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To: Bill Smith - Regional Director, Northern Region

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Subject: DRAFT
1999 Lake Survey Summary - Robinson Lake, Vilas County
(T41N, R12E, sec. 13; WBIC - 591300)
Headwaters 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, Tom Aartila

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Fisheries Expert, Steve AveLallemant Date

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cc: Bureau of F & H Prot.
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BACKGROUND INFORMATION

Robinson Lake is a 37-acre seepage lake on the northeast border of Vilas County, approximately 18 miles northeast of Eagle River. The lake has a maximum depth of 20 feet and a shoreline length of 1.1 miles, which is entirely owned by the US Forest Service. Upland hardwoods and conifers comprise about half of the shoreline cover, with spruce/tamarack bog making up the other half (south shore). Littoral bottom types are mainly sand (70%), with lesser amounts of muck (25%) and gravel (5%). There is no development on the lake and public access is provided by a gravel ramp on the north central shore. There are several 'dispersed' campsites around the lake that receive moderate use through the camping season. The water in the lake is soft and acidic and has a light brown stain.

Past fisheries management activities on Robinson Lake have been minimal. There are 2 records of fish stocking, first in 1937 when bluegill and yellow perch were planted and then in 1981 when northern pike were stocked. Fisheries investigations were conducted in 1963 and 1978, and both consisted of fyke-net surveys in August. The 1978 survey found pumpkinseed and yellow perch to be the predominant fish species. No gamefish were sampled and brown bullhead, white sucker, and rock bass were collected in low numbers. The 1963 survey had produced largemouth bass, northern pike, and walleye but none of these predators were found in the 1978 survey. The 1978 report concluded that the lake supported a fairly large panfish population, but predators would need to be introduced to maintain balance in the lake. Management recommendations were to stock fingerling northern pike in the fall of 1979 and then monitor the success of the reintroduction in 1980 and 1981. Following this, 83 adult northern pike were stocked in 1981. However, no additional management activities have been recorded since then.

The present fishery survey on Robinson Lake was conducted through the Chequamegon/Nicolet National Forest contract fisheries program. It was designed to inventory the fish populations and identify any management problems. To gather information on the fishery, the survey utilized electrofishing runs in May and September and a summer fyke-net effort in August 1999. In addition, dissolved oxygen (DO) levels and other water quality parameters were measured in March (ice cover) and August 1999.

RESULTS

The following fish species were found during the 1999 survey on Robinson Lake:

Largemouth bass	<i>(Micropterus salmoides)</i>
Northern pike	<i>(Esox lucius)</i>
Yellow perch	<i>(Perca flavescens)</i>
Pumpkinseed	<i>(Lepomis gibbosus)</i>
Black crappie	<i>(Pomoxis nigromaculatus)</i>
Yellow bullhead	<i>(Ameiurus nebulosus)</i>

Largemouth bass were not found in the spring 1999 shocker run and only 1 northern pike was collected. Based upon this and the panfish species composition/size structure, it was surmised that the lake had suffered from a heavy winterkill - likely in the spring of 1996 (after the long and severe winter of the 1995-96 season). Following the spring shocker run, approximately 86 adult largemouth bass were field

transferred into Robinson Lake on June 7, 1999. The bass were obtained from Trilby Lake, Vilas County and ranged from 7 to 15 inches in length, with many of the largemouth noted to be in a pre-spawn condition. It was hoped that the fish would be able to establish a 1999 year class and provide some immediate predatory pressure on the abundant perch and pumpkinseed in the lake.

Following the June bass stocking, a total of 4 largemouth were sampled in the subsequent sampling efforts. One adult bass was collected in the August fyke-net survey and 3 young-of-the-year (yoy) were collected in the shortened fall shocker run (only about 5 minutes of shocking due to OBM breakdown). The 3 yoy bass averaged 2.9 inches long and indicated that a 1999 year class had been produced.

