STATE OF MINNESOTA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISHERIES

IN THE MATTER OF PROPOSED ADOPTION OF RULES RELATING TO CHANGES IN LIMITS OF VARIOUS GAME FISH SPECIES

STATEMENT OF NEED AND REASONABLENESS

June 10, 2002

GENERAL PROVISIONS

I. INTRODUCTION

Purpose

The primary purpose of the game and fish rules is to provide for the preservation, protection, and propagation of desirable species of wild animals while ensuring recreational opportunities for those who enjoy wildlife-related activities. The primary purpose of the proposed changes in fish limits is to maintain sustainable harvest levels and stabilize declining trends in average size of fish.

Scope

The proposed rules include changes to daily and possession limits for lake trout, crappie, sunfish, and catfish. The changes would affect inland waters and Minnesota – Canada boundary waters.

Notification to Persons and Classes of Persons Affected by the Proposed Rules

The Department of Natural Resources (DNR) published a request for comments in the State Register on October 9, 2000 regarding potential changes for fish limits on inland waters and on August 13, 2001 for potential changes on Minnesota – Canada boundary waters. These notices described the specific area of the proposed rules, the statutory authority for the proposed rules, and the parties that could be affected by the proposed rules. The DNR also provided additional notice to people who may be affected by the rules by sending the requests for comments and additional information to a number of angling groups, other environmental and social organizations, businesses, individuals, and legislators. The DNR also published a statewide news release that described major parts of the proposed rules with instructions on how to provide comments. The DNR web site forum was used to take comments directly related to the rules.

In addition to the request for comments period, the DNR did extensive public outreach to get input on limit changes. Initially, fish limit changes were discussed at the 1999 and 2000 Fisheries Roundtable, an annual forum that is hosted by the DNR, Division of Fisheries and includes a cross section of anglers, fishing groups, guides, resort owners, outdoor writers, and legislators. At the 2000 Roundtable, the Division asked for volunteers to be part of a citizen advisory committee that would help guide the public input process to review fish limits and make recommendations to the DNR.

The citizen advisory committee included 17 people who met with Division of Fisheries personnel four times from July 2000 through May 2001 (Table 1). The Division provided biological and sociological information at these meetings and the committee made their initial recommendations for limit changes to the DNR in November 2000 (Table 2). These recommendations were discussed at the Fishing Roundtable in January 2001. The last meeting was held on May 1, 2001, when the committee made their final recommendations to the DNR after reviewing a summary of all public input that had been received to date. The DNR then reviewed the committee recommendations and developed the proposed rule changes addressed in this SONAR.

Table 1. List of citizen advisory committee participants with affiliation.

Name	Affiliation
Jerry Bodmer	None
Larry Bollig	Radio show host, professional angler
Michael Dosch	None
Ed Fussy	Minnesota Resort Association
Mary Goldman	Women Anglers of Minnesota
Jay Green	Minnesota Bass Federation
Duke Hust	Trout Unlimited
Tom Neustrom	Fishing guide
Scott Peterson	Radio show host, professional angler
Jane Randall	Resort owner
Jeff Shannon	Fishing guide
Mike Spangler	None
Jim Stratton	Viking Sportsmans Club
Tom Swedberg	None
Dave Thompson	Minnesota Resort Association
Steve Tooker	Resort owner
Terry Tuma	Professional angler
Carol Altpeter	Office of Tourism
Vince Meyer	Outdoor writer

The DNR took a three-pronged approach to gathering public input on fish limits by: 1) getting input from the 60-day request for comments periods as described above; 2) soliciting input at 19 public meetings held around the state in February and March of 2001; and 3) contracting with the University of Minnesota to do a randomized survey of resident metro area anglers, resident non-metro area anglers, non-resident anglers, and resort owners. Detailed reports on the results of this input are included with the SONAR (Appendices 1 - 3). A brief summary of the results of each is given below.

The DNR received a total of 1,595 comments during the request for comments periods. The input received during these periods was not based on any specific recommendations or proposals and, as a result, tended to be variable. About 80% of the respondents supported some reduction in fish limits for one or more species, but the amount of support for reduced limits varied widely among species. About 18% of the respondents opposed any reductions in limits. The greatest support for reduced limits was for sunfish, walleye, bass, and crappie and the median suggested limits for those species were about two thirds of the current limit.

The DNR received an additional 1,809 comments at the 19 public input meetings held in March and April of 2001. At these meetings, public comments tended to be focused around the initial recommendations made by the citizen advisory committee (Appendix 2). The recommended changes for lake trout and bass had the highest level of support. The changes for northern pike, sunfish, and crappies had the lowest level of support. There was moderate support for a recommended change for stream trout and for an alternative recommendation for a less drastic reduction in the crappie limit. The amount of support for the various recommendations varied widely by region of the state and tended, with the exception of lake trout, to be inversely proportional to the abundance of the species in the region.

Table 2. Summary of citizen advisory committee recommendations and DNR's proposed rule changes for fish limits.

Species	First Committee Recommendation	Final Committee Recommendation	DNR Proposed Rule Changes
Lake trout	Reduce limit from 3 to 2	Reduce limit from 3 to 2	Reduce limit from 3 to 2
Stream trout (in streams)	Protected slot size limit of 12-16 inches	Protected slot size limit of 12-16 inches, brown trout only	No change (current limit is 5, with only 1 over 16 inches)
Crappie	Reduce limit from 15 to 10 or 6	Reduce limit from 15 to 10, consider a size limit	Reduce limit from 15 to 10
Sunfish	Reduce limit from 30 to 10	Reduce limit from 30 to 20, consider a size limit	Reduce limit from 30 to 20
Northern pike	Increase limit from 3 to 4, with a protected slot size limit of 24-40 inches	Change statutory size limit from 1 over 30 inches daily to one over 30 inches in possession	No change
Largemouth and smallmouth bass	Reduce limit from 6 to 4	Reduce limit from 6 to 4	No change
Walleye	Reduce limit from 6 to 4 daily/6 in possession or no change	Reduce limit from 6 to 5; change statutory size limit from 1 over 24 inches daily to 1 over 20 inches in possession	No change
Catfish	No recommendation	No recommendation	Keep overall limit the same, but allow only one over 24 inches and only two flathead catfish

The University of Minnesota survey resulted in responses from 436 resident metro area anglers, 462 resident anglers from other areas, 449 non-resident anglers, and 523 resort owners. Since the survey was drawn from a random sample of anglers, the input is more representative of the angling population as a whole than that obtained from the request for comments and public meetings. Survey respondents tended to prefer to keep fish limits the same and indicated minimum acceptable possession limits that were at least two thirds of the existing limit.

Additional notice of the proposed rules will be provided to persons or classes of persons who could be affected. The notice plan includes sending the notice of intent to adopt rules with or without a public hearing to all of the groups that were contacted for the request for comments as well as the citizen advisory committee. News releases that detail the rules will be issued statewide. The DNR web site forum will be used to inform the public of the intent to adopt the rules. Notice will also be provided to appropriate legislators as required by Minn. Stat., sec. 14.116.

Statutory Authority

Statutory authority for the proposed rules is Minnesota Statutes, sections 97C.401, subd. 1 and 97A.045, subd. 2.

II. REGULATORY ANALYSIS

Description of the Classes of Persons Affected by the Proposed Rules

The existing limits for Minnesota's major game fish species have been in place a long time (Table 3). For example, the limit for crappie was last changed more than 70 years ago, while the limit for sunfish was last changed about 50 years ago. This means that current fish limits are literally institutionalized in Minnesota and many anglers and angling-related businesses are very used to the status quo. As a result, the proposed changes in fish limits (6262.0200, subp.1, items E, L, M, and N, and 6266.0700, subp. 2, items C and H) would affect anglers and could impact angling-related businesses if some anglers choose to fish in states that have higher limits.

Table 3. Current daily and possession limits for Minnesota's game fish species, showing the year the limit was last changed and the number of years since the last change.

Species	Current Limit	Year Last Changed	Number of Years Since Change
Lake trout	3	1962	38
Crappie	15	1930	70
Sunfish	30	1951	51
Catfish	5	1966	36
Largemouth/smallmouth bass	6	1930	72
Northern pike	3	1948	52
Walleye/sauger	6	1956	46
Stream trout	5	1975	25

At the same time, the sport and culture of fishing has changed dramatically in Minnesota since most limits were last changed. While keeping some fish for a meal is still important to many anglers, most people no longer need to fish for subsistence. Instead, anglers are increasingly concerned about the quality of fishing and expect the DNR to maintain or improve the average size of fish and the number of fish caught per hour in the face of increased pressure on the fisheries resource. All of these factors make it necessary and reasonable for the DNR to look at reduced limits as an option for stabilizing or reducing fish harvest and encouraging a conservation ethic that is more in keeping with the biological, social, and technological changes that fishing has undergone in the last 50 years.

It is generally acknowledged that Minnesota's fisheries resource has been subjected to ever-increasing pressures for most of the 20th century. There are three major factors that have caused this: 1) increased angling pressure; 2) advances in fishing technology; and 3) degradation of fisheries habitat.

Most people agree that fishing pressure has increased dramatically in Minnesota since the current limits were put in place, although statewide data are sketchy. A national survey of hunting and fishing, conducted every five years by the U.S. Fish and Wildlife Service, shows estimated total angling days (total number of days spent angling by all anglers combined) in Minnesota ranging from about 18 million to 26 million since 1980 with no discernible trend. However, total angling days for the state were not estimated in surveys done prior to 1980 when pressure was likely lower. Increased angling pressure has been documented on most of Minnesota's large walleye lakes, but the trend is more evident on some lakes, such as Mille Lacs and Winnibigoshish, than others such as Pepin and Leech (Minnesota DNR Special Publication No. 151 1997). Fishing license sales in Minnesota increased steadily from the 1920's

until the 1990's when they leveled off, but the percent increase has been less dramatic since the 1950's than prior to that time (Cook et al. 1997).

Fishing technology has changed dramatically since the days that current limits were established. Anglers have bigger, faster, and more comfortable boats, better access to lakes, rivers, and streams, sophisticated electronic fish finders, global positioning systems, and portable houses for ice fishing that allow mobility and comfort in extreme weather conditions. Today's anglers are not only better equipped, but also more knowledgeable because they have access to a tremendous base of fishing information through publications, seminars, and the Internet. It is not possible to quantify the effects of advanced technology and information on fishing, but it has undoubtedly had a major impact.

Degradation of fisheries habitat continues to be a problem. It must be acknowledged that many point sources of pollution have been reduced or eliminated and that has improved fishing, particularly on some of the state's rivers and streams. One of the most prominent examples of this is the Mississippi River in the Twin Cities area. Nevertheless, expanding human populations and associated sprawl, non-point source pollution, increased shoreline development, water appropriation, and channelization continue to take their toll on the state's fisheries resource.

Probable Costs to the Agency or Other Agencies from the Proposed Rules

The proposed fish rules would result in no costs to the DNR or other agencies. There is already extensive monitoring of the fish populations that would be affected by the proposed rules and no additional monitoring is planned if the rules are adopted. The proposed reduction in fish limits may reduce fishing license revenues, particularly if non-resident anglers decide to fish in another state with higher limits. However, we are unable to predict the number of currently licensed anglers that would elect not to buy a license if the proposed rules are implemented.

Determination of Less Costly or Less Intrusive Methods for Achieving the Purpose of the Proposed Rules

The proposed limit reductions (6262.0200, subp.1, items E, L, M, and N, and 6266.0700, subp. 2, items C and H) would be more restrictive and, therefore, more intrusive. However, the proposed limits would result in relatively small reductions in angler harvest on average and are, therefore, minimally intrusive. Simulation modeling showed that more drastic reductions in limits would more effectively reduce fish harvest and have a better chance of maintaining or improving fish populations. However, this option was rejected as being too restrictive and too great a change to implement in one step, given the long-standing nature of the current limits. The proposed limit reductions were considered to be the best balance between the long-term need to better control fish harvest and the need to address social and economic considerations so that there is good public acceptance of the changes.

Other options for reducing fish harvest that were considered and not selected were season adjustments and size limits. Season restrictions could achieve the goal of reducing fish harvest, but would be more intrusive than limit reductions because they would eliminate angling opportunity during the closed periods with resulting economic impacts to businesses that depend on fishing.

Size limits could also reduce fish harvest and are already in use on a statewide and lake-specific basis. Size limits were proposed for one part of the rules dealing with catfish (6262.0200, subp. 1, item N), but were not proposed for the other species. The citizen advisory committee suggested that the DNR consider size limits for crappie and sunfish that would restrict anglers to lower numbers of fish over a certain size (i.e. only 5 crappies over 9 inches allowed in a limit of 10). However, the DNR chose not to

propose this because modeling showed minimal benefit from this type of regulation and many anglers currently would find the requirement to measure large numbers of crappie or sunfish to be intrusive.

Description of Alternative Methods for Achieving the Purpose of the Proposed Rules

For reducing fish harvest, the major alternatives to season adjustments, limit reductions and size limits are: 1) quotas where a certain level of harvest is allowed after which all harvest activity is curtailed for the remainder of the season; and 2) limited entry where only a certain number of anglers are allowed to engage in harvest activities (*Inland Fisheries Management in North America*). These alternatives could achieve the purpose of the proposed rules. However, quotas and limited entry are not proposed because they are considered to be unnecessarily intrusive and would require substantial monitoring from the DNR to determine when harvest limits were reached.

Probable Costs of Complying with the Proposed Rules

The proposed limit reductions would not result in increased costs for the public.

Assessment of Differences between the Proposed Rules and Existing Federal Regulations

The proposed rules cover an area that is not addressed by federal law; therefore, this consideration is not applicable.

Regulatory, Licensure, or Other Charges in the Proposed Rules

The proposed rules do not involve any new regulatory permit, license fees, or any other charges to the public.

Proposed Rules Affect on Farming Operations

The proposed rules would not affect farming operations.

Description of How the Agency Considered and Implemented the Policy to Adopt Rules that Emphasize Superior Achievement in Meeting the Agency's Regulatory Objective and Maximum Flexibility for the Regulated Party and the Agency in Meeting these Goals

The DNR's objective with regard to recreational fishing is to provide for resource conservation, public safety, and equitable use, while maintaining a variety of opportunities for anglers and businesses to use the state's aquatic resources. To the extent possible, the DNR attempts to balance the desire for simple regulations against the demand for more specialized regulations to protect resources and provide additional angling opportunities. The DNR also attempts to balance the economic and social impacts of regulations against the biological requirements needed to meet goals that conserve and protect the aquatic resources.

In developing the proposed rules, the DNR sought to balance the need to reduce fish harvest with social and economic values that leaned against making drastic changes in fish limits. It is necessary and reasonable for the DNR to take social/economic factors into consideration when proposing fish limit reductions, because without public acceptance, the ultimate goal of using limit reductions to reduce harvest will not be realized. Relatively low rates of non-compliance can undermine the potential benefits of fishing regulation changes (Gigliotti and Taylor 1990). Further, the DNR rules would likely be changed by the legislature if proposed rules were widely opposed by anglers.

