Lake Medora
Keweenaw County, T.58N., R.29W., Sec. 10
Keweenaw Montreal River watershed, last surveyed June 2018

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Environment

Lake Medora is a 695 acre inland lake situated at the northern tip of Michigan's Keweenaw Peninsula (Figure 1 and 2). Water depths vary between shallow and 26 feet, with most of the lake being less than 25 feet in depth (Figure 3). Bottom types consist of many shallow flat shoals, sand, gravel, rock rubble, and rock outcrops. Reports of water clarity have ranged from 7 feet to 20 feet with a water color of light brown (clarity varies at times due to the shallowness of the lake and the bottom sediments getting stirred following wind events). Aquatic vegetation is sparse. Crayfish are abundant. Natural shoreline riparian forest is abundant with a good presence of downed shoal area trees.

Lake Medora has always had a simple fish community of Yellow Perch, Smallmouth Bass, and Lake Whitefish. The Medora whitefish were a unique strain, regarded as special because as a sport fish they would easily take surface casted dry flies. Both Yellow Perch and Lake Whitefish are plankton dependent species of fish, and their populations are sustained when there are abundant levels of zooplankton, however Yellow Perch are more efficient at cropping zooplankton levels down than whitefish. The chronic fisheries management challenge for this lake was to keep the Yellow Perch population in low abundance in order for the Lake Whitefish (and in later years, the Rainbow Trout) to have a sufficient plankton base to survive. Netting, to remove Yellow Perch, was moderately successful at keeping the perch numbers down, however the benefits of these thinning efforts were very short in duration.

History

Lake Medora was first surveyed in the year 1926. Notes from John N. Lowe, describing an August 1926 survey of Lake Medora state "This is an artificial lake which was formed by damming of the Mosquito River in the 1860's to supply water-power to the Keweenaw Copper Company's Medora Copper Mine" (note..Lowe was a general biologist who taught biology in the 1920's at Northern State Teachers College, now known as Northern Michigan University). Mr. Lowe's management recommendation in 1926 makes the following two comments; 1) do not plant Walleyes, 2) keep the walleyed pike out. What Mr. Lowe was indicating by his comments was that this lake is shallow and influenced by a cold and cloudy microclimate due to its close proximity to Lake Superior, whereby Walleye, once established, would not develop into an attractive fishery, plus they would outcompete the native Lake Whitefish population. The features of being a gravel substrate, shallow headwater lake situated in a cold climate, could result in the establishment of Walleye but with a low growth capability. Walleye do not grow (in length or girth) until water temperatures are 44F or higher. Walleye, being a piscivorous predator fish, requiring both a steady available forage base and warm water in order to sustain a continued sport fishery of fish of 15 inch and larger. Because of the cold microclimate here, Lake Medora will never have the capability to provide a steady large-fish Walleye fishery.

In the late 1960's, small-size Yellow Perch were abundant in the lake. The perch outcompeted the whitefish for plankton, thereby resulting in a poor sport-fishery for both Lake Whitefish and Yellow

Perch. Due to the marginal fishing conditions, numerous requests were generated by lake owners for the lake to be stocked with Walleye (to feed upon the Yellow Perch). The DNR stocked walleye into the lake in 1971. Walleye management was successful for about 10 years, and during that period netting surveys showed a diminishment of Yellow Perch and juvenile White Suckers. By 1992 Yellow Perch numbers were very low and Walleye became small and skinny, but abundant. By 1992, Lake Whitefish had totally disappeared from the Medora fishery. Walleye stocking was conducted again in 1982 and 2002 with follow-up surveys showing small and skinny Walleye, as well as a depleted forage base and very low numbers of Yellow Perch. In 2005, the management plan for this lake was to cease any further introductions of Walleye.

Rainbow Trout are a planktivorous fish that will utilize the zooplankton within Lake Medora as a forage supply. The history of fisheries management of Lake Medora shows that past introductions of Rainbow Trout, when perch populations were low, had occasionally worked in providing a viable sport fishery.

Current Status

The management plan for Lake Medora for the period of 2015 through 2020 was to continue to deemphasize Walleye as the sport fish priority for this lake and to switch to using Splake and Lake Trout as the piscivorous fish species to control Yellow Perch. Michigan fall fingerling Steelhead (Rainbow Trout) were stocked, in an effort to provide a sport fish that was not dependent on having a large minnow base for forage.