Three northern pike were sampled during the 1999 survey. One was in the spring shocker run (22.7 inches) and two came during the summer fyke-net effort (36.7 and 37.0 inches long). The northern pikes exhibited above average growth for Wisconsin (Figure 1). However, natural reproduction and recruitment were low as no pike less than 20 inches were observed during the survey.

The panfishery was comprised mainly of yellow perch, pumpkinseed, and yellow bullhead, with a much lower abundance of black crappie. Perch were the predominant species and the population was considered abundant and slow growing. They had a length range of 3.4 to 8.1 inches, but most of the fish were in the 5-inch size range. Many of the perch were in very poor condition (skinny). Perch growth rates were below average for Wisconsin (Figure 2), with fish reaching a mean length of just 5.7 inches after 5 summers of growth.

The pumpkinseed ranged from 1.8 to 6.3 inches in length and most of the fish were in the 3 to 5 inch size. Growth rates were near the Statewide average (Figure 3), as 'seeds' achieved a mean length of 5.7 inches after 4 summers of growth. The black crappie were all sampled during the August fyke-net effort. They ranged from 5.2 to 10.7 inches long and had a pretty good distribution between those lengths. The crappie experienced near average growth, with fish reaching a mean length of 9.7 inches after 5 summers of growth (Figure 4).

Yellow bullhead were the only other fish species found during the survey and their population could be considered moderate in abundance. They ranged in length from 5.5 to 10.7 inches long, with a large modal peak near 7.2 inches. No age and growth data were collected from the bullheads.

Winter DO monitoring indicated fair oxygen levels in early March 1999 and the potential for winterkill was considered low. The oxygen concentration was 9.2 mg/l at the 2-foot mark, declined to 1.4 mg/l at 7 feet, and was 0.6 mg/l at the 14-foot level (just above bottom). It should be noted however, that the winter of 1998-99 was relatively mild and 'easy' in terms of low oxygen conditions and chance of winterkill. The summer oxygen/temperature profile indicated that the lake did show some stratification, with the thermocline occurring just above bottom at the 12 to 14 foot depth. Conditions were anaerobic (no oxygen) below the 12 foot depth in early September 1999.

SUMMARY/DISCUSSION

The 1999 survey on Robinson Lake found a fishery that appeared to be heavily impacted by past winterkills. The spring shocker run (May 1999) found no largemouth bass and only one northern pike. The panfishery consisted of small yellow perch, pumpkinseed, and bullhead - species which

are generally tolerant of low oxygen conditions. Since largemouth bass and walleye were once present in the lake, it appears that periodic winterkills have had a significant impact on the fishery. The species that are intolerant of low oxygen conditions (bass, walleye, bluegill) have been eliminated. It appears that the winterkills started prior to the 1978 survey, with the most recent kill likely in the spring of 1996. This was following the long and snowy winter of 1995-96 when ice cover persisted on many lakes until early May.

Without any recorded stocking on Robinson Lake since 1981, it was apparent that the winterkill events were severe but not total. Low oxygen conditions may have caused the loss of the majority of the sportfish, but the tolerant species such as northern pike, perch, and pumpkinseed showed some survival, which has helped to maintain some sort of sport fishery in the lake. With the most recent kill suspected in 1996, the present survey indicated that northern pike were present in low density and the panfishery consisted primarily of small yellow perch, pumpkinseed, and bullhead. The northern pike did show trophy potential in the lake, as evidenced by the sampling of two fish in the 36 to 37 inch range. However, the low density of pike failed to maintain control on the abundant and slow-growing perch population.

It appears that the lake suffers from winterkill events on the order of once every 5 years, which is the frequency at which management activities are recommended to be limited. However, the lake possesses good potential to grow quality fish and management activities should be implemented to insure that sportfish populations maintain a presence in the lake.

