Winter Lake Trout Season Change Legislative Report

Minnesota Department of Natural Resources
January 9, 2008

Report Preparation Cost

Pursuant to Minnesota Statutes, Section 3.197, the costs of preparing this report were approximately $3,000 for data analysis and report writing.

Executive Summary

Minnesota Session Laws 2007 Chapter 131, Article 1, Section 84 requires the Commissioner of Natural Resources to report by 1 February 2008 to the legislative policy committees with jurisdiction over natural resources on "the pros and cons of changing the winter lake trout season so that it would open from the Saturday nearest January 1 to March 31."

There are currently two winter lake trout seasons on inland lakes in Minnesota. One covers lakes entirely within the Boundary Waters Canoe Area Wilderness (BWCAW), with a couple of exceptions, and runs from the Saturday nearest January 1st to March 31st. The other covers all other inland and border lakes, and runs from the Saturday nearest January 15th to March 15th. The longer season for lakes in the BWCAW was established in 1979 to provide additional angling opportunities after motorized access to that area was eliminated, and was considered sustainable because of lower fishing pressure on those lakes.

The change in lake trout seasons considered in this report would affect about 50 lakes lying outside, or partly outside, the BWCAW. Changing the winter season on those lakes so that it ran from the Saturday nearest January 1st to March 31st would increase the season length by about four weeks (an increase of about 50%). Creel survey data suggest that an increase in the winter season by that amount could increase annual lake trout harvest on the affected lakes by about 32%.

Principal arguments for the change in season include simplification of lake trout seasons and an increase in fishing opportunity. The main argument against the season change is an increased risk of overharvest caused by the increase in fishing pressure that would probably occur. Lake trout are particularly vulnerable to overharvest due to the low productivity of the waters in which they live, and their slow growth, late maturity, and low reproductive potential. Creel survey data suggest that harvest levels on some Minnesota lake trout lakes are already near or above maximum sustainable levels.

The Department of Natural Resources remains concerned about any expansion of seasons on lake trout. However, the DNR will further explore ways to simplify winter trout seasons for lake and stream trout lakes while protecting the trout fisheries in those lakes.

Background

Lake trout can be found in about 120 lakes in Minnesota (Siesennop 2000). All but a few of those lakes are located in Cook, northern Lake, and northern St. Louis Counties. Thirteen of the larger lakes lie on the Minnesota-Canadian border, and at least 77 lake trout lakes are entirely or partially inside the BWCAW. Thirty-five of Minnesota's lake trout lakes are considered "Heritage Lakes", because they support native lake trout strains uncontaminated by past stocking. The DNR does not stock Heritage lake trout lakes, in order to maintain the genetic purity of the lake trout strains they support. Almost all Heritage lake trout lakes lie inside the BWCAW.

Lake trout require cold water (less than 55 F) with good dissolved oxygen levels to thrive. Those conditions are usually found in deep, clear lakes with low productivity. Lake trout tend to grow slowly, mature late in life (at five or six years of age), and have low reproductive potential (they produce a relatively low number of eggs per spawning female). This makes the species more vulnerable to over-harvest than most game fish species found in Minnesota.

Lake trout are most vulnerable to angling in the winter months, when they can be found actively feeding at all depths in most lake trout lakes. They are also active, and available to anglers, in the spring and fall, when low water temperatures allow them to remain in shallow waters where they are easiest for anglers to catch. Over the summer high surface water temperatures force lake trout into deeper waters, where specialized angling methods are required to reach them. As a result, fishing pressure targeting lake trout tends to be highest in the winter and in the first two weeks of the summer season, with a lesser peak in pressure towards the end of September. Because lake trout are extremely vulnerable to angling during their spawning period (early to mid October on inland waters), Minnesota rules currently close the summer season on September 30.

Minnesota Statutes **97C.395** state the open season for lake trout is from January 1 to October 31.

Minnesota Rules **Chapter 6262.0200 Subpart 1. (E.)** set winter lake trout seasons for inland waters as follows:

For all lakes entirely within the Boundary Waters Canoe Area Wilderness except Saganaga and Ram Lakes, Saturday nearest January 1 to March 31.

