

EFFECTS OF HIGH WATER LEVELS ON LAKE METIGOSHE AND DOWN-STREAM AREAS

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In three of the last twelve years, Lake Metigoshe has felt the impact of higher than normal water levels. During the first (1999), water levels reached a peak of twenty-one inches above weir level (top of the concrete spillway) at the outlet dam. The second (2005) was a record breaking event where the water level topped forty-three inches above weir level. During the current event (2010), levels reached sixteen inches above weir level. All of these events resulted in considerable flooding, loss of personal property, and environmental damage to Lake Metigoshe as well as down-stream areas. In each case, the common perceptions among many individuals is that Lake Metigoshe is the problem, that somehow there is some type of supernatural event that allows Lake Metigoshe to create vast amounts of water and then send it cascading down Oak Creek without regard to how it may affect down-stream areas. **False!** The simple truth is - Lake Metigoshe is but **one** in a series of natural reservoirs that make up the Oak Creek watershed which, in turn, is but a small part of the vastly larger Willow Creek watershed (see map, Fig.1).

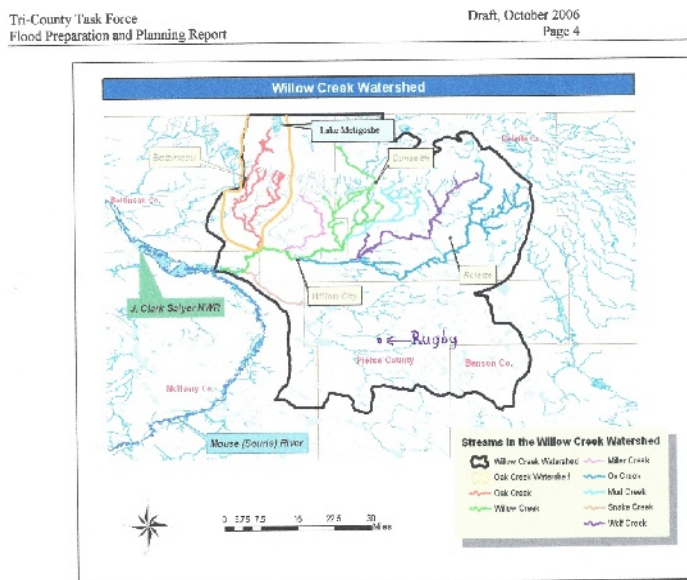


Fig. 1

A portion of Lake Metigoshe's watershed lies in Canada. The Canadian lakes, and their tributaries, constitute an estimated sixteen square miles (10,240 acres) of Metigoshe's total watershed. Sharpe Lake (717 acres, elev. 2156.0 MSL {mean sea level}), Partridge Lake (111 acres, elev. 2156.7 MSL), Hasselfield Lake (est.10 acres, elev. 2,138.0 MSL), feed into Dromore Lake (211 acres, elev. 2138.0 MSL – the same elevation as the spillway on the outlet dam of Lake Metigoshe), which is actually the northern most extension of Lake Metigoshe, being connected by a short navigable channel (Canada Creek).

On the U.S. side of the International Boundary, there is Ross Lake, a small portion of which lies in Canada, (240 acres, elev.2145.86 MSL), School Section Lake (38 acres, elev. 2143.5 MSL), and Lake McDonald Lake (est. 12 acres, elev. 2138.0 MSL). These lakes empty into Lake Metigoshe through a small outlet on the west side of Lake McDonald. The estimated U.S. watershed for Lake Metigoshe is 21 square miles (13,440 acres), for a total of 37 square miles or 23,690 acres. All of these lakes have numerous smaller lakes, ponds, springs, meadows, etc., that contribute significant amounts of water, especially during above normal precipitation events.

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Further, the total combined acreage of the Canadian lakes amounts to approximately 1050 acres, while the total for those on the U.S. side is approximately 290 acres. That brings the total to 1340 acres, compared to 1544 acres for Lake Metigoshe – or nearly 88% of the surface area of Lake Metigoshe.

The State Water Commission estimates the Oak Creek watershed at 156,800 acres (or 245 square miles). According to their data, Lake Metigoshe's watershed accounts for approximately fifteen per cent of the total Oak Creek watershed. Is Lake Metigoshe **the** problem? **No** - absolutely not! It is but one component of the Oak and Willow Creek larger and more complicated watershed – again see Fig.1.

A significant part of the overall problem is topography. Once water has descended out of the Turtle Mountains, it reaches a vast broad plain with very little change in elevation. There is simply not enough difference in gradient to efficiently move large amount of water through the natural drainage channels at a rate fast enough to avoid recurrent flooding problems, and unless the various water-courses are maintained in such a manner as to allow the water to flow swiftly into the Mouse River the problems will remain.

