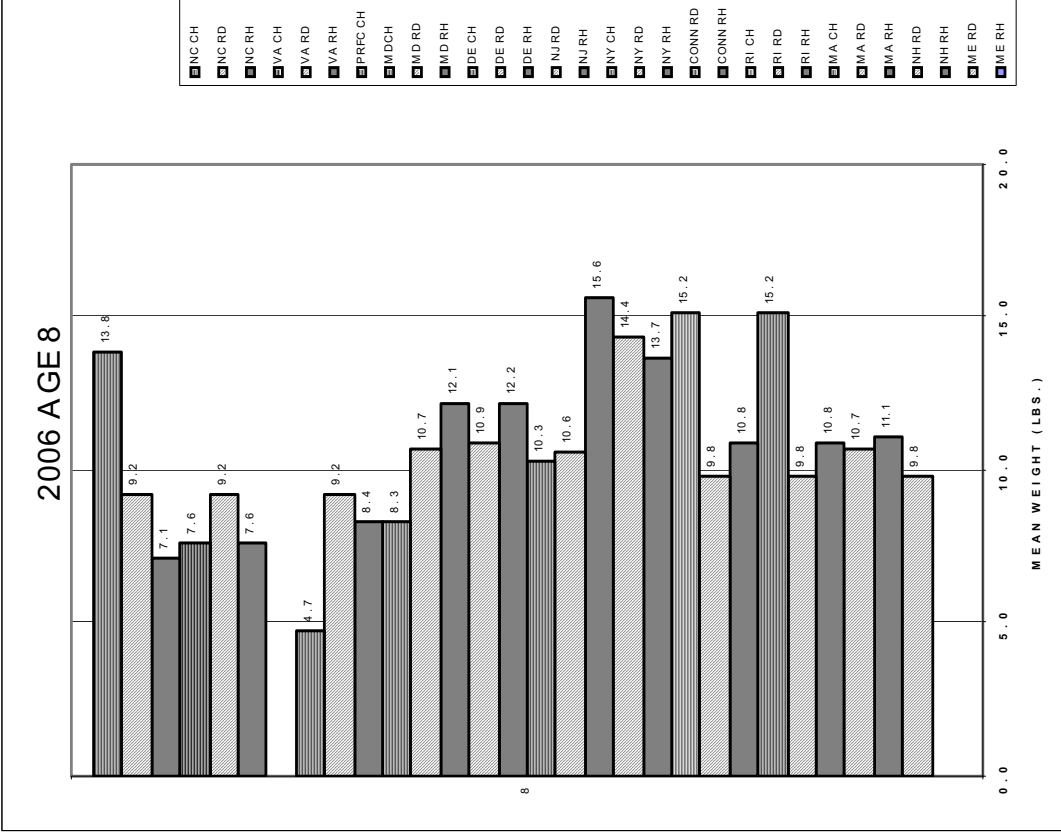
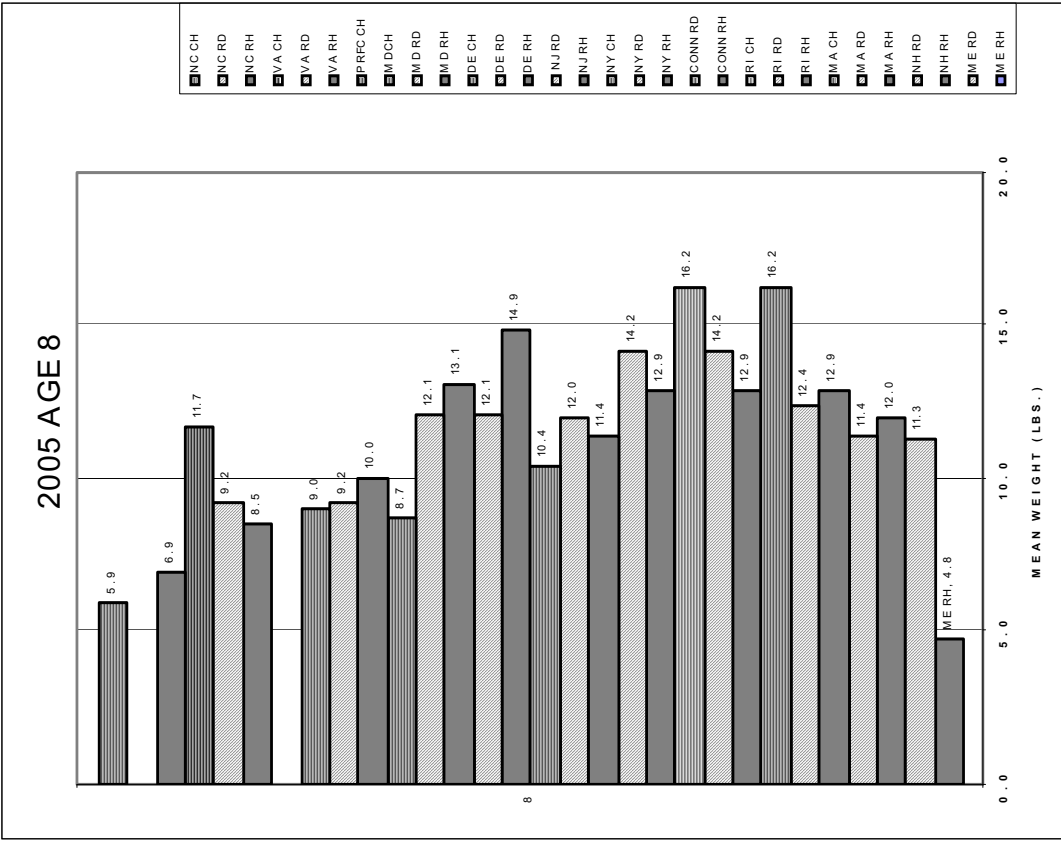


