

**Proposal for Muskellunge Management in
Roosevelt Lake (11-43) Cass and Crow Wing County, Minnesota
December 30, 2009**

Proposal: Introduce muskellunge to Roosevelt Lake by stocking 390 Leech Lake Strain muskellunge in alternate years for nine years (five stocking events), beginning in 2012. Muskellunge should become self-sustaining in this lake when adult muskellunge begin to spawn, 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), Shamaineau 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 Upper South Long Lake is 11 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:

Roosevelt Lake is 1,585 surface acres, of which 390 acres is littoral area (26%). Lawrence Lake 11-53, which is 230 acres and Leavitt Lake 11-37, which is 130 acres, are both connected to Roosevelt Lake.

2) Soft-rayed Fish Prey Species Present:

The potential muskellunge forage base in Roosevelt Lake is of high quality and abundant. The CPUE for northern cisco is 6.00, as reported in the July 2006 DNR Report--this is above the third quartile for Lake Class 22 lakes. The CPUE was 55.00 in deep sets in 2006. Historically, the cisco

CPUE has been as follows: 6.50 (2000), 16.06 (1995), 41 (1995 deep water sets), 4.87 (1990), 7.20 (1985), 9.47 (1980), and 16.50 (1968). The white sucker CPUE has historically been low. Following are the historical CPUE values from 2006 back to 1968: 0.38 (2006), 0.81 (2000), 1.44 (1995), 1.40 (1990), 1.40 (1985), 2.60 (1980), and 0.83 (1968), most of which are low to average compared to other Lake Class 22 lakes. Soft-rayed prey fish prey densities are adequate for muskellunge management.

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 1985 have ranged from 7' to 17' and a mean of 12.5' in the upper basin (north of Hwy 6) and have ranged from 6' to 15' and a mean of 9.7' in the lower basin (south of Hwy 6). There is no potential for winterkill in either basin.

5) Public Acceptance:

A low to 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 other desirable game fish.

6) Northern Pike CPUE:

The mean northern pike CPUE for Roosevelt Lake (1968 – 2006) is 1.06 fish/gillnet set. Following are the historical net catches: 2.19 (2006), 1.25 (2000), 0.88 (1995), 0.60 (1990), 0.47 (1985), 1.47 (1980), and 0.58 (1968). The only pike spawning habitat available is in Woods Bay and some of the shoreline in the upper basin. There is also some spawning habitat in the two connected lakes. The mean weight of pike captured during the 2006 survey was 3.90 lbs and 25.7 in. There is a trophy pike component to this fishery, making it attractive to a few darkhouse spearers. The number of darkhouses on this lakes in any one winter is very low.

7) Historical Presence:

There is no file information or any local reports of anyone ever observing or catching a muskellunge in Roosevelt Lake.

8) Potential for Lake to Produce a Trophy:

There is great potential for trophy management in Roosevelt Lake, as evidenced by the relatively large average size of pike, a history of producing large pike, and the abundance of northern cisco and white sucker for forage. Additionally, Roosevelt Lake has a deep, cold water refuge available, which contributes to the potential for production of large esocids. Growth is considered good for all age classes and genders. The Walford Plot asymptote was 45 in.

9) Connectivity and Natural Reproduction:

Crooked Creek flows approximately 200' from Lawrence Lake to Roosevelt Lake. The mean width of Crooked Creek is 30' with 2' of depth. The Leavitt Lake outlet flows into Lawrence Lake and has a mean width of 10' and depth of 0.5'. A new culvert was placed under County Road 58 in this creek to enhance fish spawning migrations. It is possible that muskellunge could move to and from Lawrence Lake and even into Leavitt Lake. However, because there is no preferred muskellunge habitat in Lawrence or Leavitt Lakes, muskellunge are not expected to become part of these resident fish communities. Crooked Creek flows out of Roosevelt Lake on the south end of the lake. There is a water control structure 100 yards downstream from the lake that would prevent emigration, so there is no realistic or imminent threat of muskellunge inhabiting lakes downstream of Roosevelt Lake. There are some areas of shallow water with aquatic vegetation in Roosevelt Lake that would provide spawning habitat for muskellunge.

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 starting 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 Roosevelt Lake Management Plan is in the process of being re-written to reflect the proposal to stock and manage muskellunge. The lake management plan will prescribe conducting fish population assessment nettings every six years to monitor walleye, yellow perch, northern pike, northern cisco, and largemouth bass fisheries.

Summary:

As a muskellunge management candidate lake, Roosevelt Lake meets the preferred physical, chemical and biological criteria and would support a muskellunge fishery. The amount of opposition to muskellunge management thought to be moderately low. 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.

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Appendix A
Roosevelt Lake MUE Proposal

Roosevelt Lake (11-43) Gill Net CPUE History, LC 22

Species	1946	1950	1968	1980	1985	1990	1995	2000	2000*	2006	2006*
LAT	-	-	-	-	-	-	0.3	0	0.6	0.31	1.20
NOP	0.73	0.13	0.58	1.47	0.47	0.60	0.9	1.25	-	2.19	0.10
TLC	6.83	2.75	1.65	9.47	7.20	4.87	16.1	6.50	45.60	6.00	55.00
WAE	1.38	8.88	1.50	0.87	0.53	0.33	0.6	2.63	0.50	2.56	0.40
WTS	0.93	3.88	0.83	2.60	1.40	1.40	1.40	0.81	0.30	0.38	0
YEP	28.25	11.25	7.10	10.73	25.60	5.67	3.40	4.94	0	3.63	0.70
SHR	0	0.13	0	0.13	0.13	0.07	0	0	0	0	0

*Indicates nettings that consisted only of deep water sets for lake trout evaluations

Lake Class 22 Interquartile Ranges, Gill Nets

Species	IQRange	No. of times Sp within range out of 9 nettings
LAT	NA	NA
NOP	3.0 – 7.9	0/9
TLC	0.5 – 5.2	9/9
WAE	4.0 – 9.6	1/9
WTS	1.0 – 3.5	5/9
YEP	7.1 – 33.9	5/9
SHR	NA	NA

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
	SDF	Acceptable	< 5, but ≥ 3		
		Best	0.33 to 0.55		0.35
	Northern pike CPUE	Better	NA		
		Acceptable	< 0.33, but ≥ 0.55	0.25	
Forage (size quality abundance diversity)	Best	> 1.40	3.21	U 9.01, L 11.95	
	Better	1.40 to 2.40			
Biological	Forage (size quality abundance diversity)	Acceptable	< 1.40, but ≥ 1.05		
		Best	< 2.4	2.19	
Biological	Forage (size quality abundance diversity)	Better	2.4-6.3		U 3.5
		Acceptable	≤ 15.1		L 14.5
Biological	Forage (size quality abundance diversity)	Best	Primary and secondary species present, abundance inter-quartile ranges or above	Best	
		Better	Secondary species present, abundance inter-quartile ranges or above		Better
Biological	Forage (size quality abundance diversity)	Acceptable	At least one secondary species present, with some mix of alternate species at moderate to high abundance		
		Best	WTS within i-qr.		

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

U = Upper South Long
 L = Lower South Long

Roosevelt TLC above 3rd i-qr.

Both South Longs TLC below,

WTS within i-qr.