



NORTHERN ARIZONA
UNIVERSITY

Ecological Restoration Institute

Strategic Plan 2015-2020

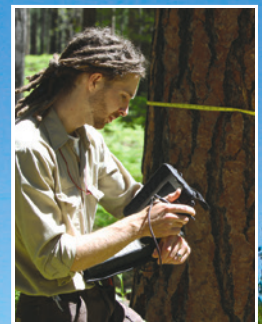


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Introduction

The Ecological Restoration Institute (ERI) at Northern Arizona University (NAU) is nationally and internationally recognized for expertise and leadership in science-based forest restoration and fire. The ERI is a mission driven research program bridging the gap between research and application. When fires burn catastrophically, the resulting economic and natural resource damage cascades through all sectors of society. The consequences are both immediate and long-term — challenging the very well-being of rural communities, water supplies, and the recreational assets on which rural communities and economies depend. The ERI mobilizes the unique abilities of the university to research, translate, transfer, and apply solutions to this critical problem facing the West.

ERI faculty, staff, and students possess the diverse skills that are necessary to tackle all facets of the forest health problem. For example, faculty, undergraduate, and graduate students conduct field work, primary research, and monitoring to test forest restoration approaches. ERI research staff and affiliated faculty design research in order to provide emerging, best available science to land management professionals and key stakeholders. Finally, professional staff translate and transfer new knowledge using communication tools and services targeted to strategic audiences.

Schultz Fire on the San Francisco Peaks north of Flagstaff in 2010. Photo by Brady Smith, Coconino National Forest, USDA Forest Service



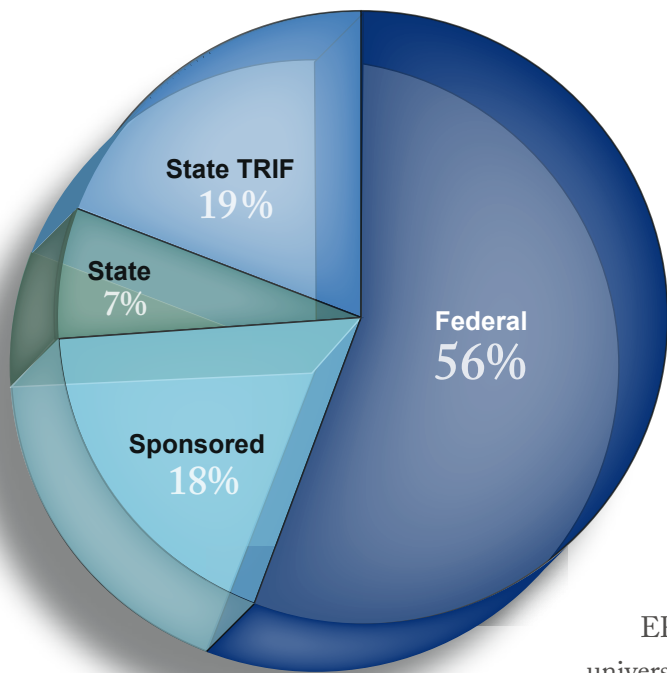
Post-fire flooding from the Schultz Fire. Photo courtesy of the ERI



The ERI is authorized by the United States Congress

Congress authorized the ERI in 2004 to be one of three ecological institutes (referred to as the Southwest Ecological Restoration Institutes, or SWERI) serving the Southwest. In 2005, the ERI and its sister institutes were chartered by the Western Governors' Association. In 2009–2010, the Meridian Institute conducted a congressionally mandated third-party review of the Institutes to determine if they were meeting the purposes of their enabling legislation. Referring to the ERI, the report states that **“no other existing entity has the capacity or mandate to carry out landscape-scale forest restoration.”** Individuals interviewed for the report expressed accolades for the work of the ERI. According to one individual, **“it is impossible to have a conversation with any U.S. Forest Service employee about restoration without some reference to ERI’s work.”** The opportunity to see different prescriptions tested by ERI (including the changes in ecological and resource conditions over time), is widely perceived by interviewees as one of the most tangible contributions of the ERI. Several interviewees cited ERI’s wealth of useful publications as **“an outstanding resource for forestry professionals everywhere.”**

In addition to federal appropriations, the ERI receives: NAU base funding, state Technology, Research and Innovation Funding (TRIF) appropriations, federal project dollars, and various competitive grants. In 2014, the ERI received funding from the Salt River Project (SRP) and the 2015 NFL Super Bowl Host Committee to study hydrologic responses to forest thinning.



The ERI contributes to achieving the goals established by the Arizona Board of Regents (ABOR)

The ERI contributes to goals established for NAU by ABOR in their 2014–2018 Strategic Plan in the areas of educational excellence, research excellence, and workforce and community. When it comes to providing science support for restoring the ecologic and economic health of forested landscapes and solving the mega-fire crisis, the research and service of ERI and NAU are unique among the three Arizona universities. The ERI is recognized by the state legislature, local and county governments, and businesses as a bright example of exceptional university performance in service to the citizens of Arizona.

