

I. Project Title: **Highline Lake screening O&M**

II. Bureau of Reclamation Agreement Number(s): R12AP40001

Project/Grant Period: Start date (12/28/2011):
End date: (9/30/2016):
Reporting period end date: 11/14/14
Is this the final report? Yes _____ No X

III. Principal Investigator(s):
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IV. Abstract:

A spillway barrier net designed to control escapement of nonnative, warm water fishes from Highline Reservoir (Highline Lake 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.

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. It is designed to flex with the surge of the current and changing water depth to prevent fish from escaping over or under it.

A major dredging operation took place at Highline Lake during the fall of 2013 and early winter of 2014, drawing the lake down 20 vertical feet. On March 12, 2014 the existing spillway barrier net was removed and on March 14, 2014 the replacement spillway net was installed. Due to the draw down, the removal and replacement were able to take place on dry land. All of the remnants of the original net were removed, and all of the existing thimbles and manta ray bolts were inspected. The replacement net was connected and tightened in a manner that ensures there would not be openings that fish would be able to escape through.

V. Study Schedule: 1999 – 2016 (end of current reporting period; study expected to continue beyond 2016)

VI. Relationship to RIPRAP: Colorado River Action Plan: Main stem
The initial Procedures for Stocking Nonnative Fish Species in the Upper Colorado River Basin (USFWS 1996), under which this project was initiated, included specific reference to the need to screen the spillway at Highline Reservoir to control escapement of nonnative, warmwater species. This requirement prescribed that "Public and private waters that have a direct connection to rivers in the Upper Colorado River Basin (e.g., Elkhead Reservoir, Highline Reservoir and many ponds) will be equipped or managed with an anti-escapement device or practice acceptable to the Service (USFWS) and the State fish and wildlife agency." In addition, the Procedures, section IV.6, state that "The [Upper Colorado River Basin Endangered Fish Recovery Program ('UCRP')] will pursue funding for equipping public reservoirs with anti-escapement devices" (USFWS 1996). Funding from the UCRP became available in 1998 for installation of a fish screen at Highline Lake and the net was installed on 18 August 1999.

General Recovery Program Support Action Plan:

III. Reduce negative impacts of nonnative fishes and sport fish management activities.

III.A.2. Identify and implement viable control measures.

III.A.2.c. Implement and evaluate the effectiveness of viable active control measures.

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

VI C. Ensure public involvement occurs as appropriate.

Colorado River Action Plan: Main stem

III.B.1.a. Operate and maintain Highline Reservoir net.

VII. Accomplishment of FY 2014 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1. Removal of old net and installation of new net: Highline Lake was drawn down because of a dredging operation, placing the old net completely out of the water. As a result, the contractor was able to remove all of the net, as well as the remnants of the original net that was left behind during that removal. The contractor was able to inspect all thimbles and manta ray bolts on the ground and they were found to be in good condition. The new net was connected and wired tight so that there should be no fish escapement once the lake filled.

Task 2. Maintain Protective Buoy Line: The buoy line was inspected on a weekly schedule with the Park's Patrol Boat during the summer season. No issues or problems were identified. The connecting cable, shackles, U bolts are in good working order.

Task 3. Net Cleaning and Repair Operations (in water): We have continued to do 3 cleanings of the net because it has shown to be very successful to lighten the load on the net. Cleaning of the net took place May 28, 2014, July 22, 2014 and October 14, 2014. The first cleaning this year took place a month later than years past because the net was new and we started the season with no algae growth. The second and third cleanings were moved back later as well due to the late first cleaning. The net was cleaned manually all 3 times by divers from United Underwater Contractors.

Task 4. Weekly visual survey—The net top line and floats along with the skirt were visually checked on a weekly basis with the Park Patrol Boat – on weekends the Patrol Boat would be on-the-water for several hours and when time permitted we would examine the net from the water surface. Due to issues with the PVC wearing on the old net the skirt was tied with ¼” poly line from the skirt to the safety line which kept the skirt stretched out the entire summer.

