



Ecological Restoration Institute
2011-2015 Strategic Plan
June 2011

I. Introduction

In 1997 Dr. Wally Covington, Executive Director of the Ecological Restoration Institute testified before Congress that it was imperative to restore fire adapted forests at the landscape scale within the next 30 years or face serious ecological and economic consequences. At that time, ecological restoration and managing at the landscape scale were novel concepts, policies to support the work were just unfolding, environmentalists were dubious and federal land managers were struggling to respond to a major paradigm shift away from a focus on extractive resource use.

For the ERI, the mid and late 90s were a time of testing new ecologically-based mechanical thinning and burn treatments at G.A. Pearson Natural Area, Mt. Trumbull and elsewhere. These were followed by some of the first treatments designed to test outcomes of collaborative planning by the Grand Canyon Forests Partnership (later to be renamed the Greater Flagstaff Forest Partnership) and the Natural Resources Working Group in the White Mountains. Early experiments were embraced in concept, but criticized by some as “logging” because a restored forest looked radically different from the overstocked, contemporary forests typifying most of Northern Arizona. Some in the wildlife community were also skeptical that restoration could benefit wildlife because the aggressive cutting of large trees in the past contributed to the decline of some wildlife species.

In 2011 it is a very different story. The unprecedented catastrophic fires of the late 90s and early 2000s were the first shocking validation that forests would manifest the changes predicted by Covington. During the last 4 years Congress, environmentalists and the federal agencies began embracing an agenda of ecological restoration at the landscape scale. There is broad support for restoring fire dependent forests and fortunately a substantial body of science to support it. The ERI has established a reputation of leadership in scientific research, translation and application that realizes our mission, “to serve as an objective leader in research, scholarship, and education and in collaborative efforts to plan and implement restoration treatments for frequent-fire forest and woodland landscapes in the Interior West.”

However, despite so much progress there are persistent barriers to restoring federal forests. Public funding is still required to accomplish restoration because the value of restoration byproducts is too low to offset cost. The collapse of harvest infrastructure, wood product markets and a bad economy depress investment in utilization, exacerbating the problem of what to do with so much small diameter wood. The federal agencies are in a period of transition that includes reduced appropriations, downsizing, and retirements that erode expertise and undermine their ability to manage resources at the scale of the problem. In addition, when work is done, management prescriptions manifest a wide spectrum of forest management values from the historic (fiber production) to the urgent (hazardous fuels

reduction) to the long term (ecological restoration). Figuring out the most prudent way to manage in the face of rapid climate change is unclear to managers. Finally, the slow process of building enough trust between the federal land managers and stakeholders in order to work efficiently at scale can be painfully slow, arduous and frustrating.

II. The Importance of the ERI

The ERI evolved from research work begun at NAU in the late 1970s. During the 1990s the Arizona Board of Regents endorsed two decision packages to provide consistent state funding for the Ecological Restoration Program. The ERI was authorized by Congress in 2004 to be one of three ecological institutes serving the Southwest (Referred to as the Southwest Ecological Restoration Institutes or SWERI). 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 had 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 by ERI. Several interviewees cited ERI’s wealth of useful publications as “an outstanding resource for forestry professionals everywhere.”

Demand for the services provided by the ERI has never been greater. In fact, it is the interdisciplinary configuration of services that makes the ERI unique. According to the five year review, “the Institute’s service is enhanced by having high-quality knowledgeable staff and by having public relations, policy, and community outreach capacity—the kinds of people who are not typically employed at research organizations.”

Finally, the five year review noted that not only should funding be increased but interviewees feel that, “their [the Institute’s] scope may need to be broadened to accomplish landscape restoration at a larger scale.”

The Relationship of the ERI to the Goals of NAU

The ERI mission strikes to the heart of the NAU Goal to elevate the environmental, economic, social and cultural vitality of rural Arizona. The ERI blends rigorous scientific research with service to communities in order to solve the significant environmental problems created by unhealthy forests. In so doing, jobs are created in the private sector, green energy development results, costly wildfires are averted and benefits accrue to a full spectrum of natural resources that include wildlife habitat, recreation and water. NAU students who work with the ERI are recognized as well- trained natural resource professionals ready to enter the work force. In addition, the highly visible work of the ERI in rural communities builds support for NAU among rural citizens, businesses, and elected officials. It reinforces the message that NAU cares about rural citizens and their communities.

