

**Ecological Restoration Institute Work Plan  
Fiscal Year 2007**

**Final**

**Originally Approved by Executive Team on 2/22/06**

**Revised in Response to Reduced Appropriation and  
Development Team Meeting on 6/5/07**

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## Executive Summary

This Statement of Work identifies actions and deliverables for the final FY07 funding committed to the Southwest Ecological Restoration Institutes (SWERI) by the USFS-Region 3 on April 18, 2007 and agreed to by the Executive Team on June 29, 2007.

The work proposed in this memorandum is consistent with the "2007 Work Plan" approved February 22, 2006 by the Executive Committee established by Region 3 to implement PL108-317. The changes reflect a funding level of \$2.2 million for the three institutes instead of the total of \$5.5 million approved by the Executive Committee in February 2006.

Thank you for this funding and the continued opportunity for partnership with the U.S. Forest Service.



**The Ecological Restoration Institute-Northern Arizona University**

**Project One: Ponderosa Pine/Mixed Conifer Restoration**

The ERI is known for 30 years of continuous, applied scientific investigations that explore all aspects of the restoration of forest health in frequent fire forests. The primary emphasis for our work is the ponderosa pine ecosystem. The work proposed in 2007 will continue to reap the benefits of treatments initiated over the past five to ten years by collecting data that monitor a variety of biophysical and fire behavior responses to treatments. These data are the best-monitored and most reliable long-term restoration sites in the Southwest. Requests for ecosystem responses and fire behavior responses to treatments are one of the most frequent information requests we receive from land managers. In addition, the Arizona Governor's Forest Health Advisory Council has expressed the need for this information. This information is essential to design effective, long-term treatments.

***Deliverables:***

- 1.1 Summary of treatment actions and ecosystem responses from sites in the Long-term Ecological Assessment Restoration Network (LEARN) for practitioners. Information will be provided through working papers, presentations, field trips and workshops (see projects 5,7,8)
  - Prepare manuscript of working paper on seasonality of fire use (See #5.4).
- 1.2 Article for scientific journal summarizing responses. These are usually peer reviewed publications. Peer review is necessary to establish legitimacy and ensure accuracy, and validate the conclusions that result from monitoring data. Peer review provides strong evidence and enhances the credibility of the recommendations to practitioners, stakeholders, scientists and for inclusion in NEPA documents.
  - Completed analysis of San Juan mixed conifer data and one publication
- 1.3 Invasive exotics are vexing practitioners and restoration projects throughout the Intermountain West. Severe wildfire creates conditions for invasion by exotics, but thinning and prescribed burning can sometimes also lead to the unintended establishment of nonnative plants. In 2007 we will monitor and evaluate existing

treatments that are designed to test whether or not cheatgrass invasions can be avoided and/or how restoration treatments should be modified to avoid creating opportunities for invasion.

1.3.a. A summary of treatment actions, responses and recommendations for avoiding cheatgrass invasions for practitioners. Information will be provided through working papers, presentations, field trips and workshops (see projects 5,7,8)

- Preparation of cheatgrass information for translation to practitioners.

1.3.b. Preparation of cheatgrass results for scientific publication.

- Cheatgrass manuscript in review.

- One publication.

1.3.c. A summary of a rigorous monitoring project of post-fire exotic species establishment and change over time through 2007 for practitioners. Information will be provided through working papers, presentations, field trips and workshops (see projects 5,7,8)

- Information assembled and one manuscript in review; modify information for practitioners.

- One publication.

1.4 Understanding how different restoration treatments influence extreme crown-fire behavior is essential to properly design restoration treatments focused on reducing hazardous fuels and reducing wildfire intensity. This information will help determine the amount of thinning, burning and frequency of prescribed burning that are necessary to maintain long-term reduction of hazardous fuels. This project will be a retrospective analysis of areas that were treated prior to wildfire to determine how the treatment modified fire intensity.

1.4.a. Summary of treatments and influence on fire behavior for land managers, practitioners and decision makers. Information will be provided through working papers, presentations, field trips and workshops (see projects 5,7,8)

- Assembled project team and charter.

