

McIntire Pond Fishery Management

By Forrest R. Bonney



Caring for Maine's Outdoor Future



February, 2008
Maine Department of Inland Fisheries
and Wildlife
Division of Fisheries & Wildlife

FISHERY INTERIM SUMMARY REPORT SERIES NO. 08-01

MCINTIRE POND FISHERY MANAGEMENT

by

Forrest R. Bonney

Maine Dept. of Inland Fisheries & Wildlife

Fisheries and Hatcheries Division

Augusta, Maine

February, 2008

JOB F-024

MCINTIRE POND FISHERY MANAGEMENT
INTERIM SUMMARY REPORT NO. 1 (2007)

SUMMARY

McIntire Pond, located in Franklin County, provides a fishery for brook trout. This 20-acre mesotrophic pond had no trout when first surveyed in 1980 but has been stocked annually since 1981. McIntire Pond brook trout grow well and progressively restrictive regulations have been imposed since 1982 in an effort to produce a quality/trophy fishery. A wild trout population has become established in recent years. The brook trout population has been monitored annually by voluntary angler surveys and periodically by gillnetting and by fall trapnetting. The increasing number of wild brook trout is attributed to imposition of restrictive regulations and increased tendency of anglers to voluntarily release legal-size trout, which together allow escapement of sexually mature fish to spawn. Because the pond periodically winterkills, we recommend continued stocking at a low rate and a liberalization of regulations to encourage harvest of a portion of the mature fish while assuring that enough remain at large to assure continued natural reproduction.

KEY WORDS: AGE & GROWTH, AGE FREQUENCY, BKT, CPUE, HARVEST, HATCHERY, LAKE, SIZE AT AGE, STOCKING RATE, TRAPNET, VOLUNTARY BOOK SURVEY

MCINTIRE POND FISHERY MANAGEMENT
INTERIM SUMMARY REPORT NO. 1 (2007)

INTRODUCTION

When first surveyed in 1980, McIntire Pond contained only three minnow species (creek chub (*Semotilus atromaculatus*), blacknose dace (*Rhinichthys atratulus*), and northern redbelly dace (*Phoxinus eos*)). Brook trout (*Salvelinus fontinalis*) stocking was initiated in 1981 and golden shiners (*Notemigonus chrysoleucas*), assumed to be illegally introduced, were documented in 2001. Because trout grew well in McIntire Pond, progressively restrictive regulations have been imposed to protect them from harvest until they attain their full growth potential.

The McIntire Pond brook trout fishery has been monitored more intensively than that of many other trout ponds because of its status as a study pond to evaluate the performance of Maine Hatchery Strain vs. Maine Hatchery Strain/Assinica hybrid in 1986; and Kennebago vs. Sourdnahunk strains in 1998-2001. Highlights of that work is summarized in this report along with the results of work conducted in 2007. Annual brook trout stocking was changed from fall fingerlings to spring yearlings in 1989 after two years of poor over-winter survival (winters of 1986-87 and 1987-88¹) attributed to winterkill². There was also a partial winterkill during the winter of 1996-97.

PAST AND CURRENT MANAGEMENT

The results of past studies at McIntire Pond have been reported in a number of documents (see References) but highlights – exclusive of strain performance - are included herein to present a unified summary of the pond's fishery management history.

Annual stockings of 400 spring yearling brook trout beginning in 1989 (Table 1) have grown well and provided a good fishery at McIntire Pond. Above-average brook trout growth

¹ Water quality conducted on February 24, 1988, indicated only 3.0 ppm of oxygen directly under the ice, with lesser amounts in deeper water. Brook trout require a minimum of 5.0 ppm of oxygen in the water.

² Fish mortality caused by a lack of oxygen resulting from a combination of snow cover, which limits photosynthesis, and decomposition of organic matter, which uses up oxygen.

rates and a preference by the majority of the pond's anglers for a quality fishery prompted promulgation of increasingly restrictive regulations over a 24 year period, culminating in a one trout bag limit and an 18-inch minimum length limit imposed in 2006 (Table 2).

