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March 9, 2023

Carla Wakeman
L&L Environmental, Inc.
700 East Redlands Boulevard, #U351
Redlands, CA 92373

Subject: Results of Focused Bat Habitat Assessment at 9950 and 10300 Calimesa Boulevard, Calimesa, California, for the Oak Valley North Commerce Center Project (LSA Project No. 20230917)

Dear Ms. Wakeman:

This letter documents the results of a focused bat habitat assessment performed in February 2023 for the proposed Oak Valley North Commerce Center Project (project). The project address includes 9950 and 10300 Calimesa Boulevard within the City of Calimesa in western Riverside County, California. It is located immediately northeast of Interstate 10 (I-10) on the northeast side of Calimesa Boulevard, about 500 feet southeast of Singleton Road and about 0.4 mile northwest of Cherry Valley Boulevard. A small, non-contiguous portion of the site is located on the southwest side of Calimesa Boulevard approximately 500 feet south of the intersection with Singleton Road. Specifically, the project area comprises Assessor's Parcel Numbers (APNs) 413-260-018, 413-260-025, 413-280-016, 413-280-018, 413-280-021, 413-280-043, 413-280-030, 413-280-036, and 413-280-037, and totals approximately 112 acres. In addition, offsite road improvements will impact portions of APNs 413-260-014, 413-260-017, 413-260-019, 413-260-020, and 413-260-052, totaling approximately 8.5 acres. The proposed project consists of an approximately 87-acre light industrial area with three large warehouses and parking, and two high density residential areas of approximately 13.5 acres (270 dwelling units) and approximately 6.3 acres (126 dwelling units). An existing vacant residence and other remnant agricultural structures and equipment present on the site will be removed for the project. A focused bat habitat assessment was performed to determine whether suitable roosting habitat for bats is present in structures and trees that will be removed or potentially subject to impacts by the proposed project. In addition to providing the results of the assessment, this document provides recommended strategies to minimize and mitigate potential project-related adverse effects to bats.

BAT NATURAL HISTORY

Day roosts serve to protect bats from predators and the elements during the day while resting and/or rearing their young; in human-made structures like buildings and culverts, these roosts are usually in small cavities or crevices. Bat species that most commonly use anthropogenic structures for roosting include the Mexican free-tailed bat (*Tadarida brasiliensis mexicana*), big brown bat (*Eptesicus fuscus*), pallid bat (*Antrozous pallidus*), and Yuma myotis (*Myotis yumanensis*). Although bat roosts in structures can be relatively easy to identify, tree roosts are more cryptic and require close examination. Some species of bats that use trees for roosting, such as western yellow bat (*Lasiurus xanthinus*), western red bat (*Lasiurus blossevillii*), and hoary bat (*Lasiurus cinereus*), day roost alone or in small family groups in the foliage of trees or shrubs (Kunz and Lumsden 2003), while other bat species (e.g., pallid bat and big brown bat) day roost in crevices or cavities found in mature trees and snags.

Some types of day roosts where bats are particularly vulnerable to disturbance include maternity colonies in which female bats congregate to give birth and raise young, and hibernacula, where bats congregate to enter a period of hibernation during the winter months. A night roost, on the other hand, refers to a structure or structural feature (natural or human-made) in which bats roost during the evening between foraging bouts (e.g., crevices, cavities, corners, and recessed open spaces that are sheltered from the wind). Night roosts are typically situated in or near a foraging area and play an important role in the energetics and social interaction of bats. Because bats have separate roosting and foraging habitat requirements, it is expected that some bats may use one area for foraging and another for roosting. While more extensive and direct impacts to bats occur through roost removal, destruction, or disturbance, indirect impacts such as decline of prey base due to loss or modification of foraging habitat can also be substantial. Therefore, when assessing an area with regard to proposed alterations to habitat, a landscape-level approach is required to adequately determine potential impacts to bats.

