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To: Bill Smith - Regional Director, Northern Region

From: Thomas (Skip) Sommerfeldt
Senior Fisheries Biologist, Park Falls

Subject:
1998 Lake Survey Summary - Woodbury Lake, Forest County
(T38N, R12E, sec. 5,8; WBIC - 1179400)
Upper Wisconsin GMU

This report is submitted with the approval of Basin Supervisor (GMU Team Leader), Tom Bashaw and Regional Fisheries Expert, Steve AveLallemant. The report was written and work supervised by Thomas (Skip) Sommerfeldt, Senior Fisheries Biologist under the Chequamegon and Nicolet National Forest contract fisheries program.

NOTED: _____
Upper Chippewa Basin Supervisor, Bruce L. Swanson

APPROVED BY:

Upper Wisconsin Basin Supervisor, Tom Bashaw Date

Fisheries Expert, Steve AveLallemant Date

Bureau of Fisheries and Habitat Protection Date

cc: Bureau of F & H Prot.
Park Falls DNR (Skip)

USFS S.O. - Sue R.
Woodruff DNR (Bob Young)



BACKGROUND INFORMATION

Woodbury Lake is an 72-acre, soft water seepage lake in west central Forest County. It is within the Eagle River/Florence District of the Chequamegon/Nicolet National Forest and located approximately 7 miles east of the town of Three Lakes. The lake has a maximum depth of 20 feet and the US Forest Service controls 1.05 miles of the 1.7 miles of shoreline (62%). Public access has recently (9/97) been limited to carry-in only, with vehicle parking located about 100 feet from the water. The shoreline is predominantly bog (70%), with the remainder consisting of upland conifer and hardwoods (mainly the northwest shore). Littoral bottom types are mainly muck (85%), with a much lesser amount of sand (15%). Water in the lake has a light to medium brown stain and is slightly alkaline (pH= 7.8). A secchi reading of 9 feet was recorded in August 1998.

Past fisheries management activities on Woodbury Lake have included the stocking of largemouth bass and northern pike, as well as several fishery surveys. Largemouth bass were first stocked in 1943 and again in 1947, 1948 1951-53, and 1964. Northern pike were stocked only once and that was a plant of 150 adult fish in April of 1981. Past fishery surveys were conducted in 1964, 1969, 1972, and 1978.

The 1978 survey utilized fyke nets and shoreline seining in late August to sample the fish populations. The survey collected 3 largemouth bass, 81 black crappie, 16 pumpkinseed, and 488 yellow perch. The survey report concluded that the lake supported a fairly large fish population. Growth was normal for all species but their condition was below average due to the low productivity of the water and competition for food and space. The yellow perch population had increased dramatically since the 1964 and 1974 surveys. Growth rates were acceptable for the perch (in 1978) but it was believed that growth would decline with the continued high abundance of the species. This would then affect the growth and condition of the other fish species as well. Management recommendations were to manage the lake for largemouth bass, northern pike, black crappie, and pumpkinseed. Northern pike were to be stocked in 1980. It was believed that the addition of this predator would help control the perch population and also provide additional angling opportunities. Further monitoring was to be conducted in 1981 or 1982 to determine the success in controlling perch abundance and in establishing a northern pike fishery. It was apparent that the additional monitoring was not conducted.

The 1998 fishery survey on Woodbury Lake was conducted through the Chequamegon/Nicolet National Forest contract fisheries program. It was designed to inventory the fish population and identify any management problems. To gather information on the fishery, fyke nets were utilized in July 1998, and visual observations and angling were used in August 1998 (electrofishing was not possible due to the recent closure of vehicle access). In addition, water chemistry data and dissolved oxygen (DO) levels were measured in March and August of 1998.

RESULTS

The following fish species were found during the 1998 fishery survey on Woodbury Lake:

Largemouth bass	<i>(Micropterus salmoides)</i>
Northern pike	<i>(Esox lucius)</i>

Pumpkinseed	<i>(Lepomis gibbosus)</i>
Black crappie	<i>(Pomoxis nigromaculatus)</i>
Yellow perch	<i>(Perca flavescens)</i>
Golden shiner	<i>(Notemigonus crysoleucas)</i>

Largemouth bass were the more abundant gamefish collected, but a total of only 9 bass were sampled. They ranged in length from 7.2 to 12.8 inches long, with most of the bass that were observed being in the 7 to 9 inch size. Growth was near average when compared to the statewide rates for Wisconsin (Figure 1), with fish reaching a mean length of 8.2 inches after 2 summers of growth. Only 2 northern pike were sampled during the 1998 survey and they measured 18.3 and 23.8 inches long. Their growth rates were also near average for Wisconsin (Figure 2).

