

Fishery Region G

Lake Whitefish Restoration

An assessment of the lake whitefish sport fishery during the recent update of the comprehensive statewide management plan for inland fish species indicated a species in decline. In the 20 years from 1981-2001, there has been a 15% reduction in the number of waters and a 33% reduction in the acreage of waters providing a sport fishery for lake whitefish (LWF). It is projected that over the next 5 years the number of waters could decline by an additional 17%.

The public working group assisting IF&W to identify management goals and objectives for inland fish species recommended the restoration of principal fisheries where use opportunity has declined. Our objective is to develop and implement rehabilitation programs for these sport fisheries.

IF&W has embarked on a two-pronged project to restore LWF sport fisheries in lakes: raising and stocking LWF in certain waters and implementing more restrictive regulations to control the harvest of LWF in those waters. Clear Lake in northern Piscataquis County was identified as a suitable donor source for the small number of eggs that would be required. Prior to bringing these eggs into the facility, Georgia Pacific Corporation in Old Town donated supplies and volunteered employees to retrofit a section of the hatchery building for the whitefish project. Hatchery personnel received training in whitefish culture by visiting the aquatic laboratory at Laval University in Quebec earlier in the year. As part of this program, whitefish in the hatchery exceeding the number requested for stocking in the targeted waters are to be released into the donor lake, i.e. Clear Lake. As a result of this effort we have been able to stock LWF in five different lakes in northern Maine. Prior to stocking the fish were marked by removing a fin (fin clipped). A different fin was excised for each year's stocking.

A 16-inch minimum length limit on whitefish was implemented on several northern Maine waters in conjunction with the experimental hatchery program. St. Froid Lake was one of these waters. Additionally, four of the project waters: Big Eagle, Churchill, Spider and 2nd Musquacook Lakes have been closed to the taking of whitefish.



The success of the restoration program is being monitored through creel surveys and netting. Returns to date have been poor with the exception of St. Froid Lake. Netting at St. Froid Lake has resulted in the collection of a significant number of stocked lake whitefish. Lake whitefish have also been reported in angler diaries. We plan a creel survey of the sport fishery in the winter of 2008.

By Dave Basley

Mantle Lake Habitat Improvement

Mantle Lake in the city of Presque Isle has long been open to fishing for children under 16 and those individuals with complimentary licenses. The pond is created by a dam on Kennedy Brook which drains several hundred acres of agricultural land. Over the years, silt and sediment carried in this brook settled in the pond making it extremely nutrient rich. In 2004, reacting to an angler complaint that the water was so filled with algae that his grandchild couldn't fish, a task force of state, federal and municipal agencies, sportsmen clubs, fraternal and social organizations, businesses and private individuals formed to resolve this problem. The solution was two part and involved dredging the nutrient rich sediments that had collected over the many years behind the dam and working with landowners in the watershed to implement best management practices to reduce siltation from adjacent farmland.

The pond was drained over the fall and winter 2005 and dredging commenced in July 2006. Inlet tributaries were isolated as was practical from the dredging activity and young of the year brook trout were observed thriving in these streams throughout the project. An estimated 15,000 yards of phosphorous rich soil were removed from the lake bottom and returned to adjacent cropland. The project was completed and the pond commenced to refill in fall 2006.

In the spring of 2007, IF&W hatchery personnel stocked the pond with legal size brook trout to give the sport fishery a boost until wild reproduction can once again sustain the fishery. The PI Order of Elks and the PI Fish and Game Club sponsored a very successful Hooked On Fishing Program in June. Indications were that anglers remained successful catching trout throughout the summer. Retired brood fish were stocked in the pond in November and should give a lucky young angler quite a surprise next spring.



By Dave Basley

Nadeau Lake Restoration

History

Prior to 1971, Nadeau Lake, which lies along the US/Canada boundary in Fort Fairfield, was a large wetland complex that had numerous areas of open water with water depths of 6-8 feet. The water was extremely clear with abundant aquatic vegetation and old, dead and dying trees around the lakeshore. By a few accounts of local anglers who lived nearby, wild brook trout could be caught, some of which were reportedly very large, if one could negotiate the very soft sediment that seemed to have no firm bottom within the lake. This loose sediment was a layer of peat (very old decaying plant matter), which overlaid a thick layer of marl, a calcium carbonate mud containing lime, silt, and clay. When saturated with water, the peat and marl created a very loose, "quick-sand" like bottom.