In the years 2015 - 2018, between 20,000 - 23,000 Steelhead were stocked annually. Splake were stocked in 2015 (6,500 yearlings) and Lake Trout were stocked in 2016 (500 adult fish). There have been no reports of successful angler catches of any of these fish.

A June 2018 netting evaluation was conducted on Lake Medora using State Status and Trend survey protocol. Gear used for this effort included 3 small-mesh fyke nets, 4 large-mesh fyke nets, 3 experimental-mesh gill nets, beach seining, and a Smith-Root electrofishing boat. More than 1,100 fish were collected in the effort and represented by 10 species (Table 1).

Prior to the 2018 survey, the last Status and Trend fisheries survey on Lake Medora was conducted in the June 2004. Comparing netting catch results with the 2004 survey shows that the then-to-now abundances of gamefishes have all increased in the 2018 survey shown by the following; Smallmouth Bass (93 to 187), Walleye (63 to 116) and Yellow Perch (139 to 287). Average sizes of these fish have not changed significantly; again shown by Smallmouth Bass (12.5 to 11.5), Walleye (14.2 to 12.2), and Yellow Perch (3.3 to 4.1). Overall the Yellow Perch fishery is showing more "keeper size" fish of 6 inches and larger fish in the 2018 survey. Figures 4-6 show the current growth rates for Smallmouth Bass, Walleye, and Yellow Perch (respetively) compared to the statewide average for each species.

Forage fish numbers are higher in 2018, both numerically and by species composition. Bluntnose minnows and Yellow Perch in the 2 inch size class are the most prevalent food source for juvenile gamefish. Walleye, while not being stocked in the lake since 2002, are firmly established as a naturally reproducing sportfish, with fish from 1 - 23 inches found in the survey. Walleye sizes continue to remain small and their average length was 12.2 inches in the survey, and 17% of the catch being of legal size. One trout was caught in the survey, a 22 inch Splake.

Analysis and Discussion

Lake Medora is not providing good conditions for trout occupancy. The lake continues to produce decent populations of Smallmouth Bass and Walleye, which are fishes that compete with the trout. The ample gravel shoals here provide ideal spawning habitat for Smallmouth Bass, Walleye, and Bluntnose Minnows, and these fish populations will continue to do well. The abundance of crayfish in this lake provides a reliable food source for keeping Smallmouth Bass numbers high. Yellow Perch numbers will continue to fluctuate in relation to annual year-class production as well as with the abundances of Smallmouth Bass and Walleye.

Management Direction

The stocking of trout in this lake was discontinued in 2019. This lake will persist to support a fishery of Smallmouth Bass, Yellow Perch, and small-size Walleye. Future walleye regulations here may consider the liberal category of a 15-inch minimum size limit, whereby 2 walleye of the 5-fish daily possession limit may be of 13 inches or larger. Walleye stocking is not necessary for this lake. Periodic mid-summer meetings with lake property owners and township officials should occur to effectively communicate the management strategy for this lake.

