

Fishery Progress Report Series No. 14-03

Magalloway River Fishery Management

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December 2014
Maine Department of
Inland Fisheries & Wildlife
Fisheries and Hatcheries Division

**Magalloway River Fishery Management
Interim Summary Report No. 7 (2013)**

SUMMARY

- The Magalloway River from Aziscohos Dam at the outlet of Aziscohos Lake to the Maine-New Hampshire border is 8.3 miles long. Season-long clerk creel surveys have been conducted periodically since 1998 on the upper 6.8 miles of this reach. Objectives of the surveys were to document existing levels of angler use, catch, and harvest prior to scheduled changes in flow regimes, and to evaluate a special harvest slot limit imposed on brook trout. The 2013 survey is the subject of this report. Results of the previous surveys are included here for comparison.
- The 2013 clerk survey of the Magalloway River was interrupted in late August because of staffing problems. Therefore, the clerk data (as well as Figure 2 and Tables 1 & 2) reflect only data from May through August.
- About 1,600 fishing trips were made in 2013, which was down from the 2010 angler estimate, but about average compared to surveys in previous years since 1998. Fishing effort continued to be concentrated in the uppermost 4.7 miles below Aziscohos Dam.
- The clerk survey showed fishing quality for legal-size brook trout (6 to 12 inches) and legal salmon (14 inches and larger) in 2013 was within the range observed since 1998. Annual variations in catch rates for all fish sizes of both species, including the ratio of sublegal fish, were indicative of variable recruitment.
- Clerk survey data showed that the ratio of brook trout in the catch exceeding 12 inches increased slightly from 1998 to 2003, declined in 2004, and then improved steadily in 2007, 2010, and 2013. Catch rates, a better indicator of the abundance of these larger trout, were relatively stable from 1998 to 2013. The availability of these larger trout appeared to be strongly associated with weak and strong year-classes.
- Fishing quality data provided by volunteers were consistent with general trends observed in the clerk surveys except from 2008-2010, when volunteers caught proportionately more sublegal salmon. Smelts, the principal forage for salmon, commonly drop into the river from Aziscohos Lake where their population abundance declined in recent years. Higher ratios of sublegal salmon possibly reflected low smelt abundance and declining salmon growth rates.
- Magalloway River anglers continued to release a high proportion of their legal catch. Just over 1,700 legal brook trout and 300 legal salmon were caught during the 2013 fishing season, but none were reported harvested.

- Anglers continued to catch small numbers of smallmouth bass. Their abundance has remained low because habitat is poor for bass in this reach of the Magalloway River.
- Special fishing regulations applied to brook trout in 1998, and altered slightly in 2006, did not dramatically enhance the availability of larger, older-age fish. The availability of these larger trout seemed more influenced by natural variability in annual spawning and recruitment success than by angler catch and harvest rates. Nonetheless, in 2013 we recommended a catch-and-release, combined with a barbed hooked prohibition, to provide maximum protection to brook trout in this heavily utilized and increasingly popular river segment. These rules became effective on April 1, 2014.

KEY WORDS: BKT, LLS, ANGLER SURVEY, INTRODUCTION, REGULATIONS

INTRODUCTION AND STUDY AREA

The Magalloway River originates near the Canadian border in western Maine and eastern New Hampshire and is a major tributary to the upper Androscoggin River. A portion of the Magalloway River is impounded by Aziscohos Dam, located 17.7 miles above its confluence with Umbagog Lake and the Androscoggin River.

The Magalloway River from Aziscohos Dam to the Maine-New Hampshire border is 8.3 miles long (Figure 1). Season-long angler surveys have been conducted periodically on the upper 6.8 miles of this reach since 1998. Objectives of the surveys were to monitor levels of angler use, catch, and harvest in conjunction with scheduled changes in flow regimes, and to evaluate a special harvest slot limit imposed on brook trout (*Salvelinus fontinalis*) in 1996. The 2010 survey is the subject of this report. Results of earlier surveys were reported by Boucher (1999a, 1999b, 2003, 2005, 2007, and 2010), and some are included here for comparison.