The economic value of the marl deposit at the bottom of Nadeau Lake was recognized at an early date by regional agriculture. After a simple process of extraction, drying, and screening, the marl could be trucked and spread to boost productivity of local farmland. Small amounts of marl were being extracted from the site as early as 1925. At least two separate claims were made during the 1960s and both individuals began the initial permitting process to mine. However, in 1970 Stanley Giles claimed mineral rights and drained Nadeau Lake during the winter of 1971. The Giles family immediately began to sell marl to local farmers and the business continued until the late 1990s when the marl deposit was nearly exhausted. On June 30, 2001 the final mineral lease granted by the State of Maine expired ending three decades of Nadeau Lake mining.

Restoring the water level

The Maine Mining Commission (now Department of Conservation, Maine Geological Survey) approved a Mining Plan for Stanley Giles on June 2, 1972. The Plan was required by the recent (1969) Mining – Conservation and Rehabilitation of Land Act and stipulated that “[affected area]...will be returned to its original state as a lake, with same high water.” In 1996 the State Departments of Conservation (DOC), Environmental Protection (DEP), and Inland Fisheries and Wildlife (IF&W) met at the mining site to discuss and help plan for appropriate restoration of the lake water level. During the ensuing five years there was clearly a dispute between the State and mining company over the exact water level of the original lake. Between 1996 and 2005 all three departments collaborated to restore the lake including a lengthy litigation period of 38 months during 2001-2004; the Maine Office of Attorney General led the State's litigation efforts and in December 2004, a final agreement between the State and mining company was reached that granted IF&W responsibility of the outlet dam.

Public access

In January 2001 IF&W completed the purchase of 33 acres adjacent Nadeau Lake for a future public access site. Securing this parcel allowed IF&W to continue its efforts in restoring the lake water level and enhancing habitat within the lake. In 2001 work began to construct an access road, parking lot, concrete ramp, and a bank angling area.

The future site will provide ample parking for anglers with small watercraft (more than 10 horsepower will be prohibited) as well as those who prefer to fish from shore. The concrete planked ramp will minimize erosion into the lake and provide a safe, convenient launching point.



Trout Habitat Enhancement

Brook trout habitat at Nadeau Lake will be excellent and should result in excellent survival and growth of this native fish.

Two naturally occurring factors combined with some help from IF&W and its contributors will result in some of the best habitat Maine has to offer. First, numerous points of cold, well-oxygenated groundwater enter the bottom of Nadeau Lake. These inlets, that are sometimes very difficult to locate, are critically important for trout survival during stressful periods of hot/dry weather or extended periods of ice cover that normally occurs during winter months. Second, the underlying geology that made Nadeau Lake an attractive mine for agriculture will also result in water chemistry that is ideal for brook trout. Not unlike all of the farm country in Eastern Aroostook County, the springs within Nadeau Lake are highly conductive (a measure of the amount of ions within the water) with alkalinity readings (a measure of the capacity to neutralize a strong acid) at some of the highest observed in northern Maine.

The low-water condition of Nadeau Lake after mining allowed IF&W to manipulate the lake bottom to create better physical habitat for brook trout. The opportunity to enhance physical habitat is rare because most Maine lakes are natural with no means of lowering water levels. During 2001-2006, IF&W coordinated six separate projects that focused on improving in-lake habitat. The two major areas of focus were 1) deepening portions of the future lake bottom, and 2) adding wood cover to provide protection especially for older, larger trout. Other work included 1) addition of small stone over two spring areas for spawning, 2) addition of cobble stone adjacent spawning areas for protection of newly emerged trout fry, and 3) planting of shoreline trees for stabilization and shade. These projects were made possible through the federal Sport Fish Restoration program and donations from the following: Trout and Salmon Foundation, Chicago, IL; Trout Unlimited, Maine Council; Maine Maintenance Center, Limestone, ME; McGillan Inc., Fort Fairfield, ME; and the Maine DEP, supplemental environmental project.

