

Environmental

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Project Title:  
Roadway Crossings for Sensitive  
Amphibians and Reptiles: Phase II

Task Number: 3787

Start Date: January 2, 2022

Completion Date: December 31, 2023

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## Roadway Crossings for Sensitive Amphibians and Reptiles: Phase II

This Task is intended to provide information to assist Caltrans engineers and planners in designing culverts, bridges, and directional fencing that best facilitates the safe passage of herpetofauna species.

### WHAT IS THE NEED?

Amphibians and reptiles (herpetofauna) have been identified as being particularly susceptible to the negative effects of roadway mortality due to collisions with vehicles. Many species of herpetofauna have distinct seasonal movement patterns and cross roadways between areas of breeding habitat and upland areas for foraging and sheltering. These species generally move slowly and do not avoid roads. Populations of rare species may become vulnerable and susceptible to genetic isolation and extirpation.

California Department of Transportation (Caltrans) project delivery must analyze over 40 species of herpetofauna in California. Many of these 40 species are considered rare or Species of Special Concern by the California Department of Fish and Wildlife (CDFW); and many are listed as threatened or endangered by the CDFW and/or the U.S. Fish and Wildlife Service (USFWS). Caltrans Division of Research, Innovation and System Information (DRISI), funded Phase I of this project completed by United States Geological Survey (USGS) and the Western Transportation Institute (WTI).

The completed research has identified herpetofauna species at highest risk due to roadway mortality. USGS developed a prototype for an elevated roadway crossing—or small bridge—that could be scaled up to the State Highway System (SHS) for providing safe passage of herpetofauna. Phase II will help Caltrans further develop mitigation strategies for projects with listed species, including the low bridge prototype. This design concept provides an opportunity for Caltrans to incorporate



DRISI provides solutions and  
knowledge that improves  
California's transportation system

mitigation into existing highway infrastructure and reduce offsite mitigation requirements, which can be costly and require long-term maintenance and monitoring.

## WHAT ARE WE DOING?

Researchers will use Hobbs Active Light Treatment cameras (new) that detect the movement of herpetofauna to experimentally investigate the responses of herpetofauna to different fence materials and culvert configurations. This work will inform the scope, cost, and design of project features that reduce the potential for the entrapment and death of listed herpetofauna and the development of fencing that can facilitate movement of species to safe crossing locations, including cost effective improvements to existing culverts and bridges along the State Highway System.

Further, the Task will develop best management practices (BMPs) to improve our understanding of the effectiveness of road crossings for herpetofauna, including by developing engineering plans and specifications for the low bridge concept. USGS will also research the potential for the installation of artificial lighting and drip systems and other design modifications that could be used to stimulate movement of listed herpetofauna through constructed crossings. Maintenance considerations will be factored into the development of design modifications.

## WHAT IS OUR GOAL?

The primary goal of this Task is to provide information to assist Caltrans engineers and planners in designing culverts, bridges, and directional fencing that best facilitate the safe passage of herpetofauna species at highest risk due to roadway mortality. Gathering these data is critical to implementing scientifically defensible mitigation that will be acceptable to resource permitting agencies.

## WHAT IS THE BENEFIT?

Improving connectivity for listed herpetofauna species that are at highest risk due to roadway mortality, may present the best opportunity to recover rare species which is consistent with Caltrans' obligations under the National Environmental Policy Act and the Endangered Species Act. Wildlife crossings represent a targeted solution to incorporating mitigation on-system, which would benefit project delivery by reducing Caltrans' offsite mitigation requirements and the cost of delivering projects.

## WHAT IS THE PROGRESS TO DATE?

A research team from United States of Geological Survey has been selected and this project is progressing well with project end date of December 31, 2023.