STEP 1) Faculty, lab staff and other qualified leaders are encouraged to outline a one-semester project below. Please include the following 1-2 paragraph summary to allow students a broad understanding of how this project may align with their interests and skill development:

- **Fellowship Mentors:** Ruth Hufbauer (professor) and Eliza Clark (graduate student)
- **Title:** Adaptation to different environments in a biological control agent
- **Justification:** Long-term, environmentally sound management of invasive weeds focuses on biological control, the introduction of insect or pathogens that are highly specialized on the weed. Biological control agents face crucial challenges when introduced into a new range, including spreading across novel environment. In this project, we are studying adaptation of a biological control agent, a beetle, to different habitats as they spread across the western United States, and the potential for evolution of host range among hybridizing populations of biological control agents. This work is crucial for informing safe and durable management of invasive species.

- **Tasks:** We have two experiments planned for the spring, and the Fellow could be part of either or potentially both. The first is to measure cold tolerance in beetles from different populations across their range in the United States, to evaluate whether populations have diverged in this trait crucial to overwintering success. The second is focused on the ability of the beetle to feed and develop on non-target host plants. The tasks will include using a programable freezer to measure super cooling point and cold recovery. Tasks for both projects will also include rearing the biological control agent and the plants on which it feeds. Day to day work will include beetle care, planning and executing experiments, collecting, managing, analyzing, and graphing data, and presenting results. Students will work both independently and as part of a team.

- **Major skills and competencies that will be developed during the project execution:** Setting up experiments requires careful planning and coordination of different organisms (e.g. beetles and plants). The Fellow will gain skills in developing answerable questions, experimental design, data management (entry, analysis, and graphing). After data have been collected, students will learn to analyze them using both Excel and R to create informative and sharable figures. These, along with a summary of the relevant literature, experimental protocol, and discussion, will be showcased in a poster and verbal presentation. Students will gain experience sharing their research with the public at an undergraduate research conference. If the Fellow is interested and the fit is good, there will be an opportunity to apply for an undergraduate hourly position to work in the lab at the end of the fellowship.

STEP 2) Please share the following to best describe how the Fellowship Mentor plans to support the Fellow throughout the Fellowship:
The Fellow will be taught all the basic protocols for working with the biological control agent and plants. They will also be given relevant readings about research in this area.

The Fellow will work directly with Eliza, and occasionally with Dr. Hufbauer, and also with undergraduate student hourly employees.

Lab meetings are held weekly, jointly with another lab. Additionally, we will hold brief update meetings every other week focused on this project in particular. The Fellow will be welcomed to other departmental events to learn about the research interests of other labs.

Both Eliza and Dr. Hufbauer are passionate about working with undergraduates in the lab. The Fellow can expect at minimum three meetings per semester with Dr. Hufbauer, and weekly work, including mentoring, with Eliza directly.

We would love to have a copy.