The Magalloway River provides suitable habitat for all life stages of brook trout and landlocked salmon (*Salmo salar*), which provide the principal sport fisheries. Brook trout are native to this drainage but salmon were introduced late in the 19th century. Populations of both species are sustained entirely by natural reproduction.

Rainbow smelt (*Osmerus mordax*) occur in the river from Aziscohos Lake, having passed over or through Aziscohos Dam, which controls flows and temperatures in this reach of the Magalloway River. When present they provide valuable forage for adult salmon and brook trout.

The presence of smallmouth bass (*Micropterus dolomieu*) in the Magalloway River below Aziscohos Lake was confirmed in 1999. This species was illegally introduced in Umbagog Lake, into which the Magalloway River flows, around 1986.

Other fish known to be present include chain pickerel (*Esox niger*), yellow perch (*Perca flavescens*), brown bullhead (*Ameiurus nebulosus*), slimy sculpin (*Cottus cognatus*), white sucker (*Catostomus commersoni*), fallfish (*Semotilus corporalis*), golden shiner (*Notemigonus crysoleucas*), common shiner (*Luxilus cornutus*), and lake chub (*Couesius plumbeus*).

The brook trout fishery is regulated with a 6 to 12-inch harvest slot (8 to 12 inches from 1996 to 2005), with one trout permitted in this size range. Landlocked salmon have a 14-inch minimum length limit and one fish per day bag limit, and unlimited harvest of smallmouth bass is permitted. Fishing is restricted to fly fishing, and the open fishing season extends from April 1 to September 30. All brook trout and salmon must be released alive after August 15. A special regulation, on the section from Bennett's Covered Bridge upstream for about 1,300 feet, allows persons under 16 to fish from June 1st to August 15th under the S-4 regulation (the use of live fish as bait is prohibited), but only from shore with barbless hooks. The Magalloway River below Aziscohos Lake can be accessed from several road crossings, roadside turnouts, and foot paths (Figure 1).

METHODS

A creel survey was conducted from May 10 to August 31, 2013 (Table 1). It was originally scheduled to be surveyed through to September 30, however staffing issues arose. The river was divided into two sections (Figure 1): from Aziscohos Dam downstream to Bennett's Covered Bridge (4.7 miles); and from Bennett's Covered Bridge downstream to the Lincoln PLT town line (1.8 miles). The survey was of a stratified random design with one weekend day and one weekday sampled each week. Each survey day was divided into three time periods of equal length (8AM-12PM; 12PM-4PM; and 4PM-8PM). Time periods were preselected randomly with approximately equal coverage given to each period throughout the survey. One time period was sampled each survey day. During each sampling event, clerks made instantaneous counts of anglers fishing each section from road, bridge, and footpath vantages. Standard clerk interviews were conducted to collect catch and harvest data. Total fishing effort for each section, and the entire reach, was estimated from formulae described by Pollack et al. (1994) for a roving survey.

SUMMARY OF FINDINGS

Fishing effort in 2013 continued to be concentrated in the uppermost 4.7 miles below Aziscohos Dam. Angler use in this reach was estimated at $1,581 \pm 393$ trips in 2013 (Table 2). Anglers were not observed in the lower section, including in the special "Kid's Fishing" area adjacent to Bennett's Covered Bridge. Youth fishing events are known to occur here during the mid-summer months, but none coincided with a scheduled survey day.

