

I. Project Title: Highline Lake screening O&M

II. Principal Investigators:

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III. Project Summary:

A spillway barrier net designed to control escapement of nonnative, warm water fishes from Highline Reservoir (Highline State Park, Colorado) that might enter the Colorado River was installed in August 1999. Research has shown that nonnative fishes eat young, native fish and compete for food and habitat in the river. In addition to keeping the nonnative and native fishes apart, installation of the fish barrier net brings the reservoir into compliance with the nonnative fish stocking requirements established by the states of Colorado, Utah, and Wyoming, and the U.S. Fish and Wildlife Service. Ayres Associates, Inc., of Boulder, Colorado, was the design engineer; Redden Nets of Bellingham, Washington, was the net manufacturer; and Ashley Construction of Grand Junction, Colorado, installed the net.

The fish barrier net is made of Dynema, a high molecular weight polyethylene material, which is extremely strong and durable. The net is approximately 363 feet wide, 19 feet deep, weighs 1,400 pounds, and has mesh openings no larger than a quarter inch. The net stretches across an area of the reservoir that empties into a concrete spillway that flows into Mack Wash and Salt Creek before reaching the Colorado River. Rigging attaches to the spillway's sides and to 13 anchors secured on the bottom of the lake. It is designed to flex with the surge of the current and changing water depth to prevent fish from escaping over or under it.

As this is the first time this separation has been attempted an MOU was reached between the Colorado Division of Parks (CDP) and the Colorado Division of Wildlife (CDOW) to permit CDP to operate the net with funding from the CDOW and to evaluate the operations and maintenance of the fish barrier net.

IV. Study Schedule: 1999-2003

V. Relationship to RIPRAP: Colorado River Action Plan: Mainstem

III.A. Reduce negative impacts to endangered fishes from sport fish management activities.

VI. Accomplishment of FY 2001 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

## Task Description and Schedule:

### Task Description

Task 1. Monitor while on site the performance of the non-native fish containment net using weekly visual observations and underwater visual observations and video as needed. *As our experience with the net increases, the need to conduct the underwater surveys has decreased – we will plan to conduct the underwater effort in the spring after water is spilling from the canal and in late summer after the cleaning effort and prior to the high flows of the fall.*

Task 2. Cooperate with the Colorado Division of Wildlife (CDOW) in their Management/Stocking Plans for Highline Lake.

Task 3. Determine the most effective manner to properly deploy the fish net skirt - the use of 4' PVC pipe notched at each end appears to be an excellent solution. *During the high flows this fall an additional number of the spreader bars were deployed – we used 1" diameter PVC this time and secured one end of the unit. This technique continues to perform well.*

Task 4. Construct a rock jetty to protect the West end of the non-native fish containment net from silt and gravel being deposited on the net and submerging the floats and causing a containment failure. Keep the net free from silt and gravel. *The jetty was completed and it reduced the amount of gravel deposited on the net. However, the jetty needs to be increased in size. We have made use of a small dredge unit to maintain the west end of the net.*

Task 5. Find the most productive method to clean the net of algae without expending large amounts of project funds – see recommendations.

Task 6. Evaluate when the net will need to be replaced: ***Evaluation of the nets longevity is underway (sent to Redden Nets 11-06-01).*** *A panel of netting was taken from the barrier net in the reservoir which has been subjected to similar environmental conditions of the net itself (test panel was taken from the skirt section near the end of the net and does not violate the integrity of the net. This panel has been submitted and with the test data we plan to consult with our agency partners and determine a suggested replacement time frame.*

## VII. Recommendations:

Cleaning operations will be focused to the period prior to high inflows - early March and late August. Cleaning will be conducted using the Colorado Division of Parks (CDP) barge and the highly efficient self-contained pump using lake water. *Cleaning operations conducted at these times proved very successful – cleaning of the top 8-12' using the barge, winch, and pump system without underwater cleaning was sufficient to prevent the distortion of the net when high flows were encountered in the fall.*

With the net panel test data we plan to consult with our agency partners and determine a suggested replacement time frame.

VIII. Project Status:

This project is on-track and on-going but an analysis of a replacement of the current net will need to be undertaken this year.

IX. FY 2001 Budget Status:

A. Funds Provided: \$8700 (CDOW). Only \$4794 was expended. These funds were used for such items as divers to inspect the net, misc. items to maintain the barge, rip rap for the jetty, fuel and a small 2" pump. Manpower costs were not charged to CDOW and were absorbed by CDP.

B. Funds Expended: \$4794

C. Difference: \$3905

D. Percent of the FY 2001 work completed: 100%

E. Recovery Program funds spent for publication charges: None

X. Status of Data Submission: NA

XI. Signed: Chris Foreman 11-27-01  
Principal Investigator Date