Installation of Nets to Contain Green Sunfish in Minus-12-Mile Slough
Glen Canyon National Recreation Area
October 6-7, 2015

TRIP REPORT

Photo: NPS and AZGFD staff assembling the block net at Lees Ferry. NPS photo by Brian Healy.

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INTRODUCTION

A reproducing population of nonnative green sunfish (*Lepomis cyanellus*) was detected in a warmwater slough within Glen Canyon National Recreation Area (GCNRA) in early July, 2015 (Arizona Game and Fish Department, AZGFD, unpublished data). The slough is located on river left, approximately 12 miles upstream of Lees Ferry. Fisheries biologists and managers were concerned that the species could disperse from the slough and colonize warmwater areas that are also critical for native fish species, including endangered humpback chub (*Gila cypha*). Flooding, such as during a High Flow Experiment (Reclamation 2011), and warming dam discharges, could increase the risk of dispersal of green sunfish out of the slough. Green sunfish are known predators upon native species and have been implicated in declines of native warmwater fish in the southwestern United States (summarized by Ward 2015). Following two unsuccessful eradication efforts using mechanical methods (electrofishing and netting; Winters 2015a, 2015b), it was determined that the installation of a barrier may help to contain the species while additional eradication methods were evaluated.

Additional background can be found in a memo from D. Ward (USGS), to G. Knowles, Bureau of Reclamation (Sept. 24, 2015 memo), and in a memo signed by T. Brindle (NPS- GCNRA, August 5, 2015) authorizing the emergency mechanical removal actions of green sunfish.

Objectives

The objective of this effort was to install a barrier sufficient to contain green sunfish within the slough, to the extent feasible, until other methods of eradication were determined, and successfully implemented.

METHODS

Logistics and Personnel

To plan net installation, in conjunction with other fisheries work planned for the Glen Canyon reach of the Colorado River, USGS-Grand Canyon Monitoring and Research Center (USGS) biologists measured two cross sections (width x depths) near the mouth of the slough to assist plans for barrier installation. It was also noted that flow fluctuations and low topography of the lower end of the bar forming the slough may cause difficulties in net installation. The widths of two potential barrier installation locations were 35 and 75 meters, and the maximum depth was recorded at 1.9 meters (6.3 feet).

Based on measurements taken by USGS, NPS fisheries staff secured a sufficient number (3) of seines, with ¼-mesh, from AZGFD Wildlife Contracts Branch and Wayne Gustaveson (Page, Arizona) that could be sewn together to create a block net 49 meters long (160 feet) x 3.7 meters (12 feet) deep. Nets with smaller mesh were not available, without a custom order, which may have taken up to a month for manufacture and delivery. Replacement nets are being purchased for the AZGFD Wildlife Contracts Branch.

All necessary compliance consistent with the National Environmental Policy Act, National Historic Preservation Act, and Endangered Species Act was completed by GCNRA, prior to net installation. In addition, permitting requirements related to Section 404 of the Clean Water Act were discussed with the

Army Corps of Engineers. A press release was also prepared by AZGFD and NPS staff to alert the public about the net installation.

On October 6, two NPS-Grand Canyon National Park (GCNP) fisheries biologists met eight GCNRA staff at Lees Ferry to begin assembling the block nets into a single net. Nets were sewn together (see photo above) using twine, parachute chord, and zip ties, and all holes in nets were repaired. A chain was sewn into the bottom of the net to keep it in place under fluctuating flows and maintain a tight seal with the substrate in the slough. Chain was also necessary because other options to secure the bottom of the net, such as placing rocks taken from the bottom of the slough, would require CWA permitting. The sewing process took approximately 5 hours.

Two NPS fisheries biologists, along with six AZGFD biologists, and four GCNRA staff, including the GCNRA dive team, were transported by the NPS patrol boat (jet boat), an AZGFD boat, and an Achilles electrofishing boat to the slough on the morning of October 7 to install the net.

RESULTS AND OBSERVATIONS

Upon arrival at the slough on the morning of the 7th, it was apparent that the entire area of the slough would be difficult to block completely with the length of net that was available. While dam discharge was relatively low in the morning when the net was placed, it would be expected to peak later in the day and inundate a very large area of the lower section of the bar that separates the slough from the mainstem of the Colorado River (Figure 1). At higher daily peaks, water would flow around the block net, and it would not be effective. To compensate, after discussion among NPS and AZGFD biologists, the net location was moved upstream, inside the slough, at a location that could be more effectively blocked with the width of net that was on hand.

The block net was in place by 11:00 AM. One GLCA staff member, wearing a dry suit, waded across the slough and secured the net and buoys, after the net was deployed by staff wearing waders and by inflatable kayak. Buoys were placed approximately every 3-5 meters all the way across the net, to minimize the risk of watercraft contact with the net. In addition, GLCA staff placed closure signs at the net (Figure 2).

The block net will be checked and maintained as frequently as possible, depending on staff availability, until an effective green sunfish removal strategy has been developed and implemented.

Figure 1. Location of block net placed in the slough. Area to the left of the red line, indicated by green arrows, is inundated at daily peak flows. The blue line indicates the location of the block net, which is the

shortest distance that could be effectively blocked with the length of net available (160’). NPS Photo by Mark Anderson).

Figure 2. Block net deployed with buoys attached. NPS Photo by Brian Healy.