The DNR used extensive public input to determine what would be acceptable to most anglers. In particular, the University of Minnesota Survey (Appendix 3) provided specific information on minimum acceptable fish limits that helped to develop the current proposals.

The DNR has promoted voluntary catch and release and selective harvest to help promote a conservation ethic among anglers and to counter the effects of increased fishing pressure. However, voluntary release of fish has not been able to counter the affects of increased pressure on the fisheries resource. There is little doubt that the role of regulations in fisheries management will need to increase in order for the DNR to achieve its goals of conserving the fisheries resource and providing diverse angling opportunities.

III. RULE-BY-RULE ANALYSIS

6262.0200 FISHING REGULATIONS FOR INLAND WATERS.

Subpart 1. General inland fishing regulations. The proposed language in this subpart would reduce daily and possession limits on inland waters as follows: lake trout daily and possession limits from 3 to 2 (Item E); crappie daily and possession limits from 15 to 10 (Item L); and sunfish daily and possession limits from 30 to 20 (Item M). In addition, catfish limits (Item N) would be changed as follows: the aggregate daily and possession limit of 5 catfish, with no more than 1 over 24 inches on tributaries to the Red River of the North and tributaries to Minnesota-South Dakota boundary waters, would be changed to 5 with no more than 1 over 24 inches on all inland waters and no more than 2 flathead catfish. The effective date of the proposed rules would be May 10, 2003, which coincides with the fishing opener.

6266.0700 TAKING OF FISH ON MINNESOTA-CANADA BOUNDARY WATERS

Subp. 2. Species, seasons, and limits on Minnesota-Canada boundary waters. The proposed language in this subpart would reduce daily and possession limits on Minnesota-Canada boundary waters as follows: lake trout daily and possession limits from 3 to 2 (Item C); and crappie daily and possession limits from 30 (15 on Black Bay of Rainy Lake) to 10 (Item H). In addition, the proposed changes for sunfish and catfish under 6262.0200, subpart 1, would apply to Minnesota-Canada boundary waters as provided by existing language in 6266.0700, subp. 2, Item I. However, this is inconsequential because the Minnesota-Canada boundary waters do not have significant sunfish or catfish fisheries. The effective date for these changes would also be May 10, 2003.

General Background

Increased fishing pressure and resulting fish harvest affect fish populations in a number of ways, but the two impacts that are most noticed by anglers are decreased average size of fish and decreased catch rates. These effects have been documented on a number of DNR creel surveys and other studies of various Minnesota lakes, but a study of a long-standing fishing contest provides one of the best illustrations of how average fish size has declined in Minnesota over time (Olson and Cunningham 1989).

In the Olson-Cunningham study, the DNR reviewed records of a fishing contest that had been conducted by Fuller's Tackle Shop in Park Rapids, Minnesota since 1915. The study showed that there were declining trends in the number of large-size fish and mean weight of fish for most of the species included in the contest (lake trout and catfish were not included in the contest). These trends were

particularly apparent for northern pike, crappie, and sunfish. While declining trends in size were also apparent for walleye and largemouth bass, they were less dramatic than for the other species.

Reductions in the average size of game fish species diminish the recreational value and quality of angling. Declines in northern pike size have greatly reduced the trophy potential of that species across Minnesota. Declines in average size of the panfish species such as crappie and bluegill can cause those populations to lose their value to most anglers.

Statewide Status of Species Included in the Proposed Rules and Predicted Impact of the Proposed Rules

In order to help assess the need for and potential impact of fish limit reductions, the DNR analyzed a statewide creel survey database containing information on fishing pressure, angler catch rates, and fish harvest for individual lakes and streams. The analysis included all of the species covered in the proposed rules, except for catfish. The database includes information from more than 2,100 creel surveys conducted on over 970 lakes since the 1930's (Cook et al. 1997; Cook and Younk 2001). The results of this analysis are included in a DNR staff report titled *Fish Limits: A Public Discussion* (Appendix 4). This information, along with the Olson-Cunningham study (1989), was used to determine the need for limit changes for the fish species under consideration, and to estimate the average statewide harvest reduction that would be realized under various limit reduction scenarios.

To predict harvest reductions resulting from lower creel limits, the DNR used harvest per trip distributions for Minnesota anglers based on creel survey data (Porch and Fox 1991, Radomski et al. 2001, Cook et al. 2001). Only completed-trip interview data were used to quantify the distribution of anglers harvesting various numbers of fish up to their individual limit. All creel data used were collected from 1980 to 1996 by the DNR. Creel surveys used in this analysis were mostly from the open-water (spring and summer) season on lakes, but a few winter and river creel surveys were included. Data for angler harvest per trip distributions for lake trout were sparse, with data only coming from the Grand Marais area. The effects of reduced limits were predicted by calculating what harvest would be if actual harvest per trip distributions were truncated to a reduced limit. For example, to predict the effects of lowering the lake trout limit from three to two, the model would reduce the catch of all anglers that harvested three fish to two fish and recalculate the total harvest accordingly. This method may underestimate the harvest under a reduced limit because it assumes fish density does not increase from reduced limits and angler dynamics do not change, but it gives some insight into possible consequences of limit reductions.

There is no law prohibiting "party fishing" in Minnesota, meaning that a group of anglers fishing together need only worry about their total combined limit rather than the limit for each individual. Therefore most anglers fishing as a party pool their harvest. Because of this, creel reports summarized an individual angler's harvest by dividing the total party fish harvest (by species) by the number of anglers in the party. This summary procedure necessitates rounding harvest numbers with fractions down to the nearest whole integer. This method of handling pooled data slightly underestimates the true percentage of individual anglers harvesting or nearly harvesting a creel limit. Conversely, when the number of fish per angler was less than one, all anglers were assigned one fish. This methodology preserved the actual percentage of party-based angler-trips where no fish were harvested by any angler, or all the anglers had harvested a limit, both of which were of interest to Minnesota fisheries managers.

Creel limit data were analyzed two ways: by pooling all anglers interviewed during a creel survey and by pooling anglers targeting (seeking) a particular species. Projections of harvest reductions at

various limits were made using all angler data, while estimates of anglers affected at various limit reductions were made from targeted angler data.

The results of this analysis, along with other information, are provided below for each of the species covered in the proposed rules.

Lake Trout

Lake trout have a limited distribution within Minnesota, being largely confined to about 110 lakes most of which are in the northeast part of the state. This species is considered to be particularly vulnerable to over-harvest because their populations are typically characterized by slow growth, late sexual maturity, low reproductive potential, and a slow replacement rate (Shuter et al. 1998). For naturally reproducing lake trout populations, over-fishing is likely occurring if annual harvests exceed 0.4 lb/acre (Healey 1978).

Since lake trout have a limited distribution, much of which is within the remote lakes in the Boundary Waters Canoe Area Wilderness (BWCAW), the DNR does not have as much statewide harvest information for this species as for others. It is difficult to sample fish populations in the BWCAW, and has become even more difficult since the mid-1980s when the United States Forest Service increased access restrictions for state agencies doing biological monitoring.

The available data does not show distinct trends in decreased average size of lake trout, but it does show that we have approached or exceeded sustainable harvest levels on a number of the state's major lake trout fisheries both inside and outside of the BWCAW (Seisennop 2000). BWCAW lakes where this has occurred include West Pike, Mountain, Clearwater, Daniels, Little Trout, Partridge, South, Saganaga, Hanson, Ester, Little Knife, Knife, Missionary, Explorer, and Snowbank. This is particularly significant in light of the fact that most of the data showing high harvest does not include open-water harvest, which is thought to have increased in the BWCAW but has seldom been measured. Lakes outside of the BWCAW that have experienced high levels of lake trout harvest include Trout, Kemo, West Bearskin, Moss, Birch, North, Mayhew, Gunflint, Big Trout, and Caribou.

The results of modeling changes in lake trout harvest from reduced limits were unique compared to the other species in that the proposed rule was predicted to reduce harvest by a substantial 29%. This is because the creel survey data showed that anglers seeking lake trout reach the limit of three more frequently than anglers reach their limit of other species.

Crappie

Crappies are actually members of the sunfish family and include two species - black and white crappie. They are common in Minnesota and provide anglers with excellent fishing opportunities both summer and winter. Crappies are the second most sought after fish in the state (Jacobson et al. 1999). Crappies often travel in schools and, unlike other members of the sunfish family, feed actively during the winter. Their diet consists of invertebrates and small fish. During periods of low prey availability, their tendency to school makes them vulnerable to sport fishing. Anglers often keep the large crappie they catch, with only 2% of the fish greater than 10 inches released (Cook and Younk 1998). Since angling is selective for the large fish in crappie populations, many populations are now made up of less large fish. The mean size of the crappies harvested in Minnesota lakes is negatively related to fishing pressure, i.e., as the number of angler-hours per surface acre increases the size of crappie significantly decreases. Olson and Cunningham (1989) also found a substantial reduction (over 20%) in mean weights of harvested crappie from 1930 to 1987.

The modeling results predicted that the proposed crappie limit reduction from 15 to 10 would likely achieve about a 3% reduction in statewide annual harvest. Crappie limits would likely have to be reduced to 3 to 5 fish to reduce harvest enough to improve the average size of crappie in many lakes across the state. However, in lakes with excellent crappie fisheries the harvest reduction under the proposed limit change could be greater and thus help to sustain the quality of those unique fisheries. For example, reducing the limit from 15 to 10 fish was predicted to reduce harvest by 24% on Upper Red Lake, which has had an exceptional crappie fishery the past few years. Also, during periods of high crappie vulnerability, a reduced limit may distribute the harvest over a longer period of time or to additional anglers.

Sunfish

Sunfish regulations apply to several species in Minnesota, including bluegill, pumpkinseed, green sunfish, and orange-spotted sunfish, but anglers are interested primarily in bluegill. As a result, DNR data collection and management emphasis focuses on bluegill.

Bluegills are common in most lakes in the state and are the most abundant sunfish species in Minnesota. The number of bluegills killed by anglers exceeds that of any other fish species in the state, with over 14 million harvested each year (Cook and Younk 2001). Thirty percent of all fish harvested in Minnesota are bluegills. Bluegills eat mainly insects and other invertebrates. As with crappie, the occurrence of large fish in many populations is now reduced. Olson and Cunningham (1989) found a 50% reduction in the mean weight of fish harvested since 1930. Bluegill and other sunfish are easy to catch. Goedde and Coble (1981) found that over half of the quality-sized sunfish could be removed in two days after the opening of a fishing season on a previously un-fished Wisconsin lake.

Over-harvest of bluegills usually leads to stunting, a condition where growth slows and fish do not reach sizes acceptable to anglers. The removal of large, mature bluegills triggers younger bluegill to mature at earlier ages and smaller sizes. The age at maturation determines the individual size potential, with earlier maturation decreasing maximum size. Many bluegill populations in Minnesota exhibit this phenomenon where populations are dominated by many slow growing fish.

Reducing the sunfish and bluegill limit from 30 to 20 was predicted to reduce annual statewide harvest about 4%. Modeling shows that limits would have to be reduced to 10 fish or less before substantial reductions in statewide harvest would occur. The DNR is currently experimenting with sunfish limits of 5 fish on specific lakes, as part of its experimental management designation authority in Minn. Stat., sec. 97C.001. More time is needed to fully evaluate the 5-limit, but the evidence to date suggests that it may be effective in sustaining a quality bluegill fishery with low angling pressure but not with high angling pressure. However, as with the proposed crappie limit change, the proposed change for bluegill may have greater benefits on lakes with exceptional fisheries and may distribute the harvest over a longer period or to more anglers during periods of high vulnerability.

Catfish

Channel and flathead catfish are two of Minnesota's largest game fish with current state records of 38 and 70 pounds, respectively. Flathead catfish are restricted to the lower Mississippi, Minnesota, and St. Croix River systems. Channel catfish are found in those waters and also in the Red River of the North and St. Louis River systems. The Minnesota River is nationally renowned for its trophy flathead catfish fishery and the Red River is similarly known for its trophy channel catfish fishery. (The Red River is a Minnesota-North Dakota border water and already has a one-over-24 inch provision for catfish.) Both

catfish species are vulnerable to angling pressure because of their narrow distribution in the state, and because their populations are often characterized by low reproductive potential, late sexual maturity, and slow growth (Pflieger 1997; Hegrenes 1992; Carlander 1969). In Minnesota, both species exist at the northern extension of their range.

The trophy element of the fisheries in rivers such as the Minnesota and Red is particularly vulnerable to angling because large, old fish take a long time to replace. Large flathead catfish in the Minnesota River may be 25 years old or more and weigh in excess of 45 pounds, while Red River channel catfish commonly reach ages of 18-24 years and sizes exceeding 20 pounds.

Extensive sampling of catfish populations has been done over the past decade, particularly in the Minnesota and Red rivers. Data indicate that populations of channel and flathead catfish are in good condition with plenty of large fish. However, tagging studies in the Minnesota River have shown that large flathead catfish are vulnerable to angling and any increase in harvest could quickly reduce the abundance of trophy-size fish.

Historically, catfish have not been one of the more popular game fish with Minnesota residents and, as a result, the DNR has very little angler catch data for channel or flathead catfish. However, catfish are very popular among anglers on certain waters, such as the Minnesota and Red rivers. Recent creel surveys have shown that 60% of anglers on the Minnesota and 50% of anglers on the Red are fishing specifically for catfish. In addition, anecdotal information suggests that the popularity of catfish is increasing. Numerous magazine articles have promoted catfish in recent years and have also promoted Minnesota as a state with a lightly exploited, high quality catfish fishery. Doug Stange from In-Fisherman magazine, stated at the International Catfish 2000 Conference that the Red River of the North is the "Yellowstone" of channel catfish fisheries. The In-Fisherman Catfish Insider magazine lists the Minnesota River as one of the best flathead catfish fisheries in the United States. While catfish populations are currently in good shape, it would be relatively easy for anglers to over-harvest large catfish if fishing pressure increases.

Summary of Need and Reasonableness

It is necessary and reasonable to reduce the daily and possession limit of lake trout from 3 to 2. The proposed limit reduction may cut average harvest by an estimated 29%, which is necessary to reduce and maintain harvest at sustainable levels. The magnitude of the proposed change is reasonable and should be relatively easy for anglers and angling related businesses to adapt to. Lake trout are a unique resource in Minnesota and the fact that many key populations exist within the BWCAW makes it difficult or impossible to closely monitor this species. However, we do know that this species is inherently vulnerable to over-harvest and that over-harvest has occurred on a number of lakes. It is necessary and reasonable to reduce the lake trout limit to reverse this trend and protect this unique resource.

It is necessary and reasonable to reduce the daily and possession limits of crappie and sunfish from 15 to 10 and 30 to 20, respectively. The DNR has established that current limits have not been sufficient to prevent long-term, declining trends in average size for these species. It is necessary to reduce harvest if these trends are to be reversed. The proposed reductions may decrease the statewide harvest of these species by about 3 to 4% on average. This is not a big enough reduction to reverse the declining trend in size statewide, but it may help to stabilize that trend. In addition, the proposed reductions may decrease harvest by more than 3 to 4%, spread harvest over a long time period, or distribute harvest among more anglers, in lakes with exceptional fisheries or during periods when fish are highly vulnerable to anglers. It is necessary for the DNR to prevent continued reductions in average size of crappie and sunfish to prevent

the loss of the recreational value of these species. The proposed limit reductions are reasonable, because they would still allow anglers to take home more than enough fish for a large meal. It is necessary and reasonable for the DNR to balance biological and social considerations in proposing reduced limits that start to stabilize declining trends, though they may not reduce harvest enough to reverse those trends. This will allow the DNR to maintain public support for limit reductions, collect additional information once the new limits are implemented, and determine if additional reductions will be needed in the future.

