



Position Description

Sierra Nevada AmeriCorps Partnership

Position Title: Watershed Technician (hydrology, water resources or biology emphasis)
Host Site: Fresno Office, Pacific Southwest Research Station, USDA Forest Service
Site Supervisor: Kevin Mazzocco (primary) & Dr. Carolyn T. Hunsaker (secondary)
Contact: 559-323-3209 (work), kmazzocco@fs.fed.us

Position Location: Shaver Lake and Fresno, CA

Shaver Lake is a mountain resort community in the Sierra Nevada with a population of less than 1,000; Fresno is the nearest large city with a population of 500,000. Additional information: www.shaverlake.com/area-guide/community or www.fs.usda.gov/sierra.

Organization Description: The Pacific Southwest Research Station (PSW) is a world leader in natural resources research through scientific excellence and responsiveness to the needs of current and future generations. The mission is to develop and communicate science needed to sustain forest ecosystems and their benefits to society. The PSW represents Forest Service Research and Development in California, Hawaii, and the U.S.-affiliated Pacific Islands. More than 50 percent of California's fresh water comes from National Forest lands. In addition to supplying clean water for residential and industrial use, forests are vital to California's economy. Comprising nearly 20 percent of California's land mass, National Forest lands support 38,000 jobs. PSW is organized into five research units: Institute of Pacific Islands Forestry, Conservation of Biodiversity, Fire and Fuels, Urban Ecosystems and Social Dynamics, and Ecosystem Function and Health. This position is in the Air, Water, and Soil Team of the Ecosystem Function and Health Unit.

Program Description: This position will support the Kings River Experimental Watersheds (KREW) research project, a watershed-level, integrated ecosystem project for 10 headwater streams in the Sierra Nevada. It was designed as a forest management experiment to examine the positive and negative effects of thinning and prescribed fire for sustainable forest management and has been collecting data since 2003. KREW addresses the interrelated consequences of change and multiple stressors on forest ecosystems: climate, water, air pollution, nutrients, and fire. It is the only designed project of its kind in the southern Sierra Nevada, and is a valuable resource for California. KREW is one of two long-term watershed research projects at PSW. KREW collaborates with the Sierra National Forest, many universities, State and other Federal organizations, and local/regional watershed groups.

Position Description: The Watershed Technician's time will be spent 55% on watershed field work at the research sites, 15% on education and outreach activities in the Fresno office or local communities, and 30% on data and laboratory work in the Fresno office. The Watershed Technician will be working primarily with the lead hydrologic technician and sometimes with either the research scientist, Dr. Carolyn Hunsaker, or with a university collaborator such as a hydrologist. This is the only KREW position with substantial time allocated to an education and outreach set of tasks; 2-page briefing papers, press releases, and other materials need to be

prepared on a diverse set of research findings such as water quality, air pollution, stream invertebrates, mountain meadows, and the Yosemite toad. The technician may be asked to attend local watershed meetings and public events and investigate the interest and feasibility of local volunteers for KREW work in the future.

Field and laboratory tasks will be diverse and may include soils and sediment processing, stream invertebrate sampling, building and installing nutrient samplers, groundwater measurements in mountain meadows, and gathering data from instruments for stream discharge and weather measurements. Two of the experimental watersheds are scheduled to be burned in 2016 so the technician could also be involved in activities related to preparation of these watersheds for prescribed fire.

Required Qualifications:

- Good Microsoft *Excel* software skills
- Science undergraduate degree or at least 2-years of college science coursework
- Ability to work 10-hour days hiking in steep mountain terrain at elevations between 5,000 and 8,000 feet, along with the ability to carry 30 lbs. in a backpack for a work day
- Ability to work independently and manage multiple tasks
- Ability to work at a desk/computer for up to 8 hours a day
- Reliable transportation

Desired Qualifications:

- Experience working or recreating in snow-covered mountain terrain using snowshoes, skis, or snowmobiles
- Experience with GPS and with Microsoft Access database and/or statistical software
- Field survey experience in mountain terrain

Additional Benefits:

Work and live in a mountain community with easy access to many beautiful recreation and wilderness areas. Work with an interdisciplinary research team on a unique landscape experiment. Gain valuable work experience with various aspects of field watershed research, laboratory and data analyses, and technical publication and science writing for non-scientists.

