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Notes On The River Herring Fishery of SA6

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In the period 1966 through 1974 the catch of river herring (*Alosa pseudoharengus* and *A. aestivalis*) in SA6 increased to a high of 35,302.1 metric tons (77.8 million pounds) in 1969 and then declined. The decline appears to reflect a decline in stock-size probably stemming from excessive harvest. In the first 3 years of this period the total catch averaged 23,087.9 metric tons (50.9 million pounds) annually, of which 2% was taken on the high seas. Average catch in 1972-74 (the last 3 years of record) was 13,471.7 metric tons (29.7 million pounds), 26% of which was taken on the high seas (Table 1). Increase in the high seas catch has been accompanied by a 40% decrease in the inshore catch. Average catch in the inshore fishery in the period 1966-1968 was 22,362.1 metric tons (49.3 million pounds) but averaged only 9,026.5 metric tons (19.9 million pounds) in the period 1972-1974 (Table 1).

Not only has the total catch declined, but also the catch per unit of effort has declined in both Virginia (Table 2) and North Carolina (Table 3). These two states account for most of the inshore catch (Table 1).

Average age of the inshore catch has declined in recent years in both North Carolina (Table 4) and Virginia (Table 5). In earlier years three year classes usually were well represented in the fishery. During 1974 and 1975, the fishery moved strongly toward dependence on a single year class.

In North Carolina during 1972-74, about half the catch was composed of virgin fish, mostly age IV. Another 25 percent of the harvest consisted of fish with one spawn mark, mostly age V. Approximately 15 percent of the catch consisted of age V and age VI fish with two spawn marks. Thus the fishery was composed principally of fishes age IV through VI with up to two spawn marks. Repeat spawners were well-represented in the population, but in decreasing proportions. In 1975, however, virgins comprised over 70 percent of the spawning population and only 6 percent of the fish examined had more than one spawn mark (Figure 1).

The inshore catch consists of mature fish averaging greater than 190 mm FL. We have no data on the size of fish in the offshore catches by other countries. However analysis of more than 11,000 blueback herring taken in offshore samples by North Carolina in 1974-75 revealed that 65% were less than 190 mm FL. Thus immature fish are available to the offshore fishery whereas they are not available to the inshore fishery.

Table 1. Catch of river herring (alewife and blueback) in the inshore fishery and in ICNAF area 6 by various countries. Catch is in thousands of pounds, round weight.

	INSHORE				OFFSHORE				Total All Countries	Offshore catch as Percent of Total Catch	
	Virginia	North Carolina	Total		U.S.S.R.	East Germany	Bulgaria	Poland			Total Offshore
			U.S.A.								
1966 ¹	29,061	12,522	46,689						46,689		
1967	28,166	18,489	48,944	2,163				2,163	51,107	4	
1968	32,326	15,529	52,137	2,370	278	0		2,648	54,785	5	
1969	30,454	19,766	53,686	22,884		1,257		24,141	77,827	31	
1970	15,051	11,523	32,822	13,126		1,645		14,771	47,593	31	
1971	10,287	12,665	26,012	5,015	12,773	1,160	1,806	20,765	46,777	44	
1972	11,175	11,197	23,389	4,515	5,227	322	897	10,961	34,350	32	
1973	8,942	7,901	16,843	1,764	2,284	615	745	5,408	22,251	24	
1974	13,342	6,210	19,552	525	3,514	1,265	908	6,464	32,450	20	
1975	11,357	5,952	17,309								
1966-1968 Average	29,851	15,513	49,257					1,270	50,860	2	
1972-1974 Average	11,153	8,436	19,928					7,611	29,684	26	

Table 2. Estimates of the landings of river herring in the Potomac and Rappahannock rivers combined, by spawning check history. Units are thousands of fish and c/f is catch/net/season, by spawning class.

Year, Total Number, c/f	Spawning checks							Total & Yearly c/f ¹	No. of Pound Nets ²
	0	1	2	3	4	5	6		
1965	17,890	4,258	2,018	973	333	0	0	25,472	146
CPE	122.5	29.2	13.8	6.6	2.3	0	0	174.5	
1966	11,826	7,915	5,573	1,277	495	0	0	27,086	139
CPE	85.1	56.9	20.6	9.2	3.6	0	0	194.9	
1967	15,603	3,964	2,574	594	321	34	23	23,113	127
CPE	122.9	31.2	20.3	4.7	2.5		0.2	182.0	
1968	12,238	3,927	2,759	951	204	65	3	20,147	133
CPE	92.0	29.5	20.7	7.2	1.5	0.5		151.5	
1969	7,336	2,243	886	455	38	4	0	10,962	119
CPE	61.6	18.9	7.5	3.8	0.4		0	92.1	
1970	10,655	2,754	1,593	613	362	14	0	15,991	97
CPE	109.8	28.4	16.4	6.3	3.7	0.2	0	164.9	
1971	2,998	1,470	506	72	22	0	0	5,068	99
CPE	30.3	14.8	5.1	0.7	0.2	0	0	51.2	
1972	3,885	472	502	131	50	5		5,045	106
CPE	36.6	4.5	4.7	1.2	0.5	0.1		47.6	
1973	2,681	817	444	140	33	0	0	4,115	
CPE	27.6	8.4	4.6	1.4	0.4	0	0	42.4	97

¹ Catch per net per season, all ages combined.

