Dollarville Flowage (Dollarville Flooding)
Luce County, T46N, R10W, S27
Tahquamenon River Watershed, Last Surveyed: 2013

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Environment

Dollarville Flowage, better known as the Dollarville Flooding, is located approximately 1.7 miles west of the town of Newberry, Michigan in southern Luce County (Figure 1). A popular destination for anglers, trappers, waterfowl hunters, and birdwatchers, Dollarville Flooding provides recreational opportunities 8 months out of the year. The existing dam was built in 1971 (completed in1972) and impounds approximately 1,100 acres with 3 feet of head at an elevation of 712 feet. The estimated surface area (1,100 acres) for Dollarville Flooding is referenced at the elevation of 712 feet, but before the dam was constructed it was believed that the surface area of the impoundment would be upwards of 1,400 acres (Leland Anderson, retired DNR Fisheries Biologist, unpublished data). The impoundment has never been mapped, but generally water depths are shallow throughout with most not exceeding 3 feet, except for the river channel where depths greater than 12 feet can be found. Water clarity is limited and stained black from natural tannins. The littoral zone (everything except the main river channel) has abundant emergent and submergent aquatic vegetation, with some limited flooded timber and stumps. Bottom substrate is primarily organic material with some sand interspersed. The entire shoreline of the impoundment is located within the Michigan state forest system and is undeveloped. Dollarville Flooding is designated as a state wildlife management area and a special conservation area (SCA). The shoreline cover types consist of a variety of coniferous and hardwood trees. In addition, the invasive plant Phragmites is well-established throughout the impoundment and has received spot treatments funded by Wildlife Division. The flooding impounds the Tahquamenon River in a stretch that drains five designated trout streams (Teaspoon Creek, East Creek, King's Creek, Silver Creek, and Syphon Creek).

Two Michigan Department of Natural Resources (DNR) public access sites (PAS) are located on Dollarville Flooding. There is a PAS located at the Dam and one at the DNR Natalie State Forest Campground on the southern shoreline, mid-lake. Both PAS allow for launching of small to medium boats, canoes, and kayaks, and provides ample parking for vehicles with boat trailers Access to the PAS at the Dam is via County Road 405 (Dollarville Road) to County Road 387 and access to the Natalie PAS is via Dollarville Road to County Road 434. County Road 434 is not maintained during the winter, but the other county roads are maintained year-round. A floating fishing pier was constructed in 1991 to provide additional angling opportunity to the general public. Michigan statewide fishing regulations apply to Dollarville Flooding and are available in the Michigan Fishing Guide (michigan.gov/fishingguide).

History

In the late 1800's, fisheries management for Dollarville Flooding was an afterthought, taking a backseat to the logging operations occurring at that time. Not until the early 1900's did the general public begin using Dollarville Flooding as a recreational resource for hunting, trapping and fishing

activities. Early documentation suggests that the flooding provided "fabulous waterfowl hunting and fishing" (office files). In addition, trapping opportunities were greatly increased by the marsh that was created by the impoundment. Stories of local people that hunted, trapped, and fished at Dollarville Flooding include "excellent" opportunities for waterfowl, furbearers, and yellow perch and northern pike. After the dam deteriorated and washed out in 1928, locals developed a desire to restore the dam to possibly re-establish those opportunities once again. In 1948, the Tahquamenon Sportsmen Club proposed a dam project to the Michigan Department of Conservation (DOC, renamed Department of Natural Resources (DNR) in 1969). The Club desired to restore the impoundment so that the "excellent" hunting, trapping, and fishing could continue and also attract nonresidents to the town of Newberry. In 1964, the people of Newberry led by District Judge Robert Wood resurrected the project, and construction was completed using 64% federal funds (Pittman-Robertson, Dingell-Johnson, and Upper Great Lakes Commission) with 20% state local bond money. In addition a total of $15,000 in private land was purchased by the people of Newberry for completion of the project, making this a cooperative effort between local residents, and state and federal authorities. This new dam structure was constructed in the exact location of an original wooden dam structure built in 1895 by the American Lumber Company Sawmill (run by Robert Dollar), for use when floating logs to the sawmill located at this site. Use of the dam was discontinued in 1924 and then over time the dam gradually deteriorated and washed out in 1928. Management authority was transferred to DNR Fisheries Division in 1971. Finally, in 1972 the Dollarville Flooding was brought to full pool. Since then, Fisheries Division has been responsible for dam maintenance and works in cooperation with Wildlife Division to control water levels.

