In 1994, the St. Louis District Corps of Engineers, in coordination with local, state, and Federal natural resource managers, completed the first pool level drawdown on the Upper Mississippi River. This experiment, in Pool 25, consisted of holding the pool level approximately 2 foot lower than in previous years, for a period of about 30 days during the growing season. This "drawdown" was followed by a slow rise back to "full pool". What resulted was an expanse band of moist soil plants, that when flooded, provided habitat and food for both fish and wildlife. All work was down within the Corps existing operating range and authority. Because the Corps was working within their existing range, there were no impacts to infrastructure, such as marinas, boat landings and commercial fleeting sites, which had to be built to accommodate the entire operational range (about 5 feet). Following the success in 1994, "Environmental Pool Management" (EPM) was expanded to all three pools within the St. Louis District. EPM goals change each year based expected flow conditions and input from the natural resource managers. In some years the pools are held near the top of the operating range to improve to fish spawning opportunities while in other years the pools are held low to allow for maximum vegetation growth. Other years are somewhere in-between.

Recently concluded research in Pool 25 is helping engineers and biologists further understand in the impacts of EPM. Those results showed that varying the timing of a drawdown results in very different plant communities (and seed crops for waterfowl), and that extended drawdowns can actually be detrimental by creating too much vegetation, resulting in serious oxygen depletion problems some re-flooded areas. Late summer and fall fish use of vegetation also varied in relation to the length of the drawdown, and resultant plant growth. That work also showed extensive use of residual vegetation the following spring by a large number of larval and juvenile fish species. In addition, to producing moist soil plants, the yearly drawdowns have begun to result in the appearance of submerged and emergent aquatic plants as well, through the compaction and drying of the soil in these shallow areas.

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Summary of hydrological- and EPM-induced responses of Pool 25 Mississippi River during 1999, 2000, and 2001. MI = macroinvertebrates; ZP=zooplankton; YOY=young of year fish.

	Summer Draw-down (DD) and Hydrology				Responses				
Year	Timing of DD	Duration of DD	Intensity of DD	Late-summer Reflood Rate	Vegetation to Hydrology	Waterbirds[1,2] to Residual Vegetation	Invertebrates[2] to Vegetation	Fish to Vegetation	Water Quality to Vegetation
1999	Early	Long	High	Slow	-dense -low diversity -high seed biomass -high residual	-abundant	-high ZP -moderate MI density -high MI diversity	-high small, backwater fish -low sunfish - high YOY	-low dissolved oxygen
2000	Late	Short	Low	Rapid	-no vegetation produced	-abundant	-open-water ZP moderate -moderate MI density & diversity in open areas (Chironomidae)	-high sunfish	-high
2001	Late	Long	Moderate	Slow	-moderately dense -high diversity -high seed biomass -moderate residual	-scarce	-moderate ZP -moderate MI density -high MI biomass (Oligochaeta)	-high small, backwater fish -moderate sunfish -high YOY	-high

[1]Results are for spring of that year and reflect vegetation and seed production the preceding year.
[2]Results from 1999 and 2000 (for waterbirds) and 1999 (macroinvertebrates and zooplankton) are summarized in Dugger and Fedderson (2000) and are included for comparison.

Table 1-2 from Responses of Fishes, Waterbirds, Invertebrates, Vegetation, and Water Quality to Environmental Pool Management: Mississippi River Pool 25: James E. Garvey, Bruce D. Dugger, Matt R. Whiles, S. Reid Adams,Michael B. Flinn, Brooks M. Burr, and Robert J. Sheehan: Submitted to the US Army Corps of Engineers, St. Louis April 2003