Even in light of the potential for low winter oxygen levels, the management goal for Robinson Lake should be to maintain a balanced predator-prey relationship. The lake should be managed primarily as a largemouth bass and panfish fishery, with secondary emphasis on northern pike. The northern pike were an integral part of the fishery but no extra protection or enhancement should be used to increase their numbers (with the small size of the lake and limited forage, there exists a chance to see a hammer-handle fishery if numbers become too high). Largemouth bass are effective predators on perch and the establishment of a moderate density population should help maintain a quality panfish population. With the field transfer of largemouth in June of 1999 and the subsequent finding of a 1999 year class, the bass had a good start toward establishing a viable sport fishery. However, supplemental stocking of the species should be continued to hasten redevelopment of the population. Additional field transfer of adult fish or the periodic stocking of large or extended-growth fingerlings should be used to maintain the largemouth bass population at a moderate density. The field transfer of adult bass is the recommended approach as this provides spawning stock, as well as fish large enough to exert direct predation on the abundant perch population.

Shoreline and littoral habitat was good, containing adequate amounts of woody structure, aquatic vegetation, and bog/swamp edge. Proper riparian management to ensure future natural tree-falls into the lake should be a management objective.

In addition, the small gravel access was adequate for a lake of this size. However, it is recommended that the area around the access site be designated for 'no camping'. This would keep the overnight campers from monopolizing the boat landing area. Currently, the immediate access area is often used as a campsite and this can block the ramp from use by other publics.

MANAGEMENT RECOMMENDATIONS

1. Manage Robinson Lake primarily for largemouth bass and panfish, with secondary emphasis on northern pike (meaning no stocking or special regulations to increase their numbers). Specific management objectives are as follows:
 - a. Largemouth bass - maintain a spring electrofishing CPE near 80 bass per hour (> 6") and a PSD₁₂ of greater than 40%.
 - b. Northern pike - maintain a spring electrofishing CPE of less than 6 pike per hour and the PSD₂₁ near 60%.
 - c. Panfish (yellow perch, pumpkinseed, and black crappie) - maintain a combined spring electrofishing CPE of less than 400 fish per hour and the PSD_x values near 40%.
2. As of September 1999, the fishery was still suffering from the effects of past winterkills. Thus, the supplemental stocking of largemouth bass should be continued to hasten re-development of the population. The field transfer of adult fish is recommended, at the rate of 2 per acre (80 fish) on an alternate year basis until the objective in 1.a. is achieved. At minimum, the stocking of extended-growth or large fingerlings should be used to boost the bass population to the desired goal.
3. The current harvest regulation for bass of a 14-inch minimum and 5 daily bag should be adequate to maintain and enhance the bass population. The current regulation for northern pike (no minimum, 5 bag) was appropriate as well.
4. On an annual basis, monitor winter dissolved oxygen levels to help determine the frequency of winterkill. A single measurement during the middle to late March period should be sufficient to assess winterkill potential. The USFS/WDNR fish program will incorporate this monitoring into their work program.
5. Conduct periodic monitoring of the fishery to assess its status and adherence to the above objectives (1.a,b,c). A spring electrofishing run every 2 to 3 years should be adequate to monitor conditions in the lake. The USFS/WDNR fish program will incorporate this monitoring into their work program.
6. Maintain the wild nature of the lake by limiting any further shoreline development and by following the guidelines for riparian management zones as described in "Wisconsin's Forestry Best Management Practices for Water Quality" (PUB-FR-093 95).
7. The public access was adequate for a lake of this size. However, the access/landing area should be designated for no overnight camping to reduce conflicts between campers and boat anglers.