A photograph (by the Bottineau County Emergency Management Coordinator and included in the final Task Force report), taken at the height of the 2005 flood, clearly shows that vast amounts of water were being backed-up at the confluence of Willow Creek and the Mouse River. The water was unable to pass quickly into the River due to a combination of restrictions caused by the Scenic Trail and other man-made obstacles in the Refuge, as well as by the serpentine channel of Willow Creek - **which was, and still is, clogged by silt, cattails, and large numbers of dead trees**. Until those problems have been addressed, succeeding high water occurrences will continue to inundate large areas of agriculture lands and private property. The Refuge, to its credit, is actively working to alleviate some of their problems; however, McHenry Co. has yet to commit the necessary resources to resolve its issues i.e., channel clearing, bank stabilization, and poorly located roads with undersized bridges and culverts.

For those who are interested in the findings and recommendations of the **Tri-County Task Force Flood Preparation and Planning Report (Bottineau, Rolette, McHenry Counties)** created by ND Governor John Hoeven during the height of the 2005 flood event, the final report can be found on the internet @ www.botco.homestead.com and then clicking on emergency management.

At the most recent meeting of the Task Force (July 15, 2010), a review was conducted to see how many of the recommendations had been implemented. Several of the representatives briefed on activities in their respective areas. To their credit, the Oak Creek Water Resource District had probably initiated and completed more work than any of the other participants. Some of the items included: snagging and clearing operations on a considerable part of the Oak Creek channel, areas of bank stabilization, removal of beaver dams and cattails in some areas, and a joint effort with the city of Bottineau in channel clearing and erosion control on the portion of Oak Creek that passes thru the city. By their own admission however, additional work needs to be done - particularly in the areas of cattail removal in and around the Duck Lake area and above the confluence of Oak and Willow creeks. It should be noted that the ND State Water Commission assisted in funding some of the Oak Creek projects.

Others who were addressing some of their problems include: the J. Clark Salyer National Wildlife Refuge, City of Bottineau, ND Department of Transportation (Minot District), ND State Parks and Recreations Department, Wold Engineering, and the Lake Metigoshe Recreation Service District (LMRSD). Most noticeable of the absentees were representatives from McHenry Co., and since a significant part of the flooding events are compounded because of problems in their area of responsibility, it is troublesome as to why they seem reluctant to resolve the problems. What little work has been done in McHenry Co. is largely because local landowners have done the work themselves and at their own expense.

If steps are not taken (and taken soon) to resolve the situation with the problems in McHenry Co. to alleviate the bottleneck at the confluence of Willow Creek and the Mouse River in an effective manner so as to allow the water to pass into the river in a timely manner, abnormal high water events will continue to have a significant impact on future flooding events.

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A dire warning! During a recent Executive Briefing on Flooding in North Dakota, a representative of the National Weather Service (NWS) relayed to the attendees that the NWS predicts that in the coming years North Dakota will see increased occurrences of flooding – and when they occur they will be more severe in nature and longer lasting than past events. If their predictions are accurate, the water is coming and we need to be prepared, pro-active instead of reactive in maintain our water-courses.

So while some may think that higher than normal water levels are desirable for enhanced recreational activities, the less noticed, but more undesirable effects of increased shoreline erosion (which adds to the filling in of the lake), the adding of additional nutrients that help to promote the grow of more aquatic vegetation (lake weeds) and increase the probability of more and increasingly severe algae blooms. It is simply too great a price to pay.

Additionally, higher than normal water levels – that is anything above the recognized mark of 2138.0 MSL (mean sea level) weir level (top of the spillway) at the outlet dam – are known to have an adverse impact on the infrastructure of the Lake Metigoshe Recreation Service District (LMRSD) waste water (sewer) collection system. Records show that when water levels reach three inches above the weir level of the dam, there are noticeable increases in the pumping times in the 260 grinder basins and three lift stations. Further, when water levels reach ten inches above weir level the lift stations are pumping at three times their normal volume. Any increase above ten inches continues to increase pumping times. Not only does this have a significant increase in electrical consumption and requires additional man-hours, but it also reduces the life-expectancy of the grinder and lift station equipment and results in substantially higher costs to the District.

In a 1971 report from the North Dakota Water Resources Institute at North Dakota State University, a professor reported that Lake Metigoshe is now considered **polluted**. Alarmed by this finding, a group of concerned property owners begin searching for ways to fund and build a lake-wide sewer system. As a result of their efforts, the State Legislature enacted into the ND Century Code a provision allowing for the creation of Recreation Service Districts. Shortly thereafter, the Lake Metigoshe Recreation Service District (LMRSD) was formed and work began on designing and funding a waste-water collection system. The system became operational in late 1983, and within a year noticeable improvements in water quality were observable. In 1998, an official of the Division of Water Quality, ND State Department of Health stated that: “Lake Metigoshe now has the best water quality of any natural lake in the state.”