Despite planning efforts for the construction of the Dollarville Dam, fisheries management practices still continued in this section of the Tahquamenon River. Michigan DNR stocking records show that fisheries managers elected to stock largemouth bass in 1950, 1951, and 1953 (Table 1). Each stocking event was an attempt to establish a black bass fishery, something that had not been previously attempted in the Tahquamenon River. Additionally, muskellunge (subspecies not identified) were stocked in 1957 and 1962 following the failure of the largemouth bass stocking events. In 1970, DNR surveyed using a 240 volt electrofishing boat from the McMillan Bridge (County Road 415) down to the M-123 Bridge in an attempt collect an inventory of animal and plant life of the river before the Dollarville Dam was constructed. The survey found that fish biomass decreased down river. Habitat was found to be well-suited for muskellunge, northern pike, walleye, and yellow perch. Water depths were upward of 25 feet in various locations and moderate densities of aquatic vegetation included Potomogeton sp., lily pads, and eel grass. Anglers encountered during the survey reported fair to good luck with muskellunge, northern pike, and walleye.

Following the filling of the impoundment, DNR was interested in observing and monitoring the hunting and fishing activities that occurred there. Records from 1972 indicate that the general public was using the new impoundment for a wide variety of activities including swimming and fishing. In 1972 anglers were observed fishing just below the dam and catching tiger muskellunge, yellow perch, rock bass, bullheads, and catching legal sized (20 inches or greater) northern pike. Anglers also reported movement of white suckers over the emergency spillway into the impoundment and schools of yellow perch just below the dam. Monitoring of fishing activity continued through the winter of 1973. In January, DNR field staff collected measurements for dissolved oxygen, temperatures and pH throughout the impoundment. Dissolved oxygen readings ranged from 2.0 ppm (mg/L) at the dam to

4.0 ppm (mg/L) about 2 miles upstream of Natalie Campground. Winter dissolved oxygen monitoring took place in 1979 at three locations, McMillan Bridge (above flooding), Natalie (within flooding), and below Dollarville Dam. Readings recorded at the Natalie site found dissolved oxygen to range from 4 mg/L to 11.8 mg/L (7 readings). The dissolved oxygen levels found during this effort were suitable for a majority of fish species found in the Upper Peninsula.

The fish community was first surveyed by DNR field staff in the spring of 1974 using 2 fyke nets and 2 trap nets for 2 nights. The survey collected a total of 61 northern pike and 1 white sucker. Another 2 night survey followed that summer using 4 fyke nets and 2 experimental gill nets. The summer survey found a more diverse fish community with a total of six species represented by northern pike, yellow perch, pumpkinseed sunfish, rock bass, white sucker, and black bullhead. The catch for northern pike was similar to the catch in the spring, while yellow perch and rock bass made up 29% of the total catch. Fisheries managers of the DNR found the fish community to have strong year classes of northern pike and a good yellow perch population. It appeared as though the fish community in Dollarville Flooding was returning to what once existed in the early 1900's.