Fishing quality in 2013 was within the normal range for brook trout compared to previous clerk creel surveys (Table 2). The catch rate for legal-sized trout (those between 6 inches and 12 inches) was 0.61 fish/trip, 0.47 fish/trip for trout over 12 inches, and 1.08 fish/trip for trout of all sizes. Legal-sized salmon (those 14 inches and larger) were caught at a rate of 0.20 fish/trip. Catch rates for legal fish of both species varied during the entire 1998-2013 period, suggesting that conditions for successful recruitment of these wild fish varied considerably. Large annual variations in the ratio of sublegal fish, as well as annual differences in catch rates for all fish sizes combined, also indicated variable recruitment. Data provided by volunteers (Table 3) were largely consistent with the clerk data in this regard.

The ratio of brook trout in the catch exceeding 12 inches, as measured by clerk surveys, increased steadily from 1998 to 2003, declined in 2004, then improved steadily, though not dramatically, in 2007, 2010, and 2013 (Table 2). Catch rates, a better indicator of the abundance of these larger trout, were relatively stable throughout much of the period (Table 2). Catch rates for larger trout reported by volunteers were highly variable from 2004 to 2013, showing no obvious trends (Table 3)

Magalloway River anglers continued to release a high proportion of their legal catch. An estimated 1,700 legal brook trout and 316 legal salmon were caught during the 2013 fishing season, but none were reported harvested.

Both clerk and voluntary surveys showed that smallmouth bass were present but their numbers have not increased dramatically (Tables 2 and 3), probably because habitat for this species is poor in this reach of the Magalloway River.

DISCUSSION AND RECOMMENDATIONS

There has been an increase in angler use since 2003 (Figure 2), but the availability of all trout sizes, including those exceeding 12 inches, have been sustained and perhaps improved, particularly since 2007 (Table 2). Restrictive regulations may now be having some influence on this population's size structure, though this remains uncertain because this riverine population appears to be heavily influenced by natural variability in annual spawning and recruitment success, rather than by angler harvest rates. Recruitment levels for riverine brook trout are often linked with stream flows and summer water temperatures that prevail during early life stages. This clearly occurs in the lower Magalloway River, despite highly regulated flows and suitable temperatures from Aziscohos Dam. A recent radio telemetry study determined that a significant portion of Magalloway River brook trout utilize Abbott Brook, a tributary to the Magalloway, for spawning and nursery habitat (Boucher and Timmins 2008). Abbott Brook is a small, unregulated stream subject to extremes in flows and temperatures, which likely influences recruitment and fishing success in the Magalloway. Nonetheless, in 2013 we recommended a season-long catch-and-release rule, combined with a barbed hooked prohibition, to provide maximum protection to brook trout in this heavily utilized and increasingly popular river segment. These rules became effective on April 1, 2014.

From 2007 to 2013, the average size of salmon reported by volunteers declined slightly, and the ratio of sublegal salmon increased (Table 3). Rainbow smelts, present as dropdowns from Aziscohos Lake, are known to be an important food item for Magalloway River salmonids (Boucher and Timmins 2008). Smelt abundance in Aziscohos declined during this same period (ME Dept. Inland Fisheries and Wildlife, unpublished data), so it's possible that growth rates of Magalloway River fish declined concurrently. However, growth rate changes cannot be confirmed because long-term, age-specific size data are not available for Magalloway River salmon.

The Magalloway River below Aziscohos Dam continues to provide attractive, heavily utilized sport fisheries for native brook trout and wild landlocked salmon. The river's sport fisheries will be monitored annually by voluntary record-keepers and with a season-long creel survey and angler counts in 2016.

ACKNOWLEDGEMENTS

Brookfield Renewable Energy Partners provided staff and funding for the creel surveys and angler counts as a condition of their licenses to operate Upper and Middle Dams from the Federal Energy Regulatory Commission. Trisha Vernesoni conducted the creel survey in 2013. Fishery Biologists Robert Van Riper and Elizabeth Thorndike reviewed this report and offered several helpful suggestions. The following anglers provided excellent records of their fishing trips from 2007 to 2013: Mike Anctil, Bob Bourassa, Bob Erickson, Ralph Johnson, Wayne MacDougall, Patrick O'Shea, Don Palmer, and Greg Swenson.

