DRISI
Caltrans Division of Research, Innovation and System Information

Research Notes

Environmental

AUGUST 2020

Project Title:
California Sensitive Amphibian and Reptile Highway Crossings

Task Number: 2666

Start Date: July 1, 2014

Completion Date: March 31, 2020

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Develop Roadway Crossings for Sensitive Amphibians

The research will develop, validate, and produce guidance for cost-effective ways that sensitive amphibian taxa can use to cross roads.

WHAT IS THE NEED?

The California Department of Transportation (Caltrans) is required to mitigate for adverse impacts arising from the construction, maintenance, and operation of the state transportation system to endangered, threatened, and other sensitive amphibians. However, Caltrans lacks the critical information necessary to plan, design and construct cost effective sustainable highway crossings for these animals. Without appropriate guidance and designs, Caltrans is challenged at times to meet its environmental obligations and obtain the permits and agreements necessary to construct highway projects within desired schedules.

Many amphibians breed and undergo larval development in aquatic habitats, but spend the majority of their adult lives in upland habitats. Thus, these species migrate as metamorphosed juveniles into uplands and then as breeding adults back to aquatic habitats. Easily traversable road crossings are needed for these amphibians when roads divide necessary upland adult habitat from aquatic breeding and larval habitat.

This study will develop the information necessary for Caltrans practitioners to design and install cost effective sustainable highway crossings for selected amphibians. It will focus on amphibians that breed in aquatic habitats and also utilize upland habitats. The amphibians of interest to Caltrans include: Arroyo Toad, Yosemite Toad, California Red-legged Frog, Sierra Nevada Yellow-legged Frog, Mountain Yellow-legged Frogs, California Tiger Salamander, and Santa Cruz Long-toed Salamander.

Areas of interest include road crossing materials, road crossing dimensions, ecological conditions within road crossings, means for preventing amphibian access to shoulders and pavement, and how to integrate amphibian road crossings with crossings for other kinds of wildlife. This task relates to the project as a whole in that the sensitive amphibians are major taxa of concern.

WHAT ARE WE DOING?

The research will develop, validate, and produce guidance for cost-effective ways that sensitive amphibian taxa can use to cross roads. Amphibian road crossing designs will be developed based on the existing literature and the animals' biology. The designs will be validated by field-testing under realistic highway conditions. This task will also determine the effectiveness of amphibian crossing structures on State Route 246 as a case study. The case study will gather statistically robust data and rigorously analyze this data to discover if amphibians are crossing through the highways with sufficient frequency to maintain healthy populations.

WHAT IS OUR GOAL?

This task will develop the information necessary for Caltrans practitioners to design and install cost effective sustainable highway crossings for selected sensitive amphibians. Guidance materials for road crossings for these amphibians will be developed for use by Caltrans personnel. The effectiveness of amphibian crossing structures on State Route 246 will be examined as a case study.

WHAT IS THE BENEFIT?

This task will develop road crossing information and guidance documentation for selected sensitive amphibians that will help the Caltrans meet its obligations under environmental law and regulations in a cost effective manner. This will help expedite the completion of transportation projects. Additionally, this task will help Caltrans practitioners select materials and designs for amphibian crossings that are durable and promote the sustainability of the transportation infrastructure as well as ecological sustainability.

WHAT IS THE PROGRESS TO DATE?

This task was completed on March 31, 2020. The next activity is to complete DRISI's Task closeout process.