

BAT HABITAT ASSESSMENT AND SPECIES INVENTORY
FOR
NOBLE RANCH AND ALLEN RANCH
(GOLD RUSH PROJECT),
SUTTER CREEK, CALIFORNIA

Prepared for:

Sutter Creek Partners, LLC
45 Koch Road, Suite A
Corte Madera, CA 94925
Contact: John Telischak
Telephone (415) 945-9982

By:

Miriam Green Associates
1321 42nd Street
Sacramento, CA 95819
Contact: Heather Johnson
Telephone (916) 452-2072

November 10, 2006

Bat Habitat Assessment and Species Inventory for Noble Ranch and Allen Ranch (Gold Rush Project), Sutter Creek, California

Executive Summary

Bat capture and acoustic monitoring surveys were conducted on July 22, August 12, and October 16, 2006 on the Noble Ranch and Allen Ranch (collectively known as the Gold Rush Project) near Sutter Creek, Amador County, California. The purpose of these surveys was to sample habitat use and species presence as follow-up to the reconnaissance-level habitat assessment survey conducted on March 27, 2006. Three sites in different habitat types were sampled: 1) a riparian woodland on Stony Creek, 2) a wetland in a cottonwood (*Populus fremontii* spp. *fremontii*) gallery near the sediment dam on the Noble Ranch, and 3) an oak savannah on the Allen Ranch. Six species of bats were acoustically detected on the project site and no bats were captured. None of the bat species detected is listed as federally or state endangered or threatened or is considered a special-status species; however, the western red bat (*Lasiurus blossevillii*) is proposed as a Species of Special Concern by the California Department of Fish and Game (CDFG).

Introduction

As part of its data collection on biological resources for the Gold Rush Project, Sutter Creek Partners, LLC, contracted with Miriam Green Associates to conduct surveys for bats on the project site. Background information on reconnaissance-level habitat surveys, habitat requirements of various bat species, and information on known occurrences of bats in the project area is provided in an earlier report (Miriam Green Associates 2006). This report is the result of the recommendation for followup surveys made in the earlier 2006 report. All figures referenced in this report follow the narrative.

Methods

Standard visual, acoustic, and capture sampling methods were used to survey foraging bats. The sample sites were chosen in areas identified during the habitat assessment survey as likely to concentrate activity, usually near a water feature. Acoustic and capture devices were deployed where bats were expected to fly low or in a somewhat defined air space while drinking and/or pursuing insects, or emerging from roosting sites. Visual surveys were conducted in ambient light and consisted of observing bats in flight around the time of sunset. Observations may indicate the proximity of roosting habitat and aid in species identification.

Mist nets (Avinet, Dryden, New York, USA) were erected in riparian habitat and over wetland vegetation in a gallery of cottonwood trees. On each night two nets were deployed that ranged in length from 6 to 12 meters by 3 meters high. In the wetland, extra poles were used to raise the nets higher and different net configurations were used between surveys.

The echolocation calls of free-flying bats were acoustically monitored in three ways: 1) by a stationary surveyor near the netting site, 2) unattended recording, and 3) while walking through the site. Visual observations of passing bats were attempted to note size and behavior. Acoustic monitoring was conducted using one or two Anabat ultrasonic detectors (Titley Electronics, New South Wales, Australia). The detectors digitally convert bat echolocation into human-audible ticks or tonal chirps that alert the surveyor when a bat is passing by; and the detectors are connected to electronic units that create computer recordings, usually one file per bat "pass". The computer files can be viewed as sonograms in real-time and/or stored for later analysis. The sonograms are graphs of the calls with frequency in kilohertz on the y-axis and time on the x-axis. Some bat species may be identified by their characteristic echolocation calls and others are grouped into phonic types. Capture and acoustic methods compliment one another and are used concurrently to investigate bat species occurrence.

