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Aziscohos Lake Salmonid Fishery

By Forrest R. Bonney

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Maine Department of Inland Fisheries & Wildlife
Division of Fisheries & Hatcheries

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Forrest R. Bonney

Maine Dept. Inland Fisheries & Wildlife
Fisheries and Hatcheries Division
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AZISCOHOS LAKE
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SUMMARY

Aziscohos Lake is a 6,700-acre water formed by the construction of a dam on the Magalloway River. The lake supports fisheries for both salmon and brook trout. All of the trout and most of the salmon are wild fish. Although salmon are stocked at relatively low rates, they provide good returns to the angler in some years.

During the summer of 1999, anglers were interviewed at Aziscohos Lake to gather biological information on the quality of the salmon and brook trout fishery. This information was compared with that collected in a similar manner in 1986, 1991, 1993, and 1996. Angler use, which varied from 3,703 days in 1999 to 6,477 in 1996, is among the lowest of the Rangeley lakes. Growth rates decreased from 1991 to 1993 but improved in 1996. The improved growth rates resulted from an increase in the number of smelt in the lake, which in turn is attributed to a 2-year salmon stocking moratorium and closure of the west-shore tributaries to smelt dipping. Growth rates declined moderately in 1999; in response, the salmon stocking rate will be reduced from 500 spring yearlings per year to 500 spring yearlings every other year.

We will continue to monitor the Aziscohos Lake fishery by conducting a creel survey and angler count every third year.

ABSTRACT

Aziscohos Lake is a 6,700-acre (2,714-ha) artificial impoundment located on the Magalloway River in northern Oxford County. The lake is mesotrophic, and supports populations of landlocked salmon *(Salmo salar)*, brook trout *(Salvelinus fontinalis)*, rainbow smelt *(Osmerus mordax)*, suckers (*Catostomidae*), brown bullhead (*Ameirus nebulosus)*, and several species of minnows (*Cyprinidae*). It is closed to ice fishing. Salmon are stocked at a low rate to augment natural reproduction. Systematic random creel surveys were conducted in 1991 and 1993 from ice-out to mid-July and during the entire 1986, 1996 and 1999 fishing seasons. Aerial angler counts were made during all survey years except 1993. The estimated number of angler trips ranged from a high of 6,477 (5,768 - 7,186) in 1996 to 3,703 (2,973-4,433) in 1999. The estimated harvest of salmon and brook trout, available for the years 1986 and 1999, remained relatively consistent. The salmon harvest increased from 0.09 to 0.11 lb/a; the brook trout harvest was 0.05 lb/a both years. Robustness (condition) of both species increased significantly from 1993 to 1996 then declined moderately from 1996 to 1999. The decline in the growth rate from 1986 to 1993 was attributed to a decline in the smelt population. Growth rates improved in 1996 after salmon stocking was temporarily terminated, then resumed at a lower rate. The closure of west-shore tributaries to smelt dipping effective 1996 also contributed to improved forage abundance. Hatchery-reared salmon accounted for 12% of those sampled. A majority of these fish was harvested at age IV+. The majority of the legal-size wild salmon sampled were ages V+ and VI+, though individuals through IX+ were sampled. The brook trout harvest consisted of fish primarily of ages III+ and IV+. We will continue to monitor the Aziscohos Lake fishery routinely to determine rates of angler use, salmonid growth and harvest, returns of stocked salmon, and effects of the restrictive brook trout regulations.

KEY WORDS: LLS, BKT, SLT, LAKE, SUMMER ANGLER SURVEY, AGE & GROWTH, HARVEST, YEARLING STOCKING, STOCKING RATE

INTRODUCTION

Aziscohos Lake is an artificial impoundment formed by the construction of a concrete dam on the Magalloway River in Lincoln Plantation. Each fall, the reservoir is drawn 20-30 ft for downstream power generation and to provide storage for spring runoff. Results of creel surveys conducted in 1991 and 1993 were reported in Progress Report No. 2. These data indicated a declining salmonid growth rate, and salmon stocking was temporarily suspended in 1993 and 1994 (Table 1) in an effort to restore size quality. Because salmon growth rates did not improve as a result of the elimination of stocking, the west shore tributaries were closed to smelt dipping effective 1996 to enhance the forage base.

