



# Lower Colorado River Multi-Species Conservation Program

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*Balancing Resource Use and Conservation*

## System-wide Surveys of the Elf Owl (*Micrathene whitneyi*) Along the Lower Colorado River, 2009



April 2010

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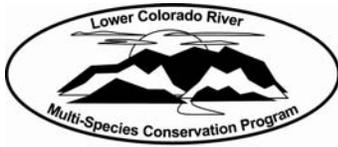
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*Prepared by Beth Sabin, Wildlife Group*

Lower Colorado River  
Multi-Species Conservation Program  
Bureau of Reclamation  
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<http://www.lcrmscp.gov>

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# Abstract

Reclamation initiated system-wide surveys along the Lower Colorado River (LCR) for the elf owl (*Micrathene whitneyi*) during the breeding season of 2008. Surveys were conducted during the breeding seasons of 2008 and 2009 with each location being surveyed in both years. The objectives of this study were to: 1) assess the current distribution of breeding elf owls along the LCR in Arizona, California, and Nevada; 2) assess the amount of cottonwood-willow (CW) I, CW II, and honey mesquite (HM) III habitat along the LCR for elf owls; and to 3) survey historic locations where elf owls were present during previous surveys and incidental sightings. This report covers the second year of surveys that took place in 2009. Study sites were selected using vegetation maps and aerial photography, historic locations, site reconnaissance, previous habitat creation projects, and previous incidental sightings. Survey protocol was taken from recommended methods by the Arizona Game and Fish Department. Three surveys were conducted at each location between 25 March and 31 May 2009. Twenty-two sites and 45 single call stations were surveyed in 2009. There were no elf owls detected in 2008 and one elf owl was detected in 2009. The following species of owls were detected during the 2009 surveys: barn owl (*Tyto alba*), long-eared owl (*Asio otus*), western screech-owl (*Megascops kennicottii*), and great horned owl (*Bubo virginianus*). These surveys and previous surveys conducted by the California Department of Fish and Game suggest that elf owls are extremely rare along the main stem of the LCR, if not close to extirpation.

# Introduction

The elf owl (*Micrathene whitneyi*) is the smallest owl in the world. It is migratory, wintering in Mexico and breeding in three areas of the United States: 1) the Lower Colorado River (LCR), from southern Nevada, eastern California, and western Arizona, east to the Rio Grande River in New Mexico; 2) the Big Bend region of Texas, east to Edwards Plateau; and 3) Dimmit County, Texas, southward, through the Rio Grande River, to Nuevo Leon, Mexico (LCR MSCP 2006). In most of the breeding range, the elf owl is associated with mature saguaro cactus (*Carnegiea gigantea*) (Brown 1903, Campbell 1934, Goad and Mannon 1987, Hardy et al. 1999, Hardy and Morrison 2001, Henry and Gehlbach 1999, Ligon 1968, Steidl 2001, Steidl 2002, Stephens 1903). Along the LCR, elf owls are associated with mesquite (*Prosopis* spp.) woodlands and Fremont cottonwood-willow (CW) (*Populus fremonti*, *Salix* spp.) riparian areas (Gilman 1909, Kimball 1922, Miller 1946, Halterman et al. 1987). The elf owl is a secondary cavity nester, relying on cavities excavated by other birds. Throughout the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) planning area, elf owls utilize cavities in cottonwood, willow, saguaro, and saltcedar (*Tamarix* spp.) trees. These cavities are formerly occupied by Gila woodpeckers (*Melanerpes uropygialis*), gilded flickers (*Colaptes chrysoides*), and ladder-backed woodpeckers (*Picoides scalaris*) (Halterman et al. 1987). Habitat loss along the LCR has likely affected this species, although it is not known whether the species was ever abundant along the LCR, which is at the edge of the species range, or if populations were even continually present (Rosenberg et al. 1991).

The elf owl is listed as endangered in the state of California (CDFG 2005). The elf owl is not federally listed or listed in the states of Arizona or Nevada. Conservation measures for the elf owl in the LCR MSCP Habitat Conservation Program (HCP) are to create 1,784 acres (722 hectares) of CW I and II and honey mesquite (HM) III (*Prosopis glandulosa*) land cover in reaches 3 to 5 and install elf owl nest boxes in created habitat (LCR MSCP 2004a).

