TR 78-5

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

Fisheries Division

Technical Report: No. 78-5

October, 1978

MAJOR CHEMICAL RECLAMATION PROJECTS AND RESTOCKING ON THE HURON RIVER AND IMPOUNDMENTS NEAR DETROIT, WITH SPECIAL EMPHASIS ON BELLEVILLE LAKE

Ronald J. Spitler, Fisheries Biologist

SUMMARY

From 1972 through 1974 a series of Fisheries Division projects on the Huron River system resulted in the eradication of over 2.24 million pounds of carp and other fish from eight impoundments (3,233 acres) and 42 miles of river. Over 24 million fish of 13 species were then planted to re-establish a sport fishery.

All phases of the program drew public interest and support, and several other governmental units assisted. Of particular interest was the Belleville Lake treatment. This 1,270 acre impoundment created attention for several reasons, including: An unplanned kill of 350,000 pounds of fish from an upstream project "overextension", aborted attempts to draw the impoundment to streambed and subsequent cancellation of the project, reinstatement of the project due to public interest, innovative procedures (first use of a helicopter in Michigan to assist in a lake treatment and new methods for dead fish collection), assistance and supplies from many sources, and finally, phenomenal growth rates (over 2X state average) of planted fish resulting in good fishing only two years after treatment. In 1975, creel census results indicated over 210,000 angler hours were expended in harvesting 149,600 fish; and 1976 data included 256,000 angler hours for 80,206 fish.

MAJOR CHEMICAL RECLAMATION PROJECTS AND RESTOCKING ON THE HURON RIVER AND IMPOUNDMENTS NEAR DETROIT, WITH SPECIAL EMPHASIS ON BELLEVILLE LAKE

Ronald J. Spitler, Fisheries Biologist

INTRODUCTION

Portions of the Huron River in Washtenaw and Wayne counties, Michigan, lie within the shadow of Detroit and its suburbs. For many years the river produced very poor fishing, due to a high population of carp and suckers. Finally, Fisheries Division of the Michigan Department of Natural Resources (M.D.N.R.) launched a fish rehabilitation project. From 1972 through 1974, a series of chemical treatments were conducted. Some 3,233 acres of water in eight impoundments, plus 42 miles of stream, were treated (Figure 1). Dead fish removed exceeded 2.24 million pounds. Over 24 million fish were stocked to establish a viable sport fishery. Of particular interest was the reclamation of the 1,270 acre Belleville Lake, Wayne County.

As with all projects of this type, public approval and support was needed prior to implementation. Fisheries Division had survey data indicating an overabundance of underutilized species such as carp and suckers, however, even before this data was presented at the first public meeting, the imbalance was demonstrated. In the spring of 1973, Ford Lake, a 975 acre impoundment immediately upstream from Belleville Lake,was treated. The water level was lowered by three feet, and that dam, plus others upstream, were closed to simplify treatment procedures and hold the toxic water long enough for dilution and detoxification. Rainstorms immediately following treatment flushed toxic waters into Belleville Lake, killing an estimated 350,000 pounds of fish. Workers spent the next two weeks collecting and hauling dead fish. Fortunately, the accident served to convince citizens of the area that the lake needed reclamation. At a scheduled public meeting, the reclamation was approved for the fall of 1973.

METHODS

A plan to drain Belleville Lake was formulated so as to vastly reduce treatment costs and dead fish cleanup. Careful adjustments were coordinated between Belleville dam and the five upstream dams. Drawdown began on September 17, 1973 and was to have taken four weeks. When the water level had dropped to 11 feet below normal, two roadways (causeways) began to settle. Apparently the dewatering of soil allowed shrinkage to occur. The dam was immediately closed and the Wayne County Road Commission, assessing the road berm settling (up to 5 feet slippage), closed the roads. Those roads linked the village of Belleville to a major freeway (I-94) thus detours of six miles were now necessary. Because of this, the D.N.R. decided on September 25 to terminate the project due to the inability to safely reduce the water volume. Within

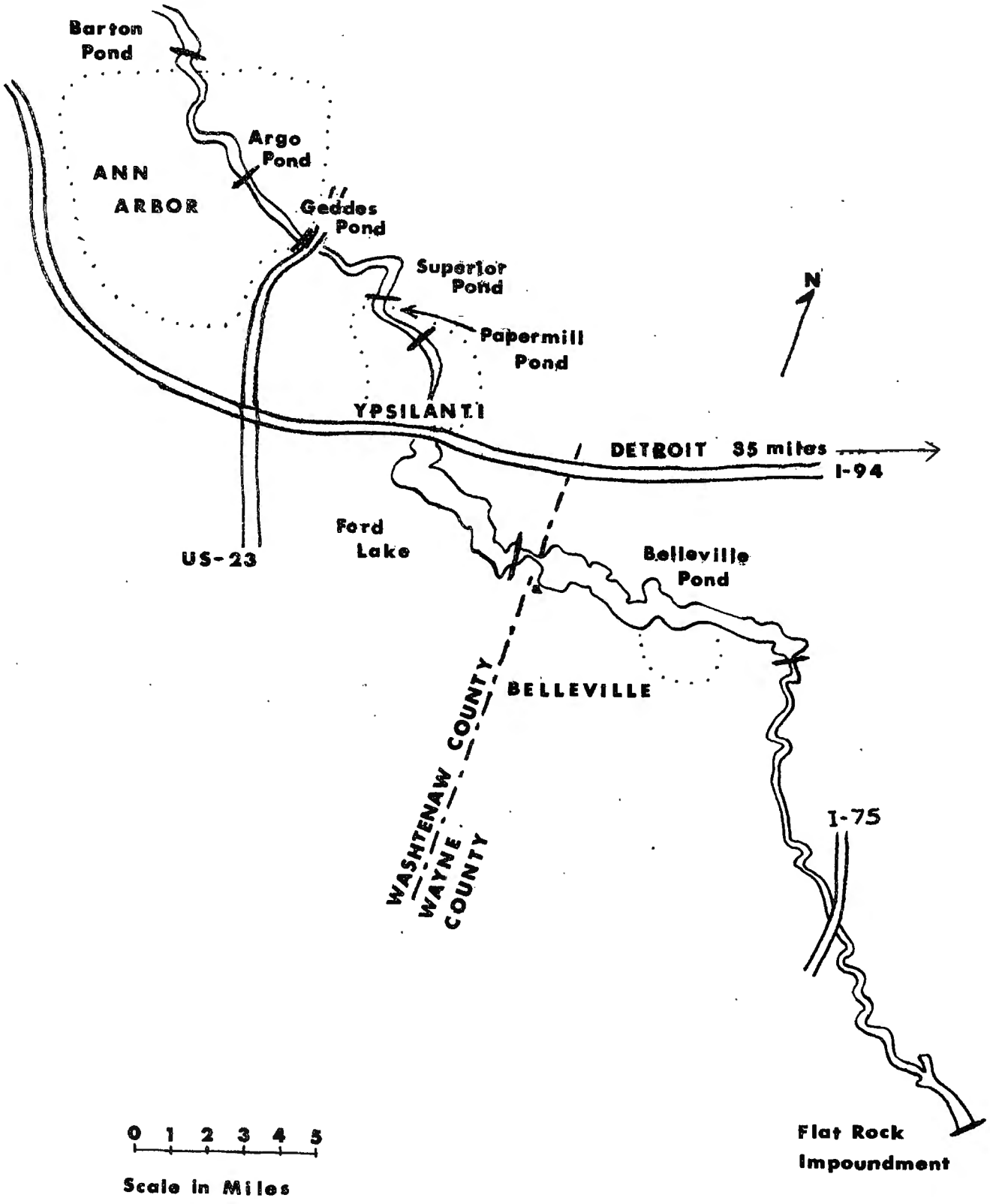

Figure 1 : Huron River project locations

three days, Belleville area citizens invited D.N.R. officials back to a public meeting that they had arranged. At the meeting were 850 people who were overwhelmingly in favor of continuing the project. With that, the D.N.R. promised to find a way to get it done.

It was determined that Belleville could be drawn down to a level 10 feet below normal and the remaining water volume would be treated at a concentration of 2 ppm. Plans were formulated for an October 5, 1973 treatment and an order was placed for 5,390 gallons of toxicant (rotenone).

Two base stations were set up on the six-mile long impoundment and the crew distributed the toxicant in just over one-half day using six boats. Each boat carried two barrels of toxicant per trip, and by direct discharge into the propwash, delivered 110 gallons in 30 minutes. Military wreckers with booms (mobile cranes) made the task of loading the barrels simple, and "quick connects" on the injection pipes speeded that effort. For the first time in a major lake treatment in Michigan, a helicopter was used to apply 550 gallons of chemical to otherwise inaccessible places. As a "spotter" and coordinator, the helicopter proved invaluable.

Removal of dead fish was eased by innovative methods devised by "experienced fish loaders". The most efficient was the lift net. An empty net was placed, spread out, in each boat and filled with up to 1,000 pounds of fish. Returning to the work station, crews quickly attached hooks to four corners of the net. It was then lifted by boom to a waiting dump truck. Once poised over the truck bed, a rope was pulled, untying the gathered center portion of the net, and all contents emptied into the truck. With the knot retied, the net was quickly placed back into the boat, ready for another load. Barrels provided another effective method. Hook holes were made at each end of the barrels, and once six to eight barrels in each boat were filled, they were hoisted two at a time into the trucks, lowered, hooks moved to the bottom holes, and contents dumped. A local sportsmans club brought in a "souped up" grain elevator which delivered "open" loads of fish to the trucks. To get the dead fish into the boats still required physical effort, by gloved hand or pitchfork.

Because of the anticipated large kill of rough fish, an organized dead fish pick-up program was planned. Fisheries personnel enlisted the aid of inmate trustees, township workers, National Guardsmen, local businesses, schools and school children, sportsmen clubs, and interested citizens. Arrangements were made to use a local garage and office as a headquarters where over 600 meals were served (much of it homemade and donated). Other donations of food, money and supplies were provided by local businesses, including Kelsey-Hayes Company (7,200 cups of coffee, 5,000 cups of hot chocolate, 960 cans of pop, and 94 dozen donuts); General Motors (200 sandwiches); Kentucky Fried Chicken (60 complete dinners); and Michigan Bell Telephone (hundreds of pairs of rubber gloves). In addition, two women set up a refreshment stand and provided hot coffee, juice, pastries, and other snacks throughout the work period. Wayne County Disposal, a nearby landfill operation, accepted all dead fish without charge.

Fish stocking began immediately after detoxification. In 1973, fall fingerling walleye, tiger muskellunge, largemouth bass, bluegills, and bluegill-green sunfish hybrids were planted. Fathead minnows were stocked to establish a forage base and fall fingerling rainbows were planted to provide fishing in 1974. In 1974, walleye and northern pike were introduced via fry plants and second plantings of rainbows, largemouth bass and bluegills were made. Also introduced were pumpkinseed, black crappie, channel catfish, and white bass. In 1975, additional stockings were made of walleye and northern pike fry and large-and smallmouth bass fingerlings.

Netting and electrofishing surveys were conducted regularly to evaluate growth, survival, and reproduction of planted fish. Standard sampling techniques were employed in the collection of data. Extensive creel census work was accomplished in 1975 and 1976 by the Institute for Fisheries Research in order to document recreational fishing effort and success.

RESULTS AND DISCUSSION

During the 11 days of fish cleanup, the Belleville area was witness to one of the finest examples of public-government joint efforts in Michigan. Thirty fisheries workers and their equipment were assisted by 40 prison inmate trustees, several township workers, and National Guardsmen for the duration of the cleanup. Response from local businesses, citizens, schools and sportsmans clubs was phenomenal. Hundreds of volunteers worked for varying periods, and Belleville High School officials declared a "Cleanup Day" allowing some 400 stundents to help out.

That wasn't all. Over 95% by weight of the fish collected were carp, and 850,000 pounds of carcasses were hauled to the landfill. All that only four months after removing 350,000 pounds of fish from the same 1,270 acre lake. The standing crop of Belleville Lake was estimated to be at least 1,000 pounds per acre. The impoundment refilled and was no longer toxic one week after treatment.

Survey data indicated that the stocked fish survived well and grew exceptionally fast. Compared to state averages, bluegills gained from two to three inches over the state average in the first year of growth and maintained that advantage to date. Largemouth bass reached 10.5 inches average in their second year of growth, compared to the state average of 10.6 inches after four years. Three year old bass averaged 12.4 inches; nearly four inches longer than the state average. Walleyes reached 9.5 inches in their first year and were 17.9 inches after three years; well above the state averages of 7.1 and 13.3 inches respectively.

Fishermen wasted no time in capitalizing on the angling opportunity (Table 1). In 1975, just two years after treatment, anglers caught over 16,000 walleyes, 92,000 crappies and 6,500 largemouth bass (149,642 total). For the five-month

Table 1. Angler Catch And Effort On Belleville Lake For A Five-Month Period In 1975 (June 1 to November 5) And A Seven-Month Periond In 1976 (April 1 to October 31)

	1975		1976	
SPECIES	Number	Percent	Number	Percent
Crappie	92,511	61.8	50,658	63.2
Bluegill	18,608	12.4	11,307	14.1
Walleye	16,436	10.9	1,550	1.9
Largemouth Bass	6,537	4.4	1,700	2.1
Sunfish	4,800	3.2	3,357	4.2
Bullhead	3,864	2.6	4,848	6.0
Smallmouth Bass	2,511	1.7	47	0.1
Rainbow Trout	1,169	0.8	-	0.1
Catfish	1,093	0.7	1,130	1.4
Perch	1,035	0.7	397	0.5
Tiger Muskellunge	460	0.3	-	0.1
Carp	248	0.2	205	0.3
Rock Bass	234	0.2	101	0.1
Northern Pike	136	0.1	-	0.1
White Bass	-	0.1	3,488	4.4
Sucker	-	0.1	1,418	1.8
Total Catch	149,642		80,206	
Catch/Acre	117.8		63.2	
Trips	66,747		91,123	
Trips/Acre	52.6		71.8	
Hours	210,282		256,983	
Catch/Hour	0.71		0.31	
Hours/Acre	165.6		202.3	
Hours/Trip	3.15		2.82	

period, June 1 - November 5, 1975, over 66,000 angler trips were logged (or 52.6 trips per acre). Success was very good with a catch rate of .71 fish per hour. In 1976, a statewide increase in size limits for walleyes (from 13 to 15 inches) and bass (from 10 to 12 inches), resulted in a lower catch. Only 80,206 fish were harvested, but the fishing pressure was 38% higher (91,123 angler trips). Crappies provided the best fishing, with over 50,000 being caught.

In the spring of 1976, walleyes migrating upstream to the base of a dam created such a rash of poaching during the closed season that the area was temporarily closed to all angling, especially dip netting for suckers (suckers were thrown back and walleyes kept). A research crew from the Institute for Fisheries Research spent several days studying the walleyes and concluded that there were over 10,000 walleyes in the river at that time.

Belleville Lake is now among the three heaviest fished inland lakes in Michigan. Angler success of .31 fish per hour (in 1976) was poor, but should improve in the future as more fish reach desirable size.

A transfer of 146 adult white bass from Lake St. Clair was successful, as some 3,400 young white bass were creeled in the fall of 1976. Natural reproduction was apparent.

COST OF MANAGEMENT

An important part of any project proposal is the benefit/cost ratio because it enables managers to determine if the economics of a program justify its inception. This project was estimated to have a benefit/cost ratio of 10:1 over a five-year period and was based on a value of $6.30 for each new angler day generated (1970 National Hunting and Fishing Survey). After two years of creel census data, it appeared as if this prediction would hold true. Although actual costs exceeded estimates, angler usage was also greater and there was no net change in the estimated benefit/cost ratio. Using the 1975 National Hunting and Fishing Survey value of $11.50 per angler day (which was not available at the time of project implementation), the benefit/cost ratio becomes 18:1.