

# Ecological Restoration Institute Work Plan Fiscal Year 2012

*Revised with edits for the Executive Team Meeting on 3/2/12*

This FY'12 work plan submitted for consideration on January 27, 2012 is revised from a preliminary plan approved on January 21, 2011. The original plan anticipated \$3 million in funding for FY'12. The ERI was directed by the Regional Forester in December of 2011 to revise the work plan downward to \$1.2 million. This revision of the plan describes what can be accomplished with reduced funding and reflects changes that will provide timely responses to new requests.

On October 5, 2004 President Bush signed into law the SOUTHWEST FOREST HEALTH AND WILDFIRE PREVENTION ACT, identifying the Ecological Restoration Institute at Northern Arizona University as one of three Institutes in the Southwest established for the purpose of ensuring the best available science is used in the development, implementation and monitoring of forest restoration treatments. **The FY'12 Work Plan explicitly links each project to the duties described in PL108-317.** Congressional intent was clear, that treatments should incorporate science-based restoration approaches that will simultaneously improve forest health, reduce the threat of unnatural wildfire and provide economic and social benefits to forest communities. To accomplish this goal the statute outlines duties that include:

1. Develop, transfer, apply, monitor, and regularly update practical science-based forest restoration treatments that will improve the health of dry forest and woodland ecosystems and reduce the risk of severe wildfires, in the Interior West;
2. Synthesize and adapt scientific findings from conventional research programs to the implementation of forest and woodland restoration on a landscape scale;
3. Facilitate the transfer of interdisciplinary knowledge required to understand the socioeconomic and environmental impacts of wildfire on ecosystems and landscapes;
4. Collaborate with Federal agencies--
  - a. to use ecological restoration treatments to reverse declining forest health and reduce the risk of severe wildfires across the forest landscape;
  - b. to design, implement, monitor and regularly revise wildfire treatments based on the use of adaptive ecosystem management;
5. Assist land managers in--
  - a. treating land with restoration-based applications; and
  - b. using new management technologies (including the transfer of understandable information, assistance with environmental review, and field and classroom training and collaboration) to accomplish the goals identified in--
    - i. the report entitled '10-Year Comprehensive Strategy: A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment' of the Western Governors' Association;
    - ii. the report entitled 'Protecting People and Sustaining Resources in Fire-Adapted Ecosystems-A Cohesive Strategy' (65 Fed. Reg. 67480); and
    - iii. The National Fire Plan.
6. Provide technical assistance to collaborative efforts by affected entities to develop, implement, and monitor adaptive ecosystem management restoration treatments that are ecologically sound, economically viable, and socially responsible; and

7. Assist Federal and non-Federal land managers in providing information to the public on the role of fire and fire management in dry forest and woodland ecosystems in the Interior West.

The ERI conducts ongoing needs assessments with all affected entities identified by PL108-317<sup>1</sup>. Those entities include: land managers and stakeholders, the Forest Supervisors of the Four Forest Restoration Initiative, a Needs Assessment from the Four Forest Initiative Stakeholder Group, and the SWERI Needs Assessment developed in cooperation with the Rocky Mountain Research Station in Fort Collins, Colorado on January 12-13, 2010. The work plan also includes monitoring and synthesis designed to inform adaptive management with emerging and best available science. The work envisioned in this plan supports Administration, Congressional and Land Management Agency directives that include: ecological restoration at the landscape scale that includes all lands, collaboration, the infusion of the best available science in land management projects, reduction of fire risk to communities and natural resources, and advancing understanding of appropriate management actions in the face of rapidly changing climate conditions.

### **Project 1: Science Support for Collaborative Landscape Scale Restoration**

USDA Secretary Vilsak and Forest Service Chief Tom Tidwell promote an innovative vision for management and conservation. During the last three years, their statements and new initiatives urge planning at the landscape scale in order to improve the effectiveness and efficiency of actions --while acknowledging that to be effective, collaboration and coordination are needed across all lands regardless of ownership. This vision is synergistic with Congressional action in 2009 establishing the Collaborative Forest Landscape Restoration Act, a legislative mandate for the Forest Service to work and plan in a collaborative framework at the landscape scale. The ERI has a history of commitment and service to advance landscape scale ecological restoration. In 1992, Dr. Wally Covington testified before Congress about the urgent need to restore frequent fire forests and to plan action at the landscape scale. Our FY'12 activities are designed to further these directives.

