



# U.S. Fish and Wildlife Service



## The Multifaceted Nature of Dam Removals: Navigating Challenges and Achieving Success through Partnerships

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### Invasive Species

- Will removal of the structure lead to the presence of non-native or invasive species?
- If so, what are the potential impacts?
  - Sea lamprey – if adequate larval habitat, increase in treatment cost or cost to construct a barrier to inhibit adult migration
  - Zebra and Quagga mussels - decrease in primary production, decrease in native mussel diversity
  - Viral Hemorrhagic Septicemia (VHS) – can result in massive fish die-offs
  - Asian Carp – potential spawning habitat leading to recruitment
- *Will the benefit (financial and ecological) to the native species outweigh potential negative impacts of the invasive species?*



Parasitic sea lamprey



Zebra mussels on a native mussel



Perch exhibiting clinical signs of VHS

### Threatened and Endangered Species

- Dam removal/modifications can positively and negatively impact the recovery of threatened and endangered species.
- Positive impacts:
  - Provide upstream access to habitat necessary for population growth and recovery (e.g. fish, mussels)
- Negative impact
  - Species in the construction zone (e.g. Indiana bat, Michigan monkey-flower) or their existing habitat will be impacted by changes resulting from the removal/modification (e.g. existing mussel beds, changes in stream habitat or hydrology).



Michigan monkey-flower  
Photo by Susan R. Crepin



Larval Lake Sturgeon



Federally Endangered Snuffbox  
Photo by G. Thomas Walters, Ohio State University

### Toxicological Impacts of River Connectivity

- An ecological impact of river connectivity projects that has not been well studied is the transfer of contaminants by fish species into upstream areas previously inaccessible due to barriers.
- Based on studies in the Great Lakes, higher concentrations of contaminant levels (PCBs, DDT, TEQs) have been found in fish below dams, posing significant adverse effects to fish-eating birds and mammals.
- The USFWS has been working with several universities (Central Michigan University and Michigan State University) to evaluate fish as upstream vectors of contaminants and as a potential link for contaminant transfer between the aquatic and terrestrial community in the Cass River, a tributary within the Saginaw River/Bay AOC.



Photo by John McAvoy

### Historic Resources

- Projects that received federal funding must be reviewed under the National Historic Preservation Act (NHPA of 1966, as amended [USC Sec. 470-470t]) to ensure significant historical and archaeological sites in the United States of America are preserved.
- Thus, all habitat projects that receive federal funding and involve any type of ground disturbance must be reviewed for potential impacts.
- Consultation with our Regional Historic Preservation Officer or the State Historic Preservation Office (SHPO) is required to determine if the project will "adversely effect" a historic resource.
- If the project will have an adverse effect on historic properties, the agency must begin consultation with the SHPO to minimize the adverse effect (note: SHPO does not stop a project).

**Cascade Dam Removal:** The SHPO determined that complete removal would have had an adverse effect on Cascade Dam, which fit the criteria for listing in the National Register of Historic Places. Impacts were minimized by only removing a section of dam that was required to restore natural flows.



### Social and Aesthetic

- Dam removal/modification is often controversial. Pros and cons must be weighed by project partners when selecting the best design solution for a particular site. Considerations including public and motor vehicle safety, special state or federal water body designations, location (rural or urban), recreational users (kayakers, canoeists, anglers), existing infrastructure, property values, etc.
- Design scenarios are often modified to address social, historical, ecological, and other concerns:



### Obtaining Funds

- There are a variety of federal, state, local and private sector funding opportunities available. Potential sources within the USFWS:
  - Coastal Program
  - Great Lakes Fish and Wildlife Restoration Act (GLFWRA)
  - National Fish Habitat Partnerships (FHPs) - Driftless Area Restoration Effort, Fishers and Farmers Partnership, Great Lakes Basin FHP, Midwest Glacial Lakes Partnership, Ohio River Basin FHP (partnerships in your area can be found at <http://www.fishhabitat.org/>)
  - National Fish Passage Program (NFPP)
  - Partners for Fish and Wildlife Program (PFW)
  - Landscape Conservation Cooperatives (LCCs) - Upper Midwest and Great Lakes LCC, Eastern Tallgrass Prairie and Big Rivers LCC
- Dam owners may be required to pay for removal in some cases (e.g. mitigation, FERC requirement, litigation, dam safety concerns).