The Bureau of Reclamation (Reclamation) as part of the LCR MSCP initiated system-wide presence/absence surveys of the elf owl in the LCR MSCP planning area during the breeding season of 2008. The Bill Williams National Wildlife Refuge (NWR) was excluded because there is a known breeding population at the refuge. Surveys were conducted during the breeding seasons of 2008 and 2009 with each location being surveyed in both years. The objectives of this initial two year effort were to: 1) assess the current distribution of breeding elf owls along the LCR in Arizona, California, and Nevada; 2) assess the amount of remaining CW I, CW II, and HM III habitat along the LCR for elf owls; and to 3) assess historic locations where elf owls were present during previous surveys and incidental sightings. Knowledge of the current distribution of elf owls will aid in the site selection of habitat creation projects targeted toward elf owls and interpreting results on habitat creation projects.

This report covers the second year of surveys that took place in 2009. For complete results of the 2008 surveys, historical occurrence, and survey effort in the LCR planning area and remaining elf owl suitable habitat refer to the report, *System-wide Surveys of the Elf Owl Along the Lower Colorado River, 2008* (Sabin 2009).

# Methods

## Study Location

Survey sites were selected in the LCR MSCP planning area (excluding the Bill Williams NWR) in 2008. The sites were selected from 2004 vegetation maps and aerial photography, historic locations, site reconnaissance, previous habitat creation projects, and previous incidental sightings. Twenty-one sites and 45 single call stations were surveyed during the breeding season of 2008 (Table 1, appendices 1, 2, 3). For complete site selection methodology refer to *System-wide Surveys of the Elf Owl Along the Lower Colorado River, 2008* (Sabin 2009).

Survey sites consisted of areas over 5 acres (2 hectares) and multiple calling stations were established at each site. Single call stations were placed in areas that were less than 5 acres (2 hectares) in which only one call station was needed to adequately cover the area. Single calling stations were chosen exclusively by field reconnaissance.

The survey sites and single call stations selected in 2008 were surveyed again in 2009 utilizing same survey methodology. Three additional sites (Picacho Camp, No Name Lake, Site 14) that were selected in 2008 but not surveyed due to lack of landowner permission were surveyed in 2009. Picacho Camp and No Name Lake are habitat creation projects that were initiated before the start of the LCR MSCP and Site 14 is non-restored CW I habitat. Two sites (Site 3, Clear Bay) that were surveyed in 2008 were not surveyed in 2009 because habitat at the sites was not suitable. In summary, 22 sites and 45 call stations were surveyed during the breeding season of 2009.