METHODS

On the afternoon of February 2, 2023, LSA Senior Biologist and bat specialist Jill Carpenter and LSA Biologist Jessica Lieuw conducted a daytime bat habitat assessment, which consisted of walking throughout the entire survey area on foot to locate any potential bat roosting sites in or around the various structures and trees. Potential bat roosting sites were identified by examining structures for any features such as crevices or recessed spaces that may be suitable for use as day- or night-roosting habitat, as well as for the presence of bats or bat sign (e.g., guano, urine staining, or vocalizations) that would indicate current or past use of an area by roosting bats. Trees within the project area were examined with binoculars and a high-powered spotlight for suitable roosting habitat such as crevices or cavities (especially those that may support maternity colonies). Trees were also assessed for their potential to serve as roosting habitat for foliage-roosting bat species such as hoary bats, red bats, and western yellow bats, as well as for any other features (e.g., the dead frond "skirts" of palm trees) that may be used by roosting bats. Although bat roosts in human-made structures can be relatively easy to identify, tree roosts are more cryptic and require close examination, particularly in the case of foliage-roosting bats, which tend to roost singly, beneath leaves, and may roost in a different location each night. Due to the nature of tree-roosting behavior, roosting activity in trees is typically difficult to confirm during a daytime assessment.

RESULTS AND DISCUSSION

Land use surrounding the project site is varied and includes vacant lands, residential developments, scattered commercial/industrial, agricultural lands, a mobile home park, and open space areas that include MSHCP conserved lands and San Timoteo canyon. Within the project area, there is a vacant residence on a small hilltop and remnant foundations of other structures. Piles of old pipes and other debris including remnants of old agricultural equipment are also present throughout the site. The project area has been historically disturbed by residential and agricultural uses, and vegetation within the site generally consists of nonnative grasslands, disturbed/developed areas with ornamental plants, groves of mature olive trees (*Olea europaea*), and pockets of native coastal sage and chaparral scrub. These habitats likely provide diverse insect prey and therefore foraging habitat for a variety of bat species. Despite the project site's heavily disturbed nature, this area's proximity to native scrub habitat along the undeveloped hillsides to the northeast and southwest increases the likelihood that any suitable bat roosting habitat within the proposed project area could be used by bats.

Suitable day-roosting habitat for bats was identified in several areas throughout the proposed project site, and the locations where suitable bat roosting habitat were identified are shown on Figure 1 (all figures attached). Representative photos of features within the proposed project area that provide suitable roosting habitat for bats are provided on Figures 2-4.

The abandoned residence contains cave-like features suitable for day-roosting bats, including a basement below the house and an attic space. Small amounts of guano confirming the use of the basement area, likely by night-roosting bats, was observed during the assessment. The attic space was not accessible during the assessment, so it was not possible to examine the interior of the attic for bats or bat guano. The abandoned residence also contains crevices suitable for use by day-roosting bats. These crevices are present in gaps behind the plywood nailed over the windows as well as in the Spanish tile roof. Bats, including maternity colonies, often roost in the crevices between Spanish roof tiles; however, guano evidence is not always visible when bats are roosting within these spaces because the guano can collect along the rooftop beneath the tiles and remain hidden from view. Consequently, these types of roosts can be difficult to verify without performing an emergence survey. A concrete double-pipe culvert beneath Calimesa Boulevard roadway was also examined during the assessment. This structure did not contain any crevices suitable for roosting, and no evidence of bat use was observed.