The ERI will continue to produce rigorous, peer-reviewed research equal to any research institution in the country. The research of the ERI is frequently used to validate the legitimacy of

NAU receiving research dollars during negotiations with Arizona State University and the University of Arizona. The School of Forestry and ERI combine to be one of the premiere natural resource programs in the state and we are committed to maintaining that leadership position.

Finally, we recognize that overall state investment in NAU and higher education has declined since the 1980s—a situation that is unlikely to change in the foreseeable future. In response to the need to diversify and leverage funding, the ERI pursued a congressional authorization as one way to leverage state dollars and increase funding. Over the past 12 years the ERI has consistently leveraged federal to state dollars on a 2 to 1 match with some years as high as 8 to 1. In addition, the high quality research of the ERI attracts competitive research dollars from grantors such as the National Science Foundation and Joint Fire Science Program. We will continue to look for new opportunities to diversify funding in order to maintain high quality programs and services.

Emerging Opportunities

The passage of the Collaborative Forest Landscape Restoration Act (CFLRA) in 2009 and the pilot projects it endeavors to motivate are further evidence of a change in the forest management paradigm. The CFLRA embraces landscape scale restoration but also relies heavily on collaboration to build support for action. The CFLRA authorizes the selection of landscape scale pilot projects in all regions of the Forest Service. In the first year, nine of the ten pilots were selected in the West and all ten included fire dependent forest types.

The ERI and our sister institutes in SWERI (the Colorado Forest Restoration Institute at Colorado State University (CFRI) and the New Mexico Forest and Watershed Restoration Institute (NMFWR) at New Mexico Highlands University) are uniquely positioned to assist the CFLRA projects. SWERI is the only federal program authorized to provide assistance to landscape scale planning and restoration. Our extensive scientific and management knowledge in fire-adapted forests, understanding of monitoring at different scales, combined with the capacity to translate and transfer science to diverse audiences, positions SWERI to be crucial partners in collaborative efforts to restore large landscapes.

The rapidly changing land management workforce resulting from retirements, downsizing and ongoing transfers generates a need for the knowledge services the ERI can provide to land management agencies. In addition, adaptive management will be difficult to implement if there isn't a consistent entity to help bring past management actions, lessons learned, and monitoring results back into the management framework. Knowledge development and monitoring are core strengths of the ERI and will be critical from the project to landscape scale.

Finally, primary research is always needed. For example, there is an urgent need for more information on how to restore both ponderosa pine and dry mixed conifer systems under different climate change scenarios. Rehabilitation following fires the size and severity of the Wallow Fire require new research designed to evaluate the efficacy of different post-fire restoration actions. In order to ensure that our research is relevant, the ERI will continue to conduct rolling needs assessments with diverse stakeholders and land managers to identify knowledge gaps. The ERI intends to explore other avenues of knowledge discovery, such as conducting evidence-based systematic reviews that analyze and interpret known scientific information for application by managers. Systematic reviews also help identify new areas where

primary research is needed. The ERI is a leader in restoration science and will continue to provide rigorous research to inform emerging needs.

III. Understanding the ERI

In 2011 the vision, mission and core values of the ERI remain relevant. However, the context for our work is evolving and in response to that the ERI will evolve too.

Vision

The ERI will provide science-based services that directly contribute to the comprehensive restoration and conservation of fire-adapted forested and woodland landscapes in the West.

Mission

The ERI will serve as an objective leader in primary and secondary biophysical and social science research, collaborative efforts, scholarship, information transfer, and workforce education to support the restoration of fire-adapted forested and woodland landscapes in the West.

Core Values

The Ecological Restoration Institute is an applied research and development institution born out of deep commitment to restoration of degraded ecosystems and the obligation to pass along ecologically healthy communities to future generations. We are dedicated to combining traditional best practices of land management with new and innovative scientifically informed strategies that help nature and communities heal and that reconnect people to the land through sustainable, ecologically informed resource use. We view humans as members of a community of organisms with a range of unique niches, roles, and responsibilities in their ecosystems.

We will conduct all activities with objectivity, open-mindedness, flexibility, honesty, and full public accountability. We are dedicated to maintaining a high degree of excellence by acquiring thorough knowledge, conducting carefully reasoned analysis, and systematically checking the application of the outcomes against factual evidence. We embrace the principles of adaptive ecosystem management and learning by doing. Our work will proceed with humility and respect for all life forms.

We will actively promote interdisciplinary and integrative approaches to developing solutions, and are committed to translating those solutions into action.