Figure 5G. 2005 and 2006 weight at age 8 by state and fishery.

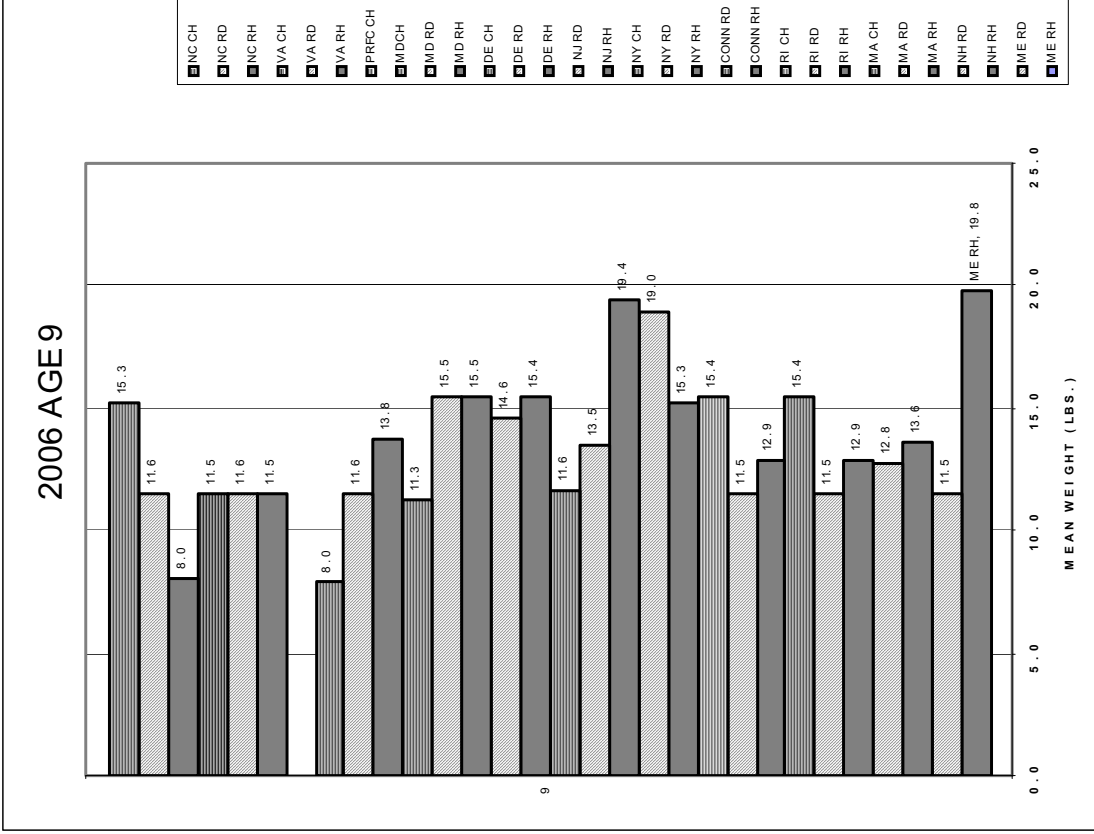
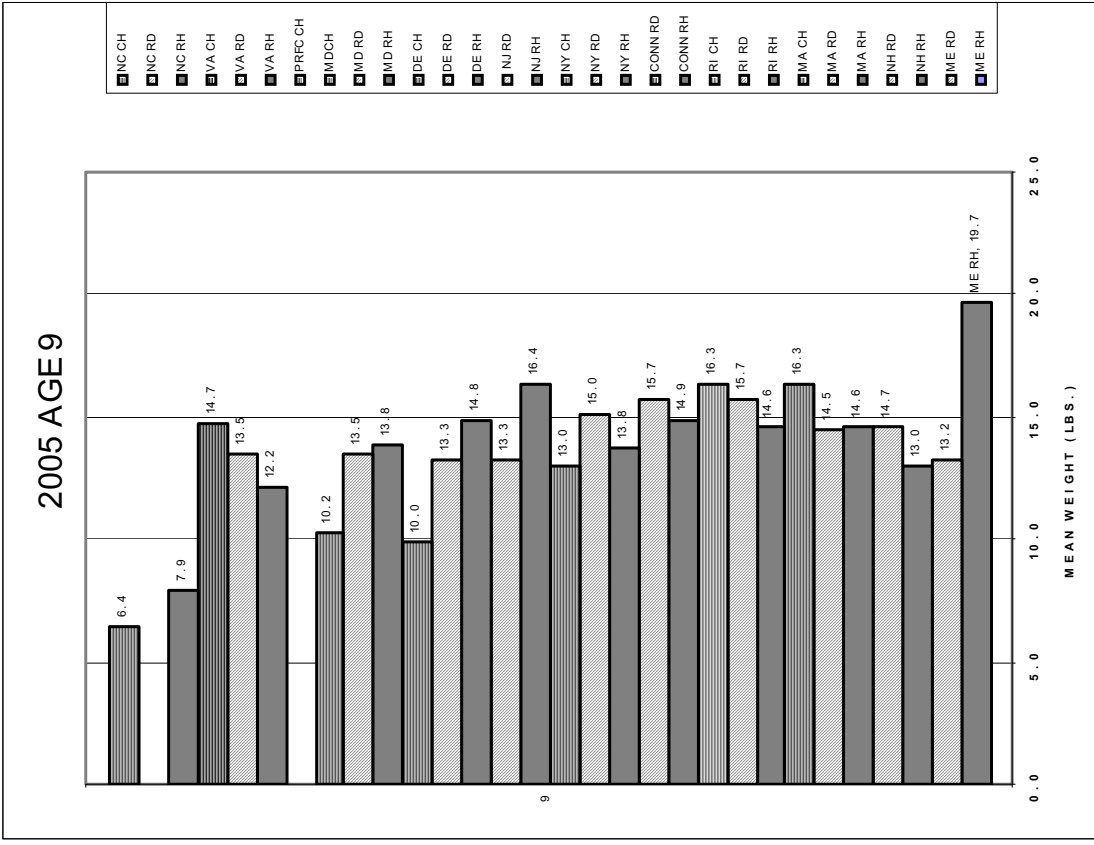