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April 2014

Figure 1. Site location map for Magalloway River creel surveys.

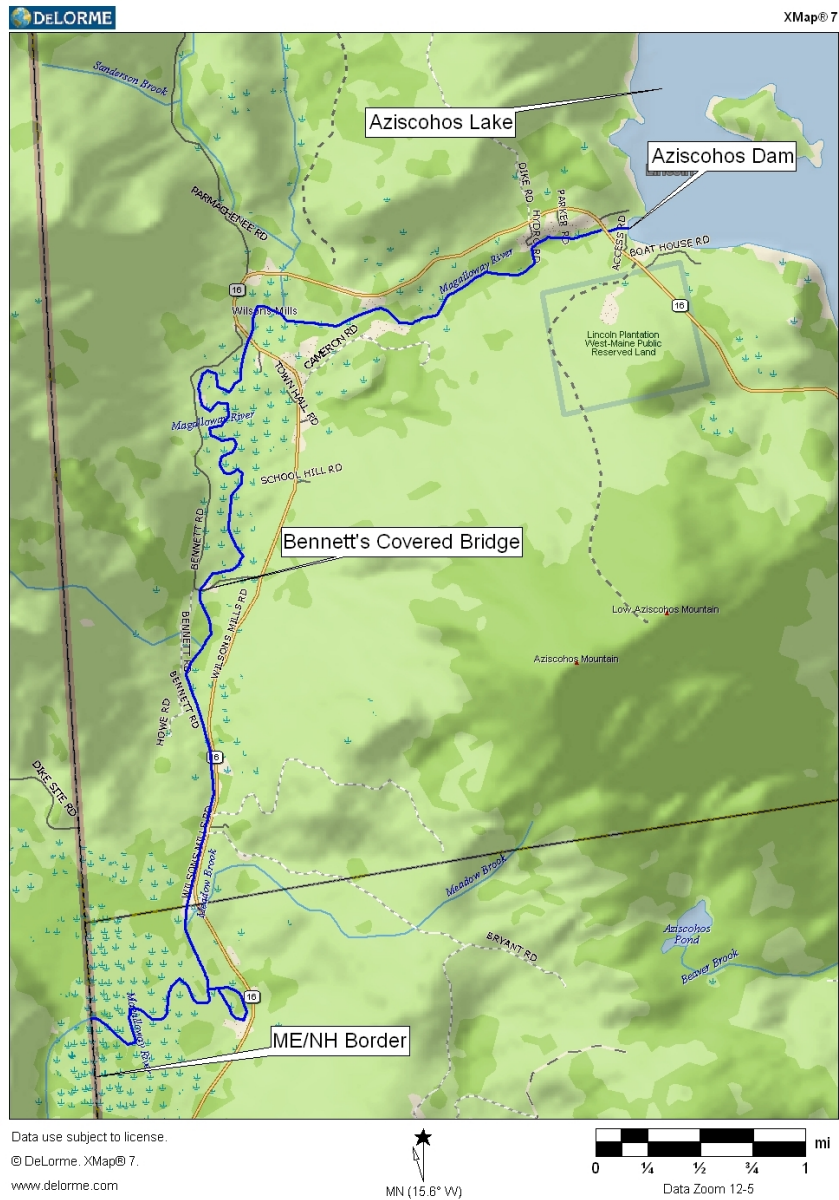


Table 1. Description of Magalloway River clerk creel surveys.