For all lakes lying entirely or partly outside the Boundary Waters Canoe Area Wilderness and exceptions, Saturday nearest January 15 to March 15.

Minnesota Rules **Chapter 6266.0700 Subpart 2. (C.)** establish winter lake trout seasons for Minnesota-Canada border waters that are the same as those established for BWCAW and non-BWCAW inland waters.

A change in winter lake trout season to an opening on the Saturday nearest January 1 and a closing date of March 31 would affect only those lake trout lakes currently described in rule as “lakes lying entirely or partly outside the Boundary Waters Canoe Area

Wilderness and exceptions.". Lakes partly outside the Boundary Waters Canoe Area Wilderness (BWCAW) and exceptions include Snowbank, Magnetic, Ram, Seagull, Clearwater, East Bearskin, and Saganaga. In the remainder of this report, lakes will be referred to as 'non-BWCAW' if they were covered by the season for lakes lying entirely or partly outside the BWCAW.

Winter lake trout seasons have changed several times over the past 60 years. Prior to 1955 the winter lake trout season for all lake trout lakes ran from about January 1 to February 15. From 1955 through 1971 the winter season for all lake trout lakes started at about January 1, with no winter closure (the season was continuous through late September). From 1972 through 1979 the winter season for all lake trout lakes ran from about January 1 to February 28.

Current rules establishing different seasons for BWCAW and non-BWCAW lake trout lakes have been in place since the winter of 1979-1980 (Table 1). Federal legislation establishing the BWCAW as a wilderness had been enacted in 1978, and access to most BWCAW lakes had been restricted by the ban on motorized (snowmobile) travel. Creel survey data indicated that fishing pressure on many BWCAW lakes was low, compared to non-BWCAW waters. There was a desire to expand fishing opportunities in and near the BWCAW, and it was determined that a longer season could be supported by BWCAW lakes, due to more difficult access and lower fishing pressure on those waters. As a result, the season in the BWCAW lakes was extended by about four weeks, beginning in the winter of 1979-1980. At the same time, the season for non-BWCAW lakes was shifted; its length stayed roughly the same, but it started and ended two weeks later.

The strongest arguments for and against a change in the winter lake trout season depend on how much the change would affect lake trout harvest, and on whether an increase in lake trout harvest could be sustained. Lake trout harvest and yield estimates are obtained by doing winter and summer creel surveys on selected lake trout lakes. Creel surveys are generally scheduled to address lake-specific management issues, not to provide statistically valid estimates of lake trout harvest in Minnesota as a whole. Fishing pressure and harvest estimates can vary widely from year to year on the same lake. As a result, it generally takes more than one creel survey to provide useful estimates of "typical" pressure and harvest on any given lake, for any given time period.

Two methods have been used in Minnesota to estimate potential yields in lake trout lakes (Siesennop 2000). Potential yield estimates based on the lake's morphoedaphic index (MEI) are based on the lake's productivity (as indicated by the concentration of total dissolved solids in lake water) and mean depth, with lake trout potential yield estimated at 25% of total MEI yield (Ontario Ministry of Natural Resources 1982). Potential yield estimates based on thermal habitat volume (THV) are based on the water volume in the lake having optimal temperatures and dissolved oxygen levels for lake trout (temperature 46.4-53.6 F; oxygen 6 ppm or greater). Potential yield is considered to be the maximum sustainable harvest for a species – if it were exceeded over a period of time, one could expect the population to go into decline.

To prepare this report, data from 99 single-season winter creel surveys of 19 non-BWCAW lake trout lakes (43 done prior to 1980, 56 done in 1980 or later) were compiled. Comparing pre-1980 winter creel survey data to data collected since 1980, average fishing pressure on non-BWCAW lake trout lakes has declined (from 4.3 to 4.1 angler-hours/acre), winter lake trout yield has declined (from 1.09 to 0.80 lb/acre), and the average mean length of harvested lake trout has increased (from 14.8 to 18.6 inches; Table 2).