In 1976, the Boy Scouts of America requested a permit for placement of rock crib structures in the Flooding. Along with these rock crib structures three fishing piers were permitted, but were never constructed. Also in 1976, the fish community was surveyed by DNR field staff using fyke nets for a total of 5 nights. The fish community was more diverse with a total of 9 species. Species caught during the 1976 survey included northern pike, tiger muskellunge, pumpkinseed sunfish, yellow perch, largemouth bass, rock bass, white sucker, brown bullhead, and golden shiner. The shift to a more diverse fish community suggested that either fish were migrating through the fishway at the Dollarville Dam or anglers were moving species to the impoundment in hopes of creating a new fishery. The yellow perch fishery grew in popularity with many anglers targeting them during the summer months and catching exceptional numbers of 8-12 inch fish. Overall, the fish community appeared to be in good condition and all fish species were growing at or above state average growth rate. The presence of largemouth bass prompted DNR fisheries managers to attempt establishing a bass fishery through stocking. In 1978 and 1979, 30,000 and 15,000 fall fingerling largemouth bass were stocked.

A follow-up electrofishing survey was conducted in September 1980 to evaluate the survival and success of the stocked largemouth bass. Two stations in the lower end of the impoundment were sampled with a total of 1 hour each with an electrofishing boat. Only one largemouth bass was collected. Seven other species were collected and were represented by tiger muskellunge, northern pike, rock bass, pumpkinseed sunfish, yellow perch, brown bullhead, and white sucker. Overall, the largemouth bass introduction was considered a failure and since then, no other species have been stocked in Dollarville Flooding.

Since 1980 there have been four drawdowns at Dollarville Flooding. A drawdown in 1981 took place in order to replace the radial arm gates that control the water level. An emergency drawdown was necessary in spring of 1989 for repair of broken gate cables. In 1999, a drawdown was necessary to make repairs to the radial arm gates as recommended by the Michigan Department of Environmental Quality (DEQ). In 2008, the drawdown was necessary again as recommended by the DEQ to replace the stop logs in the fish ladder and to allow the flocculate material in the impoundment to settle. By drawing down the impoundment the flocculate material, which is low in dissolved oxygen and can negatively impact the nutrient cycle, could be reduced by allow them to dry out. However, following

the most recent drawdown, Phragmites became established and was subsequently treated in 2013 and 2014 using Pittman and Robertson funds through the DNR Wildlife Division.

Current Status

During the time period of May 28- August 29, 2013, DNR Fisheries Division conducted a Status and Trends survey on Dollarville Flooding. Sampling effort consisted of 6 trap net lifts, 12 large-mesh fyke net lifts, 6 mini-fyke (small-mesh fyke) net lifts, 5 seine hauls, and 3, 10-minute boat electrofishing stations. Field crews conducting the survey observed boat trailers in the parking lot at the access sites indicating some angling activity. Water levels were noted to be near average for this time of year.

A total of 18 species were captured during the survey (Table 2). The species represented in the catch are typical for waters in the Eastern Upper Peninsula and are commonly captured in various survey gear types. Total catch was 961 fish with a total weight of 425.4 pounds (Table 2). Large predator fish comprised 6% of the total catch by number and consisted of northern muskellunge, tiger muskellunge, northern pike, and largemouth bass,. The panfish community represented 43% of the total catch by number, and was dominated by pumpkinseed sunfish, but also included bluegill, and rock bass, Popular among anglers who fish Dollarville Flooding, yellow perch (n=60) represented 6% of the total catch in number. The total catch of black bullhead (n=87) was 9% and total catch of white sucker (n=1) was less than 1% based on number (Table 2). Additionally, a total of 5 minnow species were collected adding to the diversity of the forage fish community (Table 2).

The total catch of white suckers was surprisingly low considering Dollarville Flooding impounds the Tahquamenon River which possesses a large white sucker population. The substrate in Dollarville Flooding is highly organic which is suitable for bullheads, but they seem to be only present in moderate to low numbers compared with other Eastern Upper Peninsula waters with similar habitat conditions (MDNR, office files).

Predatory fishes of Dollarville Flooding are dominated by muskellunge and northern pike. Muskellunge numbers in Dollarville Flooding are considered to be high compared with many other waters with muskellunge populations. The netting survey showed a good representation of what anglers typically encounter when targeting muskellunge here. A total of 23 muskellunge were captured with an average size of 34.9 inches and a total length range of 14 to 43 inches. Four percent (n=1) of the muskellunge captured were greater than legal size at 42 inches (Table 3). Mean length at age for muskellunge in 2013 was 4.6 inches below statewide average (Table 4). While conducting the netting survey, DNR staff jaw tagged all muskellunge captured to evaluate exploitation and growth. At the time of completion of this document a total of 4 tagged fish had been caught and reported by anglers. All fish were reported as released.