It is necessary and reasonable to provide increased protection for large catfish by reducing limits for catfish over 24 inches and flathead catfish. It is necessary to have reasonable limits on flathead catfish and large catfish of both species before catfish angling pressure increases, to prevent non-sustainable harvest from depleting these species or diminishing their trophy potential. Over-harvest of large catfish could lead to the same declines in average size and trophy status that occurred for northern pike in Minnesota. These declines would take a long time to reverse, because of the long replacement time for large, old fish. The current limit of five catfish, along with the proposal to allow only one over 24 inches and only two flathead catfish is reasonable because it would still allow anglers the opportunity to take more than enough catfish home for a large meal.

It is necessary and reasonable to make limit changes on the Minnesota-Canada boundary waters that are consistent with the proposed changes on inland waters. There is no fishing reciprocity agreement with Canada and many of the Canadian fishing regulations on the boundary waters have become quite different from Minnesota regulations. Since it has not been possible to maintain fishing regulations that are consistent with Canada, it is reasonable to instead work towards having consistency between Minnesota's portion of the boundary waters and its inland waters. In addition, it is necessary to implement the reduced lake trout limit on the boundary waters to protect that species, because some of the state's most important lake trout fisheries lie on the Minnesota-Ontario border. It is reasonable to implement the reduced crappie limit on the boundary waters, because it would have the same benefits as described for inland waters.

The effective date of May 10, 2003 is reasonable because it coincides with the Minnesota fishing opener. For the species covered in the proposed rules, the fishing opener only applies to lake trout because crappie, sunfish, and catfish have a continuous fishing season. However, the May 10 fishing opener is the most reasonable effective date because it is highly visible to anglers and therefore the best time to publicize changes in fishing regulations.

OTHER CONSIDERATIONS

Review of Documents

Sources cited in this document may be reviewed on workdays between 8:00 am and 4:30 p.m. at the Division of Fisheries office in the DNR headquarters, 500 Lafayette Road, St. Paul, Minnesota.

Upon request, this document and others can be made available in an alternative format, such as large print, Braille, or cassette tape. To make such a request, please contact Linda Erickson-Eastwood, by writing to 500 Lafayette Rd, Box 12, St Paul, MN, calling 651-296-0792, or email to linda.erickson-eastwood@dnr.state.mn.us

Witnesses

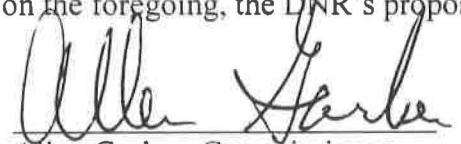
If the rules go to public hearing, the witnesses below may testify on behalf of the DNR in support of the need and reasonableness of the rules. The witnesses will be available to answer questions about the development and content of the rules. The witnesses for the DNR include:

Ron Payer, Director of Fisheries
Minnesota Department of Natural Resources
500 Lafayette, Box 12
St. Paul, MN 55112

Paul Radomski, Fisheries Research Biologist
Minnesota Department of Natural Resources
1601 Minnesota Drive
Brainerd, MN 56401

Steve Hirsch, Assistant Director of Fisheries
Minnesota Department of Natural Resources
500 Lafayette, Box 12
St. Paul, MN 55112

Based on the foregoing, the DNR's proposed rules are both necessary and reasonable.

By: 
Allen Garber, Commissioner
Department of Natural Resources

Dated: 6/12/02

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Prepared by Gerold C. Grant, Fisheries Research Biologist
December 28, 2000

Summary of Public Comments on Changes in Minnesota Fish Limits

Introduction

As part of the rule-making procedure, public comments were solicited on a proposal to change the statewide daily bag limits for fish in Minnesota. The proposal included possible reductions in daily bag limits for common Minnesota freshwater sport fish, although no specific daily limits were proposed. The initial rule-making comment period extended from October 12, 2000 to December 8, 2000. We analyzed the comments to determine the extent to which anglers support reduced limits for various species and their preferences for daily limits for each species. We also received and analyzed comments on other potential rule changes, including possession limits, size limits, gear restrictions and season lengths. In this report we present a summary of the comments received during the initial rule-making comment period.

Methods

Public comments were collected via phone, e-mail, letter, the DNR website discussion forum, and public input comment sheets which were distributed to angler groups, guides, resort communities, lake associations and other interested constituents. Each comment was read and a corresponding record was input to a spreadsheet. The spreadsheet included fields to record the respondents name, general support or opposition for reduced limits and length limits, support or opposition for reduced limits for each species, specific daily bag limit, possession limit, and length limit suggestions for each species, and other comments.

Results

During the initial rule-making comment period, the Department of Natural Resources Division of Fisheries collected 1,595 comments. Reductions in daily limits for one or more species were supported by 1,273 (79.8 %) of respondents, while 284 (17.8 %) opposed any reductions in bag limits. The remaining 2.4 % of respondents did not comment on daily bag limits, but instead offered only length limit suggestions (13 responses; 0.8 %), suggestions for specific waters (5 responses, 0.3%) and miscellaneous or vague comments (21 responses, 1.3%; Appendix A). An additional 83 comments were received before or after the official comment period. In this report we present only the comments received during the rule-making comment period.

Daily bag limits

Although most respondents supported reduced bag limits for one or more species, the amount of support for reduced limits varied widely among species (Table 1). The greatest support for reduced limits occurred for sunfish, walleye, bass and crappie. There was moderate support for reduced stream trout limits, and little support for reduced northern pike, muskie, lake trout, catfish, burbot and whitefish limits. The median suggested limits were 2/3 of the current limits for panfish, walleye, bass and crappie, and equal to the current limit for all other species (Table 1). There was a wide range of suggested limits for each species which generally ranged from catch and release (0 fish limit) to double or more the

current limits (Table 1). Ten percent of respondents suggested increasing northern pike limits

Table 1. Number of comments, number and percent supporting reduced limits, median suggested limit and range of suggested limits for each species.

Species	# suggestions	# supporting reduced limit	% supporting reduced limit	Median suggested limit	Range of limits	
					Min	Max
Walleye	1404	950	68%	4	0	8
N Pike	1253	303	24%	3	0	10
Sunfish	1316	924	70%	20	0	60
Crappie	1324	810	61%	10	0	30
LM Bass	1220	784	64%	4	0	15
SM Bass	1219	785	64%	4	0	15
Muskie	155	33	21%	1	0	nl*
Lake Trout	178	57	32%	3	1	3
Stream Trout	940	380	40%	5	0	6
Channel Cat	912	252	28%	5	0	10
Flathead Cat	862	248	29%	5	0	8
Burbot	820	134	16%	nl	0	nl
Whitefish	863	214	25%	nl	0	nl

*nl = no limit

Possession limits

Few of the respondents suggested possession limits that were different from daily bag limits (Table 2). Respondents who offered limit suggestions for walleye were most likely to suggest higher possession limits. The median suggested possession limit was equal to the current daily bag limit for walleye, sunfish and bass, greater than the current daily limit for crappie, trout and catfish, and less than the current daily limit for burbot and whitefish. The median suggested possession limits for burbot and whitefish were less than the median suggested daily limits in Table 1 because they were offered by the few who supported implementing reduced limits for these species.

Table 2. Number of possession limit suggestions.

Species	# of possession limit suggestions	% suggesting higher possession limits	Median suggested possession limit	Range	
				Min	Max
Walleye	82	6.5%	6	4	16
Pike	24	2.0%	6	3	15
Sunfish	48	4.1%	30	10	120
Crappie	39	3.3%	20	10	60
LM Bass	29	2.7%	6	3	15
SM Bass	30	2.7%	6	2	15
Muskie	0	0.0%			
Lake Trout	2	1.4%	4.5	3	6
Stream Trout	12	1.4%	6	4	10
Channel Cat	10	1.2%	10	5	200
Flathead Cat	5	0.6%	10	5	10
Burbot	1	0.1%	60	60	60
Whitefish	2	0.3%	40	20	60

Length limits

Many respondents suggested length limits of various types for many species (Table 3). The suggested length limits include minimums, maximums, slots and "1 over" rules and varied greatly, with no clear consensus on which limit would be best for each species.

Table 3. Suggested length limits for each species.

length limit suggestions	WAE	NOP	BLG	BLC	LMB	SMB	LAT	Catfish	Trout	MUE	Flathead
Total	342	175	58	67	89	90	2	11	28	30	11
2 under 12"									1		
6 under 17"		1									
1 under 24"											1
2 over 5"			1								
5 over 7"			6								
15 over 7"			1								
1 over 8"			1								
3 over 8"			1								
5 over 8"			5	1							
6 over 8"			1								
10 over 8"			1								
1 over 9"			1								
2 over 9"			1								
3 over 9"			1								
5 over 9"			1								
10 over 9"			1								
1 over 10"			3								
2 over 10"			1								
3 over 10"				2							
5 over 10"			2	2							
2 over 11"				1							
1 over 11.5"									1		
1 over 12"				3	1	1			3		
3 over 12"				2							
5 over 12"				4							
1 over 13"				1	1	2					
3 over 13"				1							
1 over 14"				6	2	2					
2 over 14"				3					1		
1 over 15"				1	4	4			2		
1 over 16"					6	6			6		
1 over 17"	3				1	1					
1 over 18"	4	1			9	9		1			1
1 over 19"	7				1						
1 over 20"	32				7	7					
1 over 21"	21	1			4	4					
1 over 22"	8	2				1		1			
1 over 23"	1	1									
1 over 24"	29	11						3			1
1 over 25"	6	5						1			1
1 over 26"	7	2									
1 over 27"	3	4									
1 over 28"	13	3									1
1 over 30"	2	28					2	2			2
1 over 32"		1									
1 over 34"		1									
1 over 36"		5									
1 over 40"		5									
1 over 44"										1	
1 over 46"										1	
1 over 48"										2	
unspecified 1 over	3	2			2	2					1
5" min			1								
6" min			2	1							
7" min			7	1							
8" min			6	5							
9" min			1	4							
10" min				11							
11" min				2							
12" min	4	1			7	7			4		
13" min	8				2	2					
14" min	35				7	5					
15" min	48	1				1					
16" min	9	1			3	3					
18" min	1	1			1	1					
20" min	1	2									
22" min		9									

length limit suggestions	WAE	NOP	BLG	BLC	LMB	SMB	LAT	Catfish	Trout	MUE	Flathead
24" min		6									
25" min		1									
26" min		2									
30" min		3									
36" min										1	
40" min										3	
42" min										1	
43" min										2	
45" min		1								4	
46" min										1	
48" min										11	
50" min										3	
0.75 lb min			1	1							
unspecified min	9	8	1	2	4	4	2	2	2	2	
7" max			1	1	3	3					
12" max				1	1	1					
14" max	1										
15" max						1					
18" max	2	1									
19" max	1				1	1					
20" max	1										
21" max		1									
24" max	1	4									
25" max		1									
26" max		1									
27" max		1									
28" max		1									1
30" max		5						1			1
0.75 lb max			1								
unspecified max	1	6	3	1	1	1			1		
6 - 9" HS*			1	1							
8 - 12" HS				1							
8 - 14" HS				1							
10 - 14" HS					1	1					
12 - 14" HS					1	1					
12 - 18" HS	1				1						
12 - 20" HS	1										
13 - 17" HS	9										
13 - 18" HS	3				1	1					
13 - 20" HS	1										
14 - 17" HS	1										
14 - 18" HS	7										
14 - 19" HS	3										
14 - 20" HS	10										
14 - 22" HS	1										
14 - 23" HS	1										
14 - 26" HS	1										
15 - 18" HS	1										
15 - 19" HS	4										
15 - 20" HS	3										
15 - 25" HS	1										
16 - 19" HS	2				1	1					
16 - 20" HS	2										
16 - 21" HS	1										
18 - 24" HS		1									
18 - 26" HS		1									
19 - 20" HS	1										
19 - 26" HS	1										
19 - 27" HS		1									
20 - 24" HS		1									
20 - 32" HS		1									
22 - 28" HS		1									
8 - 10" PS*			1								
8 - 12" PS			1								
10 - 14" PS				1							
12 - 14" PS				1							
12 - 15" PS	1								1		
12 - 16" PS						1			3		
12 - 20" PS					1	1					
14 - 19" PS					1						
14 - 20" PS					2	2					
14 - 22" PS						1					
15 - 20" PS		1									
16 - 20" PS					2	2					
17 - 19" PS	1										
17 - 25" PS	1										
17 - 26" PS	1										

length limit suggestions	WAE	NOP	BLG	BLC	LMB	SMB	LAT	Catfish	Trout	MUE	Flathead
17 - 28" PS	1										
18 - 21" PS	1										
18 - 24" PS	3										
18 - 26" PS	3										
18 - 28" PS	1										
19 - 20" PS	2										
19 - 22" PS	1										
19 - 24" PS	1										
19 - 26" PS	1										
20 - 26" PS	1										
20 - 28" PS	3										
20 - 30" PS		1									
24 - 36" PS		2									
25 - 35" PS		1									
26 - 36" PS		1									
29 - 35" PS		1									
30 - 40" PS		4									
unspecified slot	66	38	4	7	20	21		2	5		1

* HS = harvest slot; PS = protected slot

Other suggestions

Many other suggestions and ideas were offered by respondents (Table 4).

Table 4. Other comments and suggestions.

Comment:	# suggestions
General slot limits/size limits	44
More/stricter enforcement	43
Close panfish/crappie season	38
Ban NOP spearing	33
Ban/reduce netting and Indian harvest	26
Promote C & R	24
More stocking	18
Mille Lacs limits	15
Specific lake/river suggestions	14
Increase possession limit	13
Ban/restrict technology	13
Ban/reduce tournaments	12
More education	9
No size limits	8
More research/exper. regs	8
Combined panfish/crappie limit	8
Barbless hooks	7
Increase license fees	7
Protect spawning areas	6
Habitat protection/improvement	6
Study limits and revise periodically	6
Conservation license	6
Guide regulations	5
Allow perch as bait	4
Restrict fishing by dams	3
Ban treble hooks	3
Allow 2 lines per angler	3
Regulate by regions/lake categories	3
Annual limits	2
More public access	2
Close certain waters	2

Conclusions

The initial rule-making comments indicated broad support for reduced limits for one or more

species, however some species garnered more support than others. Most respondents supported a reduction in walleye, sunfish, crappie and bass limits to 2/3 their current level. Many respondents supported reduced stream trout limits, while there was little support for reduced limits for other species. Few comments were received for muskie and lake trout, suggesting there is little concern for these species. Respondents were most likely to suggest increasing limits for northern pike, probably due to the abundance of small northern pike in many Minnesota lakes. Few respondents suggested possession limits that were different from daily bag limits, and those that did typically chose possession limits that were close to current daily bag limits (which would result in little change from current possession limits).

