Adopted Regulation Strategy
Lake of the Woods Control Board
June 5, 2020

The Lake of the Woods Control Board held a Regulation Meeting via teleconference on June 5, 2020, when it adopted a Regulation Strategy to guide operations through the end of October. The strategy was formulated considering basin conditions, hydrological and meteorological forecasts, and the input of the various interests concerned with basin management. Input was provided in written and verbal reports as well as from the Board's Regulation Guide: (http://www.lwcb.ca/regguide/index.html).
For an update on current conditions, please refer to the Basin Data section of the Board's web site at http://www.lwcb.ca/waterflowdata.html . For regulation actions and directives taken under the strategy please see the Regulation Actions at http://www.lwcb.ca/regulation/index.html.

At the time of the Regulation Meeting, dry conditions prevailed in both the English and Winnipeg River basins. In the Lac Seul area, there had been just one week since the start of the year that had normal precipitation, with the rest being below normal. In the Lake of the Woods basin, precipitation had been below normal every week since the first week of April. Due to this absence of precipitation, much of the basin had been classified by federal US and Canadian agencies as either abnormally dry or in moderate drought. In most areas of the basin, tributary flows were on the decline with some falling well below normal for early June. While low flows in the basin are an indicator of substantial room in the ground to store future precipitation, it was noted at the Regulation Meeting that the wettest period of the year is normally June and early July, and that significant precipitation could change conditions quickly.

The strategy covers the period to the end of October, 2020. It specifies key aims and how the Board intends to balance these under a range of possible flow conditions should they develop during the strategy period. The goal of balancing conditions across the entire basin is a complex task given the diverse nature of the different, and sometimes conflicting, interests and the largely unpredictable nature of the hydrology that drives the system.

Lac Seul

A) Seasonal Considerations

Inflow to Lac Seul is below the normal range with the lake level rising near the lower quartile. The Secretariat recommends regulation hedge against continued dry conditions, as the abnormally dry recent months will likely result in a need for substantial rainfall to return to normal inflow conditions. Ideal or desirable regulation objectives for the next several months, based on input provided to the Board, include the following:

- When flow capacity exists downstream in Manitoba, the rate of rise on Lac Seul should be controlled so that the lake level remains below upper quartile.
- Lac Seul level and outflow should be managed to balance low flow conditions at Lac Seul, along the English River and the Winnipeg River in Manitoba.
- Attempt to meet the preferred Lac Seul, Pakwash Lake and English River levels for the fishery and tourist outfitter interests.
- Ideally, reach a target an elevation of 356.3 m (1169.0 ft) on July 15 if precipitation restores

inflow to normal seasonal rates.

- The tourist outfitters' preferred summer maximum level for Lac Seul is 356.6 m (1170 ft).
- Supply water requested by Ontario Power Generation and Manitoba Hydro for hydroelectric energy generation; avoid spill in wet conditions and violation of low flow constraints in dry conditions.
- Maintain English River flow below 550 m^3/s at Caribou Falls to avoid levels at Grassy Narrows above 319.6 m (1048.6 ft) during the tourist season (May long weekend to after Thanksgiving).
- Use Lac Seul storage to offset Lake of the Woods high/low outflows for the benefit of users of the Winnipeg River in Manitoba.
- Lac Seul level and outflow should be managed to reduce the need to close the Lake St. Joseph diversion with resulting spill down the Albany River. However, the diversion should be closed to reduce impacts in the English and Winnipeg River basins under wet conditions.

B) Strategy

i) Low Inflow Conditions

- Manage outflows as necessary to achieve and maintain the lake level above 356.0 m (1168.0 ft), provided outflow is no less than 75 m^3/s. If the required reductions would lead to English and/or Winnipeg River flows less than minimum requirements of the provincial power utilities, the Board would convene a Regulation Consultation with First Nations, Specific Interest Groups and Resource Agencies to arrive at an appropriate balance between dry upstream and downstream conditions.
- Reduce outflow as necessary to reach and maintain lake levels above 355.5 m (1166.3 ft) from August through September. For context, Lac Seul outflow below 75 m3/s has occasionally occurred in the past few decades. In 2007, Lac Seul outflow was reduced to 50 m3/s for the month of May to rebuild the lake storage, while in 2003 it was held at 50 m3/s for nearly all of the five months from May to September during a drought. In 1988, outflow was reduced to 25 m3/s and, in 1981 and 1977, outflow was reduced to 0 m3/s during severe drought periods. Again, a Regulation Consultation would be necessary to appropriately balance upstream and downstream interests should extremely dry conditions evolve.