Northern pike (n=34) captured in the survey had an average total length of 16.7 inches with 6% greater than 24 inches (Table 3). The total length range for northern pike was 9 to 30 inches. Seeing northern pike upwards of 30 inches is encouraging for a quality fishery and suggests good survival. Growth for northern pike was similar to that of muskellunge at 4.1 inches below statewide average (Table 4). For northern pike in the Upper Peninsula it is not uncommon to see populations with slow growth. In

Dollarville Flooding, the presence of muskellunge in high densities may affect northern pike growth by outcompeting for similar resources (habitat and forage).

Pumpkinseed sunfish were the most common panfish species in the survey (Table 2). Pumpkinseed sunfish ranged in size from 1-7 inches with 48% at an acceptable size for anglers to harvest (6 inches). A total of 6 year classes were found when determining ages (Table 4). Mean length at age was slightly above statewide average which is very acceptable for an Upper Peninsula waterbody. Few bluegill (n=13) were captured in the survey making it difficult to make any evaluations of the population. This may be a function of the high density of pumpkinseed sunfish or variability in sampling, although at this density anglers may still encounter them.

Rock bass captured in the survey averaged 5 inches with 35% greater than 6 inches (Table 3). Some anglers target rock bass on Dollarville Flooding and can be a large component of an angler's panfish harvest. Yellow perch, which are more frequently targeted by anglers, averaged 7.5 inches with a total length range of 2-12 inches (Table 3). When determining ages from scales, a total of 8 year classes were revealed indicating good survival and growth slightly above statewide average (Table 4).

One tiger muskellunge was collected during the survey. As indicated by the age of the fish this is not from any stocking efforts by the Fisheries Division, but more likely a natural hybrid from within the Tahquamenon River system. The relatively high densities of muskellunge and northern pike in Dollarville Flooding may make conditions favorable for muskellunge/pike hybridization. However, based on the 2013 survey results and many angler reports, tiger muskellunge probably only exist in Dollarville Flooding at low numbers.

In addition to biological data collected from the aquatic community (including chlorophyll a), physical and chemical data were collected from Dollarville Flooding as part of the Status and Trends survey. Typically, physical parameters compiled include shoreline habitat descriptions such as counts for docks, shoreline woody debris, submerged large woody debris, substrate characterization, and aquatic vegetation identification. However, due to the nature of this impoundment and lack of access, the shoreline could not be evaluated for these parameters. Other physical characteristics collected include transparency (water clarity) and stratification. Chemical parameters collected include total alkalinity, total phosphorus, total nitrogen, and dissolved oxygen. Water parameters were compared with other area lakes and lakes throughout Michigan using Wehrly et al. (in press).

The shoreline of Dollarville Flooding is entirely undeveloped with the exception of the state-owned dam and Natalie Campground. Large woody debris is plentiful throughout the flooding as it is still recruited well through the spring runoff period. The substrate throughout the impoundment is primarily organic with mixed sand in various locations. Aquatic vegetation present during the survey was identified as Potamogeton amplifolius (large-leaf pondweed), Ceratophyllum demersum (coontail), Typha spp. (cattail), Scirpus spp. (bulrushes), and Elodea canadensis (waterweed), and Nyphar spp. (lilies).

Water clarity is evaluated by using a Secchi disk and measuring the depth at which it can be seen. The Secchi disk depth for Dollarville Flooding was measured at 4.5 feet. When compared to Secchi depths of other area waters, the measurement for Dollarville Flooding is low indicating high primary production in the water column (or may be an effect of stained water due to tannins being heavy in the

watershed). High primary production typically suggests a lake to be classified as eutrophic, however total nitrogen and chlorophyll-a are atypical and below the majority (25th percentile) of other area lakes as well as other lakes throughout Michigan. In addition, total alkalinity and total phosphorus here are both typical of other area lakes and lakes throughout Michigan. These results suggest that Dollarville Flooding would be classified as mesotrophic (moderate primary production).

