

**Proposal for Muskellunge Management in Lower South Long Lake (18-136) in
Crow Wing County, Minnesota
December 30, 2009**

Objective: Provide a trophy muskellunge fishing opportunity in the Brainerd Lakes Area.

Stock a total of 461 Leech Lake strain muskellunge in Lower South Long Lake every other year for a nine year period (5 stocking events), beginning in 2011. Muskellunge should become self-sustaining in these lakes within 10 years, subject to verification through monitoring. Self-sustaining adult fish densities should be about 0.5 fish per acre.

Justification: The only muskellunge water in the Brainerd management area is the Mississippi River. A proposal to stock 3,100 Leech Lake Strain muskellunge, in an effort to enhance the river fishery was approved in 2005. Muskellunge fingerlings have been stocked in the river from 2005 through 2008 and will be stocked again in 2009, according to the stocking plan.

There is an increasing interest by anglers for muskellunge management near Brainerd. Other than the Mississippi River, the nearest muskellunge angling opportunities are Mille Lacs Lake (25 miles southeast), Cedar Lake (25 miles northeast), Shamineau Lake and Lake Alexander (25 miles southwest, and Woman Lake (45 miles north) of Brainerd. The Brainerd Lakes Area Chapter of Muskies Incorporated (MI) which has 200+ members has asserted pressure for and provided written support for muskellunge management in waters near Brainerd. The distance from Brainerd to Lower South Long Lake is 9 miles.

Important Criteria for Muskellunge Management:

1. Lake Size >500 acres
2. Soft-rayed Fish Prey Species Present
3. Adequate Justification to Create a New Muskellunge Water
4. Moderately Clear to Clear Water
5. Public Acceptance
6. NOP CPUE 3/Gill Net or Less
7. Historical Presence
8. Potential for Lake to Produce a Trophy

1) Lake Size:

Lower South Long Lake is 1313 acres with a littoral area of 461 acres or 35% littoral. This lake is part of the Nokasippi River system which consists of five other lakes with a total area of 2,285 acres and the 45 mile long Nokasippi River.

2) Soft-rayed Fish Prey Species Present:

The potential forage base in Lower South Long Lake is of good quality and abundance. The CPUE for white sucker in Lower South Long Lake is 3.75 fish/gill net and the average of seven

nettings since 1969 is 2.37 fish/gill net set, which is above the median for Lake Class 27 lakes. Northern cisco are present in Lower South Long Lake with a current CPUE of 0.33 and a long term average of 2.02.

The Nokasippi River flows from Upper South long Lake to Lower South Long Lake, then over a water control structure and flows through one small lake, Round Lake and into the Mississippi River. The Mississippi River is a good source of white sucker and redhorse spawning migrations that ultimately reach the South Long Lakes. As a result, recruitment of suitable prey will be consistent and reliable. Soft-rayed fish prey species are present in adequate numbers to support a muskellunge fishery.

3) Adequate Justification to Create New Muskellunge Water:

Currently, the Brainerd Fisheries Management Area (Crow wing and Lower Cass Counties) only manages the Mississippi River for muskellunge (including the Rice Lake Reservoir). Local muskellunge fishers have a strong interest in more fishing opportunities in the Brainerd Area.

4) Water Clarity:

Secchi disc measurements since 1941 have ranged from 4.0' to 9.0' in Lower South Long Lake. The mean Secchi disc measurement for the lower lake is 6.1'. Water clarity is moderately clear and is at the lower end of the range for lakes in this ecoregion. There is no potential for winterkill.

5) Public Acceptance:

A moderate amount of opposition is expected for this proposal. Organized muskie anglers will support the proposal, as will some lakeshore property owners. Northerns, Inc. has indicated they are not opposed to the proposal. However, there are some property owners who will be in opposition based on the perception that muskie prey on walleyes and other game fish.

6) Northern Pike CPUE:

The mean northern pike CPUE for Lower South Long Lake (1941 – 2007) is 5.31 fish/gill. Historically, northern pike CPUE in Lower South Long has been:

Year	41	69	79	84	89	94	99	04	07	Interquartile
CPUE	2.38	5.83	0.50	0.67	4.11	2.56	3.78	13.50	14.50	2.76 – 9.00

The mean length of pike sampled in gill nets in 2007 in Lower South Long Lake was 20.0" with a mean weight of 1.82 lbs. Pike over 36" have been sampled and growth is good for all age classes. Local reports include 20+ pound northern pike taken by both spearing and angling. There is a light to moderate amount of darkhouse spearing occurring on this lake.

7) Historical Presence:

There are no reports of muskellunge being observed in either of these two lakes. However, prior to the construction of the water control dams at the outlet of Lower South Long Lake and

in the Nokasippi River between Lower and Lower South Long Lakes, muskellunge could have migrated from the Mississippi River to the South Long Lakes via the Nokasippi River.

