

Characterization of montane ecosystems, their microclimates, and wildlife distribution and abundance across the hydrographic Great Basin

This project retrieves four years of data from over 200 temperature sensors nested within 28 sites across ~40 million hectares of the hydrographic Great Basin. The sensors span all major aspects and up to 700 m of elevation within sites, and occur in numerous management jurisdictions in 18 mountain ranges plus other areas not in ranges.

This project:

- Quantifies the variability of climate at micro-, meso-, and macroscales across the Basin, and across diel, seasonal, and interannual periods.
- Informs management and conservation efforts, in terms of helping calibrate and refine the climatic 'stage' upon which all biological 'actors' and efforts hinge (Beier and Brost 2010).
- Feeds into other bioclimatic and wildlife studies seeking to describe climate and biotic responses to it.



Understanding the causes and consequences of cheatgrass die-offs in the Great Basin

Cheatgrass die-offs are unexplained instances of stand failure observed in areas of Nevada and Utah, where cheatgrass fails to grow even though it has been a dominant component of plant communities in the past.

This project:

- Provides information on the size and extent of historic (1985 – 2012) die-offs in the Winnemucca area using satellite imagery.
- Determines if die-offs are restoration opportunities by planting and monitoring local and commercially available native grasses in die-off areas.
- Develops predictive spatial models of die-off from analysis of satellite imagery and GIS models.

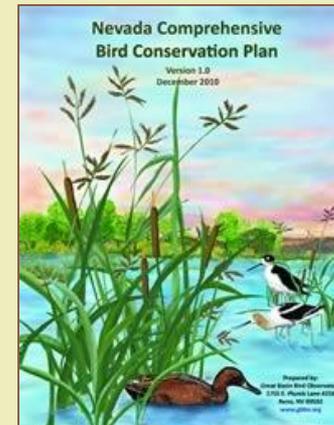


Evaluating Species Management Guidance and Monitoring Programs for the Great Basin in Nevada

The project builds on recent, well-researched species conservation plans for Nevada (GBBO 2010, NWPT 2012) and research on scientifically based disturbance buffer recommendations to evaluate GBBO's statewide landbird monitoring program, the Nevada Bird Count.

This project will create an online open-source compendium document that will provide a scientific review of:

- Current priority species management practices in Nevada
- Status of our combined scientific knowledge of priority species' needs and gaps in that knowledge
- Adequacy of current monitoring programs of priority species.



Development of tools and technology to improve the success and planning of restoration of big sagebrush ecosystems

Shrub-dominated ecosystems of the Great Basin are being threatened by disturbances, typically wildfire followed by encroachment of invasive plants (e.g., cheat grass). To mitigate these threats and future changes in the climate to big sagebrush (*Artemisia tridentata*), restorationists require a knowledge base and tools to inform them of the most appropriate seed sources to plant to greatly enhance the success of restoration under contemporary and future climates.

This project develops climate-responsive seed transfer zones based on associating plant quantitative traits and ecophysiological data from common gardens to the climate of the seed source.



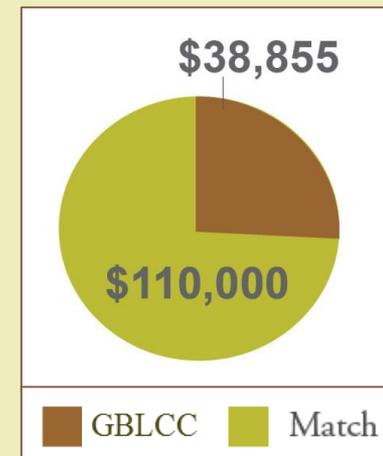
2013

Dr. Bryce Richardson, USDA Forest Service,
Rocky Mountain Research Station

Effects of genotype and management treatments of native and invasive herbs on success of sagebrush restoration

The increase in large wildfires at a time when habitat for Greater Sage Grouse and other species dependent on big sagebrush has also increased has led to substantial needs for big sagebrush seeds. Significant decisions on which sagebrush seed to use and on management treatments that affect competing herb layers on the same restoration sites affect the trajectory of habitat.

This project evaluates how seed source, specifically genotype and climate-of-origin, interact with landscape-scale and replicated treatments (fencing, herbicide application, mowing, and seeding).



Desatoya Mountains Project and the Porter Canyon Experimental Watershed

Piñon (*Pinus* spp.) and juniper (*Juniperus* spp.) (PJ) currently occupy approximately 19 million hectares in the Intermountain West. Prior to 1860, approximately 66% of what is now woodland occurred as sagebrush plant communities.

This watershed scale project:

- Documents the impact of PJ treatments in formerly sagebrush steppe communities on understory vegetation composition, hydrologic function, and surface runoff and soil erosion at the landscape scale.
- Expands the snow monitoring component to understand snow dynamics and timing of plant phenology in cut and uncut treatments
- Secures expertise to analyze existing datasets.



2013

Dr. Keirith Snyder, USDA Forest Service,
Agricultural Research Station

Assessment and Inventory of the Great Basin Climatological Monitoring Stations for Climate Adaptation

Almost any map showing weather and climate stations for the United States shows a conspicuous lack of data in the Great Basin compared to surrounding states in all directions.

This project will:

- Create an assessment summarizing the state of climate monitoring
- Identify both areas where observation coverage is acceptable and where there are gaps in monitoring based on present future climates.

Outcomes from this effort will be incorporated into the scenarios for climate change assessment in the Great Basin (SP2 above).

\$ 75,000 GBLCC

Target of
Opportunity



Dr. Kelly Redmond, Western Regional Climate Center