<b>Science Support for Collaborative Landscape Scale Restoration</b>	
Fulfills Duties under the Act: 1,2,3,4,5,6,7,8	
<b>REQUESTED NEED</b>	<b>REQUEST SOURCE</b>
1. Provide support for the Four Forest Restoration Initiative (4FRI), an approved Collaborative Forest Landscape Restoration Program project. Actions include: support for integrating science, monitoring and adaptive management in planning and implementation; assistance in the organization and leadership of the 4FRI Stakeholder Group; assistance to develop landscape planning approaches that are scalable down to the treatment level.	1.Attachment 1-ERI/SWERI Needs Assessment #1, 8, 17
2. Provide technical support for landscape scale restoration efforts on other National Forests in Arizona	1.Attachment 1-ERI/SWERI Needs Assessment #1, 27, 80
3. Provide support for other CFLRA projects and emerging projects. Share and leverage lessons learned from different projects to help build efficiency and avoid unnecessary reinvention of approaches.	Attachment 1-ERI/SWERI #17, 64 Attachment 3-SWERI/RMRS #9

<sup>1</sup> According to PL108-317 affected entities include: (A) land managers; (B) stakeholders; (C) concerned citizens; and (D) the States of the Interior West, including political subdivisions of the States.

## **Deliverables**

### **1.1) Provide Support for the Four Forest Restoration Initiative (4FRI) a Collaborative Forest Landscape Restoration Act project.**

- a. Provide technical assistance for science and monitoring
- b. Provide leadership and technical assistance to steering committee
- c. Provide technical assistance to the landscape strategy working group
- d. Provide GIS support to ID Team for technical analyses
- e. Provide IT support for the 4FRI Website and BASECAMP (an online collaborative work space), Website and Administration (Ongoing)

### **1.2) Provide technical support for landscape scale planning and implementation in other national forests in Arizona**

- a. Provide technical assistance to the Prescott National Forest to develop a collaborative strategic plan
- b. Provide technical assistance to the Coronado National Forest/Firescape effort
- c. Provide technical assistance to the Apache-Sitgreaves National Forest for Wallow Fire Recovery

### **1.3) Provide science and technical support for other CFLRA projects and emerging projects**

- a. Compile and Publish lessons learned across the sites in order to build efficiency into CFLRP implementation. This will become a restoration handbook.
- b. Help facilitate the CFLR monitoring network.

## **Project 2: Evidence-Based Restoration**

**Evidence-based restoration** means the application of ecological science to restoration, conservation, and management of ecosystems. Evidence-based approaches are used worldwide to make the best use of unbiased scientific and social science information to support policy and management decisions. The goal of this approach is to help managers understand their options for a particular management action and the consequences of those actions as reflected in the best available science and knowledge. Lack of well-documented, objective knowledge can limit the effectiveness and efficiency of restoration treatment implementation.

The paradigm of evidence-based restoration is central to the mission of the Ecological Restoration Institute (ERI) at Northern Arizona University, providing science support for ecological restoration of fire-adapted ecosystems where frequent-fire forests are a key forest type. We will initiate two restoration-based systematic reviews (based on needs identified by affected entities during 2011) and begin implementation of one primary research projects based on knowledge gaps identified in 2011. Year end funding in FY'11 enabled the ERI to initiate the systematic reviews described in the preliminary FY'12 work plan, therefore new topics are included in the current work plan.

Evidence-based Restoration Fulfills duties under PL108-317: 1, 2	
REQUESTED NEED	REQUEST SOURCE
1. Two systematic reviews.	a. Attachment 2-4FRI/ERI Needs Assessment # 23, 25 Attachment 3-SWERI/RMRS- #36 b. Attachment 1-SWERI/ERI Needs Assessment- # 38
2. Summary of one primary research project that is designed to fill knowledge gaps revealed by systematic reviews and science needs assessments.	a. Attachment 1-ERI/SWERI #45 b. Attachment 3-SWERI/RMRS- #12,15

