

**Project Title:** Feasibility Study for Developing a Unified Data Management Strategy for UMR Invasive Carp Projects, Phase 2

**Geographic Location:** UMR Basin

**Lead Agency:** US Fish and Wildlife Service La Crosse FWCO, Mark Fritts  
(mark\_fritts@fws.gov)

**Participating Agencies:** Minnesota DNR, Wisconsin DNR, Iowa DNR, Illinois DNR, Missouri Dept. of Conservation, US Geological Survey (USGS), US Army Corp of Engineers, National Park Service

**Statement of Need:** The Upper Mississippi River Asian Carp Team (UMRACT) has no established data management strategy to govern how project data is stored, shared, and archived following collection. At present, individual partners manage project data according to a number of different strategies. Consistent data management policies among the UMR ICT partners has the potential to enhance the collective impact of our programs on invasive carp management in the UMR by increasing the visibility, reproducibility, and validity of research projects because data are well documented, including the project's approach and methodology. Consistent policies will also reduce unnecessary duplication of data collection or procurement by ensuring that all partners are aware of on-going and previous projects. This strategy will also help to ensure data and data products are accessible and available for re-use in the long term.

**Project Objectives:**

1. Research technical capacities and develop proposed designs and costs for the creation and long-term maintenance of UMRACT data sharing hub.

**Project Highlights:**

- USFWS staff continued collaborative research with data scientists to determine technical design aspects of the proposed UMRACT data management system, termed CarpDAT.
- Demo version of this data system will be developed during FY22.

**Methods:** USFWS staff continued collaborative research with data scientists from the USFWS, USGS Upper Midwest Environmental Science Center, Ft. Collins Science Center, and Leetown Science Center to investigate technical aspects for the development of a multi-partner invasive carp data management hub currently being termed CarpDAT (Data Analysis and Tools). The primary focus of these investigations during FY21 were technical requirements, such as strategies for ensuring the security of partner data resources and developing a proposed data infrastructure.

**Results and Discussion:** The USFWS and USGS workgroup met formally in August and November 2021. However, informal discussion and project development continued throughout FY21 as new information became available. The group began to include discussion of the ways that the CarpDAT system may work to support the proposed National Monitoring Framework by

taking lessons learned from initial research and partner feedback within the UMRACT. While CarpDAT is being designed to accommodate the data management needs of the UMRACT, this model can be scaled up to include data from other partnerships in support of larger-scale, multi-basin data management efforts.

The CarpDAT team will work to develop a demo version of this data system during FY22 that can be used to demonstrate the capacities of CarpDAT and provide a first opportunity for partners' feedback on system design. This initial effort will be designed to accommodate demographics data from contracted commercial and fishery-independent surveys collected within the UMRACT partnership. Data scientists will construct relational databases to house these data. To ensure consistency among data producers, we will work with partners to develop standardized data elements aligned with objectives established in the National Monitoring Framework. Our team also plans to engage with data producers on the topic of electronic data collection through the use of mobile apps and forms. These technologies have the potential to reduce the time required for data producers to transcribe and proof their data before submission to a data hub like CarpDAT. The CarpDAT team will also continue researching the best ways to house and host other kinds of data from UMRACT projects like hydroacoustics. In the short-term, this demographics database will be hosted on local USGS drives. However, a long-term potential for CarpDAT is to migrate the system to a cloud-based data catalog that can enhance the scalability and flexibility of the system if data from other sub-basins is incorporated into CarpDAT. Data scientists from USGS will continue efforts to determine the viability and costs of cloud-based data catalogs during FY22.

**Recommendation:** The original purpose of this project was to assess partner perspectives on unified data management. Given the favorable and supportive responses of partners collected during FY20, our group has continued efforts to develop the CarpDAT system during FY21. The needs of our partnership continue to be the primary focus of our efforts. CarpDAT has potential for emergent and increasing value in the future. The flexibility and scalability of the proposed CarpDAT system design may offer support for the data management needs of partners in other sub-basins, thereby taking the lessons learned in this UMRACT-supported project and sharing these lessons with other partnerships. The partners strongly recommend continuing support for this project as a partner-focused data sharing and decision support platform. In order to ensure the creation and management of the CarpDAT system, funding is needed to initiate and/or continue efforts to understand how data sharing agreements can be established with our different partner institutions.