NA-01570-01

LAKE MANAGEMENT PLAN

Region	Area	D.O.W Number	County	D.O.W. Lake Name	Acreage
II	250	69-0841	St. Louis	Pelican	10945

Long Range Goal:
A healthy, self-sustaining fish community with northern pike abundance near 10 per gill net (historical average abundance) with a mean length >21 inches. Largemouth bass RSD-P should be greater than 20 and smallmouth bass RSD-P should be greater than 10. Bluegill trap net abundance should be greater than 3.2 and black crappie abundance should be greater than 2.6 (Lake Class 7 medians).

Operational Plan:

- Do a fish population assessment in 2012 using 15 gill-net lifts, 24 trap-net lifts, ice-out trap netting for northern pike and spring electrofishing for bass. Standard trap netting should be done in June to improve centrarchid catches.
- Determine sex of northern pike in summer assessments and surveys to aid growth analysis. Take walleye otoliths for age determination.
- Do a full lake survey in 2016 using the above methods to provide information for the regulation evaluations.
- Do an open water creel survey in 2016 to provide updated information on angler demographics, angling pressure, harvest and catch.
- Evaluate the experimental regulations for northern pike and bass in 2017.

Midrange Objective: Monitor the size structure of northern pike for continued growth into the larger size classes. Though abundance of medium sized pike has increased under the slot limit, few fish over 32 inches were sampled in 2007. Recruitment of more fish into the larger size classes (>32 inches) will provide evidence that the regulation is meeting objectives. Monitor northern pike growth.

Potential Plan: Do a shoreline habitat survey to identify critical habitats. Work with local units of government (City of Orr and St. Louis County) to protect natural shorelines. Consider doing the next creel survey for two consecutive years (2016 and 2017).

TOTAL $

NARRATIVE: (Historical perspectives - various surveys; past management; social considerations; present limiting factors; survey needs; land acquisition; habitat development and protection; commercial fishery; stocking plans; other management tools; and evaluation plans)

(see additional pages)

Check the appropriate boxes below:

- ☐ BWCAW
- ☐ Superior National Forest
- ☐ Chippewa National Forest
- ☐ Leech Lake Indian Reservation
- ☐ 1854 Ceded Territory
- ☐ 1837 Ceded Territory
- ☐ Fond du Lac Indian Reservation
- ☐ Voyageurs National Park

Primary Species Management:	Secondary Species Management:	
Northern Pike, largemouth and smallmouth bass	Black crappie, bluegill, walleye	
Area Supervisor's Signature:	Date 4/1/08	
Regional Manager's Signature:	Date 5/20/08	

NARRATIVE:

Pelican Lake is located near Orr, Minnesota on the extreme southwestern edge of the Canadian Shield and borders the ancient basin of glacial Lake Agassiz. Pelican Lake drains an area of 62 square miles with numerous inlets. The outlet provides the initial source of flow for the Pelican River, which empties into the Vermilion River on its way to the Rainy River and Hudson Bay.

Pelican is a Class 7 lake with a total surface area of 10,945 acres and a maximum depth of 38 feet. However, much of the lake is relatively shallow; fifty-four percent of the total surface area is less than 15 feet deep and the average depth is approximately 10 feet. The waters of Pelican Lake are more fertile and productive than most other lakes in Northeastern Minnesota.

Submerged aquatic vegetation is prolific and algae blooms usually occur in late summer. Wild celery, coontail, northern watermilfoil and various pondweeds were the most common species noted in the 1998 aquatic vegetation survey. Scattered stands of bulrush and wild rice were also present in 1998. Purple loosestrife was observed at Pine Acres Resort and near the outlet. Rubble, boulder, gravel, sand, muck and detritus were the dominant substrates. Excellent spawning conditions were reported for smallmouth and largemouth bass, walleye, yellow perch and panfish. Spawning habitat for black crappie and northern pike was described as good.

In 1938 a concrete dam with stop logs was built on the outlet of Pelican Lake at County Road 23. The normal ordinary high water level was determined to be 1288.4 feet above mean sea level. In 1946, all stop logs were permanently fixed in place and the run out was set at 1287.4 feet above mean sea level. Plans were developed in 1998 to replace the aging structure. A new dam was installed in 2002 at the same elevation of the original control structure. The new dam contains a "fish passage window" twelve inches below the top of the weir to improve fish passage and provide flow to the Pelican River. Subsequent investigations indicate the dam has settled or was not installed to the proper elevations. See the DNR Division of Waters Hydrologic and Hydraulic Re-analysis of the Pelican Lake Outlet Dam for more information.