ii) Moderate Inflow Conditions

- Due to higher inflow and water levels in recent years, strive to keep the lake level below 356.4 m (1169.3 ft), while balancing with other interests. Outflow should be at or below 450 m^3/s to achieve these levels.
- Lac Seul outflow should be no lower than 100 m^3/s to have the lake level stay above 356.0 m (1168.0 ft) while satisfying the overall objectives.
- Within the general outflow targets, supply water for hydropower production and for English River fishery concerns.
- If flows on the Winnipeg River in Manitoba are high, use the storage available in Lac Seul to minimize the water released downstream. However, Lac Seul levels throughout the entire regulation period should not be above 356.6 m (1169.9 ft).
- Lac Seul should be regulated to target for an end of October water level between 356.0 m (1168.0 ft) and 356.2 m (1168.3 ft) with outflow between 100 and 450 m^3/s.

iii) High Inflow Conditions

- Balance outflow with the rise in Lac Seul level to reduce flood risk both on Lac Seul and on downstream areas such as Pakwash Lake and the Winnipeg River in Ontario and Manitoba.
- Outflow should remain at or below 450 m^3/s for moderately wet conditions; at or below 500 m^3/s for most conditions; and below 600 m^3/s in all but extreme conditions.
- Regulate Lac Seul outflow to as high as 550 m^3/s to prevent the lake level exceeding 356.6 m (1169.9 ft).
- Lac Seul should be regulated to target for an end of October water level below 356.35 m (1169.1 ft) with outflow at or below 600 m^3/s. The Lake St. Joseph diversion should be reduced to the extent necessary before Lac Seul outflow is increased above 550 m^3/s. (The Lake St Joseph Diversion falls under LWCB authority when Lac Seul level is above 356.31 m (1169 ft) in June and above 356.62 m (1170 ft) in July through December.)
- Once the diversion is closed, regulate outflow to as high as 600 m^3/s to prevent the lake exceeding 356.9 m (1170.9 ft), to as high as 800 m^3/s to prevent the lake exceeding 357.1 m (1171.6 ft) and as high as necessary to ensure that the upper storage limit of 357.2 m (1171.9 ft) is not exceeded.

Lake of the Woods

A) Seasonal Considerations

Inflow to Lake of the Woods is currently low-normal, with Rainy River flow at Manitou Rapids also at a low-normal rate. Most tributaries upstream of the Namakan chain of lakes have declining flows and are just above or just below lower quartile. With the lack of rain and the early, but brief, freshet the challenge has been to balance the slowly rising lake level with the need to maintain water levels on the Winnipeg River during spawning season. The Secretariat recommends a strategy that hedges against continued dry weather in June and July in advance of what is normally a drier period in August and early September (2019 being a notable exception to this).

Ideal or desirable regulation objectives for the next several months, based on input provided to the Board, include the following:

- Adjust lake level and outflow to achieve a balance between upstream and downstream interests, as inflow dictates.
- For loons on the Winnipeg River, flow changes during the primary incubation period (normally to about the end of June) should be avoided. About 4½ to 5 weeks of relatively steady flows are needed for nesting success. Loons can make a second or third attempt, which means they could be on their nests into August for late nesting.
- A peak summer level of 323.0 m (1059.7 ft) is desired for Lake of the Woods property owners.
- For piping plovers on Lake of the Woods, maintain lower lake levels and minimize lake level increases during their nesting and rearing season, which could extend to mid-July.
- For wild rice, the most important period for controlled and stable water levels is during the floating leaf stage from early June to mid-July. During this period, the optimal level of Lake of the Woods is between 322.5 m (1058.1 ft) and 322.8 m (1059.0 ft), although the most important consideration is that water level increases be gradual.