The panfishery was dominated by black crappie, with lesser abundances of yellow perch and pumpkinseed. A total of 751 crappie were sampled during the July fyke-net effort, with a length range of 3.6 to 12.8 inches. There was a large modal peak of crappie near the 4.3-inch size, indicating a very strong 1997 year class. The fyke-net catch-per-effort (CPE) was 83 per net-day and the PSD₈ was 73%, indicating a good quality population. Growth rates were generally above average for Wisconsin (Figure 3). Crappie had a mean length of 9.9 inches after 4 summers of growth and increased to 11.7 inches after 7 summers. Growth had improved since the 1978 survey.

Yellow perch were second in abundance with 321 fish being collected. They ranged from 4.1 to 9.0 inches in length, with most in the 5 to 6 inch size. The fyke-net CPE was 35.7 per net-day and the PSD₇ was 17% (fair for a quality rating). Growth rates were below average for Wisconsin (Figure 4). Perch reached a mean length of 5.4 inches after 3 summers of growth and improved to 7.2 inches after 6 summers. Growth had declined significantly since the 1978 survey.

Pumpkinseed were found in the lowest abundance of the panfish species with a total of 178 fish being sampled. They ranged in length from 4.2 to 7.7 inches long and most fish were in the 5 to 6 inch size. Growth was average to above average for Wisconsin (Figure 5), with fish achieving a mean length of 6.3 inches after 4 summers of growth. Their growth had shown an improvement since 1978.

Dissolved oxygen monitoring during March of 1998 showed fair to good winter oxygen levels for the late winter period. The DO's were greater than 1 mg/l to a depth of 11 feet, which was just off the bottom of the lake. The August 1998 oxygen/temperature profile indicated no stratification and oxygen levels were above 6 mg/l from top to bottom of the water column.

SUMMARY/DISCUSSION

The 1998 fishery survey of Woodbury Lake found low numbers of largemouth bass and northern pike and moderate densities of black crappie, yellow perch and pumpkinseed. Largemouth bass were the more numerous gamefish and a strong 1997 year class represented the majority of the bass observed. Little could be said of the northern pike population as only 2 individuals were sampled. Crappie were the predominant panfish and their population could be considered good quality. Crappie growth rates were above average and good numbers of harvestable-size fish were present. Yellow perch were second in abundance to the crappie but their population suffered from below

average growth rates. Pumpkinseed were lowest in abundance but good growth rates helped produce fair numbers of quality size fish in the lake.

Since there has been no recent stocking on Woodbury Lake, it must be concluded that all of the fish species were self-sustaining in the lake. However, it seemed that some sort of lake-wide fish mortality had occurred in the recent past. This observation was based on the low number of larger fish sampled (especially bass), and the presence of large year classes of young crappie and bass. The logical explanation was that a major winterkill had occurred during the long and harsh winter of 1995-96. While not a total winterkill, upwards of 75% of the adult bass, northern, and crappie populations may have succumbed to the severe winter. Then, with the delayed ice-out and late spring in 1996, spawning was likely disrupted for that year and the strong 'recovery' year classes were then produced in 1997.

The recommended management goal for Woodbury Lake is for a quality largemouth bass and black crappie fishery, with secondary emphasis on northern pike, yellow perch, and pumpkinseed. While the adult numbers of bass and crappie were low at present, sufficient numbers were available to provide adequate spawning stock as well as some harvestable fish. In addition, the strong year classes of bass and crappie that were coming up would greatly improve their respective populations and add stability to the entire fishery. Northern pike were present in relatively low numbers and this low density should be maintained. The limited habitat and forage associated with the lakes small size does not make Woodbury Lake ideally suited for northern pike. As such, no effort should be made to increase their numbers (i.e. no stocking, maintain current harvest regulations). The yellow perch and pumpkinseed populations were low to moderate in density and stunting was not a major problem at present. Perch were experiencing slow growth rates but they did show continued growth in later years and some were achieving quality size. Perch are a prime forage item for both bass and northern pike and these gamefish populations should keep the perch numbers in check in the lake.