We strive to treat all human communities with respect, integrity, and appreciation for their different perspectives.

We are committed to creating an intellectually and culturally diverse workplace where knowledge sharing, innovation, and creativity are encouraged, and where all individuals can feel valued, supported, and encouraged to achieve their full potential.

IV. Managing for Flexibility to Meet Existing and New Demands

In 2011-2015 the ERI has six goals that build from our core strengths of biophysical science, agency experience, and science translation and transfer capacity. However, how we configure resources associated with these strengths will be flexible and adaptive in order to increase our capacity to discover, translate and transfer science to key audiences. There is no other entity in the West with the legislative mandate of the ERI and our sister institutes at New Mexico and Colorado to work with partners to increase the scientific robustness of restoration. During the next five years we will strive to continue to be viewed as essential to the development of science-based restoration treatments. The actions identified under each goal indicate the specific direction we will take.

In response to the downturn in the economy and the uncertainty facing public funding in the near term, the ERI will strive to maintain a revenue stream of between 2-2.5 million in 2011 and to increase funding in subsequent years. In order to maximize efficiency, the ERI will coordinate with our sister institutes in order to prevent unnecessary redundancy and maximize complementarity as we deliver services in the West. As additional funds become available the ERI will add staff and seek partners at other non-SWERI institutions to help deliver site-based services across a broader geographic region.

The section below identifies the six goals of the ERI for 2011-2015.

Goal 1: Biophysical Science

The ERI will develop rigorous, biophysical science and science synthesis to inform the restoration of the ecological health of fire-adapted forests and related ecosystems at the landscape scale. In addition, we will enter a new field of research designed to support post-fire restoration-based rehabilitation. We will:

- Use an evidence-based approach to inform research
- Conduct primary biophysical research to address management knowledge gaps
- Prepare evidence-based systematic reviews at multiple levels of detail
- Design, implement and analyze biophysical monitoring at multiple scales
- Provide GIS-based decision support for landscape scale management and monitoring

Context

Over the past twenty years the ERI invested significantly in the development of rigorous research, peer reviewed literature, demonstration sites, and monitoring to create a scientifically robust knowledge base to inform restoration treatments in ponderosa pine dominated ecosystems. The ERI is a recognized leader in the development and testing of science-based treatments to restore ponderosa pine forests and we will continue our lead in that area through monitoring and research at existing and new sites, data analysis and publication. However, other important information gaps require ERI attention. Although not an exhaustive list, examples include: dry mixed conifer restoration and restoration approaches for other degraded forest types, managing for climate change, and post-fire rehabilitation and restoration.

Evidence-based systematic reviews are a comprehensive approach to synthesizing what is known about a management question and determining an appropriate course of action. In addition to the “full blown” systematic review, ERI is developing additional approaches that

include a rapid literature assessment and an intermediate assessment. These analyses are needed to help deliver the best available science to inform management action. A key element of the evidence-based approach is working closely with information users to identify the questions, the ideal delivery format, and the timeline that will make them useable and consistent with agency needs. In addition to written sources of information, expert knowledge can be analyzed and synthesized as well (e.g., the Delphi approach).

Creating a practical and affordable monitoring framework to assess biophysical responses to restoration is one of the greatest needs identified by CFLRA projects and the land management agencies. The ERI will build from its considerable expertise in this area to help identify and implement monitoring approaches appropriate from the stand level to the landscape scale across the West.

The ERI will examine expanding services to assist CFLRA projects with landscape scale analysis and monitoring. Stakeholders and the land management agencies struggle to prioritize treatments and develop monitoring at large scales. The ERI, in combination with our sister institutes, have the expertise to assist stakeholder groups to use combinations of field plots, remote sensing, and GIS to develop management scenarios and monitoring at large scales.

Goal 2: Social Science

The ERI will develop knowledge-based information and provide support to address social, economic, and political challenges to restoration at the landscape scale. We will:

- Conduct primary and secondary research on critical topics that include: collaboration, utilization, ecosystem services, NEPA, federal policy, and economics
- Provide support for workforce development
- Support local, forest-based economic growth

Context

During the next five years, the ERI will respond to social, political, and economic issues through a configuration of existing capacity, subcontracts, and collaboration with our sister institutes. Presently, the Colorado Forest Restoration Institute (CFRI) excels in facilitation, support for collaboration, and multi-party monitoring. The New Mexico Forest and Watershed Restoration Institute (NMFWRRI) is strong in workforce development and assistance to tribes. Where these resources can be used to benefit partners in our service area we will strive to do so.