Annual angler use estimated five years between 1988 and 2000 indicated that the number of anglers fishing the pond averaged about 500 per year (Table 3). Brook trout harvest, estimated for three years between 1998 and 2000 (when regulations were of moderate to high severity), averaged about 75 per year. These values suggest that anglers who fish the pond value the opportunity to voluntarily catch and release fish and catch quality-size fish more than the opportunity to harvest them in large numbers.

We estimated the post-fishing season brook trout population abundance eight years between 1985 and 2001 to evaluate the relative performance of different strains of hatchery-reared brook trout. Because strain performance results have been presented in other reports, only the total numbers sampled are presented here (Table 4). The 1985 and 1986 population estimates evaluated stockings of 1,000 fall fingerling brook trout per year (with a regulation of fly fishing only, 2 trout bag limit; minimum length limit 6"), and indicated that an average of only 41 trout remained after one year at large (no fish older than age I+ were captured).

Population estimates conducted in 1992 and 1993 evaluated stockings of fewer (400 per year) but larger spring yearlings with no change in fishing regulations. An average of 171 fish survived after one year at large despite the smaller number stocked per year. More restrictive regulations were imposed in 1996 (fly fishing only; 2 trout bag limit; minimum length limit 12", only one trout may be greater than 14") and estimates made annually from 1998 through 2001 indicated an average population of 263 trout at large annually for the four year period. In addition to these stocked fish, however, there were also an estimated 132 wild brook trout (from age I+ to age IV+) in the 2001 sample, representing 30% of the total number. This was the first year that we captured substantial numbers of wild fish. Imposition of the 12" minimum length limit in 1996 appears to have allowed sufficient escapement of mature fish to assure natural reproduction. Stocking the wild, more fecund Kennebago and Sourdnahunk strains beginning in 1998 may have also contributed to increased natural reproduction. By 2001, wild brook trout up to age IV+ were sampled. Lengths and weights of stocked and wild fish sampled by trapnetting are presented by age in Tables 5 and 6.

Effective 2006, a more restrictive regulation (fly fishing only; 1 trout bag limit, minimum length 18") was imposed at McIntire Pond in an effort to create a trophy fishery. However, the 2007 population estimate indicated an even higher proportion of 414 wild brook trout, representing 68% of the total population. The high abundance of brook trout in 2007 (an estimated 606 fish, or 30 per acre) has impacted their growth rate through intraspecific competition. Despite the fact that age II+ and older stocked and wild brook trout at McIntire exceed statewide averages (Table 7), the largest fish sampled have not attained 18 inch in length in recent years (Table 8). Reports provided by anglers confirm that few if any brook trout attained the restrictive length limits in effect in recent years (Table 9). The large trout population is likely resulting in intraspecific competition, effectively reducing their growth rate. Although termination of annual stocking would be a logical method of reducing the numbers of trout, periodic winterkill would likely result in years with few or no brook trout present. A more measured response would be to liberalize the regulations by reducing the length limit to protect trout to spawning size but allow harvest of fish greater than that size. All of the age II+ and older wild trout sampled in 2007 were sexually mature; these fish were 10 inches long or greater (Table 10). Nearly 80% of the age I+ stocked fish were sexually mature; these fish were also 10 inches long. A return to the regulation in effect from 1996 to 2004 (fly fishing only; 2 trout bag limit; minimum length 12 in.; only one may be greater than 14 in.) would protect both stocked and wild fish to maturity but would allow harvest of most age II+ and older stocked and most age III+ and older wild brook trout. Because of periodic winter kill, we recommend continued annual stockings of spring yearling brook trout but at a reduced number of 200 fish.

Despite the high rate of catch and release, few fish showed signs of hooking injuries. Only 4% of the stocked fish and 12% of the wild fish had evident injuries in 2007 (Table 11). The higher rate of injuries on the wild fish is attributed to the fact that they are at large for a longer period of time before they reach legal size.