Year	Date	No. days surveyed	No. days in season
2013	May 10 to August 31	45	183
2010	May 2 to September 30	50	183
2007	May 12 to September 30	44	183
2004	May 22 to September 30	40	183
2003	May 3 to September 30	46	183
2002	May 7 to September 30	40	183

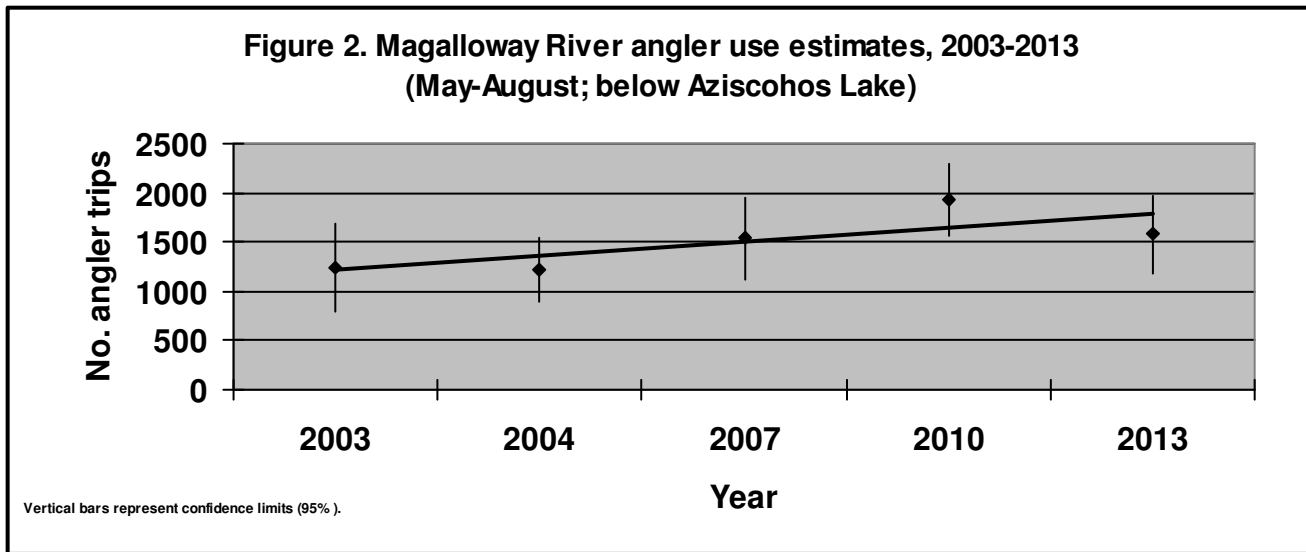


Table 2. Summary statistics for Magalloway River clerk creel surveys, 2003-2013 (May through August only). Upper reach only¹. Confidence limits (\pm) were computed at the 0.05 probability level.

Parameter	Species and year of survey									
	Brook trout					Salmon				
	2003	2004	2007	2010	2013	2003	2004	2007	2010	2013
No. anglers surveyed:	188	118	234	433	414	188	118	234	433	414
No. angler hours surveyed:	473	350	594	1,300	1,256	473	350	594	1,300	1,256
No. (%) successful anglers:	29 (15)	45 (38)	74 (32)	214 (49)	165 (40)	20 (11)	20 (17)	33 (14)	73 (17)	54 (13)
No. legals ² caught:	24	61	141	407	252	25	25	43	93	82
No. (%) legals released:	24 (100)	61 (100)	141 (100)	407 (100)	252 (100)	22 (88)	25 (100)	43 (100)	93 (100)	82 (100)
No. (%) brook trout > 12”:	25 (51)	13 (18)	55 (28)	154 (27)	196 (44)	-	-	-	-	-
No. (%) sublegals released:	26 (35)	44 (37)	67 (25)	88 (14)	24 (5)	34 (61)	27 (52)	71 (62)	146 (61)	152 (65)
No. legals ² caught/angler-trip:	0.26	0.63	0.84	1.30	1.08	0.26	0.21	0.18	0.21	0.20
No. legals kept/angler-trip:	0	0	0	0	0	0.02	0	0	0	0
Hours/legal ² caught:	9.7	4.7	3.0	2.3	2.8	18.9	14.0	13.8	14.0	15.3
No. brook trout >12” caught/trip:	0.13	0.11	0.23	0.36	0.47	-	-	-	-	-
All sizes caught/angler-trip:	0.40	1.00	1.12	1.50	1.40	0.31	0.44	0.49	0.55	0.57
Estimated total catch of legals ² \pm CI:	323 \pm 116	768 \pm 200	1,289 \pm 354	2,508 \pm 482	1,707 \pm 424	162 \pm 58	256 \pm 67	276 \pm 76	405 \pm 78	316 \pm 79
Estimated. total harvest of legals ² \pm CI:	0	0	0	0	0	19 \pm 7	0	0	0	0
Estimated total angler days \pm CI:	1,243 \pm 447	1,219 \pm 317	1,535 \pm 421	1,929 \pm 371	1,581 \pm 393					
Percent of total effort in upper reach:	100	100	99	100	100					
No. angler days/river-mile:	264	259	327	410	363					
Number of smallmouth bass reported:	8	11	1	8	3					

