Water Level Management Update

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The 2002 Drawdown - A Success in Many Ways

For the greater part of this summer Kevin Kenow, a research biologist for the USGS Upper Midwest Environmental Sciences Center and his team have spent most of their time working on lower Pool 8. Their mission has been to monitor the effects of two consecutive summer drawdowns on aquatic plant growth. They have used different tactics to do this ranging from diving to the bottom of the river to collect all of the plants in a square meter area, to analyzing seed samples in the lab to determine seed yield at selected sites. During September they counted stems, measured the heights and looked at species composition of the plants produced on 13 permanent transects on areas exposed during the drawdown. In late September they collected core samples of the mud to determine how many tubers were produced.

"Congratulations are in order for the state and federal agencies and all other private and public stakeholders of the Upper Mississippi River. The second of back to back drawdowns of pool 8 completed 9/27, by all reports is a tremendous success. Tours of the area certainly presented visual results. The Port of La Crosse did not experience any adverse effects of the draw down; furthermore, main channel navigation did not report any negative impacts. This just goes to show when stakeholders understand an issue and collaborate, we can make something positive happen. This should be an example for other issues on the Upper Mississippi River."

Kent Pehler
Vice President
Brennan Marine

Plants Flourish

Although the official results of the monitoring won't be available until January it is readily apparent that there have been some dramatic changes in the vegetation of lower Pool 8 from pre-drawdown conditions to what currently exists. Plants have flourished along the border of the main channel as well as on the exposed mudflats in the backwaters of Pool 8. Even sites that were just bare sand now support plant beds.

River Resource managers had recommended a follow-up drawdown this summer to help the aquatic plants that sprouted in 2001 develop more vigor and build energy reserves in their root systems. This goal has apparently been accomplished. "My general impression is emergent perennial plants that became established during the 2001 drawdown did very well this year," said Kenow. "Arrowhead, rice cutgrass, nutgrass, bulrush and cattail (in places) flourished this year and I suspect arrowhead tuber production will be very good." Arrowhead is a dense erosion-buffering perennial plant, whose tubers are a favorite food of tundra swans. "Good tuber production enhances overwinter survival and will contribute to the persistence of these plants next spring when water levels are back to "normal" said Kenow.

Target reached

River managers were pleased with the results of this summer's drawdown for another reason as well. Flows in the Mississippi River were high for much of the summer, which enabled the U.S. Army Corps of Engineers to maintain the maximum target drawdown level of 18 inches at the lower end of the pool while minimizing the impact upstream. Even the mid pool area around Lawrence Lake and Goose Island experienced only a limited effect from the drawdown.

Because of these favorable conditions, the drawdown was in effect in the lower portion of Pool 8 for the prescribed time frame of 85-90 days. In contrast, last year the drawdown lasted only 40 days. Refilling of the pool began on September 16, reaching full pool level by September 24.

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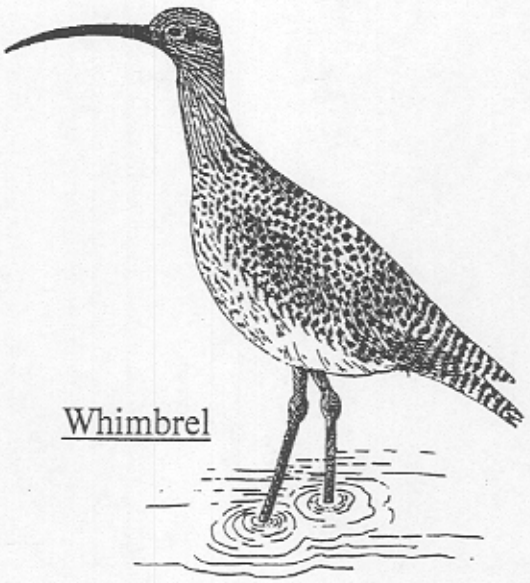
Wildlife benefits

In the meantime a variety of wildlife have taken advantage of the drawdown. For the last two months approximately 600-700 white pelicans have been enjoying the opportunity to loaf undisturbed on the expanded sandbars in the lower pool. A trip through lower Pool 8 can result in hundreds of blue-winged teal and other ducks taking wing and protesting at being disturbed.

