Adopted Regulation Strategy
LWCB Regulation Meeting – June 14, 2006

The following strategy attempts to strike a balance among the various interests in the Winnipeg River Drainage basin, while considering the limitations of hydraulics and hydrology. However, each year is different hydrologically and impacts on interests may vary. Level and outflow targets must be considered together, as well as the impact of the combined operation of Lac Seul and Lake of the Woods on the Winnipeg River in Manitoba.

Lac Seul

a) Seasonal Considerations

The Secretariat recommends that the regulation of Lac Seul over the near term hedge against a higher risk of wet conditions. Regulation should be carried out to provide storage in the event that inflows remain high, or become even higher. Ideal or desirable regulation objectives for the next several months, based on input provided to the Board, include the following:

- Lac Seul level and outflow should be managed to reduce flood risk on the lake and downstream in Ontario and Manitoba.
- Attempt to meet the preferred Lac Seul, Pakwash Lake and English River levels for the fishery and tourist outfitter interests.
- 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.
- A minimum flow of 200 m^3/s below Manitou Falls is desirable during spring spawning and fry development. A uniform flow should be maintained through this period, which extends to about the end of June; the constraint becomes less critical after mid-June.
- Preferred river flows at Grassy Narrows are less than 550 m^3/s.
- Use Lac Seul storage to offset Lake of the Woods high/low outflows for the benefit of users of the Winnipeg River in Manitoba.
- Avoid closing the Lake St. Joseph diversion with resulting spill down the Albany River.

b) Strategy

i) Low Inflow Conditions

- At the present time, a return to low inflow conditions appears unlikely anytime soon. However, conditions could change quite quickly if warmer, drier weather predominates over the summer.
- Reduce outflows as necessary to maintain the lake level above lower quartile. If the required reductions would lead to English and/or Winnipeg River flows less than minimum requirements of the provincial power utilities, consultations would be necessary with the OMNR in Red Lake and Sioux Lookout, as well as with the two provincial power companies, to determine an appropriate balance between upstream and downstream conditions.
- Severely restrict outflow to maintain lake levels above lower decile. In 1988 Lac Seul outflow was reduced to 25 m^3/s and, in 1981 and 1977, outflow was reduced to 0 for an extended period. Again, consultations would be necessary to appropriately balance upstream and downstream interests.

ii) Moderate Inflow Conditions

- Although lake levels and inflows are currently in the high range, these conditions seem to be declining and so the moderate inflow strategy should apply at least in the near term, provided that conditions do not become wetter.
- Generally target for lake levels between lower and upper quartile, with a transition from the above-normal level currently, while supplying water for hydropower production and for English River fishery concerns. An effort should be made to transition Lac Seul levels (or projected levels) from the current 80 %ile to near upper quartile by the end of June (356.36 m / 1169.2 ft).
- Under moderate inflow conditions, ensure that Lac Seul level rises to no higher than 356.75 m (1170.4 ft) and that Ear Falls discharge is below 450 m^3/s.
- 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 report period should not be above 356.75 m (1170.4 ft).
- Maintain Lac Seul outflow within a range of approximately 100 to 400 m^3/s to satisfy the overall objectives and maintain the lake level in the 25-75 %ile range.

iii) High Inflow Conditions

- Balance Ear Falls 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 Manitoba.
- An effort should be made to transition Lac Seul levels (or projected levels) to near upper quartile by the end of June (356.36 m / 1169.2 ft). Outflows should remain below 450 m^3/s for moderately wet conditions, 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 500 m^3/s at Ear Falls to prevent the lake level exceeding 356.75 m (1170.4 ft) from June 30 to October 31; the Lake St. Joseph diversion should be reduced to the extent necessary to achieve this.
- 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 357.05 m (1171.4 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

Inflows to Lake of the Woods are low and it is a concern that the lake level is beginning to decline. Outflow reductions are warranted but, following discussions with fisheries advisors, outflow reductions have been delayed until the week of June 5th to assist the Winnipeg River walleye fishery. However, Lake of the Woods conditions can change dramatically. The lake level is currently only 2 cm below median, it is 10 cm above the Board's preferred target level for the end of May and it is only 10 cm below the preferred target for the end of June. June is typically the wettest month of the year. In addition, heavy rainfalls in June and early July, while certainly not guaranteed, seem to be becoming more frequent and can quickly raise the lake to undesirable levels if the lake has little storage space left when the storms hit.