The Aziscohos Lake fishery is primarily dependent on natural reproduction for salmon and brook trout. The lake was stocked intermittently with brook trout from 1937 to 1973 when stocking was abandoned due to poor returns. Salmon stockings provided higher returns to the angler, but rates are kept low to maintain satisfactory growth in a lake noted for slow growth rates for this species. Salmon stocking was resumed in 1995 at a lower rate of 500 spring yearlings per year, not to exceed an annual weight of 150 lb.

STUDY AREA

Aziscohos Lake, a 6,700-acre impoundment near the New Hampshire border in Western Maine, is one of the headwaters of the Androscoggin River drainage. The lake is 18 miles long, narrow in width, and has a maximum depth of 60 ft; the mean depth is 31 ft. Water below 30 ft is deficient in oxygen during the warm summer months. For this reason, and because it is drawn for power generation, Aziscohos Lake provides only fair landlocked salmon habitat. Water quality is ideal for brook trout, however, and the lake and its tributaries support good populations of this species.

There is a public launch site and a commercial camp ground near the south end of the lake and one set of commercial sporting camps near the north end of the lake. Private camps are numerous along the east shore. Aziscohos Lake is closed to ice fishing and has a

no-live-fish-as-bait (NLFAB) restriction. Restrictive brook trout regulations were imposed in 1992 and in 1996 (Table 1).

METHODS

Creel surveys were conducted at the public landing site from ice out through September in 1999. Sixty-four aerial angler counts were also conducted throughout the season, from which estimates of total angler use and fish harvest were made (Table 2). These data were compared to previous surveys conducted in 1986, 1991, 1993, and 1996 to determine trends in the fishery. A partial-season creel survey and season-long aerial angler counts were conducted in 1991, and a partial-season creel survey was conducted in 1993. Because there was evidence that not all unsuccessful angler trips were recorded by the clerk in 1991, 1993, and 1996, estimates based on these data were deleted from summary tables. Angler use estimates and information on fish ages and growth rates for these years are accurate and are therefore included in this report.

Growth and condition were described by length-weight regressions using log 10 transformed data (F test for covariance, $P < 0.05$). Significance levels were set at $P=0.05$ for all tests and data were analyzed using the Statistical Analysis System (SAS Institute 1996) software package.

RESULTS AND DISCUSSION

The estimated number of angler trips per year declined from 6,477 (1.0 angler days per acre[1]) in 1996 to 3,703 (0.6 angler days per acre) in 1999. Angler use has been variable over the period surveyed, however, and this decline is not seen as a trend. Aziscohos Lake angler use, as measured by the number of angler days per acre, is at the lower end of the normal range for the Rangeley lakes (Table 3). Because Aziscohos is a relatively remote lake with public access restricted to its southern end, the relatively low rate of angler use is not unexpected. The average

[1]The value for angler days per acre is derived by dividing the total estimated number of anglers for the season by the acreage of the lake. This estimate of angler use allows for comparison of different-sized water bodies on a per-unit-of-area basis.

annual harvest rates of 0.10 lb of salmon and 0.05 lb of brook trout per acre were commensurately lower than those of the other Rangeley lakes (Table 4).

As mentioned previously, estimates relying on data collected during the 1991, 1993, and 1996 clerk surveys were not included in summary tables, because unsuccessful angler trips were not consistently recorded. For example, of the 33 parties interviewed in 1991, all were reported as being successful in catching a legal fish; in 1993, 59 of 70 (84%) were successful; and in 1996, 111 of 123 (90%) were successful. By way of comparison, clerk surveys for 1986 indicate an 18% success rate; those for 1999 indicate a 18% success rate; these rates are in line with those of other regional waters, and are considered to be realistic.

