

Seedling Ecology/Restoration Ecologist

USDA-ARS, Research Ecologist/Research Rangeland Management Specialist GS-0408/0454-12/13/14/15, Burns, OR

Assigned Responsibility

The incumbent is a Research Ecologist/Research Rangeland Management Specialist with the Range and Meadow Forage Management Research Unit in Burns, Oregon. The overall mission of the Research Unit is to provide service to private and public land managers. This research is a Component of the ARS National Program 215 - Pasture, Forage, and Rangeland Systems, and is directly related to NP 215 Action Plan Problem Statements B1 and C1. The emphasis of the incumbent's program will be to improve success of rangeland reseeding efforts by: (1) using field-based and hypothesis-driven research to determine ecological processes and factors that are limiting establishment of seeded perennial herbaceous and shrub vegetation on sagebrush rangelands, and (2) developing seed amendment technologies to overcome ecological barriers to seedling establishment. Incumbent conducts independent research for assessing the relationships between environmental factors and seedling establishment and growth of vegetation, developing seed amendment technologies for rangeland restoration, and works as a team member assessing the impacts of restoration practices on specific ecosystem services such as wildlife habitat and forage production. Ultimately, the incumbents' research will contribute to a more mechanistic and comprehensive understanding of the seedling ecology of critical perennial plant species used in rangeland restoration. The incumbent establishes and maintains collaborations with scientists from university, private industry, and federal and non-federal agencies on technical matters and represents ARS in their own field of research expertise. Transfers technology through scholarly publications, patents, and presentations to scientific and industry groups.

Research Objectives and Methodology

The incumbent's research objectives are to identify ecological processes and factors that limit seedling establishment in the sagebrush steppe, and develop and apply seed amendment technologies (for example, seed coatings, seed pellets, and seed pillows) to overcome ecological barriers to seedling establishment and improve rangeland seeding success. Methods and tools used to achieve the objectives include developing and testing hypotheses that link important environmental attributes in space and time with seedling performance at key demographic milestones (i.e., germination, emergence, and establishment), measurement of climatic and edaphic factors at both the microclimatic and landscape scales, seed coater and various devices used in the food service industry to develop seed amendment technologies, and seedling growth and development analysis. General methodologies include laboratory bioassays and field studies and evaluation of novel technologies that may improve seedling establishment.

Expected Results

The results of this research will help managers match species and seed enhancement technologies to specific site and environmental conditions and thus improve restoration/reseeding success. The research will provide critical information for improving revegetation guidelines and decision tools for restoration of sagebrush steppe rangelands.