In addition to the abandoned residence, day-roosting habitat for crevice-roosting bats (including colonial species that form maternity colonies) was also observed several trees in the southeastern part of the project area. Specifically, this day-roosting habitat is present in the palm frond "skirts" of several nonnative palm trees and in three dead trees. Several crevice-roosting bat species roost in the crevices and cavities of dead trees, including big brown bat, pallid bat, and several myotis (*Myotis* spp.) species. The western yellow bat, a California Department of Fish and Wildlife (CDFW) Species of Special Concern (SSC), is considered an obligate palm-roosting bat. In addition to western yellow bat, at least seven other bat species that may occur in the vicinity of the proposed project site have also been documented using palm trees as roosts, including western mastiff bat (*Eumops perotis*), Mexican free-tailed bat, big brown bat, western red bat, hoary bat, pallid bat, and canyon bat (*Parastrellus hesperus*). In addition, big brown bats and some myotis species have been documented using palm trees as maternity roosts, so it is possible that any of the palm trees could be used for maternity roosting by species other than western yellow bat. Various ornamental trees such as eucalyptus (*Eucalyptus* spp.) and conifers (e.g., *Pinus* spp.) do not have crevices or cavities but could be used by foliage-roosting species, particularly hoary bats and western red bats.

CONCLUSIONS AND RECOMMENDATIONS

Various regulations afford protections to bats, which are classified as indigenous nongame mammal species, regardless of their status under the California or Federal Endangered Species Acts. These regulations include Title 14, Section 251.1 of the California Code of Regulations, which prohibits harassment (defined in that section as an intentional act that disrupts an animal's normal behavior patterns, including breeding, feeding, or sheltering) of nongame mammals (e.g., bats), and California Fish and Game Code Section 4150, which prohibits "take"[1] or possession of all nongame mammals or parts thereof. Any activities resulting in bat mortality (e.g., the destruction of an occupied bat roost that results in the death of bats), disturbance that causes the loss of a maternity colony of bats (resulting in

[1] Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."

the death of young), or various modes of nonlethal pursuit or capture may be considered "take" as defined in Section 86 of the California Fish and Game Code. In addition, impacts to bat maternity colonies, which are considered native wildlife nursery sites, could be considered potentially significant under the California Environmental Quality Act.

Suitable day-roosting habitat for bats is present in several areas throughout the proposed project site, including at the abandoned residence and in various trees in the southwest portion of the site, and it is LSA's understanding that all structures and trees currently present on site will be removed for project construction. Maternity colonies exhibit high roost-site fidelity in human-made structures, and re-aggregate to use the same site every maternity season. The following measures are recommended to minimize potential impacts to bat maternity colonies:

- A nighttime acoustic and emergence survey shall be performed during the bat maternity season (April 1–August 31), preferably during the peak period between late May and late July, at least one to two years preceding project construction to determine whether bats are using the abandoned residence as a maternity roost. This timing is necessary to ensure adequate time for mitigation planning if a maternity colony is found. The number and species of any bats present in that structure will be determined during those surveys, which shall be initiated no later than 0.5 hour before sunset and be completed no sooner than 1.25 hour after sunset to ensure detection of any day-roosting bats.

- If maternity-roosting bats are found during the nighttime emergence survey, a CDFW-approved bat biologist will assess whether alternate roosting habitat would be successful for the bat species present. If the installation of alternate roosting habitat is appropriate, the CDFW-approved bat biologist would determine the appropriate design and placement of this replacement roosting habitat.

Bats may also roost within the abandoned residence at other times of the year outside of the bat maternity season, and would be subject to direct impacts including potential mortality if present during structural demolition. The following measures are recommended to avoid "take" of bats roosting in the abandoned residence:

- A qualified bat biologist shall install or directly supervise installation of humane eviction devices and exclusionary material to prevent bats from roosting in the structure. Implementation of the humane eviction/exclusions shall be performed in the fall (September or October) preceding demolition to avoid impacts to hibernating bats during the winter months or during the maternity season (April 1–August 31), when nonvolant (flightless) young are present. An alternative eviction/exclusion window during the month of March may also be used. Any humane eviction/exclusion devices must be installed at least 10 days prior to the demolition of a structure housing bats to allow sufficient time for the bats to vacate the roost(s).

