

Work Task E12: Butler Lake

| FY07 Estimates | FY07 Actual | Cumulative Accomplishment Through FY07 | FY08 Approved Estimate | FY09 Proposed Estimate | FY10 Proposed Estimate | FY11 Proposed Estimate |
|----------------|-------------|----------------------------------------|------------------------|------------------------|------------------------|------------------------|
| \$120,000 | \$11,633 | \$121,350 | \$0 | \$0 | \$0 | \$0 |

Contact: Nathan Lenon, (702) 293-8015, nlenon@lc.usbr.gov

Start Date: FY04

Expected Duration: Closed in FY07

Long-term Goal: Restoration research.

Conservation Measures: BONY2, RASU2, LEBI1, CLRA1.

Location: Reach 5, Imperial NWR, River Mile 61, AZ.

Purpose: Evaluate potential lower-cost alternatives to dredging such as aeration, in situ bioremediation, or temporarily opening the backwater to the river, while meeting the needs of the LCR MSCP to provide habitat for covered native fish.

Connections with Other Work Tasks (past and future): This work task was previously included in the FY04 Work Tasks as Butler Lake, Imperial National Wildlife Refuge (D5). Species monitoring is being addressed under F2 and F4.

Project Description: Backwaters are an expensive land cover type to create. Studies were conducted on this backwater to develop technology to effectively restore existing backwaters to suitable habitat. Butler Lake, and other existing backwaters, contain many of the components required to sustain native fish, but suffer from poor water quality. This research project evaluated the water quality of the lake by conducting seasonal sampling, identified options to improve water quality in the eutrophic backwater, and developed a range of alternatives for improving water quality.

Located on Imperial NWR, Butler Lake is a 43-acre disconnected floodplain lake with an approximate mean depth of 3 ft. This backwater is seepage-driven, with no known surface connection to the Colorado River, or any other body of water. The lack of freshwater flushing has caused the lake to become hypereutrophic (an advanced state of nutrient enrichment) to the extent that, in its present condition, Butler Lake provides little benefit to fish or wildlife.

During FY06, the U of A initiated a limnological assessment of Butler Lake. The purpose of this assessment was to address the uncertainty related to restoring a eutrophic backwater system and identify whether any of the alternatives to dredging would be feasible in this situation. This agreement was executed at the end of FY05; therefore, all the work funded out of FY05 was completed during FY06.

Previous Activities: In FY05, Reclamation completed a preliminary assessment report, based on limited data collection during FY04, which evaluated conditions at Butler Lake, and proposed various restoration alternatives. Because of the uncertainty related to experimental treatments, Reclamation, in consultation with Imperial NWR, decided to collect additional data prior to selecting a restoration approach (see description of U of A limnological assessment in previous paragraph.)

A monitoring protocol was developed to address the concerns regarding uncertainty and includes data collection on major and minor ions, nutrients, metals, sediment chemistries, algal toxins, zooplankton, and macro-invertebrates. This will provide Reclamation with an increased understanding of the ecological dynamics of the system, as well as a solid baseline from which to measure the effectiveness of any proposed restoration activities.

Three sampling trips in FY06 were conducted and a preliminary report of initial impressions after the first site visit was submitted.

FY07 Accomplishments: A full year of quarterly sampling trips was completed. The year-end report included recommendations for the best course of action to restore the backwater for native fish. Preliminary findings indicated that only through large-scale restoration could Butler Lake be made suitable for native fish.

Because a large-scale restoration technique such as dredging or excavation of an inlet/outlet channel is likely to be required, Reclamation will evaluate this site relative to all other candidates included in the Backwater Site Selection (E15) for reaches 5 and 6. Under this scenario, no further activity would occur under this work plan in FY07, which would reduce expenditures for FY07 below the current estimate.

Proposed FY08 Activities: Closed in FY07. At this time, no site-specific activities are planned at Butler Lake in FY08. This site will be evaluated relative to all other candidates included in the Backwater Site Selection (E15) for reaches 5 and 6.

Pertinent Reports: *Butler Lake Native Fish Refugium, Preliminary Assessment* is posted to the LCR MSCP Web site. *Limnological Survey and Assessment of Butler and McAllister Lakes* will be posted to the LCR MSCP Web site.