When evaluating dissolved oxygen in a waterbody, a vertical profile of the water column is typically conducted during the summer time. This investigates the temperature and dissolved oxygen regime of the water column and determines if the waterbody experiences stratification. The vertical profile revealed that the water column does not stratify during the summer time months and maintains unified temperature and dissolved oxygen through the water column.

Analysis and Discussion

Species diversity in Dollarville Flooding in 2013 is relatively unchanged from that found in the 1976 survey of the fish community. The abundance of most species is also very similar to that of the community found in 1976 with the exception of the bullhead population, which displayed a precipitous drop in abundance. In 1976, bullheads comprised 45% of the total catch in number, while in 2013 bullheads only comprised 9% of the total catch in number. This may be a result of a slightly higher density of predators or a change in optimal habitat conditions. Hanchin et al. (2002) found at times predatory fishes can control abundance and size structure of black bullhead populations. Bullheads which are native to the Tahquamenon River watershed may be experiencing a decline in abundance due to an increase in northern pike and muskellunge abundance. Typically, bullheads in high densities will negatively affect fish communities by out-competing some game fishes, such as yellow perch, panfish, and northern pike for resources. Hanchin et al. (2002) suggested that black bullhead habitat and diet likely overlap with other species resulting in competitive interactions. Today, predatory fish in Dollarville Flooding appear to be controlling the bullhead population resulting in a higher number of game fishes.

The sport fishery today in Dollarville Flooding primarily consists of a high density muskellunge population and moderate density yellow perch, pumpkinseed, and northern pike populations. The popularity of this fishery is growing as evidenced by the number of inquiries received at the Newberry office (anecdotal evidence, Kovacs). Most anglers are interested in fishing for muskellunge, while some have shown an interest in the yellow perch fishery. For many years, Dollarville Flooding was primarily utilized by local anglers, but today it is becoming popular with many out-of-area and out-of-state anglers.

The muskellunge population of Dollarville Flooding is one with a high number of fish that experiences slow growth. Generally, muskellunge in most systems display density-dependent growth due to their specific requirements for habitat and forage resources. A majority of muskellunge populations in Michigan lakes experience slow growth. Those lakes generally possess the same shallow, well-vegetated, and high density of woody habitat characteristics as Dollarville Flooding. Since the creation of the flooding in 1972, the muskellunge population has been increasing. Today muskellunge are well-established and are sustained entirely by natural reproduction. Anglers that target muskellunge on Dollarville Flooding are content with catch rates and the potential to catch a fish greater than 45 inches.

Northern pike in Dollarville Flooding have a size structure that suggests high angler harvest at 24 inches (Table 3). Age and growth analysis revealed a population with slow growth and a short life span. Natural reproduction in Dollarville Flooding northern pike is variable due to the high water, but is successful enough to sustain an acceptable fishery.

The Dollarville Flooding panfish community is fairly diverse offering four species; bluegill, pumpkinseed sunfish, rock bass, and yellow perch. The most available species include pumpkinseed sunfish and rock bass. Growth for both species is slightly above statewide average with potential of a long life. Bluegill densities are low in Dollarville Flooding so they typically would not be a large component of an anglers catch. Yellow perch historically have been heavily targeted by local anglers in the spring time near the dam. Yellow perch growth is slightly above statewide average with various year classes suggesting that natural reproduction is strong enough to sustain the population. Anglers today could expect to see good catches of panfish with variety in their harvest.

Overall, the fish community appears to be healthy with slow growth of predatory fishes. The diversity is relatively high with a total of 18 species, which is typical of an impoundment (flooding). The fishery is acceptable with a fair balance of predator and prey fishes; however the community is predator heavy. The bullhead and white sucker populations appear to be having very little impact on any of the other fish populations. Dollarville Flooding for now is a successful muskellunge and panfish fishery.

