PUBLIC LANDS INSTITUTE
UNIVERSITY OF NEVADA, LAS VEGAS

NORTHERN ARIZONA UNIVERSITY
Ecological Restoration Institute

The Ecological Restoration Institute and the Public Lands Institute Will Use Terrestrial Ecosystem Surveys to Assess Potential Landscape-Scale Treatments in Arizona and Nevada

Resource managers need tools for developing and monitoring restoration prescriptions across large landscapes. A collaborative project between the Ecological Restoration Institute at Northern Arizona University and the Public Lands Institute at the University of Nevada Las Vegas will use the U.S. Forest Service's Terrestrial Ecosystem Survey to assess reference conditions and response functions for possible landscape-scale restoration treatments.

Resource managers need a means of identifying practical management units when working with large landscapes; a method that identifies vegetation-environment relationships based on soils, topography, productivity, and microclimate. This perspective is useful because topography, soils, and microclimate vary across landscapes, with vegetation and productivity responding to this spatial variability. With a map that subdivides large landscapes into units that have similar management needs and will likely respond similarly to treatment, managers can tailor specific treatments to specific parts of the landscape.

The U.S. Forest Service has invested a great deal of money in developing Terrestrial Ecosystem Surveys (TES), and, based on the results of preliminary work with these surveys, we believe that they have the potential to assist land managers implementing landscape-scale restoration projects. We intend to expand this work to enable other land managers (e.g., BLM, NPS, FWS, state, TNC, BIA, tribal lands, private lands) to take advantage of ecological land classifications and resource response functions, in anticipation of landscape-scale work throughout the western Grand Canyon/southern Nevada greater ecosystem.

Three key pieces of reference information in most forest types are historical tree density, pattern, and fire regimes. Ongoing work suggests that both historical density and pattern in ponderosa pine forests is generally predictable among soil types near Flagstaff, Arizona. While not a substitute for site-specific information, these relationships can help land managers understand the variability in reference conditions across landscapes. This information about reference conditions helps support the development of restoration prescriptions by allowing the prescriptions to be tailored to specific sites and ecosystem types. For instance, in areas where natural understory recovery is slow due to infertile soils, prescriptions could include seeding to attempt to more rapidly restore productivity.

A second component of the ERI-PLI project will assess information needs for planning landscape-scale forest restoration in the Spring Mountains of southern Nevada.

In the second part of the project, we will assess information needs for landscape-scale forest restoration at the Spring Mountains National Recreation Area District of the Humboldt-Toiyabe National Forest. We will take advantage of two existing resources. First, we have made preliminary observations of forest structure and potential fire history at ten sites spanning a range of vegetation from pinyon-juniper through mixed conifer forests. Second, we will tie these observations and new observations to a TES that the Forest Service and NRCS are currently completing for the NRA. We will conduct more detailed analyses of our observation sites and expand observations to include different TES sites. When completed, we will write a report outlining the information needed to determine reference conditions (forest structure and fire history) in the Spring Mountains and make suggestions for research about how to obtain that information.

To determine the information needs for landscape-scale forest restoration in the Spring Mountains, we will use tested methods to reconstruct the historical forest structure at ten or more demonstration sites (2.5-acre plots) encompassing a range of TES types on the district. By also making rough observations about potential fire regimes (which could be examined in more detail in future research), we will be able to provide examples of the types of reference conditions occurring on the district. We will also measure current forest structure to determine the difference between reference conditions and current forests as a basis for restoration. We will use this information to provide recommendations for gathering further information that could assist managers in implementing strategically located, landscape-scale treatments. We anticipate that the difference between reference and current conditions will vary among TES types, so we will be able to provide suggestions for what TES types require the most treatment. This may assist managers in prioritizing portions of the landscape for treatment using a landscape perspective.

We believe this landscape-scale perspective is important for several reasons. First, many organisms require large areas in order to exchange genetic material and, thus, sustain evolutionary processes among populations. Second, large areas require treatment for tangibly reducing hazardous fuels in order to protect habitat from severe fire. Third, treatments required to restore landscape health as a whole may be suitable on some areas of the landscape but not on others. For these and other reasons, developing restoration prescriptions and effective monitoring strategies suitable for large landscapes is an indispensible research and adaptive management need.

The ERI team, led by Executive Director, Dr. W. Wallace Covington, and the Public Lands Institute group, led by Dr. Scott Abella, have been working together for several years to better understand the dynamics of dry, frequent-fire forests in the American Southwest.

FOR MORE INFORMATION

Contact:
Dr. Scott Abella, Program Manager, Public Lands Institute, University of Nevada Las Vegas, 4505 S. Maryland, Parkway, Las Vegas, NV 8915-2040, 702-895-5163, Scott.Abella@unlv.edu.
Dr. Wally Covington, Executive Director, Ecological Restoration Institute, 928-523-7182, wally.covington@nau.edu.