

Categories of Drawdowns Performed on the Chippewa Reservoir

Revised September 15, 2016

Water levels in the Chippewa Reservoir are dictated by an exemption order that was granted by the Federal Energy Regulatory Commission (FERC) on September 28, 1984. The exemption order requires Northern States Power Company – Wisconsin (d.b.a. Xcel Energy) to maintain reservoir elevations between a minimum elevation of 1297.0 ft. and 1315.0 ft. (emergency full). The reservoir level may be lowered during the winter season below elevation 1297.0 ft. to accommodate maintenance requirements at the dam and under unusual precipitation conditions under mutual agreement with appropriate regulatory agencies. The normal full elevation of the reservoir is 1313.0 ft. The FERC exemption order also requires a minimum flow of 90 cfs be discharged from the dam at all times; although, a side agreement between the Wisconsin DNR, U.S. Fish and Wildlife Service and the Lac Courte Oreilles Band of Chippewa Indians increased the minimum flow to 250 cfs in 1987.

The Chippewa Reservoir dam was built to provide water for flow augmentation to downstream hydro plants and for flood control. The dam is operated such that it captures water during periods of excess river flow (typically spring and fall) and releases water during periods of low river flows (winter and summer months).

This information was developed in consultation with the Chippewa Reservoir Partners Group and will be used to help educate the public to the various drawdowns that may be utilized over the life of the dam.

Drawdowns throughout the history of the reservoir have been performed during the summer and winter months. Drawdowns of up to 22 ft. have been performed during the winter months whereas drawdowns of around 3.5 ft. have occurred during the summer months. Recently, conditions have allowed for coordination of drawdowns that have the potential to reduce invasive species prevalence and improve aquatic habitat, specifically for fish. The categories of drawdowns that are performed on the Chippewa Reservoir are summarized below:

Drawdown 1: Summer Drawdown (June 1 to September 30)

Summer drawdowns are performed during the summer months with the lowest elevations reached typically in late-September or early-October. A typical low elevation of 1310.0 ft is achieved by early-Fall, although summer drawdowns deeper than 1310.0 ft. have occurred during drought conditions. The Summer Drawdown period and therefore water levels are managed by Xcel Energy with the primary purpose of providing energy during cooling degree days. Other variables also being managed by Xcel Energy include hydro energy generation support for maintenance of other energy generation sources under repair or maintenance.

Drawdown 2: Winter Drawdown (December 1 to March 31)

A winter drawdown generally occurs beginning in early December and ending in mid-March to early April depending on snowmelt runoff. The drawdowns can vary somewhat from year to year based on inflows into the reservoir, the need for downstream hydroelectric production (increased discharge), and the presence or lack of accumulating snowpack. Drawdowns performed during the winter season can reach the minimum elevation of 1297.0 ft., although the 10-year average drawdown is only 4.7 ft. (2006-2015) due to long-lasting drought conditions. Drawdown depths

averaged 8.2 ft. from 1970 to 2015 and 13.0 ft. for the period of record (1923 to 2015). Refill of the reservoir in the springtime usually occurs by early May. Similar to the Summer Drawdown, the Winter Drawdown also is managed by Xcel Energy and the primary purpose for the winter drawdown is energy generation during the winter heating season. Other variables also being managed by Xcel Energy include hydro energy generation support for maintenance of other energy generation sources under repair or maintenance.

Drawdown 3: Habitat Manipulation Drawdown (October 1 through March 31)

Xcel Energy has been a member of the Chippewa Reservoir Partners Group since 2006 to evaluate environmental conditions in the reservoir. After several years of meetings and research, the committee agreed in the fall of 2013 to perform an earlier (pre-ice) drawdown to return to a more traditional depth of winter drawdown. The hypothesis was that the deeper drawdown would benefit the fishery as well as provide control for the exotic plant species Eurasian Water Milfoil.

The drawdown involves a continuation of the summer drawdown into the fall months until a 5-foot drawdown (elevation 1308.0 ft.) is achieved in mid-November. Lowering the water before ice formation is less harmful to reptiles, amphibians, and furbearing mammals and also aids control of invasive plants. These considerations should be balanced with the need for recreational access to the flowage throughout the fall. The reservoir elevation would then continue to decrease during the winter months until an 8 ft. drawdown is achieved in early-March. A drawdown of 8 feet in the winter has been shown to provide considerable benefits to the fish community as a whole and can reduce invasive Eurasian Water Milfoil populations. Deeper drawdowns carry considerably more risk of fish kills and poor spawning conditions for fish in the spring. Refill of the reservoir may take longer than a normal winter drawdown but it is anticipated that water levels would fill to a satisfactory level by mid-May. Changes to the depth and timing of habitat manipulation drawdowns may be considered as new data becomes available.

Drawdown 4: Construction Drawdown (variable dates)

At some point in the future, it may be necessary to conduct a drawdown to perform construction work. Work at the dam may need to be coordinated through FERC as well as local stakeholders. The drawdown might involve decreasing water levels below the 1297.0 ft. minimum with approval from the FERC depending on the type of work that needed to be completed.

Drawdown 5: Emergency Drawdown (variable dates)

An emergency drawdown may need to be performed if a condition at the dam develops that creates a potential dam safety problem that could lead to the failure of the dam. In order to reduce the likelihood of a dam failure situation, or to minimize the uncontrolled release of water from the dam, the lake would be drawn down in advance. This drawdown would be undertaken very quickly and would involve consultation with FERC and local entities.

For winter drawdowns where drawdown depth will exceed 4 feet, the general recommendation from resource managers is to draw water in the fall, prior to ice formation, to minimize the amount of draw after ice formation. This may provide benefits including 1) reduce amount of hazardous ice shift or cracking after ice formation; 2) reduce impacts to aquatic fur bearers, reptiles and amphibians that overwinter in the ice transition zone; and 3) expose aquatic plant beds to help control invasive plants.