8) Potential for Lake to Produce a Trophy:

There is good potential for trophy muskellunge management in Lower South Long Lake. This lake has a reputation for producing large northern pike and the mean size of pike in survey nets has exceeded 4 lbs. Northern pike 36"+ have been sampled and darkhouse spearers have taken 20 lb. + pike. Growth rates for all year classes of northern pike are good. A Walford Plot for northern pike from Lower South Long Lake predicts a potential maximum size of 39 inches. There is a dependable and abundant prey population of white sucker and northern cisco.

9) Connectivity and Natural Reproduction:

The Nokasippi River begins at Clearwater Lake 15 miles upstream from Lower South Long Lake and flows 45 miles through seven lakes to the Mississippi River. There are water control structures at the outlet of each lake in the system.

Moving downstream from the headwaters to the Mississippi River, the Nokasippi River flows through Clearwater Lake (18-38) 880 acres, to Eagle Lake (18-296) 358 acres, to Nokay Lake (18-104) 660 acres, to Pointon Lake (18-50) 274 acres, to Lower South Long Lake (18-96) 802 acres, Lower South Long Lake (18-136) 1,313 acres, to Round Lake (18-147) 137 acres, and to the Mississippi River.

Natural reproduction of muskellunge may occur in the shallow, vegetated portion of Lower South Long Lake. Lower South Long Lake has expansive shallow water areas where aquatic plants such as bulrush and burreed are common.

Muskellunge should be stocked on alternate years over a 10-year period (five stocking events) to establish the population. The self-sustainability of the population should be verified through monitoring before stocking is discontinued.

10) Monitoring:

Monitoring will consist of biennial ice-out netting beginning seven years following the introduction of muskellunge. A Peterson population estimate would be the preferred method for gauging population density. The relative success of muskellunge management would be based on goals established after reasonable sampling effort. The most recent Lake Management Plan for Lower South Long Lake does not include muskellunge management so it will be amended to reflect this proposal.

Summary:

As a muskellunge management candidate lake, Lower South Long Lake meets the preferred physical, chemical and biological criteria and would support a muskellunge fishery. There will likely be some opposition to the proposal. There will also be strong support for this proposal from anglers interested in an expansion of muskellunge fishing opportunities. This lake is

proposed for muskellunge management to meet the growing demand for muskie fishing, and to help establish these fishing opportunities geographically across the state.

Prepared and submitted by Tim Brastrup, Area Fisheries Supervisor
 Revised December 30, 2009

Appendix A

Lower South Long Lake (18-136) Gill Net CPUE History, LC 27

Species	1941	1969	1979	1984	1989	1994	1999	2004	2007	Inter-quartile
NOP	12.0	5.83	0.50	0.67	4.11	2.56	3.78	13.50	14.50	2.76-9.00
TLC	13.0	2.25	16.88	0.78	2.33	3.78	2.56	2.08	0.33	0.77-6.18
WAE	2.00	6.50	2.0	5.22	7.56	9.89	6.33	3.00	5.33	3.25-8.81
WTS	8.00	2.33	4.4	2.22	1.11	2.33	2.67	2.17	3.75	0.88-4.00
YEP	395.0	49.17	52.38	15.67	2.22	44.33	12.89	2.08	7.5	7.00-46.33
SHR	-	-	0.13	-	0.11	-	-	-	-	0.14-0.78

Table 2. Physical and biological characteristics for new introductions based on existing muskellunge waters (Taken from Long Range Plan). Roosevelt and Upper and Lower South Long Lakes based on list characteristics compared to the lake selection criteria.

Characteristic	Attribute	Priority	Criteria of attribute	Roosevelt	U&L South Long
Physical	Lake size (acres)	Best	> 3,000		
		Better	300 to 3,000	1,585	2,115
	Maximum depth (ft)	Acceptable	< 300, but ≥ 100		
		Best	> 80	129	
	Secchi (ft)	Better	40 to 80		47
		Acceptable	< 40, but ≥ 15		
	Littoral area (%)	Best	> 10	13	
		Better	5 to 10		7
		Acceptable	< 5, but ≥ 3		
		Best	0.33 to 0.55		0.35
SDF	Better	NA			
	Acceptable	< 0.33, but ≥ 0.55	0.25		
	Best	> 1.40	3.21	U 9.01, L 11.95	
	Better	1.40 to 2.40			
	Acceptable	< 1.40, but ≥ 1.05			
	Best	< 2.4	2.19		
Northern pike CPUE	Better	2.4-6.3		U 3.5	
	Acceptable	≤ 15.1		L 14.5	
	Best	Primary and secondary species present, abundance inter-quartile ranges or above	Best		
Biological	Forage (size quality abundance diversity)	Better	Secondary species present, abundance inter-quartile ranges or above		Better
		Acceptable	At least one secondary species present, with some mix of alternate species at moderate to high abundance		

Both Upper and Lower South Long Lakes are 47' max depth
 Both u & l Roosevelt
 Both U & L So. Long Lakes

U= Upper South Long
 L= Lower South Long

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 L = Lower South Long

Roosevelt TLC above 3rd i-qr.

Both South Longs TLC below,

WTS within i-qr.