Figure 5H. 2005 and 2006 weight at age 9 by state and fishery.

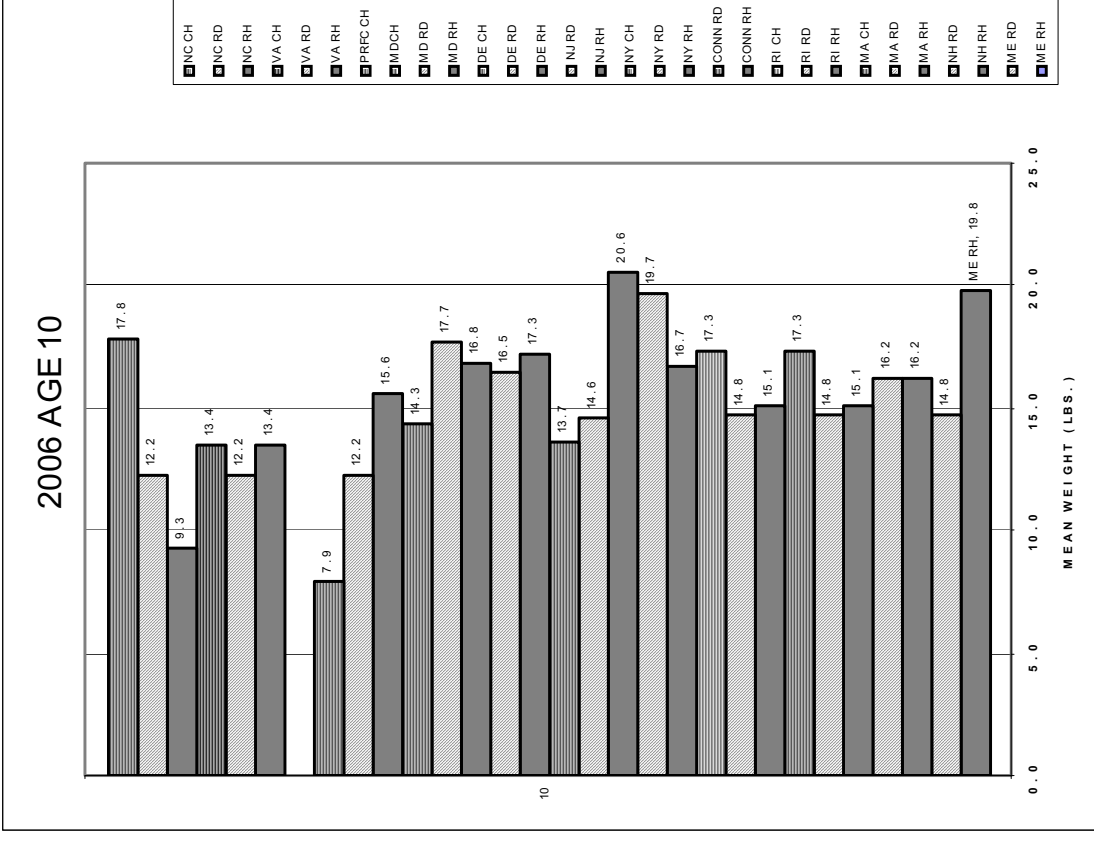