Many respondents suggested length limits of some type, although there was no specific length limit which was clearly preferred for any species. The support for length limits suggests anglers perceive these regulations as effective, although the large variation in length limit proposals suggests that anglers have little understanding of which limits would produce the desired results. For instance, most respondents wanted to increase the size of northern pike, but some suggested minimum length limits to achieve this goal. Many respondents suggested general length limits for all species, stricter enforcement of current limits, closing panfish and crappie seasons during spawning, and banning or reducing northern pike spearing or Indian harvest to conserve fish.

Appendix A. Miscellaneous or vague comments

Make daily limit = possession
Announce fish limits will be reviewed after 5 yrs to make more acceptable
Close crappie during spawning
Increase enforcement and license fees
Lower limits for residents but not non-residents
Need more biological based regs., wants to see results of experimental reg lakes
DNR may be preparing us for lower limits in the future
Annual limits
Should look into banning NOP spearing
Sunfish anglers don't stand a chance with muskie/walleye/bass fishermen who want small sunfish, Mille Lacs quota is hocus pocus, a joke
Reduced group limit for stream trout in lakes
Reduce limits on lakes less than 500 acres to WAE 1, sunfish 10, BLC 10
Only comments on YEP
Manage each lake individually
No gill-netting, spearing or electro-shocking
No opinion, support other resorters
Allow enough weight for a fresh fish meal, get away from number per species
Wants info/ partners for snapping turtle research
Manage some water for non-game species
Rough fish are the problem, not the bag limits
Each lake should have own limit

Summary of Staff Input to Proposed Changes in Minnesota Fish Limits

The Minnesota Department of Natural Resources (MNDNR), Division of Fisheries, has sought staff input into proposed changes in fish bag limits in addition to seeking public input. The current and proposed limits for crappie, bass, walleye, northern pike, sunfish, stream trout and lake trout are shown on the input form (Appendix A).

A total of 141 staff comments were received. A summary of the responses by region is given in Table 1. The total amount of staff support (statewide) for each proposed change is shown in Figure 1. Only the respondents which clearly indicated support or opposition for each proposed change were tallied, as many respondents did not indicate a preference for one or more species. The amount of staff support for the proposed changes was generally slightly higher than public support, except the stream trout proposal, which received 43% support from staff versus 60% public support, and the northern pike proposal, which received 29% staff support and 30% public support. The second walleye option, no change, also was less supported by staff (42%) compared to the public (54%), due to higher staff support of walleye option 1 (4 daily/6 poss., 1 over 21") which was supported by 56% of staff versus 48% of anglers. Staff support for the proposed lake trout limit (2 daily and possession), proposed sunfish limit (10 daily and possession) and crappie option 1 (6 daily and possession) was much higher than public support for these changes (LAT: 90% staff versus 66% public; sunfish 62% staff versus 35% public; crappie option 1 37% staff versus 15% public). There was little difference between amount of staff versus public support for the second crappie option (10 daily and possession), the proposed bass limit (4 daily and possession).

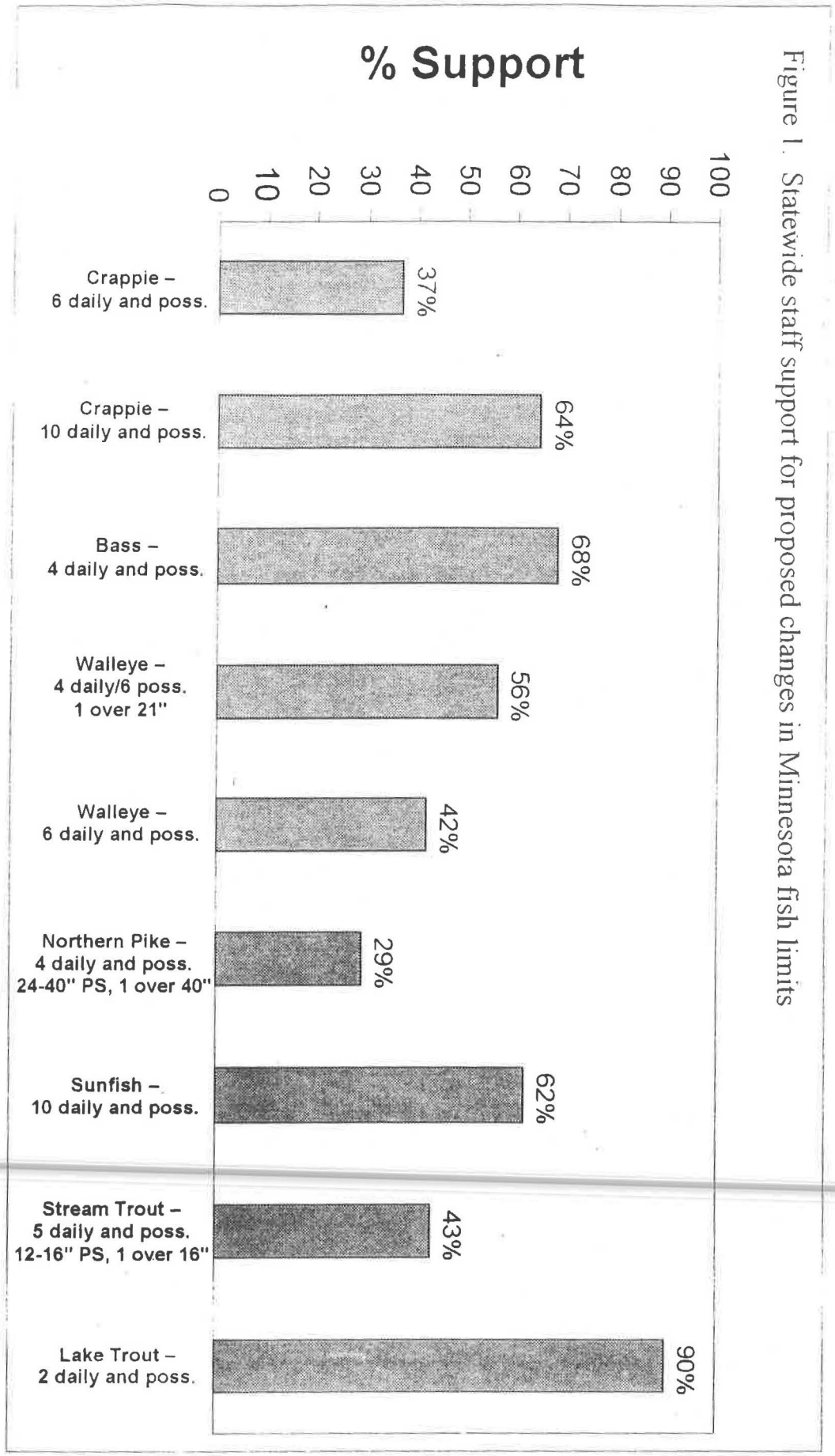


Figure 1. Statewide staff support for proposed changes in Minnesota fish limits

Appendix A

Fish Limit Changes
Public Input Meeting
COMMENT SHEET

Meeting location: _____

The Minnesota Department of Natural Resources (DNR) Fisheries Division is considering changes to limits for our major game fish species. The reasons we are looking at limits in Minnesota are:

1) Existing limits have been in place a long time. It's time to review them to see if they are adequately protecting our fisheries under current levels of fishing pressure and harvest.
2) Many anglers feel that bag limits are too high and need to be reduced to reflect the changing values of modern-day anglers.
3) Increased fishing pressure and improved angler efficiency have led to declining quality of some fish populations and we need to look for ways to reduce harvest to turn this trend around. Limit reductions may be one way to do that.

Do you support the proposed changes in limits for the following fish species?

	Yes, I support the proposed change	No, I do not support the proposed change	Suggested Alternative?
<u>Crappie, option 1</u> - proposed change: **daily/possession limit of 6**	☐	☐	_____
<u>Crappie, option 2</u> - proposed change: **daily/possession limit of 10**	☐	☐	_____
<u>Largemouth/Smallmouth Bass</u> - proposed change: **daily/possession limit of 4**	☐	☐	_____
<u>Walleye/Sauger, option 1</u> - proposed change: **daily limit of 4, possession limit of 6, only 1 over 21 inches**	☐	☐	_____
<u>Walleye/Sauger, option 2</u> - proposed: **no change**	☐	☐	_____
<u>Northern Pike</u> - proposed change: **daily/possession limit of 4, protected slot limit (no harvest) of 24 - 40 inches, only 1 over 40 inches**	☐	☐	_____
<u>Sunfish/Bluegill</u> - proposed change: **daily/possession limit of 10**	☐	☐	_____
<u>Stream Trout</u> - proposed change: **daily/possession limit of 5, protected slot limit (no harvest) of 12 - 16 inches, only 1 over 16 inches**	☐	☐	_____
<u>Lake trout</u> - proposed change: **daily/possession limit of 2**	☐	☐	_____

OTHER SUGGESTIONS OR COMMENTS (use back side if additional space is needed): _____

_____

Name (optional): _____

Address: _____

Phone: _____

Prepared by Gerold Grant April 26, 2001

Summary of Public Input to Proposed Changes in Minnesota Fish Limits

The Minnesota Department of Natural Resources (MNDNR), Division of Fisheries, has sought public comment on proposed changes in statewide limits on fish since December, 2000. The current and proposed limits for crappie, bass, walleye, northern pike, sunfish, stream trout and lake trout are shown in Appendix A. Between February 20 and March 28, 2001, the MNDNR held a series of 19 public input meetings and solicited input at informal meetings with angling groups and through media releases. Forms were passed out at meetings which outlined each proposed change and allowed the respondent to approve, dissaprove, or give alternate suggestions (Appendix A). Input was also obtained through written comments submitted via mail, e-mail, telephone, and the MNDNR web forum.

A total of 2,207 comments were received, of which 1,809 were gathered at the 19 public input meetings. A summary of the responses by meeting location is given in Table 1. Responses that were not received at input meetings (i.e. via mail, phone or e-mail) are combined in Table 1 into a miscellaneous category. The total amount of support (statewide) for each proposed change is shown in Figure 1. Only the respondents which clearly indicated support or opposition for each proposed change were tallied, as many respondents did not indicate a preference for one or more species. The highest support was for the proposed change in lake trout limits from 3 to 2 (66%) and the proposed change in bass limits from 6 to 4 (65%). The lowest support was for the proposed change in crappie limits from 15 to 6 (15%), the proposed change in northern pike limits from 3 to 4 with a 24-40" protected slot and 1 over 40" (30%), and the proposed change in sunfish limits from 30 to 10 (35%). There was moderate support for the proposed change in crappie limits from 15 to 10 (57%), and the proposed change in stream trout to include a 12-16" protected slot with 1 over 16" (60%). A higher percentage of respondents supported leaving the walleye limit at 6 (option 2; 54%) than supported changing the daily limit to 4, with 6 in possession and only 1 over 21" (option 1; 48%).

The amount of support for each species varied by region (Figures 2-10), and in general the amount of support was inversely related to the abundance of the fisheries resource in the region. For instance, stream trout regulations were least supported in Region 5, where most trout streams are located. The exception to this was proposed changes in lake trout, which were supported in Region 2 and broadly throughout the state. Anglers in Region 6 (Metro) expressed the most opposition to changing limits for all species except for northern pike, which was more strongly opposed in northern Minnesota (Regions 1 and 2), and stream trout, which was more strongly opposed in Regions 2 and 5.

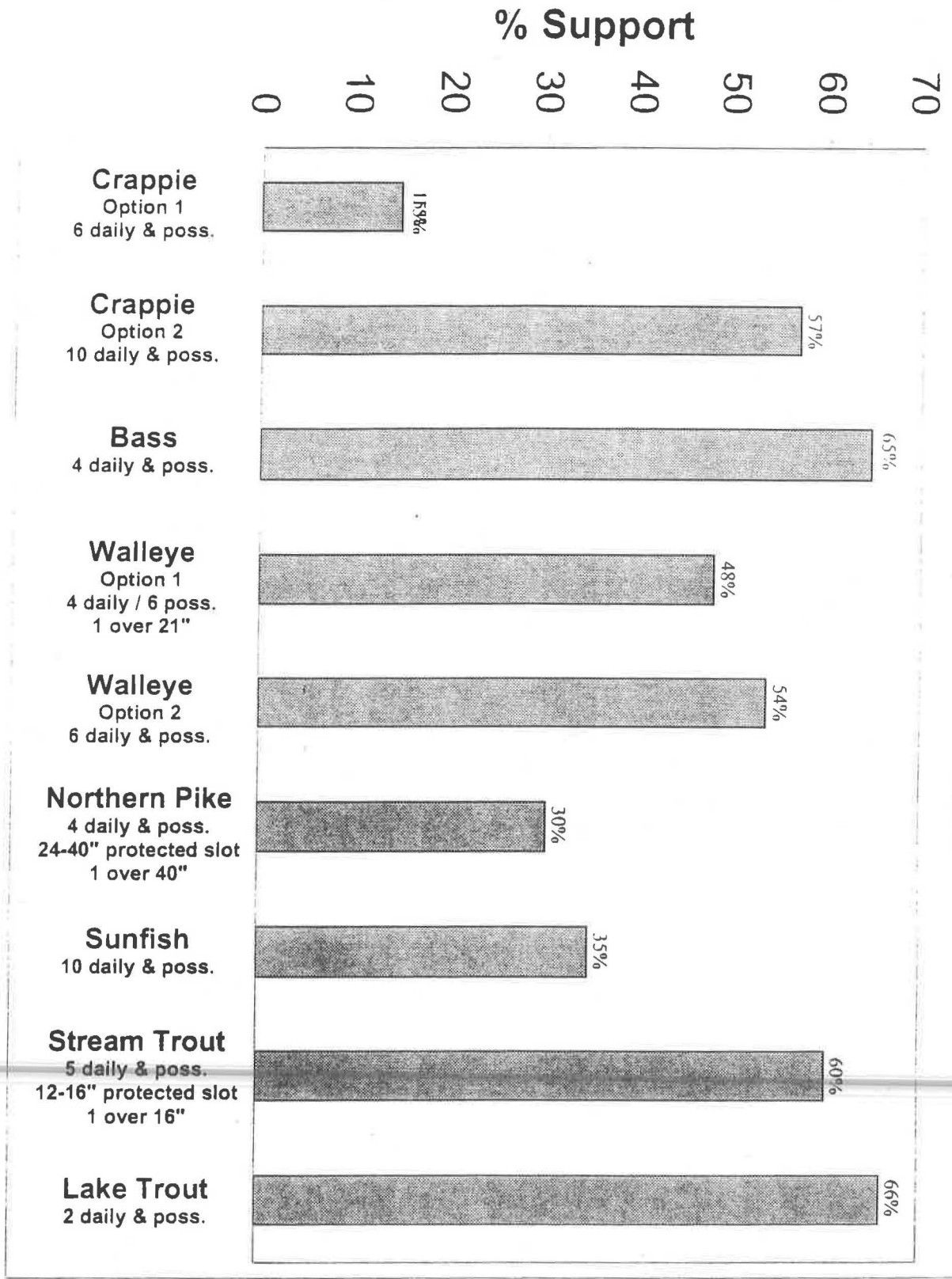


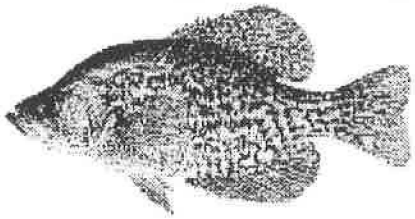
Figure 1. Statewide support for proposed changes in Minnesota fish limits.

