## LAKE ONALASKA PROTECTION AND REHABILITATION DISTRICT

## September 2021 Meeting

### U.S. Geological Survey, Upper Midwest Environmental Sciences Center – Science Update

**Upper Mississippi River Restoration Program (UMRR) –** [**Long Term Resource Monitoring (LTRM) Element**](https://www.usgs.gov/centers/umesc/science/umrr-long-term-resource-monitoring)**:**

* US Army Corps’ Federal-State Partnership program aimed at restoring habitat and monitoring the ecological health of the UMR celebrates 35 years in 2021
  + USGS has science oversight for LTRM element of UMRR.
* Continue to monitor Fish/Veg/Water Quality annually with 6 State operated field stations
* Systemic Land-Cover/Use Maps:
  + imagery collected Fall 2020; U.S. Fish & Wildlife Service plane & new cameras; summer peak vegetation (August); entire UMR and Illinois Rivers
  + Maps developed and available online 2021-2025 = 6 Key Pools (4, 8, 13, 26, Open, and LaGrange-IL) first; HREP pools and IL Waterway (pre & post closures)
    - Status - Pool 4 online 2021; Pools 8, 13, 26 in review; Pool 7 (~2022)
* Status and Trends Report # 3:
  + Target release ~Nov. 2021; last [S&T report in 2008](https://pubs.usgs.gov/mis/LTRMP2008-T002/pdf/LTRMP2008-T002_web.pdf)
  + The LTRM data are used to describe biological, physical, and chemical indicators of river condition every 9–12 years

**Characterizing ecological-hydrological processes in the UMRS to inform large-river management**

* Floodplain-River Connectivity
  + Leverage the floodplain inundation model along with other existing UMRR datasets to:
    - learn about how connectivity influences ecosystem dynamics
    - contribute to the improved health and resilience of the UMRS by developing concepts, maps, and models relevant to management activities.
* Floodplain Forests
  + Dispersal, growth, and mortality affected by flooding
  + Can guide the selection of floodplain forest restoration projects that maximize restoration value
* Freshwater Mussels

**Quantitative Sampling** (COE-funded)

* + Pool wide sampling in Pools 8 and 13 results –
    - Pool 8: 279 million mussels, average density of 3.2 mussels/m2, 19 species. Pool 13: 592 million mussels, average density of 5.4 mussels/m2, 23 species. Significant differences in mussel assemblage structure across Pools 3, 5, 6, 8, 13, and 18.
  + Assessment of geomorphic indices to predict the distribution, abundance, diversity, and recruitment of native mussels across 6 pools (3, 5, 6, 8, 13, 18)
    - Analyzes underway; goal is to inform management decisions related to design and implementation of habitat restoration and enhancement projects to benefit mussels.

**USGS RESEARCH:**

**Invasive Species:**

*INVASIVE CARP* –

* Sound Barrier (Behavioral Deterrent) –
  + Pool 19 – USGS and Army Engineer Research & Development Center collaboration with UMR states to design, install and monitor underwater Acoustic Deterrent System (uADS) at a priority pinch point location
    - Pre-uADS - Tagging, monitoring, and data on Invasive carps and native fish movement and behavior to inform placement and testing
    - Rapid track = 1-year to design 105-foot long, 16 speaker soundbar;
      * Installed Feb. 6, 2021 in the lock approach channel in the last discharge lateral on downstream side to allow commercial traffic, minimize debris/damage.
    - Operational for 3-year testing: 350 carp and 250 native fish captured upstream, tagged and moved below barrier (i.e., motivated fish with experience navigating L&D increases the challenges to uADS)
* Modified Unified Method (or MUM; Harvest) –
  + First week in April 2021, MN DNR and other state and federal agencies conducted intensive invasive carp removal efforts in Pool 8. The innovative and aggressive MUM developed by USGS combines netting and herding techniques to drive and concentrate invasive carp from a large area of water into a small zone for removal.
  + Goals were to identify where carp are present, remove carp, and train agency staff to use as an early detection and rapid response technique. Carp are in low density up here and more challenging to capture/monitor so tagged silver carp were used to plan for and execute MUM.
  + Planning for fall efforts in October 2021.

*ZEBRA MUSSELS* –

* Lake Minnetonka –
* Assessment of lake applications of copper sulfate in St. Albans Bay to evaluate the ability to prevent zebra mussel veliger (juvenile) attachment to substrates. Bays were evaluated for target zebra mussel effects and unintended consequences on native invertebrates, fish and mussels. One-year post treatment evaluations completed in summer and more planned for fall.
* Request and planning for additional bay applications in 2022.

**UMESC Science Activity Report:**

* USGS UMESC Semi-annual report of publications and activities will be sent to Marc Schultz in October of 2021 to disseminate.