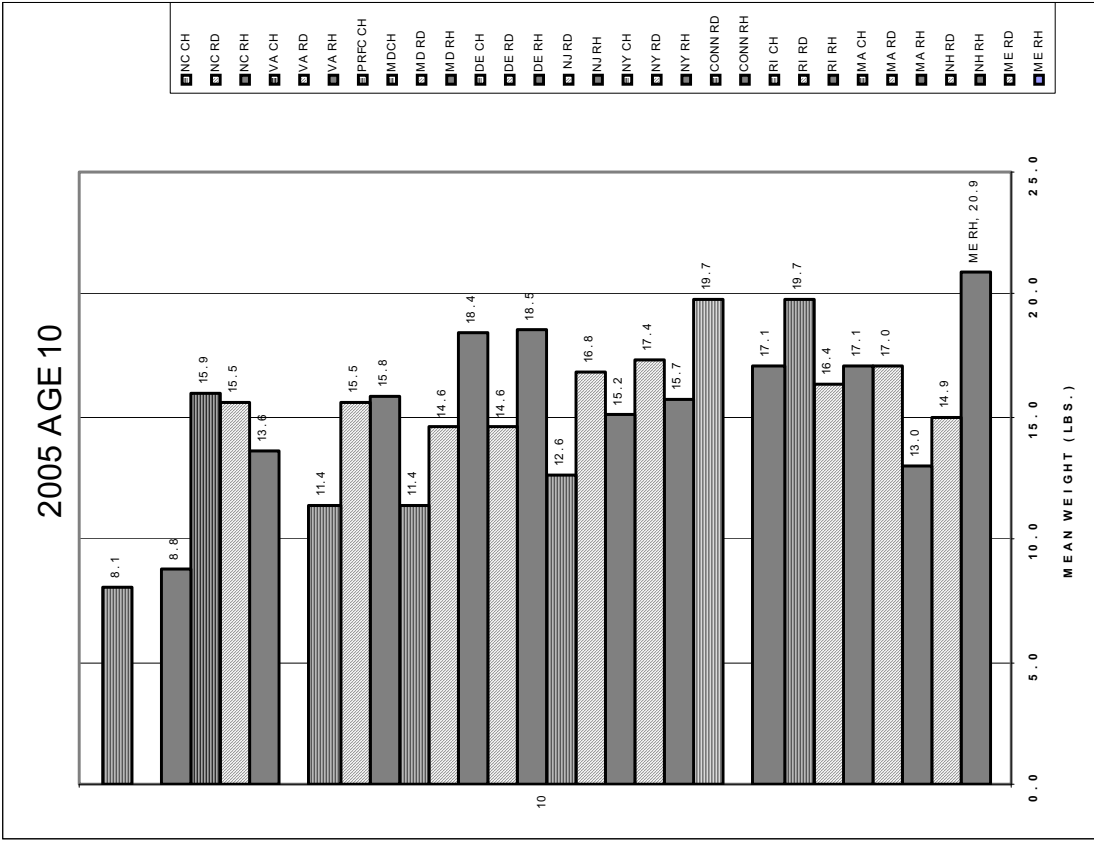


Figure 5I. 2005 and 2006 weight at age 10 by state and fishery.