Of the hatchery-reared salmon sampled since 1986, 84% were age III+ or IV+ (Table 5). The majority of the hatchery salmon sampled (76%) were age IV+; most of the wild fish were age V+. The fact that few hatchery-reared salmon were recruited before age IV+ is indicative of slow growth; in most lakes, salmon stocked as spring yearlings become legal (14 in) at ages II+ or III+. Compared to hatchery-reared fish, wild salmon were more abundant, slower growing, and longer-lived, with age V+ - VIII+ fish comprising 89% of the harvest. The abundance of older salmon indicates a balanced population structure that is not being overexploited by anglers.

Although the number of salmon stocked during the 5-year period immediately prior to 1993 was numerically fewer than for the 5-year period prior to 1986, the weight of salmon stocked increased by 77% during the latter period due to the stocking of larger fish (Table 6). These larger salmon presumably preyed on smelts at a younger age and more heavily than did their predecessors, resulting in depleted forage stocks and reduced growth rates. Analysis of covariance indicated that salmon robustness declined significantly from 1985-86 to 1993 (Bonney 1994). This decline was attributed to the increased size of salmon stocked from 1988 to 1992. As a result of declining growth rates, salmon stocking was suspended in 1993 and 1994 and the west-shore tributaries were closed to smelt dipping effective 1996 to increase forage abundance. When stocking was resumed in 1995, it was at a lower rate, with the intent that the weight stocked not exceed 150 lb. per year. Salmon growth improved significantly in 1996 after the west-shore tributaries were closed to smelt dipping and the stocking rate was reduced (Bonney 1997). The average weight of age V+ (the most abundant age class) salmon sampled increased from 1 lb. 1 oz in 1993 to 1 lb. 6 oz. in 1996, a 28% increase in weight (Table 7). The

average weight of age V+ salmon increased again to 1 lb. 10 oz. in 1999. Despite the numerical increase in weight, there were no statistically significant changes in salmon growth rates between the 2 years for age V+ fish. However, when all salmon were compared, the fish sampled in 1999 were less robust, indicating a slight decline in the overall growth rate. To obtain a larger sample group, age V+ salmon sampled in 1991 and 1993 (when growth rates were poor) were compared to those collected in 1996 and 1999 (after the closure to smelting). Those sampled in 1996 and 1999 were significantly more robust than those sampled earlier (Table 8).

Brook trout growth at Aziscohos Lake over the study period approximated the statewide average. The brook trout harvest from 1985-96 was composed of age II+ to age VI+ fish (Table 9) with ages III+ and IV+ representing 83% of the total sample. A substantial number of age V+ and VI+ brook trout, representing 18% of the total, was sampled during the 1996 survey. Condition factors were greater than 1.0 for all ages and all years, and there was a significant increase in robustness from 1993 to 1996. The increase in the growth rate was consistent with that of salmon; the average weight of brook trout increased from 1 lb 2 oz in 1993 to 1 lb 6 oz in 1996, a 27% increase. From 1996 to 1999, however, brook trout growth rates declined (Table 10). For age III+ fish, both growth and robustness declined significantly; for all brook trout, robustness declined significantly.

Progressively restrictive brook trout regulations imposed at Aziscohos Lake over the last 6 years were promulgated as part of a statewide effort to protect wild brook trout populations from over-harvest rather than to remedy any perceived problem specific to the brook trout fishery. Although it is encouraging that a higher proportion of older-age brook trout, including age VI+ fish, were sampled in 1996, it is too soon to determine whether the regulations have resulted in a permanently higher proportion of older fish or whether a resulting increase in biomass has affected growth rates.

Increased growth rates of both salmon and brook trout at Aziscohos Lake was attributed to an increase in the abundance of smelts, which provide the forage base. The increase in the smelt population, in turn, was attributed to closure of the west-shore spawning tributaries to dipping and to the moratorium and subsequent reduction in number when salmon stocking was restored. Salmon stocking has been resumed at a weight-level that has historically maintained forage abundance and provided acceptable salmonid growth rates. In a lake that has traditionally

had slow salmon growth rates, the improvement in size quality in 1996 is encouraging. However, the subsequent decline in salmonid growth rates, though moderate in nature, suggest that a further reduction in salmon stocking would be prudent. The abundance of older-age salmon and brook trout in the catch is indicative of slow growth rates, but results in desirable population structures, which are especially important from a genetic standpoint in naturally sustained populations. The presence of older-age fish also indicates that, at the present rate of exploitation, current regulations are adequately protecting the fishery.

