

Final Report  
on  
Cooperative Work Plan FY'05

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## **Introduction**

The ERI is a national leader in developing, testing and transferring science-based treatments to accomplish forest restoration. Our intent is simple – to help stakeholders and managers develop practical science-based restoration treatments that are implemented on the ground. The work supported by the FY'05 funding advances this goal using multiple strategies that include:

- Supporting collaboration between federal agencies and other stakeholders to design treatments;
- Working to synthesize scientific findings into outreach materials for diverse audiences;
- Assisting land managers with specific problems in the forest; and
- Providing technical assistance to those who seek to create healthy forests in their communities.

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. This report is the third and final report for FY'05 funding. It includes the final deliverables for Goals 2 and 3. The final deliverables for Goal 1 were reported in the second report from December 31, 2005.

## **Work Plan Summary**

This work plan helps to ensure that the best available science is used by land managers and stakeholders to develop and implement comprehensive, restoration-based forest treatments. It seeks to fill a critical void that exists between applied and existing scientific findings, and the translation and transfer of that knowledge to inform forest management. Improving the knowledge base of practitioners is accomplished through an active analysis of scientific information within the framework of land manager realities. The information includes an explicit articulation of science-based actions that can accomplish land management objectives. This funding helps fulfill an ERI commitment to develop effective communication approaches for land managers and stakeholders including: continuing education, user friendly GIS-based decision support tools, and written and electronic products that will result in the transfer of knowledge to practitioners.

In March 2005 the Washington D.C. office of the Forest Service made \$400,000 available to the Ecological Restoration Institute at Northern Arizona University for work in Fiscal Year 2005. Harv Forsgren, Regional Forester for Region 3 decided that the plan of work proposed by the ERI should serve as a “straw man” to test the review and approval structure developed by the Forest Service as part of the implementation of PL 108-317. The 2005 work plan was reviewed, modified and approved by the Development and Executive Review Teams established as a part of PL 108-317. In the spirit of cooperation and to support the other two institutes named in the legislation, \$100,000 was transferred to New Mexico Highlands University and Colorado State University to conduct information needs assessments in their states.

The work outlined in this document is a small part of a much larger, comprehensive set of activities underway at the Ecological Restoration Institute. The comprehensive set of actions responds to numerous specific land manager needs compiled in the document entitled, “Examples of Specific Land Manager Needs, March 10, 2005”, included in the original proposal. Four additional sources also inform this plan of work. They include: 1. The Forest Service Strategic Plan; 2. Ideas articulated by Region 2 and 3 at an October 29<sup>th</sup>, 2004 meeting in Flagstaff; 3. Ongoing policy directives that include the Western Governors’ Association (WGA) 10-Year Comprehensive Strategy, the Healthy Forest Restoration Act, the new Forest Planning rule and others; and, 4. Gaps revealed to Ecological Restoration Institute (ERI) scientists and practitioners while working with stakeholders and land managers.

Some of the deliverables for 2005 build on previously funded activities. These actions provide new knowledge and increase the number of audiences that benefit from earlier work. For example, the analysis of understory responses to different restoration treatments is informed by monitoring that extends back to 1995.

Based on present needs and opportunities, the following three goals were developed and approved for funding provided in FY’05:

***Goal One: Contribute to improving the health of degraded public and private forest lands at risk for unnatural, catastrophic fire through the development and promotion of science-based restoration treatments for project-level action.***

***Goal Two: Translate and transfer biophysical and social science research into communication products for land managers, communities and other stakeholders to inform project-level action.***

***Goal Three: Support collaborative action to identify utilization options for small diameter wood.***

## Summary of Deliverables

***Goal One: Contribute to improving the health of degraded public and private forest lands at risk for unnatural, catastrophic fire through the development and promotion of science-based restoration treatments for project-level action.***

--From "A Collaborative Approach For Reducing Wildland Fire Risks to Communities and the Environment: 10 Year Comprehensive Strategy

### **Goal Three: Restore Fire Adapted Ecosystems**

- Restoration – Restore healthy, diverse, and resilient ecological systems to minimize uncharacteristically severe fires on a priority watershed basis through long-term restoration
- Using Science and Information – Promote the development and use of the best available science along with local and indigenous knowledge.
- Monitoring – Monitor restoration and rehabilitation projects for effectiveness and share the results in order to facilitate adaptive implementation. (p.10)

To achieve goal one the ERI obtained, synthesized and analyzed existing scientific information in support of forest restoration. Specifically, these activities are used to inform management decisions. These activities include: (1) synthesis/analysis of existing scientific information, (2) identification of wildlife habitat use in wildland-urban interface treatment areas, (3) inventorying impacts of landscape-scale wildland fire use in ponderosa pine and higher elevation forests, and (4) short administrative studies, synthesis and analysis documents to answer emerging management questions.