In an attempt to determine the effects of past season changes on fishing pressure, pre- and post-change creel survey results covering 19 season changes affecting 14 lakes were compiled and compared (Table 3). Most valuable for comparing pre- and post change results are those cases where the season changed but accessibility did not. Unfortunately, there were only two cases where a season length was increased without a decrease in accessibility to potentially offset it, and both came from creel surveys of Trout Lake, in Cook County. In one case, a 162% increase in season length was accompanied by a 150% increase in fishing pressure. In the second case, a 35% increase in season length was accompanied by an increase in fishing pressure of seven percent.

A review of raw angler count data from 11 creel surveys conducted on six Cook County lakes between 1986 and 2005 indicated that daily fishing pressure on non-BWCAW lakes during the first week of the current season appears to have been about twice as high as daily pressures over the rest of the season. On the two BWCAW lakes surveyed (Daniels in 1991 and Saganaga in 1988), daily fishing pressure was highest in late February – early March, with a lesser peak at the end of March, after the non-BWCAW season had closed.

Arguments for the season change

Fishing opportunities on non-BWCAW lakes would be expanded because more days would be available for fishing. Anglers might respond by scheduling more fishing trips, or they might respond by fishing about the same amount, but at more convenient times or under more comfortable conditions.

Although the winter season would be roughly 50% longer, the increase in annual fishing pressure and lake trout harvest would not be as great. Siesennop (2000) found that for six non-BWCAW lakes for which annual yield estimates could be made, average winter yield was 63% of average annual yield. If a 50% increase in the length of the winter season resulted in a 50% increase in winter yields, annual yield would increase by 32%. The increase would be less if the increase in winter fishing pressure were less than the change in season length would suggest (as was the case following one increase in season on Trout Lake).

Opening and closing BWCAW and non-BWCAW lakes on the same dates might result in decreased pressure on BWCAW lakes. Some anglers presently fishing BWCAW lakes during the early and late seasons on those lakes would probably fish non-BWCAW lakes instead, if they were open. Many of the State's most important native lake trout lakes lie within the BWCAW. Some are heavily fished in the open-water season, as well as during the winter season. Avoiding overharvest on those lakes is particularly important,

since wilderness restrictions and difficult access would limit management options and make it more difficult to restore impaired fisheries in those waters. Some decline in winter fishing pressure on those lakes would give them a wider margin of safety.

Rules governing lake trout seasons would be simplified. There would no longer be a need to describe and list exceptions to any season length, since all inland and Minnesota-Canadian-border lake trout lakes would be covered by the same season.

Enforcement of winter lake trout regulations might be easier. Enforcement staff would have one, rather than two, winter lake trout 'openers' to cover. Anglers possessing lake trout outside the open season would not have a period in the winter when they could claim to have taken those fish in the BWCAW.

The Department of Natural Resources has management options that can be exercised on non-BWCAW lakes where lake trout harvest appears to be excessive. Experimental or special regulations could be used to restrict harvest. Stocking has the potential to support lake trout fisheries in some cases where natural reproduction is lacking or has been lost, although stocking alone cannot overcome the effects of excessive harvest on the quality of lake trout fisheries.

Arguments against the season change

An extension of the winter season on non-BWCAW lake trout lakes could result in excessive lake trout harvest on the more heavily fished lakes, even if increases in harvest resulting from the change weren't large. Winter lake trout harvest is already high on many non-BWCAW lakes, and may already be excessive in some (Siesennop 2000). On the six non-BWCAW lakes for which Siesennop (2000) had winter and summer lake trout yield estimates, winter yields accounted for an average of 63% of the total annual yield. That figure, combined with an average winter lake trout yield of 0.8 lb/acre since 1980, suggests that annual yields may have averaged around 1.3 lb/acre since 1980 (and prior to the reduction in bag limit to two fish). Some literature suggests that annual yields as low as 0.2 to 0.4 lb/acre may not be sustainable (Macins 1985; Healy 1978). Siesennop (2000) reported that MEI-based potential lake trout yield averaged 0.52 lb/acre for 69 lakes with data available, while THV-based potential lake trout yield averaged 1.27 lb/acre for 118 lakes. On five of the six non-BWCAW lakes for which winter and summer creel survey data were available, Siesennop (2000) reported that annual yield estimates exceeded MEI-based potential lake trout yield estimates. Estimated annual yield exceeded THV-based potential yield estimates in one of the five cases where annual yield and THV-based yield estimates were available. Among the 13 non-BWCAW lakes with winter lake trout yield estimates available, winter yields alone in six lakes exceeded the MEI-based potential annual yield, while in three of the lakes they also exceeded THV-based potential annual yields.