RECOMMENDATIONS

Conduct a creel survey and aerial angler counts at Aziscohos Lake in 2002 and every third year thereafter. Rely on natural reproduction to provide the brook trout fishery and the majority of the salmon fishery, but continue to supplement the salmon fishery by stocking at a rate of 500 spring yearlings every other year, not to exceed 150 lb./stocking.

Prepared by: Forrest R. Bonney

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CREEL SURVEY DESCRIPTION

Table: 1. Season: Summer
Water: Aziscohos Lake Acres: 6,700 Miles:

Water type: Mesotrophic Town: Lincoln Plt., etc. County: Oxford

Principal fisheries: Landlocked salmon, brook trout

Year	Date	No. days surveyed	No. days in season	Clerk	Vol.	Other
1986	May 15 - Sep 30	59	157	X		
1991	May 5 - July 12	27	153	X		
1993	May 7 - July 5	33	153	X		
1996	May 8 - Sep 27	49	144	X		
1999	May 16 - Sep 25	27	144	X		

Year	Stocking History	Marks	Regulation History
1994	None		NLFAB, closed to ice fishing Brook trout: 5 fish limit, 10" minimum length.
1995	500 SY LLS, 4.4/lb.	BV	Same as above
1996	500 SY LLS, 3.6/lb.	RV	Same as above except: Brook trout: 2 fish, 10" min. length, only 1 > 12".
1997	500 SY LLS, 4.8/lb.	AD	Same as above
1998	500 SY LLS, 5.0/lb.	LV	Same as above
1999	500 SY LLS, 3.3/lb.	BV	Same as above

Remarks: LLS: Landlocked salmon BKT: Brook trout
SY: Spring yearlings NLFAB: No-live-fish-as-bait

CREEL SURVEY SUMMARY

Table: 2. Season: Summer

Water: Aziscohos Lake Acres: 6,700 Miles:

Town: Lincoln Plt., etc County: Oxford Region: D

Principal fisheries: Landlocked salmon, brook trout

Survey method: Stratified random clerk

		CENSUS YEAR				
Statistics	Species	1986	1991	1993	1996	1999
No. anglers surveyed		1,244	58	141	263	228
No. angler hours		8,031	343	913	1,316	1,115
No. anglers (and %) successful in catching a legal fish	LLS BKT	103 (8) 120 (10)				41 (18) 22 (10)
No. legal fish kept	LLS BKT	80 87	33 18	69 34	94 78	28 20
No. (and %) legal fish released	LLS BKT	27 (25) 43 (33)	35 (51) 16 (47)	35 (34) 11 (24)	92 (49) 32 (29)	23 (45) 3 (9)
No. (%) sub legal fish released	LLS BKT	233 (69) 5 (4)	69 (64) 0	441 (81) 2 (4)	136 (42) 21 (16)	169 (77) 4 (15)
Hours to catch a legal fish (all legal fish caught	LLS BKT	75.1 61.8				21.9 48.5
No. legal fish per angler (only those kept)	LLS BKT	0.08 (0.06) 0.10 (0.07)				0.22 (0.12) 0.10 (0.09)

Table 2. (con't)

Statistics	Species	1986	1991	1993	1996	1999
Mean length in mm ± SE (and no.) fish sampled or reported	LLS	405±5 (82)	395±6 (46)	392±6 (74)	418±3 (90)	433±6 (52)
	BKT	316±7 (72)	356±10 (23)	356±6 (54)	372±6 (79)	357±9 (40)
Mean weight in g. ± SE (and no.) fish sampled or reported	LLS	730±28 (82)	602±41 (38)	545±35 (72)	740±23 (82)	754±29 (50)
	BKT	348±26 (72)	502±51 (18)	502±32 (52)	636±33 (78)	482±34 (35)
No. (and %) hatchery fish sampled or reported	LLS	Unknown	9 (20)	18 (24)	3 (3)	2 (4)
	BKT	0	0	0	0	0
Estimated total fish harvested ± CI (@ 95%) during survey period	LLS	368 (304-432)				455 (365-545)
	BKT	402 (332-472)				325 (261-389)
Estimated total angler days ± CI (@ 95%) during survey period		5,746 (4,743-6,749)	4,146 (3,472-4,820)		6,477 (5,768-7,186)	3,703 (2,973-4,433)

Remarks: Catch and harvest estimates prior to 1999 may be exaggerated due to the failure of the clerks to record all unsuccessful angler trips.

