Ecological Restoration Institute Work Plan
Fiscal Year 2006

W. Wallace Covington
Peter Z. Fulé
Diane Vosick

Ecological Restoration Institute
Northern Arizona University
P.O. Box 15017
Flagstaff, AZ 96011

December, 2005

Table of Contents

Executive Summary

This work plan will help 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 information to inform forest management. Improving the knowledge base of practitioners will be accomplished through an active analysis of scientific information within the framework of land manager realities. The information will include an explicit articulation of science-based actions that can accomplish land management objectives. Central to the proposal is a commitment to develop effective communication approaches for land managers and stakeholders, these include: continuing education, user friendly GIS-based decision support tools, and written and electronic products that will result in the transfer of knowledge to practitioners.

This is the second work plan to be considered by the Development Committee established by the Forest Service- Region 3 as a means to provide a fair and transparent process to implement PL 108-317. It is based on a budget of $2.5 million.

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.” (see Appendix D) Six 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 29th, 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; Information included in a Needs Assessment of Community practitioners; and, a survey of land managers to determine best approaches for transferring scientific information.

Most of the deliverables included in this plan build on previously funded activities. The proposed products will increase the breadth of knowledge and increase the number of audiences that benefit from earlier work. In addition, state dollars are leveraged to help fund several of the projects, particularly where the ERI can include students in monitoring activities.

The projects pertain to ponderosa pine ecosystems unless otherwise noted.

The three universities identified in the Southwest Forest Health and Wildfire Prevention Act of 2004 are implementing a series of actions to ensure coordination and complementarity of action. On June 13, 2005 the Governors and university presidents signed a Charter Agreement (Appendix E) that establishes a framework for the universities to work together. In addition, the institutes will meet in Flagstaff, Arizona on July 20-22 to discuss roles and responsibilities.

Most of the work proposed in this final workplan overlaps with the "2006 Work Plan" previously approved by the Executive and Development Committees established by Region 3 to implement PL108-317. The changes in this final document reflect a focus on Arizona and its multi-jurisdictional stakeholders and an overall reduced funding level of $1.6 million instead of the total of $2.5 million originally approved by the Executive Committee. PL 108-317 authorizes funding for the Institutes up to $15 million annually.

Additional criteria that guided the final changes to the original work plan include: 1. A focus on synthesis of information for frequent fire forests (resulting in a temporary suspension of work in pinyon/juniper); 2. Choosing actions that serve multiple constituencies; and, 3. Actions which take advantage of work accomplished in previous years that can be synthesized and used to solve immediate problems.

Based on the needs and opportunities identified we have developed the following goals under this work plan:

***Goal One**: Support a knowledge-based and spatially explicit collaborative landscape-scale assessment to help design a twenty year strategy for restoring degraded frequent fire forest ecosystems. The strategy will strive to engage stakeholders to prioritize the location of restoration-based and hazardous fuel reduction treatments to protect and enhance community protection and economic viability; human and wildlife habitats; watersheds and other critical components of Arizona's landscape ecosystems.*

***Goal Two**: Develop, transfer, apply, monitor, and update practical science-based forest restoration treatments to improve the health of ponderosa pine forests.*

***Goal Three**: Synthesize, translate and deliver biophysical and social science knowledge into communication products for land managers, communities and other stakeholders to inform project-level action.*

***Goal Four:** 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.*

Background

The mission of the ERI is to provide the best available science to support management actions that restore the health of dry forest and woodland ecosystems of the Southwest. Our core function is to work with a variety of stakeholders, including land managers, citizens, and communities to develop scientifically credible treatments that are operationally practical and ecologically effective. To accomplish this goal we actively develop and synthesize scientific information, translate it into the appropriate language for key audiences, and aggressively transfer it through publications, workshops, field trips and training. Unlike most research or university-based institutes we are committed to producing science and information that answers contemporary and immediate management questions.

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. 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 explicit 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.

This work plan articulates actions that meet the criteria established by the legislation. It is the second work plan prepared by the ERI to be reviewed through the process established by the Forest Service to implement PL108-317.