Management Direction

1) The aquatic community of Dollarville Flooding should continue to be monitored. A further look is needed to evaluate the usage of bullhead and panfish as foraging options for northern pike and muskellunge, also to investigate the white sucker population. The next netting survey should focus on prey selectivity and the use of these species as forage. This should be done through the use of netting surveys. Another netting survey should be completed by 2020 to document any changes in the aquatic community. Unless otherwise needed, Fisheries Division should maintain this time schedule in order to identify trends in the aquatic community.

2) Muskellunge (northern) have never been stocked in Dollarville Flooding (proper). Muskellunge were stocked in the Tahquamenon River below the dam in the 1980's and before creation of the flooding in the section of river where the flooding exists today. Muskellunge have become well-established through natural reproduction and passage through the fishway on the dam. Today the muskellunge fishery is a highly popular destination for anglers in the Upper Peninsula. Slow growth in the muskellunge population suggests density-dependent growth which should require continued monitoring through netting surveys, angler reports, and tag returns. Muskellunge > 42 inches are rare with many fish only attaining 38 inches. Fisheries Division should consider other regulations when there are opportunities. A lower minimum size limit would allow more opportunity for anglers to harvest a preferred size muskellunge (38 inches, Gabelhouse 1984). A more liberal minimum size limit may help to lower density enough to improve growth, increasing the possibility to get more muskellunge >42 inches. Consideration should be given to comments and opinions of muskellunge anglers who frequent Dollarville Flooding, as well as the general public who utilize the fishery. For now, the statewide 42 inch minimum size limit regulation is suitable for muskellunge in Dollarville Flooding.

3) Anglers are urged to report catches of all species to the local DNR biologist. Muskellunge tag returns can be made to the local DNR biologist or using the online reporting system on the Michigan DNR website. Fisheries managers use angler reports along with survey data in order to make management recommendations for public waters of the State of Michigan. These reports are valuable for current management recommendations as well as for future management directions.

4) The Dollarville Flooding is a popular destination for anglers, trappers, waterfowl hunters, and birdwatchers. Fisheries Division is responsible for the dam creating the flooding and the associated maintenance and inspections. Wildlife Division is currently treating the Phragmites throughout the flooding as an effort to control this invasive aquatic vegetation. In order to evaluate the cost/benefit of operating the dam, a user survey should be conducted at Dollarville Flooding. This type of survey will also help Fisheries and Wildlife Divisions to understand user demographics and the values of those users in regards to Dollarville Flooding.