Table 1 Number and percent of responses supporting and opposing proposed regulations by meeting location

	# Forms / Responses		Crappie Option 1 6 daily and poss		Crappie Option 2 10 daily and poss		Bass 4 daily and poss		Walleye Option 1 4 daily / 6 poss 1 over 21"		Walleye Option 2 6 daily and poss		N. Pike 4 daily and poss 24-40" PS*, 1 over 40"		Sunfish 10 daily and poss		Stream Trout 5 daily and poss 12-16" PS*, 1 over 16"		Lake Trout 2 daily and poss	
			Support	Oppose	Support	Oppose	Support	Oppose	Support	Oppose	Support	Oppose	Support	Oppose	Support	Oppose	Support	Oppose	Support	Oppose
Alexandria	241	#	22	177	119	77	147	65	112	91	72	79	41	190	52	161	113	53	110	55
		%	11.1	88.9	60.7	39.3	69.3	30.7	55.2	44.8	47.7	52.3	17.7	82.3	24.4	75.6	68.1	31.9	66.7	33.3
Bemidji	223	#	33	161	118	88	128	76	79	122	85	75	20	196	95	116	88	94	96	88
		%	17.0	83.0	57.3	42.7	62.7	37.3	39.3	60.7	53.1	46.9	9.3	90.7	45.0	55.0	48.4	51.6	52.2	47.8
Brainerd	122	#	12	88	57	50	49	59	46	53	44	39	42	66	38	69	46	29	47	31
		%	12.0	88.0	53.3	46.7	45.4	54.6	46.5	53.5	53.0	47.0	38.9	61.1	35.5	64.5	61.3	38.7	60.3	39.7
Detroit Lakes	130	#	21	96	72	43	86	34	59	58	47	48	37	88	41	87	60	39	67	31
		%	17.9	82.1	62.6	37.4	71.7	28.3	50.4	49.6	49.5	50.5	28.6	70.4	32.0	68.0	60.6	39.4	68.4	31.6
Duluth	59	#	12	36	33	15	39	9	25	22	19	19	16	33	30	21	25	23	37	15
		%	25.0	75.0	68.8	31.3	81.3	18.8	53.2	46.8	50.0	50.0	32.7	67.3	58.8	41.2	52.1	47.9	71.2	28.8
Eden Prairie	179	#	13	142	60	93	78	86	49	93	74	56	62	97	30	133	70	66	70	69
		%	8.4	91.6	39.2	60.8	47.6	52.4	34.5	65.5	56.9	43.1	39.0	61.0	18.4	81.6	51.5	48.5	50.4	49.6
Grand Rapids	133	#	9	111	66	52	62	49	33	74	55	41	19	106	52	71	51	45	62	36
		%	7.5	92.5	55.9	44.1	55.9	44.1	30.8	69.2	57.3	42.7	15.2	84.8	42.3	57.7	53.1	46.9	63.3	36.7
International Falls	48	#	11	33	30	9	43	4	21	21	16	15	14	31	34	10	35	6	38	4
		%	25.0	75.0	76.9	23.1	91.5	8.5	50.0	50.0	51.6	48.4	31.1	68.9	77.3	22.7	86.4	14.6	90.5	9.5
Lanesboro	41	#	5	28	22	15	23	14	11	25	18	14	12	27	14	22	4	34	15	13
		%	15.2	84.8	59.5	40.5	62.2	37.8	30.6	69.4	56.3	43.8	30.8	69.2	38.9	61.1	10.6	89.5	53.6	46.4
Mankato	87	#	5	69	65	21	61	20	51	30	31	31	34	49	20	64	62	12	67	9
		%	6.8	93.2	75.6	24.4	75.3	24.7	63.0	37.0	50.0	50.0	41.0	59.0	23.8	76.2	83.8	16.2	88.2	11.8
Pine City	38	#	2	29	28	8	29	6	13	17	16	9	14	18	14	21	21	5	22	6
		%	6.5	93.5	77.8	22.2	82.9	17.1	43.3	56.7	64.0	36.0	43.8	56.3	40.0	60.0	80.8	19.2	78.6	21.4
Rochester	57	#	15	34	26	26	36	18	26	26	22	22	25	25	25	30	24	25	32	15
		%	30.6	69.4	50.0	50.0	66.7	33.3	50.0	50.0	50.0	50.0	50.0	50.0	45.5	54.5	49.0	51.0	68.1	31.9
Schroeder	36	#	6	24	14	12	21	10	12	17	17	6	4	29	11	20	8	26	11	22
		%	20.0	80.0	53.8	46.2	67.7	32.3	41.4	58.6	73.9	26.1	12.1	87.9	35.5	64.5	23.5	76.5	33.3	66.7
Slayton	29	#	0	27	22	6	20	4	20	6	7	12	6	21	13	13	12	3	14	3
		%	0.0	100.0	78.6	21.4	83.3	16.7	76.9	23.1	36.8	63.2	22.2	77.8	50.0	50.0	80.0	20.0	82.4	17.6
Saint Cloud	141	#	14	104	64	49	69	48	52	57	57	40	52	71	26	100	61	28	55	32
		%	11.9	88.1	56.6	43.4	59.0	41.0	47.7	52.3	58.8	41.2	42.3	57.7	20.6	79.4	68.5	31.5	63.2	36.8
Saint Paul	81	#	11	53	32	35	31	31	32	30	31	20	36	25	30	32	41	22	34	23
		%	17.2	82.8	47.8	52.2	50.0	50.0	51.6	48.4	60.8	39.2	59.0	41.0	48.4	51.6	65.1	34.9	59.6	40.4
Tower	28	#	10	16	13	13	16	11	13	15	12	11	4	20	17	9	14	10	21	7
		%	38.5	61.5	50.0	50.0	59.3	40.7	46.4	53.6	52.2	47.8	16.7	83.3	65.4	34.6	58.3	41.7	75.0	25.0
Willmar	71	#	6	52	45	20	46	17	31	32	20	27	24	44	21	45	42	5	46	6
		%	10.3	89.7	69.2	30.8	73.0	27.0	49.2	50.8	42.6	57.4	35.3	64.7	31.8	68.2	89.4	10.6	88.5	11.5
Winona	65	#	5	51	36	24	30	30	31	29	21	27	29	30	25	35	17	41	34	15
		%	8.9	91.1	60.0	40.0	50.0	50.0	51.7	48.3	43.8	56.3	49.2	50.8	41.7	58.3	29.3	70.7	69.4	30.6
Misc	398	#	55	210	133	141	188	63	143	114	109	79	99	192	89	206	135	54	144	45
		%	20.8	79.2	48.5	51.5	74.9	25.1	55.6	44.4	58.0	42.0	34.0	66.0	30.2	69.8	71.4	28.6	76.2	23.8
Total	2207	#	267	1541	1055	797	1202	654	859	932	773	670	590	1358	677	1265	929	620	1022	525
		%	14.8	85.2	57.0	43.0	64.8	35.2	48.0	52.0	53.6	46.4	30.3	69.7	34.9	65.1	60.0	40.0	66.1	33.9

* PS = Protected slot, all fish between specified lengths must be immediately released

Figure 2



Crappie

Option 1

Daily and Possession Limit 6

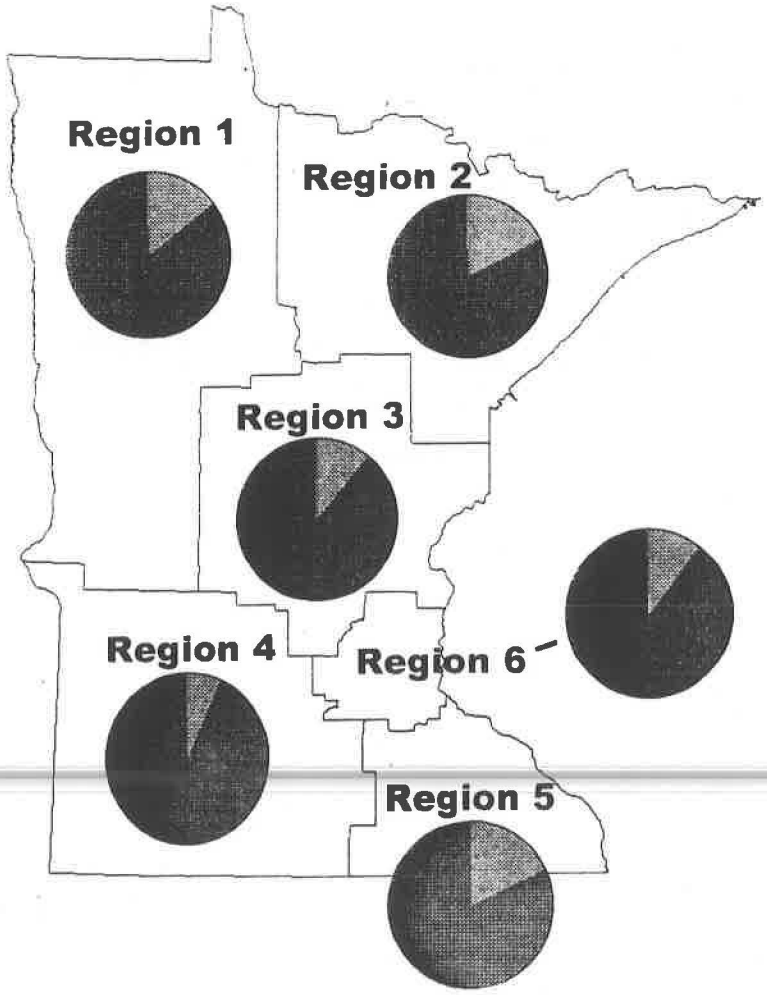
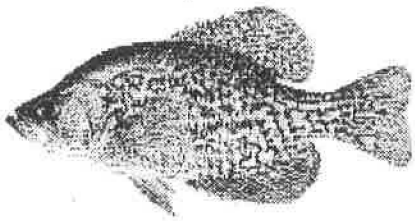


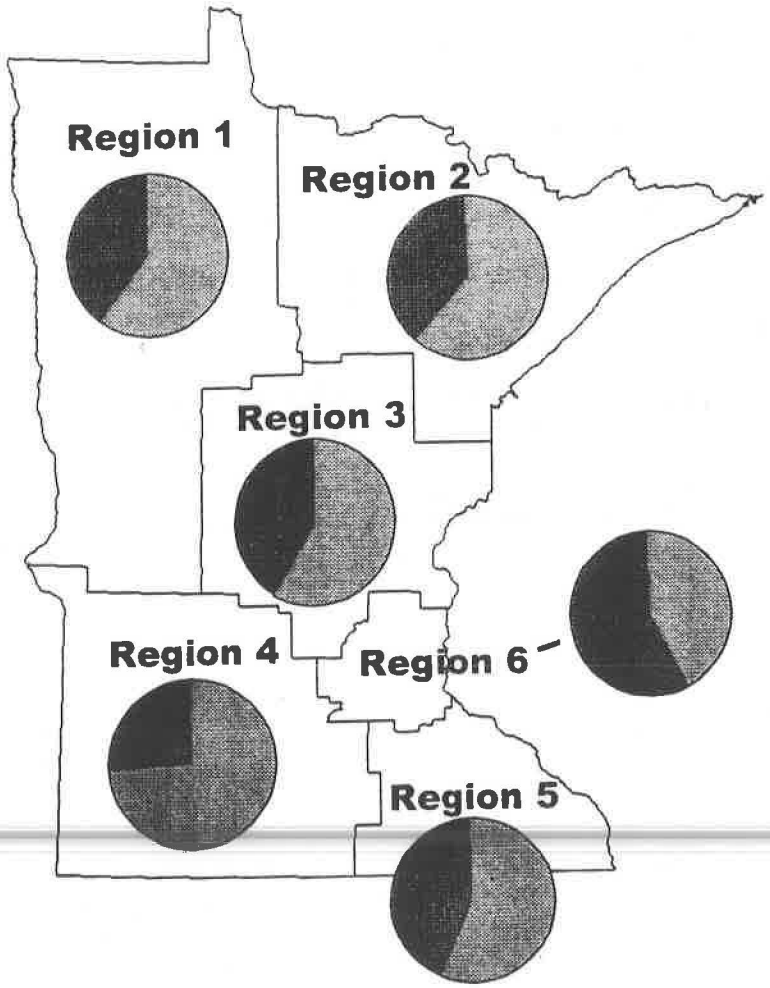
Figure 3



Crappie

Option 2

Daily and Possession Limit 10



Support Oppose

Figure 4

Bass

Daily and Possession Limit 4

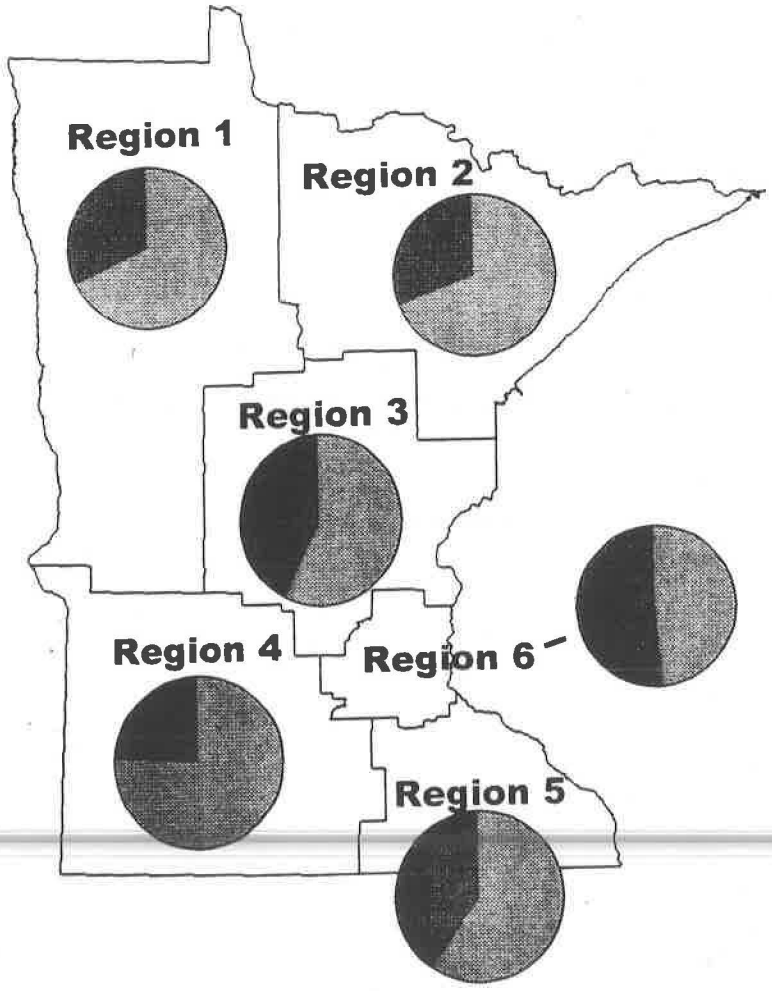
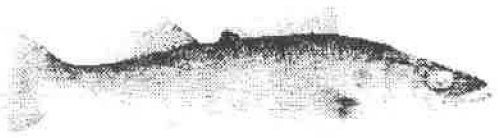


