

POSITION ANNOUNCEMENT:

FUTURE PARK LEADERS of EMERGING CHANGE

The National Park Service (NPS) is pleased to support the *Future Park Leaders of Emerging Change* (FPL) internship program as a pathway for exemplary students in higher education (advanced undergraduate students and graduate students) to apply their skills and ideas to park-based challenges and solutions. The program offers 12-week paid internships which allow students to gain valuable work experience, explore career options, and develop leadership skills through mentorship and guidance while helping to advance NPS efforts on emerging management issues. Successful students may be eligible for non-competitive hire into federal positions for which they qualify following completion of all academic requirements.

Climate Change Impacts on a Zoonotic Disease in Alpine Ecosystem

Lassen Volcanic National Park/Resource Management Division
Mineral, CA

PROJECT SUMMARY

The Future Park Leader (FPL) selected for this project will coordinate with Lassen Volcanic National Park (LAVO), Washington Office Biological Resources Divisions (WASO BRD), and USGS staff, to experimentally manipulate plague in LAVO to clarify its effects on pikas.

INTERNSHIP PROJECT BACKGROUND

Plague is found at elevations above 3,000 m but the disease seems especially active at 1,000-3,000-m elevations in mountainous areas, where temperatures and precipitation are moderate. Plague is known to be quite active in the northern Sierra Nevada. Furthermore, plague activity is predicted to increase under future climate scenarios in northern California and at elevations where pikas are found. In Lassen Volcanic National Park (LAVO) talus slopes, fluctuations in occupancy patterns of American pika habitats raise suspicion that interactions of plague and climate change are impacting their populations. In California, *Y. pestis* was detected in a pika carcass and is often detected in small mammal species found in pika habitats. Marmots (*Marmota* spp.), susliks (*Spermophilus* spp.), and pikas (*Ochotona* spp.), play prominent roles in plague cycling in parts of Asia at various elevations (including above 3050 m), demonstrating susceptibility of these taxa to the disease and occurrence of plague at high elevations. Plague is likely to be even more influential on North American taxa that have little evolutionary history with the disease.

INTERNSHIP PROJECT DESCRIPTION

The Future Park Leader (FPL) 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.

Internship Tasks

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*, *Neotamias*, *Callospermophilus*, *Mustela*) in field studies. Working with NPS and USGS biologists, the FPL 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 FPL will:

- Apply deltamethrin to locations frequented by small mammals and to bait stations;
- Trap, ear tag and PIT tag, and 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;
- Develop a final report on the project comparing methodology for pika survival and occupancy using observation, cameras, pit tags, etc.

Internship Products

- A report on the efficacy of camera and remote sensing technology for pika occupancy monitoring to inform this and future “Pikas in Peril” work.
- Management recommendations with respect to pika monitoring at high elevations in the Sierra Nevadas and recommendations for future research on plague risk to high elevation ecosystems.
- Intern will present results to LAVO and Pikas in Peril staff on the findings and results of their internship.

QUALIFICATIONS

A highly qualified applicant will possess the following:

- Experience operating camera traps OR conducting field survey methods (mandatory)
- Experience trapping and handling live small mammals (mandatory)
- Experience communicating science through writing, speaking, and social media
- Experience using Garmin® or Trimble® GPS units for navigation

LEADERSHIP DEVELOPMENT

LAVO, WASO BRD, and USGS wildlife biologists will provide the FPL mentorship, establish their benchmarks of success, and provide training regarding project protocols. LAVO staff will provide training on park safety protocols (e.g., radio, backcountry travel, and vehicles), NPS resource management, government employment, and general park information, plus four-day seasonal and Operational Leadership training. While the FPL will receive specific training and an opportunity to implement a unique biological study, they will also receive mentorship directed at larger developmental goals:

- An appreciation of life on this planet and care for the future of biodiversity.
- An understanding of the complex interactions within ecological systems.
- Emphasis on applied research for management.
- Appreciation and understanding of One Health and networking with the California Department of Public Health, NPS Office of Public Health, and CDC vector borne disease group to foster interdisciplinary work.

DATES OF POSITION

Approximate dates of internship: 06/29/2020 – 09/18/2020. Dates are flexible; time frame for project completion is sometime between 06/22/2020 and 09/30/2020.

COMPENSATION

This initiative supports one student at \$16/hour for 12 weeks, or 480 hours.

HOUSING & TRAVEL

The FPL provides a travel stipend to all interns to supplement the cost of student travel to the park site.

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. Housing includes basic furniture and kitchen appliances, but FPL 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.

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 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 85% in the field and 15% data extraction, recording, and processing. Lassen Volcanic National Park has both rugged, remote backcountry and frontcountry areas with high visitation. The FPL 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.

CONTACT INFORMATION

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