Results and Discussion

Six bat species were acoustically identified as occurring in the project area (Table 1). No bats were captured during surveys. Bats were observed foraging near the mist nets and approaching or flying over them, however raising the net height and varying the deployment configuration was unsuccessful. Overall activity of foraging bats was observed to be relatively

low. Foraging activity is reported as an index consisting of the number of bat passes recorded per unit time.

Table 1. Bat Species Detected in the Project Area

Common Name <i>Scientific Name</i>	Legal Status	Habitat Requirements
Western red bat <i>Lasiurus blossevillii</i>	CSC*, USFS	Roosts singly in the foliage of trees and shrubs; prefers cottonwood and sycamore riparian habitat; the Central Valley of California and surrounding foothills is likely the primary habitat of reproductive females
Hoary bat <i>Lasiurus cinereus</i>	--	Roosts singly in the foliage of trees and shrubs
Big brown bat <i>Eptesicus fuscus</i>	--	Roosts in colonies in crevices and cavities found in rocks, trees, buildings, and bridges
California myotis <i>Myotis californicus</i>	--	Roosts in colonies in crevices of rocks and buildings
Western pipistrelle <i>Pipistrellus hesperus</i>	--	Roosts singly or in small groups in crevices in rocks and cliffs
Mexican free-tailed bat <i>Tadarida brasiliensis</i>	--	Roosts in colonies in crevices of rocks, trees, buildings, and bridges

CSC* = Proposed as a CDFG species of special concern

USFS = U.S. Forest Service Sensitive Species

-- = no designation

Stony Creek

The survey was conducted for two hours July 22, 2006 on Stony Creek in the vicinity of a cement vehicle crossing. The sampling site was located at the border of the project site beyond the turn-off to the limestone outcropping known as Sugar Rock. Mist nets were set over remnant pools in the creek bed on either side of the cement crossing (Figure 1). The acoustic monitoring system was set in a nearby dry creek bed since the creek splits into parallel beds in this section. One bat pass was recorded every 1.6 minutes and calls were attributed to the western pipistrelle (*Pipistrellus hesperus*) (Figure 2), western red bat, and hoary bat (*Lasiurus cinereus*). The echolocation calls of these species were recognizable. Visual observations indicated that some bats were foraging along both creek beds and some bats were in transit through the area flying at tree canopy height, possibly roosting nearby but foraging or drinking elsewhere. These bats may be commuting to the several large water bodies that occur on the neighboring property on the south side of Ridge Road.

Additional calls were not immediately recognizable and can only be categorized by their characteristic frequency: 25kHz and 50kHz phonic types. Capture of the bats or inspection of a roost site is necessary for further identification. The calls were likely from the big brown bat (*Eptesicus fuscus*) (Figure 3) and the California myotis (*Myotis californicus*) based on the flight behavior and appearance of the passing bats, some recognizable echolocation calls, and the habitat type and elevation. The California myotis and Yuma myotis (*Myotis yumanensis*)

compose the 50kHz phonic group; both species are common and may be present in the area. The Yuma myotis is more likely to occur near permanent water features.

Cottonwood Gallery Wetland

The August 12 and October 16, 2006 surveys were conducted in a wetland surrounded by a gallery of cottonwood trees near where Stony Creek passes through the sediment dam. The wetland is a large sunken area adjacent to the creek bed. The mist nets were set across the low area amongst the trees (Figure 4), an attended acoustic monitoring system was set up on higher, more open ground nearby (Figure 5), and a second unattended acoustic monitoring system was set on the sediment dam (Figure 6). This site was sampled on two nights as it appeared to be excellent western red bat roosting habitat. It was sampled in the fall because western red bats and hoary bats exhibit shifts in seasonal abundance and may occur in migratory groups.

One pass was recorded every 6.7 minutes during the three hour survey on August 12, 2006 and calls were attributed to the western pipistrelle, western red bat (Figure 7), and hoary bat (Figure 8). Additional calls were categorized as 25kHz and 50kHz phonic types and are likely from the Mexican free-tailed bat (*Tadarida brasiliensis*) (Figure 8) and the California myotis based on the flight behavior and appearance of the passing bats, some recognizable echolocation calls, and the habitat type and elevation. Bats were observed flying soon after sunset indicating roosting habitat is in the vicinity, and they foraged within the trees and in the adjacent open grassland.