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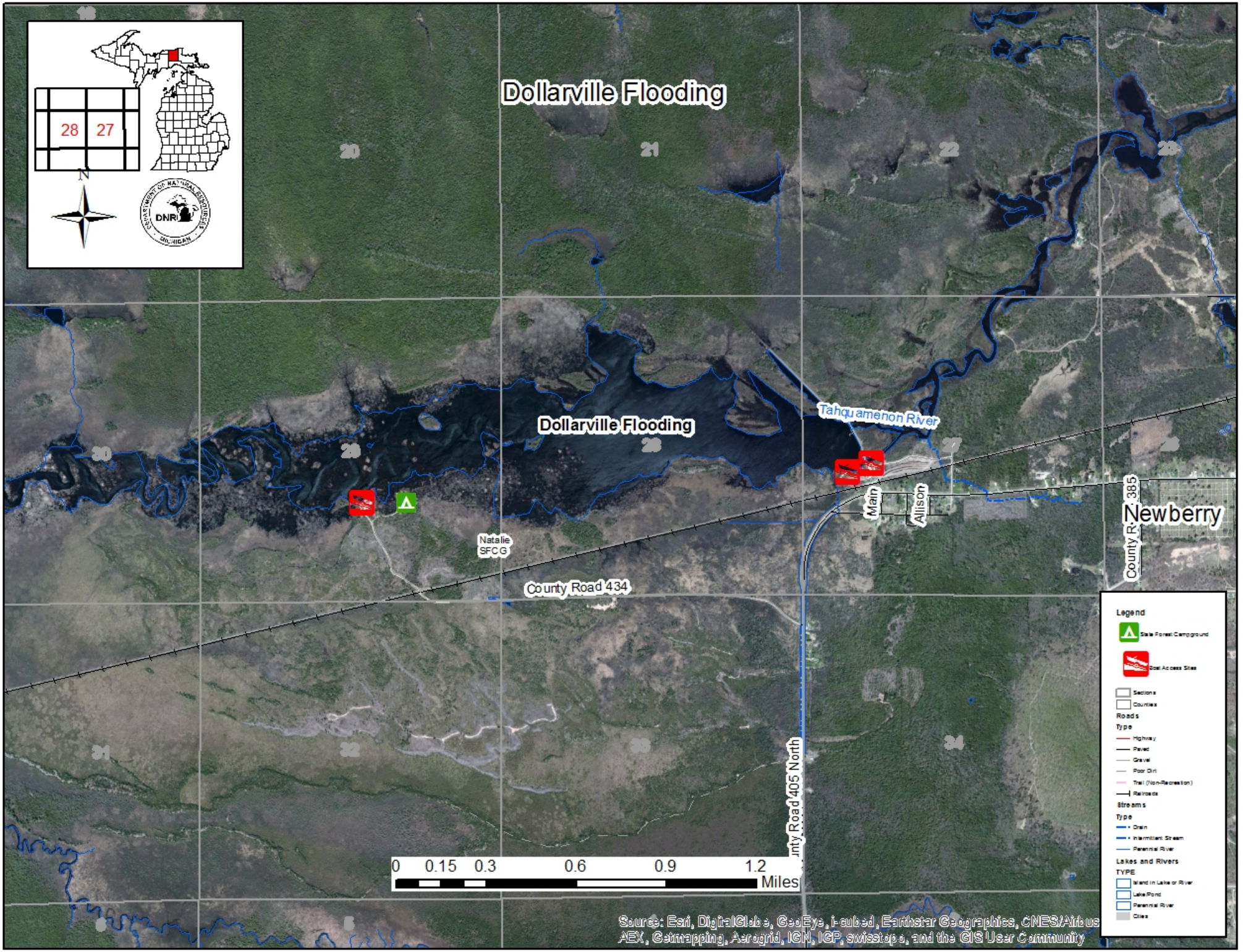
Dollarville Flooding
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Railroads
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Island in Lake or River
Lake/Pond
Perennial River
Cities
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus
AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Table 1.-Stocking history for Dollarville Flooding, Luce County.

Year	Species	Age	Average Size (inches)	Number
1950*	Largemouth bass	-	2	2,000
1951*	Largemouth bass	-	1.5	2,440
1953*	Largemouth bass	-	3	9,000
1957*	Muskellunge	Fingerling	-	1,000
1962*	Muskellunge	Fingerling	-	1,000
1978	Largemouth bass	Fall fingerling	-	30,000
1979	Largemouth bass	Fall fingerling	-	15,000

* Indicates stocking in the Tahquamenon River before the creation of Dollarville Flooding.

Table 2.-Numbers, calculated weights, total lengths, and percent legal for fish species collected during the netting survey conducted on Dollarville Flooding from May 28-August 29, 2013.

