Experiment with Carlson Road Dam on Little Round Lake

A. Description of Project Area

The project area is the area commonly known as the Round Lake Watershed, consisting of Round Lake, Little Round Lake, Osprey Lake and Osprey Creek down to County Highway NN.

B. Description of the Problem to be addressed by the Project

There has been a great deal of discussion and debate over the past 70+ years related to the management of water levels on the Round Lake Watershed. This has intensified over the past 5 years.

Work done for Sawyer county by SEH, the results of which were published in a report dated December 27, 2010, concludes that the current Carlson Road dam is inconsequential in all situations except when all stop logs are in place at elevation 1345.0 feet, due to the fact that the downstream obstructions become the low water control.

As part of their work, SEH analyzed a passive control structure with a v-notch weir as a possible replacement for the Carlson Road Dam, but their analysis showed that it would be no more effective as a low water control than a simple box culvert set at stream bed level. The County has therefore recommended replacing the Carlson Road Dam with a 12-foot by 7-foot box culvert set at the elevation of the streambed.

The Round Lake Property Owners Association has concerns regarding the county's recommendation because we believe that the beaver dams and other obstructions downstream of the dam are not reliable and could wash out over time resulting in a significant lowering of the normal water surface elevation (WSE) of Round Lake.

Based on our understanding of SEH's engineering analysis, the passive structure described in their December 2010 report would be of no consequence as long as the beaver dams and downstream obstructions remain intact at their current elevation or higher. Should the beaver dams and downstream obstructions erode or wash out, this passive structure would provide a low water control that would help maintain the normal WSE of Round Lake near the desired level of 1344.75' during times when precipitation patterns are in the range of historic averages. This structure would also allow a base flow through the system to ensure that Osprey Lake is supplied with water at all times when the WSE of Round Lake exceeds the streambed level upstream of Carlson Road.

One of the primary obstacles to reaching a consensus regarding a solution to the water level management issue is the lack of a common understanding and agreement within the various constituencies concerning the actual influence of the dam and potential weir, or lack thereof, on the water levels within the watershed. Those most interested in higher water levels on Round Lake and Little Round Lake believe that the absence of a dam is adverse to their interests, lacking the confidence in the downstream obstructions as a means of controlling low-level flows. Those on Round Lake and Little Round Lake concerned about the impact of high water on their property believe the presence of the dam/weir to be adverse to their interests, as they perceive it to be a significant means to retain high water levels. Property owners on Osprey Lake have expressed concerns that the dam/weir will significantly reduce the flow of water from Little Round Lake to Osprey Lake and result in a lowering of the "normal" WSE on Osprey Lake to a level that will be problematic.

With the current WSE of Round Lake near the desired level of 1344.75', we are in an excellent position to test the concept of the passive structure as described above in a "real time" laboratory and thereby address these perceptions and concerns.

C. Discussion of Project Goals and Objectives

The primary goal of the project is to gain a clear, thorough and common understanding of the differences in performance of the options under consideration for a permanent solution for managing the water levels on the lakes within the Round Lake Watershed.

The project will also result in the establishment of a database that accurately documents the relationship of the water levels on all three lakes to each other as well as to the control structures in the system. The data will also detail how rainfall impacts water levels within the watershed, including peak bounce and recovery times. This data will be invaluable in the development of future water level management plans. It will also serve as a base line to measure changes in the system over time.

Establishing the optimum water level management system is critical to maintaining a healthy eco-system, and preventing damage to the lake through the spreading of invasive plant species, shoreline erosion and flooding.

D. Description of Methods and Activities

We will first contract with a local surveyor to install accurate gauges to measure water levels on Round Lake, Little Round Lake and Osprey Lake. The existing Gauges have been shown to vary from one to another and there is currently no gauge on Osprey Lake. We will also clearly identify and survey the beaver dams on Osprey Creek.

With new gauges in place, we will be able to collect data regarding water levels on all the lakes and monitor their relationship to the passive structure as well the beaver dams.

With the survey work complete, we will simulate the passive structure described by SEH by installing the standard wooden stop logs in one bay of the Carlson Road Dam. In the other bay, we will install a weir fabricated from wood that will mimic the weir described in SEH's report:

a fixed-crest concrete weir wall (overtop elevation of 1345.0'). To allow drawdown of Round Lake to elevation1343.8'(the sill level of the current dam), a trapezoidal notch would be included in the weir. The notch in the weir has a trapezoidal shape with a 6-inch long base at elevation 1343.8' and a 45-degree angle up to the crest elevation of 1345.0'.

With reliable gauges in place and the weir installed, we will measure and record water levels in all three lakes on a daily basis. We will also record rainfall.

Should the results of project prove to be problematic for any of the stakeholders for any reason, the stop logs will be removed from the dam at their request. If that occurs, responsibility for the operation of the dam will immediately become solely the responsibility of Sawyer County.

E. Description of Project Deliverables

The project deliverables include all data gathered along with a comprehensive written analysis of this data which addresses the viability of the passive structure as an alternative to the County's recommended plan to replace the dam with a box culvert

F. Description of the Data to be collected

The data to be collected will consist of :

- Water level measurements on all three lakes on a daily basis
- Daily record of all rainfall
- The bounce in WSE as a result of a rainfall event
- The recovery time to restore the WSE to pre-rain level

G. Description of Existing and Proposed Partnerships

While there are no formal partnerships existing or proposed, this project is expected to strengthen the level of cooperation and rapport between the Round Lake Property Owners Association, the Osprey Lake Property Owners Association, Sawyer County, the Wisconsin DNR and the Lac Courte Oreilles Band of Ojibwe.

H. Discussion of Role of Project in Planning and/or Management of the Lake

We expect the results to be extremely valuable input to the process of developing and implementing the final, permanent solution to the issues related to the management of the water levels on the Round Lake Watershed.

I. Timetable for the Implementation of Key Activities

Timing will be as follows:

1. Survey work (including setting of new gauges) to be completed by April 30
2. Weir installed at Carlson Road by May 15
3. Data collection will begin as soon as gauges are set and continue until ice-up.
4. Final report to be complete by December 31, 2012

J. Plan for Sharing Project Results

A written report will be sent to all stakeholders and published on the Round Lake Property Owners website. Also, a meeting will be held to present and discuss results. Invited to attend the meeting will be representatives from Round Lake Property Owners Association, Osprey Lake Property Owners Association, Sawyer County, the Wisconsin DNR, and the LCO Band of Ojibwe.