**Table 1. Sites surveyed for elf owls in 2008 and 2009 during system-wide surveys along the LCR.**

Site Name and Type	Location	Size	Habitat Description	Years Surveyed
Site 1 (CW II veg map)	Havasu NWR (Pintail Slough)	7.0 ac (2.8 ha)	CW II	2008 and 2009
Site 2 (HM III veg map)	Havasu NWR (Pintail Slough)	15.0 ac (6.1 ha)	HM III	2008 and 2009
Site 3 (HM IV veg map)	South of Fort Mohave near Needles, CA	16.0 ac (6.5 ha)	HM IV	2008
Site 4 (CW I veg map)	Havasu NWR (Pintail Slough)	9.0 ac (3.6 ha)	CW I	2008 and 2009
Site 5 (CW I veg map)	Havasu NWR (Glory Hole)	14.0 ac (5.7 ha)	CW I	2008 and 2009
Site 6 (CW I veg map)	Havasu NWR (Glory Hole)	5.0 ac (2.0 ha)	CW I	2008 and 2009
Site 7 (CW I veg map)	Havasu NWR (Bermuda Pasture)	20.0 ac (8.1 ha)	CW I	2008 and 2009
2 single calling stations	Havasu NWR (New South Dike Road)		CW I/II small isolated patches	2008 and 2009
9 single calling stations	Havasu NWR (South Dike Road)		CW I/II small isolated patches	2008 and 2009
5 single calling stations	Havasu NWR (Levee Road)		CW I/II small isolated patches	2008 and 2009
11 single calling stations	Havasu NWR (Lower Levee Road)		CW I/II small isolated patches	2008 and 2009
7 single calling stations	Havasu NWR (Road to Pintail Slough)		CW I/II small isolated patches	2008 and 2009
Site 8 (CW I veg map)	Havasu NWR (Blankenship Bend)	9.0 ac (3.6 ha)	CW I	2008 and 2009
Clear Bay (historic site)	Havasu NWR (Clear Bay and adjacent cove)	8.0 ac (3.2 ha)	saltcedar/mesquite/palo verde	2008
Site 9 (CW I veg map)	Havasu NWR (Lake Havasu City near golf course)	7.0 ac (2.8 ha)	CW I	2008 and 2009
Desilt Wash (historic site)	1 mile southwest of Parker Dam	10.0 ac (4.0 ha)	CW I	2008 and 2009
CRIT 8 (habitat creation project)	'Ahakhav Preserve on CRIT land		mesquite/CW I and III	2008 and 2009
CRIT 9 (habitat creation project)	'Ahakhav Preserve on CRIT land	134.0 ac (54.2 ha)	CW I, II, and III	2008 and 2009
Site 14 (CW I veg map)	CRIT land south of Parker, AZ	6.0 ac (2.4 ha)	CW I	2009
No Name Lake (habitat creation project)	CRIT land south of Parker, AZ	100.0 ac (40.5)	CW II and HM III	2009
Ehrenberg (incidental sighting)	Arizona side of levee road down river from Blythe, CA	11.6 ac (4.7 ha)	CW III	2008 and 2009
Cibola 1 & 2 and Hart Mine (incidental sighting)	Cibola NWR levee road	147.6 ac (55.7 ha)	CW/saltcedar	2008 and 2009
Three Fingers Lake (historic site)	Cibola NWR Three Fingers Lake	160.0 ac (64.7 ha)	mesquite/palo verde/saltcedar	2008 and 2009
Site 19 (CW I veg map)	Walkers Camp Road South of campground	6.0 ac (2.4 ha)	CW I	2008 and 2009
Site 20 (CW I veg map)	Walkers Lake	5.0 ac (2.0 ha)	CW I	2008 and 2009
Site 21 (CW I veg map)	south of Draper Lake	18.0 ac (7.3 ha)	CW I	2008 and 2009
Site 22 (CW I veg map)	Adobe Lake	8.0 ac (3.2 ha)	CW I	2008 and 2009
Site 23 (CW I veg map)	Imperial NWR Headquarters/DU ponds/nursery	13.0 ac (5.3 ha)	CW I	2008 and 2009
7 single calling stations	Imperial NWR Headquarters/DU ponds		CW I/II	2008 and 2009
Picacho Camp (habitat creation project)	Picacho State Recreation Area Winterhaven, CA	30.0 ac (12.1 ha)	CW I/II	2009

## Survey Methods

The elf owl protocol used was adapted from Arizona Game and Fish recommended methods<sup>1</sup>. No aspect of the methodology changed between years. Surveys were conducted three times at each site or single call station between 25 March and 31 May 2009. The first survey period was from 31 March to 10 April 2009, the second survey period was from 14 April to 1 May 2009, and the third survey period was from 7 May to 29 May 2009. For each site or single calling station, one of the three surveys was conducted within three days of the full moon.

Multiple call stations were established every 492 feet (150 meters) when feasible at the 21 sites that were greater than 5 acres (2 hectares) in patch size. The single call stations were placed in habitat with small patch sizes. Surveys were conducted by walking, vehicle, kayak, or motor boat, depending on conditions at the site. A high quality elf owl call was broadcast with a Sony CD player connected to an external speaker at 80 decibels from 3 feet (1 meter) away. All surveys were conducted between 30 minutes after sunset and 0100 hours. Surveys were discontinued or did not occur in the event of rain, or if wind exceeded 12 miles per hour (19 kilometers per hour).

At each station, two minutes of passive listening for elf owls occurred. After the two minutes, elf owl calls were broadcast for 30 seconds followed by a 90-second listening period. The 30-second broadcast and 90-second listening period occurred four times, for a total of eight minutes. After the broadcast-listening period an additional two minutes of passive listening occurred. The total time spent at each station was 12 minutes.

The following data were recorded for each site: 1) general location of site, 2) site name, 3) Anderson and Ohmart vegetation classification (1976, 1984), 4) date site was surveyed, 5) name of surveyor(s), 6) start and end temperature (C°), wind speed (kilometers per hour) and cloud cover (percentage), 7) start and end time of survey, and 8) moon phase.

