

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.

Oak Tree Demography Post-Wildfire and Comparing High Resolution Image Analysis to Ground Truthing

Santa Monica Mountains National Recreation Area/Fire Management and Resource Management
Thousand Oaks, CA

PROJECT SUMMARY

SMMNRA needs mapping and field verification of the scale and geographic distribution of oak dieback following ten years of drought and fire. These data will direct restoration and management decisions by the park for its oak species.

INTERNSHIP PROJECT BACKGROUND

Climate change in southern California forecasts hotter, drier, more variable conditions, leading to more frequent wildfires and droughts. As the climate fluctuates and exacerbates environmental stressors on Californian flora and fauna, it will be harder for land managers to maintain native species biodiversity. Land managers will need to promote resilience and restore native species in areas that will remain suitable even under the worst-case climate scenarios.

In the Santa Monica Mountains, the landscape is a complex intermix of protected wildlands and development. Severe fires such as Woolsey Fire have burned 88% of NPS land. At the same time, the Santa Monica Mountains is a hotspot of biological diversity and fire management must consider both public safety and the conservation of the unique biodiversity of the native shrublands and oak woodland.

Native oak and riparian woodlands are a limited and valuable part of the SMMNRA landscape that provide habitat, connectivity, and fundamental ecosystem services. Although native tree species are adapted to the periodic droughts and fires characteristic of the area, prolonged drought and increasing fire frequency compounded with the effects of fragmentation, urbanization, and invasive species are causing extensive dieback and decreased recruitment. Given the extreme drought of [2011-2017](#), the extraordinary extent of the [2018 Woolsey Fire](#) and the continued changing climate, documenting how

the two SMMNRA oak tree species' populations (*Quercus agrifolia* and *Quercus lobata*) survived these stressors will provide important clues as to how they might be expected to persist in the coming century. A combination of high resolution image analysis and ground truthing will be used to document mortality in the past decade as a result of drought, fire and their interaction. These data can be used to determine future population trends in these two oak species, inform park management, and guide future restoration projects.

INTERNSHIP PROJECT DESCRIPTION

Internship Tasks

The project goal is attain answers for these questions:

- Where has mortality occurred from drought and wildfire
- How has dieback changed the spatial distribution of the oaks
- What is the best method to identify changes in oak cover and density - by high resolution image analysis or LiDAR
- How much and what type of ground truthing is required to support the image analysis
- Given future climate conditions where will populations of these two species persist

Oak populations will be counted and mapped using high resolution aerial image analysis, and compared with LiDAR and NDVI remote sensing, to test for resolution and accuracy. 1937 vegetation type maps (VTM) can be compared to the 2007 park vegetation map, to identify potential long-term change of adult populations. Changes can be analyzed with respect to trends in warming and wildfires to see what contributes to oak tree populations growing or shrinking.

Internship Products

- Maps that show tree kill following drought and wildfire, using high resolution imagery and remote sensing of oak trees
- Comparisons of various techniques for oak tree detection using side by side graphics
- Data collection, preliminary statistical comparison, and presentation of demographic maps compared to ground truth sampling

QUALIFICATIONS

Narrative:

The most qualified applicants will be pursuing an advanced degree in the field of biology/ecology, with a background in GIS. This internship will include both field data collection and spatial analysis and qualified applicants should have experience and skills in both areas. Because of the communication elements of the internship, the best applicants will have skills and experience in communicating science through writing, speaking, and social media.

Check-box options: The applicant should possess the following qualifications.

- Be pursuing, an advanced degree in biological/ecological sciences.

- Skills and experience in the southern California flora
- Strong spatial analytical skills and experience with ArcGIS
- Strong organizational and collaborative skills for field work as a team leader
- Able to work under strenuous field conditions
- Possess a valid state driver's license; be comfortable driving a government vehicle

LEADERSHIP DEVELOPMENT

- Collaborative science. The intern will work with park fire ecologist, Marti Witter, who coordinates the fire science program with the resource management division and is co-author on a number of peer-reviewed papers related to fire ecology and restoration. The intern will interact with partners at CSUN, USGS, and UCLA La Kretz Center for the Environment. Paula Schiffman, CSUN terrestrial ecologist, will be a co-advisor.
- Natural resource and NPS management. The intern will work with park managers, restoration ecologists, university staff, volunteers, and education staff.
- Science communication. The park's science program is fully integrated with the Interpretive Division. In addition to developing science writing skills, the intern will help interpretive staff in communicating scientific findings at the park.

DATES OF POSITION

This position will ideally start in mid-May and be for 12 weeks ending in August, but we are very flexible, between 05/01/2020 – 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.

SMMNRA spans two counties, Los Angeles and Ventura, and a number of cities – Malibu, Calabasas, Thousand Oaks, Agoura Hills and portions of LA City, so there are services located in any direction. Housing is available at one of several dorm facilities at either Rancho Sierra Vista or Diamond X Ranch. There is very limited public transportation to the park, and none to the dorm sites, so a car is strongly recommended.

WORK ENVIRONMENT

Santa Monica Mountains National Recreation Area is the nation's largest urban national park, with 153,250 acres of rugged mountains, narrow canyons, chaparral, and ocean surf. The mountains rise out of the heart of Los Angeles and follow the Pacific coast some 50 miles west to Point Mugu in Ventura County. More than 18 million people live within an hour's drive of the park. Summer temperatures can

vary between moderate to extremely hot, with a strong gradient of cool temperatures on the coast to much higher temperatures inland. Most work will be at the park headquarters in Thousand Oaks CA in the GIS lab. Field work will be throughout the recreation area and can be physically demanding with heavy loads of equipment, off trail hiking, plants that poke, rattlesnakes, poison oak, steep slopes and high heat in summer months.

CONTACT INFORMATION

Park Service Supervisor: Marti Witter, Fire Ecologist, marti_witter@nps.gov, 805-370-2333

Project Advisor: Paula Schiffman, California State University Northridge, paula.schiffman@csun.edu, 818-677-3350