² In the last half of April, only nets above mile 10 used.

TABLE 3 --River herring catch-and-effort, Albemarle Sound, North Carolina 1971-75. Data are in pounds (lb) and metric tons (MT).

Season	Total catch		Pound net catch		Percent of total	Pound net effort	Catch/effort		Other gear	
	(lb)	(MT)	(lb)	(MT)			(lb)	(MT)	(lb)	(MT)
1971	12,711,200	5,745	12,005,975	5,446	95	645	18,614	8.44	705,225	320
1972	11,237,033	5,766	11,020,023	4,999	98	727	15,158	6.88	217,010	98
1973	7,931,600	5,079	7,613,900	3,454	96	625	12,182	5.53	317,700	144
1974	6,277,671	2,817	5,876,357	2,665	95	653	8,985	4.08	401,314	182
1975	5,903,957	2,678	5,427,072	2,462	92	675	8,040	3.65	476,885	216

TABLE 4 --Year class composition (percent of total sample, sexes combined) for blueback herring from pound nets, Albemarle Sound area, NC, 1972-75. Figures in parentheses represent age.

<u>Year class</u>	<u>Year</u> 1972	1973	1974	1975
1963	1 (9)			
1964	1 (8)			
1965	3 (7)	1 (8)		
1966	15 (6)	5 (7)		1 (9)
1967	34 (5)	19 (6)	4 (7)	1 (8)
1968	32 (4)	40 (5)	18 (6)	5 (7)
1969	15 (3)	32 (4)	32 (5)	17 (6)
1970		4 (3)	45 (4)	29 (5)
1971			1 (3)	43 (4)
1972				4 (3)

Table 5. Summary of age frequency data for alewife and blueback herring from the Potomac and Rappahannock commercial fishery.

	<u>Percent at age, seasonal average</u>							<u>Percent age V and older</u>
	<u>III</u>	<u>IV</u>	<u>V</u>	<u>VI</u>	<u>VII</u>	<u>VIII</u>	<u>IX</u>	
<u>Alewife-Potomac</u>								
1966	18.6	42.2	17.6	19.6	2.0	--	--	39.2
1967	9.3	26.2	30.0	21.5	7.5	4.7	1.0	63.7
1968	2.2	41.3	31.5	26.1	1.0	--	--	57.6
1969	26.6	48.8	11.1	13.3	--	--	2.4	24.4
1970	7.3	66.0	16.7	4.2	2.1	2.1	2.1	41.5
1971	2.6	32.4	53.0	10.0	2.0	--	--	65.0
1972	12.4	30.2	22.1	24.2	6.8	3.9	0.4	57.4
1973	2.4	59.4	22.7	8.2	5.3	1.9	--	38.1
1974	--	86.5	9.0	2.7	1.8	--	--	13.5
1975	2.7	80.7	15.1	0.6	0.9	--	--	16.6
Average	9.3	51.4	22.9	13.0	3.3	3.2	1.5	
<u>Alewife-Rappahannock</u>								
1966	25.2	36.1	17.4	15.6	4.3	1.3	--	38.6
1967	14.8	52.0	19.4	6.6	6.1	1.0	--	33.1
1968	8.8	33.2	39.3	12.6	5.2	--	0.8	57.9
1969	10.2	41.6	23.5	18.4	4.0	0.8	1.6	48.3
1970	4.8	40.5	31.2	13.2	8.5	1.8	--	54.7
1971	2.6	29.5	49.3	15.5	2.4	0.7	--	67.9
1972	4.4	27.3	30.3	25.6	9.0	3.0	0.4	68.3
1973	0.6	53.8	26.4	12.6	5.2	1.2	0.2	45.6
1974	0.2	60.9	27.1	8.6	0.5	2.4	--	38.6
1975	1.7	82.6	13.4	1.6	0.6	0.1	--	15.7
Average	7.3	45.8	27.7	13.0	4.6	1.4	0.8	
Average of both rivers	9.6	47.8	25.0	12.7	4.0	1.9	1.1	

Table 5. (continued).