Needs Assessment

Forest management is in a period of rapid change. Over the past four years the Forest Service, the Western Governors' Association, and the Department of the Interior have produced policy directives designed to advance forest restoration and reduce the risk of unnatural wildland fire. Imbedded in each policy are similar themes that include the need for: multi-jurisdictional collaboration and cooperation; science-informed treatments; and prioritization and action at the landscape scale (see Table One). The goal of these directives is to revise policy and action to meet the challenge of restoring 132 million acres of degraded public and private land.[1]

Policy Document		Collaboration	Best Available Science	Landscape-level Planning	Prioritization of Treatments	Coordination with State / Local Governments
National Forest Management Act	2005 Planning Rule	X	X	X		X
Healthy Forests Restoration Act/Healthy Forest Restoration Initiative		X		X	X	X
Executive Order: Cooperative Conservation		X				X
National Fire Plan Documents	Managing the Impact of Wildfires on Communities and the Environment	X		X		X
	10-year Comprehensive Strategy	X	X	X	X	X
	10-year Strategy Implementation Plan	X		X	X	X
GAO Report GAO-03-805					X	
Forest Service Strategic Plan, 2000 Revision		X	X		X	X

Table 1: Analysis of federal policy directives

[1] USDA Forest Service. 2004. USDA Forest Service Strategic Plan for Fiscal Years 2004-2008. October 2004 FS-810

The land management agencies have rapidly increased the area treated with hazardous fuel reduction treatments beginning in the mid-1990s. Between 1994 and 2000, the Forest Service and the Bureau of Land Management increased the number of acres treated from fewer than 500,000 acres in 1994 to more than 2.4 million[2]. From a National Forest perspective the Coconino National Forest has completed over 60,000 acres of hazardous fuel reduction treatments around local communities since 2001—with many of the treatments selected and designed through a collaborative process.[3] The Forest Service Strategic Plan sets an ambitious, yet attainable annual goal of treating two million acres of degraded forests in the wildland-land urban interface and in the wildlands, respectively.

Yet, restoring forest ecosystems takes more than hazardous fuel reduction. It includes restoring forest structure and function, protecting and restoring critical habitat, riparian areas, watersheds and a plethora of other attributes as well. Our experience shows that there is confusion and ambiguity about what is meant by ecological restoration by most practitioners. This is also true at the highest policy levels, where a recent letter from the WGA Forest Health Advisory Committee (FHAC) identified the need for a clear definition of ecological restoration.[4]

The land management agencies, including the Bureau of Land Management and State Departments of Forestry have considerably more responsibilities than just reducing hazardous fuels. For example, National Forest Planning is underway throughout the West. New guidance for forest planning requires collaboration and the use of the best available science. In September 2003, Tom Thompson, Deputy Chief, National Forest System stated to a group of the leaders in collaborative forestry that the complexity and challenges of land management coupled with limited human and financial resources creates a new urgency for land managers and stakeholders to find innovative ways to work together to solve problems.

Two polls[5][6] conducted in Arizona demonstrate that the public believes the Forest Service and the Universities are the most credible sources of information for land management. A recent unpublished poll of 693 individuals revealed that although people want to be informed of land management activities they believe the experts should do the work. The activities outlined in this work plan will enhance and expand the capacity of the public and private land managers to improve their expertise and advance rigorous, effective, and socially acceptable forest ecosystem restoration.

---

[2] USDA and USDI, 2000. The National Fire Plan. September 2000. Washington, D.C.

[3] USDA Forest Service. 2004. 2004 Coconino National Forest: Report to Stakeholders. Flagstaff, Arizona

[4] Western Governors' Association Forest Health Advisory Committee (FHAC). 2004. Report to the Western Governors on the Implementation of the 10-Year Comprehensive Strategy. November 2004. Denver, Colorado

[5] Solop, F. 2003. Social Research Lab, Northern Arizona University. Grand Canyon Poll: A Survey to Assess Public Attitudes Towards Forest Health and Management. http://www4.nau.edu/srl/News.aspx?Year=2003.

[6] Delost, J. 2001. Public attitudes toward forest restoration methods in Arizona. M.S. Thesis, School of Forestry, Northern Arizona University.

Program Design

<u>Goal One</u>: Support a knowledge-based and spatially explicit collaborative landscape-scale assessment to help design a twenty year strategy for restoring degraded frequent fire forest ecosystems. The strategy will engage stakeholders to prioritize the location of restoration-based and hazardous fuel reduction treatments to protect and enhance community protection and economic viability, human and wildlife habitats, watersheds and other critical components of Arizona's landscape ecosystems.

--From "Managing the Impact of Wildfires on Communities and the Environment: A Report to the President in Response to the Wildfires of 2000."

Key Point #3. Invest in Projects to Reduce Fire Risk
Building on the forest policies of the last eight years, the wildland fire policy, and the concepts of ecosystem, the Departments should establish a collaborative effort to expedite and expand landscape-level fuel treatments.

--From "Healthy Forest Restoration Act

Section 2. Purposes
(1) To reduce risk to communities, municipal water supplies, and other at-risk Federal land through a collaborative process of planning, prioritizing and implementing hazardous fuel reduction projects.

