



Photo: BLM Nevada



Great Basin LCC

Mission

The Great Basin LCC enhances understanding of the effects of changing climate and other natural and human impacts across the region, and promotes the coordination of science-based actions to enable human and natural communities to respond and adapt to those conditions.

The Great Basin LCC is a partnership among public and private groups working to meet large-scale conservation challenges across five states. We support critical conservation research that addresses our science and traditional knowledge priorities. This year, the Great Basin LCC selected six projects in five categories to fund through a competitive process. In addition, we are supporting one traditional knowledge initiative.



Category 1

Develop a strategic multi-scale synthesis of resistance and resilience and a recommended approach for use in restoration and conservation of wet meadows and riparian areas of the Great Basin

A multi-scale resilience-based framework for restoring and conserving Great Basin wet meadows and riparian ecosystems.

Investigators: Jeanne Chambers, RMRS-Reno (Lead); Jerry Miller, Western Carolina Univ.; Peter Weisberg, UNR; Keirith Snyder, ARS; Rosemary Carroll, DRI

This project will develop a strategic approach for conservation of wet meadows and riparian ecosystems and the species they support that focuses on threats caused by natural and anthropogenic disturbance. It uses geospatial and other information on (1) the factors affecting wet meadow and riparian ecosystem

resilience to both natural and human-caused disturbances at the scale of the watershed and meadow or riparian ecosystem, and (2) the distributions and population abundances of at risk species to determine focal areas for management. Decision matrices will be developed based on the characteristics of watersheds, wet meadows, and riparian areas allowing managers to (1) evaluate their relative resilience to disturbance and capacity to support at risk species and (2) determine appropriate management strategies. A process for rapidly assessing meadow ecosystem resilience will be developed, and the approach shared with managers through field tours and workshops.

Category 2

Synthesize findings and recommendations from common garden experiments that can be used to develop and refine native seed and plant transfer guidelines for current and forecasted climates

What Do We Know About Seed Transfer in the Great Basin? A synthesis of existing knowledge and identification of knowledge gaps.

Investigators: Francis Kilkenny, RMRS-Boise (Lead); Elizabeth Leger, UNR

Establishing native species from seed is challenging, and using the best-adapted seeds for particular locations is important for achieving restoration goals. A diverse science team will review the existing literature, summarizing what is known about the scale and prevalence of local adaptation in the Great Basin and assess current practices for determining seed transfer zones, describing benefits and limitations of different approaches. Through the reviews, the team will identify gaps in knowledge and opportunities for addressing these gaps, and determine best-practices for the creation of high quality seed transfer guidelines in a rapid and efficient manner.

Category 3

Examine the effects of fragmentation from proposed fire and fuels management actions

Quantifying the combined effects of climate, fire, and treatments on the connectivity and fragmentation of wildlife populations across the Great Basin.

Investigators: Samuel Cushman, RMRS-Flagstaff (Lead); Valerie Horncastle, Northern Arizona Univ.; Kathy Zeller, Univ. of Mass.

This project will evaluate the effects of vegetation treatments on population connectivity, genetic diversity and gene flow of wildlife species across the Great Basin. The researchers will use a dynamic landscape model to simulate fire and treatments, allowing each to vary by type (e.g., juniper removal, prescribed fire), extent, and influence on vegetation and fuels. They will develop scenarios reflecting current conditions and future scenarios based on proposed treatments and predicted future climate. They will model the effects of these scenarios on the extent and pattern of natural vegetation types and use existing information from the literature to parameterize landscape resistance models for various species under each scenario. Finally, they will use the UNICOR landscape connectivity model to predict core areas, corridors and fracture zones for each species across a range of realistic dispersal abilities.

Category 4

Evaluate the multi-scale (e.g., pasture to range-wide) effects of grazing regimes, both domestic and wild, on sage-grouse habitats and populations in the Great Basin

Effects of spring cattle grazing on sage-grouse demographic traits.

Investigators: Courtney Conway (Lead) and Karen Launchbaugh, Univ. of Idaho; Shane Roberts, IDFG; Paul Makela, BLM.

This project builds upon field experiments that began in 2014 to evaluate the effects of spring cattle grazing on sage-grouse habitat selection, insect abundance, and sage-grouse demographic and behavioral traits. The research team is examining the relationship between cattle grazing and sage-grouse demography at multiple spatial scales: microhabitat (nest site), subpasture, pasture, and allotment. They are also comparing three experimental grazing treatments (i.e., grazing regimes) 1) forage removed via spring-only cattle grazing; 2) forage removed via spring and fall cattle grazing, and 3) no livestock grazing for at least four consecutive years. They include the duration of spring cattle grazing in the analysis to account for the slight variation in turn-out dates and duration of spring grazing among allotments which may influence the extent to which spring grazing affects sage-grouse populations. They also measure insect abundance and the following sage-grouse habitat characteristics, both before and after experimental changes in cattle grazing intensity: sagebrush canopy cover and height, cover and height for other shrub species, and cover, height, and percent biomass removal of each species of grass and forbs.

