

# Water Level Management Update

## Details of the Pool 5 Drawdown

- The target drawdown depth of 1.5-foot was achieved on June 29, 2005.
- The drawdown exposed over 1000 acres of mudflats and sand bars by mid July.
- Pool elevation was raised starting on September 15 and the water levels were back to normal by September 30.

## Pool 5 Drawdown Becomes a Reality

After three years of planning, agency collaboration, and public involvement, a pool-scale drawdown of Pool 5 was implemented during the summer of 2005. The purpose of the drawdown was to promote the growth of emergent aquatic vegetation to benefit habitat for fish and wildlife.

The drawdown began on Monday, June 13, 2005 as the U.S. Army Corps of Engineers began to lower the pool elevation at Lock and Dam 5, located near Minnesota City, MN. The pool was lowered gradually until the target drawdown depth of 1.5-foot at LD 5 was achieved on June 29, 2005.

In June and for most of July, river flows were higher than normal, so the 1.5-foot at LD 5 was maintained until about July 25.

The drawdown exposed over 1000 acres of mudflats, and a significant vegetative response was observed.

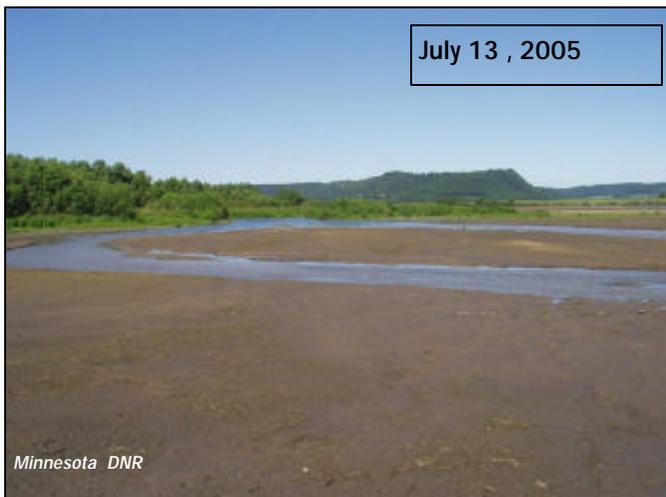
In late July and through September, low flows in the river necessitated an increase in the water level at Lock and Dam 5. Consequently some areas in the lower portion of the pool that had been exposed in mid July were re-flooded.

The pool elevation in Pool 5 was raised starting on

September 15, and Pool 5 was in normal pool regulation by September 30, 2005.

During the drawdown, a few challenges came up regarding navigation and recreational boating access, but prompt and effective response by the project team handled these issues as they arose over the summer.

In general, the Pool 5 drawdown appears to be a rousing success. This is a tribute to the effective work of the inter-agency project team, and a high level of public support. A second year drawdown of Pool 5 is planned if funding is available.



The drawdown exposed approximately 1000 acres of mudflats and sand bars, some of which haven't been uncovered for over 50 years, including this area in the Whitewater delta. A significant vegetative response was observed as illustrated in these before and after photos.

*Water level management during a drawdown is always dictated by the whims of Mother Nature and this year was no different.*

## Managing the Water Level during a Drawdown

Water level management during a drawdown is always dictated by the whims of Mother Nature and this year was no different. First, flows in the river were at the upper level for a drawdown due to rain fall in the upper part of the Mississippi River watershed. Flows eventually subsided and the drawdown reached its maximum level from June 30 to late

July. However, river flows declined to below 20,000 cubic feet per second (cfs) in late July as drought conditions took hold. As a result, management of the pool shifted to "primary control". This means that the Corps had to maintain a maximum drawdown level of 1.0-foot at the primary control point, located in Alma, WI. To do this, the water level at the

dam had to be raised to back fill the pool to that level. Therefore the drawdown at LD 5 had to be decreased to a range of 0.5 – to 1.0-foot. rather than the planned 1.5-foot drawdown. The river flows at LD 5 remained below 21,000 cfs for the remainder of the drawdown, and the pool remained in primary control until September 15.

## Pool 5 Island Construction Update



Construction of the Spring Lake EMP project, as well as the channel maintenance islands is nearing completion.

### Environmental Management Program (EMP) Islands

The Spring Lake Islands Habitat Rehabilitation and Enhancement Project, funded by the Corps of Engineers' Environmental Management Program, is nearing completion. The drawdown did cause some challenges for the contractor, but the sand base for all of the islands was completed in August, with all of the sand for the Spring Lake Islands coming from 2 different backwater areas. L.W. Matteson, Inc. is now in the process of dredging in the upper end of Spring Lake to get topsoil for the islands

and further improve fisheries habitat conditions in Spring Lake. They expect to be done dredging by mid-November. This winter, the project area will begin providing greatly improved habitat conditions for a variety of fish and wildlife species.

### Channel Maintenance Islands

Another part of the Spring Lake Islands contract involved the construction of two smaller islands in the lower end of the Lost Island Closed Area to promote the establishment and protection of aquatic vegetation beds. These two smaller islands were built with sand

dredged from the main channel as part of the Corps' channel maintenance activities. All of the funding for the construction of these small islands came from the Corps' Channel Maintenance Program, and illustrates a way that sand dredged from the main channel can be used beneficially and economically to also provide habitat. The topsoil for these two islands was dredged from an area between the two islands. The contractor, L.W. Matteson, Inc., expects to be finished with these islands by the end of October.