### ***Deliverables***

- 2.1) Two systematic reviews** summarizing and methodically analyzing published literature, “gray” literature (reports not rigorously peer reviewed), and expert opinion on a key issue of concern for forest restoration. Under previous work plans and external funding, the ERI has completed or is presently carrying out systematic reviews on treatment effects on crown fire behavior, restoration effects on goshawk prey species, use of native seeds for post-wildfire, and pinyon-juniper fire ecology.
- a. Deliverable: A systematic review evaluating silviculture prescriptions that achieve ecological restoration. (December 2012)
  - b. Deliverable: A systematic review of the benefits of old growth (March 2012)
- 2.2) Filling one knowledge gap.** Using field data collected in 2011 we will leverage state funding to fill a critical information gap related to historical reference conditions in dry mixed-conifer forests of the Southwest.
- a. Deliverable: Report on conclusions of research to reconstruct fire history and forest structure of a mixed conifer site on the Mogollon Rim. (March 2013)

### **Project 3: Monitoring, Evaluation and Adaptive Management**

**Monitoring, evaluation and adaptive management** are vital to informed land management. They create the essential feedback loop to ensure that managers can learn by doing and can improve the effectiveness of land management actions. Unfortunately, because monitoring can be expensive or is perceived as difficult it isn’t well operationalized as a part of ongoing land management. The result is that a critical piece of management is relegated to a low priority in the face of a multitude of demands before the agencies.

Monitoring, evaluation and informing adaptive management are a core activity of the ERI and have been since its inception. The ERI monitors the **LEARN** (Long-term Ecological and Assessment Restoration Network) system of restoration research, demonstration, and applications sites located in Arizona, New Mexico, Colorado, and southwestern Oregon in forests ranging from mixed conifer through ponderosa pine to pinyon-juniper woodlands (Figure 1). The LEARN sites are the longest-established and best-monitored replicated forest restoration demonstration projects in the West. Treatments at new sites and monitoring of existing sites provide a substantial amount of spatially explicit scientific knowledge about

forest responses to treatments, effects on potential fire behavior, and changes in wildlife habitat and biodiversity--information that forms the building blocks for landscape-scale treatments.

In the summer of 2011, the ERI re-measured treatments at the Fort Valley restoration area. These and previous data provide a unique opportunity to evaluate treatments that reflect some of the earliest restoration treatments designed by a collaborative group (The Greater Flagstaff Forests Partnership). These sites were scrutinized by environmental groups nationwide and became the beacon or lightning rod—depending on your ideology—for defining ecological restoration in frequent fire forests. Data from Fort Valley as the basis for a critical review of how the socio-political concerns and fears raised by stakeholders and addressed during treatment design influenced treatment outcome and effectiveness.

The ERI will also develop an overview of approaches to monitoring at the landscape scale that can be used by CFLRP sites (a requirement under the CFLRA) as well as to identify and evaluate through case studies operational examples of adaptive management.



**Figure 1.** Map of permanent Long-term Ecological Assessment and Restoration Network (LEARN) and other research sites. These are the longest-established and best-monitored replicated forest restoration demonstration sites in the Southwest.

Monitoring, Evaluation and Adaptive Management	
Fulfills Duties under PL108-317: 1, 3	
REQUESTED NEED	REQUEST SOURCE
1. Biophysical responses to restoration treatments 10 years post treatment.	1. Attachment 1-ERI/SWERI Needs Assessment # 38 2. Attachment 2-ERI/4FRI- 17, 20, 22, 23, 28, 30 2. SWERI/RMRS #8, 17
2. Analysis of how early socio-political concerns addressed in treatment design at Fort Valley influenced biophysical outcomes.	1. Attachment 1-ERI/SWERI #79
3. Monitor Wildlife Responses to Restoration Treatments in the 4FRI Analysis Area	1. Attachment 2-ERI/4FRI #61,70

## **Deliverables**

- 3.1) Analysis of biophysical monitoring data from LEARN sites the Southwest** (March 2013)
  - a. Deliverable: Analysis and publication of results biophysical responses to ecological restoration treatments.
- 3.2) Analysis of how socio-politically based adjustments to ecological restoration treatments affected ecological outcomes** (Fall 2012)
  - a. Deliverable: Analysis and publication designed for stakeholders and land managers.
- 3.3) Monitor Wildlife Responses to restoration treatments in the 4FRI Analysis Area** (March 2013)
  - a. Deliverable: Two manuscripts for peer reviewed publication

## **Project 4: Restoration-based Economic Opportunities**

**Restoration-based economic opportunities** include a diverse spectrum of activities. For purposes of this work plan it pertains to how to pay for treatments on public land and how restoration can help create jobs.