Many shorebirds, including killdeers, sandpipers, plovers, avocets and a whimbrel have stopped to probe for small invertebrates in the exposed mud flats. Shorebirds are among the earliest of fall migrants and their numbers generally peak in late July and early August along the river. Over 2,230 shorebirds of 22 different species were observed on lower Pool 8 during the weekly monitoring surveys.

Shorebirds are only the first of the fall migrants. Soon they will be followed by hundreds of thousands of migrating ducks, geese, swans, and other birds. The seeds and tubers produced by the lush growth of plants on the mudflats and sandbars of Pool 8 will provide important food for them as they work their way south.



Whimbrel

What's Next for Pool 8?

When the plan for a demonstration drawdown of pool 8 was initially presented to the public it was based on the premise that the drawdown would last one summer with the possibility of a second drawdown the following summer if judged necessary. The Water Level Management Task Force has followed this plan, which was approved by the public.

Over the next several years we will monitor the long-term success of this demonstration drawdown project. There are numerous questions that still need to be answered. Such as:

- How many acres of aquatic vegetation were gained as a result of the drawdown and exactly what types? (submersed, floating or emergent?)
- How many years will the newly established plant bed persist?
- When might we need to repeat a drawdown to maintain the habitat benefits?
- Is there more use by ducks, geese, and swans in areas where the plants reestablished?
- Did we detect any changes in the fish communities?
- Did we detect any changes in the tributaries that flow into Pool 8 as a result of the reduced water levels?
- In order to maintain commercial navigation during the drawdown the main channel was dredged deeper. Will this additional dredging reduce dredging needs in the next couple of years? (If so, the overall cost of the drawdown may be much less than originally thought.)
- Are there options for water level operations at Lock and Dam 8 that will benefit aquatic habitat while not affecting commercial or recreational use?

The answers to these questions will help guide the future direction of water level management on the Mississippi River.

Summer of 2002 demonstrates the Complexity of Water Level Management

Even though the drawdown was in effect in Pool 8 at the maximum level of 18 inches at the dam for the full 85-90 days it was scarcely apparent in the upper pool near La Crosse. Yet during the 2001 drawdown, the river near La Crosse hit the lowest level of recent history. These two sharply contrasting situations are both good demonstrations of how the amount of flow in the river influences the effect a drawdown has on the upper portion of Pool 8.

If river flows are high (less than 30,000 cubic feet per second at Lock and Dam 8) there is enough water entering the upper end of Pool 8 that the drawdown may not be detectable. However, as river flows decrease the effects of the drawdown move upstream. If river flows are low (30,000 cubic feet per second or less) the full drawdown becomes noticeable in the upper portion of the pool. This was the situation during the 2001 drawdown. The amount of area exposed during the drawdown will increase as flow drops, until water levels at the dam have to be raised to maintain enough depth for commercial navigation at the upper end of the pool.

During 2002, flows were high all summer and the lowest level observed in the upper portion of the pool was 5.46 (almost eight tenths of a foot above normal summer lows of 4.7) at the La Crosse gage. Meanwhile in the lower pool the 18-inch drawdown was in effect from July 1 to September 16. What did change as water levels went up and down was the extent that the drawdown could be observed upstream. Most of the summer it was noticeable to Stoddard, Wisconsin but as flows decreased the effects would creep upstream to Brownsville, Minnesota area.

