

Water Level Drawdowns for Sediment and Aquatic Plant Management

Drawdown is a process whereby the water level on a lake or pond controlled by a dam, or other structure is lowered and held at a reduced level for some period of time, typically for several months to two years depending on the goals of the project.

Drawdowns have been tried on many impoundments in Wisconsin with beneficial results. Typical management objectives for drawdowns are to reduce aquatic plant abundance/density (specifically invasive species) and increase lake depth.

The timing, duration and level of drawdowns all factor into the degree of success achieved for the specific management action. Results have shown that to increase lake depth it is best to conduct drawdowns during summer months and to control aquatic plants it is best to drawdown for the winter months. Measurable improvements have been achieved for both depth and aquatic plant control regardless of the time of year the drawdown took place. A drawdown of at least one to two consecutive years ensures that maximum benefits to both objectives are achieved.

A drawdown can be partial or whole-lake. A partial drawdown is typically done at a vertical level of 2 to 6 feet. The timing and speed of drawdown should be carefully planned to reduce the amount of sediment that is transported downstream and to give aquatic organisms an opportunity to relocate. Typically, lakes are drawn down about four inches per day. Drawdowns can affect the fishery of the lake, so it is important to fully evaluate the benefits of the drawdown against the impacts to the fishery. It is typical that an impoundment (lake) during a drawdown, will look like a river as a channel will form in the lake bed (see picture on back page).

Benefits

- Winter drawdown kills vegetative parts of plants by drying, freezing, or physical disturbance. A cold winter with little snow provides the most control.
- Reduces the density of invasive aquatic plant species such as Eurasian watermilfoil and increases native species diversity.
- Restores emergent plant communities such as sedges and bulrush.
- Exports nutrients and sediment from the impoundment.
- Summer drawdown allows exposed sediment to oxidize, decompose and consolidate thereby increasing lake depth.
- Can improve pond water quality post-drawdown.
- Improves fish spawning substrate post-drawdown by lessening the amount of fine sediments and uncovering coarser sediments, especially nearshore.

Disadvantages (temporary)

- Sediment will be transported downstream during the water lowering process. Carefully lowering water depth in the lake will help reduce transport.
- Potential short-term reduction of fish populations post-drawdown.
- Fish and wildlife habitat areas are reduced during the drawdown.
- Loss of fishing, hunting, and recreational opportunities and natural scenic beauty during drawdown.
- Lakebed colonized by terrestrial vegetation.
- Dense submerged plant species reestablish post-drawdown.

Wisconsin Regulatory Authority

Wisconsin statute Chapter 31.02 requires water levels and flows be maintained for dams with an established water level order. It's important to note that not all dams have water level orders established, however.

Photographs illustrating dense aquatic plant growth, water level control structures, channel cutting and exposed sediments after water level drawdown.



The dam and outflow structure determine how much water levels can be lowered



Dense aquatic plant growth in an impounded river with a water level control structure



Sediments dry, decompose and consolidate after de-watering. This also allows for terrestrial plants to start growing to stabilize the sediments.



After water levels are lowered, the river channel finds its path.