Day-roosting habitat for bats is also present in several mature Mexican fan palm trees and in three dead trees within the project area. Any of these trees can be used by a variety of bat species for roosting (including maternity roosting). Bats may roost within the palm trees or the dead trees identified as potential roost sites at any time of the year, including during the maternity season (April 1–August 31). To avoid potential "take" of adult and/or juvenile bats during project-related tree removal, the following measures are recommended:

- A nighttime survey confirming the absence of bats in the trees identified as potential roost sites shall be conducted within three days of removal. At any trees identified as potential roost sites where the absence of bats cannot be confirmed, those trees shall be removed using a two-step process that occurs over a 2-day period. On Day 1, some of the palm fronds or tree branches shall be removed using hand tools or chainsaws under the direction of a qualified biologist. The goal is to create a disturbance sufficient to cause any bats roosting in the tree to leave that night and not return, but not at a level of intensity that will cause bats to fly out of the tree during the disturbance itself (i.e., during the daytime, when leaving the roost will likely result in predation). The fronds and branches shall be inspected for the presence of bats by a bat biologist before disposal. On Day 2, the remainder of the tree may be removed and disposed.

- Removal of the palm trees and the three dead trees identified as potential roost sites shall occur outside the maternity season (April 1–August 31), which coincides with the bird nesting season, to avoid the potential for "take" of nonvolant (flightless) young. If removal of potential roost trees during the bat maternity season is necessary for project construction, each of the trees will be surveyed at night within three days prior to removal to identify any maternity roosts and avoid "take" of juvenile bats. Any trees suspected or confirmed during those surveys as housing maternity-roosting bats will be avoided until after the maternity season concludes.

Given the proposed project site's location in proximity to open space areas characterized by native scrub vegetation, an increase in lighting from the proposed project could result in potential adverse effects to bats. Multiple studies indicate that ongoing night lighting, in particular, can be very disruptive to foraging and roosting behaviors. Stone et al. (2009) found that light pollution can negatively impact bats' selection of flight routes by limiting the options for flyways, and can even eliminate bats' ability to use certain roosts and/or foraging areas. Rydell et al. (2017) and Voigt et al. (2018) note that maintaining darkness near maternity roosts is particularly important because at these types of roosts, aggregations of bats are present consistently over a long period of time, individual bats emerge from predictable locations, and juvenile bats are learning how to fly. Illumination of a maternity roost renders the colony more vulnerable to opportunistic predators such as raptors and owls, and predator-avoidance behaviors such as delayed emergence times reduce their foraging opportunities, thereby lowering juvenile survivorship. The following measure is recommended to reduce potential adverse effects to bats from lighting:

- To avoid permanent impacts to roosting and foraging bats (and other nocturnal wildlife) from the installation of new light fixtures associated with the proposed project, shielded, wildlife-friendly lighting shall be used for all outdoor lighting. Wildlife-friendly lighting consists of a shielded light source falling at or below the 2500K color temperature spectrum. Shielding of lighting fixtures (including bulbs) shall result in zero backlight and uplight, and limit glare (sidelight) from direct lighting to a 60-degree angle from bottom center, or less, under the Backlight, Uplight and Glare (BUG) classification system established by the Illuminating Engineering Society (IES)[1]. Incorporation of these elements will minimize the direct and indirect effects to wildlife between dusk and dawn.

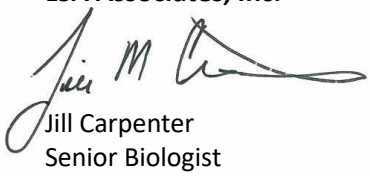
[1] Illuminating Engineering Society of North America. 2011. Luminaire Classification Systems for Outdoor Luminaires Technical Memoranda (TM) 15-11

Implementation of the above strategies will reduce the potential for adverse effects to bat species to the greatest extent feasible.

If you have questions regarding this report or would like to discuss the project further, please contact me at (949) 553-0666.

Sincerely,

LSA Associates, Inc.