Table 3. Comparison of Aziscohos Lake angler days per acre to that of other Rangeley lakes, 1979-99.

	Lake			
Year	Aziscohos	Mooselookmeguntic	Rangeley	Richardson
1979			1.48	
1981		0.62		
1985			3.76	
1986	0.86	0.63		1.64
1990			1.60	
1991	0.62	0.56		1.40
1995		0.59	2.37	
1996	0.97			1.00
1998		0.37	2.58	0.33
1999	0.55			
Mean	**0.75**	**0.55**	**2.36**	**1.09**

Table 4. Comparison of Aziscohos Lake harvest in pounds per acre to that of other Rangeley lakes, 1979-96.

Year	Species[2]	Lake			
		Aziscohos[3]	Mooselookmeguntic	Rangeley	Richardson
1979	LLS			0.26	
	BKT			0.11	
1981	LLS		0.29		
	BKT		0.06		
1986	LLS	0.09	0.24		0.15
	BKT	0.05	0.10		0.02
1990	LLS			0.28	
	BKT			0.01	
1991	LLS		0.18		0.31
	BKT		0.05		0.04
1995	LLS		0.32	0.67	
	BKT		0.08	0.02	
1996	LLS				0.23
	BKT				0.03
1998	LLS		0.14	0.57	0.02
	BKT		0.06	0.09	0.01
1999	LLS	0.11			
	BKT	0.05			
Mean	**LLS**	**0.10**	**0.23**	**0.45**	**0.18**
	BKT	**0.05**	**0.07**	**0.06**	**0.03**

Table 5. Number of wild (W) and hatchery-reared (H) landlocked salmon sampled by creel survey at Aziscohos Lake, 1986-1999.

	Age															
	III+		IV+		V+		VI+		VII+		VIII+		IX+		All	
Year	H	W	H	W	H	W	H	W	H	W	H	W	H	W	H	W
1986	0	1	8	14	0	25	0	22	1	3	0	0			9	65
1991	0	0	6	5	2	10	0	9	0	3	0	2			8	29
1993	3	0	14	5	0	38	0	13	0	0	0	0			17	56
1996[4]					2	22	1	41	0	16	0	6	0	1	3	86
1999	0	0	1	6	0	19	0	14	0	7	0	3			1	49
All	**3**	**1**	**29**	**30**	**4**	**114**	**1**	**99**	**1**	**29**	**0**	**11**	**0**	**1**	**38**	**285**
Percent Hatchery	**75**		**49**		**4**		**1**		**3**		**0**		**0**		**12**	

[2]LLS = landlocked salmon; BKT = brook trout.

[3]Harvest rates prior to 1999 are probably inflated due to failure of clerks to record all unsuccessful angler trips.

[4] No age III+ or IV+ hatchery-reared salmon were available to anglers in 1996.

Table 6. Aziscohos Lake landlocked salmon stocking for various periods from 1981-99.

Year stocked	Age at stocking	Number stocked	Weight stocked (Lb)
1981	SY	3,500	432
1982		0	
1983	SY	3,500	318
1984		0	
1985		0	
Mean		**1,400**	**150**
1988	SY	1,000	200
1989	SY	1,000	244
	FF	500	52
1990	SY	1,000	200
1991	SY	1,000	286
1992	SY	1,000	345
Mean		**1,100**	**265**
1995	SY	500	114
1996	SY	500	135
1997	SY	500	104
1998	SY	500	100
1999	SY	500	152
Mean		**500**	**121**

Table 7. Mean lengths (mm), weights (g), and condition factors of all (wild and stocked) Aziscohos Lake **salmon**. Sample size in parentheses. Condition factors are below sample sizes.