- Develop plan for knowledge acquisition and synthesis (systematic review).

1.5 Re-establishment of native understory plant communities is a critical factor in forest restoration. This project will evaluate different seeding approaches with the goal of encouraging natives while discouraging exotics.

1.5.a. Summary of findings related to seeding techniques for practitioners

Information will be provided through working papers, presentations, field trips and workshops (see projects 5,7,8)

- Working paper (see 5.4)

## **Project 2: Pinyon-Juniper Restoration**

There is little information on the outcomes of comprehensive restoration treatments in pinyon-juniper ecosystems. Yet the agencies are confronted with millions of acres of degraded pinyon-juniper woodlands. Degradation of these systems leads to wildfires that are considered undesirable by managers, coupled with poor forage and wildlife habitat and increased erosion. This project will continue work already underway at the Grand Canyon Parashant National Monument, on the Tusayan Ranger District in the Kaibab National Forest, on the White Mountain Apache Reservation, and in other locations in the Southwest. It includes an integrated series of actions to examine herbaceous, overstory and understory responses to treatments. Expanding our work to pinyon-juniper ecosystems responds to requests from the Washington DC office of the Bureau of Land Management, and practitioners and stakeholders at the district and local levels.

### ***Deliverables:***

2.1. Overstory responses to restoration

2.1.a. Summary of results of treatments that can be used by practitioners.

Information will be provided through working papers, presentations, field trips and workshops (see projects 5,7,8)

- Report results of PJ demonstration projects at Mt. Trumbull.

2.1.b. Preparation of results for publication in a scientific journal.

- In progress, will incorporate 2006 monitoring.

2.2 Understory responses to restoration

- 2.2.a Summary of understory responses to treatments that can be used by practitioners. Information will be provided through working papers, presentations, field trips and workshops (see projects 5,7,8)
  - Initiate preparation of PJ understory information for translation to management audiences.
- 2.2.b Preparation of results for publication in a scientific journal
  - Edit manuscript for submission.
  - One publication.
- 2.3 Understanding the role and frequency of natural fire in pinyon-juniper ecosystems is essential to inform the design of restoration treatments. Currently there is much confusion about this topic in the management and stakeholder communities. Data, such as fire dates, stand ages, and fire evidence will be collected to help answer this important variable.
  - 2.3.a Summary of findings related to natural fire regimes for practitioners. Information will be provided through working papers, presentations, field trips and workshops (see projects 5,7,8)
    - Develop background data and prepare monitoring permit request.
    - Submit monitoring permit application, develop field schedule for future measurements. Measurements minimal in 2007 due to funding.
  - 2.3.b Preparation of results for publication in a scientific journal
    - Submit results from PJ fire study in Tusayan and Canjilon

### **Project 3: Evaluating Post-Fire Re-burn Potential, Implications for Salvage Logging and Other Post-Fire Treatments**

Post-fire salvage of timber is an issue of concern to managers, policy makers, and the public. An ecological reason cited in support for removing trees is the fear of re-burn and the damage it may cause to soils. However, a countervailing concern is that salvage logging itself has negative consequences. Little reliable quantitative scientific information exists in the Southwest to help evaluate the vulnerability of severely burned forests in the semi-arid Southwest to environmentally harmful re-burning. This may be partially due to the very contemporary nature of the problem (it is only in the last 10 years we've seen overstocked forests burn catastrophically at a large scale). This

project will proceed in two parts. First we will conduct a synthesis of what is known about the potential for re-burn in the semi-arid Southwest, followed by initiating an analysis of fuel loads at sites that have burned catastrophically. The Colorado and Arizona Institutes will collaborate in this endeavor. Colorado will take the lead on compiling the status of current knowledge and a synthesis of this information. Arizona will sample burned areas to determine the potential for re-burning.

Requests for information about salvage logging have come from congressional offices.

