

Project Summary
Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Tracking Brown Trout and Lake Trout Predation on Kokanee at Curecanti National Recreation Area

Discipline: Natural
Type of Project: Research
Funding Agency: National Park Service
Other Partners/Cooperators: Colorado State University
Effective Dates: 5/15/2010 - 12/31/2011
Funding Amount: \$ 19,975

Investigators and Agency Representative:

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Investigator: Brett Johnson, Professor, Department of Fish, Wildlife, and Conservation Biology, 233 Wagar Building, 1474 Campus Delivery, Colorado State University, Fort Collins, CO 80523; 970-491-5002; brett@cnr.colostate.edu

Project Abstract: Dr. Brett Johnson at the Department of Fish, Wildlife & Conservation Biology at Colorado State University is an expert in food web dynamics, trophic interactions and diet analysis. Dr. Johnson also has nearly 20 years of research experience with the fishery of Blue Mesa Reservoir.

Brown trout predation will be quantified by partnering with Colorado Division of Wildlife to capture samples of piscivorous-size brown trout from multiple locations along the migration route of the kokanee fry as they move down the Gunnison River to Blue Mesa Reservoir in April 2010. Samples of lake trout, brown trout and adult yellow perch will be collected from Iola Basin of the reservoir during a one week period after kokanee fry stocking. Finally, diet samples will be obtained from all lake trout that are culled as part of the ongoing lake trout suppression project conducted by Colorado Division of Wildlife in 2010.

Diet samples will be preserved in 10% formalin until they can be processed in Dr. Johnson's laboratory at CSU. Diet items will be identified to the lowest taxonomic level possible. Prey will be measured and converted to live weight using standard methods developed by Dr. Johnson's lab. Diet composition will be computed as percent composition of each prey on a mass basis.

Tissue samples from fish (dorsal muscle) and invertebrates (whole body) will be collected from each prominent member of the Blue Mesa Reservoir food web. These members include kokanee salmon, lake trout, yellow perch, rainbow trout, crayfish, zooplankton, chironomids, and amphipods. A large number of lake trout samples have already been collected by CDOW and are stored in a freezer in Dr. Johnson's lab. All laboratory work will be performed by Dr. Johnson and staff.

Tissue samples will be dried at 60°C and ground to a powdery consistency. Samples will then be analyzed for ¹³C/¹²C and ¹⁵N/¹⁴N signatures at the CSU Laboratory for Ecological Mass Spectrometry. Conventional mixing models will be used to estimate fractional consumer diets based on the isotopic signatures of the consumer and potential prey organisms. These estimates will provide valuable information on possible trophic shifts and/or diet alterations post-perch introduction/kokanee decline in Blue Mesa Reservoir.

Outcomes with Completion Dates: December 31, 2011

Keywords: Lake trout, Brown Trout, Kokanee, predation, Blue Mesa Reservoir, Curecanti National Recreation Area, Colorado Division of Wildlife, Colorado State University, National Park Service