

CLARK LAKE DAM: an INTRODUCTION

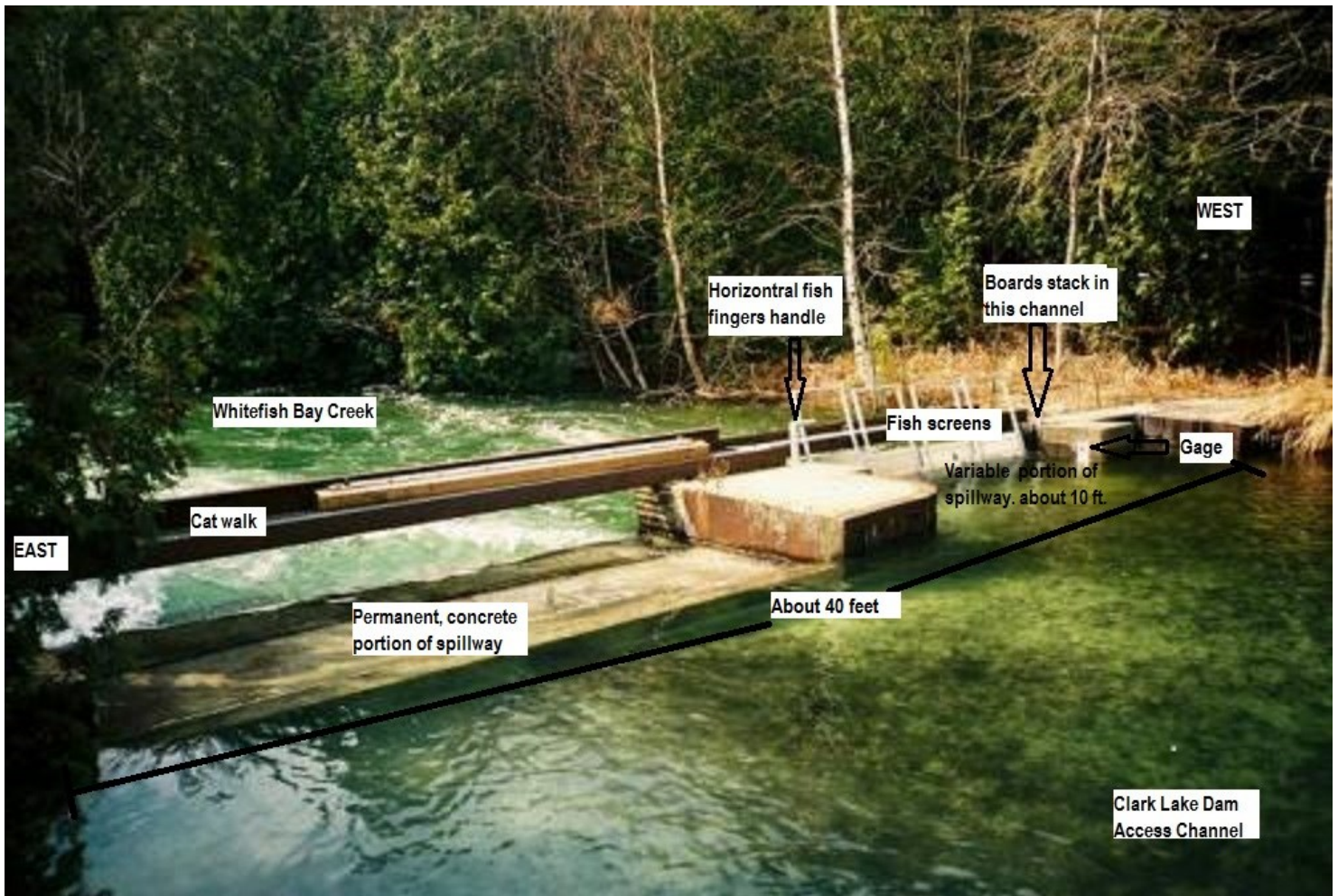
Most Clark Lake residents have never visited the dam or are aware of its components and operation. This document is only intended to allow everyone to “see” the dam and learn a little about how it operates. Hopefully, this will facilitate discussion of other dam related topics.