Millions of dollars have been spent on constructing, improving, and maintaining this system in an attempt to save the lake while at the same time some pursue other practices that work in opposition to this goal. **Lake Metigoshe is in trouble! The Lake is dying!** All lakes, like everything else in nature, have their time. Science has devised a scale by which the **trophic** status of a lake is determined. **Trophic** status refers to the present condition, or measurement of **eutrophication** i.e., the aging process by which a lake becomes more fertile, fills-in, and eventually ceases to exist. The scale ranges from: **oligotrophic (best), mesotrophic, eutrophic, and hypereutrophic (worst)**. In the 1996 annual report from the North Dakota Department of Health, Division of Water Quality to the LMRSD (as part of a joint seven year survey to establish an empirical data base for determining the status of the lakes water quality), they defined **Lake Metigoshe as being in a range between eutrophic and hypereutrophic for most of the season; but in the fall, the trophic state tends to become hypereutrophic**. Since then, the Lake has had to suffer the effects of three abnormally high water events (1999, 2005, & 2010), which are almost surely to have caused substantial additional undesirable impact to the Lake and the overall water quality.

The seemingly well intentioned, but misguided, practice of artificially (and illegally) raising the water level by the use of flashboards on the outlet dam have caused irreparable damage to the lake shoreline and served to exacerbated the natural ageing process of the lake. Most long time property owners can cite case after case of substantial shoreline erosion around the lake. On North Lake alone, there are a minimum of eight areas of shoreline (points) where it can be noted that 30 to 50 years ago they projected anywhere from 10 to 30 feet, or more, further into the lake than they do today and similar areas can be found on South Lake.

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Excerpts from the field notes of the 1884 U.S. Survey of the Exterior Boundaries of Townships 163 and 164 North of Ranges 74, 75, and 76 West make reference to the depth of Lake Metigoshe as being, in some places, more than 70 feet. During the late 1940's and early 1950's, local lore claimed a maximum depth of 35 feet. A report from the ND State Water Commission to the ND State Conservation Commission in 1955 placed the maximum depth at 23.3 feet, with an average depth of 16.7 feet. In 2004, the ND State Game & Fish Department survey placed to maximum depth at 24.3 feet, with the average depth at 11.3 feet – a loss of 5.4 feet of average depth in approximately 50 years. Add in the effects of the high water events of 1999, 2005, & 2010, a further reduction seems extremely likely. Additionally, the loss of nearly one-third of the average depth has reduced the total volume of water that the Lake contains by nearly 8,000 acre feet (enough to cover twelve and one-half square miles of land to a depth of one foot). Those are staggering numbers!

If concerned property owners, and part-time recreational users of the lake, do not adopt measures to reduce the adverse impact of excessive development and the resulting abuse to unprotected shorelines – we are going to lose what is certainly one the most valuable natural and economical valuable resources in Bottineau County, and possibly the entire state. How many other places in North Dakota will you find a small city (like Bottineau) that features three lumber yards, two sports and recreational oriented centers, five motels, one marina, three RV parks, numerous contractors and a variety of other small businesses, as well as one of the more popular State Parks without the influence of a major recreational attraction? Also, the Lake generates substantial revenues for utility companies like Souris River Telephone and North Central Electric Cooperative, Inc. Additionally, the Lake (according to the 2009 County Treasures office breakdown of property values) accounts for 25% of the taxable valuation for all of Bottineau County, and is 47% larger than the taxable valuation of the city of Bottineau. If anyone thinks that Lake Metigoshe is not an extremely valuable economic resource – well, they need to think again.

It is time for us to wake-up! Property owners at the Lake need to take the necessary measures to protect their valuable shorelines – indeed, many have, many more have not. Another area of some concern is the practice of a few property owners who attempt to build and maintain a sand beach. Most often these efforts prove futile as the material is eroded into the lake within a season or two - adding yet more material to the bottom of the lake. One also has to wonder where all the sand that filled the thousands of sand bags during the 2005 flood ended-up? Finally, as the size and numbers of watercraft continue to increase and the types of water oriented sports activities continue to evolve i.e., “tubing” and “wake-boarding,” larger than normal wakes are being generated placing additional pressure on un-protected shorelines. We **ALL** need to be more considerate of the way we conduct ourselves while engaging in the many recreational opportunities available on the water.

Since the late 1880's, *picturesque* Lake Metigoshe has been providing generations of people with an almost unparalleled setting for quite relaxation, solitude, and recreational activities - a wholesome environment to bond with friends and family. It is time to work together in a co-operative spirit to preserve this valuable resource – not only for the foreseeable future, but for future generations as well.

As a start, let's remove those darn “**flashboards**” from the outlet dam!

Les Turner: Concerned property owner and 65 year *friend* of - “**The Lake!**”