References

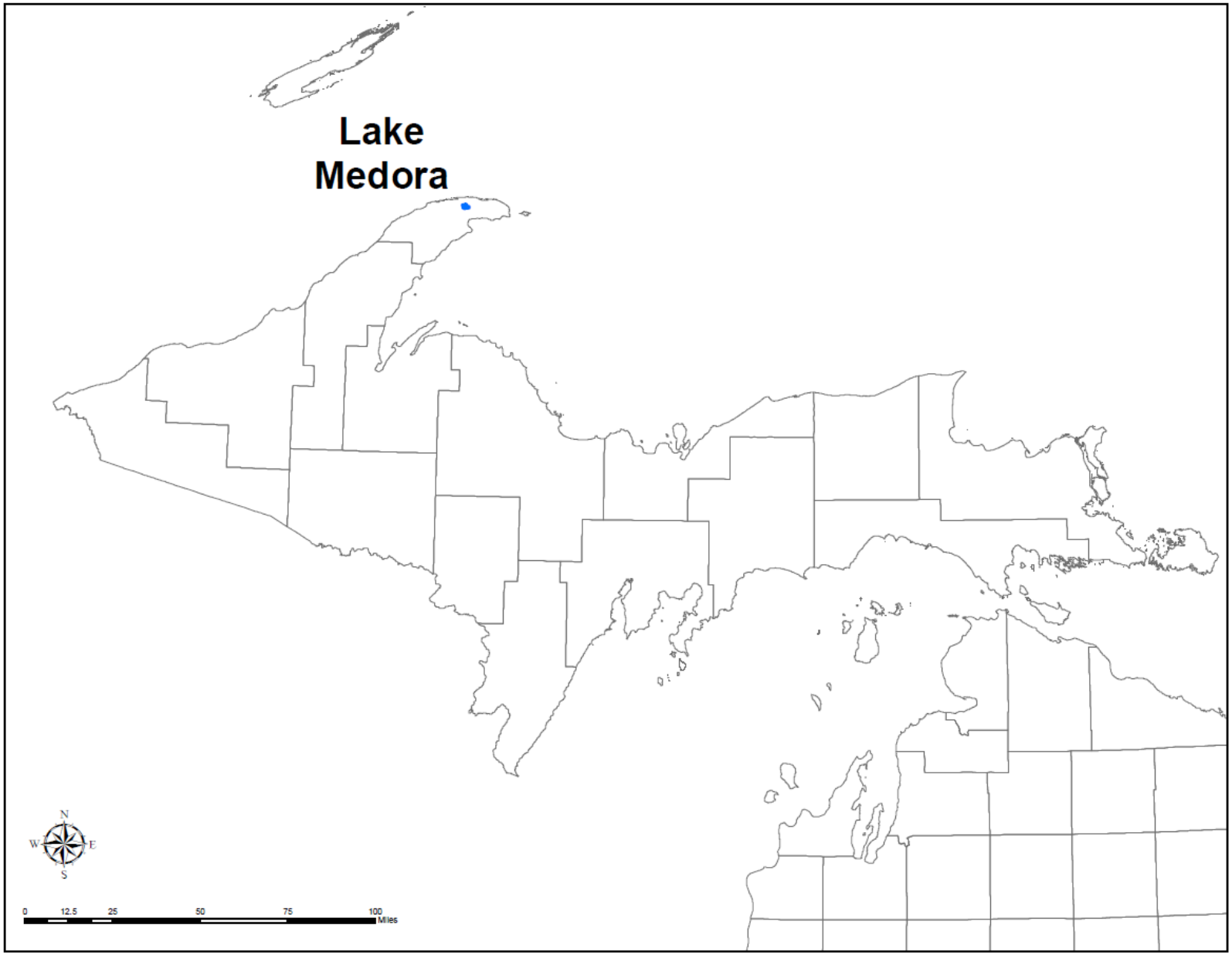

Figure 1. Location of Lake Medora in Michigan's Upper Peninsula.