Some Dam Construction History

- 1937** Dam built by WPA lake owners help fund.. Watershed 12.8 sq.mi.
- 1947** Lake level order
- 1967** Dam refurbished cost or extent?
- 1981** Temporary new lake level order
- 1987** New dam boards (?)
- 1991** New level order made Permanent
- 2007:** Revised watershed 17.5 sq.mi surface and 22sq.mi subsurface
- 2009** Dam repairs and reinforcement shore; \$23,000 towns share cost
- 20??** Fence and locked gates to close dam land access
- 2015** Dam failure rotted boards; All boards replaced with 4X4 treated lumber with metal facing
- 2016** Jacksonport stops shared payment for dam maintenance
- 2018** Sevastopol closes water access to dam

Clark Lake Dam



The dam spans the mouth of Whitefish Bay Creek which flows into Lake Michigan.

The spillway opening through which water can exit the lake is composed of a fixed concrete overflow section and another 10 foot wide section of stacked 4X4 untreated lumber boards. By adding or removing a board on the stack, the height of this section varies which then causes the outflow to change accordingly.

Note

This photo prior to the fence being built.

Spring water is flowing over the fixed concrete portion of the spillway.

The boards seen on the catwalk are an older version that do not have metal facing but the length is the same as current boards.

Clark Lake Dam May 2022
View looking from east to west
Upstream side



Clark Lake Dam May 2022
View looking from east to west
Downstream side



Clark Lake Dam May 2022
View looking from west to east
Upstream side



Clark Lake Dam May 2022

Looking west toward east

Downstream view



CLARK LAKE DAM BOARDS



Each board is 3.5 inches thick with metal facing on two sides so the boards fit securely together when stacked to obstruct the flow of water. The boards are stacked with each end aligned in channels (a 3-4 inch groove) cut into the concrete sidewalls of the 10 foot open section of the dam.

The 4 boards shown here are lying on the east bank. The boards are carried via a metal catwalk that runs across the top of the dam.

The boards are 9.5 feet long and heavy. This can require two people to add or remove them.

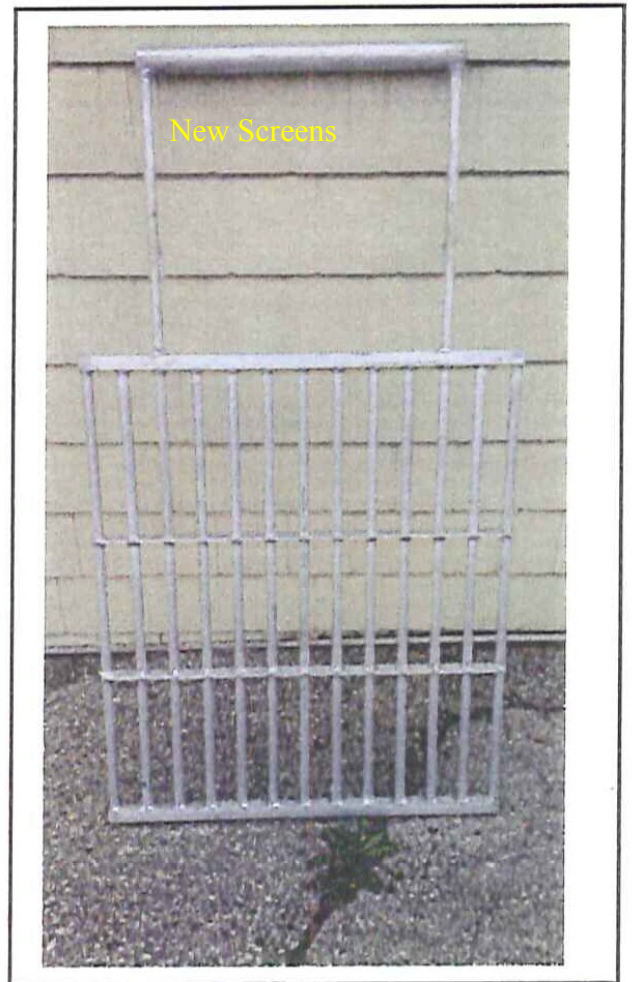
If water is leaving the lake too rapidly through the 10 foot wide spillway, then mounting another board on top of the existing stack will block outflow and allow the lake level to stabilize or rise. Alternatively, removing a board will allow more water to drain over the shortened stack.

FISH SCREENS (1)

Vertical metal grates hang on the catwalk over the lake side of the boards to prevent fish, such as suckers, carp, gobi, salmon and trout from traversing into Clark Lake.

These fish screens are light weight metal and can be manipulated by one person.

There are two sizes and are designated for different seasons depending on fish spawning activity so are swapped out in the spring and fall.



The fish screens are designated as the “old screens” and “new screens”.

The new screens have wider spacing between the vertical bars and less horizontal bars thus allowing more flow than the old screens.

The new screens are in place between Sep 16th and April 30th with the older smaller mesh screens in place the rest of the year.