Sample of water elevations and flows for Pool 8 during the 2002 summer

Date	La Crosse Gage - MSL	La Crosse Stage	L&D 8 Elevation	L&D 8 Flows
17-Jun	632.42	6.12	629.86	47,200
21-Jun	632.31	6.01	629.68	45,600
25-Jun	633.00	6.70	629.58	62,200
29-Jun	634.98	8.68	629.16	74,000
02-Jul	634.47	8.17	628.44	68,900
06-Jul	633.75	7.45	628.41	63,500
10-Jul	633.00	6.70	628.49	50,200
14-Jul	633.27	6.97	628.61	58,700
18-Jul	633.64	7.34	628.54	66,500
22-Jul	633.42	7.12	628.68	58,200
26-Jul	632.59	6.29	628.53	47,100
30-Jul	632.10	5.80	628.38	40,500
03-Aug	631.76	5.46	628.46	37,500
07-Aug	632.24	5.94	628.46	43,800
11-Aug	632.55	6.25	628.51	50,900
15-Aug	632.22	5.92	628.38	43,400
19-Aug	631.82	5.52	628.61	42,700
23-Aug	632.44	6.14	628.68	48,500
27-Aug	633.95	7.65	628.63	66,000
31-Aug	632.74	6.44	628.35	52,500
04-Sep	632.20	5.90	628.53	46,000
08-Sep	632.84	6.54	628.58	53,600
12-Sep	633.86	7.56	628.60	64,900
16-Sep	632.77	6.47	628.49	52,800
20-Sep	632.17	5.87	629.40	43,800
24-Sep	631.52	5.22	629.77	31,200
26-Sep	631.95	5.65	630.18	38,200

Pool 8 During the Summer of 2002 - Similar to the "Good Old Days"?

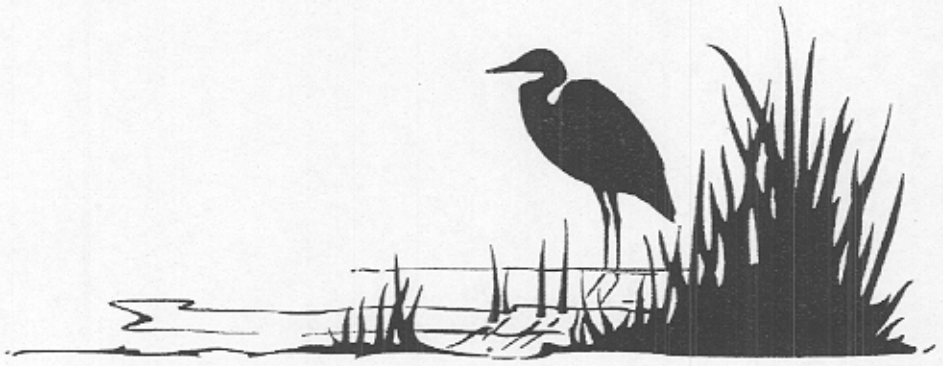
Many people, including long time residents, are not aware that the Upper Mississippi River navigation pools in the St. Paul District were not always regulated in their current manner. The amount of fluctuation currently allowed at the dams during non-flood periods is relatively small, a maximum of 1 foot at Locks and Dams 3, 5A, 6, 8, 9, and 10; and as little as 0.5 foot at Locks and Dams 4 and 5. This was not the case in the 1930's when the dams first went into operation. The amount of allowable fluctuation at the dams ranged from 2 feet at Locks and Dams 3 and 10 on up to 4 feet at Lock and Dam 4. The allowable fluctuation at Lock and Dam 8 in 1937 was 3.5 feet.

Over the years, the amount of allowable fluctuation at the locks and dams was periodically reduced for a number of reasons, primarily to reduce navigation channel dredging requirements and because people generally preferred more stable, higher water levels. At Lock and Dam 8, the allowable fluctuation was reduced to 2 feet in 1945, to 1.5 feet in 1964, and the current 1 foot in 1972. The minimum water surface elevation at the primary control point in La Crosse has always remained at 631.0 (4.7 on the La Crosse gage).