Goal one responds to requests from members of the Arizona legislature, Governor's Forest Health Councils and the scientific community. The ERI will work with federal, state, local, and non-governmental partners to design (within a collaborative and cooperative framework) a twenty year cohesive strategy to help design effective, performance-based treatments that are strategically located to protect communities, wildlife habitat, watersheds, and key elements of the landscape.
Recognition of the need to address declining ponderosa pine forest ecosystem health at a landscape scale was explicitly recognized by Congress following the large fires of 2000. Report language in the FY'2001 Interior Appropriations and Related Agencies Committee Report directed the ERI to, "*conduct an adaptive ecosystem analysis of ponderosa pine and related forests as a prototype for larger ecosystem analyses, and to fill the gaps between project or district/forest level analyses and regional analyses to support future operational scale treatment".* In response to this request, the ERI funded Dr. Tom Sisk to develop a landscape scale forest planning tool (ForestERA) that could analyze different treatments and predict their outcomes. An explicit goal of this project is to ensure that the tool is practical and accessible to forest managers and interested stakeholders and capable of analyzing action at the landscape scale.

1. The ERI and ForestERA will support a knowledge-based and spatially explicit collaborative landscape-scale assessment to help design a twenty year strategy for restoring degraded frequent fire forest ecosystems in Arizona. Deliverables include:

- The first draft of a strategic vision for Arizona. The first draft will use the collaborative landscape assessments conducted for the Western Mogollon Plateau and in the White Mountains as the basis for creating a model vision based on broad stakeholder participation. Discussion of the draft will be a central focus of the Governor Napolitano's Forest Health Summit in March of 2006. ***March 2006***
- Provide access to the data layers developed by ForestERA to the Forest Service and stakeholders, ***ongoing***
- A final Strategic Vision that will help inform forest plan revisions and provide the logic for future state-level forest restoration actions, ***December 2006***
- Representatives of ForestERA will assist the Forest Service and US Fish and Wildlife Service to explore and identify uses of the ForestERA decision support tool that will assist land managers evaluate the impact of hazardous fuel reduction treatments on Mexican Spotted Owls. ***June 2006***
- Representatives of ForestERA will define work to be accomplished for incorporating existing socio-economic information into the decision support tool. These actions will be the basis for that section in the FY2007 Work Plan for the Ecological Restoration Institute. ***June 2006***

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

<u>Goal Two</u>: Develop, transfer, apply, monitor, and update practical science-based forest restoration treatments to improve the health of ponderosa pine forests.

--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 two the ERI will obtain, synthesize and analyze scientific information in support of forest restoration. Specifically, these activities will lead to explicit recommendations that will provide the best available science to land managers and other stakeholders for purposes of informing and encouraging appropriate management activities. These activities include: (1) monitoring and analysis of key results of established restoration treatments, and: (2) timely study/synthesis/analysis responses to emerging management questions.

1. The ERI monitors a wide-range of diverse ponderosa pine restoration treatments in the Intermountain West. This ongoing monitoring of the Long-term Ecological Restoration Network (LERN) contributes to our understanding of various responses to different treatments ranging from full restoration through minimal cutting and burn-only treatments. Sites in the LERN network include: the Mount Trumbull Restoration Project in the Grand Canyon/Parashant National Monument, the Pagosa Springs Ranger District on the San Juan National Forest, multiple sites in the Grand Canyon National Park, the Gus Pearson Natural Area, Fort Valley-Coconino National forest, Centennial Forest-Coconino National Forest, Camp Navajo-Arizona National Guard, and sites in the Apache-Sitgreaves and Gila National Forests.

   The LERN data provide some of the most comprehensive and reliable information to inform actions by forest managers in the Southwest because of their geographic representation, and because they track multiple characteristics of forest structure, fuels and fire behavior.

   - Summary and analysis of monitoring activities at existing ponderosa pine restoration demonstration sites focused on the implications for operational-scale treatment design and implementation, ***December 2006***.

2. The ERI will synthesize and adapt scientific findings, based on needs assessments and land manager requests, from conventional research programs for the implementation of forest and woodland restoration on a landscape scale. These analyses will be formatted to match the Status of Knowledge documents

developed by the research stations with a focus on providing the information in a language and format that is accessible to the land management community.