Various surveys

Pelican Lake has a long history of fisheries assessments dating back to the 1930's. A 1943 report entitled "Notes on Pelican Lake with reference to closing the winter fishery" by Kenneth Carlander reported angler catch rates from 1939 through 1943 for both winter and summer angling. This report contains references to fish collections made in 1936, but the initial survey was completed in 1946 by the Bureau of Fisheries Research. Re-surveys were done in 1959, 1971, and 1998. Fish population assessments were done in 1974, 1977, 1980, 1986, 1989, 1992, 1995 and 2001. Ice-out trap netting was done in 1998, 1999, 2000 and 2001 to sample northern pike. Spring electrofishing was done in 1995, 1996, 1998, 1999, 2000, and 2001 to sample largemouth and smallmouth bass. Summer angling creel surveys were completed in 1993 and 1994. Reproduction checks were made in various years from 1972 through 1990. Vegetation surveys (transects) were done in 1971 and 1989.

The initial survey in 1946 reported 14 different species that were sampled with gill nets, trap nets, and seines; including northern pike, white sucker, rock bass, largemouth bass, pumpkinseed sunfish, black crappie, yellow perch, darters, sculpins and various other minnow species. The gill net CPUE for northern pike was 3.6 and their mean length was 23.5 inches. Black crappie and yellow perch were abundant with gill net catch rates of 24.2 and 28.6 respectively.

The 1959 survey added walleye, smallmouth bass, brown bullhead and bluegill to the species list for Pelican Lake. Northern pike abundance increased to 7.7 per gill net. Yellow perch abundance of 98 per gill net was the

highest ever reported. Black crappie trap net catches declined to 3.4 per lift. Brown bullheads were sampled by seining, but not in gill nets or trap nets.

Many changes were observed in the fish community in the six investigations that occurred in the 1970's and 1 980's. Muskellunge were reported for the first and only time in 1971. Black bullhead were first reported in 1 986 at a record high 130 per gill net, but then steadily declined. The brown bullhead population expanded slightly and then stabilized at an average of 8.7 per gill net. Northern pike abundance increased, posting a record high 17.2 per gill net in 1989. Yellow perch abundance declined in the 1970's to an average of 28 per gill net; then declined further to an average of 9 per gill net in the 1980's. Walleye abundance was low during this period, averaging one per gill net. Black crappie trap net catches ranged from 1.5 to 8.3, showing variable recruitment. Bluegill numbers remained low throughout the 1970's, but increased sharply to 20 per trap net in 1 986. Bluegill growth slowed as abundance increased. Rusty Crayfish, an exotic species was first reported from Pelican Lake in 1989.

The fish community showed signs of returning to earlier levels of abundance in the three investigations conducted in the 1990's. Northern pike abundance returned to historical levels, averaging 9.1 per gill net for the decade. Yellow perch abundance rebounded slightly to an average of 16.6 per gill net. Bluegill trap-net catches declined to levels observed in the 1970's. Little or no bluegill and largemouth bass recruitment occurred in the cold summers of 1992 and 1993. Black and brown bullhead catches declined to low levels. Black crappie and walleye abundance was similar to previous observations. Spring electrofishing produced the first good samples of the bass population. Largemouth Bass PSD was 87 and RSD (15") was 35.

Northern pike, yellow perch, and black crappie once again dominated the net catch in the 2001 population assessment. Northern pike abundance of 9.9 per gill net was similar to the long-term mean for Pelican Lake and well above the third quartile of 3.6 for similar lakes. The mean length in gill nets increased from 18.3 inches in 1998 to 20.3 inches in 2001. Yellow perch gill-net CPUE increased to 26.6, which was above the third quartile of 7.1 for Class 7 lakes and similar to the long-term mean for Pelican Lake. Black crappie trap-net CPUE of 6.0 was above the third quartile of 3.3 for similar lakes. Bluegill abundance in trap nets was near the median of 3.2. This is similar to levels observed on Pelican Lake since 1971, except 1986 – 1992 when abundance was twice the third quartile of 8.7 per trap net lift. Black and brown bullhead gill-net catches remained low at 3.6 and 5.9 per lift respectively.

The abundance of most fish species found in Pelican Lake continued on increasing trends in the 2007 fish population assessment. Black and brown bullhead were the exception, continuing a decade long decline. Generally, growth and size structures also showed improvements. Black crappie trap-net abundance of 8.05 per net was the second highest level reported for Pelican Lake. Several strong black crappie year-classes were present (from age-1 to age-9). Bluegill trap-net abundance of 7.91 per net was the highest level observed since 1992. Spring electrofishing set new record high catch rates for largemouth and smallmouth bass, 54 and 64 per hour (on-time) respectively. The size of bass in the sample was impressive; largemouth bass ranged from 3.7 to 19.3 inches and smallmouth bass from 2.5 to 20.2 inches were sampled. Northern pike abundance increased to 22.2 per gill net set, which was more than twice the long-term average of 10.0 per gill net. The average length of northern pike in the gill-net sample increased from 18.3 inches in 1995 to 21.7 inches in 2007. Walleye abundance increased to 2.1 per gill net, with an average length of 19.8 inches. Nine walleye year-classes were present in the sample, ranging from 2 to 21 years old. Yellow perch abundance increased to 44.3 per gill net set, the highest level observed since 1959.

