

Estimate of the 2004 Harvest and 2005 Quota
for Spring Coastal Migrant Striped Bass in Chesapeake Bay

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Introduction

The Maryland Department of Natural Resources re-opened its spring recreational and charter fisheries for coastal migrant striped bass in 1992 after a six-year closure. One of the tools used to manage the spring fishery in Chesapeake Bay is a harvest quota. The baywide harvest quota was set at 30,000 fish in 2003 and 40,151 fish in 2004.

Estimate of the 2004 Spring Coastal Migrant Harvest of Striped Bass in Chesapeake Bay.

The method used to estimate the spring trophy season harvest in Maryland was presented in detail in Jones (2003). The estimate is based on the following assumptions:

- size specific probabilities that striped bass tagged on the spawning grounds in Maryland will migrate to the Atlantic coast before December of the first year at large as presented in Dorazio et al. (1994).
- the harvest of coastal migrants takes place between April 17 and June 15.

The standard methodology uses the following data sources to estimate the spring trophy season harvest in Maryland:

- length data from the Maryland Volunteer Angler Survey.
- length data from the Maryland DNR Charterboat Creel Survey.
- harvest data from the MRFSS access/intercept survey.
- harvest reports from the Maryland charter fishery.

The migrant harvest season overlaps parts of both Wave 2 and 3 of the MRFSS Survey, and the length distribution of the harvest is known to change over this time period. Therefore, the methodology partitions the data into intervals. In 2003, length data were available from the Maryland Volunteer Angler Survey for four 2-week intervals, and from the Maryland DNR Charterboat Marina Creel Survey for 3 2-week intervals. In 2004, due to problems with the Volunteer Angler Survey and a shorter survey period for the Charterboat Marina Creel Survey, the only available Maryland-generated length data were from the Charterboat Marina Creel Survey during the Trophy Season (April 17 – May 15). These problems are not anticipated in future years.

Both Maryland-generated data and MRFSS data were used to develop interval-specific estimates of migrant harvest (Table 1). Harvest estimates based on length data from the NMFS MRFSS Survey are presented in Table 2. These data indicated that Maryland harvested 30,759 coastal migrant striped bass during the 2004 season. Harvest estimates based on length data from the MD DNR Charterboat Survey are presented in Table 3. These values collaborated the migrant harvest values developed from the MRFSS survey for April 17- May 15. Because Maryland-generated data were not available for May 16 to June 15, the harvest estimate developed from MRFSS length data for this time period was used. These data indicated that Maryland harvested 31,678 coastal migrant striped bass during the 2004 season. The final estimate of Maryland coastal migrant harvest was developed as an average of these two estimates – 31,218. The preliminary estimated coastal migrant harvest in Virginia in the spring of 2004 was 186. Therefore, the overall estimate of the spring 2004 trophy striped bass season harvest in Chesapeake Bay is 31,404 fish.

Estimate of the 2005 Spring Coastal Migrant Striped Bass Harvest Quota in Chesapeake Bay.

The 2005 spring coastal migrant striped bass fishery harvest quota in Chesapeake Bay was estimated using the methodology approved by the ASMFC Technical Committee. As proposed by the three Chesapeake Bay management entities, the quota on the annual spring coastal migrant striped bass harvest is adjusted each year according to changes in the size of the population. Specifically, the spring season quota changes in proportion to the number of age 8+ striped bass in the population, as determined annually by the ADAPT VPA.

The estimate of striped bass abundance of a given age for ages 8 and older in 2005 was calculated from the equation:

$$N_{2005,i+1} = N_{2004,i} * \exp(-(F * PR_{2003} + M))$$

where:

$N_{2005,i+1}$ = number of striped bass of age $i+1$ in the population on January 1, 2005,

$N_{2004,i}$ = number of striped bass of age i in the population on January 1, 2004, taken from the 2004 striped bass ADAPT VPA,

$F = 0.30$ (target),

$M = 0.15$,

PR = the age specific PR vector from the most recent VPA run.

The harvest quota (HC) for 2005 was estimated using the following equation:

$$HC_{2005} = (N_{2005} / N_{1996} * 30,000)$$

where:

N_{2005} = projected number of striped bass age 8+ in the population in 2005,

N_{1996} = estimated number of striped age 8+ striped bass in the population in 1996 (2,658,000 fish as determined by 2004 assessment).

Based on this approach, the Baywide harvest quota for 2005 will be 31,434 fish (Table 4). Historical estimates of the spring coastal migrants harvest and quotas are presented in Table 5.

References

Dorazio RM, KA Hattala, CB McCollough and JE Skjveland. 1994. Tag recovery estimates of migration of striped bass from spawning areas of Chesapeake Bay. Transactions of the American Fisheries Society 123: 150-163.

Jones P. 2003. Estimates of the harvest of coastal migrant striped bass in Chesapeake Bay in the spring of 2003. Report to the ASMFC Striped Bass Technical Committee, November 2003.

Table 1. Total 2004 Maryland striped bass spring harvest, reported charter harvest, portioned Maryland spring harvest, and estimates of Maryland 2004 striped bass coastal migrant harvest.

	Total Wave Harvest	Interval	Charter Harvest (number of fish)	Charter Harvest (% by interval)	MD Spring Harvest (portioned into intervals)	MRFSS Migrants	MD Charter Survey Migrants
Wave 2	30,387	Apr 1-16	0	0	0		
		Apr 17-30	6,550	100	30,387	21,344	21,577
Wave 3	62,300	May 1-15	6,096	17.41	10,845	7,418	8,104
		May 16-Jun 30	15,366	51.87	32,315	1997	1997
		June 16-30	10,827	30.72	19,140		
Total					73,547 (Apr 17 - Jun 15)	30,759	31,678
# Measured						226	480

Table 2. Development of the 2004 Maryland striped bass coastal migrant harvest, based on length data collected in the MRFSS angler intercept survey.