1. Summarizing, analyzing and interpreting existing scientific information for land management purposes is one of the most cost-efficient ways to bring new findings to the attention of managers. Under this work plan, we will focus on biodiversity responses to forest restoration treatments. Up to 99% of plant species richness is comprised by the herbaceous and shrub plant community. This diversity is directly related to wildlife resources, erosion control, fire spread, and conservation of rare species. We will summarize biodiversity data from long-term study sites in Arizona and Colorado over a range of thinning and burning treatments.
  - Technical synthesis and analysis paper on biodiversity response to forest restoration treatments that includes recommendations to practitioners *Field work completed by September 30, 2005; Report due December 31, 2005. **Complete. Referenced in Report 2, dated 12/31/05.***
2. Wildlife habitat use is poorly understood in wildland-urban interface treatment areas, especially for nocturnal foraging forest bats, several of which are managed as sensitive species. We will assess bat habitat use, taking advantage of an externally-funded study, to maximize information about the wildlife implications of restoration in the urban interface.

- Report on forest bat habitat use following treatments in the wildland-urban interface, including considerations and recommendations important for the conservation, protection and habitat enhancement of bats as it relates to treatments. *Field work completed by September 30, 2005; Report due December 31, 2005. Complete. Referenced in Report 2, dated 12/31/05.*
3. Wildland fire use (the explicit use of natural ignitions that are planned for and permitted to burn) is a promising management tool for the restoration of ecological processes and the reduction of hazardous fuels across large landscapes. However, a number of constraints limit wildland fire use, including inadequate knowledge about the effects of these fires on ecosystem diversity and productivity. Under this work plan, we will take advantage of large-scale wildland fires that burned over pre-existing forest monitoring plots across a broad elevational range from ponderosa to mixed conifer, aspen, and spruce-fir forests. Measurements on tree effects were previously funded by the interagency Joint Fire Science Program; we are adding resources under this work plan to include monitoring and of vegetation diversity, productivity, and exotic species.
- Report on effects on diversity and productivity following landscape-level wildland fire use that will be published in a form that is beneficial to land managers and stakeholders. *Field work completed by September 30, 2005; Report due December 31, 2005. Complete. Referenced in Report 2, dated 12/31/05.*
4. Management questions arise that require intensive collecting and analysis of existing information. The ERI will prepare a synthesis of knowledge document to answer an emerging and urgent question.
- **A status of knowledge report based on a topic to be determined. The report will explicitly serve information requested by stakeholders and land managers. “Issues of Ecological Restoration in Wilderness Areas”, is completed and in review. Referenced in Report 2, dated 12/31/05.**

*\*The deliverables in this section fulfill the following needs articulated in the “Examples of Specific Land Manager Needs, March 10, 2005”: A(1)a, A(1)c, A(1)d, A(1)e, A(2)c, A(2)d, A(3)e, B(2)d, C(2)a-c*

***Goal Two: Translate and transfer biophysical and social science research into communication products for land managers, communities and other stakeholders to inform project-level action.***

*From—USDA Forest Service Strategic Plan*

**Objective 3.c: Improve the knowledge base provided through research, inventory and monitoring to enhance scientific understanding of ecosystems, including human uses, and to support decision making and sustainable management of the Nation’s forests and grasslands.**

We will...

- Provide research results and tools through technology transfer that support effective management, protection, and restoration of ecosystems
- Incorporate/integrate the best available science in all broad-scale assessments and land and resource management plan revisions

The Office of Management and Budget (OMB) has asked the Joint Fire Science Program to identify new performance measures to evaluate the effectiveness of scientific research. The traditional measure of success for the research community is the number of peer-reviewed publications resulting from research. Research is undeniably important and memorializing it in the scientific literature is critical to learning and ensuring accuracy and high standards. However, there are few practitioners that seek answers to management questions in the scientific literature. The request by OMB is indicative of a growing desire to transfer more research into measurable action on the ground.

The ERI has an active translation and transfer program that ensures that practitioners are receiving the best available science. For example, over the last two years the ERI has offered land manager workshops that explain the difference between ecological restoration treatments and hazardous fuel reduction treatments. The workshops include lectures and field trips designed to ensure transfer of this knowledge to project-level action. Although it is difficult to quantify, our work has led to a change in attitude about the amount of fuel reduction necessary to enable the return of low-intensity fire. These services are in high demand. The level of interest by practitioners could lead to creating a permanent continuing education program at the field level.

The ERI also actively supports community collaboration. We are actively engaged in the development of multi-party monitoring protocols and the training of the practitioners that will use them as a part of the New Mexico Cooperative Forest Restoration Program.

For 2005 funds the ERI will continue to offer an integrated set of communication tools and activities to maximize information exchange with land managers, stakeholders and decision-makers.

