

Work Task E12: Butler Lake

FY05 Estimate	FY05 Actual	Cumulative Accomplishment Through FY05	FY06 Approved Estimate	FY07 Proposed Estimate	FY08 Proposed Estimate	FY09 Proposed Estimate
\$55,000	\$70,893	\$77,566	\$140,000	\$120,000	\$200,000	\$40,000

Contact: Nathan Lenon, (702) 293-8015

Start Date: FY04 **Expected Duration:** FY07

Long-term Goal: Restoration Research

Conservation Measures: BONY2, RASU2, LEBI1, CLRA1

Location: Reach 5, Imperial National Wildlife Refuge, 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 are being addressed under Work Tasks F2 and F4.

Project Description: Backwaters are an expensive land cover type to create. Studies are being conducted on this backwater to develop technology to effectively restore existing backwaters to levels of sustainable backwater 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 will evaluate the water quality of the lake by conducting seasonal sampling, identify options to improve water quality in the eutrophic backwater, and develop 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 feet. 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.

FY05 Accomplishments: 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.

During FY05, Reclamation entered into a cooperative agreement with U of A to perform a limnological assessment of Butler Lake and provide recommendations on alternatives for habitat creation. The purpose of this assessment is to address the uncertainty related to restoring an 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 is being completed during FY06.

Higher than projected costs were incurred in FY05, because U of A's additional information was required to make an informed decision. A more comprehensive monitoring protocol was selected to address the concerns regarding uncertainty and is the source of the additional FY05 expenditures. This monitoring 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.

FY06 Activities: In consultation with Imperial NWR, Reclamation has scaled-back a planned boat ramp to provide minimal boat access. Staff cleared vegetation and made minor improvements to a restricted-access road to provide access for small boats. This decision is expected to reduce the actual expenditures for FY06.

The U of A has completed two quarterly monitoring trips during FY06 and has submitted a preliminary report of initial impressions. They will complete their first full year of monitoring and submit year-end report in FY07. Should the U of A's recommendations include experimental treatments other than dredging, the agreement provides for one year of post-treatment monitoring to evaluate the effectiveness of said treatment(s).

Proposed FY07 Activities: In FY07, the U of A will submit a final report to Reclamation. This report will include recommendations for the best course of action to restore the backwaters for native fish. These recommendations may include alternatives, which range from small scale treatments which could be implemented fairly quickly to large-scale alternatives such as dredging, and/or excavating inlet/outlet canals. Activities occurring in FY07 may vary greatly, depending on the recommended restoration techniques. After a review of the U of A's final report, Reclamation will decide, in consultation with the Imperial NWR, whether to pursue the project.

Should a small-scale experimental restoration technique (or combination of techniques) be proposed which would be feasible and cost-effective, Reclamation will prepare a design (if applicable), cost estimate, and restoration plan during FY07. Any required environmental compliance will be initiated in FY07. Implementation of the restoration plan would not occur until at least FY08. Because large-scale activities will not be occurring in FY07, costs associated with the project will be reduced.

Should a large-scale restoration technique, such as dredging and/or excavation of an inlet/outlet channel be proposed, Reclamation will add Butler Lake to Backwater Site Selection (E15).

Under this scenario, no further activity would occur in FY07, which would reduce expenditures for FY07.

Pertinent Reports: *Butler Lake Native Fish Refugium, Preliminary Assessment* is posted on the LCR MSCP website. A study plan is available upon request.



Figure E12: Aerial photo of Butler Lake, September 2004. The bright green color is caused by an overabundance of Cyanobacteria, known as “blue green algae”. Cyanobacteria-dominated systems are considered to be impaired.