The creel surveys done in 1993 and 1994 provided estimates of open water angling pressure harvest and catch rates, as well as angler demographics. Angling effort was significant for a lake this size, estimated at 150,000 hours per season or 14 angler-hours per acre. The survey found that most of the angling pressure was from non-local anglers staying at Resorts on Pelican Lake. Northern pike, black crappie, largemouth bass and bluegill

were the species sought most often by anglers. Northern pike provided the greatest harvest in pounds, but more bluegill were caught and harvested than any other species. Bluegill anglers enjoyed the highest catch and harvest rates. A comparison of mean length of harvested and released fish (all species) showed that anglers tended to release smaller fish and harvest larger ones. Northern pike harvested in 1994 ranged from 14.5 inches to 32.2 inches, with a mean length of 22.9 inches. The mean length of harvested bluegill and largemouth bass was 7.1 and 15.2 inches respectively.

A creel survey was done during the open water-angling season in 2007, which showed a decline in both angling effort and harvest. The creel survey followed the methods used in previous creel surveys, except that estimates of boat-hours were based on instantaneous counts of fishing boats made by a pilot flying over Pelican Lake. Previous surveys derived instantaneous boat counts from a boat on the water. The total estimated fishing effort in 2007 was 88,693 hours or 8.1 angler hours per acre. Anglers released most (80%) of the fish they caught and harvested 22,139 pounds, or 2.0 pounds per acre. While angling pressure and harvest declined, catch rates for most species increased. Angler demographics looked similar to earlier creel surveys. Most anglers were seeking panfish, followed by northern pike, bass, and walleye. Non-local anglers dominated the fishery, with more than half coming from other states.

Past management

The 1946 survey reported stocking of trout, whitefish, walleye, crappie, sunfish, northern pike and bass between 1908 and 1942. Small quantities of sunfish, crappie, rock bass, largemouth bass and northern pike were stocked during the 1950's and 1960's. Some of these fish apparently came from "winter rescue" operations on other lakes. Muskellunge fry were stocked in 1965 and 1966. Six million walleye fry were stocked in 1991 and again in 1992. Subsequent fish population assessments did not show any increase in walleye abundance that could be attributed to the 1991 and 1992 stocking events.

Spawning beds were posted (closed to angling) from 1944 through 1958. Pelican Lake was closed to winter spearing from 1944 through 1951 and winter angling was closed from 1944 through 1948 due to concerns about high angling pressure and harvest directed at black crappie.

Concerns about the quality of the northern pike fishery began to surface in the late 1980's. The Orr Chamber of Commerce was "very concerned about the abundant small northern pike and the lack of large fish". These concerns led to a voluntary "catch and release" program sponsored by the Pelican Lake Resort Association and the DNR during the late 1980's. Anglers were encouraged to release northern pike over 24 inches, largemouth bass between 12 and 16 inches and bluegill over 7 inches in length. The objectives were to improve fishing quality and promote a balanced fish community by increasing abundance of large predators. The program never really caught on, as documented in the 1993 and 1994 creel surveys.

Experimental regulations for northern pike and bass were implemented on Pelican Lake in 1998. Protected slot length limits required the immediate release of all northern pike from 24 to 38 inches and all bass (smallmouth and largemouth) from 14 to 20 inches. Anglers were allowed to keep one fish over the upper end of the slot in a possession limit. The primary objective was to improve and maintain the size structure of the northern pike and bass population. The secondary objective was to improve angler catch rates of large fish and provide indirect benefits to the fish community by increasing the abundance of large predators. A public input meeting was held on the proposal in Orr and was lightly attended. Those who attended the meeting supported the proposal, as did the Pelican Lake Resort Association.

Local opposition to the new regulations began to surface soon after the slot limits were implemented on the 1998 fishing opener. Some anglers said that they did not know about the proposal or that their input wasn't considered. Others complained that the northern pike slot limit benefited the tourism industry at the expense of

local anglers. Anglers who liked to spear northern pike on Pelican Lake were concerned about how the new regulation would affect their sport. A petition with approximately 600 signatures "opposing the slot restrictions imposed on Pelican Lake...." was delivered to the Area Fisheries Office later that same year. Subsequent meetings with all stakeholders and another round of public comments led to a modified northern pike regulation (24" to 32" protected slot), which was implemented in 2000.