Golden shiners were captured in trapnets in 2001 but apparently did not become established in the pond, as none have been captured since. Creek chub, once abundant, have declined dramatically in numbers (Table 12). Crayfish were first captured in 2002 but are not abundant.

RECOMMENDATIONS

1. Change the regulation to fly fishing only; 2 trout bag limit; minimum length 12; only one may be greater than 14”.
2. Reduce the stocking rate to 200 spring yearling brook trout annually (10 fish per acre or approximately 0.25 pounds per acre).
3. Resample the pond by trapnetting and/or gillnetting to evaluate the impact of the modified management strategies.

Prepared by: Forrest R. Bonney
February, 2008

Acknowledgements

We are grateful to the following anglers who recorded their McIntire Pond fishing trips: Roger Dumas, Paul Friend, Emil Jahoda, Dave Lachapelle, Chris Leo, Marty DiMuzio, and Maynard Webster. Thanks to biologists Dave Boucher and Jim Lucas who edited the report.

References

Bonney, F.R. 1992. McIntire Pond Progress Report No. 2 (1985-92). Maine Department of Inland Fisheries and Wildlife. 15 pp. Mimeo.

_____ 2002. Comparative Performance of Two Genetic Groups of Stocked Brook Trout in Maine Lakes. Final Report (1997-2001). Maine Department of Inland Fisheries and Wildlife. 68 pp. Mimeo.

DeSandre, R. A., 1987. McIntire Pond Progress Report No. 1 (1986). Maine Department of Inland Fisheries and Wildlife. 7 pp. Mimeo.

Table 1. Stocking history of McIntire Pond, 1984-2007.

Year stocked	Age at stocking	Number	No/acre	Ln (in) stocked	Total Lbs stocked	Lbs per acre stocked
1984	FF	1,000	50	4-6	70.9	3.5
1985	FF	1,000	50	6-8	204.0	10.2
1986	FF	1,000	50	6-8	92.2	4.6
1987	FF	1,000	50	6-8	91.8	4.6
1988	FF	1,000	50	4-6	42.0	2.1
1989	SY	400	20	8-10	153.8	7.7
1990	SY	400	20	6-8	133.3	6.7
1991	SY	400	20	8-10	181.8	9.1
1992	SY	400	20	10-12	129.0	6.5
1993	SY	400	20	10-12	153.8	7.7
1994	SY	400	20	8-10	153.8	7.7
1995	SY	400	20	8-10	160.0	8.0
1996	SY	400	20	10-12	173.9	8.7
1997	SY	400	20	10-12	200.0	10.0
1998	SY	400	20	6-10	67.0	3.4
1999	SY	400	20	6-8	60.7	3.1
2000	SY	400	20	6-8	68.5	3.4
2001	SY	400	20	6-8	62.0	3.2
2002	SY	400	20	10-12	166.7	8.3
2003	SY	400	20	8-10	142.9	7.1
2004	SY	400	20	8-10	129.0	6.5
2005	SY	400	20	8-10	166.7	8.3
2006	SY	400	20	8-10	133.3	6.7
2007	SY	400	20	8-10	137.9	6.9

Table 2. Brook trout regulation history, McIntire Pond.

Year(s)	Minimum length limit (in)	Creel limit	Gear restriction	Regulatory severity ³	Regulatory category
1980-1981	6	8	None	0	Low
1982-1983	6	5	FFO ⁴	2	Moderate
1984-1995	6	2	FFO	4	Moderate
1996-2004	12; 1>14	2	FFO	7.5	High
2005	16	1	FFO	8.75	Severe
2006-2007	18	1	FFO	9.75	Severe

Note: Effective 2000, McIntire Pond has been open to catch and release fishing, fly fishing only, during the month of October.

³ A subjective ranking of regulations from 0 (general law) to 10 (catch and release, fly fishing only). Values are then grouped into regulatory categories (0-1.5 = low; 1.6-4.5 = moderate; 4.6-7.5 = high; 7.6-9.9 = severe; 10 = catch and release or closed to fishing)

⁴ Fly fishing only

Table 3. Estimated angler use and brook trout harvest, McIntire Pond.