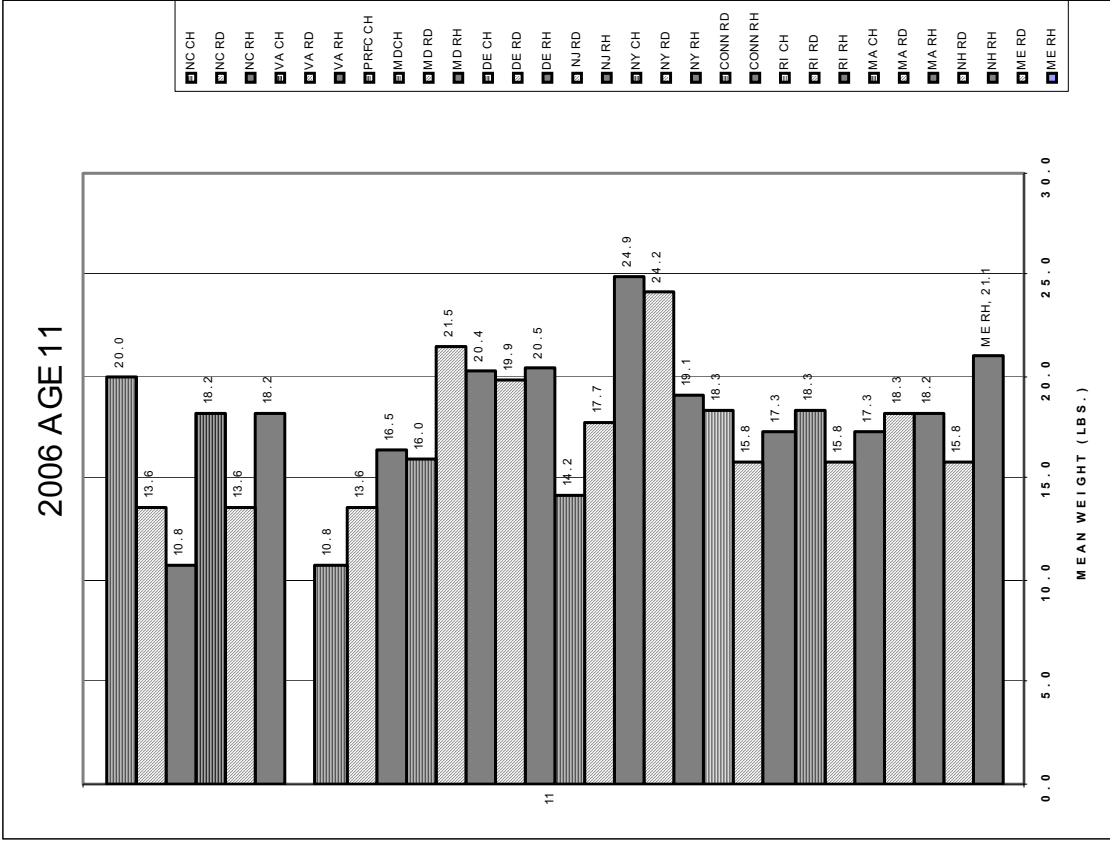
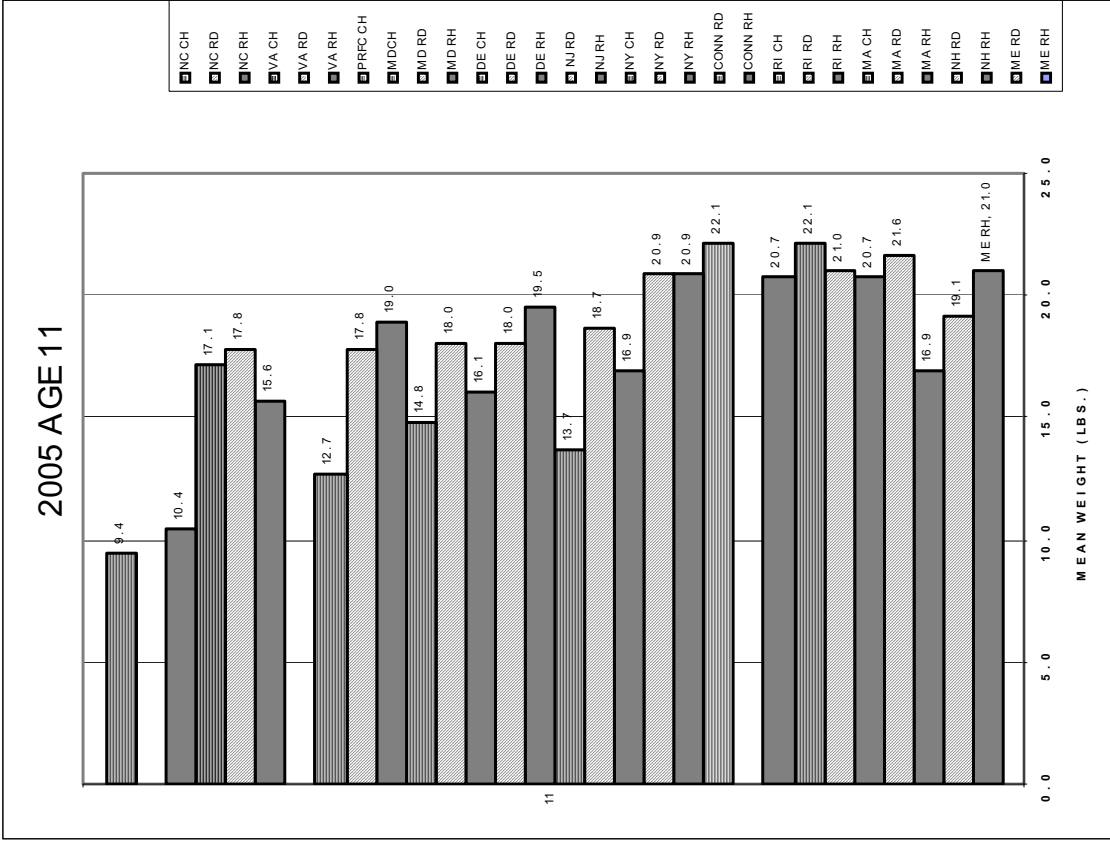


Figure 5J. 2005 and 2006 weight at age 11 by state and fishery.