Year sampled	Size variable	Age II+	III+	IV+	V+	VI+	VII+	VIII+ & older	All
1985	Length		377±5	395±8	401±7	476±20	457		400±5
			(13)	(15)	(22)	(4)	(1)		(55)
	Weight		543±34	612±33	711±51	1,028±68	1134		675±30
			(13)	(15)	(22)	(4)	(1)		(55)
	Cond.		1.002	0.993	1.082	0.977	1.188		1.033
1986	Length		358	384±5	399±6	433±10	451±22		405±5
			(1)	(26)	(29)	(22)	(4)		(82)
	Weight		482	615±30	699±38	885±68	971±160		733±29
			(1)	(26)	(29)	(22)	(4)		(82)
	Cond.		1.051	1.069	1.080	1.055	1.033		1.067
1991	Length			376±7	384±8	403±9	466±9	495±38	395±6
				(14)	(18)	(9)	(3)	(2)	(46)
	Weight			536±67	467±30	623±42	965±143	1,079±284	603±41
				(11)	(11)	(9)	(3)	(2)	(36)
	Cond.			0.950	0.875	0.954	0.944	0.866	0.923
1993	Length		373±12	382±7	382±3	444±13			392±4
			(4)	(19)	(38)	(13)			(74)
	Weight		468±75	522±37	493±16	748±73			545±21
			(4)	(18)	(37)	(13)			(72)
	Cond.		0.878	0.914	0.873	0.834			0.877
1996	Length			373±5	399±5	420±4	425±6	458±19	418±3
				(2)	(22)	(41)	(16)	(6)	(90)
	Weight			683±113	630±25	758±35	738±45	954±132	740±23
				(2)	(22)	(36)	(14)	(5)	(82)
	Cond.			1.308	0.993	0.984	0.945	0.926	0.985
1999	Length	369		390±9	425±6	439±9	462±19	485±4	433±6
		(1)		(7)	(19)	(14)	(7)	(4)	(52)
	Weight	400		529±35	747±37	769±44	901±106	958±42	754±29
		(1)		(7)	(17)	(14)	(7)	(4)	(50)
	Cond.	0.796		0.884	0.932	0.898	0.897	0.843	0.901

Table 8. Comparison of length-weight regressions, log 10 transformed data, Aziscohos Lake **landlocked salmon**, various ages, 1996 and 1999; 1991-93 and 1996-99. Legal size (≥14 in) fish only.

All ages, wild and hatchery origin

Year(s)	df	Slope	(SE)	Intercept	(SE)	P	R^2
1996	81	2.94	(0.21)	-4.86	(0.55)	0.0001	0.71
1999	49	2.90	(0.15)	-4.77	(0.39)	0.0001	0.89
Both	131	2.83	(0.14)	-4.58	(0.36)	0.0001	0.76

Comparison of Slope F Test
$F_{1,128}=0.03$ $p=0.864$
Comparison of Intercept F Test
$F_{1,48}=11.50$ **$p=0.00092$**

Age V+, wild fish only

Year	df	Slope	(SE)	Intercept	(SE)	P	R^2
1996	21	2.33	(0.49)	-3.26	(1.28)	0.0001	0.53
1999	16	3.31	(0.33)	-5.85	(0.88)	0.0001	0.87
Both	38	2.61	(0.26)	-3.99	(0.69)	0.0001	0.72

Comparison of Slope F Test
$F_{1,35}=2.47$ $p=0.12517$
Comparison of Intercept F Test
$F_{1,15}=0.94$ $p=0.33969$

Age V+, wild fish only

Years	df	Slope	(SE)	Intercept	(SE)	P	R^2
1991-93	47	3.06	(0.27)	-5.21	(0.69)	0.0001	0.74
1996-99	38	2.61	(0.26)	-3.99	(0.69)	0.0001	0.72
Both	86	3.24	(0.17)	-5.66	(0.45)	0.0001	0.81

Comparison of Slope F Test
$F_{1,83}=1.41$ $p=0.23790$
Comparison of Intercept F Test
$F_{1,37}=18.24$ $p=0.00005$

Table 9. Mean lengths (mm), weights (g), and condition factors of Aziscohos Lake **brook trout**. Sample size in parentheses. Condition factors are below sample sizes.

