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CALTRANS DIVISION OF RESEARCH, INNOVATION AND SYSTEM INFORMATION
TRANSFORMING IDEAS INTO SOLUTIONS

Research Notes

Bats in Transportation Structures: Alternative Night Roosting Strategies and Noise Monitoring Methods

This task will attempt to recommend alternative night roosting strategies and noise monitoring techniques while taking into consideration the operation, maintenance, and future needs on Caltrans transportation facilities.

Environmental

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Project Title: Bats in Transportation Structures: Alternative Night Roosting Strategies and Noise Monitoring Methods

Task Number: 4349

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Completion Date: March 31, 2027

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WHAT IS THE NEED?

Bat populations are generally declining throughout Southern California, exacerbated by climate change, evolving threats from toxins and diseases, and a growing human footprint. The importance and ecological value of anthropogenic structures such as bridges as roosts has consequently increased to the point that many of these "artificial" roost sites are becoming essential to the survival of local bat populations. Less well known are night roosts, which play an important role in the energetics and social interaction of bats, and construction noise effects including ultrasonic frequencies. While the California Department of Transportation (Caltrans) strategizes avoidance and minimization measures through Bat Management Plans, acoustic surveys, and monitoring efforts, there is a growing concern to address operation and maintenance timely, complete accurate structural assessments, and adhere to project schedules, which have been significantly delayed due to additional measures and restrictions such as lengthened seasonal work windows and construction noise effects. This research will address the need for successful night roosting structures and identify construction noise effects and monitoring techniques for construction equipment within the audible bat frequencies.

WHAT ARE WE DOING?

This study includes preliminary research to identify existing practices and further develop a study design (anticipated 6-month duration). The study design (anticipated 1 ¼ -year duration), in collaboration with or directed by a qualified bat biologist and structural engineer, will include identifying site location(s), completing site habitat suitability assessment

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surveys, designing and implementing night roost structure(s) including the use of field tools such as temperature loggers to ensure proper temperatures, monitoring site location(s), identifying construction equipment producing audible bat frequencies, and identifying and/or developing methods to mask audible frequencies. A final report will document recommendations for Caltrans (anticipated 3-month duration).

WHAT IS OUR GOAL?

Currently, bat behavior and knowledge is extremely limited and continuously evolving. A standard design(s) or practice is not available to address night roosting or construction noise impacts. This study will attempt to recommend alternative night roosting strategies and noise monitoring techniques while taking into consideration the operation, maintenance, and future needs on Caltrans transportation facilities.

WHAT IS THE BENEFIT?

Caltrans mission is to provide a safe and reliable transportation network that serves all people and respects the environment. By conducting this research and implementing the recommendations not only will Caltrans drive efficiencies and improve reliability but will also strengthen stewardship and partnering both internally and externally. This research has implications far beyond transportation structures and can offer insight for residential and commercial structures, restoration, mitigation, and future research needs.

WHAT IS THE PROGRESS TO DATE?

A research team from University of California Los Angeles has been selected and the project started on April 2024 and is progressing well. The research team and the sub-contractor have developed a noise scoping method document, and the research panel has reviewed and approved that document. The team is currently traveling to select Caltrans Maintenance Facilities to collect noise data on construction equipment. The team has proposed a slight modification to the research approach on night roosting habitat and the panel fully endorsed the modified approach.