***Deliverables:***

- 3.1. Initiate analysis of post-wildfire sites that have not been salvaged to determine potential effects of severe re-burn.
  - Develop background data and prepare monitoring permit request.
  - Prepare & submit special use permit requests, Kaibab NF and Grand Canyon NP.
- 3.2. Summary of potential reburn effects for stakeholder community in the form of a working paper.
  - Data collection will occur in 2007 to support preparation of a working paper in 2008

**Project 4: Landscape Assessment**

The state of the art for strategic location and monitoring of restoration-based hazardous fuel reduction treatments urges planning at the landscape scale. The ForestERA Project convenes and supports a neutral process for collaboration by practitioners and stakeholders to engage in a constructive dialogue for prioritizing treatments and identifying appropriate management actions at the landscape scale. It also can help build working relations for achieving collaboration objectives during the forest plan revision process.

Evidence for the importance of this tool is the fact that it is referenced in the multi-agency USDA/DOI Wildland Fire Use Guide ([http://www.fs.fed.us/fire/fireuse/wildland\\_fire\\_use/use\\_index.html](http://www.fs.fed.us/fire/fireuse/wildland_fire_use/use_index.html)). The Guide includes examples of the Western Mogollon Plateau Adaptive Landscape Assessment data (pp.17-18) and describes the use of landscape-scale analysis in Wildland Fire Use planning. The authors downloaded the images directly from the ForestERA web pages. The introduction states that it "provides **standardized procedures**, specifically associated with the planning and implementation of wildland fire use."



On February 6<sup>th</sup>, representatives of Arizona Fire Map (State Lands and Cartographers offices) and WALTER (U of A) information management tools met with the staff from ForestERA to determine how best to coordinate and combine efforts. By combining these three tools coverage of all lands in Arizona will be increased, accessibility by all citizens and practitioners will improve and some of the most basic information management questions asked by policy makers can be answered. Finally, this collaboration should result in improved efficiency of both human and financial resources.

***Deliverables:***

4.1. Complete the Statewide Strategy

- Administrative support to Statewide Strategy sub-committee and editor of Statewide Strategy report.
- Final statewide strategy document to be completed by July 2007.

4.2. Wildlife layers

4.2.a. Initiate field work, data integration, and spatial analysis to develop a model for Goshawk occupancy that will allow ForestERA scenario analysis and assessment of northern goshawk responses to proposed forest treatments. This project will span two years with the following deliverables being accomplished in this funding period:

- Progress report
- Foundational data layers
- Models and maps of Goshawk habitat occupancy

4.3. Validation of watershed models - In order to increase confidence in ForestERA watershed data layers, independent field data is needed to assess model accuracy and enhance technology transfer.

- Collect field data to validate landscape-level models of watershed vulnerability to post-fire erosion and sedimentation. Conduct analyses and report on model accuracy to stakeholders; submit paper for publication.

All the actions proposed under Duty #1, Projects 1 &2 have an integrated synthesis and translation component designed to serve the needs of practitioners and stakeholders. The ERI has ten years of experience from which to predict the level of

information services that will be requested from our customers and the number of requests that can be met with available resources. Flexibility to define specific writing topics is needed so that the ERI can respond to important and emerging needs. As a general rule those topics that serve the most audiences will be the highest priority for completion. The services delivered in project five are requested from collaborative groups, practitioners, and community organizations.

## **Project 5: Practitioner and Stakeholder Knowledge Services**

### ***Deliverables:***

- 5.1. In 2005 the number of requests for information, fact sheets and other rapid response information increased dramatically. This activity ensures that land manager and stakeholder questions are answered in a complete and timely manner.
  - 5.1.a. Fulfill information requests
    - Provide answers to questions
  - 5.2.b. List of information requests
    - Report on requests including information on who requested the information, what was provided and approximate the amount of time spent fulfilling request.
- 5.2. Occasional short summaries that compile best available information as needed by non-technical stakeholders and practitioners.
  - 5.2.a. Two white papers based on requests
    - Two white papers
- 5.3. Practitioners and stakeholders need very short, concise descriptions of land management options and the outcomes of those options. The Working papers distill information that already exists in the literature or is generated through monitoring activities conducted in Project 1 and 2.
  - 5.3.a. Four Working Papers or Technical Notes
    - Complete four working papers

