

A Transformed River

Prior to 1866, the upper Mississippi River was largely natural. It twisted and turned haphazardly across the wide river valley. Numerous islands divided the river into side channels and backwaters. In spring the river flowed fast and furious scouring new channels and forming sandbars in unexpected places. In summer it meandered over countless sandbars and was so shallow in places a person could walk across it.



Lower Pool 8 -Coon Slough 1890
Henry Bosse

The ever-changing natural river was too dangerous and unreliable for commercial boat traffic so in 1866 the 4' channel project was begun. It was the first of several channel improvement projects that would eventually result in the building of the locks and dams in the 1930's to maintain a 9-foot shipping channel.

When the system of locks and dams was completed, the free flowing river had been transformed into a series of navigation pools. The locks and dams maintained high and relatively stable water levels in the lower portion of the pools, which insured the passage of tows and barges even in the middle of summer.

Changes in River Habitat

For several decades, these pools supported a wealth of fish, wildlife and aquatic habitat, but it has gradually diminished. The high water levels, caused by the locks and dams, made the islands in the lower portion of the pools more vulnerable to erosion from waves and many of them have disappeared. In addition material carried by the river and soil washed from the nearby eroding islands have gradually filled in channels and deep holes.

Aquatic plants that grew in the shallow water bordering the islands were affected by these changes, and many formerly lush beds have either diminished in size or disappeared completely. These plants are part of the foundation for the web of life in the river providing food and shelter for fish and wildlife.

Some pools have been affected more than others by this chain of events, but many of the pools now have a wide open expanse of shallow water above the lock and dam. These areas are much less productive for fish and wildlife

In order to restore this habitat, river managers have been rebuilding islands, as well as restoring channels and deep-water habitat with funds from the federal Environmental Management Program. Even with these restorations, plant beds have only partially recovered.



For More Information

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Pool 8 Raft Channel – Drawdown 2001
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Water Level Management

Upper Mississippi River



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A Chance to
Improve Habitat

Water Level Management – A Tool for Habitat Restoration

Aquatic plants, particularly “emergents” such as arrowhead, cattail and bulrush, which grow along the water’s edge, depend on a natural seasonal fluctuation in water levels for their long-term survival and the production of new plants. With the relatively stable water levels created by the navigation pools, the plant beds have had little chance to reestablish.



Water level management offers a way to restore the necessary seasonal fluctuation in water levels. It is an important step in renewing important fish and wildlife habitat on the river.

What is Water Level Management?

Water level management involves a temporary seasonal increase or decrease in the water level for the benefit of fish and wildlife habitat. Currently the U.S. Army Corps of Engineers is keeping water levels higher in the winter to provide more space for certain fish species. Temporary water level reductions or drawdowns during the summer months have been used to stimulate the recovery of aquatic plants in the lower portion of the pools.

A drawdown is a limited reduction in the water level, which primarily impacts the lower portion of the pool.

The effects are less pronounced upstream. Favorable weather conditions and sufficient flows in the river are required to achieve this balance. Drawdowns are not a one-time solution but instead will probably have to be repeated periodically.

The amount of the drawdown recommended will vary from pool to pool depending on constraints such as:

- ◆ The structure of the pool and the amount of acres which can be exposed economically.
- ◆ The amount of dredging required to maintain commercial shipping, commercial harbors, and recreational access to the river.
- ◆ Water intake pipes for industry or municipalities.

Water level management on the Mississippi River has evolved over time and has been based on scientific analysis as well as the lessons learned through a series of demonstration projects.

A Series of Steps

First Step: Small-scale Drawdowns

Project: Reduce water levels in three small backwater areas (less than 25 acres) by isolating with sandbags and pumping out water.

Purpose: Test the vegetation response because much of the river bottom had not been exposed for over 60 years.

Results: *The drawdown demonstrated a significant vegetation response on the small backwater sites.*

Pool 8 Drawdown- Raft Channel South



June 11, 2001



September 10, 2002

Dramatic changes have occurred to the vegetation as a result of the drawdowns

Second Step: Demonstration Large-scale Drawdown

Project: River resource managers conducted demonstration drawdowns during the summers of 2001-2002 on Pool 8.

2001 Purpose: Promote the growth of aquatic plants, particularly emergents such as arrowhead, and dry the exposed sediments.

Results:

- ◆ The drawdown was scheduled to last 85-90 days, but was shortened to 40 days due to the effects of weather and reduced flows in the river.
- ◆ 1,954 acres of river bottom were exposed, some for the first time in 60 years.
- ◆ The plants responded well, but in the lower pool they did not have enough time to grow into mature plants that would persist through reflooding.

2002 Purpose: Give perennial plants such as arrowhead a better chance to become established

Results:

- ◆ 1,954 acres were exposed
- ◆ Arrowhead tuber production increased 16 fold during the second year. (The tuber is a starchy bulb that enables the plant to overwinter.)

Future Plans

The results of the large-scale drawdowns were very encouraging. Not only did plants and animals respond to the drawdown but also commercial boat traffic was only minimally impacted by the water level reduction. One of the biggest challenges remaining for large-scale drawdowns is obtaining funding for dredging for recreational access. Future plans include:

- ◆ additional large-scale drawdowns,
- ◆ minor pool drawdowns,
- ◆ post drawdown monitoring to determine when the process should be repeated.