During a visit to Arizona in the summer of 2010 Harris Sherman, Under Secretary for Natural Resources and the Environment, made it clear that inadequate federal funding exists to pay for all the acres of restoration treatments that are envisioned by the partners in the White Mountain Stewardship Contract. **He urged citizens to create new partnerships to support restoration.**

**Ecosystem services** include clean air, clean water, cycling of nutrients, and other critical roles that ecosystems play to support populations of plants, animals, and people. Although these benefits are essential, their economic value is hard to calculate and therefore doesn't figure into the valuation of benefits from ecological restoration. In FY 12 we will provide science support to new efforts in Flagstaff exploring payments for ecosystem services.

<b>Restoration-based Economic Opportunities</b>	
Fulfills Duties under PL108-317: 3	
<b>REQUESTED NEED</b>	<b>REQUEST SOURCE</b>
1. Provide technical assistance to Partnerships exploring alternative approaches to supporting restoration	1. Attachment 1-ERI/SWERI #81
2. Provide technical assistance to support Advance opportunities to calculate and mainstream the economic value of ecosystem services	1.Attachment 2-ERI/4FRI Needs Assessment # 7, 107

## **Deliverables**

- 4.1) Provide technical assistance to partnerships exploring alternative approaches to supporting treatments** (March 2013)
  - a. Deliverable: Technical support to stakeholders involved in the White Mountain Forest Restoration Partnership.
- 4.2) Scientific support to advance efforts to mainstream the economic value of ecosystem services** (March 2013)
  - a. Deliverable: Provide scientific support to stakeholders, the Forest Service and the City of Flagstaff to capture the benefits of ecosystem services.

## **Project 5: State, Tribal and Private Forestry – The All Lands Approach**

Our State, Tribal and Private Forestry program provides assistance and expertise to a diversity of landowners and natural resource managers, ranging from private lands to tribal and state lands. Assistance includes helping landowners, land managers, and the communities they are a part of care for their forests, strengthen local economies, and improve the quality of life.

Arizona is home to diverse forest ecosystems, spanning approximately 27% of the state (over 19 million acres), as well as extensive urban and community forests. These forests contribute to the overall functioning of ecosystems by playing a vital role in cycling water and nutrients, filtering pollutants, producing oxygen, absorbing carbon dioxide, and providing habitat for humans and wildlife.

Consistent with the 2008 Farm Bill (section 8001), the State of Arizona Forestry Division, with assistance from ERI and other partners, completed a statewide assessment of forest resource conditions, trends, and priorities on all forested lands in the state to determine a strategic approach to respond to identified threats to these valuable ecosystems. Implementation of the assessment has been delayed due to current economic conditions. The ERI remains poised to help State Forestry implement the plan when the timing is right. The State Assessment is critical to supporting an “all lands approach” consistent with current Forest Service direction. However, until that effort is reactivated we will continue to provide science support to State Forests and all affected entities as envisioned in the Act.

<b>State, Tribal and Private Lands—An All Lands Approach</b>	
Duties Fulfilled under PL108-317: 1, 5, 6	
<b>REQUESTED NEED</b>	<b>REQUEST SOURCE</b>
1. Provide scientific support to affected entities including State Forests.	1. Attachment 1- ERI/SWERI- #82

### ***Deliverables***

#### **5.1) Provide scientific support to affected entities with a focus on State Forests(ongoing)**

- a. Deliverable: Report on scientific support to state forests and other affected entities

## **Project 6: Services to the Intermountain West**

The ERI provides knowledge services, information and education to managers, stakeholders, and the public concerned with restoration and conservation of frequent-fire adapted forests across the Intermountain West. In partnership with the other SWERI members, we leverage the skills and resources of all three institutes for the greatest public benefit.

One of the most important information transfer strategies at the ERI is to work directly with land managers. Public land managers regularly change jobs and individuals retire taking with them the knowledge and experience developed on their local forest. When new employees arrive, a knowledge gap exists that the ERI helps to fill. In FY12 we will continue to support knowledge transfer and capacity building within agencies to ensure that the best available science is mobilized to support treatment design and implementation. Where requested we will continue to provide technical assistance to help managers understand the historic and desired forest conditions at a proposed treatment site through preparation of Rapid Assessments (RAP's). Work to support the RAP's includes fulfilling information requests and site visits including on-the-ground training for participants.

