

Water Prize Competition Center  
Ecosystem Restoration Theme Area

## Challenges Currently Being Considered

### Fish Recovery

The current “Short List” of candidate topics that has been recommended by Reclamation and our Federal fish recovery collaborators is shown below. Although the list is subject to change, we are scheduling these topics for prize competition design and launch during 2015 and 2016, with the initial prize competition launch scheduled for late spring 2015.

**Challenge Title:** New Fish Tracking Technology

**Problem Statement:** Can we find a way that allows fish recovery managers to monitor movements of free-swimming individual fish without repeated capture and handling?

**Challenge Title:** Improve Existing Passive Integrated Transponder (PIT) Tag Technology

**Problem Statement:** Can improvements be made in existing PIT tag technology to significantly improve read distance and simultaneously improve the accuracy and precision of detecting PIT-tagged fish in remote large-stream applications?

**Challenge Title:** Mortality Indicator for Passive Integrated Transponder (PIT) Tags

**Problem Statement:** Can a PIT tag be developed that indicates when it is no longer in a live fish?

**Challenge Title:** Extending the Life of Active Fish Tags

**Problem Statement:** Can the life of active telemetry tags for tracking freshwater fish be extended by 100 percent or more over currently available tags?

**Challenge Title:** Remote Activation and Deactivation of Active Fish Tags

**Problem Statement:** Can we develop a method to remotely activate and/or deactivate a radio or acoustic transmitter once it has been implanted into a live fish and released into the environment?

**Challenge Title:** Upstream Fish Passage at Large Dams

**Problem Statement:** Is there a better way to pass upstream-moving fish over or around large dams?

**Challenge Title:** Downstream Fish Passage at Large Dams

**Problem Statement:** Is there a better way to pass downstream-moving fish over or around large dams?

**Challenge Title:** Quantifying the Availability of Food Sources for Critical Fish Species

**Problem Statement:** Can we improve methods for quantifying food resources, such as drift invertebrates and zooplankton, available for salmon and other critical fish species in river and estuary systems?

**Challenge Title:** Reducing the Loss of Threatened and Endangered Fish Caused by Predator Fish

**Problem Statement:** Are there cost-effective methods to reduce mortality of juvenile salmon from piscivorous predation associated with the water export and diversion facilities in California’s Central Valley while conserving valuable sport fisheries by not harming the predators that are valued by anglers?

**Challenge Title:** Reduce the Spread of Nonnative Fish in Riverine Habitats

**Problem Statement:** How can we contain populations of nonnative fish species within reservoirs during spills?

**Challenge Title:** Dynamic Baffling System for Fish Screens

**Problem Statement:** Can we design a dynamic baffling system for fish screens that provides real-time adjustments to continuously distribute flows over the screen?

## **Sediment Management**

In March 2015, we broadened the Ecosystem Restoration prize competition theme area to start considering prize competitions that can help us solve problems related to sediment management. Below is a list of some of the initial ideas we have gathered. These ideas have not yet been fully vetted and discussed across Reclamation, or with collaborating Federal representatives. As such, the “Short List” of topics recommended for prize competition design and launch has not yet been identified.

**Challenge Title:** Reservoir Sediment Dredging Technology

**Problem Statement:** Can a new type of dredge system be designed to efficiently excavate clay, silt, sand, and gravel from reservoirs while keeping costs for manufacturing, operating, and maintaining dredges less than existing technologies?

**Challenge Title:** Beneficial Uses of Dredged Reservoir Sediment

**Problem Statement:** Is there a new way to use dredged reservoir sediments such as clay and silt for beneficial uses?

**Challenge Title:** Minimizing Sediment Abrasion in Pipes

**Problem Statement:** How can we minimize the abrasion of water intakes and pipes in dams with the passing of coarse-grained reservoir sediments?

**Challenge Title:** Debris Management at Intakes

**Problem Statement:** Are there better ways to prevent debris, such as submerged wood and manmade materials, from racking against and clogging deep water intakes?

**Challenge Title:** Maintaining In-Stream Sediment Transport Through Reservoirs

**Problem Statement:** Can we identify a new technology or method for passing incoming riverine sediment through reservoirs for beneficial uses downstream from dams and to reduce sediment accumulation in the reservoir?

**Challenge Title:** Indirect Estimates of Reservoir Sedimentation Volume

**Problem Statement:** Can we create a more efficient and accurate data model to predict the rate of storage loss over time for a specific reservoir due to sedimentation using existing datasets?

**Challenge Title:** Reservoir Sediment Contaminant Sampling Efficiency

**Problem Statement:** How can we sample in-place sediments for heavy metals, nutrients, and other contaminants on a large scale in a deep water environment?

**Challenge Title:** Remote Reservoir Sediment Sampling

**Problem Statement:** How can we remotely characterize sediment particle size and distribution in reservoirs on a large scale?