Website: www.fs.fed.us/psw/topics/water/kingsriver



Member Service Plan Sierra Nevada AmeriCorps Partnership

Host Site: *Pacific Southwest Research Station, Fresno Office*
Position Title: *Watershed Technician (hydrology, water resources, or biology emphasis)*
Designated Site Supervisor: *Mr. Kevin Mazzocco and Dr. Carolyn T. Hunsaker*
Term of Service: Mid-October 2016 to mid-September 2017

Organizational Background:

The Pacific Southwest Research Station (PSW) is a world leader in natural resources research through scientific excellence and responsiveness to the needs of current and future generations. The mission is to develop and communicate science needed to sustain forest ecosystems and their benefits to society. The PSW represents Forest Service Research and Development in California, Hawaii, and the U.S.-affiliated Pacific Islands. More than 50 percent of California's fresh water comes from National Forest lands. In addition to supplying clean water for residential and industrial use, forests are vital to California's economy. Comprising nearly 20 percent of California's land mass, National Forest lands support 38,000 jobs. PSW is organized into five research units: Institute of Pacific Islands Forestry, Conservation of Biodiversity, Fire and Fuels, Urban Ecosystems and Social Dynamics, and Ecosystem Function and Health.

This position is in the Air, Water, and Soil Team of the Ecosystem Function and Health Unit of PSW. Team members work in four problem areas: (1) determination of how biophysical factors influence the function and productivity of tropical, subtropical, and temperate ecosystems; (2) quantification and prediction of ecosystem responses and adaptation to environmental stressors; (3) definition and measurement of the impacts of biotic and abiotic stressors on hydrological and atmospheric systems; and (4) development of models and tools and evaluation of management options for restoring, sustaining, and enhancing ecosystem function and productivity.

Organizational/Program Goals 2016-2017:

This position will support the Kings River Experimental Watersheds (KREW) research project within PSW's Ecosystem Function and Health Unit. KREW is a watershed-level, integrated ecosystem project for 10 headwater streams in the Sierra Nevada. It was designed as a forest management experiment to examine the positive and negative effects of thinning and prescribed fire for sustainable forest management and has been collecting data since 2003. KREW addresses the interrelated consequences of change and multiple stressors on forest ecosystems: climate, water, air pollution, nutrients, and fire. It is the only designed project of its kind in the southern Sierra Nevada, and is a valuable resource for California. KREW is one of two long-term

watershed research projects at PSW. KREW collaborates with the Sierra National Forest, many universities, State and other Federal organizations, and local/regional watershed groups.

Watershed Research Goal 1 is to characterize and improve knowledge about the variability in headwater stream ecosystem components in the southern Sierra Nevada.

Watershed Research Goal 2 is to measure headwater stream ecosystem components after forest restoration treatments, mechanical thinning (2012) and prescribed fire (2013), and compare to the range of these measurements during the pretreatment phase (Goal 1).

Watershed Goal 3 is to effectively communicate findings from Goals 1 and 2 to land managers and the public through short, written briefing papers and presentations at local and regional meetings.

Member Service Plan Overview and Outcomes:

The Watershed Technician's time will be spent in the following manner and will address all three of the watershed goals stated previously. All percentages include related training.

- 55% on watershed field work at the research sites (Watershed Restoration and Assessment)
- 15% on education and outreach activities in the Fresno office or local communities (Watershed Education and Outreach and possibly Volunteer Recruitment and Support)
- 30% on data and laboratory work in the Fresno office (Watershed Restoration and Assessment)

Service Position Major Projects:

1. Watershed Restoration and Assessment:

- a. **Priority Project: Watershed Assessment and Monitoring after restoration.** The Member will be collecting field data on restored and control watersheds. Data collected will include a stream invertebrate survey at all 10 streams, stream geomorphology, groundwater measurements in mountain meadows with Yosemite toad surveys, installation of nutrient samplers, and gathering of stream discharge and weather measurements from automated samplers.
 - i. **Projected Hours:** 55% of time or 990 hrs of total appointment (including related training)
 - ii. **Estimated Acres Restored:** 1,184 acres were restored in 2012 and 2013 and 571 acres remain to have prescribed fire treatments done. If prescribed fire is applied in spring or fall of 2016, then the Member would participate in data collection post-burn or possibly site preparation if the burn is delayed until fall.
 1. **Acres Restored by Member (ONLY):** 0
 - iii. **New Knowledge:** Because this is a research project, the primary outcome is data collection after forest restoration: the 4th year following 2012 thinning and the 3rd year following burning in 2013, and the 1st year following 2016 burning.
- b. **Priority Project: Laboratory Work and Data Analysis.** In the laboratory the Member will work on sample processing for soils and sediment collected in 2016 and on building of nutrient samplers to be installed in 2017. Data analysis can be on any of the data being collected and will depend on the Member's background and academic training.