The following data were recorded for each calling station: 1) Universal Transverse Mercator, 2) start and end time, 3) number of elf owls detected, 4) number of other species of owls detected, 5) other species of wildlife detected, and 6) general comments.

## Results

Twenty-two sites from historical locations, incidental locations, and CW I, CW II, HM III, and HM IV were surveyed in 2009 (Table 1, appendices 1, 2, 3). Forty-five additional single call stations were surveyed in 2009 (Table 1, appendices 1, 2, 3).

Site 8, Three Fingers Lake, Site 20, Site 23, and the seven individual call stations at Imperial NWR were only surveyed twice because of high winds and lack of personnel. All other sites and single calling stations were surveyed three times.

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<sup>1</sup> Michael Ingraldi (mingraldi@frontiernet.net) and Shawn Lowery, Arizona Game and Fish Department, 5000 West Carefree Highway, 602-942-3000

There were no elf owls detected in 2008 and one elf owl was detected in 2009. The elf owl in 2009 was detected at Site 8, which is CW I habitat located on the Havasu NWR near Blankenship Bend. The individual was detected aurally during survey period 3 on 11 May 2009. Breeding evidence was not confirmed. Ten owls of other species were detected in survey period 1, 15 owls in survey period 2, and 8 owls in survey period 3 (Table 2). The following species of owls were detected: barn owl (*Tyto alba*), long-eared owl (*Asio otus*), western screech-owl (*Megascops kennicottii*), and great horned owl (*Bubo virginianus*) (Table 2).

There were many other types of wildlife observed during the surveys including: Yuma clapper rail (*Rallus longirostris yumanensis*), least bittern (*Ixobrychus exilis*), lesser nighthawk (*Chordeiles minor*), mastiff bat (*Eumops perotis*), and free-tailed bat (*Nyctinomops* spp.) (heard at several locations), the pacific tree frog (*Pseudacris regilla*) (heard at sites on Havasu NWR) and black rail (*Laterallus jamaicensis*) (heard at Site 8).

**Table 2. Owls detected per site per survey period in 2009.**

Site	Period	Species and number of owls detected
Site 4	2	1 long-eared owl, 1 great horned owl
Site 6	3	1 western screech-owl
7 single calling stations Road to Pintail Slough	2	1 long-eared owl, 1 western screech-owl
Site 8	2	2 great-horned owls, 1 western screech-owl
Site 8	3	1 western screech-owl
Site 9	2	1 great-horned owl, 2 western-screech owls
Site 9	3	1 western screech-owl
CRIT 8	1	1 great-horned owl
CRIT 8	3	2 barn owls
CRIT 9	2	2 great-horned owls
No Name Lake	2	1 western screech-owl
Ehrenberg	1	1 great-horned owl
Cibola 1 & 2 and Hart Mine	1	5 great-horned owls
Cibola 1 & 2 and Hart Mine	3	2 western screech-owls
Three Fingers Lake	3	1 great-horned owl
Site 19	1	1 great-horned owl
Site 23	1	1 great-horned owl
7 single calling stations Imperial NWR	1	1 great-horned owl
Picacho Camp	2	1 great-horned owl, 1 western screech-owl

## Discussion

Two years of base line elf owl presence/absence surveys were conducted at selected sites in suitable elf owl habitat in the LCR MSCP planning area (excluding Bill Williams NWR) in 2008 and 2009. One elf owl was detected near Blankenship Bend in existing CW I habitat. Breeding evidence or mated status was not confirmed. There is a known breeding population of elf owls on the Bill Williams NWR, a tributary of the LCR, approximately 30 miles to the south.

These surveys and previous surveys conducted by the California Department of Fish and Game suggest that elf owls are extremely rare along the main stem of the LCR, if not close to extirpation. The California Department of Fish and Game has conducted surveys on the California side of the river since 1978 (Cardiff 1978, 1979, Haltermann 1987, CDGF 2005). No elf owls were detected during the last surveys conducted by California Department of Fish and Game in 1999, although there have been incidental sightings since then in California (CDFG 2005, LCR MSCP 2004b). The 2008 and 2009 surveys covered a large portion of suitable elf owl habitat in Arizona and California and additional suitable habitat along the LCR may be identified in the future.

Populations of elf owls may fluctuate depending on rainfall, temperatures, and arthropod prey abundance (Rosenberg et al. 1991, CDFG 2005). Changes in population along the LCR may occur due to overall population fluctuations. It is the intent of the LCR MSCP (LCR MSCP 2004a) to provide suitable habitat, and increases in the population on the LCR are possible in the future. Presence/absence surveys for elf owls in existing and created habitat will continue throughout the life of the LCR MSCP to document these changes. Future surveys will include locations surveyed during 2008 and 2009, future habitat creation projects, and additional, existing suitable elf owl habitat.

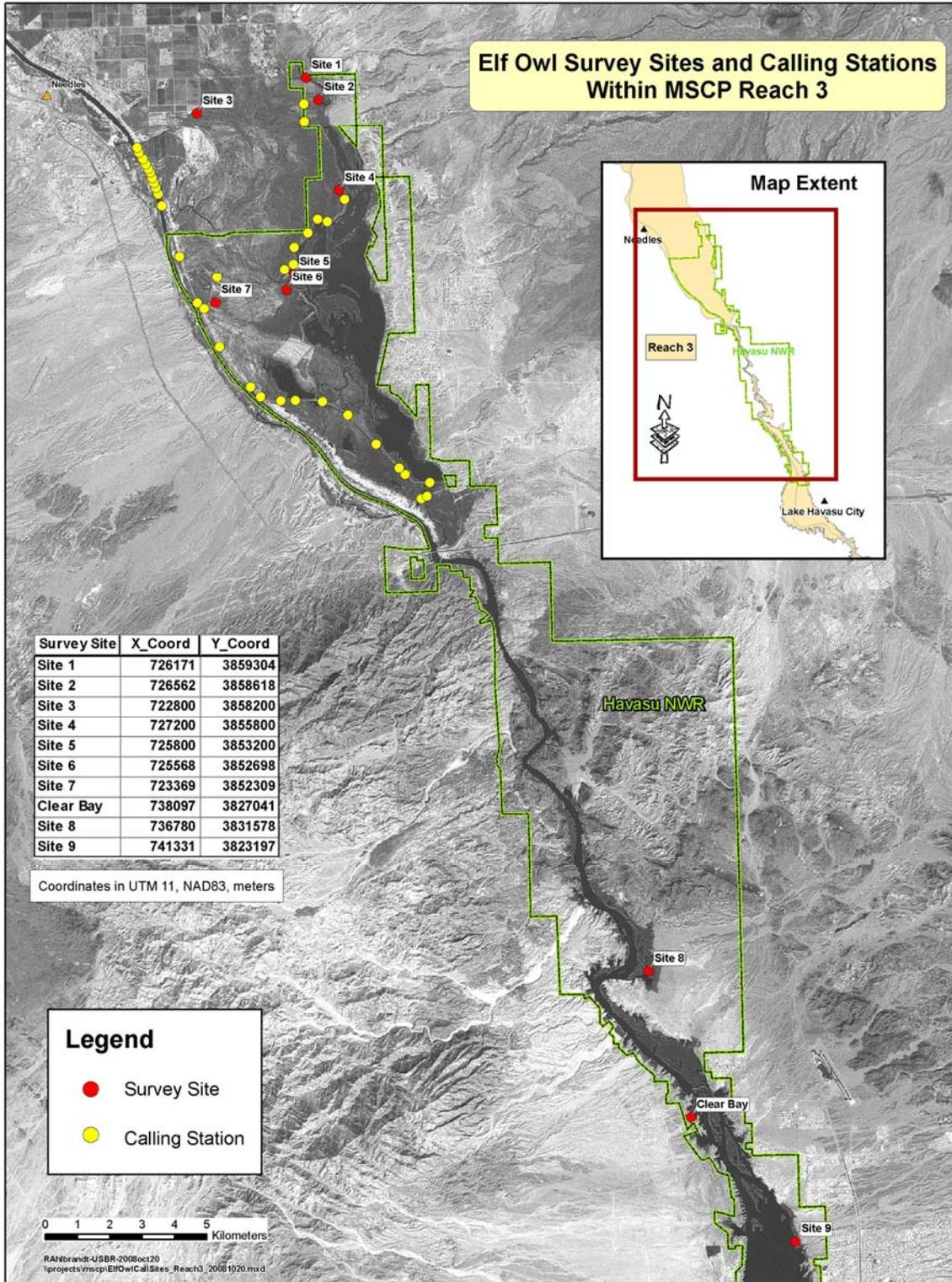
Reclamation is in the process of refining the elf owl survey protocol and creating a long-term monitoring strategy in the LCR MSCP planning area. An elf owl detectability study funded by Reclamation will aid in developing a scientifically defensible survey method and long-term monitoring strategy that can be used to detect changes in elf owl distribution and population status in the LCR MSCP planning area. The two-year study will begin in the spring of 2010. Other future elf owl monitoring and research efforts may include habitat studies and the placement and use of nest boxes in habitat creation areas.