Figure 5



Walleye

Option 1

Daily Limit 4 / Possession Limit 6

1 over 21"

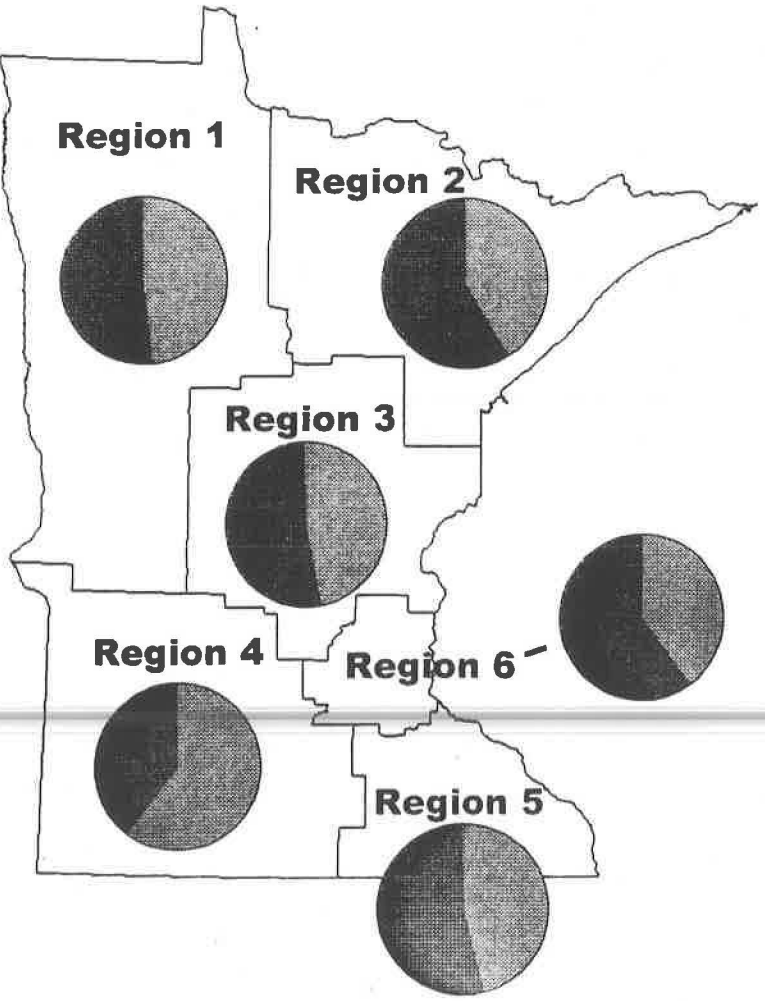
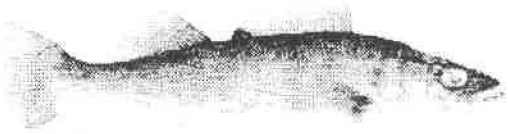


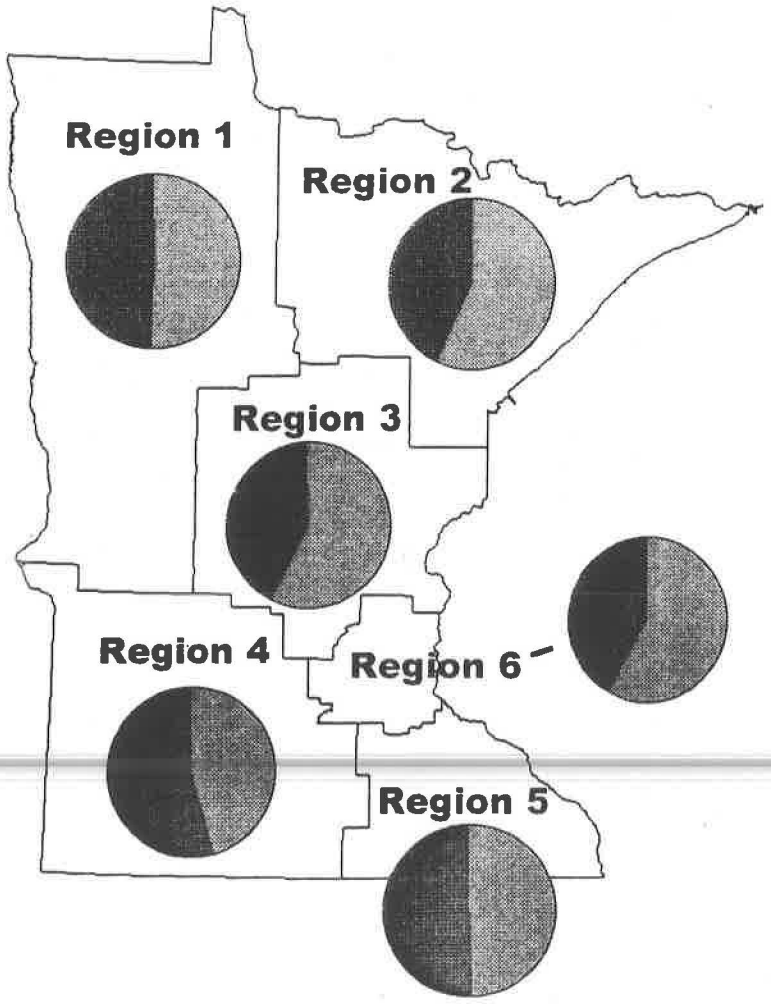
Figure 6



Walleye

Option 2

Daily and Possession Limit 6



Support Oppose

Figure 7

Northern Pike

Daily and Possession Limit 4
24-40" Protected Slot
1 over 40"

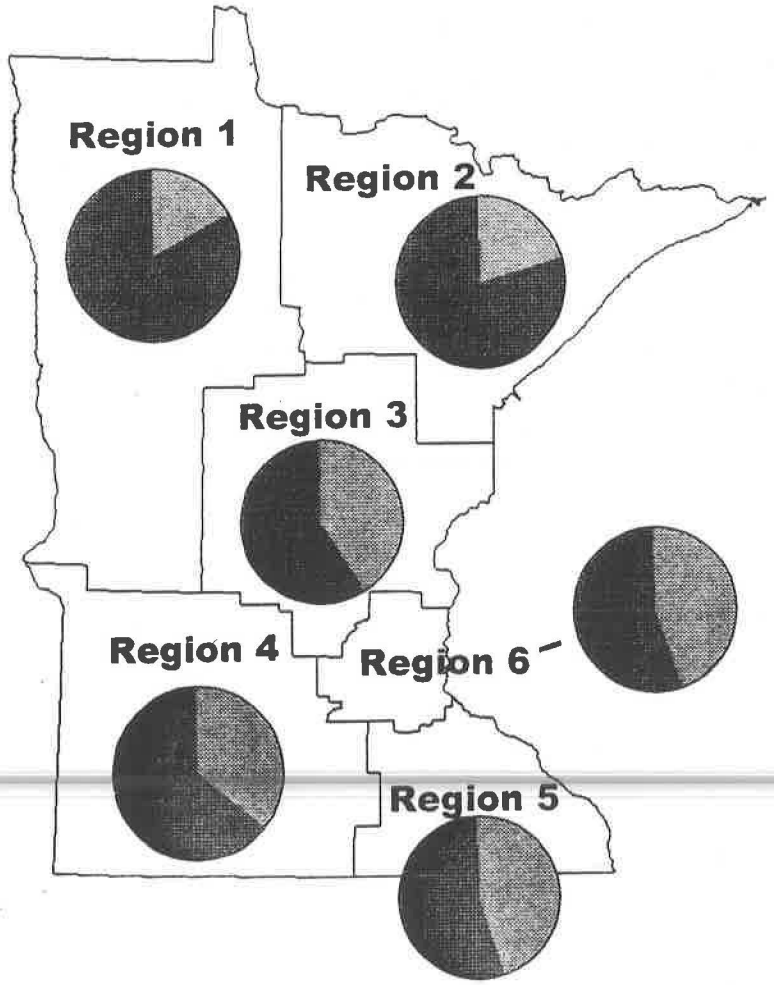


Figure 8

Sunfish

Daily and Possession Limit 10

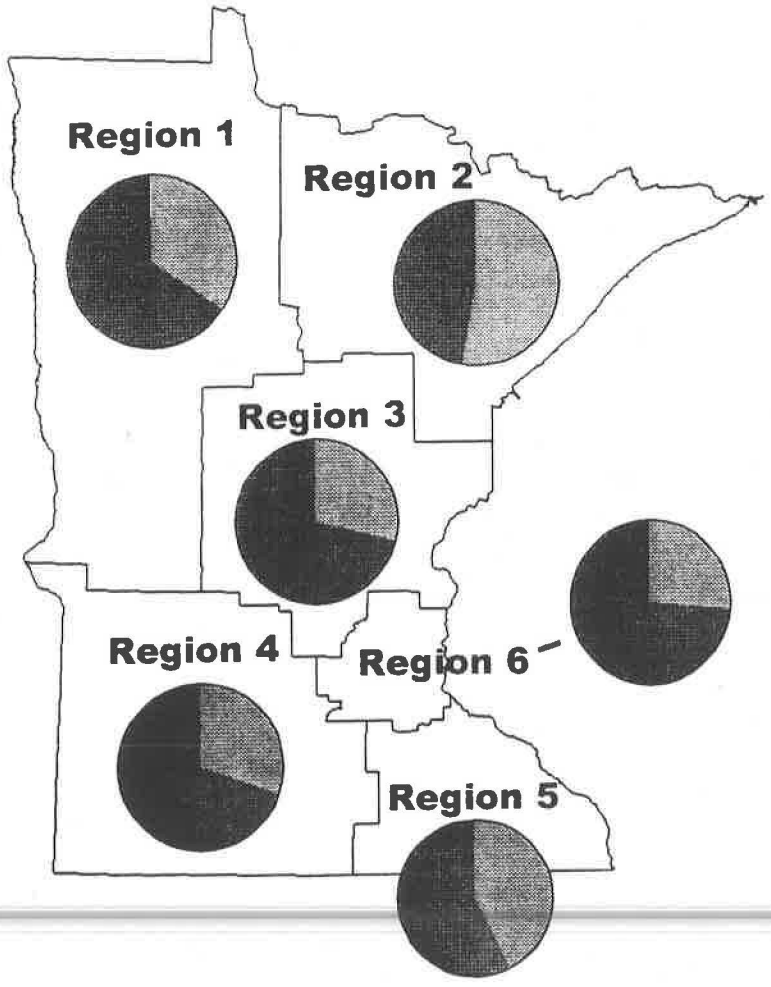


Figure 9

Stream Trout

Daily and Possession Limit 5
12-16" Protected Slot
1 over 16"

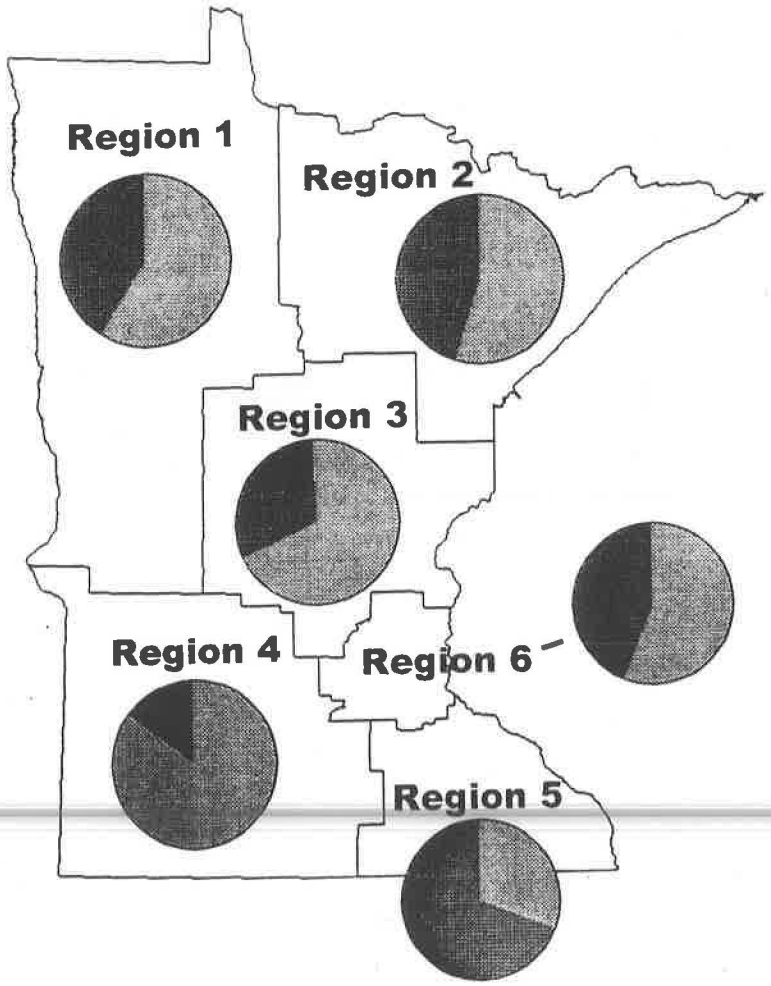
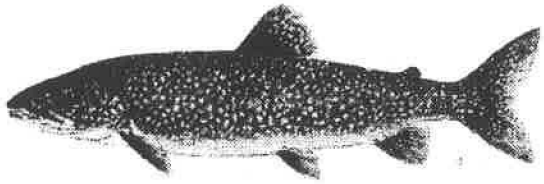
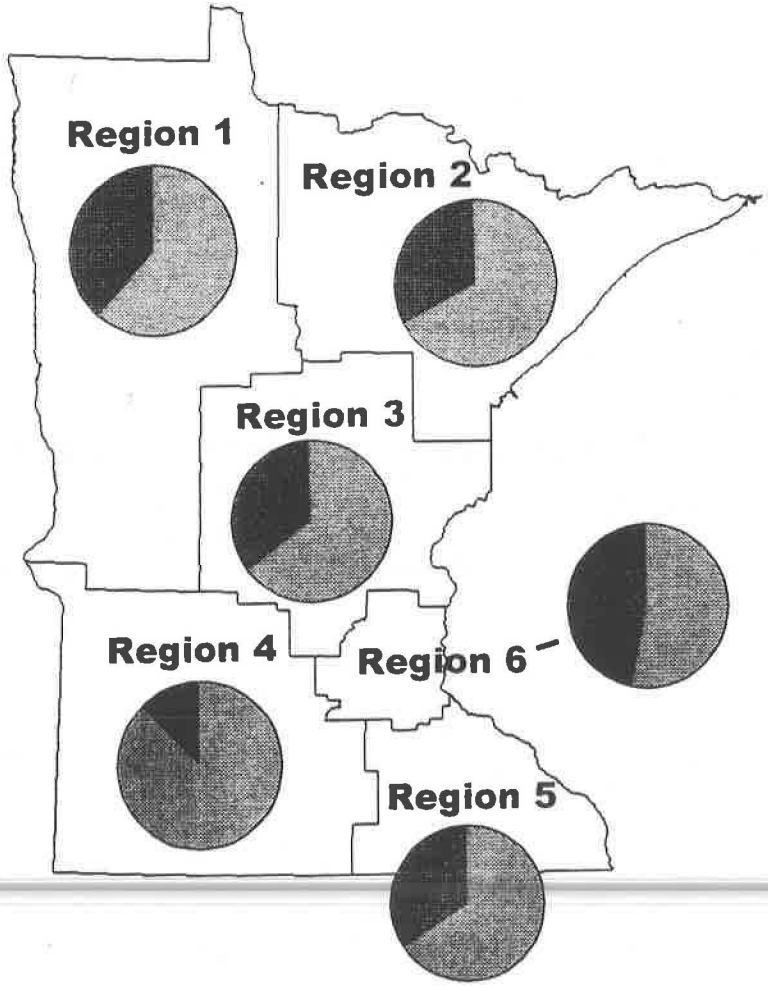


Figure 10



Lake Trout

Daily and Possession Limit 2



Managing Minnesota's Fishing

Executive Summary

April 2001

Prepared by
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and
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Minnesota Cooperative Fish and Wildlife Research Unit
University of Minnesota
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A cooperative study conducted by the Minnesota Department of Natural Resources and the University of Minnesota

Table 1: Percent respondents indicating species as "targeted."

