

# **Coalition for Equitable Water Flow**

## **“Preferred Water Levels”**

on the Reservoir and Flow-Through Lakes  
in the Haliburton Sector of the Trent River Watershed

### **Summary Report**

May 2017

## **Executive Summary**



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## EXECUTIVE SUMMARY

### PURPOSE

In 2011 the Coalition for Equitable Water Flow initiated a project to identify preferred water levels on the reservoir and flow-through lakes of the upper Trent River watershed during the navigation season with two main goals in mind:

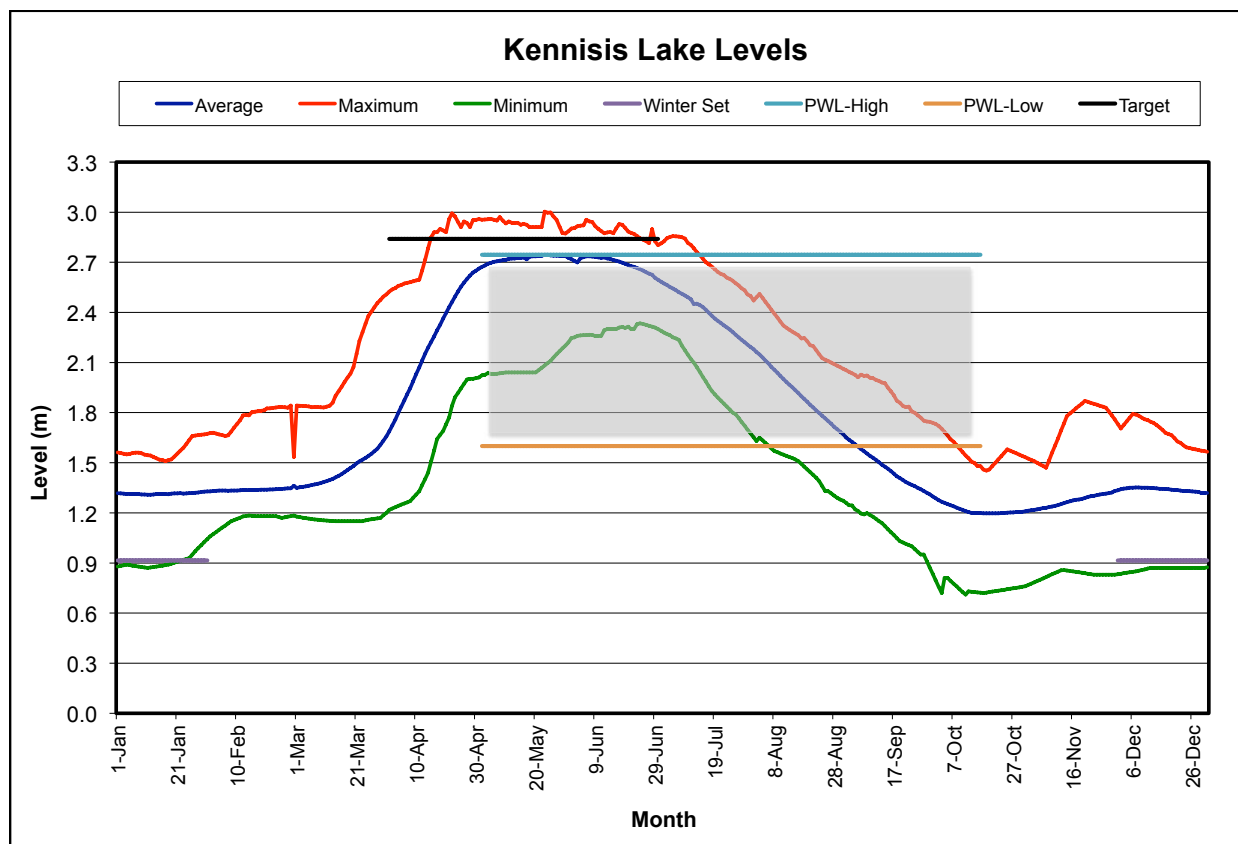
- first, to engage member lake associations in an exercise to document local (lake-specific) water level issues using measurable criteria; and
- second, to compile this information for submission to the Trent Severn Waterway (TSW) as support for the inclusion of lake-specific constraints in a more sophisticated model for integrated water management at the watershed level.

### LEVEL OF PARTICIPATION

The participating lake associations represent approximately 81% of the TSW's reservoir storage capacity in the Haliburton Sector. Full representation is not possible as 11% of the storage capacity is from lakes without a cottage association, including some with no cottages.

### TYPICAL LAKE ASSOCIATION INPUT

A summary chart for each participating lake association overlays the 'preferred water levels' during the navigation season on the TSW 30-year average and extreme levels data, along with the TSW's target full level and the winter log-set level, as per the example from Kennisis lake:



## **CEWF CONCLUSIONS**

The Coalition's PWL initiative has proved a useful vehicle to engage Member lake associations both in terms of increasing their understanding of water management issues on their lake and for the watershed. The following general conclusions reflect the content of the individual lake association submissions. These are being submitted to the TSW for detailed discussion.

### **1. UPPER PREFERRED WATER LEVELS CORRESPOND TO THE AVERAGE HIGH WATER LEVELS**

The upper preferred water level limits identified by participating associations generally correspond to the average high water levels attained by the current approach to water management. The variability (deviation from the average) of the annual high water is a concern and efforts to reduce this variation would benefit shoreline property owners by providing greater certainty regarding the risk of flooding and ice damage to shoreline infrastructure.

### **2. LOWER PREFERRED WATER LEVELS REQUIRE ATTENTION TO LAKE-SPECIFIC CONSTRAINTS.**

The lower preferred water levels indicate that the ability to include lake-specific constraints in the water management model would result in a more equitable approach in terms of the hardship experienced by waterfront property owners. Again the variability (deviation from the average) of the annual low water level is a concern due to the resulting uncertainty regarding navigation, water-access and the usability of shoreline infrastructure (docks, water intakes etc.).

### **3. WATER CONSERVATION MEASURES ARE INCREASINGLY IMPORTANT DUE TO CLIMATE CHANGE**

It is recognized that efforts to reduce the variability of water levels, while desirable, will meet with limited success given that the controls available to the TSW are not adequate to handle rapid changes in water levels and flows following extreme weather events. Nonetheless, the increasing frequency of extreme weather events, coupled with the projected long-term impact of climate change does suggest the need for an evolution of the current water management model, particularly in terms of water conservation during 'dry years'.

### **4. THE TSW NEEDS BETTER WATER MANAGEMENT MODELLING TOOLS**

As the water management agency, the TSW needs a sophisticated, constraint-based water management modeling capability as recommended in the 2011 AECOM Water Management Study, one capable of considering lake-specific constraint data.

### **5. AN OPPORTUNITY EXISTS FOR IMMEDIATE INCREMENTAL WATER MANAGEMENT ENHANCEMENTS**

Pending the acquisition of an enhanced water management modelling capability, and on an interim basis, the Coalition believes it would be appropriate for the TSW to:

- i. review the 'extent' of the drawdown and the winter-set levels on each lake, given the projected reduction in the spring freshet based on climate change models;
- ii. be prepared to make minor adjustments in an effort to mitigate lake-specific navigation and access issues based on the constraints identified by the participating lake communities;
- iii. review the timing of the draw-down on a sub-watershed-basin basis, so that in wet years the drawdown could be designed to take only the water needed for the TSW to meet its mandate and to provide adequate flows through the flow-through lakes; whereas in dry years the drawdown could be designed to incorporate appropriate conservation measures throughout the system while maintaining adequate flows for the TSW to meet its mandate and to protect public health;

- iv. consider their ability to protect smaller lakes from extreme draw-down when there is demonstrable hardship for residents and minimal benefit to the TSW; and
- v. monitor reductions in leakage resulting from the replacement of dam #1 at Trenton and other TSW infrastructure upgrades that may allow for reduced flows throughout the system without compromising the various minimum flow constraints related to public health and safety.

#### **6. THE TSW SHOULD CONSIDER MODIFYING THE CALCULATION OF EQUAL PERCENTAGE DRAWDOWN**

While maintaining the underlying principle of equal percentage for the main period of the annual drawdown of the reservoir lakes (typically from June to early September), consideration should be given to the viability of the following phased approach using a more equitable calculation of 'equal percentage':

- initially drawdown all lakes with water levels above the TSW target full level in order to achieve the upper limit of the preferred range as evenly and as quickly as possible and to minimize local flooding and shoreline erosion;
- subsequently, rather than using the lower limit of the maximum storage depth in the denominator in the equal percentage drawdown calculation, instead use the lower limit of the PWL (or the mid-September average water level for those lakes who have not provided a PWL document) in the denominator to determine equal percentage for drawdown so that in a typical year all the reservoirs would reach the lower limit of their PWL at about the same time.

It is understood that some elements of such an approach might require modelling prior to implementation to avoid unintended negative consequences.