Vision

The Ecological Restoration Institute will provide science-based services that directly contribute to the comprehensive restoration and conservation of forested and woodland landscapes in the West.

Mission

The ERI will serve as an objective leader in primary and secondary ecological and social science, scholarship, information transfer, collaborative efforts, policy analysis, and workforce education to support landscape-scale restoration of forests and woodlands in the West.



ERI Supports Watershed Restoration Research

ERI in partnership with NAU’s School of Earth Sciences and Environmental Sustainability, the Salt River Project (SRP), and others has been developing critical research in watersheds to support watershed restoration, resiliency, and function.

Strategic Plan

2015–2020

The last 15 years of restoration and research demonstrate that science-based treatments in ponderosa pine forests are achieving ecological restoration goals while simultaneously reducing the risk of unnatural wildfire to communities. However, restoration is in a race against time and the anticipated effects of climate change.

More research is needed in previously understudied forest types to identify appropriate restoration approaches in a changing climate. Post-fire rehabilitation will require new management actions in response to hotter conditions. To be successful, more research and application is needed at the landscape scale to configure treatments to reduce the probability of mega-fire and to identify monitoring frameworks that will detect change and enable adaptive management. From the human dimension angle the ERI, in partnership with affiliated faculty, will continue to analyze the economics of restoration, public attitudes, and facilitate innovative policy approaches to accelerate restoration.

The 2015–2020 Strategic Plan has four goals that build from the ERI core strengths of ecological and social science, land management agency experience, and science translation and transfer capacity. However, the ERI will be flexible in order to shift direction when changing circumstances demand a new focus on emerging discoveries and critical audiences to accomplish landscape scale forest restoration.



Goal One

The ERI will contribute to the body of ecological and social science required to advance restoration of western forests and woodlands.

Objectives for 2015–2020

- Conduct research to address critical knowledge gaps in restoration of western forest ecosystems.
- Conduct research to address long-term restoration needs of post-fire landscapes.
- Compile and synthesize existing research using systematic reviews, literature reviews, and other methods to answer management questions.
- Contribute to the understanding and implementation of landscape-scale assessments and monitoring methods and goals.
- Conduct rapid assessments (RAPs) designed to understand the natural range of variability at proposed treatment locations in order to inform environmental review documents and prescription design.
- Monitor watershed and other natural resource responses to landscape-scale restoration.
- Analyze market and nonmarket economic consequences of restoration and fire.
- Examine and report on the influence of laws and policy towards achieving landscape-scale restoration.

Past Accomplishments

- Implementation and re-measurement of ten Long-term Ecological Assessment and Restoration Network (LEARN) sites throughout the West. LEARN allows researchers and land managers to compare the effects of forest restoration treatments on all aspects of ecosystem dynamics across a variety of forest types from pinyon-juniper and ponderosa pine to warm-dry mixed conifer.
- Establishment of the first landscape-scale ecological restoration project at Mount Trumbull on the Arizona Strip. This research, which began in 1995 in partnership with the Arizona Game and Fish Department and Bureau of Land Management, measured wildlife responses to restoration treatments. The results were instrumental to building support for restoration among wildlife professionals and interested citizens.
- In 2013, the ERI in cooperation with Dr. Yeon-Su Kim, produced “The efficacy of hazardous fuel treatments: A rapid assessment of the economic and ecologic consequences of alternative hazardous fuel treatments: A document for policy makers.” The results were presented during a Congressional Hearing, to the Office of Management and Budget and to the Congressional Research Service. The findings were instrumental in compelling the Office of Management and Budget to restore funding for restoration treatments.
- More than 350 articles published in peer-reviewed journals.

Goal Two

The ERI will seek to improve the quality of science-based ecological restoration treatments through the translation and transfer of best available science to key audiences.

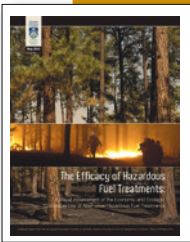
Objectives for 2015–2020

- Interpret scientific findings for specific audiences including land managers, citizens, businesses, and policy makers using publications, presentations, workshops, social media, websites, and one-on-one consultation.
- Test emerging communication tools with key audiences.
- Expand outreach to include underserved populations, including Native American tribes.

Past Accomplishments

- The ERI has produced 32 Working Papers that are designed to provide interpretation and guidance for using best available science; 66 Fact Sheets with short synopses of scientific papers and their management outcomes; and 20 White Papers exploring the intersection of policy, economics, and the human dimensions of restoration.
- Each year, the ERI presents scientific information at workshops, on field trips, and in other forums designed to educate diverse audiences. On average, the ERI provides more than two dozen field trips and presentations.