- Water level is also important during wild rice harvesting, which runs from about mid-August to mid-September on Lake of the Woods. If the water level is too high, the top of the plant will be too close to the water. If water levels are too low, the crop may be inaccessible to the harvesters' boats or canoes. Levels near 322.8 m (1059.0 ft) seem to be satisfactory.
- A significant drop in river level during the period up to mid-July could adversely impact sturgeon spawning and fry development on the Winnipeg River. The actual period of concern may vary and may be better defined by district fishery biologists.
- For recreational users on Lake of the Woods, maintain water levels in the range of 322.8 to 323.1 m (1059.0 to 1060.0 ft).
- Within the regulation parameters for Lake of the Woods, regulate outflows to assist in meeting targets/preferences for the Winnipeg River in Manitoba.

B) Strategy

i) Low Inflow Conditions
- Limit size and speed of any outflow reductions necessary to balance lake and river conditions during the spawning period for several species (Black Crappie, Smallmouth Bass, Largemouth Bass, Muskies, Lake Sturgeon), possibly to mid-July.
- Reduce outflow to as low as 150 m^3/s if lake level falls below 322.60 m (1058.4 ft) to limit further decline. Reduce outflow to as low as 100 m^3/s to prevent to lake from declining below 322.5 m (1058.1 ft) through the regulation period.
- If Lake of the Woods level drops below 322.20 m (1057.1 ft) reduce outflow to 70 m^3/s, following consultations with OMNRF and OMOECC regarding fishery and water quality concerns.

ii) Moderate Inflow Conditions
- Set outflows to target a summer level range of 322.78 to 322.9 m (1059.0 to 1059.4 ft) with outflow in the 300 m^3/s to 700 m^3/s range.
- Increase outflow to as high as 800 m^3/s to keep the lake level from exceeding 323.1 m (1060.0 ft).
- Balance attempts to achieve the above preferred summer levels range with consideration of the impacts of outflows on downstream interests in both Ontario and Manitoba.
- Attempt to limit Lake of the Woods outflow changes that would adversely affect nesting loons on the Winnipeg River.
- Avoid outflow reductions that would impact sturgeon eggs and larvae (possibly to mid-July).
- Try to manage lake levels to limit the rate of rise of the lake for wild rice during the floating leaf stage and to benefit the piping plovers nesting at Windy Point and on the Sable Islands.
- Lake of the Woods should be regulated to target for an end of October water level between 322.8 m (1059.0 ft) and 323.0 m (1059.7 ft). The preferred level on October 31 would be no higher than 322.9 m (1059.4 ft) with outflow between 300 m^3/s and 700 m^3/s.

iii) High Inflow Conditions
- Balance higher water levels on the lake with the impact of high outflows downstream, both

in Ontario and Manitoba.

- An outflow of about 900 m^3/s would be appropriate to keep the lake level (or projected level) below 323.3 m (1060.7 ft). However, under some circumstances, it may be appropriate to adjust outflows to accommodate changing inflows, to provide a storage buffer to reduce the risk of higher lake levels or outflows, or to provide relief to the lake or river.
- Lake of the Woods should be regulated to target for an end of October water level between 322.8 m (1059.0 ft) and 323.0 m (1059.7 ft) with a preferred level no higher than 322.9 m (1059.4 ft) with outflow at or below 900 m^3/s.
- Outflow should be set as necessary to try to prevent the lake level (or the projected level) from rising above 323.47 m (1061.25 ft), which is the legislated top of the normal operating range. Note however, that the Convention and Protocol states "during periods of excessive precipitation the total discharge from the lake shall, upon the level reaching 1061 sea-level datum, be so regulated as to ensure that the extreme high level of the lake shall at no time exceed elevation 1062.5 sea level datum".
- An attempt should be made to keep outflow increases/reductions to a maximum of 100 m^3/s per week. Note, however, that development of high inflow conditions in the past have frequently necessitated outflow changes of 200 m^3/s or more per week.