# Literature Cited

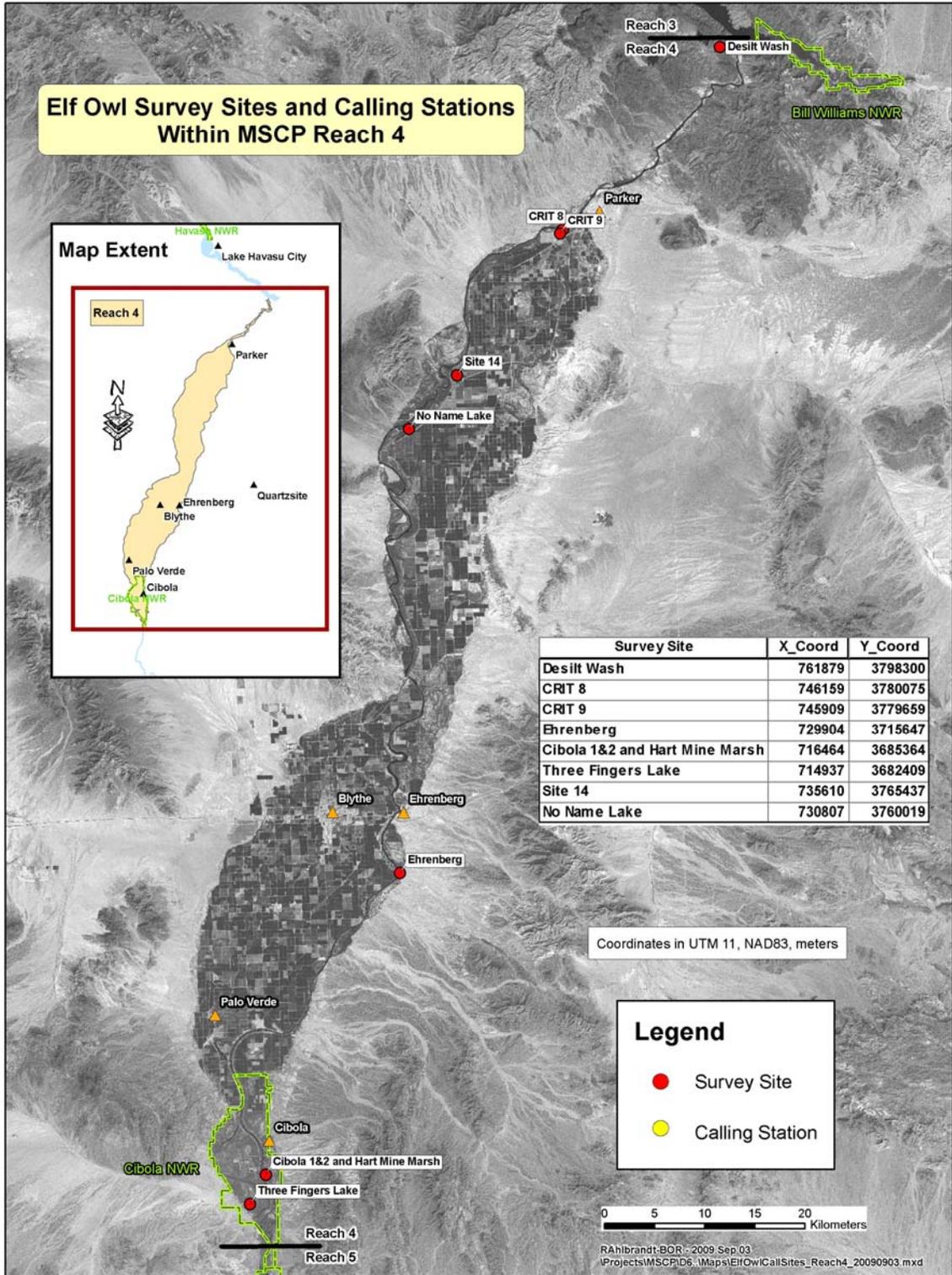
- Anderson, B.W., and R.D. Ohmart. 1976. Vegetation type maps of the lower Colorado River from Davis Dam to the southerly international boundary. Bureau of Reclamation, Contract No. 14-06-300-2531.
- Anderson, B.W., and R.D. Ohmart. 1984. Lower Colorado River riparian methods of quantifying vegetation communities to prepare type maps. Final report. Boulder City, NV: Bureau of Reclamation, Lower Colorado Region.
- Brown, H. 1903. Arizona bird notes. *The Auk* 20:43-50.
- California Department of Fish and Game. 2005. The Status of Rare, Threatened and Endangered Animals of California, 2000-2004. State of California, Resources Agency, Department of Fish and Game. pp. 37-38.
- Campbell, B. 1934. Bird notes from southern Arizona. *The Condor* 36:201-203.
- Cardiff, S.W. 1978. Status of the Elf Owl in California. Progress Report to Nongame and Mammal Section, Wildlife Management Division, California Department of Fish and Game.
- Cardiff, S.W. 1979. Status of the Elf Owl in California. Final Report to Nongame and Mammal Section, Wildlife Management Division, California Department of Fish and Game.
- Gilman, M.R. 1909. Some owls along the Gila River in Arizona. *The Condor* 11:145-150.
- Goad, M.S., and R.W. Mannan. 1987. Nest-site selection by elf owls in Saguaro National Monument, Arizona. *The Condor* 89:659-662.
- Halterman, M.D., S.A. Laymon, and M.J. Whitfield. 1987. Population Assessment of the Elf Owl in California. Final Report to Nongame and Mammal Section, Wildlife Management Division, California Department of Fish and Game.
- Hardy, P.C., M.L. Morrison, and R.X. Barry. 1999. Abundance and habitat association of elf owls and western screech owls in the Sonoran Desert. *The Southwestern Naturalist* 44:311-323.
- Hardy, P.C., and M.L. Morrison. 2001. Nest site selection by elf owls in the Sonoran Desert. *The Wilson Bulletin* 113:23-32.
- Henry, S.G., and F.R. Gehlbach. 1999. Elf owl (*Micrathene whitneyi*). In A. Poole and F. Gill (editors), *The Birds of North America*, No. 413. The Birds of North America, Inc. Philadelphia, Pennsylvania.
- Kimball, H.H. 1922. Bird records from California, Arizona, and Guadalupe Islands. *The Condor* 24:96-97.