- i. **Projected Hours:** 30% of time or 540 hrs of total appointment (including related training)
- ii. **Estimated Acres Restored:** See answer to a above--not applicable
- iii. **New Knowledge:** Because this is a research project, the primary outcome is new knowledge from the data analysis after forest restoration. These findings will go into the development of research papers and public handouts.

c. Watershed Restoration and Assessment Totals:

- i. **Total Projected Hours:** 1,530 hrs (1,340 hrs + 80 for SNA training + 110 for PSW project training)
- ii. **Total Estimated Acres Restored:** 1,184 acres have been restored and the member will be gathering data on all of these acres. If the prescribed fire is applied in 2016 an additional 571 acres will be restored.
 - 1. **Total Member Acres Restored:** 0 at KREW (unless prescribed fire is delayed to fall of 2016). Acres would be acquired from working with Sequoia Riverlands Trust on restoration projects as was done by Member in 2015-16.
- iii. **New Knowledge:** This would be the primary output from this task and will go into the development of research papers and public handouts.

2. Watershed Education and Outreach

- a. **Priority Project:** The Member will develop educational handouts and newspaper articles that translate science results into products useful to land managers and other publics. This work will be a continuing effort from what was completed in 2016. Topics will depend on the Member's background, but could include stream invertebrates, Yosemite toad, water quality and air pollution, and vegetation and fuel loads. Briefing papers will be reviewed/evaluated by local watershed groups to ensure they meet the needs and interests of the intended audience.
 - i. **Projected Hours:** 270 hrs (180 hrs + 20 for volunteer task and 50 for training by SNA and 20 for training by KREW)
 - ii. **Estimated Education Outcomes:** (Complete one of the following for this project)
 - 1. **Presentations** (Presentations and/or Service Learning projects of at least 30 minutes in which the Member will be able to query participants with a pre and post test): estimated 100 at 4 events
 - a. Southern Sierra Integrated Regional Water Management Work Group—2 meetings
 - b. Sierra Resource Conservation District and/or Sierra Foothill Conservation Committee
 - c. Sierra Foothill Conservancy and/or San Joaquin River Parkway and Trust education coordinators

2. Outreach (Educational Outreach in which Members will be able to ask participants if the outreach conducted increased their level of understanding): 50 people for piloting of the 2-page briefing handouts

3. Development of Educational Materials

Development of at least four 2-page briefing pieces for non-science audience. This is the primary output of this project. Presentations and outreach will be based on these handouts.

b. Watershed Education Totals: 270

i. Total Projected Hours: 270

ii. Total Estimated Outcomes:

1. Presentations: 100 people at 4 events

2. Outreach: 50 people

3. Development of Education Materials: Four 2-page briefing pieces that are evaluated at the meetings for 1 and 2 above. These handouts will go on to reach hundreds of people as they are used by PSW and KREW in the following five years.

3. Volunteer Recruitment and Support:

a. Priority Project: Continue from 2016 to investigate the interest and feasibility of using local volunteers for KREW work in the future. The Member would follow up on a 2014 effort by working with one or two of the groups that organized that activity (e.g., Justine Reynolds with Sierra Resource Conservation District). It is not clear that the work gained from volunteer effort would outweigh the time invested to train and oversee volunteers for a project like KREW. Also of interest is whether volunteers will be interested and/or willing to put in more than a few days of rigorous field work or tedious laboratory work.

i. Projected Hours: 20 hrs

ii. Estimated Outcomes: This is a feasibility study and neither the number of volunteers recruited nor the total number of volunteer hours is an appropriate outcome this year. Outcome would be to gather enough information to make a decision to use or not to use volunteers in the future.

1. Number of Volunteers Recruited: There may be some volunteers recruited by the Member, but the goal of this project is to investigate the feasibility of using volunteers on the research in the future.

2. Total # of Hours Served by Volunteers: 0--Not a goal this year.

iii. Estimated Outcomes: (Complete one of the following for this project) Outcome will be a decision on whether to invest time in future years on volunteer recruitment and training.

1. Number of Volunteers Recruited: There may be some volunteers recruited by the Member, but the goal of this project is to investigate the feasibility of using volunteers on the research in the future.

2. Total # of Hours Served by Volunteers: 0—Not a goal this year.

b. Volunteer Recruitment and Support Totals:

