

Work Task C36: Elf Owl Detectability Study

FY11 Estimate	FY11 Actual Obligations	Cumulative Expenditures Through FY11	FY12 Approved Estimate	FY13 Proposed Estimate	FY14 Proposed Estimate	FY15 Proposed Estimate
\$50,000	\$50,440.81	\$231,212.25	\$20,000	\$0	\$0	\$0

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Start Date: FY09

Expected Duration: FY12

Long-term Goal: To develop a long-term elf owl monitoring field protocol for the LCR MSCP.

Conservation Measures: MRM1 (ELOW).

Location: Bill Williams River.

Purpose: To conduct a detectability study on a known population of elf owls that breed in riparian habitat.

Connections with Other Work Tasks (past and future): This study will be used to modify the survey protocol used for system-wide (D6) and post-development (F2) presence/absence elf owl surveys.

Project Description: Data to support the current tape-playback presence/absence elf owl survey protocol are lacking. A detectability study will be conducted on a known population of elf owls that breed in riparian habitat along the Bill Williams River. If the population is not large enough, then other populations away from the LCR region, but within other desert riparian areas in the southwest may be studied.

The objectives of this study are to 1) systematically test how varying the parameters of call-broadcast surveys (distance to owl, time of night, decibel level of call playback, habituation, duration of call playback) affects the response type and response time of elf owls in known locations, 2) recommend survey protocols that optimize detectability, and recommend the number of seasonal surveys and amount of long-term survey effort required for effective population monitoring, and 3) quantify the likelihood of detection if the recommended methods are implemented. Data from this study may be used to modify the existing elf owl presence/absence survey protocol.

Previous Activities: In FY2010, a study plan for the elf owl detectability study was completed. An annual report for the first year of the study was prepared. Passive listening and call-broadcast surveys were conducted along the survey routes to inventory elf owls and determine their nesting

sites and/or activity centers. Seven territories were identified that were all located on the edge of the riparian habitat that interfaces with upland habitat.

Capturing and radio tagging of the elf owls occurred and six elf owls were captured and radio-tagged. Detectability experiments were conducted on these seven pairs. In total, 53 detectability trials were performed.

FY11 Activities: In FY11, field work took place at the Bill Williams River NWR from 1 March to 2 June. A draft final report incorporating both years of data was prepared (2009 and 2010). A draft recommended call-broadcast survey protocol was prepared giving recommended distance between points, call-broadcast listening time at each point, illumination levels, time of night surveys shall be conducted, decibel level of call-broadcast, time of year surveys shall take place, and number of surveys in a season. A likelihood of detection of 95% was calculated for the recommended survey protocol.

Passive listening and call-playback surveys were conducted along survey routes in the interior and along the edges of the riparian habitat to inventory elf owls and determine their nesting sites and/or activity centers. Ten territories were identified on the edge of the riparian habitat that interfaces upland habitat. Five of the territories were in the same locations as in 2010. Two additional territories were identified in the riparian interior.

Detectability experiments were conducted on five of the pairs from 28 April to 21 June. Parameters tested were distance and time. Three different call-playback distances were tested (100 m, 250 m, and 450 m) and three different times of night (Dusk: 30 minutes after sunset until 12 a.m., Midnight: 12 a.m. to 3 a.m., and Predawn: 3 a.m. until 30 minutes before sunrise) were tested. An experimental matrix was constructed whereby each owl was tested for each combination of distance and time of night. In 2011, tests were conducted within open upland habitat and dense riparian habitat. Responsiveness of elf owls was highest at dusk (78%), at the 100 m distance (77%) and in low and intermediate illumination (63% and 65%, respectively). The majority of elf owls (85%) responded within two minutes of the start of the call-broadcast. Elf owls exhibited some movement in response to call-broadcast; however, movement patterns differed greatly between the individual owls.

In 2011, two birds were captured in late May and radio transmitters were attached. They were telemetered over the course of several nights to gather more detailed information about activity budgets, habitat use, and home range. Male birds appear to spend the daylight hours in a day roost site, which is usually located within 100 m of the nest cavity. Emergence from the day roost occurs during the dusk period, after the sun has set but before full darkness occurs. Typically, emergence is followed by a nest-attendance shift between the mates as the female departs for a foraging foray. Additional nest exchanges between the male and female occurred occasionally during the early and middle part of the night. The early part of the night was characterized by territorial behavior, movement near its territory, and vocalizations. The middle part of the night was characterized by extended feeding forays within the riparian habitat. The later part of the night was characterized by sheltering behavior in the canyons or near the nest cavity.

Natural elf owl chatter vocalizations were measured at several locations. Four good readings were obtained that were within or close to the decibel range of recordings used for this study (65-70 db at 1 m from the speaker).

Digital recordings of elf owl vocalizations were obtained. A peeper cam was used to locate and visually examine the contents of three different elf owl nest cavities and to photograph owls in the nest cavities. On the same date, breeding stage was different among the three territories, ranging from presence of eggs to presence of feathered nestlings.

FY12 Activities: The project report and the recommended elf owl survey protocol will be reviewed and finalized.

FY13 Activities: Closed in FY12.

Pertinent Reports: The report, *Elf Owl Detectability Study 2010 and 2011*, will be posted on the LCR MSCP website. The study plan is available upon request.