PROJECT TITLE: EFFECTS OF SEED PREDATION BY HARVESTER ANTS ON SAGEBRUSH STEPPE RESTORATION

David Pilliod,

Discipline: Ecology; Wildlife Biology; Soil science;

PROJECT DESCRIPTION

BACKGROUND

Many grassland and shrubland communities in the western US are degraded because of human use, invasive species, and changes in fire regime. Ecological restoration efforts on public lands are underway. We are investigating the effects of seed predation by Owyhee harvester ants, Pogonomyrmex salinus, on the success of vegetation restoration efforts in the Snake River Basin in southern Idaho. Seed predation by harvester ants has been linked to declines in soil surface seed availability within many grassland and shrubland communities, however, the consequences of seed predation for vegetation restoration efforts have yet to be thoroughly investigated. Our study focuses on three key variables relevant to ant foraging behavior: (1) seed species, (2) seed abundance and dispersion within an ant colony’s foraging range, and (3) time of year. This research will establish whether ants are a significant source of seed mortality for species commonly seeded during restoration, whether seed predation poses a greater threat to some plant species than others, and whether it is possible to minimize the effects of seed predation through alteration of the spatial distribution of seeds. The study is being conducted at the Morley Nelson Snake River Birds of Prey National Conservation Area (NCA). The NCA is an area of ecological importance to many wildlife species and the public, and where restoration is underway to slow the cheatgrass-fire cycle and restore healthy, native plant communities.

INTERN TASKS

The student intern will assist with all aspects of the research investigating seed predation rates and patterns, and tradeoffs that ants make when foraging. Using a stratified random design, we will set out and monitor trays of seeds around active ant colonies at replicated plots during the summer. We will also measure characteristics of the soils and plant communities at each plot. The intern has opportunities for developing independent research. For example, we would like to conduct some focal studies of seed handling, or the time and direction ants take when carrying seeds back to their colonies. Differences in how quickly ants can transport seeds of different species will provide context for ant foraging decisions. We will also investigate whether foraging decisions are based on seed size, weight, nutritional content, or distance from the colony.

BENEFITS TO INTERN

The student will be part of a team and will learn about ecological research, fieldwork, sampling design, and conducting experiments in natural settings. The student will learn skills in ant identification, plant identification in sagebrush steppe, and soil ecology in relation to a common species considered an ecological engineer because of its ability to shape the environment. The student will learn about ecological restoration in sagebrush steppe and
the complexity of factors influencing restoration outcomes. The student will learn about the importance of careful
data recording and data management. If the student chooses to develop an independent study, there are opportunities to learn about data analysis and publishing scientific research.

MENTORING PLAN

The student intern will meet with Dr. Pilliod and his team of scientists and technicians to learn more about the different research activities in his lab and to learn more about FRESC, USGS, and opportunities for working for the Department of Interior. Prior to conducting field work, the intern will meet with the research team to obtain a strong understanding of the context, background, details, and management implications of the research. Safety and training will be emphasized. The intern will also participate in lab meetings every two weeks and will have opportunities to learn about and potentially assist with other research projects as desired and time allows.

ADDITIONAL DETAILS

STUDENT SKILLS AND INTERESTS

No specific skills will be required other than a willingness to conduct fieldwork in a semi-arid landscape and to work as part of a team.

LOCATION: Boise, Idaho

ACTIVITY LEVEL:

Level 8-2: The work requires some physical exertion such as long periods of standing, walking over rough, uneven, or rocky surfaces; recurring bending, crouching, stooping, stretching, reaching, or similar activities; or recurring lifting of moderately heavy items. The work may require specific, but common, physical characteristics and abilities such as above-average agility and dexterity.

FIELD WORK 75-100% VIRTUAL? No
LAB WORK 0-25%
OFFICE WORK None
OTHER None

PROJECTED START DATE 5/9/2022
EXPECTED DURATION 2-3 months