There was no need at present for any supplemental stocking or restrictive regulations to enhance any of the fish species in the lake. The fishery was still changing/expanding and periodic monitoring should be conducted to ensure that the fish populations develop as prescribed. In addition, winter oxygen monitoring should also be measured during severe winters to help determine the frequency of any winterkill events.

Littoral (shallow water) habitat in the form of woody cover and vegetation was considered good and there was a low need for in-lake habitat improvements. The carry-in access was considered adequate for a lake of this size and productivity. However, the access should be modified to allow administrative/motorized use of the lake. The installation of a simple locking standpipe in place of the large rocks would permit administrative, drive-in access. This would allow use of more efficient fish survey gear, especially an electrofishing boat, which is the preferred method of sampling for largemouth bass and most panfish.

MANAGEMENT RECOMMENDATIONS

1. Manage Woodbury Lake primarily for largemouth bass and black crappie, with secondary emphasis on northern pike, yellow perch, and pumpkinseed. Specific management objectives are as follows:
 - a. Largemouth bass - maintain a spring electrofishing catch-per-effort (CPE) of greater than 40 bass per hour and the PSD₁₂ at > 40%.
 - b. Northern pike - maintain a low-density population such that the spring electrofishing CPE does not exceed 4 pike per hour.
 - c. Black crappie - maintain a spring electrofishing CPE near 150 fish per hour and the PSD₈ at greater than 40%.
 - d. Yellow perch and pumpkinseed - maintain a combined spring electrofishing CPE of not more than 200 fish per hour and the respective PSD values at greater than 40%.
2. No supplemental stocking for any of the fish species was recommended at the present time. In addition, the current statewide regulation for bass of a 14-inch minimum and 5 daily bag should be adequate in helping to expand and maintain the bass population in the lake. The current regulation for northern pike (5 bag, no minimum) was appropriate as well.
3. Conduct periodic winter dissolved oxygen monitoring to determine the frequency of low oxygen conditions. A single reading in mid to late March during severe winters (long and cold with a lot of snow) should be sufficient to assess the potential for winterkill.
4. Since the fishery is still changing/expanding, periodic monitoring should be conducted to assess the status of the fishery and achievement of the above objectives. A spring electrofishing run every 2 or 3 years is the recommended approach for monitoring.
5. Modify the current access to allow administrative, motorized use of the lake. This will allow the use of electrofishing gear to monitor the fishery, which is the preferred and most efficient method to assess bass populations. The installation of a locking standpipe in place of the existing boulders would be the simplest way to allow administrative access.
6. Maintain the wild nature of the lake by continuing to limit public access to carry-in only. In addition, no further development should be allowed around the lakeshore and any logging in the area should follow the guidelines for riparian management zones as described in "Wisconsin's Forestry Best Management Practices for Water Quality" (PUB-FR-093 95).