<b>Service to the Intermountain West</b> Fulfilling Duties of the PL108-317: 1,2,3,4,5,6,7	
<b>REQUESTED NEED</b>	<b>REQUEST SOURCE</b>
1. Provide support to Forest Service Land Managers with program planning and implementation workshops	1. Attachment 1- ERI/SWERI- 1, 6, 8, 9, 11, 15, 17, 24,27, 28, 33, 38, 41, 42,45, 47, 48,49, 51, 79
2. Assist with Forest Plan Revisions	1. Attachment 1- ERI/SWERI # 27
3. Provide information through Website(s)	1. 4FRI Stakeholders, Duty 7
4. Translate scientific information for managers on topics identified by affected entities	1. Attachment 3- SWERI/RMRS- #43
5. Present information to affected entities as requested via field trips and presentations	1. Attachment 3- SWERI/RMRS- #34, 43
6. Educate the general public about forest restoration	1. Attachment 3- SWERI/RMRS- #34, 43

**Deliverables**

**6.1) Provide support to Forest Service Land Managers with program planning and implementation**

- a. Deliverable: Technical assistance to Forest Service land managers (this includes field trips, Rapid Assessments, workshops and science support)
- b. Supplemental deliverable: Implement 6 Desired Conditions workshops. To be submitted under separate supplemental funding request mechanism.

**6.2) Assistance with Forest Plan Revisions**

- a. Deliverable: Technical assistance and science support for Forest Plan revisions

**6.3) Web support for ERI, SWERI and the 4FRI**

- a. Deliverable: Technical support for ERI, SWERI and 4FRI websites

**6.4) Translate biophysical and social-political-economic information for affected entities**

- a. Deliverable: Editorial support for 1 white paper
- b. Deliverable: Editorial support for 2 Working Papers
- c. Deliverable: Translate and disseminate 15 Scientific Abstracts for managers
- d. Deliverable: 4 Fact Sheets

**6.5) Conduct Field Trips and Presentations as requested by affected entities**

- a. Deliverable: Presentations for affected entities
- b. Deliverable: Field Trips for affected entities

**6.6) Educate the General Public**

- a. Deliverable: 4 newspaper articles to inform the general public on the benefits of restoration.

**Project 7: Duty 5 under the ACT. Provide annual progress reports**



The legislation establishing the Institutes requires an annual progress report.

**Deliverable**

7.1) Complete annual progress report on June 30<sup>th</sup>, 2012 and June 30<sup>th</sup>, 2013

**BUDGET**

USFS-FY12 Budget							
	Project 1: Science Support for Collaborative Landscape Scale Restoration	Project 2: Evidence-Based Restoration	Project 3: Monitoring, Evaluation and Adaptive Management	Project 4: Restoration-based Economic Opportunities	Project 5: State, Tribal and Private Forestry	Project 6: Services to the Intermountain West	Total
<b>Personnel:</b>	\$ 204,563	\$ 153,312	\$ 179,134	\$ 57,793	\$ 100,960	\$ 278,226	\$ 973,988
<b>Outside Services:</b>	\$ -	\$ 40,000	\$ -	\$ -	\$ -	\$ -	\$ 40,000
<b>Travel:</b>	\$ 8,183	\$ 3,420	\$ 5,374	\$ 578	\$ 3,029	\$ 8,347	\$ 28,931
<b>Operations &amp; Supplies:</b>	\$ 14,319	\$ 4,599	\$ 8,957	\$ 1,156	\$ 5,048	\$ 13,911	\$ 47,990
<b>Total Direct Costs:</b>	\$ 227,065	\$ 201,331	\$ 193,465	\$ 59,527	\$ 109,037	\$ 300,484	\$ 1,090,909
<b>Indirects:</b>	\$ 22,706	\$ 20,133	\$ 19,347	\$ 5,953	\$ 10,904	\$ 30,048	\$ 109,091
<b>Total:</b>	\$ 249,771	\$ 221,464	\$ 212,812	\$ 65,480	\$ 119,941	\$ 330,532	\$ 1,200,000