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 (approximately mid-May to the end of June) should be avoided. If outflow changes are needed during this period, Bird Studies Canada recommends trying to make them by mid-June and then hold flows steady for 4½ to 5 weeks. This will provide the loons a better chance for success on a second nesting attempt.
- A summer Lake of the Woods level 10-15 cm (4-6 in) below the summer peak median level of 323.14 m (1060.2 ft) is desired for south shore residents. This criteria would result in a peak summer level of about 323.0 m (1059.7 ft).
- For piping plovers on Lake of the Woods, maintain lower lake levels and minimize lake level increases during their nesting and rearing season of May, June and 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 regulate the level of Lake of the Woods between 322.48 m (1058 ft) and 322.78 m (1059 ft); any increases in water level should be gradual.
- Water levels are 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 322.78 m (1059 ft) seem to be satisfactory.
- For walleye spawning and fry development, avoid outflow reductions until the end of June, although this criteria likely becomes less critical after mid-June.
- For sturgeon spawning and fry development on the Winnipeg River, avoid a significant drop in river level during the period from early May until mid-July.
- For recreational users on Lake of the Woods, maintain water levels in the range of 322.8 to 323.1 m (1059 to 1060 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
- Although Lake of the Woods level is currently within the moderate range, inflow conditions and the declining level currently place the lake within the “low inflow” strategy.
- Outflow reductions should be kept to a minimum until the end of the spawning period on the Winnipeg River.
- Reduce outflow in stages to as low as 150 m^3/s to prevent the lake from declining below 322.6 m (1058.4 ft) and to as low as 100 m^3/s to prevent to lake from declining below 322.5 m (1058.1 ft)
- If Lake of the Woods level drops below 322.2 m (1057.1 ft) reduce outflow to 70 m^3/s, following consultations with OMNR and OMOE regarding fishery and water quality concerns.
- In 1988 and 1987, Lake of the Woods outflow was reduced to 100 m^3/s and in 1977 it was reduced to 63 m^3/s.

ii) Moderate Inflow Conditions
- The following strategy will only apply when/if inflows improve into the moderate range.
- Outflow reductions should be kept to a minimum until the end of the spawning period on the Winnipeg River and outflow increases should be kept moderate during the spawning period.
- Attempt to keep the summer lake level 10-15 cm (4-6 in) below the summer peak median level of 323.14 m (1060.2 ft) in accordance with the commitment made by the Board following the high water year of 2001. Try to balance this with: avoiding outflows in excess of the generation capability at Kenora, optimizing hydroelectric generation downstream and attempting to provide optimum conditions for other river residents and interests.
- Through June, attempt to limit Lake of the Woods outflow changes that would adversely affect nesting loons on the Winnipeg River.

- Through June and early July, try to manage lake levels to limit the rate of rise for wild rice.
- Set outflow to as much as 800 m^3/s to prevent the peak lake level from exceeding 323.09 m (1060 ft) for the benefit of Lake of the Woods cottagers and south shore residents, if inflow is no higher than median.
- 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 median (322.88 m/1059.3 ft) with outflow between 300 and 700 m^3/s.

iii) High Inflow Conditions

- Balance higher water levels on the lake with the impact of increased outflows downstream, both in Ontario and Manitoba.
- Do not increase outflow above 800 - 900 m^3/s to keep the lake level (or projected level) below upper quartile. (maximum 323.26 m / 1060.6 ft in mid-July)
- Increase outflow 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". In future years, the Board may wish to consider making use of this flood storage during periods of high inflow.
- An attempt should be made to keep outflow increases to a maximum of 100 m^3/s per week, except during the spawning season when it would be desirable to not exceed 50 m^3/s per week. Note, however, that persistent 90 %ile inflows would necessitate outflow increases of 200 m^3/s per week.