	Metro Anglers	Outstate Anglers	Non-resident Anglers	Resort Owners
Walleye	81.0%	85.7%	82.2%	90.8%
Northern Pike	63.8%	66.0%	66.8%	88.9%
Crappie	62.2%	68.6%	43.9%	69.2%
Sunfish/Bluegills	61.5%	57.4%	42.3%	63.7%
Largemouth Bass	45.0%	33.5%	47.2%	60.6%
Smallmouth Bass	31.9%	23.6%	36.1%	8.0%
Perch	24.5%	32.0%	32.3%	40.2%
"whatever is biting"	22.7%	22.1%	22.5%	26.2%

Source: Question 1, Minnesota Angler (Appendix B), Non-resident Angler (Appendix C) and Resort Owner (Appendix D) Surveys

Motivations for Angling

- Two aspects of the angling experience commonly reported as "very important" or "extremely important" were catching fish [MA(59.0%), OA(54.6%), NR(70.0%), RO(85.4%)] and catching at least one fish [MA(60.7%), OA(57.4%), NR(73.3%), RO(85.6%)].
- Two aspects of the angling experience commonly reported as "slightly important" or "not at all important" were catching more than one different species of fish [MA(69.3%), OA(72.1%), NR(54.3%), RO(49.7%)] and keeping a trophy fish [MA(73.5%), OA(70.2%), NR(74.0%), RO(49.6%)].
- Two non-angling aspects of the overall fishing experience commonly reported as "very important" or "extremely important" were relaxing [MA(87.9%), OA(85.3%), NR(89.5%)] and enjoying nature and the outdoors [MA(88.5%), OA(85.4%), NR(89.0%)].
- The aspect of the angling experience commonly reported as "slightly important" or "not at all important" was being around other anglers [MA(69.5%), OA(69.8%), NR(63.7%)].

Overall Satisfaction

- Most respondents indicated they were either "satisfied" or "very satisfied" with their overall fishing experience in Minnesota [MA(66.2%), OA(70.0%), NR(75.0%), RO(65.6%)]. Satisfaction decreases when asked about number [MA(42.5%), OA(49.3%), NR(52.9%), RO(46.0%)] or size [MA(46.4%), OA(56.0%), NR(55.2%), RO(48.9%)] of fish, rather than the overall experience.
- Fewer, however, reported being "dissatisfied" or "very dissatisfied" with their overall fishing experience [MA(9.8%), OA(12.0%), NR(11.8%), RO(10.0%)], the number [MA(23.1%), OA(20.4%), NR(21.4%), RO(19.4%)] or size [MA(19.2%), OA(16.2%), NR(18.1%), RO(12.6%)] of fish caught in Minnesota.

Perceptions of over-harvest of various species

- Respondents were most likely to agree that Walleye [MA(50.7%), OA(45.7%), NR(41.2%), RO(50.5%)] were being over-harvested. *Percents refer to those responding "Agree" or "Strongly Agree" when asked if various species were being over-harvested*

Management Activities

- The management activities commonly considered "effective" or "very effective" were minimum size limits[MA(62.1%), OA(68.2%), NR(69.5%), RO(68.2%)], slot length limits[MA(56.9%), OA(64.5%), NR(67.7%), RO(70.5%)], maximum size limits[MA(56.7%), OA(61.2%), NR(56.6%), RO(63.8%)], more enforcement of current regulations[MA(57.3%), OA(52.3%), NR(54.9%), RO(66.0%)] and improving angler ethics[MA(59.9%), OA(56.3%), NR(58.8%), RO(69.0%)].

Source: Question 9B, Minnesota Angle, Non-resident Angler and Resort Owner Surveys

Purpose of Bag Limits

- The two most agreed upon statements regarding the purpose of bag limits were to "protect fish populations" [MA(77.4%), OA(78.5%), NR(74.8%), RO(74.8%)] and "bag limits should be based on biological impacts to the fisheries resource" [MA(71.6%), OA(69.5%), NR(79.7%), RO(77.3%)]. *Percents refer to those responding "agree" or "strongly agree."*
- Respondents were most likely to disagree with the two statements "bag limits establish a goal for how many fish to catch to have a successful trip" [MA(55.2%), OA(55.4%), NR(54.1%), RO(50.9%)] and "bag limits should reflect what anglers feel is socially desirable" [MA(51.4%), OA(41.9%), NR(46.2%), RO(51.0%)]. *Percents refer to those responding "disagree" or "strongly disagree."*

Ethics

- Behaviors considered to be ethical by anglers and resort owners included: help maintain a clean environment, NOT waste fish, NOT exceed daily bag limits, follow rules and regulations along with others. Behaviors that need not be practiced to be ethical include: NOT using new technology to improve fishing success and releasing all fish that are caught.
- All four strata had a very similar order in terms of responsibility for promoting the angling ethic in Minnesota. A large percent of respondents considered individual anglers and their families "extremely responsible" [MA(51.8%), OA(49.1%), NR(46.2%), RO(49.9%)], while many considered the state legislature "not at all responsible" [MA(23.3%), OA(21.4%), NR(16.2%), RO(17.5%)].

Conclusions

Information regarding responsibility for promoting an angling ethic and management practices can guide the creation of education/awareness programs if and when regulations change. Understanding motivations for fishing can also help focus attention on creating and enhancing aspects of the overall fishing experience that are most important to anglers in Minnesota.

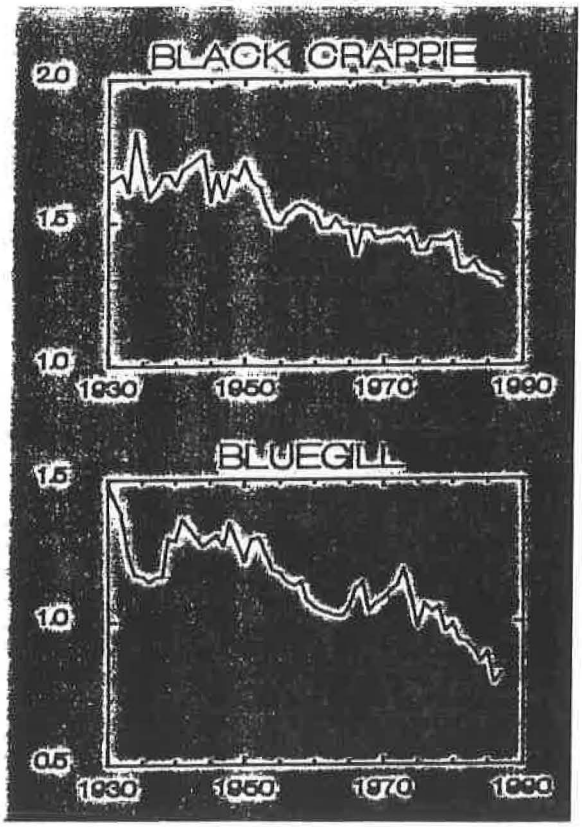
In addition, the MNDNR now has information regarding the levels at which anglers and resort owners would prefer limits to be set, minimum acceptable limits, and their perceptions as to why limits exist in the first place. The results from this survey show that respondents feel limits should play a biological role, and should *not* be based primarily on social preference. However, anglers would prefer limits to stay where they are; levels that have not been set based on fisheries science, and have no discernable biological impact. This gap represents another area where attention could be focused.

If limits are to serve their perceived purpose, biological information regarding harvest reduction should be used to revise limits. If harvest reduction is a goal, revised limits will generally be lower than what anglers and resort owners feel they can accept. With an understanding of the biology behind the limits, however, it may be possible to shift public perception and increase acceptance of regulations.

Fish Limits: A Public Discussion

Welcome. This is an outline of a slide presentation on Minnesota's discussion on fish limits.
By Paul J. Radomski
November 2000.

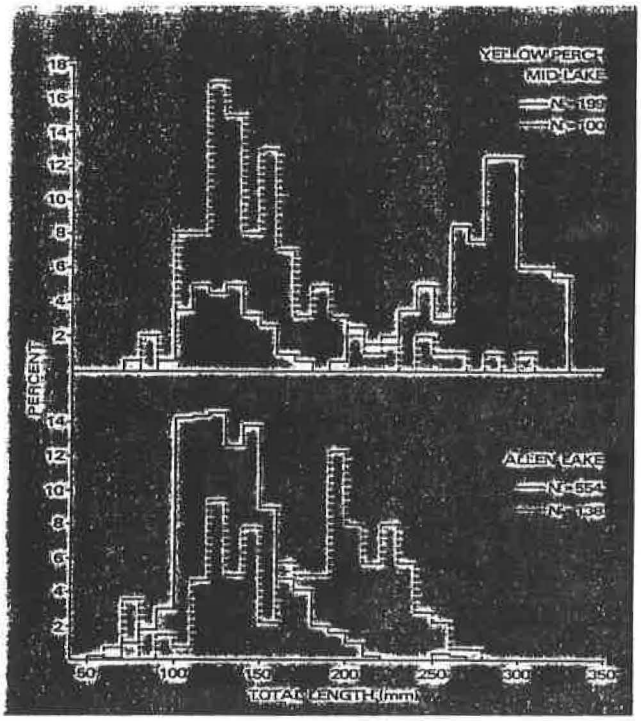
First fact. The evidence is clear. The number of large fish of some species in many water bodies has dramatically declined. But for some species this is not the case.



The mean size, in pounds, of crappie, bluegill, northern pike were shown to be decreasing. Angling is selective for the larger fish in these populations, so that in many fish populations large fish are now less numerous.

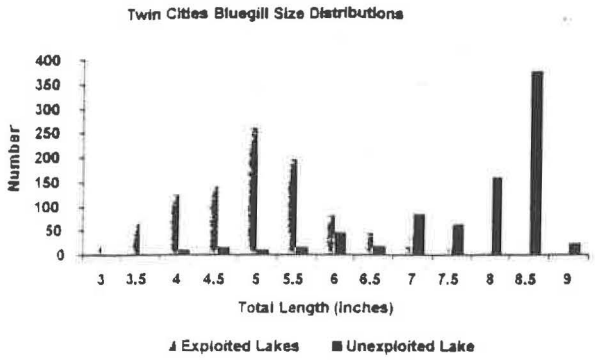
Other species like muskie, walleye, and stream trout were shown to have stable or increasing mean sizes. In fact, numerous investigations have demonstrated that the state's walleye fisheries are improving rather than declining.

Second fact. Numerous studies have shown how rapidly angling can diminish the quality of our fisheries. Yellow perch, bluegill, northern pike, and lake trout are most vulnerable to angling.

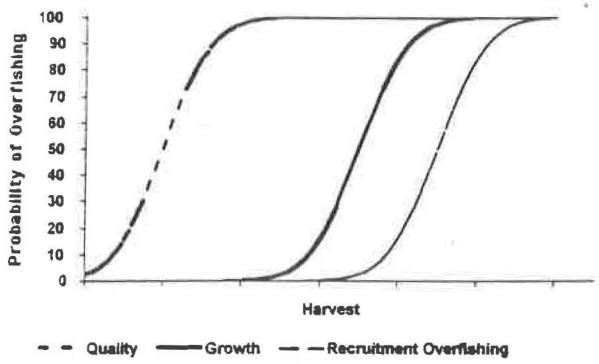


Mid Lake was closed to fishing (solid lines), and then opened to fishing with statewide fish limits. Exploitation rates (i.e., the percent of the population harvested) were substantial in the first month-even on the opening weekend-that Mid Lake was opened to angling. Over half the pumkinseeds, yellow perch, largemouth bass and northern pike were removed.

Angling effects are, however, mostly manifested in changes to size and age structure of the fish population, with some species more vulnerable than others. For example, walleye size structure appears to be fairly resilient to angling in Minnesota, but northern pike populations in many Minnesota waters have less large fish.



This graph shows the size frequency of bluegills in an unfished lake in the Metro area compared to the average size frequency of fished lakes in the area. Note that the number of large bluegills are common in the unfished lake compared to what is found in the fished lakes. This shift in size can happen quickly without much angling pressure, and it is difficult to shift the size distribution back to bigger fish.



Traditionally, overfishing is defined as high fish harvest that produces conditions of decreased harvest in weight over time. Overfishing is often put into one of two types. Growth overfishing is taking too many fish when they are too small, and recruitment overfishing is taking too many fish overall causing reductions in the number of spawners and young fish recruiting to the fishery.

Scalet et al. (1996) report that there are no documented cases of recruitment overfishing where the primary factor was sportfishing harvest. In addition, growth overfishing is rarely specifically cited with sportfisheries.

Thus, a third type of overfishing must be defined. Quality overfishing likely occurs when fish harvest exceeds the fishing-caused mortality of optimal satisfaction yield. Quality overfishing occurs at much lower fishing pressure levels than maximum sustainable yield--above which growth and recruitment overfishing occur.

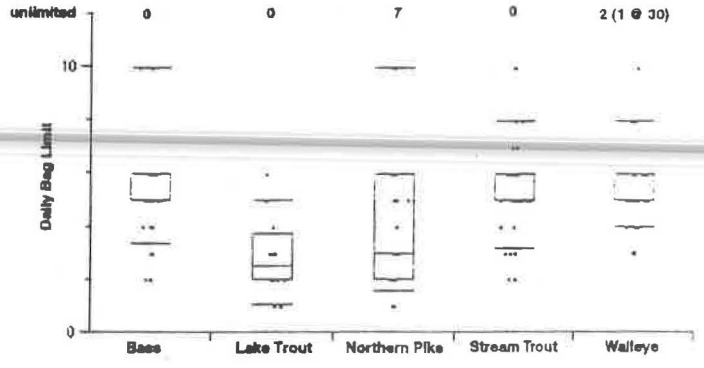
To determine optimal satisfaction yield it is necessary to quantify angler preferences, values and behavior. Without applying social science to quantify angler values, fisheries managers often fail to predict angler responses on factors dealing with fishing quality.