- 5.4. The ERI maintains an integrated web site that includes publications and information about the biophysical and social science aspects of restoration. Recommendations are peer reviewed and the ERI maintains the highest standards for information posted to the site.
  - 5.4.a. Report on major updates to the web
    - Report on updates
- 5.5. Direct communication with individuals is still the knowledge delivery choice preferred by practitioners and stakeholders alike. The ERI will continue to provide in person delivery to convey emerging scientific information on restoration treatments, community collaborations and other relevant topics.
  - 5.5.a. 10 presentations
    - 10 presentations.
- 5.6. Seeing is believing. Fortunately, many restoration treatments have been applied throughout the Southwest. The ERI will continue to take diverse audiences to the field to demonstrate and discuss the outcomes of forest restoration on ecological health and wildfire behavior.
  - 5.6.a. 10 Field Trips
    - 10 field trips.

### **Project 6: Utilization**

Following seven years of struggle to attract small wood utilization businesses to the Flagstaff region we are on the brink of a breakthrough. Development is underway to create an integrated wood utilization campus ten miles west of Flagstaff and in Winslow, Arizona. Although still in the preliminary stages of development, the Greater Flagstaff Economic Council believes it is realistic to have businesses operating at the 80 acre site in 2008. To realize the vision of an “integrated campus” at Camp Navajo the ERI-NAU has been invited to participate and provide the knowledge services required to help both the private and public sector realize the full potential of this endeavor. We will work in partnership with the Forest Products Lab, NAU School of Engineering and Greater Flagstaff Economic Council to help in this new endeavor. Our participation was specifically requested by the Greater Flagstaff Forests Partnership and the Greater Flagstaff Economic Council.

***Deliverables:***

- 6.1 Report on contributions
  - Report on contributions through March, 2007

**Project 7: Assistance to Communities to Design and Monitor Treatments**

Community collaborative groups endeavor to assist the land management agencies in the design, implementation and monitoring of restoration treatments. Most stakeholders are neither foresters nor resource professionals. Our work with these groups shows that workshops to assist with collaborative forestry in addition to field consultations are invaluable methods for advancing constructive collaboration and science-based (as opposed to ideologically based) treatments.

***Deliverables:***

- 7.1 One workshop for communities and other stakeholders
  - One workshop.
- 7.2. Five field consultations
  - Five consultations.

**Project 8: Assistance to Practitioners**

Our experience reveals that the most effective way to improve the design of restoration treatments is to spend a combination of time with practitioners in the classroom and in the field. In particular, field consultations that include demonstrations of how to design and implement restoration treatments have the highest education impact. Rapid Assessments that reveal historic fire regimes, stand density, spacing and structure for a given project enhance science-based treatment design. The ERI considers these activities some of the most important aspects of our work.

***Deliverables:***

- 8.1 Two workshops for practitioners
  - Two workshops
- 8.2 Ten field consultations
  - Ten field consultations.
- 8.3 Three rapid assessments
  - Three rapid assessments.

## **Project 9: Peer-Reviewed Reports**

The legislation establishing the Institutes is explicit that there should be annual peer-reviewed reports.

### ***Deliverable:***

9.1 Peer-reviewed report

## **Monitoring and Evaluation**

The Ecological Restoration Institute will provide a report articulating progress on the deliverables 13 months after contract has been signed and consistent with the agreement that accompanies this work plan. The institute will also follow billing protocols and requirements established by the Forest Service. The progress reports, along with all materials resulting from work funded under this grant, will be provided to the project representatives for the Forest Service.

## **Acknowledgements**

The preparation of this work plan would not have been possible without the dedicated work of the many natural resource practitioners, land managers, stakeholders, community groups, and government officials at the federal, state, tribal, and local level. These individuals, the lay public, and policy makers at all levels are now committed to restoring the ecological and economic integrity of frequent fire forest landscapes and the communities that depend upon them. Among these individuals, we wish acknowledge in particular the hard work and valuable contributions made by the Southwest Ecological Restoration Institutes Coordinating Committee and that of the Interagency Development and the Executive Teams in reviewing, discussing, and helping to improve the Institutes' work plans. Finally, we wish to acknowledge the long hours and great skill of the professional staff at each of our Institutes and within our universities who helped produce this work plan.