1. It has been several years since a conference covering the restoration of frequent fire forests has been held. The ERI will begin planning for national workshop on forest restoration for land managers and stakeholders that will focus on interpreting current research findings for application on the ground. The date for the conference is October 2006.
2. A conference work plan, timeline and report on progress, *June 30, 2006*. **See Appendix E**
  - The ERI will prepare fact sheets, short analyses and white papers to respond to land manager and stakeholder inquiries. Copies of all materials, *June 30, 2006*.
3. The ERI will prepare fact sheets, short analyses and white papers to respond to land manager and stakeholder inquiries. Copies of all materials, *June 30, 2006*. **See Appendix F**.
  - Noss, Reed F. and Friederici, Peter. "Integrating Ecological Restoration and Conservation Biology: A CASE STUDY FROM Southwestern Ponderosa Pine forests"
  - Snider, G. and Vosick, D. "Rodeo Chediski Full Cost Analysis". Request from State Forester (Arizona), Kirk Rowdabaugh
  - "Ecological Restoration at the Gus Pearson Natural Area". Prepared for visit from U.S. Secretary of Agriculture, Mike Johanns, and United States Senator Jon Kyl (Arizona)
  - "Environmental Effects of Fire Retardant", Memo to Senator Kyl Staff

*\*The deliverables in this section fulfill the following needs articulated in the "Examples of Specific Land Manager Needs, March 10, 2005": A(2)e, B(2)b, B(2)c, C(2)a-c, D(2)a*

**Goal Three: Support collaborative action to identify utilization options for small diameter wood.**

*From-- "Contractor Selected for White Mountain Stewardship Project on Arizona's Apache-Sitgreaves National Forests" Press Release, August 20, 2004*

"The forests of the Southwest are in dire need of thinning, and stewardship contracts will provide a much needed mechanism by which large tracts of land can be treated resulting in increased protection of communities and improved health of our precious forests," said Harv Forsgren, Regional Forester of the Southwestern Region. "A stewardship contract allows for the costs of removal of small trees, residue and slash to be exchanged for the value of the excess trees that are removed. **The goal is to find uses for all the wood fiber and by doing so, reduce the amount of wood burned in the forest, reduce treatment costs and provide jobs in the local communities.**"

Finding ways to utilize the huge quantity of small diameter wood generated during restoration continues to impede implementation of treatments at the pace and scale required to adequately address the problem. It is an issue at the interface of ecology, economy and social acceptability. The ERI continues to participate in efforts to promote small wood utilization. A fundamental and controversial question associated with utilization is defining exactly how much harvesting and utilization is ecologically sustainable. The answer can lead to higher comfort by interest groups who want land management decisions decoupled from economic activity.

1. The ERI will work with businesses and NGO's in Arizona to develop the information and implement the actions required to successfully attract small wood utilization businesses. The work envisioned under this activity is specifically focused on assisting the business development efforts of the Greater Flagstaff Economic Council (GFEC) and other similar organizations. The products articulated below were identified by GFEC as essential to developing a marketing portfolio. The strategy for the Flagstaff region is to develop an integrated campus of activity that includes an anchor industry with the development of smaller-scale affiliates that can use by-products or provide related goods and services.
  - Collect, organize, and present baseline supply information and data on the physical properties and characteristics of wood to inform what products are appropriate for the available wood supply. (This action will identify what products are suitable).
  - Categorize the wood supply by volume, diameter, and distribution for regional units, adjusted by transportation and infrastructure variables. (This action tells the private sector how much wood is available and where).
  - Articulate the potential utilization options for anchor industries and associated small scale activities and characterize the supply and availability for each scenario.

Identify the barriers and opportunities presented by the public land management agencies' policies and procedures, such as planning, that affect continuity of supply and investor confidence. Articulate the changes that are needed. All of deliverables are finished and included in Appendix G. The ERI contributed information to the CD prepared by the Greater Flagstaff Economic Council. In addition, the draft document,



“Potential Wood Supply for the Greater Flagstaff Region” was used at an industry forum on August 26, 2006 to attract wood utilization businesses to the Flagstaff Region.

*\*The deliverables in this section fulfill the following needs articulated in the “Examples of Specific Land Manager Needs, March 10, 2005”: A(3)a, C(2)a-c, D(2)a*

## **Conclusion**

This is the final report on FY'05 funding for \$300,000. The ERI and its partners are grateful to the Forest Service for this financial support. Highlights of this work include: This funding is focused on synthesizing and analyzing existing scientific information into information for diverse audiences; identifying wildlife habitat use in WUI treatment areas; and inventorying the impacts of landscape-level wildland fire use in ponderosa pine and other higher elevation forest types. We also continued to work with NGOs and businesses to identify and refine methods for extracting and utilizing small diameter trees. The ERI is in the process of planning a national workshop which will bring land managers and stakeholders together to focus on current research findings and to develop innovative strategies for on-the-ground implementation. These efforts will make substantial contributions to the advancement of forest restoration in the southwest.

## **Appendices**

For Appendices A-D, please refer to second progress report submitted on 12/31/05

Appendix E – Conference Work Plan, timeline & report on progress

Appendix F – Fact Sheets, Short Analyses and White Papers

Appendix G – Potential Wood Supply for The Greater Flagstaff Region (draft/not ready for publication). Also includes information disk from the Greater Flagstaff Economic Council (GFEC)