Improving the efficiency and effectiveness of conducting requirements under NEPA is crucial to accelerating action, reducing cost and operating at greater scales. The ERI already contributes to improving this process by offering technical assistance to the Forest Service. However, navigating the socio-political issues that impact NEPA processes presents novel challenges. The ERI will seek opportunities to analyze problems, develop solutions and support experiments to improve the environmental review process.

The ERI would like to provide more support for job and business development to support restoration over the next five years.

Goal 3: Outreach

The ERI will assist land managers, practitioners, and stakeholders to design and implement science-based forest restoration treatments at the project to landscape scale. We will:

- Provide administrative support and technical assistance for the stakeholders of the Four Forest Restoration Initiative (4FRI) that include: science and monitoring, communication, collaboration assistance, and administration
- Provide technical support to the Forest Service through NEPA and implementation of the 4FRI
- Provide technical assistance for land managers and tribes that include: rapid assessments (RAPS), training, workshops and field trips
- Support collaborative efforts under the CFLRA in the West

Context

During the next five years the ERI will continue to provide science and technical support to land managers, tribes, stakeholders, and decision makers in a format and language that ensures clear understanding and straightforward application. Our first priority will be to deliver these services in Arizona and in partnership with our sister institutes at CFLRA sites in New Mexico and Colorado. These sites will provide the opportunity to examine recurrent needs and to test products and solutions. From these sites we will leverage our knowledge for the benefit of other CFLRA sites in the West.

Given limited staff capacity, our work with land managers will seek to identify strategic opportunities to transfer knowledge. However, where resources are available, the outreach and research and development staff will coordinate delivery at the tactical and project level to produce RAPS, deliver training, and provide other services that include building capacity within the agency to conduct rapid assessments and historical reconstruction.

Goal 4: Science Translation, Transfer and Communications for the General Public

The ERI will translate and transfer new and existing biophysical science and social science research for stakeholders, land managers and the general public. We will:

- Maintain and update the ERI and SWERI website and revise it to take advantage of new approaches to learning and emerging social media
- Develop and deliver written products that respond to information gaps and requests
- Identify and test information transfer approaches to address agency turnover and the need for continuing education
- Experiment with expanding publication reach and relevance to the West
- Experiment with new forms of electronic outreach and social media
- Market restoration to build support for restoration by the general public
- Expand the electronic library (over 600 items, web-based), and video archive (online and hard copy)
- Create an image gallery, which includes treatment photos of forest restoration

Context

The translation and transfer of new knowledge via the website and publications are core strengths of the ERI. However, the modes of information delivery are rapidly changing, while

agency retirements and transfers require identification of new re-education strategies. Our knowledge transfer activities will focus on adapting to changing technology and needs.

Treating forests at the landscape scale have the potential to shock the public. Restoration will generate smoke, temporarily diminish aesthetic values and lead to a temporary increase in mechanized logging activity. In order to promote the benefits of restoration and to maintain public and therefore political support for treating forests, we will continue an active public education program.

Goal 5: Education

The ERI will contribute to the development of a professional restoration workforce through academic education at the undergraduate and graduate levels and continuing education for professionals. We will:

- Develop a professional restoration workforce through field work and academic education at the undergraduate and graduate levels
- Support undergraduate and graduate education through course work and financial support for undergraduate and graduate research assistants

Context

The ERI provides funds to support undergraduate and graduate students interested in all aspects of ecological restoration. This support provides direct field experience to undergraduates and expands opportunities for faculty who would not otherwise have funding for graduate students. In addition, the ERI participates in continuing education for professionals as one strategy to transfer the best available science to land managers.

Goal 6: Build Institutional Strength

The ERI will identify and implement strategies to increase organization effectiveness. We will:

- Work with the University to maintain revenue and identify new sources of income
- Examine opportunities to increase regional effectiveness by creating and implementing a strategic plan with our sister institutes
- Integrate a project-based organizational structure to directly tie measurable staff responsibilities with project deliverables

Context

The demands for services from the ERI have never been greater. Yet we face an uncertain state and federal economy. During the next five years the ERI will examine and cultivate new sources of revenue in addition to redoubling activity to ensure strong support for public funding.

Much of what the ERI has learned in the Southwest has application in fir- adapted forested landscapes throughout the West. Working with our sister institutes, we will explore opportunities to increase our impact west-wide by implementing high-leverage actions identified through strategic planning.