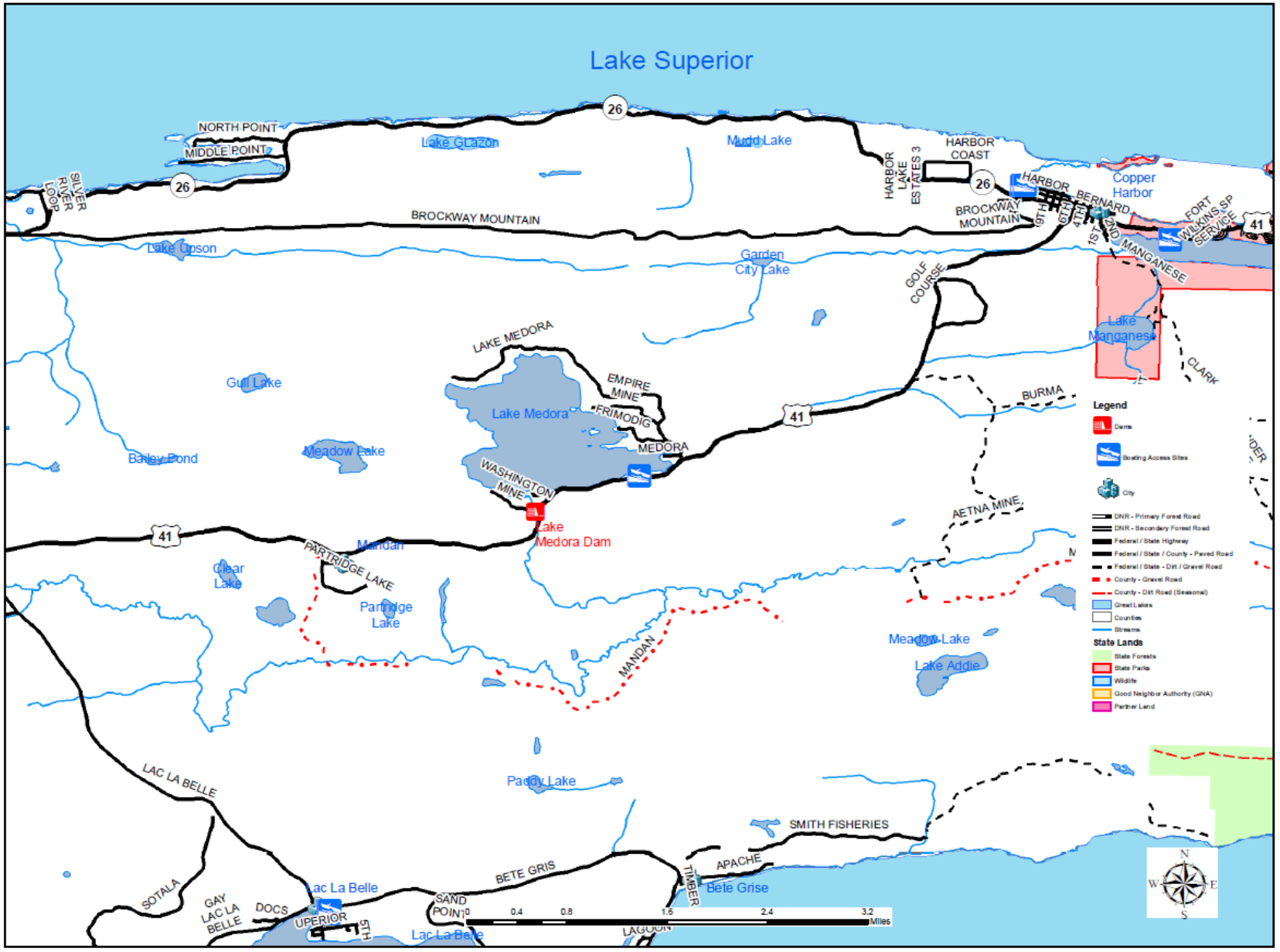

Figure 2. Lake Medora and surrounding features in Michigan's Keeweenaw County.