FISH SCREENS (2)



Old Screens
May1st-Sep15th



New Screens
Sep 16th-April 30th

FISH FINGERS (1)



There are horizontal metal projections that extend downstream above the water level to prevent invasive fish from leaping over the dam into Clark Lake.

The fingers on the fixed, concrete part of the dam are permanently attached.

FISH FINGERS (2)

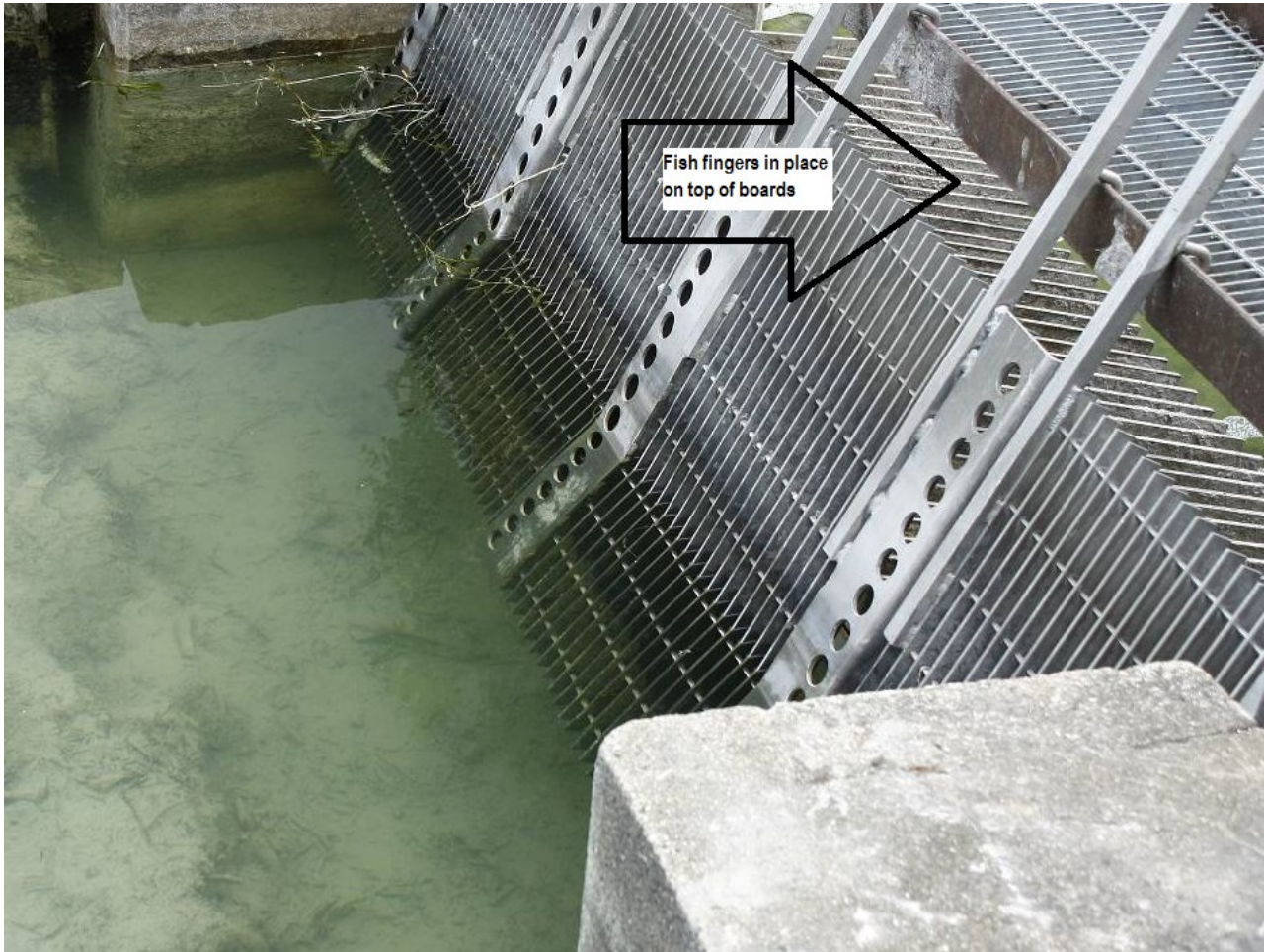


There is also a removable set of fingers that fits into the channel on top of the boards.

These fingers have a vertical base that approximates an additional board.

The fingers require two people to move, and must be moved each time a board is added or removed.