ERI Publishes Groundbreaking Economic Analyses



- ERI completed “The Efficacy of Hazardous Fuel Treatments” for the U.S. Department of Interior, Office of Wildland Fire. The study determined the ecological and economic effectiveness of forest restoration treatments.



- ERI published “A Full Cost Accounting of the 2010 Schultz Fire” in partnership with the NAU W.A. Franke College of Business’ Rural Policy Institute and Coconino County. The study was a sobering analysis of the full cost of fire and post-fire flooding, and how the cost impacts the public and private sectors.



NAU School of Forestry grad and former ERI student Katelynn Jenkins has since worked with The Nature Conservancy in North Carolina using her knowledge of fire ecology to help restore longleaf pine forests. Photo courtesy of Katelynn Jenkins

ERI Gives Students the Tools They Need to Succeed

Working as an Undergraduate Research Assistant for the Ecological Restoration Institute (ERI) was definitely one of the highlights of my college experience. To this day, I get excited about dendrochronology samples in museums and universities. I worked two full field seasons and about four years in the dendro lab, which gave me invaluable experience and helped me get a position on the Fire Effects Crew at Grand Canyon National Park. I earned my Bachelor of Science degree in Forestry in 2013 with two certificates: Ecological Restoration and Wildland Fire Ecology and Management. My interests in fire ecology and restoration were fostered by my work with ERI and Grand Canyon National Park. I completed a senior research project on the effects of jackstrawing burned aspen stands to protect aspen regeneration, and after college went on to work in primary firefighting/prescribed burning positions in North Carolina and Grand Teton National Park. Next summer I hope to work on an engine in western Montana and return to graduate school within two years to continue studying forest restoration and fire ecology.

—Katelynn Jenkins, Wildland Firefighter and Ecologist

Goal Three

The ERI will help identify, experiment with, and facilitate novel approaches for funding landscape-scale restoration.

Objectives for 2015–2020

- Facilitate the development of novel funding approaches to pay for ecological restoration.
- Provide assistance and guidance for exploring methods for the utilization of biomass.
- Facilitate landscape-scale assessments and restoration beyond the borders of National Forests.
- Advise new efforts to create restoration-based forest carbon offsets.

Past Accomplishments

- The ERI is playing a supporting role to the City of Flagstaff as it implements the Flagstaff Watershed Protection Program. This program is the result of passage of a \$10 million bond for the sole purpose of restoring Flagstaff-area critical watersheds. The ERI provides technical support, facilitation, and monitoring.
- The ERI is a campus champion for locating a biomass-based energy facility on the NAU campus. Though still in the exploratory phase, this biomass plant can provide multiple benefits including: energy generation on campus, reduction of the NAU carbon footprint, and a destination for restoration by-products. By burning biomass in a power plant, as opposed to the forest, the community is spared the negative impacts of smoke.



It is impossible to have a conversation with any U.S. Forest Service employee about restoration without some reference to ERI's work.

— SWERI 5-Year Assessment Report by the Meridian Institute, U.S. Institute for Environmental Conflict Resolution, and USDA Forest Service Southwestern Region

Goal Four

The ERI will contribute to achieving the goals established for NAU by the Arizona Board of Regents.

Objectives for 2015–2020

- The ERI will continue to attract research and program funding in excess of \$1 million annually from diverse sources.
- The ERI will provide quality, paid research experience for undergraduates and graduates to prepare them as contemporary land managers or to pursue further education.
- The ERI will continue to maintain a national profile of excellence in the field of forest restoration and fire through scholarly activities, media, testimony, and participation at national meetings and other venues.
- The ERI will assist other faculty by funding relevant contributions to resource management and human dimension research.

Past Accomplishments

- The ERI has brought more than \$35,000,000 in federal appropriations, federal subcontracts, competitive grants, and other sources to NAU.
- Dr. Wally Covington and the ERI staff are nationally recognized experts by the media. Since 2012, the ERI/NAU has appeared in more than 70 news articles, many of which were subsequently syndicated. This represents important free advertising for NAU.
- The ERI has supported more than **300 undergraduate and graduate students**, 67 of whom transitioned to professional employment or graduate student programs during the seven years this was reported to ABOR. At least **600 working professionals** have attended continuing or professional education programs led by the ERI.
- The ERI has shared funding with faculty across campus at the School of Forestry, W.A. Franke College of Business, Department of Politics and International Affairs in the College of Social and Behavioral Sciences, School of Earth Sciences and Environmental Sustainability, and the Landscape Conservation Initiative (Formerly ForestERA), among others.
- More than **200 partnerships** with governments, organizations, and others in Arizona, the West, and the nation.