The experimental regulations for northern pike and bass were reviewed in 2007 prior to the March 1, 2008 expiration date. The size structure of the northern pike population improved while the size limits were in place. The average length of northern pike in the summer gill-net sample increased from 18.3 inches in 1995 to 21.7 inches in 2007. The proportion of northern pike over 24 inches in the summer gill net sampling also increased; from approximately 15% in the 1980's and 1990's to approximately 30% in 2007. The size structure of the largemouth and smallmouth bass populations also improved. A public meeting was held in Orr, Minnesota on October 25, 2007 to present the results of the evaluation and listen to public comments on the future of the regulation. Opinions expressed at the meeting were mixed. Most people were in favor of managing Pelican Lake for larger sized northern pike, but this did not necessarily result in support for the regulation. A total of 43 comments were received during the comment period. Approximately half of those who commented (23) expressed support for continuing the regulation. The remainder was split evenly between dropping the regulation altogether and modifying it in some way. Most of the opposition was from northern pike spearing enthusiasts. The Pelican Lake Association supported continuing the regulations. A petition (132 signatures) called for extending the current regulation or expanding the northern pike slot limit to 24 to 36 inches. Pelican Lake anglers were asked their opinions of the regulations during the 2007 creel survey. Eighty-one percent of the 929 parties interviewed supported continuing the regulations for northern pike and bass. Ultimately, the bass regulation was extended as is and the northern pike regulation was modified to a 24 to 36 inch protected slot. Both regulations will remain in place until March 1, 2018.

Social considerations

Pelican Lake provides economic benefits and recreational opportunities for local residents and the people who visit the area. The community of Orr is located on its eastern shore. Twelve resorts and 261 private homes and cabins were reported in the 1998 survey.

Local residents and lakeshore property owners have expressed concerns about low lake levels since the outlet control structure was replaced in 2002. St. Louis County replaced the control structure as part of a bridge replacement project on County Road 23 and owns the structure. The Minnesota DNR Division of Waters (DOW) held a public meeting in Orr in 2007 to share information and listen to public concerns about low lake levels. Persistent droughts in 2006 and 2007 in Northeastern Minnesota have exacerbated the problems. The DOW is reviewing the status of the Pelican Lake dam and analyzing the risks associated with raising the dam.

Present limiting factors

Growth of northern pike in Pelican Lake is among the slowest observed in the International Falls management area.

The cold summers of 1992 and 1993 limited recruitment of bass and bluegill in Pelican Lake.

The early bass opener on Pelican Lake exposes bass to fishing activity and harvest during the spawning season.

Rusty crayfish, an invasive species native to the Ohio River are present in Pelican Lake. Rusty crayfish often displace native crayfish in Minnesota lakes and have been associated with declines in aquatic vegetation.

Habitat development and protection

Pelican Lake still has significant amounts of undeveloped shoreline. Lakeshore development has been increasing on many lakes in this area. Shoreline development can have adverse affects on aquatic habitat and water quality. Efforts should be taken to protect natural shorelines. Consider using the new Alternative Standards (DOW) for any new shoreline development on Pelican Lake. At a minimum, all new and existing shoreline development should follow local and statewide shoreland ordinances. Any timber harvesting within the watershed should follow the Minnesota Forest Resource Council (MFRC) guidelines to protect riparian areas.

Commercial fishery

There are no records of commercial fishing on Pelican Lake.

Stocking plans

There are no stocking plans.

Survey needs and evaluation plans

Fish population assessments should be repeated on a five-year rotation. The next fish population assessment should be done in 2012 using 15-gill nets and 24 trap net sets. A full survey should be completed in 2016, rather than 2017 as scheduled. Moving the assessment up one year will provide additional time for evaluating the experimental regulations. The timing of the trap net sampling was changed in the 2007 assessment. Sampling was traditionally done in late July, but trap net catches at that time of year did not seem to be a good indicator of bluegill and black crappie size and abundance. In 2007, trap net sampling was done in mid-June, and catches of bluegill and black crappie improved. More investigation and analysis should be done to determine the optimum time to sample bluegill and black crappie in Northeastern Minnesota lakes. In the meantime, continue the June trap net sampling on Pelican Lake. Spring electrofishing for bass should be included in years with fish population assessments and lake surveys to provide more information on the bass population and monitor the size regulation for bass. Determine sex of northern pike in all summer surveys to aid growth analysis. Standard shoreline seining should be included during full surveys. Ice-out trap netting for northern pike should be done in 2012 and 2016 to help evaluate the experimental regulations. An open-water creel survey should be done in 2016 to provide updated information on angler demographics, angling pressure, harvest, and released fish. One of the goals of the size regulation for northern pike was to improve angler catch rates of fish >24 inches, so creel surveys are needed to answer that question. An evaluation of the experimental regulations for northern pike and bass will be completed in 2017 and shared with stakeholders during public meetings.

Rusty crayfish abundance should be monitored and a survey should be done to assess their impacts to native crayfish and the aquatic ecosystem.