Year	No. anglers	No. trout harvested
1988	384±200	.
1992	746±253	.
1998	356±146	66±28
1999	378±116	72±22
2000	589±189	90

Table 4. McIntire Pond fall brook trout population estimates by age and origin. Confidence intervals in parentheses.

Year	Origin	Ages				All
		I+	II+	III+	IV+	
1985	Stocked	34 (28-44)				34 (28-44)
1986	Stocked	48 (42-59)				48 (42-59)
1992	Stocked	122 (114-134)	26 (25-29)			148 (139-163)
1993	Stocked	171 (165-176)				194 ⁵ (187-200)
1998	Stocked	307 (180-416)				307 (180-416)
1999	Stocked	129 (93-210)	28 (18-58)			155 (120-218)
2000	Stocked	207 (156-307)	34 (24-55)	6 (5-7)		276 (241-325)
2001	Stocked	290 (198-543)	27 (16-77)	2 (1-3)		315 (226-518)
	Wild	5 (3-11)	66 (43-143)	56 (36-121)	5 (3-11)	132 (86-285)
2007	Stocked	168 (149-193)	24 (21-27)			192 (170-220)
	Wild	88 (78-101)	242 (214-278)	70 (62-81)	13 (12-15)	414 (367-475)

⁵ Includes 23 wild and/or older age, unmarked stocked brook trout.

Table 5. Mean length (in.), and weight (lb.-oz.) of **stocked** brook trout sampled in the fall. Sample sizes in parentheses.

Year sampled	Size variable	Age		
		I+	II+	III+
1998	Length	10.1±0.1 (85)		
	Weight	6±0.1 (85)		
1999	Length	9.8±0.1 (63)	13.1±0.2 (13)	
	Weight	6.8±0.2 (63)	13.6±0.7 (13)	
2000	Length	10.9±0.1 (96)	13.8±0.1 (23)	15.6±0.4 (5)
	Weight	8.5±0.2 (96)	1-1.0±0.6 (23)	1-7.8±1.3 (5)
2001	Length	10.1±0.1 (77)	11.7±0.3 (26)	15.0±0.4 (2)
	Weight	6.5±0.2 (77)	10.8±0.7 (25)	1-6.8±1.2 (2)
2007	Length	10.5±0.1 (42)	13.4±0.4 (6)	
	Weight	7.3±0.2 (42)	15.6±1.4 (6)	

Table 6. Mean length (in.) and weight (lb.-oz.) of **wild** brook trout sampled in the fall. Sample sizes in parentheses.

Year	Size variable	Ages			
		I+	II+	III+	IV+
2000	Length		9.9±0.2 (16)		
	Weight		6.9±0.6 (16)		
2001	Length	5.6 (1)	10.5±0.2 (13)	11.3±0.3 (11)	13.2 (1)
	Weight	1.1 (1)	7.9±0.6 (12)	9.5±0.5 (11)	10.9 (1)
2007	Length	5.6±0.1 (20)	9.9±0.1 (55)	13.3±0.3 (16)	16.1±0.6 (3)
	Weight	1.3±0.1 (20)	6.1±0.1 (55)	15.1±1.2 (16)	1-7.7±3.2 (3)

Table 7. Size comparison (in.; oz.) of McIntire Pond brook trout sampled in 2007 to statewide averages.

Origin	Water(s)	Age					
		I+		II+		III+	
		Length	Weight	Length	Weight	Length	Weight
Hatchery	McIntire	10.5±0.1 (42)	7.2±0.2 (42)	13.4±0.4 (6)	15.6±1.4 (6)		
	Statewide ⁶	10.0±0.03 (5697)	6.6±0.1 (5390)	12.5±0.03 (1569)	13.1±0.2 (1507)	14.3±0.1 (352)	20.1±0.6 (336)
Wild	McIntire	5.6±0.1 (20)	1.3±0.1 (20)	9.9±0.1 (55)	6.1±0.1 (55)	13.3±0.3 (16)	15.1±1.2 (16)
	Statewide	7.0±0.03 (2572)	2.3±0.03 (2465)	9.2±0.03 (3701)	5.0±0.1 (3629)	11.7±0.03 (2293)	10.5±0.1 (2246)

Table 8. Lengths (in.) of largest brook trout sampled at McIntire Pond by year and sampling method.