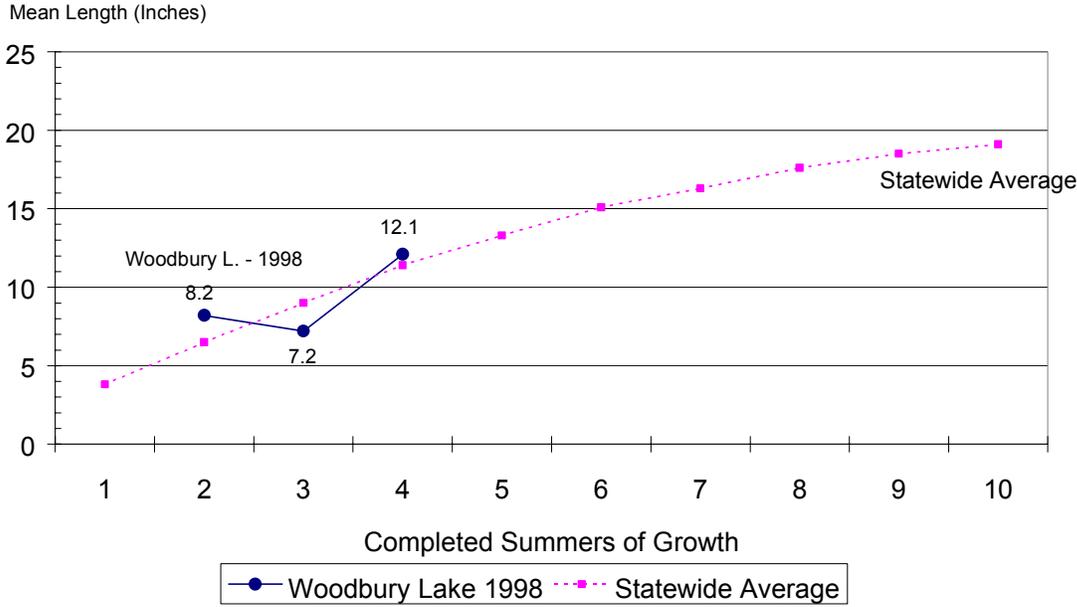


Woodbury Lake, Forest Co.