Task 5. Underwater Survey—the net was inspected by United Underwater Contractors, (the same divers that have been checking the net for the last several years) and they prepared a report for each of their inspections. The reports are available at the park.

The highlights of the report submitted on May 28, 2014 were: 1) Cleaning was done on the new net for the first time and the net is in good condition. There was minimal algae growth. 2) All hardware was inspected anchoring cables are attached to the 4 manta bolts and the safety wire is in place and holding the shackles secure. 3) The net, thimbles, shackles, manta bolts and cable were completely inspected and all were in good condition.

The highlights of the report submitted on July 22, 2014 were: 1) the net, lead line, thimbles, shackles, manta bolts and cable were completely inspected. All of the hardware is in good working condition. 2) All anchoring cables are attached to the 4 manta bolts and the safety wire is in place and holding the shackles secure. 3) The net has just started to show spots of heavy algae growth and most of it cleaned off well. 4) The ¼” poly line spreading the top skirt is holding up well.

The highlights of the report submitted on October 14, 2014 were: 1) The net cleaned up well and the ¼” poly line spreading the top skirt is holding up well. The net is just starting to show small hard algae spots and some are becoming very difficult to remove. 2) The lead line, thimbles, shackles, manta bolts and cable were inspected and in good condition. 3) All anchoring cables are attached to the 4 manta bolts and the safety wire is in place and holding the shackles secure. 4) As the net has stretched into position the larger buoys attached to the main net are leaving gaps on the surface with some up to 4”. United Underwater Contractors is going to contact Redden Nets and see if this is a manufacturer defect and will see about sewing the net to the buoy line.

VIII. Additional noteworthy observations: The small separation from the net and buoy line will be looked into. If it is in fact a defect, we will get the repair done to remedy any issue that may result in fish escapement.

As in previous years, CPW will survey Mack Wash in mid-November, after the end of the irrigation season when flows become suitable for in-stream sampling. Due to the warm dry fall the irrigation company still has water flowing into Highline as of November, 13, 2014. The sampling will be delayed until the lake quits spilling and we get suitable flows for in-stream sampling. See the 2013 report for data from the November 2013 Mack Wash surveys.

IX. Recommendations: Due to the hard buildup of algae beginning on the net and with past experience we will monitor the net in 2015 to see if 4 cleanings are necessary. Park staff will monitor the net and debris being washed into the lake in the spring and will inform divers when the cleaning of the net will need to take place.

X. Project Status: This project is on-track and on-going

XI. FY 2014 Budget Status

A. Funds Provided:

B. Funds Expended: \$5,700 expended by CPW. \$2,700 was for net removal and installation and \$3,000 was for three net cleanings (CPW covers annual O&M up to \$10,000)

C. Difference:

D. Percent of the FY 2014 work completed, and projected costs to complete: 100%

E. Recovery Program funds spent for publication charges: \$0.00

XII. Status of Data Submission (Where applicable): N/A

XIII. Signed: Alan C. Martinez 11/13/14
Principal Investigator Date

(Just put name and date here, since you will be submitting the report electronically)

APPENDIX: *E.g., more comprehensive/final project reports (NOT to be used in place of a complete annual report.). If distributed previously, simply reference the document or report.*

For projects where more than one agency/entity receives funds from the Bureau of Reclamation, append one PPR from each agency/entity. Otherwise, delete.

ANNUAL PERFORMANCE PROGRESS REPORT (PPR)

BUREAU OF RECLAMATION AGREEMENT NUMBER: _____

UPPER COLORADO RIVER RECOVERY PROGRAM PROJECT NUMBER: _____

Project Title:

Principal Investigator: *[Name, mail and e-mail addresses, phone number]*

Project/Grant Period: Start date (Mo/Day/Yr):
 End date: (Mo/Day/Yr):
 Reporting period end date (Mo/Day/Yr):
 Is this the final report? Yes _____ No _____

Performance: *Briefly describe the tasks accomplished and any tasks not met. One paragraph is sufficient.*