Year	Voluntary:		Clerk survey	Gillnetting	Trapnetting
	booklets	cards			
1981	10.3				
1982	10.8				
1983	16.0			16.0	
1985	19.0	19.0		17.5	
1986	12.0	15.0	12.8		
1988	10.5				
1989	9.5				
1991	13.0				
1992			11.3		16.7
1993	13.5				
1995	10.5				
1996	15.0				
1997	12.8			14.5	
1998	15.0				14.3
1999	13.5		14.2		15.6
2000	18.5		13.0		17.0
2001	14.0				15.4
2002	16.0				
2003	15.8				
2004	15.0				
2005	14.0				
2007	10.3				16.1

⁶ From statewide age and growth data set, lakes 200 acres or less.

Table 9. Voluntary creel survey, McIntire Pond, 2003-2007.

Statistics	Species	CENSUS YEAR				
		2003	2004	2005	2006	2007
No. anglers surveyed		21	5	14	5	3
No. angler hours		16	41	12	38	9
No. anglers (and %) successful in catching a legal fish	BKT	13 (62)	2 (40)	1 (7)	0	0
No. legal fish kept	BKT	14	1	0	0	0
No. legal fish released	BKT 12-14	0	1			
	BKT GE 14	2	0			
	BKT GE 16			1		
	BKT GE 18				0	0
No. (and %) sublegal fish released	BKT	39 (71)	6 (75)	56 (98)	0 (0)	5 (100)
No. legal fish per angler (only those kept)	BKT	0.76 (0.67)	0.40 (0.20)	0.07 (0)	0 (0)	0 (0)
Hours to catch a legal fish(<u>all</u> legal fish caught)	BKT	1.0	20.5	12.0		
Mean length in in.± SE(and no.) fish sampled or reported	BKT	14.0±0.3 (16)	13.5±1.5 (2)	17.0 (1)		9.1±0.5 (5)

Table 10. Sex and maturity of brook trout trapnetted in 2007 by origin and ages.

Origin	Sex	Maturity	Ages				All ⁷ (%)
			I+	II+	III+	IV+	
Wild	Male	Mature		38	5	2	45 (48)
	Female	Mature		17	10	1	28 (30)
	Unknown	Immature	20				21 (22)
	Unknown	Unknown			1		1 (1)
	All	All	20	55	16	3	94 (100)
Hatchery	Male	Mature	16	5			21 (43)
	Female	Mature	17	1			18 (37)
	Unknown	Immature	10				10 (20)
	All	All	43	6			49 (100)
Both	Male	Mature	16	43	5		66 (46)
	Female	Mature	17	18	10		46 (32)
	Unknown	Immature	30		1		31 (22)
	All	All	63	61	16		143 (100)

Table 11. Number and (%) of trapnetted brook trout with hooking injuries, 2007.

Origin	Hooking injury observed	Age				All
		I+	II+	III+	IV+	
Hatchery	Yes	2 (5)				2 (4)
	No	41 (95)	6 (100)			47 (96)
Wild	Yes		9 (16)	1 (6)	1 (33)	11 (12)
	No	20 (100)	46 (84)	15 (94)	2 (67)	83 (88)
All	Yes	2 (3)	9 (15)	1 (6)	1 (33)	13 (9)
	No	61 (97)	52 (85)	15 (94)	2 (67)	130 (91)

Table 12. Trapnetting by-catch by species and year, expressed as actual numbers caught.

Year	Species		
	Creek chub	Blacknose dace	Crayfish
1985	100		
1986	50	6	
1993	49	1	
1999	388	2	
2002	118		1
2007	1		2

Note: Hundreds of pollywogs were also caught each year but were not consistently counted.

⁷ May not be additive if unaged fish are included.

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