One pass was recorded every 15 minutes during the two and one-half hour survey on October 16, 2006. The calls had characteristic frequencies of 25kHz, likely the Mexican free-tailed bat, and no foraging activity was observed in the woodland or adjacent grassland. The passing bats were flying fast and high above tree canopy appearing to be in transit through the area.

Allen Ranch Water Trough

On the night of October 16, 2006, after concluding the survey on the Noble Ranch, two water troughs and nearby large oak trees just off Ridge Road on the Allen Ranch were acoustically surveyed for approximately 30 minutes while walking along the tree line to the troughs and back. A bat pass was recorded every 1.4 minutes and one or more bats were flying near the double water troughs. Most of the calls were from the western red bat and some were categorized as phonic type 50kHz, likely the California myotis (Figure 9), and phonic type 25kHz, likely the Mexican free-tailed bat.

Additional Species

A daytime cursory inspection of the limestone formation known as Sugar Rock determined that it does provide suitable bat roosting habitat but the spotted bat (*Euderma maculatum*) and the western mastiff bat (*Eumops perotis*) are not likely to be present. These species emit recognizable low frequency echolocation calls that are audible to the unaided ear; they were not detected in the project area during the three surveys. Species such as the western pipistrelle, California myotis, big brown bat, and the Mexican free-tailed bat may roost in the crevices and cavities that the limestone formation provides. Terry Strange, a local biologist, reported that he surveyed the limestone formation in mid-June 2005 and observed approximately 25 small bats foraging there. He assumed the small bats were likely California myotis and western

pipistrelle. He stated that some roosting was observed within fissures in the upper 25 percent of the rocks (T. Strange personal communication).

Historic gold mines are known to occur in the project area but no existing shafts have been found by local residents (M. Bowers personal communication) that could provide roosting habitat for the Townsend's big-eared bat (*Corynorhinus townsendii*). The pallid bat (*Antrozous pallidus*) is typically found in oak woodland habitat. Additional surveys would have to be conducted to confirm the presence of this species.

Conclusion

Of the 15 bat species listed in the habitat assessment as potentially occurring in the project area, six were detected in three survey nights. The spotted bat and western mastiff bat are not likely to occur in the project area. The Townsend's big-eared bat may forage in the area but roosting habitat is not likely to be on the project site. The pallid bat is likely to be present, although none was detected during 2006 surveys. It should be noted that additional species may occur on the project site that were not detected during the 2006 surveys. The large, clear water troughs with open flight space above them would likely provide productive mist netting sites, such as the troughs acoustically monitored near Ridge Road on the Allen Ranch, and the circular one on the Noble Ranch next to the central access road.

References

- Barclay, R. M. R., and G. P. Bell. 1988. Marking and observational techniques. Pp. 59-76, in *Ecological and behavioral methods for the study of bats* (T.H. Kunz, ed). Smithsonian Institution Press, Washington, D.C. 533 pp.
- Britzke, E. R., K. L. Murray, B. M. Hadley, and L. W. Robbins. 1999. Measuring bat activity with the Anabat II system. *Bat Research News* 40(1):1-3
- Miriam Green Associates. 2006. Reconnaissance level bat habitat assessment for the Gold Rush project, City of Sutter Creek, Amador County, California. Prepared for Abbott & Kindermann, LLP. Sacramento, CA. March 30, 2006. 6 pp.
- O'Farrell, M. J., B.W. Miller, and W. L. Gannon. 1999. Qualitative identification of free-flying bats using the Anabat detector. *J. Mammalogy* 80(1):11-23

Personal Communications

- Bowers, Mark. July and August 2006. Independent Public Outreach Consultant. Sutter Creek, CA. Meetings.
- Strange, Terry. July 2006. Consultant. Strange Aquatic Resources. Wilseyville, CA. Telephone conversations.