Blueback-Potomac	Percent at age, seasonal average							Percent age V and older
	III	IV	V	VI	VII	VIII	IX	
1966	4.0	34.6	30.5	23.0	6.0	1.7	--	61.2
1967	1.6	45.1	28.0	17.4	6.9	1.0	--	53.3
1968	1.0	29.1	39.5	21.5	7.2	1.3	0.4	69.9
1969	8.6	50.5	27.9	8.2	4.8	--	--	40.9
1970	1.2	66.0	18.2	11.0	2.1	1.5	--	32.8
1971	0.6	43.4	45.4	9.7	0.6	0.3	--	56.0
1972	0.3	40.0	31.0	22.2	5.1	1.5	--	59.8
1973	1.5	38.9	32.5	15.5	3.1	1.5	--	52.6
1974	0.2	60.9	27.1	8.6	0.5	2.4	--	38.6
1975		85.4	12.4	1.0	1.0	0.2	--	14.5
Average	2.2	52.7	32.0	15.1	4.0	1.4	0.4	
<u>Blueback-Rappahannock</u>								
1966	11.8	28.2	36.5	17.6	3.5	2.4	--	60.0
1967	4.0	29.1	38.0	19.4	7.7	1.6	--	66.7
1968	5.8	49.4	26.2	10.0	6.9	1.2	0.4	44.7
1969	6.7	52.5	25.4	9.2	3.5	2.5	0.4	41.0
1970	2.1	54.5	32.0	8.3	1.7	1.4	--	43.4
1971	0.5	35.7	53.0	9.0	1.6	0.1	0.1	63.8
1972		30.1	42.4	19.5	6.8	1.2	--	69.9
1973	0.4	48.9	30.9	15.4	3.7	0.6	--	50.6
1974	0.2	43.1	34.9	15.7	4.6	1.3	--	56.5
1975	0.6	85.4	11.6	2.0	0.2	--	--	13.8
Average	3.6	45.7	33.1	12.6	4.0	1.4	0.3	
Average of both rivers	2.9	49.2	32.5	13.9	4.0	1.4	0.3	
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Alewife, both rivers,								
average for 1966-68	13.1	38.5	25.9	17.0	4.4	1.2	0.3	48.8
average for 1973-75	1.3	70.7	18.9	5.7	2.4	0.9	0.1	28.0
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Blueback, both rivers,								
average for 1966-68	4.7	35.9	33.1	18.2	6.4	1.6	0.1	59.4
average for 1973-75	0.6	60.7	25.2	9.9	2.4	1.1	--	38.6

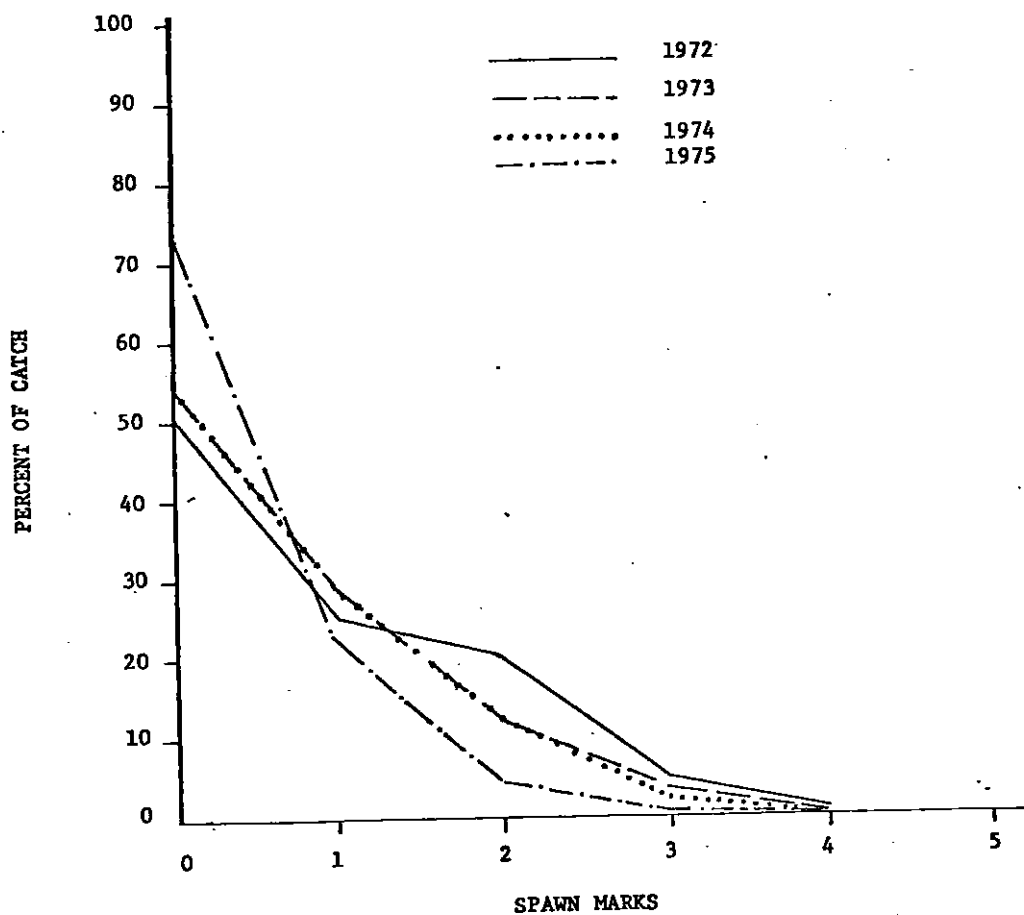


Figure 1. - Percent frequency of virgins and repeat spawners in commercial landings of blueback herring, 1972-75. Data for each year combined for all sample locations, Albemarle Sound, North Carolina