Jill Carpenter
Senior Biologist
Bat Specialist

Attachments: Figure 1: Locations of Potential Bat Roost Sites
Figure 2: Representative Photos
Figure 3: Representative Photos
Figure 4: Representative Photos

REFERENCES

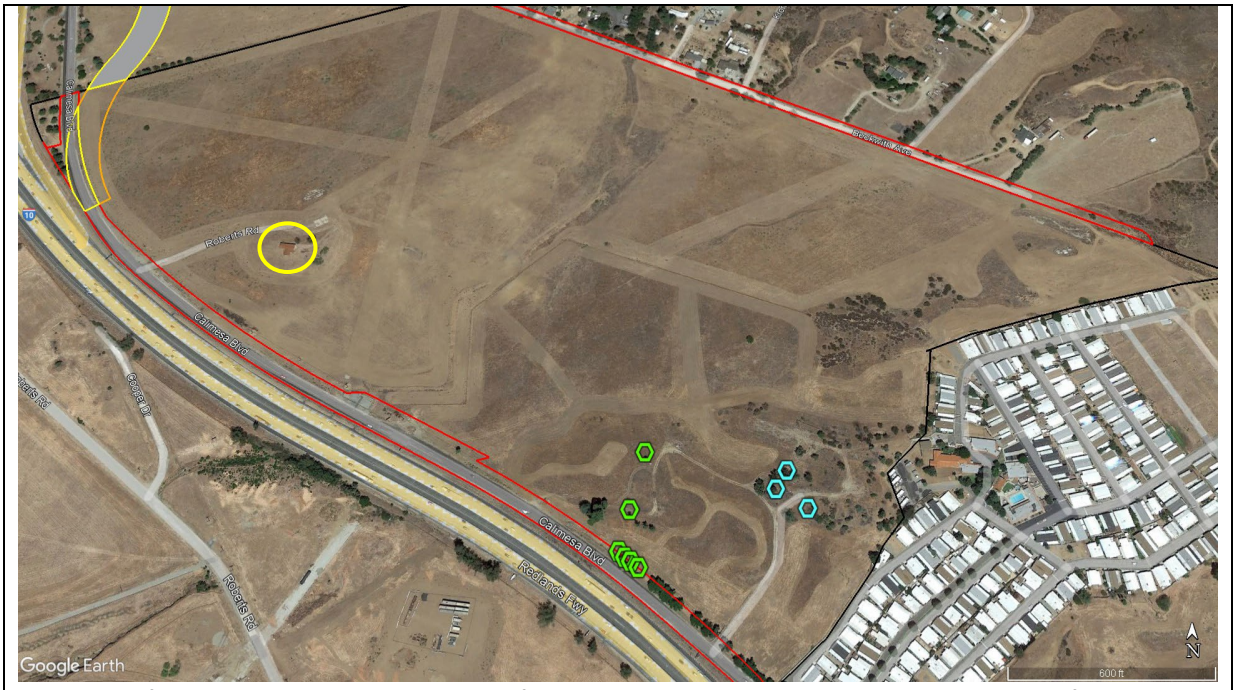
Kunz, T.H., and L.F. Lumsden. 2003. Ecology of Cavity and Foliage Roosting Bats, pp. 3-89, in Bat Ecology (T.H. Kunz and M.B. Fenton eds.). University of Chicago Press, Chicago and London.

Rydell, J., J. Eklöf, and S. Sánchez-Navarro. 2017. Age of Enlightenment: Long-Term Effects of Outdoor Aesthetic Lights on Bats in Churches. *Royal Society Open Science* 4(8):161077. http://dx.doi.org/10.1098/rsos.16107 7.

Stone, E.L., G. Jones, and S. Harris. 2009. *Street Lighting Disturbs Commuting Bats*. Current Biology 19: 1123-1127

Voigt, C.C., et al. 2018. *Guidelines for Consideration of Bats in Lighting Projects.* EUROBATS Publication Series No. 8. Bonn, Germany: UNEP/EUROBATS Secretariat. 62 pp.