Relying on management efforts to identify and protect endangered lake trout fisheries on individual waters is risky. Creel surveys are required to identify overharvest and craft effective regulations, but they are expensive and time-consuming. Creel survey data recent enough to be useful are available for only a handful (or less) of Minnesota's lake trout lakes. If creel survey data were obtained, experimental or special regulations could

be proposed to protect threatened lake trout populations; however, Minnesota has had no experience regulating individual lake trout fisheries. If regulations became necessary on individual waters, they would probably have to be very restrictive before we could have much confidence that they would be successful. While stocking may be able to restore or sustain some lake trout fisheries, stocking alone cannot restore the quality of a fishery once it has been lost. If overharvest were to occur, declines in fishing quality would be more likely than complete collapses.

With a single opening day, enforcement effort might be spread thin, with many more lakes to cover with a fixed number of crews. Enforcement on BWCAW lakes would likely suffer.

Anglers would still have to cope with complex season language covering BWCAW and non-BWCAW stream trout lakes. In non-BWCAW lakes with lake trout and stream trout, two seasons would apply. Anglers could be legally fishing for lake trout while the stream trout season in the same lake was still closed.

Conclusions

The change in lake trout seasons considered in this report would affect about 50 lakes lying outside, or partly outside, the BWCAW. Changing the winter season on those lakes so that it ran from the Saturday nearest January 1st to March 31st would increase the season length by about four weeks (an increase of about 50%). Creel survey data suggest that an increase in the winter season by that amount could increase annual lake trout harvest on the affected lakes by about 32%.

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The Department of Natural Resources remains concerned about any expansion of seasons on lake trout. However, the DNR will further explore ways to simplify winter trout seasons for lake and stream trout lakes while protecting the trout fisheries in those lakes.

References

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Ontario Ministry of Natural Resources. 1982. Partitioning yields estimated from the morphoedaphic index into individual species yield. Strategic Planning for Ontario Fisheries, Policy Development, Working Group Number 12. Toronto.

Siesennop, G. D. 2000. Estimating potential yield and harvest of lake trout *Salvelinus namaycush* in Minnesota's lake trout lakes, exclusive of lake Superior. Minnesota Department of Natural Resources, Division of Fish and Wildlife, Section of Fisheries, Investigational Report 487, St. Paul.

Table 1. Current winter fishing seasons for lake trout and stream trout in inland and Minnesota-Canadian border lakes (Minnesota Rule Chapter 6262.0200).

Lakes	Season Dates
	Lake Trout
Lakes entirely within the BWCAW (except Ram and Saganaga Lakes)	Saturday nearest January 1 to March 31
Lakes entirely or partly outside the BWCAW and exceptions.*	Saturday nearest January 15 to March 15
	Stream Trout
Lakes entirely within the BWCAW (except Ram Lake)	Saturday nearest January 1 to March 31
Lakes entirely or partly outside the BWCAW and exceptions.**	Saturday nearest January 15 to March 15

There is no winter stream trout season for lakes in Becker, Beltrami, Cass, Crow Wing, and Hubbard (except Blue Lake) Counties.

* Lake trout lakes partly outside the BWCAW, and exceptions, include Snowbank, Magnetic, Ram, Seagull, Clearwater, East Bearskin, and Saganaga Lakes.