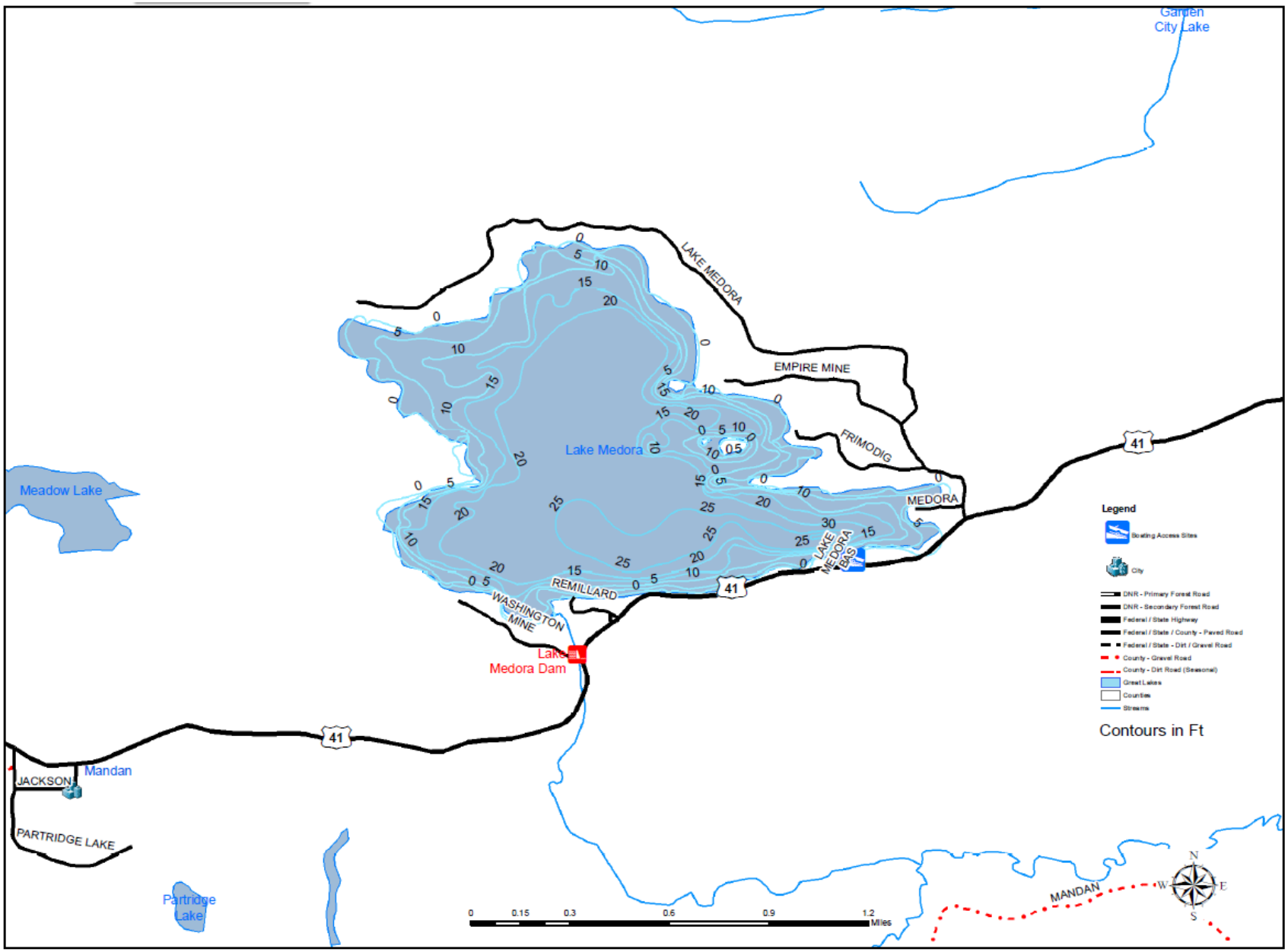

Figure 3. Bathymetric map of Lake Medora.

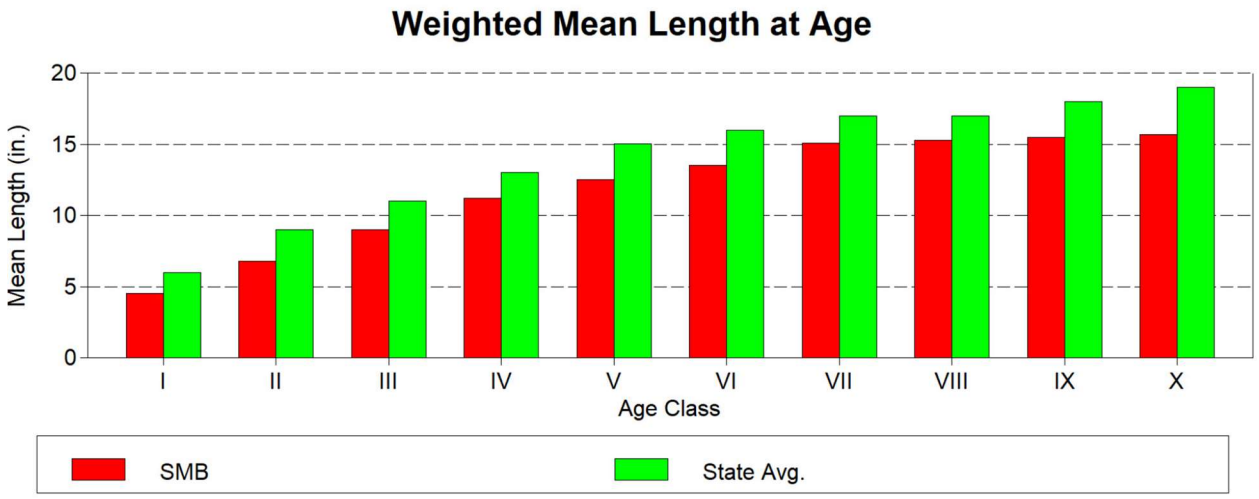

Figure 4. Weighted mean length at age for Smallmouth Bass collected in Lake Medora in June 2018 compared to the statewide length at age for this species.