- Ligon, J.D. 1968. The Biology of the Elf Owl, *Micrathene whitneyi*. University of Michigan Museum of Zoology, Miscellaneous Publication 136.
- Lower Colorado River Multi-Species Conservation Program. 2004a. Lower Colorado River Multi-Species Conservation Program, Volume II: Habitat Conservation Plan. Final. December 17. (J&S 00450.00.) Sacramento, CA.
- Lower Colorado River Multi-Species Conservation Program. 2004b. Lower Colorado River Multi-Species Conservation Program, Volume IV: Appendices to Volume I-III and V. Final. December 17. (J&S 00450.00) Sacramento, CA.
- Lower Colorado Multi-species Conservation Program. 2006. Combined Species Document for the LCR MSCP. Lower Colorado River Multi-Species Conservation Program, Boulder City, NV. 328 pp.
- Miller, L. 1946. The elf owl moves west. *The Condor* 48:284-285.
- Rosenberg, K.V., R.D. Ohmart, W.C. Hunter, and B.W. Anderson. 1991. Birds of the lower Colorado River Valley. University of Arizona Press, Tucson. 416 pp.
- Sabin, L.B. 2009. System-wide Surveys of the Elf Owl Along the Lower Colorado River, 2008. Bureau of Reclamation, Lower Colorado River Multi-Species Conservation Program, Boulder City, NV. 17 pp.
- Steidl, R.J. 2001. Summary Report: Monitoring Elf Owls in and Near Saguaro National Park, 2000-2001. University of Arizona. Tucson, AZ.
- Steidl, R.J. 2002. Summary Report: Monitoring Elf Owls in and Near Saguaro National Park, 2000-2002. University of Arizona. Tucson, AZ.
- Stephens, F. 1903. Bird notes from eastern California and western Arizona (concluded). *The Condor* 5:100-105.

# Appendix 1



# Appendix 2



# Appendix 3