Since anglers generally believe that limits conserve fish population, anglers often ask the DNR to reduce limits to improve fishing.

The following must be remembered. There appears to be discrepancies between the public perception of the effectiveness of creel limits and the perception held by many fisheries biologists. Many people have a difficult time accepting one fact about fish limits, that is, if adjusted slightly downward they generally don't affect harvest Anglers tend to overestimate creel limit reduction effects.

Minnesota anglers generally believe that daily limits along with possession limits are important in conserving fish populations. However, enacting creel limits that are low enough to reduce harvest may be socially unacceptable.

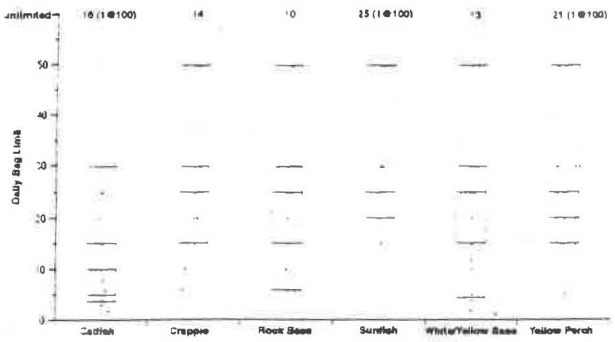
I reviewed fishing regulations across North America. You can find limits everywhere.



Box plots of limits for 54 North American fisheries agencies. Boxes represent the range where half the limits are (inter-quartile ranges), lines through

boxes the median, and lines above and below boxes represent the 90 and 10 percentiles, respectively.

The median creel limit for northern pike was 3 fish, and for walleye 5 fish.



Box plots of limits for 54 North American fisheries agencies. Boxes represent the middle 50% (inter-quartile ranges), lines through boxes the median, and lines above and below boxes represent the 90 and 10 percentiles, respectively

Yellow perch and sunfish had median limits of 25 and 50 fish, respectively. Moreover, many states and provinces do not have limits for yellow perch. A wide range of creel limits exist for catfish, crappie, rock bass, and temperate bass.

General Background

- Ubiquitous across North America
- Most limits set with no information on harvest consequences

On what criteria are creel limits based? Fisheries agencies rarely address creel limit rationale or effectiveness. Long ago, agencies presumably enacted daily creel limits to prevent occasional large catches. Today, there may be some value in creel limits since these regulations remind anglers that fish populations are finite.

General Background

- Ubiquitous across North America
- Most limits set with no information on harvest consequences
- Generally set by defining how many fish an angler can/should keep

The function of most limits are likely social in that they may be only limitations on human greed or as a gauge used by anglers to measure their fishing success. However, many fish management agencies want to set limits that produce a blend of positive social and biological consequences.

General Background

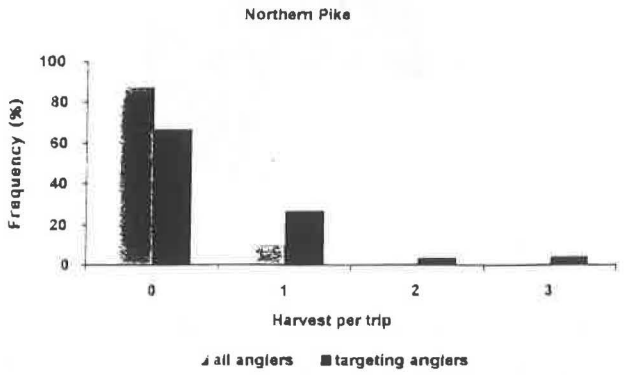
- Ubiquitous across North America
- Most limits set with no information on harvest consequences
- Generally set by defining how many fish an angler can/should keep
- Few anglers catch their limit in a day

The effect of limit reductions on harvest is a function of the size of the creel limit, the mean harvest per angler-day, and the variation of harvests among anglers. Because creel limits have historically been higher than the daily angler harvest for most anglers fishing in most waters for most species, creel limit reductions commonly proposed and implemented are generally unsuccessful in reducing angler harvest or affecting fish populations.

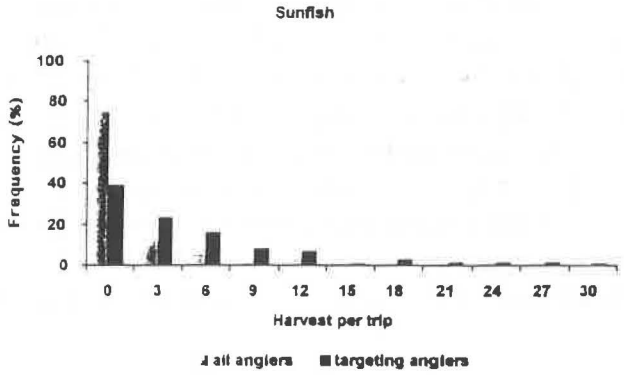
A lot of fish are caught and harvested from Minnesota's lakes and streams, and fishing is pretty good in the state. In addition, the state is fortunate to have a diverse angling population, from a huge

number of casual anglers to many highly skilled, active anglers.

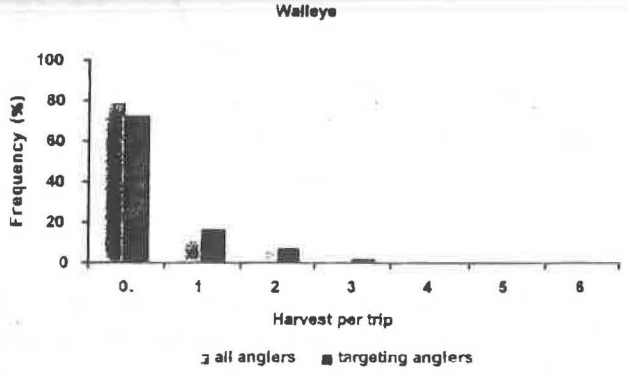
Next I will present data on the distribution of harvest. The frequency distributions of harvest per trip for Minnesota anglers is presented. These data were compiled from many creel surveys where angling parties were interviewed on the water and their catch and harvest determined.



Distribution of harvest for northern pike. Note that most anglers harvest zero fish. This is the harvest per trip distribution, I will not present the catch per trip distributions.



Distribution of harvest for sunfish. Note that most anglers harvest zero fish.



Distribution of harvest for walleye. Note that most anglers harvest zero fish.

I will present distribution of harvest for other species, including stream trout, largemouth bass, and yellow perch.

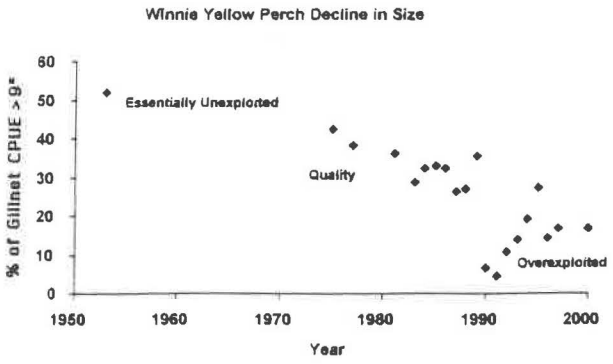
General Background

- Ubiquitous across North America
- Most limits set with no information on harvest consequences
- Generally set by defining how many fish an angler can/should keep
- Few anglers catch their limit in a day
- Limit reductions must be substantial to save significant number of fish

Recall that the amount of total harvest reduction is a function of the size of the creel limit, the mean harvest per angler-day, and the variation in harvest among anglers. Substantial reductions in existing creel limits would likely be necessary to reduce total harvest in Minnesota.

The next several graphics illustrate total harvest reduction predictions resulting from lower creel limits. Two methods are used. The first is simple censoring or truncating of harvest per trip distributions for Minnesota anglers. This method predicts harvest reduction by determining the number of anglers that a reduced limit would affect and how many fish they would have had to release.

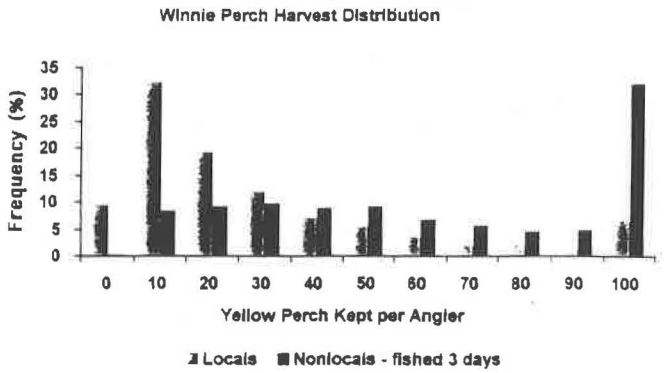
Truncating creel distributions to a reduced creel limit likely overestimates the harvest reduction because it assumes that fish density does not benefit from reduced harvest limits and angler dynamics do not change (e.g., more anglers come to fish the fish 'saved' by the reduced limit, or the fish 'saved' are redistributed to existing anglers). However, this analysis gives some insight into the possible consequences of creel limit reductions.



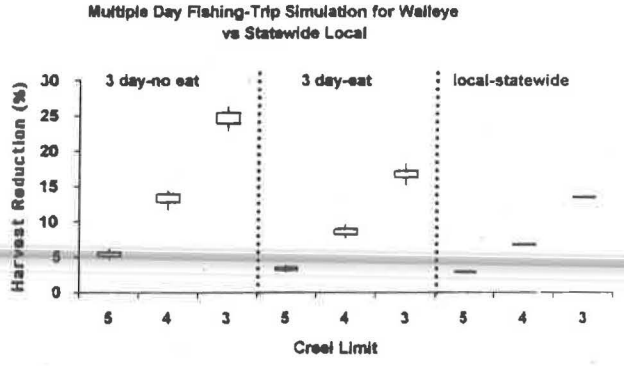
The problem with the Winnie perch fishery is demonstrated with this graph. The percent of yellow perch greater than 9 inches in the experimental gillnets has decreased from 52 percent in 1953, which is essentially unexploited population, to about 15 percent in the 1990's. A corresponding decrease in condition for 8 inch yellow perch was found, and also troubling, was an observed increase in the production of small perch due to the removal of large fish . The increase in the number of small perch has meant leaner young fish due to competition for food. These phenomena are often seen with high rates of fish harvest.

The exploitation rate was 67% for Winnie 7-9 year-old perch (fish greater than 9 inches). That is, anglers remove two-thirds of the yellow perch greater than 9 inches every year. An estimate of the rate of exploitation that would likely assure that large perch existed in this fishery and in the angler's creel is 38% (a little more than one-third of the fish greater than 9" may be removed, given their population characteristics, in a sustainable way). Therefore, it appears that to maintain or sustain a high quality perch fishery in Winnie that a 40% reduction in harvest numbers is needed.

Limit reductions on Winnie and other lakes may be effective because anglers accumulate perch over multiple-day stays. Reduced limits will likely reduce harvest because many anglers will be affected by a reduced limit.



Nonlocals are in the majority for the Winnie yellow perch winter fishery. The graph shows the perch harvest per trip distribution for locals compared to nonlocals who generally stay for 3 days. The data are mean values based on 3 winter creel surveys. The frequency of nonlocal anglers that leave for home with their limit depends on winter conditions, but the values ranged from 8 to 60% (some unsurveyed years where harvest conditions were better likely had higher percentage of nonlocals leaving for home with their limit of perch).



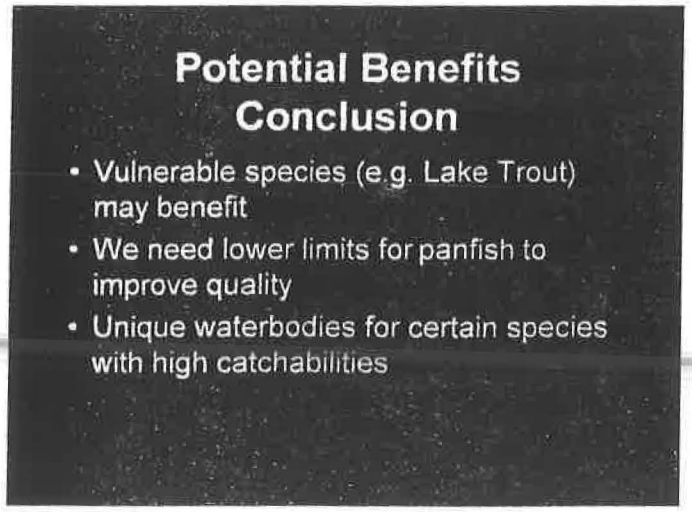
It was predicted that perch limits less than 25 in this situation would likely have high confidences of success in reducing harvest.

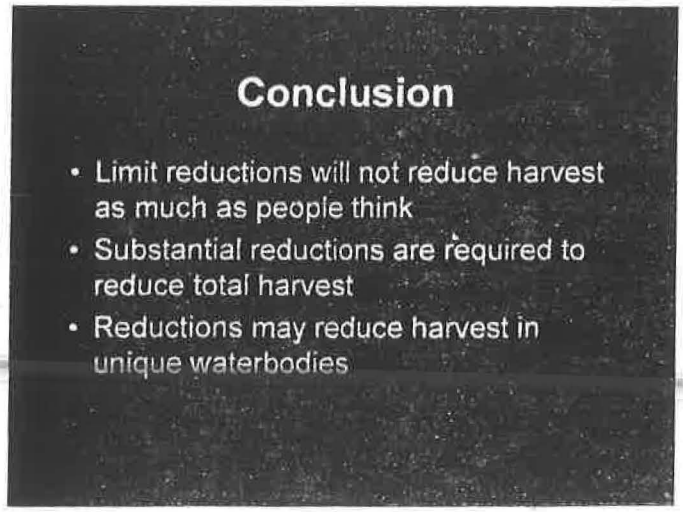
Could other cases exist where lower creel limits may reduce harvest, like they may with Winnie

perch? I simulated the consequence of limit reductions for walleye where anglers could accumulate fish over time, like that of a several day stay at a resort. I used a model similar to the Winnie perch model.

The above graph compares harvest reductions with 5, 4, and 3 fish limits with different assumptions or realities. The three assumptions are1) anglers accumulate fish but are not eating fish, 2)anglers accumulate fish but eat fish if they harvested them so that they may continue fishing, and 3)previously presented results which assumed no accumulation of fish to a limit over several days. It was predicted that limit reductions would have a higher effect on harvest reduction than noted previously, but if anglers are giving fish away or eating fish during their stay, creel limits of 5 down to 3 would have little effect on reducing total harvest. This is so because harvests are not likely constrained.

Harvest reductions due to creel limits are greater when anglers have a high chance of accumulating fish up to the limit. Do anglers find ways to keep fishing if they are lucky to accumulate their limit? If they do, and there are many legal ways, then the likelihood that the angler accumulates fish up to the limit or a reduced limit will be low and harvest will not be reduced as much.





The end.