Category 5

Analyze the effects associated with pinyon and juniper treatments on non-target species at a landscape level

Measuring the regional impacts of pinyon and juniper removal on insect, bat, and reptile communities.

Investigators: Kevin Shoemaker, UNR (Lead); Jason Williams, NDOW; Gail Collins, FWS; Bryan Hamilton, NPS; Matt Forister, Chris Feldman, Thomas Dilts, and Peter Weisberg, UNR

As part of a coordinated effort for managing Greater sage-grouse habitat, thousands of acres of pinyon and juniper woodlands (PJ) have been targeted for removal on lands managed by the Bureau of Land Management and the U.S. Forest Service. The investigators propose to quantify how PJ woodland removal alters vegetation community structure and how such shifts potentially cascade through insect and small vertebrate communities at small to large spatial scales. They will test the effects of planned PJ removal treatments on **insect** communities and the **reptile** and **bat** species that depend upon them, using a rigorous before-after-control-impact experimental design that spans the Great Basin in Nevada. They will also identify environmental factors driving observed multi-species responses.

Multi-scale assessment of wildlife response after juniper removal in a sagebrush steppe landscape.

Investigators: Tracey Johnson, Univ. of Idaho (Lead); Doug Shinneman, David Pilliod, and Todd Katzner, USGS

This research will evaluate the effects of pinyon and juniper removal in support of greater sage-grouse while accounting for influence of treatment type, phase of pre-removal woodland development, and landscape-level variables on **avian** and **mammal** community composition and abundance, potential changes in the predation risk for greater sage-grouse, and vegetation characteristics relevant to wildlife habitat. The researchers will study the wildlife impacts of Idaho's Bruneau-Owyhee Sage-grouse Habitat project that will remove approximately 600,000 acres of juniper across a landscape of ~1.5 million acres over the next 15 years to reverse sage-grouse habitat loss caused by woodland encroachment. By monitoring the effects of the project on wildlife, they will address the following questions: 1) How will removal of junipers affect



distribution and abundance of PJ and sagebrush-obligate species?, 2) How will juniper removal affect the abundance or activity of more generalist species, including those identified as important predators of sage grouse?, and 3) What are the key environmental and vegetation conditions that most influence distribution and abundance of both groups of species?



Traditional Knowledge

In addition to the six projects selected from the 2016 Notice of Funding Opportunity, the Great Basin LCC is partnering with the USGS Northwest Climate Science Center to support the following project:

Building tribal capacity for climate change vulnerability assessment.

Investigator: Meade Krosby, Univ. of Washington (Lead).

This project will address limited tribal capacity for vulnerability assessment by providing guidance and data tailored to the needs and capacities of Northwest and Great Basin tribes. Specifically, the project will: 1) Make the vulnerability assessment process more accessible to tribal staff by providing online guidance materials targeted to tribal needs and capacities; 2) Address the demand for climate data at the scale of tribal decision-making by providing downscaled climate data and climate change summaries for tribes; and 3) Support tribal staff through the vulnerability assessment process via workshops and a webinar to provide training on the use of project resources and datasets, and by staffing a Tribal Climate Technical Support Desk to provide rapid response to relevant queries. These objectives will be accomplished in consultation with an advisory group consisting of representatives from regional tribes and tribal organizations. The team will also work with existing tribal knowledge-sharing networks to connect project products and training opportunities to a broad range of tribal communities. Together, these activities will promote the ability of tribal communities to respond to climate-related threats, enhancing tribal and regional resilience to change.



LANDSCAPE
CONSERVATION
COOPERATIVES



Photo: BLM Nevada

Get Involved!

The Great Basin LCC is always looking for new ways to collaborate and advance landscape-scale conservation in the Great Basin. Please contact us any time at info@greatbasinlcc.org.

Learn more about the Great Basin LCC or sign up for a quarterly newsletter at GreatBasinLCC.org.

Great Basin LCC

Steering Committee Organizations

Bureau of Land Management
California Department of Fish and Wildlife
California Tahoe Conservancy
Confederated Tribes of the Goshute Reservation
Duckwater Shoshone Tribe
Eastern Nevada Landscape Coalition
Friends of the Nevada Wilderness
Great Basin Cooperative Ecosystem Studies Unit
Great Basin Environmental Program
Great Basin Research and Management Partnership
Intermountain Bird Observatory
Inter-Tribal Council of Nevada
Nevada Department of Wildlife
Northwest Climate Science Center (non-decisional)
Paiute Indian Tribe of Utah
Southwest Climate Science Center (non-decisional)
State of Utah, Office of the Governor
The Nature Conservancy
Trout Unlimited
Upper Snake River Tribe Foundation
U.S. Fish and Wildlife Service
U.S. Geological Survey
USDA Farm Service Agency
USDA Forest Service