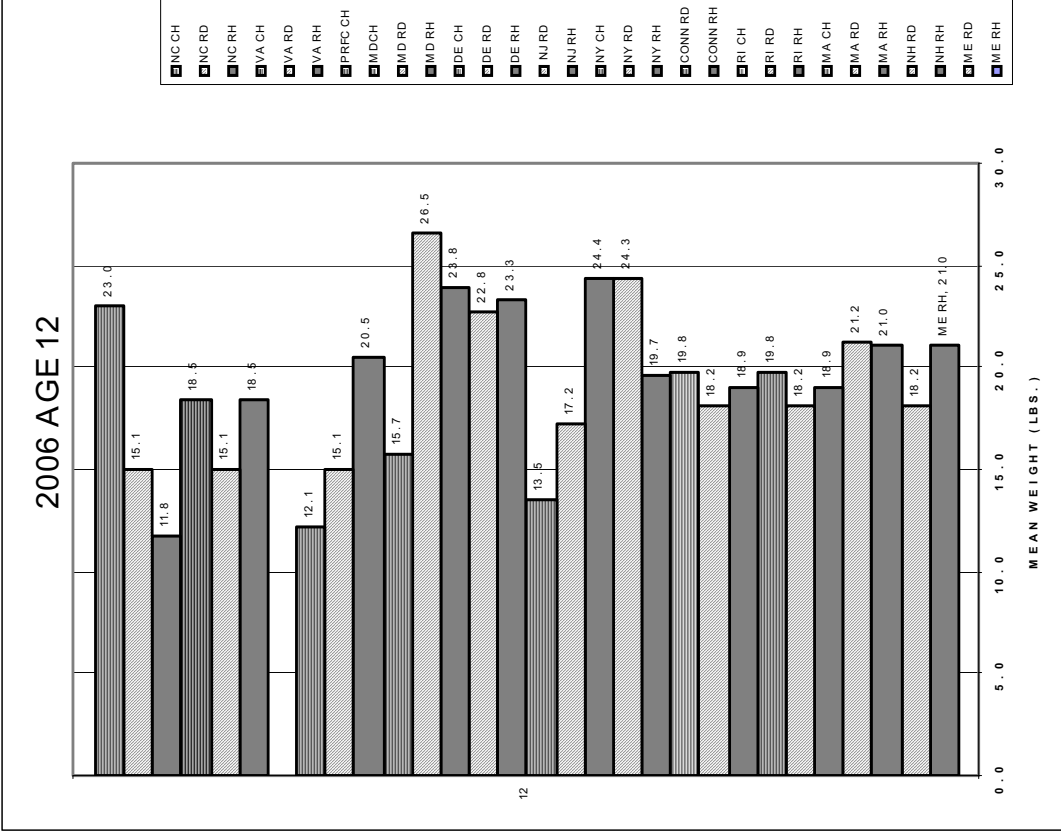
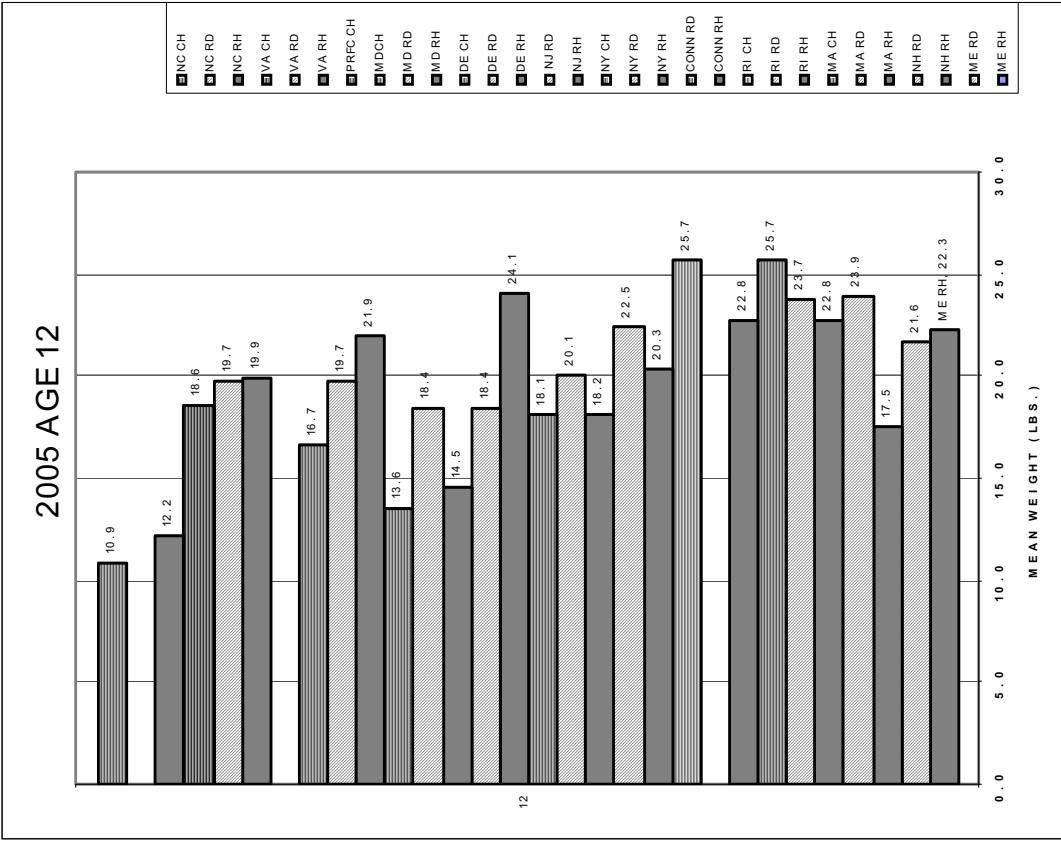