Figure 1: Locations of Potential Bat Roost Sites



Trees identified as containing suitable habitat for day-roosting bats in the southeastern portion of the project area. The green symbols denote palm trees while the blue symbols denote dead trees containing suitable roosting habitat. The abandoned residence is circled in yellow.

Closer view of the trees identified as containing suitable habitat for day-roosting bats in the southeastern portion of the project area. The green symbols denote palm trees while the blue symbols denote dead trees containing suitable roosting habitat.

Figure 2: Representative Site Photos

Representative view looking northwest across the nonnative grassland habitat comprising the majority of the project area. The abandoned residence is visible in the background.

Closer view of the exterior of the abandoned residence containing suitable bat roosting habitat. The basement entrance is at visible at the lower right corner.

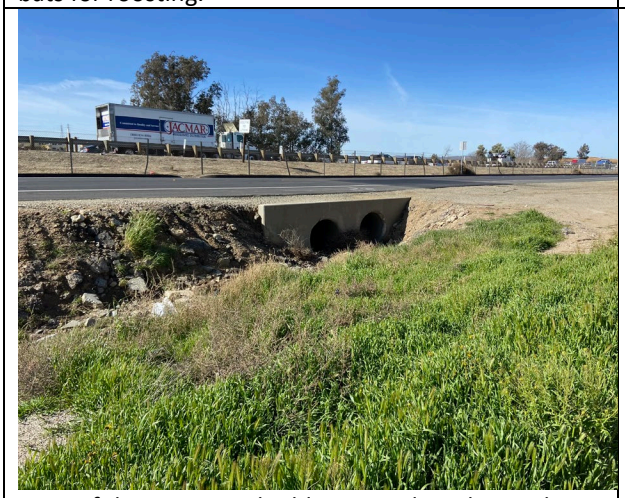
Closer view of the Spanish tile roof of the abandoned residence, and the crevices that contain suitable roosting habitat for bats.

View of one of the crevices suitable for use by roosting bats created by the plywood nailed over the windows of the abandoned residence.

Figure 3: Representative Site Photos

View of the basement beneath the abandoned residence. Some scattered guano was observed along the walls of the basement, indicating some use by bats for roosting.

View of the attic access point in the ceiling on the inside of the abandoned residence. Access points are also available for bats along the exterior of the house.



View of the concrete double-pipe culvert beneath Calimesa Boulevard.

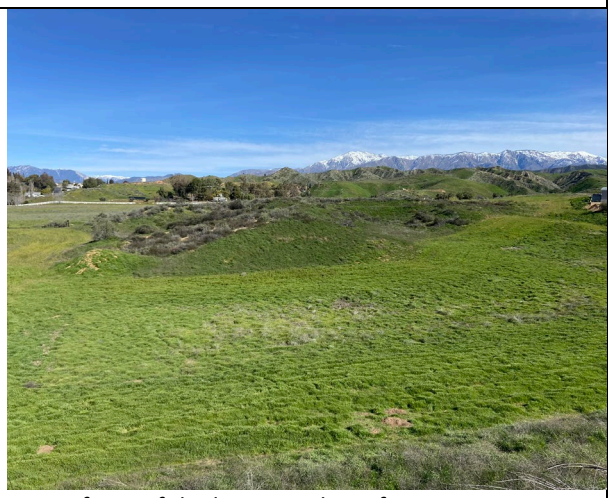
Representative view of the interiors of the double-pipe culvert beneath Calimesa Boulevard. No suitable crevices or evidence of roosting were observed.

Figure 4: Representative Site Photos

Representative view of some of the ornamental trees scattered throughout the project area. A skirted palm tree suitable for use by roosting bats is visible on the right side of the frame.

Representative view of some of the skirted palm trees containing suitable roosting habitat along Calimesa Boulevard.

Representative view of one of the dead trees containing suitable crevice habitat for roosting bats.



View of one of the large patches of remnant native scrub that increases the diversity of foraging habitat for bats within the project site.