Length group (inches TL)	Probability of migration	April 17-30				May 1-15				May 15 to June 15			
		N	Prop. of Harvest	Harvest	Estimated # of Migrants	N	Prop. of Harvest	Harvest	Estimated # of Migrants	N	Prop. of Harvest	Harvest	Estimated # of Migrants
26	0.0528	1	0.01	217	11	1	0.02	164	21	1	0.02	164	21
27	0.0831	0	0.00	0	0	1	0.02	164	32	1	0.02	164	32
28	0.1283	1	0.01	217	28	6	0.09	986	276	6	0.09	986	276
29	0.1930	1	0.01	217	42	6	0.09	986	381	6	0.09	986	381
30	0.2797	12	0.09	2,605	729	7	0.11	1,150	582	1	0.05	1,616	818
31	0.3868	13	0.09	2,822	1,091	10	0.15	1,643	1,027	1	0.05	1,616	1,179
32	0.5061	14	0.10	3,039	1,538	5	0.08	822	600	5	0.08	822	669
33	0.6247	13	0.09	2,822	1,763	6	0.09	986	865	6	0.09	986	908
34	0.7300	20	0.14	4,341	3,169	7	0.11	1,150	1,092	7	0.11	1,150	1,092
35	0.8146	9	0.06	1,953	1,591	2	0.03	329	318	2	0.03	329	318
36	0.8771	16	0.11	3,473	3,046	2	0.03	329	322	2	0.03	329	322
37	0.9206	11	0.08	2,388	2,198	1	0.02	164	162	1	0.02	164	162
38	0.9496	7	0.05	1,519	1,443	1	0.02	164	163	1	0.02	164	163
39	0.9683	4	0.03	868	841								
40	0.9803	4	0.03	868	851								
41	0.9878	6	0.04	1,302	1,286								
42	0.9924	3	0.02	651	646								
43	0.9953	3	0.02	651	648								
44	0.9971	0	0.00	0	0								
45+	1	2	0.01	434	434								
Total # measured		140				66				128			
Total			1.00	30,387	21,344		1.00	10,845	7,418		0.01	3,232	1,997

Table 3. Development of the 2004 Maryland striped bass coastal migrant harvest, based on length data collected in the MD DNR Charterboat Creel survey (April 17 – May 15) and MRFSS angler intercept survey (May 16 – June 15).

Length group (inches TL)	Probability of migration	April 17-30				May 1-15			
		N	Prop. of Harvest	Harvest	Estimated # of Migrants	N	Prop. of Harvest	Harvest	Estimated # of Migrants
26	0.0528								
27	0.0831								
28	0.1283	3	0.01	336	43	1	0.01	57	7
29	0.1930	2	0.01	224	43	6	0.03	344	66
30	0.2797	18	0.07	2018	565	9	0.05	516	144
31	0.3868	24	0.09	2691	1041	7	0.04	402	155
32	0.5061	26	0.10	2915	1475	18	0.10	1033	523
33	0.6247	35	0.13	3925	2452	19	0.10	1090	681
34	0.7300	37	0.14	4149	3029	27	0.14	1549	1131
35	0.8146	23	0.08	2579	2101	14	0.07	803	654
36	0.8771	22	0.08	2467	2164	23	0.12	1320	1158
37	0.9206	26	0.10	2915	2684	16	0.08	918	845
38	0.9496	19	0.07	2130	2023	12	0.06	689	654
39	0.9683	12	0.04	1346	1303	13	0.07	746	722
40	0.9803	11	0.04	1233	1209	6	0.03	344	338
41	0.9878	5	0.02	561	554	8	0.04	459	453
42	0.9924	4	0.01	449	445	4	0.02	230	228
43	0.9953	3	0.01	336	335	3	0.02	172	171
44	0.9971	0	0.00	0	0	1	0.01	57	57
45+	1	1	0.00	112	112	2	0.01	115	115
Total # measured		271				189			
Total			1.00	30,387	21,577		1.00	10,845	8,104

Table 4. Projected population size and harvest quota the Chesapeake Bay spring coastal migrant striped bass fishery in 2005.

Age	Partial Recruitment in 2003	Estimated 1/1/2004 Abundance (thousands)	Projected 1/1/2005 Abundance (thousands)
1	0.009	21,622	
2	0.025	4,002	18,610
3	0.066	12,561	3,445
4	0.245	8,632	10,811
5	0.259	2,711	7,430
6	0.416	2,971	2,333
7	0.597	1,476	2,557
8	0.71	1,114	1,270
9	0.755	623	959
10	1	436	536
11	0.822	226	375
12	0.781	133	195
13	0.781	194	114
8+		2,726	2,785
Spring Quota			31,434

Table 5. Summary of the spring coastal migrant striped bass harvest in Chesapeake Bay and spring harvest quota by year since 1991. (Note that the PRFC harvest is included in data presented for Maryland and Virginia.)

Year				ASMFC Harvest Quota
	Md.	Va.	Total	
1991	336			3,000
1992	1,013			3,000
1993	2,719			3,000
1994	3,672			5,000
1995	42,368	266	42,634	25,000
1996	11,480	133	11,613	30,000
1997	21,001	221	21,222	30,000
1998	9,898	123	10,021	30,000
1999	16,758	293	17,051	30,000
2000	26,669	79	26,748	30,000
2001	25,714	14	25,728	30,000
2002	14,814	25	14,839	30,000
2003	43,248	242	43,900	30,000
2004	31,218	186	31,404	40,151