Figure 5K. 2005 and 2006 weight at age 12 by state and fishery.

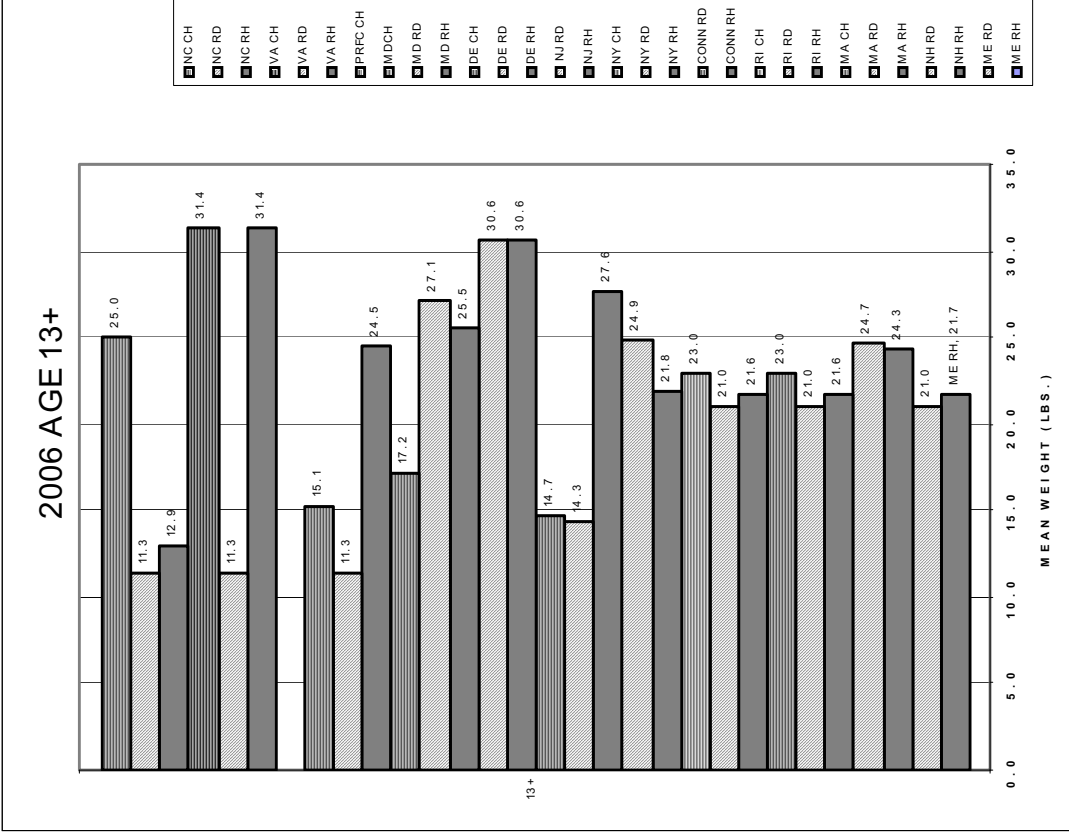
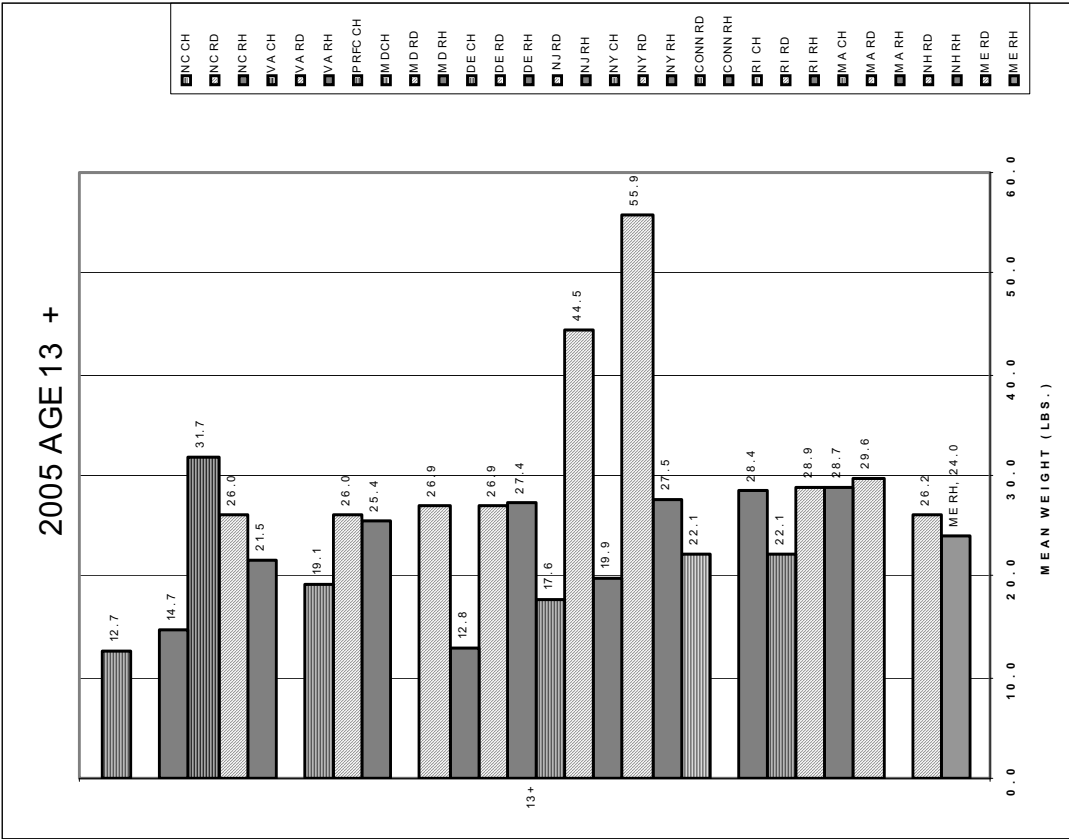