** Stream trout lakes partly outside the BWCAW, and exceptions, include Ram, Meditation, and Lizz Lakes.

Table 2. Mean, standard error (SE), minimum, and maximum for estimates of fishing pressure, lake trout harvest, harvest rate, lake trout yield, and mean length at harvest for lake trout from winter creel surveys done prior to 1980, in 1980 or later, and in 1990 or later, on Minnesota's BWCAW and non-BWCAW lake trout lakes. N = number of creel surveys from which this estimate was available.

	Pressure (angler-hr/acre)	Harvest (fish/acre)	Harvest rate (fish/angler-hr)	Yield (lb/acre)	Mean length (inches)
			Non-BWCAW Lakes, Prior to 1980		
Mean	4.33	1.40	0.190	1.09	14.8
SE	0.74	0.33	0.031	0.37	1.0
Minimum	0.0	0.0	0.019	0.06	9.6
Maximum	20.9	5.44	0.531	5.72	22.8
N	43	30	29	21	16
			Non-BWCAW Lakes, 1980 or later		
Mean	4.11	0.58	0.125	0.80	18.6
SE	0.59	0.10	0.010	0.12	0.7
Minimum	0.025	0.010	0.017	0.01	11.8
Maximum	24.5	2.97	0.265	5.72	24.5
N	56	51	51	47	29
			Non-BWCAW Lakes, 1990 or later		
Mean	1.43	0.17	0.116	0.34	20.4
SE	0.72	0.09	0.014	0.10	1.3
Minimum	0.16	0.01	0.052	0.01	13.2
Maximum	7.60	0.95	0.206	1.03	24.5
N	10	10	10	10	10
			BWCAW Lakes, Prior to 1980		
Mean	0.84	0.18	0.146	0.39	18.7
SE	0.21	0.06	0.038	0.16	0.7
Minimum	0.0	0.0	0.0	0.0	17.1
Maximum	6.15	0.42	0.272	1.03	20.6
N	35	6	6	6	5
			BWCAW Lakes, 1980 or later		
Mean	1.04	0.21	0.158	0.28	17.3
SE	0.18	0.07	0.029	0.06	0.8
Minimum	0.0	0.0	0.0	0.0	13.8
Maximum	6.86	2.59	0.900	1.91	22.7
N	50	46	35	45	15

Table 3. Mean season length and mean of creel survey-estimated winter fishing effort, prior to and after changes in winter lake trout season length. From creel surveys done on selected Minnesota inland lake trout lakes. N = number of creel surveys. Years = years covered by creel surveys. Lakes currently covered by non-BWCAW seasons are underlined.

	Prior to Season Change				After Season Change			
Lake	Season length (days)	Fishing effort (angler-hr)	N	Years	Season length (days)	Fishing effort (angler-hr)	N	Years
Burntside*	121	10,539	1	1971	60	6,357	5	1972-84
Clearwater	89	3,480	1	1965	61	413	2	1981-84
Greenwood*	89	0	1	1965	59	515	1	1982
Little Trout	121	0	1	1971	62	49	2	1972-02
Loon*	89	300	1	1965	62	428	4	1972-93
Mayhew*	89	0	1	1965	60	1,561	12	1972-89
Moss*	89	180	1	1965	62	1,996	3	1980-84
Mukooda*	121	1,067	1	1971	62	1,762	2	1972-02
Ojibway*	121	1,868	1	1971	60	1,013	5	1972-84
Saganaga*	90	6,213	1	1988	60	4,499	3	1992-05
Snowbank*	121	12,940	1	1971	60	4,896	5	1972-84
South	89	1,080	1	1965	60	1,224	3	1973-75
South	60	1,224	3	1973-75	94	704	1	1980
Trout*	46	1,190	3	1953-55	120	2,986	5	1956-60
Trout*	120	2,986	5	1956-60	89	2,340	1	1965
Trout*	89	2,340	1	1965	120	2,511	3	1968-70
Trout*	120	2,511	3	1968-70	59	1,953	1	1999
Tuscarora*	89	880	1	1965	60	719	3	1972-75
Tuscarora	60	719	3	1973-75	91	392	2	1980-81

* season changes on asterisked lakes occurred with no change in accessibility.