FISH FINGERS (3)



CLARK LAKE DAM GAGE (1)



Lake levels are supposed to adhere to ranges depending on dates set by the DNR .

The DNR order specifies lake levels pegged to a geologic brass benchmark of 99.5 feet set on the top of the dam. The lake levels in the order range between 96.25 feet up to 98.0 feet.

A gage installed on the west wall of the dam is used to determine the current lake level. The gage is set so that 9.00 is equal to a benchmark (DNR order) reading of 98.0 feet.

The gage is to be read as feet with each large hash mark representing 0.1 feet or 1.2 inches.

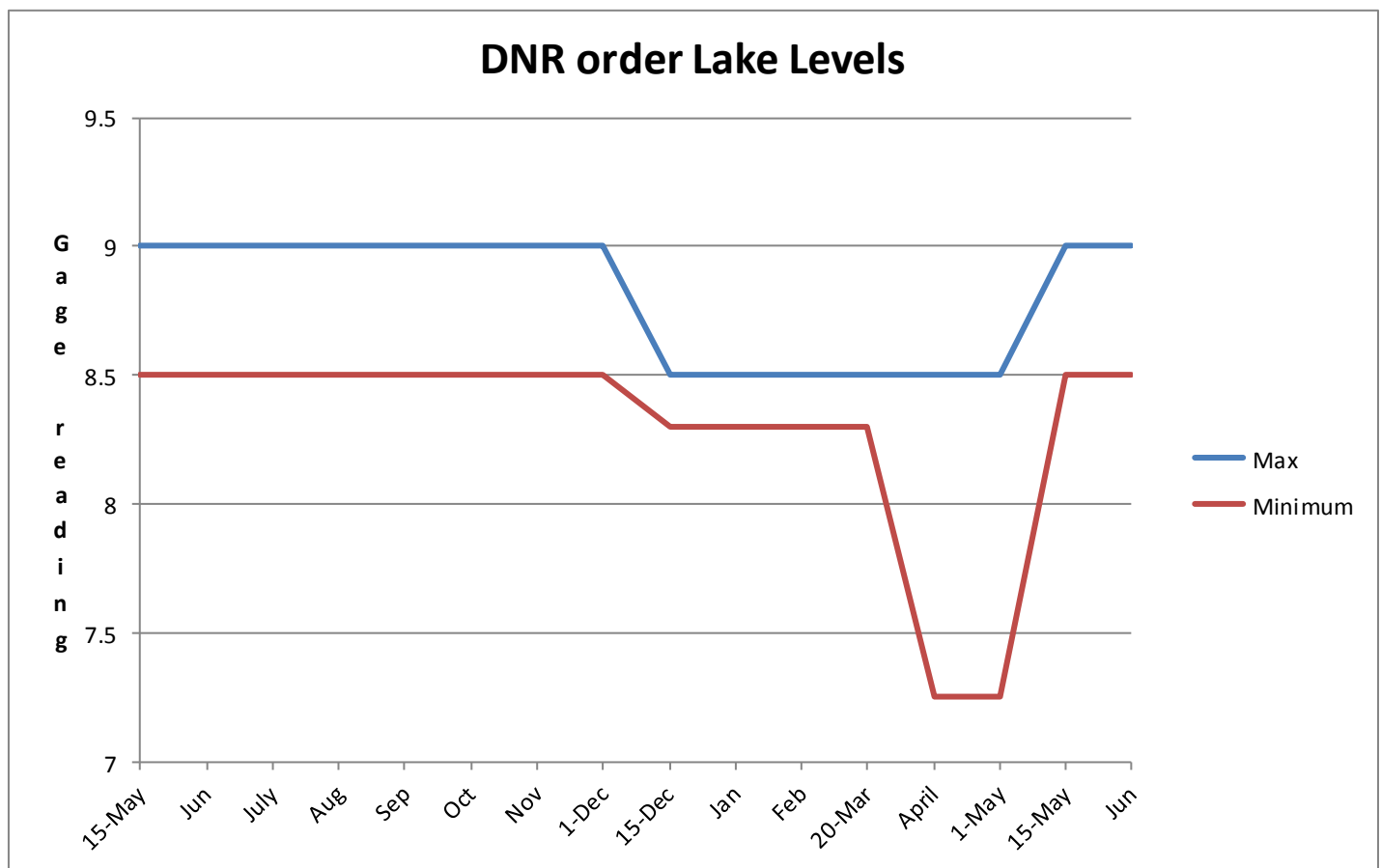
The top of the fixed side of the spillway is 98.1 feet or a gage reading of 9.1.