²Legal brook trout: 8”-12” prior to 2006; 6”-12” 2007 to present.

¹ Upper reach extends from Aziscohos Lake dam to ¼ mile upstream of Bennett’s Covered Bridge (4.7 miles).

Table 3. Summary statistics for Magalloway River voluntary creel surveys, 2007-2013. Upper reach only².

Parameter	Species	2007	2008	2009	2010	2011	2012	2013
No. anglers surveyed:		40	22	28	25	13	6	9
No. angler hours surveyed:		207	77	117	114	50	24	37
No. legal ² caught:	BKT	39	29	35	27	12	8	13
	LLS	29	1	11	5	3	1	9
No. (%) legal ² released:	BKT	39 (100)	29 (100)	35 (100)	27 (100)	12 (100)	8 (100)	13 (100)
	LLS	29 (100)	1 (100)	11 (100)	5 (100)	3 (100)	1 (100)	9 (100)
No. (%) brook trout > 12”:	BKT	21 (31)	9 (24)	43 (55)	12 (31)	4 (25)	1 (11)	19 (59)
No. (%) sublegals released:	BKT	7 (10)	0	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	LLS	24 (45)	18 (95)	10 (48)	9 (64)	8 (73)	2 (67)	2 (18)
No. legal ² caught/angler-trip:	BKT	0.98	1.32	1.25	1.08	0.92	1.33	1.44
	LLS	0.73	0.05	0.39	0.20	0.23	0.17	1.00
No. legal ² kept/angler-trip:	BKT	0	0	0	0	0	0	0
	LLS	0	0	0	0	0	0	0
Hours/legal ² caught:	BKT	5.3	2.7	3.3	4.2	3.1	3.0	2.8
	LLS	7.1	77.0	10.6	5.0	16.7	24.0	4.1
No. brook trout >12” caught/trip:	BKT	0.53	0.41	1.54	0.48	0.31	0.17	2.11
All sizes caught/angler-trip:	BKT	1.68	1.73	2.79	1.56	1.23	1.50	3.56
	LLS	1.33	0.86	0.75	0.56	0.85	0.50	1.22
Mean length (inches) of fish reported: (no. fish reported)	BKT	12.1 (59)	11.2 (38)	11.9 (55)	11.1 (39)	11.7 (20)	10.8 (8)	13.8 (32)
	LLS	16.8 (28)	17.0 (1)	14.8 (11)	15.6 (5)	16.7 (3)	16.0 (1)	15.0 (9)
Number of smallmouth bass reported:	SMB	0	0	0	0	0	0	0

²Legal brook trout: 8”-12” prior to 2006; 6”-12” 2007 to present.

² Upper reach extends from Aziscohos Lake dam to ¼ mile upstream of Bennett’s Covered Bridge (4.7 miles).

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 angler's and boater's tax dollars in state sport fishery projects. This program which was founded 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."



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