## Second Year Drawdown Planned for Pool 5

A second year drawdown in Pool 5 was recommended in the Pool 5 Drawdown Letter Report/Environmental Assessment. This recommendation was presented to the public in the drawdown public meetings, and endorsed by the Water Level Management Task Force (WLMTF) and River Re-

sources Forum (RRF).

Implementation of a drawdown for 2006 will depend on several things: funding, authorization, agency collaboration and public input.

The benefits, impacts and lessons learned from our 2005 drawdown experience will also

play a key role in the decision making process. The decision to go forward in 2006, and the recommended drawdown level, will also need to be endorsed again by the WLMTF and the RRF.

*Implementation of a drawdown for 2006 will depend on several things: funding, authorization, agency collaboration, and public input.*

## Monitoring the Changes

Water levels in Pool 5 may have returned to the normal operating level but multi-agency teams of scientists are still working to finish their assessment of the effects of the drawdown. The findings from the monitoring studies will be available in the next newsletter. Here is a summary of the work completed this past summer.

### Plant Response

Scientists from the U.S. Geological Survey Upper Midwest Environmental Sciences Center (USGS), Minnesota, and Wisconsin Departments of Natural Resources are evaluating the vegetation response to the pool-wide drawdown of Pool 5. Aerial photography allows scientists to assess how many acres were exposed and determine how much and where emergent and moist-soil plant communities responded. Additional sampling by field crews will provide details of plant growth on the exposed mudflats. The abundance of submersed aquatic vegetation in Pool 5 is also being determined through sampling. Together these studies should help scientists understand the plant response.

### Waterbirds

Surveys were conducted by the U.S. Fish and Wildlife Service during the drawdown to determine shorebird use of the exposed flats and shallow water areas. Waterfowl surveys will begin in late September to document fall use in the area, however some waterfowl such as Canada geese and a couple thousand blue-winged teal took advantage of the changes which occurred as a result of the drawdown before the fall survey period.

### Mussels

No mussel rescue took place during this drawdown as unadulterated results of native mussel mortality were needed to accurately determine the effects on near shore and shallow water mussels. Transects with permanent one meter square grids were established in Pools 4 and 5 by WI DNR to compare survival during a drawdown to mussel survival in a pool without a drawdown. Marked mussels were placed inside the grids pre-drawdown and recollected after the water level reduction reached its maximum. A visual survey was also conducted in order to sample areas without transects.

### Recreation

Aerial photographs were taken of boats in Pools 4, 5 this summer. These photographs are compared with aerial photographs taken in 1989, 1991, 1993, 1995, 1997, 1999, 2001, and 2003 to help determine if recreational use of the pool changed. In addition, vehicles and trailers at boat ramps were counted in Pools 4 and 5 and will be compared with similar data collected in 2003.

### Transit Time for Commercial Navigation

Tow operators were handed a survey to fill out about the ease or difficulty of navigating through Pool 5 during the drawdown. Many of these operators have been through Pool 5 before and have the ability to compare movement during the drawdown to movement during routine pool regulation.

### Water Quality Monitoring

Equipment was installed on a small platform to monitor various parameters of water quality including water temperature (2 depths), dissolved oxygen, gross sedimentation rates, and total suspended solids. Wind speed, wind direction, and solar radiation, were also monitored. Sampling began in late May and continued through September for most variables. The continuous water quality monitoring data collected at the platform site will be evaluated by WI DNR and compared to similar monitoring conducted in Weaver Bottoms during the summer of 1994 and in Pool 8 (drawdown evaluation work). Of particular interest is the impact of drawdown and wind speed on sediment resuspension, suspended solids levels and primary production (diurnal DO fluctuations). The response of submersed aquatic vegetation and how this influences sediment resuspension, sediment deposition, and oxygen dynamics will also be examined.

### Sediment Movement and Budget

The St. Paul District Corps of Engineers monitored the flow of water and movement of sediments in Pool 5, before, during, and after the drawdown. Water flow was monitored to get a handle on how the drawdown altered current patterns and the speed at which water was moving. Sediment was monitored to determine the effects of the drawdown on the movement of sand in the navigation channel, and the resuspension of fine sediments in backwater areas such as Weaver Bottoms.

### Sediment Nitrogen Cycling

Nitrogen cycling and movement through the Mississippi River has implications for both river water quality concerns and low oxygen concentrations (hypoxia) in the Gulf of Mexico (Dead Zone). Management of the Mississippi River could remove nitrogen by promoting natural water

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***Monitoring the Changes continued.***

cleansing properties of river wetlands and flood plains; hence studies have been conducted by USGS to determine the effect of a drawdown on different aspects of nitrogen cycling. In Pool 5, sampling of the sediments of both wet and dry areas was conducted before, during and after the drawdown to determine the effect of drawdown-stimulated plant growth on nitrogen movement from sediments into plant tissue followed by release of organic nitrogen during plant breakdown in the fall. The nitrogen content of rooted submersed aquatic plants throughout the Pool was also measured. This information will be used in a nitrogen budget model to estimate how much nitrogen stored in sediments is moved from the sediments either by bacterial denitrification or into plants during growth. Much of the nitrogen from plant tissues will end up in the water column during fall decomposition, where it will either be flushed downstream or recycled back into sediments through uptake by algae and bacteria. These data will be used to model the ecosystem-level effects of water level management.

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