GAUGE	LAKE LEVEL
9.0	98.00 FEET
8.5	97.50 FEET
8.3	97.30 FEET
8.0	97.00 FEET
7.5	96.50 FEET
7.25	96.25 FEET

CLARK LAKE DNR LAKE LEVEL ORDER 1991

Here is the current DNR lake level order and also a graph depicting the levels ordered beginning in May and through to the next year.

GAUGE	LAKE LEVEL	TIME PERIOD
9.0 TO 8.5	98.00 TO 97.50 FEET	MAY 15 TO DEC. 1
8.5 MAXIMUM	97.50 FEET	DEC. 1 TO DEC. 15
8.5 TO 8.3	97.50 TO 97.30 FEET	DEC. 15 TO MARCH 20
7.25 MINIMUM	96.25 FEET MINIMUM	MARCH 20 TO MAY 1
9.0 TO 8.5	98.00 TO 97.50	MAY 1 TO MAY 15



Clark Lake Dam Gage (2)

Reading the gage is frequently difficult and only an estimate



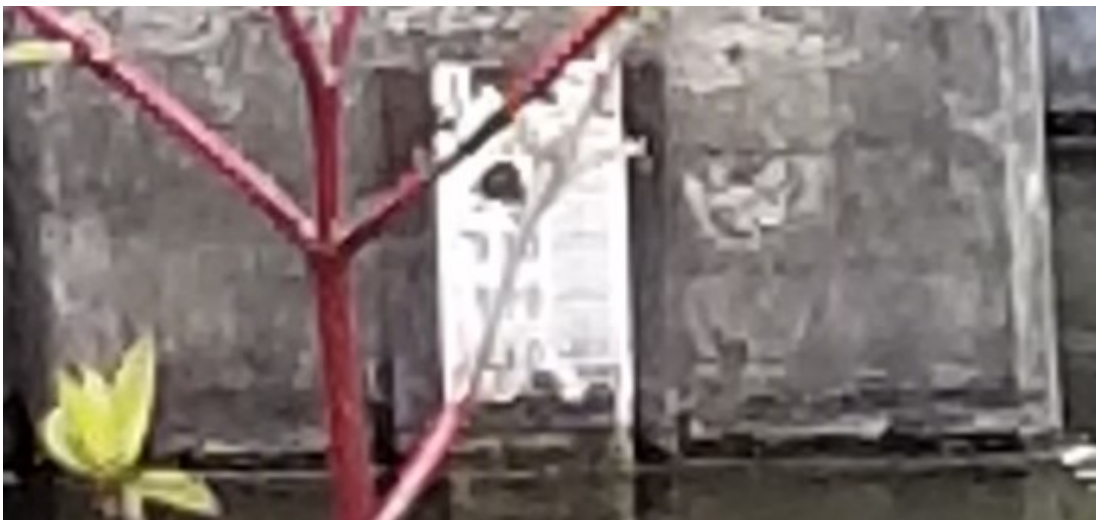
The dam gage is on the west wall facing east so must be viewed through the fence at a distance of about 30-40 feet.

Binoculars are recommended.



Unless a calm day, waves mean readings are an estimate dependent on wave amplitude and frequency

Reflection off the water can confuse the reading



The gage can be obscured by dirt and grime.

DEBRIS OBSTRUCTING OUTFLOW

Debris can accumulate on the grates and obstruct outflow from the lake.

This is most noticeable during the spring and fall but can occur anytime when significant debris can accumulate within hours.

Someone has to clear the debris frequently enough to adhere to the DNR lake level order and prevent shore damage and habitat disruption.



Downstream and upstream view of debris accumulating to simulate the effect of 1 or 2 additional boards May 15, 2022.



Dam Maintenance routine tasks



Maintenance work on and around the dam includes the risk of slipping, falling, straining your back or other muscles or even drowning. Safely doing some of the tasks requires two people. Weather conditions may also turn a one person task into a team effort.

Clearing debris off the grates

Rake: Standing on the catwalk one person can sweep the debris up and over and away from the dam.

Turning grates : Grates are lifted up and turned around to allow water flow to push the debris downstream. Can be done by one person but if adverse conditions or water flow too powerful may require two.

Changing boards

The boards are almost 10 feet long and have metal facing so they have considerable weight. A strong person can do this task but two may be safer.

When lowering the lake level it is recommended to not routinely remove more than one board per day.

If the fish fingers are in place and perched upon the top board, this will require two people to remove them, place the board and then replace the fish fingers.

The fish fingers have not been in place on the boards for a few years so this is not a current consideration.