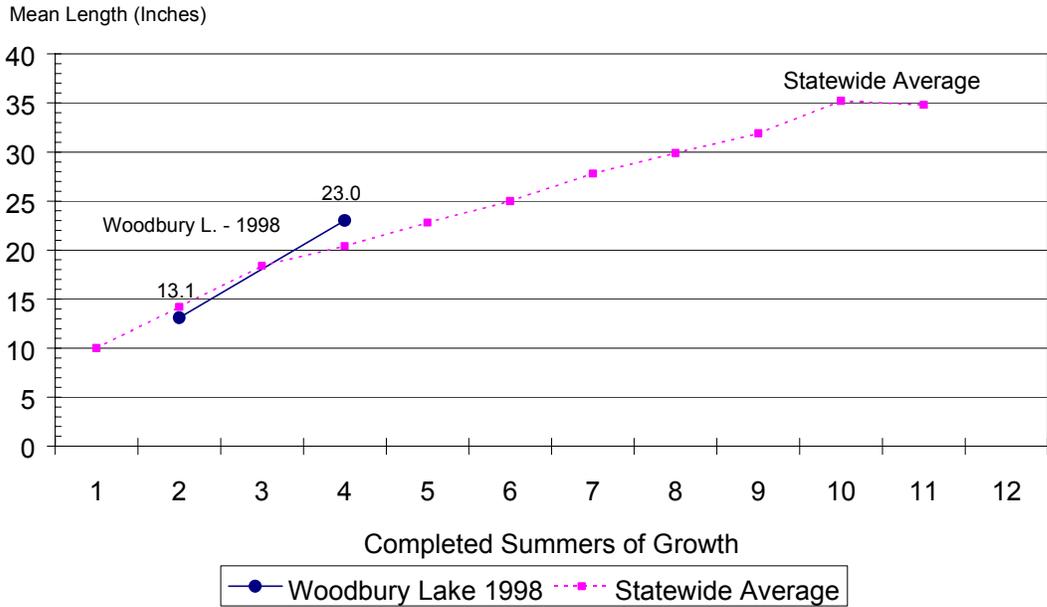
Nicer Black Crappie



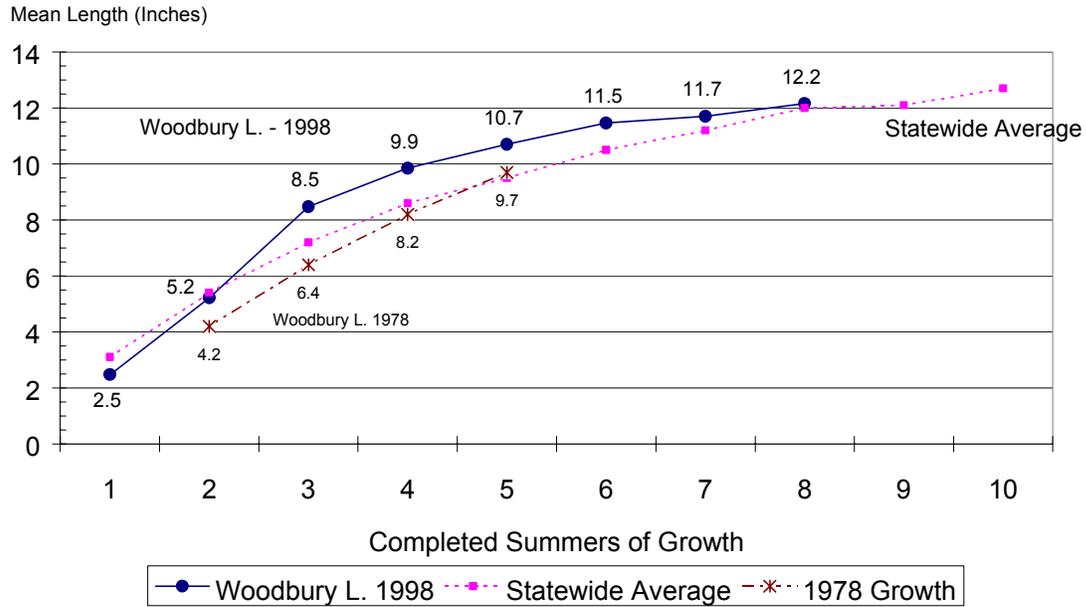
**Figure 1. Largemouth Bass Growth Rates
Woodbury Lake, Forest Co.**



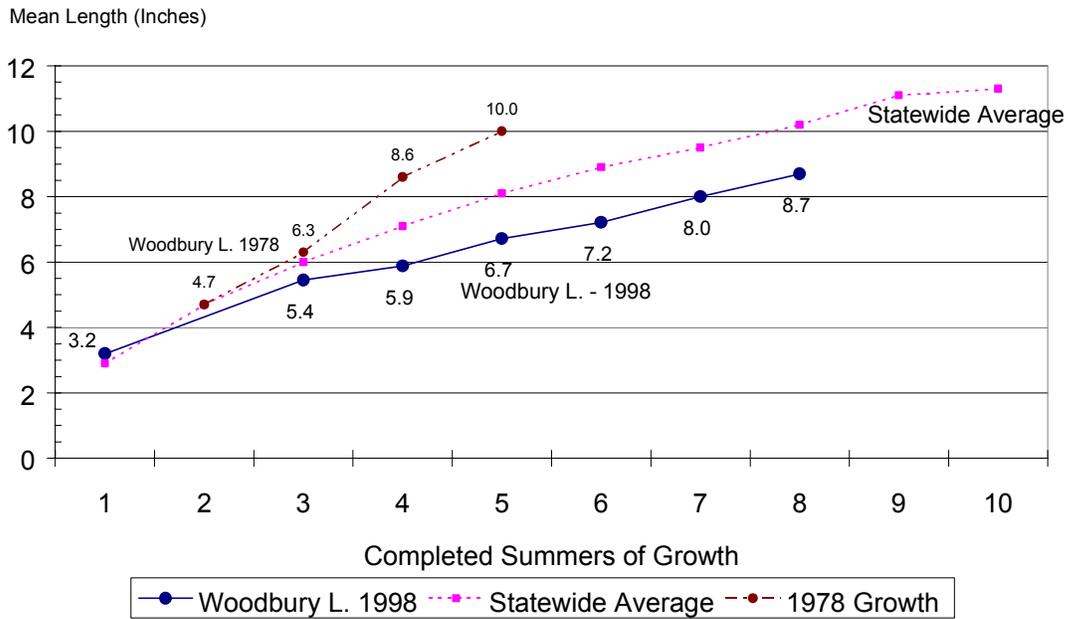
**Figure 2. Northern Pike Growth Rates
Woodbury Lake, Forest Co.**