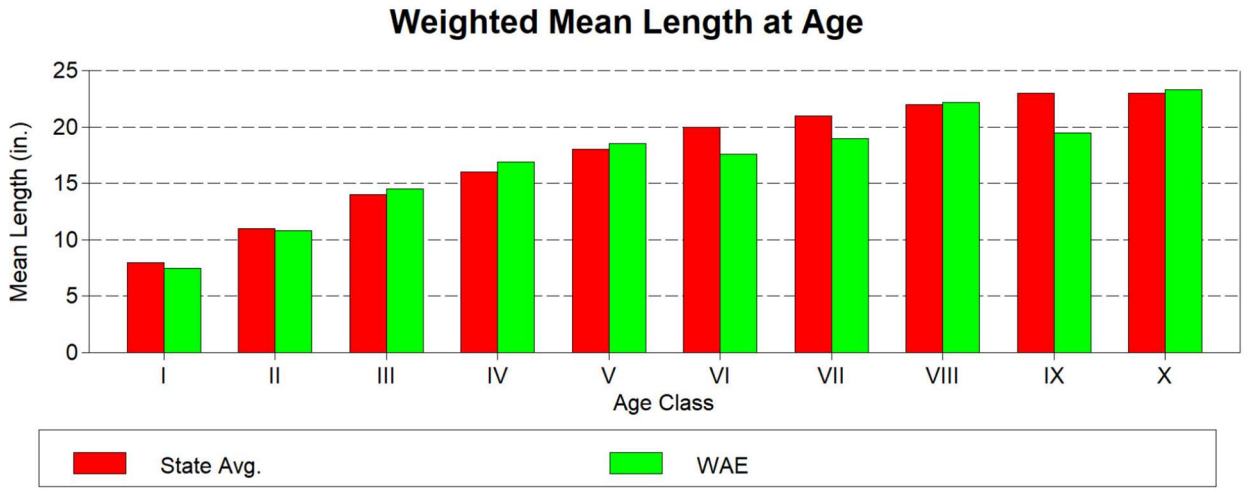

Figure 5. Weighted mean length at age for Walleye collected in Lake Medora in June 2018 compared to the statewide length at age for this species.

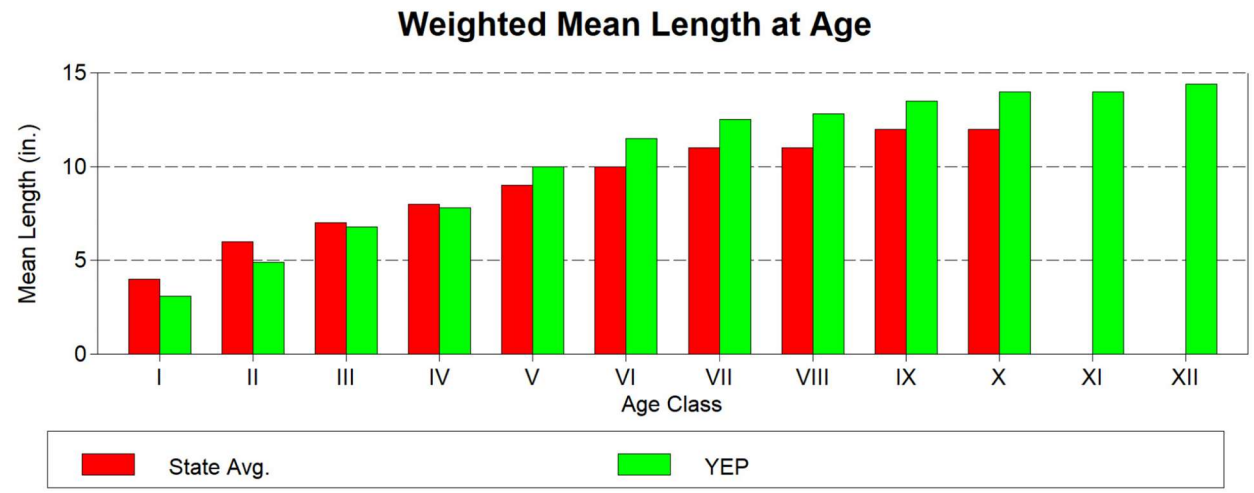

Figure 6. Weighted mean length at age for Yellow Perch collected in Lake Medora in June 2018 compared to the statewide length at age for this species.

Table 1. Catch composition of fish species from a Department of Natural Resources Status and Trends lake survey in Lake Medora, June 2018.

Species	Number	Percent by number	Weight (lb.)	Percent by weight	Length range (in.)*	Average length (in.)	Percent legal size**
Bluntnose minnow	515	45.5	2.9	0.9	1-3	2.4	100
Fathead minnow	2	0.2	0.0	0.0	3-3	3.5	100
Iowa darter	4	0.4	0.0	0.0	1-2	1.8	100
Mottled sculpin	2	0.2	0.0	0.0	2-2	2.5	100
Central mudminnow	1	0.1	0.0	0.0	2-2	2.5	100
Slimy sculpin	4	0.4	0.1	0.0	2-3	2.8	100
Smallmouth bass	188	16.6	173.6	53.2	4-16	11.7	21
Splake Hybrid	1	0.1	4.4	1.4	22-22	22.5	100
Walleye	123	10.9	102.8	31.5	1-24	12.7	21
Yellow Perch	292	25.8	42.4	13.0	0-14	7.8	19
All species totals:	1,132		326.1				