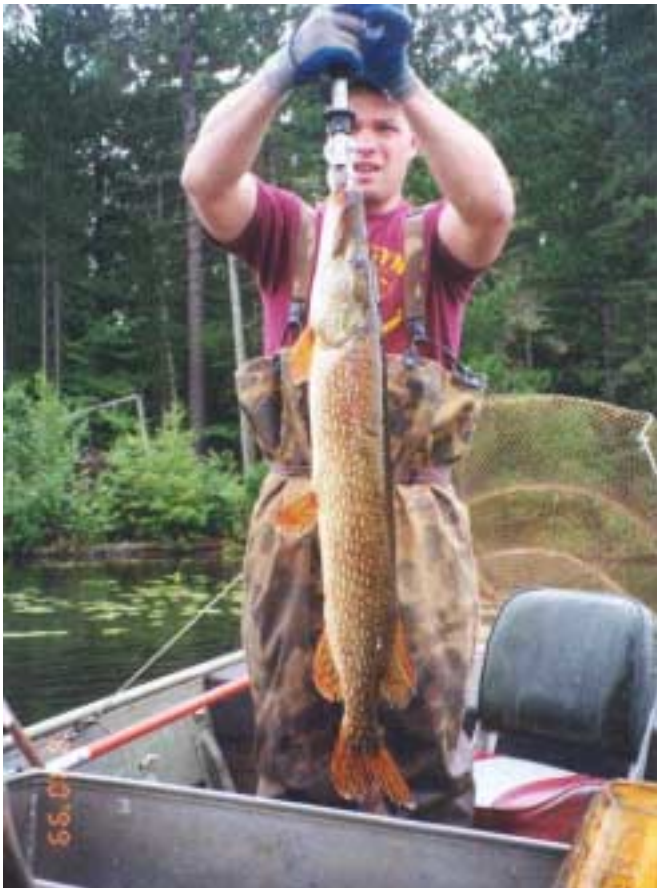
Robinson Lake, Vilas County -- 1999 Survey Pictures