Excavation within the lake focused on upwelling groundwater and shallow water areas where water depths would have been 1-3 feet deep, but by excavating water depths would now be 3 – 6 feet. Shallow waters tend to freeze to the bottom during winter months and warm quickly in the spring; by deepening these areas trout could forage within them for longer periods throughout the year. Excavators and bulldozers were used for the work. Spring areas were deepened and widened to provide larger volumes of cool water and as well as protection from predators such as common merganser, common loon, and river otter. Wood cover was then added to provide additional cover within deepened springs. In total, 18,400 cubic yards of material were removed from the future lake bottom; this equates to 1,530 dump truck loads. Thirty whole trees and sixty-eight large wood pieces were inserted as cover. The combination of increased water depth, cool groundwater, and added wood cover will provide the habitat necessary for trout to grow well and survive to older ages. In all, 2 acres (8 percent) of the total 25 acres surface area of Nadeau Lake were changed to improve trout habitat.



Well tile project

Two concrete well tiles were placed within upland springs on IF&W property with water lines piped down to Nadeau Lake. The goal of this aspect of habitat enhancement was to provide a cool source of water during warm late summer months where trout could congregate and survive a stressful period. The inlets, consisting of a 1.5 in pipe and a 4 in pipe, enter the lake adjacent to approximately 25 ft of water, the deepest within the lake. In addition six large, whole trees were buried in the shoreline over the inlets to provide protection for trout using the inlet area.



Outlet dam construction

The outlet dam, completed on August 10, 2007, is a key component in maintaining ideal brook trout habitat in Nadeau Lake. The new structure consists of an inlet pipe leading to a 10 ft high riser fitted with stop-logs and an outlet pipe that drains eventually to Limestone Stream. The correct height of stop-logs within the dam will raise

the water level of Nadeau Lake to a point very close to the historic watermark.



In addition, the dam does not allow upstream fish migration so that invasive fishes may not gain access to the lake and compete with wild, native brook trout. Upon completion of the dam, water had more than 12 ft to rise to reach the full mark; early in December 2007 the lake had completely filled from fall precipitation.

Reclamation

During the process of draining Nadeau Lake and the subsequent three decades of mining, several species of fish became established that were non native to the system. Some species are very detrimental to the existence of brook trout through direct competition for food resources. On August 1, 2007 IF&W conducted a reclamation project whereby all fish within the small pools of the mine area were removed; the process involved the spraying of liquid rotenone, a licensed substance approved to remove fish (photo). Nine species of fish were recovered during the reclamation including brown bullhead (pictured) and white sucker, both species that, when present, are obstacles to establishing a brook trout sport fishery.



Brook trout reintroduction

With the goal of reestablishing a native trout population, wild brook trout from an Eastern Aroostook County stream were collected, measured, marked, and released into



Nadeau Lake during September and October 2007. The donor stream met all criteria as a source of trout including no documentation of having ever been stocked with domestic strains, a strong population with adequate numbers available to be collected, and within similar water quality (conductivity and alkalinity) as that of Nadeau Lake. Trout were collected by electrofishing and transported in coolers to Nadeau Lake for release. Three hundred ten (310) trout were reintroduced in 2007; most (225) were less

than one year old ranging from 2 to 4 inches in length. Eleven (11) trout were judged to be mature, ready to spawn, at time of release, the largest of which was 8.3 inches.

Future sport fishery

The goal of the Nadeau Lake restoration project is to reestablish a native population of brook trout in very high quality lake habitat so that a sport fishery can be created for Maine anglers. Preserving Nadeau Lake habitat is of high importance to IF&W; maintaining the single fish species is the single most important aspect of habitat quality. Brook trout survive and grow best under conditions where they are the only species present. Therefore, sport fishery regulations include a prohibition on use or possession of live fish as bait to maintain the single species system. Along with fisheries associated uses, Nadeau Lake will also provide habitat for a large number of wildlife species; we expect significant non-consumptive uses will develop including canoeing, kayaking, boating, and wildlife viewing.

By Frank Frost