Work Task E34: Groundwater and Soil Salinity Monitoring Network

FY13 Estimate	FY13 Actual Obligations	Cumulative Expenditures Through FY13	FY14 Approved Estimate	FY15 Proposed Estimate	FY16 Proposed Estimate	FY17 Proposed Estimate
$250,000	$31,841.15	$31,841.15	$250,000	$150,000	$150,000	$100,000

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Start Date: FY13

Expected Duration: FY55

Long-term Goal: Restoration research to guide management actions.

Conservation Measures: CLRA1, WIFL1, BONY2, RASU2, WRBA2, WYBA3 CRCR2, YHCR2, LEBI1, BLRA1, YBCU1, ELOW1, GIFL1, GIWO1, VEFL1, BEVI1, YWAR1, SUTA1, FLSU1, MNSW2, CLMB2, PTBB2.

Location: Conservation Areas.

Purpose: Monitor soil and groundwater salinity to inform management actions that will allow for the long-term health and survival of established land cover types on LCR MSCP Conservation Areas.

Connections with Other Work Tasks (past and future): This work task was initiated with funds from G3, E24, and E4.

Project Description: Monitoring soil and groundwater conditions provides information about why some restoration sites establish and develop more successfully than others. The network will be expanded, and soil and groundwater monitoring will be standardized across all applicable LCR MSCP Conservation Areas. The process of determining which phases will be monitored and to what level will occur over a period of years. The information gathered through this effort will inform decisions about managing saline conditions of soils and groundwater, and will ensure the long term viability of LCR MSCP conservation areas.

Previous Activities: Research from previous studies funded by G3 has suggested that riparian obligate trees will utilize groundwater over applied surface water when they have reached sufficient maturity.

An extensive review of the literature available on salinity and sodicity was conducted to summarize what was already know about managing saline soil and groundwater conditions and is available on our website.

A soil and groundwater monitoring network was established at portions of three LCR MSCP Conservation Areas: Beal Lake, PVER, and Cibola Unit #1.

Using the data collected from the three conservation areas over 2.5 years, a mass balance model to evaluate salt accretion/loss in soils and groundwater was developed.

FY13 Accomplishments: The draft *Soil and Groundwater Salinity Conditions for Lower Colorado River Multi-species Conservation Program Habitat Creation Sites* was prepared late in FY 13. The report summarizes soil and ground water salinity conditions at the Beal Lake Conservation Area, Palo Verde Ecological Reserve, and Cibola NWR Unit #1 Conservation Area.

In general, salinity is not a concern at Conservation Areas with frequent irrigation and coarse soil texture (Palo Verde Ecological Reserve and Beal Lake Conservation Area) and therefore the monitoring network density would be lower and frequency of sampling could be infrequent. At Conservation Areas with higher salinity values (Cibola Unit NWR Unit #1) the network density would be higher and the frequency of sampling should be more frequent. Expenditures were less than approved to allow time to accept and review the report.

Proposed FY14 Activities: Data from the preceding three years will be sequenced into the LCR MSCP database. A master plan to expand the monitoring network to encompass all Conservation Areas is expected to be drafted. The report will be completed.

Proposed FY15 Activities: The long-term soil and groundwater monitoring effort, guided by the master plan, will go into effect and additional LCR MSCP conservation areas will be added to the network starting in FY15. The monitoring network will be established over a longer period of time and likely not be as dense as originally projected which is reflected in the decreased budgets. Conservation Areas, such as Yuma East Wetlands where salinity values are elevated, would be addressed first.

Pertinent Reports*: Cibola NWR Unit 1 Conservation Area 2010 Annual Report*; *Review of Salinity and Sodicity; Monitoring, and Remediation for Riparian Restoration Areas*; and *Groundwater and Soil Salinity Monitoring Network in Support of Long-Term Irrigation* and *Salt Management of MSCP Restoration Areas: Well Installation and Preliminary Monitoring Data Report,* will be posted to the website.