# Service Learning Project: Native Plant Restoration

Biology 211 Fall 2017... and Spring 2018

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Introductory Biology for Majors students partner with the Rio Mora National Wildlife Refuge to conduct a novel experiment and serve the Mora watershed community.

Can we develop a locally adapted native plant seed mix for people to use in ecological restoration?

**Experiential Learning = Service + Novel Research** 



#### Native plants are crucial for ecological restoration in our watersheds

- 1. Students collected native prairie plant seeds on site at RMNWR during a field trip (2 weeks)
  - Seeds are collected for the RMNWR seed bank to archive seed stock adapted to this local environment
  - Students cleaned, labeled and stored seeds





2. Student groups chose a unique experiment in the greenhouse to answer questions from Shantini and Carmen at the Refuge (6 weeks)

- Which native plant species germinate quickly?
- Do native plant species germinate if planted together with other species?
- Which combination of species do best in a seed mix?

Students continue to grow plants over six weeks. Students are invited to join us in Spring planting of their 'babies' at restoration sites (long-term impact of student actions).



### Example Experiment: Cota and Bison

Does the nutrient richness from Bison patties affect germination rate and growth of Cota, a traditional medicinal herb used in Dineh-Hopi tea?



# 3. Students will analyze results and present to class/partners (2 weeks)

- Oral presentation for each group November 30<sup>th</sup>
  - How well seeds grew
  - Which seeds are good candidates for seed mixes
  - Insights about how to develop a seed mixture for RMNWR to distribute to local land owners and use for restoration at the refuge
  - What they enjoyed about the science & society aspect
- Invite partners to student presentations



## **Desired** Outcomes

#### **Students will learn to:**

- Conduct a research experiment
- Connect local community issues to scientific research
- Actively contribute to restoring land for local people
- Interact with living organisms in positive ways (growing plants!)

#### Partners will receive:

- Help building the native plant seed bank
- New information on locally adapted plant species germination rates and which species combinations grow well together
- Familiarity with up-and-coming Biologist at Highlands



## Service Learning Assessment

#### **Formative assessments**

- Do students at the refuge ask questions about native plants and their ecological functions, human uses?
- Do students participate in cleaning, planting, and caring for their seedlings every week (6 weeks)?
- Can students analyze data on germination rates and growth between two treatment groups?

#### **Summative assessments**

- Do students successfully design a novel experiment in their group?
- Do group oral presentations describe research design, results, and a reflection on the impact of their study on local landowners and the refuge?
- Does the student write a report describing the experiment, results, and reflect on the meaning of their service learning experience?

# Service Partnerships Highe





- Highlands has an ongoing partnership with the Rio Mora National Wildlife Refuge and the Denver Zoo
  - Joe Zebrowski is the NMHU Liaison for research and outreach at RMNWR
  - Shantini Ramakrishnan coordinates activities at Rio Mora including native plant seed mix and restoration project
  - Carmen Briones is a native plant restoration specialist.
- I spoke to Joe, Shantini, and Carmen before the semester.
  - I had biology learning objectives (experimental design, experience with living growing things).
  - Shantini and Carmen had native plant restoration objectives.
  - Joe had outreach partnership objectives.
  - We discussed and designed the project together from the start.