Species	Number	Percent by number	Weight (lb)	Percent by weight	Total length range (inches)	Percent legal size*
Pumpkinseed sunfish	332	34.5	51.2	12	1-7	48
Golden shiner	261	27.2	2.2	<1	1-5	-
Black bullhead	87	9.1	20.4	4.8	4-10	72
Rock bass	66	6.9	9.8	2.3	1-8	35
Yellow perch	60	6.2	11.8	2.8	2-12	42
Common shiner	48	5.0	1.5	<1	1-5	-
Northern pike	34	3.5	45.4	10.7	9-30	6
Muskellunge (northern)	23	2.4	276.9	65.1	14-43	4
Blacknose shiner	17	1.8	<1	<1	1-3	-
Bluegill	13	1.4	<1	<1	1-5	0
Bluntnose minnow	7	<1	<1	<1	2-2	-
Blackchin shiner	5	<1	<1	<1	2-2	-
Central mudminnow	3	<1	<1	<1	1-2	-
Tiger muskellunge	1	<1	5.4	1.3	30-30	100
Largemouth bass	1	<1	<1	<1	7-7	0
Brook trout	1	<1	<1	<1	1-1	0
White sucker	1	<1	<1	<1	8-8	100
Brook stickleback	1	<1	<1	<1	1-1	-
Total	961		425.3			

*Percent legal or acceptable size for angling.

Table 3.-Length frequencies for important game fishes collected during the Status and Trends survey conducted in 2013.

Inch Group	Northern Muskellunge	Northern Pike	Yellow perch	Pumpkinseed sunfish	Rock bass	Bluegill
1	-	-		28	6	10
2	-	-	6	15	3	
3	-	-	6	28	21	1
4	-	-	4	36	8	1
5	-	-	15	67	5	1
6	-	-	4	134	9	-
7	-	-	6	24	2	-
8	-	-	4	-	12	-
9	-	1	6	-	-	-
10	-	-	4	-	-	-
11	-	-	3	-	-	-
12	-	6	2	-	-	-
13	-	4	-	-	-	-
14	1	4	-	-	-	-
15	-	4	-	-	-	-
16	-	2	-	-	-	-
17	-	3	-	-	-	-
18	-	2	-	-	-	-
19	-	-	-	-	-	-
20	-	1	-	-	-	-
21	-	-	-	-	-	-
22	-	1	-	-	-	-
23	-	4	-	-	-	-
28	-	1	-	-	-	-
29	3	-	-	-	-	-
30	-	1	-	-	-	-
31	1	-	-	-	-	-
32	-	-	-	-	-	-
33	-	-	-	-	-	-
34	6	-	-	-	-	-
35	4	-	-	-	-	-
36	1	-	-	-	-	-
37	1	-	-	-	-	-
38	4	-	-	-	-	-
39	-	-	-	-	-	-
40	1	-	-	-	-	-
43	1	-	-	-	-	-

Table 4.-Mean length (inches) at age for important game fishes collected during the Status and Trends survey in 2013. Number in parentheses indicates number aged. State average length for January-May from Schneider et al. (2000).

Species	Age group	2013	2013 Growth compared to state average
Muskellunge (northern)	Age V	31.3 (2)	-4.6
	Age VI	31.0 (2)	
	Age VII	34.6 (8)	
	Age VIII	37.5 (4)	
	Age IX	37.2 (4)	
	Age X	38.9 (1)	
	Age XII	43.6 (1)	
Northern pike	Age I	10.9 (4)	-4.1
	Age II	13.46 (13)	
	Age III	16.8 (11)	
	Age IV	22.7 (4)	
	Age V	29.0 (2)	
	Age VII	25.7 (2)	
Pumpkinseed sunfish	Age III	4.8 (14)	+0.3
	Age IV	6.1 (10)	
	Age V	6.8 (6)	
	Age VI	7.1 (4)	
	Age VII	7.3 (3)	
	Age VIII	7.3 (1)	
Rock bass	Age II	4.3 (3)	+0.4
	Age III	5.7 (13)	
	Age IV	6.3 (5)	
	Age V	7.6 (2)	
	Age VI	8.2 (4)	
	Age VII	8.4 (3)	
	Age VIII	8.3 (2)	
	Age X	8.7 (1)	

Table 4.-Continued.

Yellow Perch	Age I	4.4 (2)	+0.6	
	Age II	5.5 (14)		
	Age III	7.1 (7)		
	Age IV	7.6 (3)		
	Age V	9.3 (9)		
	Age VI	8.9 (3)		
	Age VII	11.1 (5)		
	Age VIII	11.3 (3)		