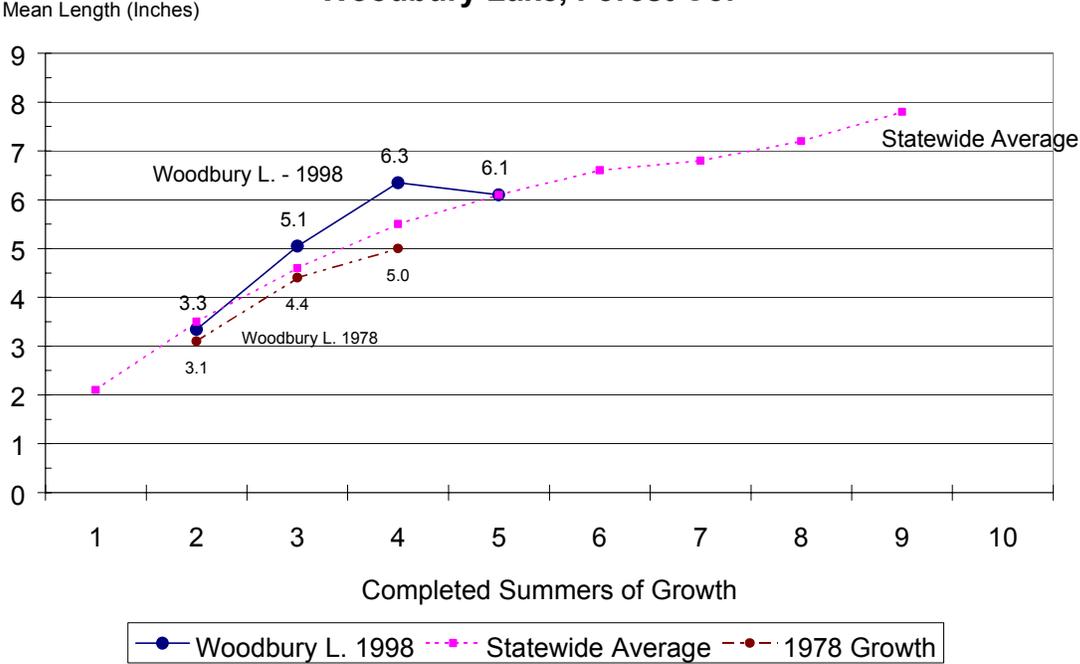
**Figure 3. Black Crappie Growth Rates
Woodbury Lake, Forest Co.**



**Figure 4. Yellow Perch Growth Rates
Woodbury Lake, Forest Co.**



**Figure 5. Pumpkinseed Growth Rates
Woodbury Lake, Forest Co.**



SUMMARY FISHING RECORD

FORM 3600-63

REVISED 1-94

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

COUNTY Forest		WATERS Woodbury Lake			MWB CODE 1179400
SAMPLING OBJECTIVE Summer Panfish Netting		DATES FISHED July 8 - 10, 1998			WATER TEMP. 72 to 75 F
GEAR		Sommerfeldt/Bunde/Wallner			
BOOMSHOCKER	PANFISH	NO. DIPPERS	NIGHT	AC	
HOURS	GAMEFISH	NO. MILES	VOLTS	AMPS	
FYKE NET	PANFISH	NO. NETS: 3	NO. DAYS: 3		
LIFTS	GAMEFISH	LEAD LEN: 50'	FRAME: 4 x 5'	MESH: 3/4"	
GILL NET	(NO. LIFTS)	NO. NETS:	LENGTH:	DEPTH:	MESH:
SEINE	(NO. PULLS)	NO. NETS:	LENGTH:	DEPTH:	MESH:
ANGLING	(TOT. HRS.)	NO. ANGLERS:	TIME OF DAY:		
OTHER					
FISHING RESULTS					
GAMEFISH	NUMBER	MODAL SIZES (IN.)	SIZE RANGE (IN.)	CATCH/EFFORT	
Muskellunge			-	per net-day	
Northern Pike	2		18.3 - 23.5	0.2 per net-day	
Walleye			-	per net-day	
Largemouth Bass	1		- 12.8	0.1 per net-day	
Smallmouth Bass			-	per net-day	
White Sucker			-	per net-day	
			-		
			-		
PANFISH	NUMBER	MODAL SIZES (IN.)	SIZE RANGE (IN.)	CATCH/EFFORT	
Bluegill			-	per net-day	
Pumpkinseed	178	6.2	4.2 - 7.7	19.8 per net-day	
Black Crappie	751	4.3, 10.4	3.6 - 12.8	83.4 per net-day	
Yellow Perch	321	6.6	4.1 - 9.0	35.7 per net-day	
Rock Bass			-	per net-day	
Black Bullhead			-	per net-day	
			-		
Observations: Also found were golden shiner (C-A) and crayfish (P).					
Compiled By:				Date	
Skip Sommerfeldt				7/13/98	