The demonstration drawdown of 1.5 feet in 2001 and 2002 at Lock and Dam 8 increased the allowable fluctuation from 1 foot to 2.5 feet, quite similar to the method of pool regulation in effect between 1945 and 1964. Because river discharges remained relatively high during the summer of 2002 there was no drawdown in the upper reaches of the pool in the La Crosse area. If the pool regulation rules for the period 1945-64 were in effect in 2002, the drawdown in lower pool 8 this past summer would have been considered just part of normal river conditions.

Thirty to fifty years ago when pool regulation changes trended toward more stabilized water levels, it is likely few people ever considered what the long-term effects on the river ecosystem might be. With the benefit of hindsight, we now realize stabilizing water levels can affect river habitats in a negative way, and may be one of the primary factors contributing to the long-term decline of emergent aquatic vegetation in the lower portions of most navigation pools. It is the lower portions of the pools where water levels remain the most stable during the range of river discharges normally occurring during the summer growing season. The effects of pool regulation are less in the upper reaches of the navigation pools, and water levels there can fluctuate 5 feet or more during a normal summer.

As interest in regulating the navigation pools in a manner to improve river habitat continues to grow, one of the options that will receive consideration will be returning to earlier regulation plans that allowed for more fluctuation in water levels. A return to the good old days!



Demonstration in Pool 8 is Complete What's Next for Other Areas?

Is There Potential for Minor Drawdowns in the other Mississippi River

The habitat response from the two consecutive summer drawdowns in Pool 8 have been judged a success by the Water Level Management Task Force. As a result, task force members want to continue similar work in other areas and have asked the Corps of Engineers to assess the possibility of conducting minor drawdowns in other navigation pools. A minor drawdown is defined as having minimal cost and effect on main channel dredging.

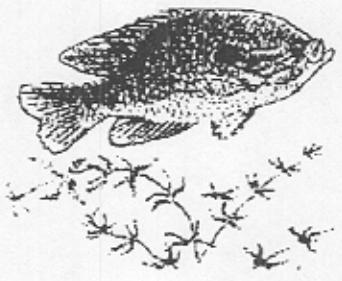
In an initial assessment of nine pools, Pools 6 (from Fountain City to Trempealeau, Wisconsin) and Pool 9 (from Genoa to Lynxville, Wisconsin) hold the most promise for a minor water level reduction. The level of drawdown under consideration for both pools would range from 6 inches to 1 foot at the dams. The drawdown in the upper portion of these pools would be about 50 percent of the drawdown at the dam. The next step will be to determine if any recreational or commercial navigation activities will be affected by a drawdown in Pool 6 and Pool 9. This fall, resource managers will measure water depths at boat landings, marinas and other facilities to help determine what impacts might occur from reduced water levels. A member of the task force representing commercial navigation will survey commercial operators for their concerns for minor drawdowns in Pools 6 and 9.

If it is determined that these drawdowns can be achieved with minimal cost or effect, a proposal will be brought out to the public for review and comment. We will keep you posted on the progress of these potential projects.

Selecting a Pool for Another Demonstration Drawdown

The Water Level Management Task Force has begun to investigate the other pools in the St. Paul District (St. Paul, Minnesota to Guttenberg, Iowa) to determine where another demonstration drawdown may occur. Water level reduction under consideration will range from one to four feet during this analysis. Several factors go into the decision. Such as:

- Where there would be the most biological benefit,
- Number of acres exposed from a drawdown,
- Effects on recreation facilities and access,
- The effects on commercial navigation and main channel dredging and disposal considerations.

After taking these factors into account river resource managers will pick the best candidate for the next demonstration drawdown. This initial evaluation will be completed by early December. As soon as the managers determine the candidate pool they will provide the information to the public for review and comment, and will begin discussions about whether or not to implement a drawdown.

If you have an opinion on what pool would or would not show a benefit from a drawdown, call or write to one of the people on the back of this newsletter.