Landing on north-central shore



Skinny 6" yellow perch

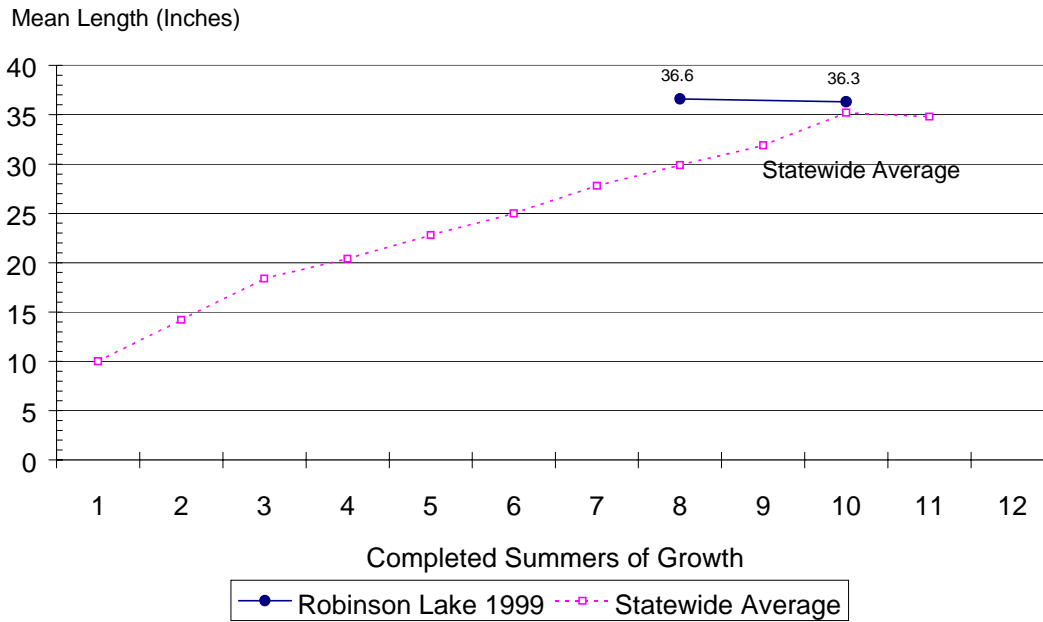


36.6" northern pike

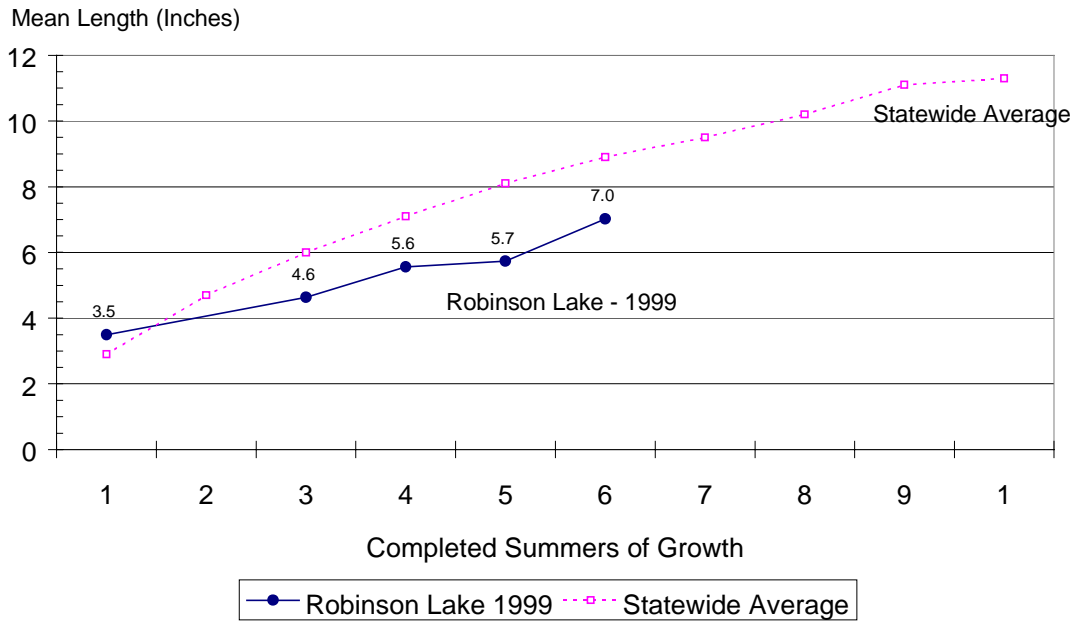


Littoral and shoreline habitat

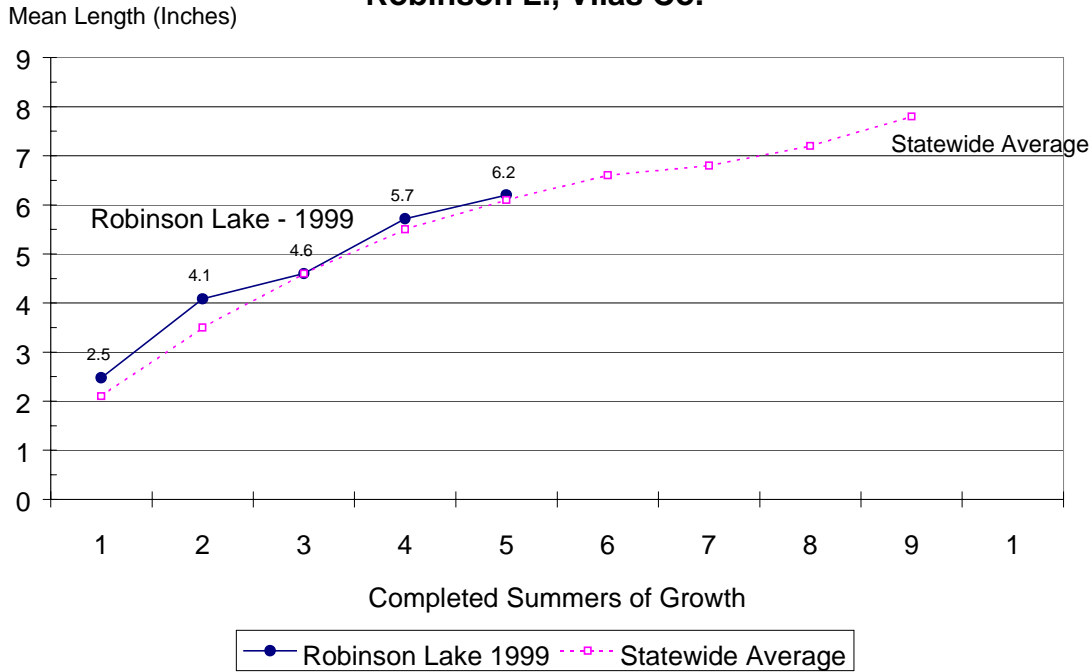
**Figure 1. Northern Pike Growth Rates
Robinson Lake, Vilas Co.**



