



SCIENTISTS IN PARKS
Fellows
2021 Project Descriptions



NPS UNIT: LASSEN VOLCANIC NATIONAL PARK	PD #: 2021308
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Project Title: Climate Change Impacts on a Zoonotic Disease in Alpine Ecosystem
Primary natural resource discipline: Biological Sciences
Project keywords: Pika, Mammals, Trapping, Survey, Disease
Location: Mineral, California

COVID-19 NOTICE

As the COVID-19 pandemic continues to change and evolve, project timelines and structure remain flexible and it may be necessary to postpone start dates, begin work remotely, or reformulate the project’s description. Should any development in the COVID-19 outbreak impair a project’s timeline or results, the SIP Team will work with the park and project mentors to assess the situation and determine the best course of action at that time.

PROJECT DESCRIPTION AND WORK PRODUCTS

Position Description: The SIP selected for this project will coordinate with LAVO, Washington Office Biological Resources Divisions (WASO BRD), and USGS staff, to experimentally manipulate plague in LAVO to clarify its effects on pikas. This work will complement the NPS “Pikas in Peril” program by assessing the pika’s vulnerability to plague and validate remote methods of occupancy monitoring that can be used by both projects, as well as support the current emphasis of the U.S. Fish and Wildlife Service and USGS on candidate species for listing under the Endangered Species Act. Background levels of plague transmission in wild rodent populations increase human health risk. Thus, a better understanding of plague circulation in these ecosystems will also have “One Health” ramifications extending well beyond the central focal pikas of this research. This work is a continuation of a project piloted by during the summer of 2020.

Manipulative treatment-control studies provide insight into plague circulation in susceptible hosts. Experimental plague vaccines and flea control with deltamethrin powder applied in burrows, nests, and bait stations, have increased survival rates of mammals (Cynomys, Neotoma, Neotomias, Callospermophilus, Mustela) in field studies. Working with NPS and USGS biologists, the intern will conduct controlled experiments on pikas and associated small mammals, with comparative population indices (e.g., automated camera detections and passive integrated transponder (PIT) readers) as response variables.

The intern will work with wildlife biologists and technicians to: Apply deltamethrin to locations frequented by small mammals and to bait stations; trap, ear tag and PIT tag, and possibly vaccinate pikas; employ trail cameras and PIT readers at selected sites in treated and control plots; systematically search experimental plots for pika hay piles and scat; and, develop a final report on the project comparing methodology for pika survival and occupancy using observation, cameras, pit tags, etc.

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This study will inform management decisions regarding active response to disease presence through flea treatments, vaccination of small mammals, and/or temporary closure of high-risk areas, and it will open new avenues for management tools such as oral vaccine baits. If successful, this proposal would allow managers to

apply the proven, successful management techniques used in NPS units for prairie dogs to alpine communities and American pika, creating the first management tool to slow the decline or restore American pika populations. Alternately, if results show low prevalence of plague and low risk to wildlife populations or public health, effort can be reallocated to management response for other park priorities.

This position is offered through the National Park Service's Scientists in Parks Program in partnership with Ecological Society of America.

Work Products: 1. Successful implementation of survey protocols refined between 2018 and 2020. 2. Contributions to Pika and Peril long-term monitoring program. 3. A final report and associated brief highlighting: evaluation (e.g. efficacy, efficiency, etc.) of camera and remote sensing technology use for pika occupancy monitoring to inform future pika work; management recommendations with respect to pika monitoring at high elevations in the Sierra Nevadas; recommendations for future research on plague risk to high elevation ecosystems; and final presentation of results to LAVO staff and partners regarding the findings and results of their internship. 4. Fun: experience piloting unique work in a great National Park.

NATURAL & PHYSICAL WORK ENVIRONMENT

Lassen Volcanic National Park is a largely undiscovered gem of the National Park Service. Situated where the Cascade and Sierra Nevada Ranges meet, it contains a wonderful diversity of mixed conifer forests, lakes, streams, alpine fell-fields, and meadows resplendent in summer wildflowers and butterflies. Various types of volcanoes dominate the landscape, as well as active hydrothermal features like steam vents and mud pots. Recreational opportunities abound, with cross-country skiing and snowshoeing in the winter, and hiking, camping, backpacking, fly fishing, and kayaking in the summer. Boating is available on nearby Lake Almanor or the Sacramento River. Weather during the summer can range from highs of 85 degrees to lows of 35 degrees and snow can persist on the ground in the park into August. The work setting will range from 4,870 ft. (office) to 10,462 ft. (Lassen Peak) in elevation. Amenities are limited in Mineral, CA with only a couple lodges, a small camper store, and no gas station. The nearest full amenities are in Chester, CA, or Red Bluff, CA, which are 35 and 45 miles away, respectively.

The work will be approximately 65% in the field and 35% data extraction, recording, and processing. Lassen Volcanic National Park has both rugged, remote backcountry and front country areas with high visitation. The intern should expect foot travel through hazardous volcanic terrain in inclement weather. Being a high-elevation park, temperatures can range considerably during the day and season, so be prepared for both cold and hot environments. A driver's license is required.

QUALIFICATIONS

Intern should possess or be seeking a degree in wildlife biology or related field. Preferably they would have experience in: Operating camera traps OR conducting field survey methods; Trapping and handling live small mammals; Communicating science through writing, speaking, and social media; Using Garmin® or Trimble® GPS units for navigation; Working in high elevation, alpine environments (including talus slopes).

The applicant must be a U.S. citizen or U.S. National between the ages of 18 and 30 years old inclusive, or veterans up to age 35. Prior to starting this position, a government security background clearance will be required.

VEHICLE AND DRIVER LICENSE REQUIREMENTS

Applicant must have a valid drivers license and a good driving record.

A personal vehicle is RECOMMENDED but not required for this position.

HOUSING

Park housing is available and will be provided at no cost to the participant. The park will provide housing at park headquarters in Mineral, CA. Housing is typically a dorm room, such as in a 3-bedroom, historic, Mission 66 style house with a living room, kitchen, and bathroom. There are typically two persons per room (shared rooms) and generally 5-6 persons per house; however, this has been altered to 1 person per bathroom with a private bedroom to adjust for COVID-19 mitigations. Housing includes basic furniture and kitchen appliances, but the intern will need to provide their own bedding, kitchen utensils, etc. There are very limited amenities nearby, internet is only available in employee lounge, and limited cell phone reception. The majority of tenants remark on the quality and condition (both good) of park housing at Lassen.

INTERNSHIP START/END DATES

Start Date: 7/5/2021

Eleven weeks of the internship will be in the park. A mandatory Professional Development Workshop will be held in Washington, D.C. from August 1 – 5, 2021.