Figure 5L. 2005 and 2006 weight at ages 13+ by state and fishery.

Appendix 5b Appendix

Problems encountered in this analysis

Lisa Warner, a striped bass biologist with extensive experience with striped bass biology and working with age-length keys, performed these calculations. Several problems were found with the compliance report spreadsheets that required adjustment before accurate WAA calculations could be performed.

General Comments

1. Apparent difference in weights at age between states, and Bay and coast needs to be further investigated. Weights range in younger ages – age 3 ranged from 1.4 lbs to 4.8 lbs., age 4 ranged from 1.9-10.2 lbs. and age 5 ranged from 3.1-11.1 lbs... Is it a biological difference – i.e. females on the coast grow really, really fast (age length keys contained 28” age 4 fish)? Growth curves from annual compliance reports indicate similar growth patterns between all states, therefore differences may stem from ageing error.

2. Data standardization – we need to utilize standard units for the compliance report. For example, data was in kg and pounds; total length and fork length. Care needs to be taken to make sure there are no missing formulas or ages, especially when length groups have been collapsed. Maybe a template with locked cells would help.

3. The summary page in the compliance report needs to be re-evaluated. The way it is currently set up makes it extremely easy to make an error in the statewide summary due to sum product errors, making it unusable.(Example- ages 1-3 below) It might be easier to omit this step and save the weighting for the coastal WAA process and not have these state combined fisheries WAA. Unless there are mean weights in every cell of each age for each fishery, the weighted mean weight at age for the state will be incorrect

Fishery	Total #	Total wt	Mean weight at age													
			0	1	2	3	4	5	6	7	8	9	10	11	12	
Rec Harvest	310441	4768272	-	-	-	-	10.21	10.30	11.24	12.41	15.61	19.42	20.60	24.91	24.36	
Comm	73528	688446	-	-	-	4.83	5.91	6.48	7.49	8.75	10.28	11.60	13.67	14.21	13.45	
Rec Discard	142027	542461	-	0.50	1.14	1.98	3.49	4.61	5.85	6.76	9.38	11.95	12.96	15.72	15.31	
TOTAL	525996	5999179	w/d by wt	0.00	0.05	0.10	0.73	9.11	9.34	10.33	11.48	14.44	17.84	19.12	22.85	22.29
			w/d by #	0.00	0.14	0.31	1.21	7.79	8.23	9.26	10.37	13.18	16.31	17.57	20.93	20.39