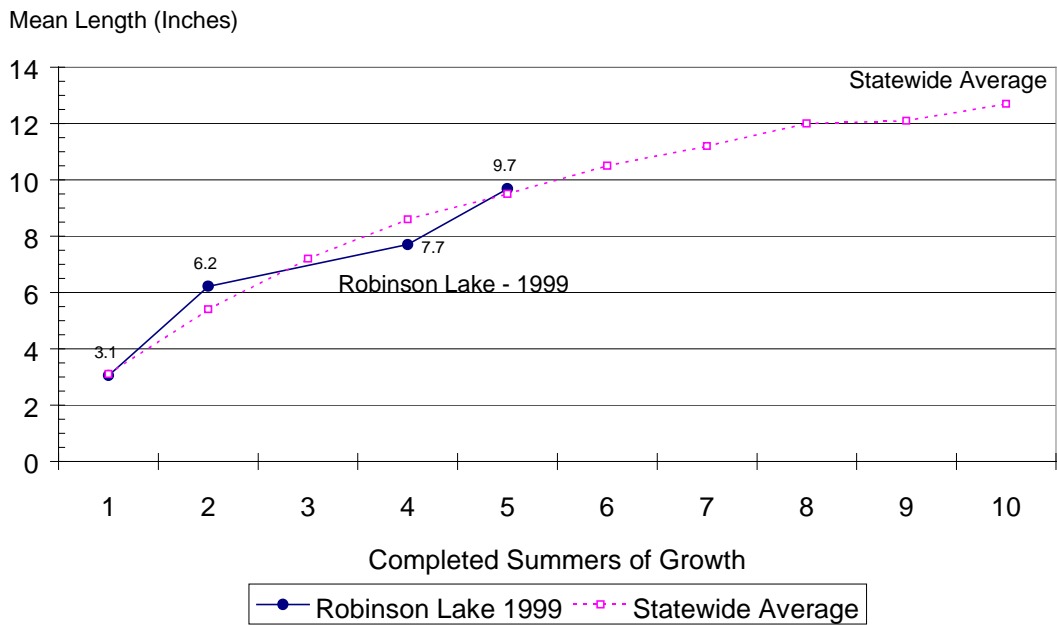
**Figure 2. Yellow Perch Growth Rates
Robinson Lake, Vilas Co.**



**Figure 3. Pumpkinseed Growth Rates
Robinson L., Vilas Co.**



**Figure 4. Black Crappie Growth Rates
Robinson Lake, Vilas Co.**



Robinson Lake Vilas Co. 1999

Fish Survey Totals

Species	Spring Netting	Spring BS	Summer Netting	Fall BS	Totals
Largemouth Bass Mode; Length range			1 12.2	3 2.6 - 3.5	4
Northern Pike Mode; Length range		1 22.7	2 36.7 - 37.0		3
Walleye Length range					
Musky Length range					
Smallmouth Bass Length range					
Sucker Length range					
Bluegill Mode; Length range					
Black Crappie Mode; Length range			48 5.8; 5.2 - 10.7		48
Pumpkinseed Mode; Length range		35 2.2 - 6.2	361 3.6,4.8; 3.1 - 6.3	16 1.8 - 6.2	412
Yellow Perch Mode; Length range		121 5.2; 3.4 - 7.6	51 5.8; 5.1 - 8.1	32 5.5; 4.2 - 6.1	204
Yellow Bullhead Length range		4 5.6 - 8.4	494 7.2; 5.5 -10.7	1 3	499
Hybrid Sunfish Length range					
Golden shiner					
Bullhead					
Creek chub					
Bluntnose minnow					
Mudminnow					
Sculpin					
tadpole madtom					
Crayfish					