Year sampled	Size variable	Age					
		II+	III+	IV+	V+	VI+	All
1985	Length		366±6	394±8			373±6
			(8)	(3)			(11)
	Weight		567±28	758±45			619±41
			(8)	(3)			(11)
	Cond.		1.156	1.239			1.178
1986	Length	253±7	301±9	342±8	425±13		316±7
		(12)	(28)	(28)	(4)		(72)
	Weight	172±13	335±25	484±36	893±75		400±26
		(12)	(28)	(28)	(4)		(72)
	Cond.	1.062	1.228	1.210	1.163		1.159
1991	Length		333±7	421±17			357±10
			(14)	(6)			(23)
	Weight		375±21	794±79			502±51
			(13)	(6)			(20)
	Cond.		1.016	1.064			1.009
1993	Length		347±5	411±12			357±6
			(46)	(8)			(54)
	Weight		458±28	741±56			501±29
			(44)	(8)			(52)
	Cond.		1.052	1.057			1.053
1996	Length		337±6	369±6	433±10	472±8	372±6
			(29)	(29)	(10)	(4)	(79)
	Weight		479±32	576±31	943±69	1,214±123	636±33
			(29)	(28)	(10)	(4)	(78)
	Cond.		1.199	1.121	1.154	1.150	1.163
1999	Length	286±24	335±7	423±11			357±9
		(2)	(27)	(11)			(40)
	Weight	270	401±28	729±44			482±34
		(1)	(25)	(9)			(35)
	Cond.	0.906	1.017	1.024			1.015

Table 10. Comparison of length-weight regressions, log 10 transformed data, Aziscohos Lake **brook trout**, various ages, 1996 and 1999. Legal size fish only.

All ages

Year(s)	df	Slope	(SE)	Intercept	(SE)	P	R^2
1996	77	3.16	(0.15)	-5.34	(0.37)	0.0001	0.86
1999	34	2.87	(0.19)	-4.67	(0.49)	0.0001	0.87
Both	112	3.13	(0.12)	-5.28	(0.31)	0.0001	0.86

Comparison of Slope F Test
$F_{1,109}$=0.05 p=0.25397
Comparison of Intercept F Test
$F_{1,33}$=13.82 **p=0.00032**

Age III+

Year	df	Slope	(SE)	Intercept	(SE)	P	R^2
1996	28	3.79	(0.45)	-6.94	(1.12)	0.0001	0.73
1999	24	3.00	(0.26)	-4.99	(0.64)	0.0001	0.86
Both	53	3.38	(0.28)	-5.91	(0.70)	0.0001	0.74

Comparison of Slope F Test
$F_{1,51}$=0.13 **p=0.00709**
Comparison of Intercept F Test
$F_{1,23}$=7.70 **p=0.00771**

COOPERATIVE

STATE  FEDERAL

PROJECT

This report has been funded in part by the Federal Aid in Sport Fish Restoration Program. This is a cooperative effort involving federal and state government agencies. The program is designed to increase sport fishing and boating opportunities through the wise investment of anglers' and boaters' tax dollars in state sport fishery projects. This program which was funded in 1950 was named the Dingell-Johnson Act in recognition of the congressmen who spearheaded this effort. In 1984 this act was amended through the Wallop-Breaux Amendment (also named for the congressional sponsors) and provided a threefold increase in Federal monies for sportfish restoration, aquatic education and motorboat access.

The Program is an outstanding example of a "user pays-user benefits", or "user fee" program. In this case, anglers and boaters are the users. Briefly, anglers and boaters are responsible for payment of fishing tackle excise taxes, motorboat fuel taxes, and import duties on tackle and boats. These monies are collected by the sport fishing industry, deposited in the Department of Treasury, and are allocated the year following collection to state fishery agencies for sport fisheries and boating access projects. Generally, each project must be evaluated and approved by the U.S. Fish and Wildlife Service (USFWS). The benefits provided by these projects to users complete the cycle between "user pays — user benefits".

Maine Department of Inland Fisheries and Wildlife
284 State Street, Station #41, Augusta, ME 04333