- Three status of knowledge reports designed to provide background on current management issues and trends

  1. First Report, ***March 2006***
  2. Second Report, ***August 2006***
  3. Third Report, ***December 2006***

**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(1)f, A(2)c, A(2)d, A(2)f, A(3)e, B(2)d, C(2)a-c*

<u>Goal Three</u>: Synthesize, translate and deliver biophysical and social science knowledge 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

In 2003 the ERI conducted a survey of state and federal land managers to determine how the ERI can effectively transfer the best available science to field practitioners. The strongest preferences were for either field-based training or a combination of classroom and field-based instruction. Consistent with other surveys learning from the web scored much lower as a technical transfer tool. Following the survey, the ERI initiated land manager workshops that explain and demonstrate the differences and overlaps 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. Our work has led to a change in attitude about the amount of fuel reduction necessary to enable the return of low-intensity fire. The level of interest expressed by practitioners could lead to creating a permanent continuing education program at the field level.

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. In 2006 we will continue training workshops for land managers and broaden the workshops to include other stakeholders. The goal is to teach participants about ecological restoration treatments and their potential to reverse declining forest health and reduce the risk of severe wildfires across the forest landscape; and to help them to design, implement, monitor and regularly revise wildfire treatments based on the use of adaptive ecosystem management. This will be accomplished by offering six continuing education workshops.

    - Three workshops that include field training, ***May 2006***
    - Three workshops that include field training, ***December 2006***

2. For three years the ERI has produced brief "working papers" designed to translate scientific information for application in treatment design and implementation. These are short, non-technical and appreciated by land managers and stakeholders. Six working papers.

    - Three working papers, ***May 2006***

- Three working papers, ***December 2006***

3. Development of information pertinent to management actions for posting on the Web.

   - Updates on new material included for stakeholders and land managers, ***ongoing with list of new sections in final report***

4. Hold national workshop on restoration of long-needled pine forests for land managers and stakeholders that will focus on interpreting current research findings for application on the ground.

   - Conference, ***October 2006***

5. Preparation of fact sheets and white papers on request

   - Three fact sheets, ***December 2006***
   - Two white papers for decision-makers and stakeholders

     1. Paper one, ***June 2006***
     2. Paper two, ***October 2006***

6. 20 Field trips for stakeholders to visit restoration sites

   - 10 field trips, ***June 2006***
   - 10 field trips, ***December 2006***

7. 10 Presentations on forest restoration for stakeholders

   - 5 Presentations, ***June 2006***
   - 5 Presentations, ***December 2006***

8. Six Rapid Assessments (field estimates of localized reference conditions, fire regime, and restoration prescription development, etc.) of treatment sites that provide explicit recommendations for action

   - 3 RAPs, ***June 2006***
   - 3 RAPs, ***December 2006***

**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(2)b, A(2)e, A(2)f, A(3)a, A(3)b, B(2)a, B(2)b, B(2)c, C(2)a-c, D(1)a, D(2)a*

<u>Goal Four:</u> 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.

From--Executive Order: Facilitation of Cooperative Conservation (Executive Order 13352 of August 26, 2004)

Section 1. Purpose.
The purpose of this order is to ensure that the Departments of the Interior, Agriculture, Commerce, and Defense and the Environmental Protection Agency implement laws relating to the environment and natural resources in a manner that promotes cooperative conservation, with an emphasis on appropriate inclusion of local participation in Federal decision-making, in accordance with their respective agency missions, policies, and regulations.

Section 2. Definition.
As used in this order, the term "cooperative conservation" means actions that relate to use, enhancement, and enjoyment of natural resources, protection of the environment, or both, and that involve collaborative activity among Federal, State, local, and tribal governments, private for-profit and nonprofit institutions, other nongovernmental entities and individuals.

Working with communities, local government and stakeholders is key to developing comprehensive solutions to the wildfire crisis. The ERI will continue to support collaborative efforts by providing information, service and in the case of the Greater Flagstaff Forest Partnership funding through an integrated program of work.

1. 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. The ERI will continue to support utilization efforts through analysis and technical assistance.
    - Fulfillment of two information requests based on private sector and collaborative utilization process needs. These information requests will be at a range of scales from the local to the state level and are anticipated to come from diverse stakeholders (e.g., the Arizona Joint Legislative Healthy Forest Task Force, the Arizona Governor's Forest Health Councils, local collaborative groups). ***December 2006***

2. Increasing demands for collaborative planning and assessment process do not automatically lead to successful development and implementation of restoration projects that meet the needs and interests of multiple stakeholders. There is considerable confusion about what collaborative conservation means and how it can best be integrated into existing planning and management procedures. The

ERI provides information, training, and technical assistance in collaboration best practices, including multiparty monitoring and stewardship contracting.

- Develop and conduct either alone or in partnership a training module on collaboration best practices ***December 2006***
- Respond to requests for information and technical assistance related to collaboration. ***Ongoing***

3. The forest planning process and environmental review process for forest treatments have changed with the passage of the Healthy Forest Restoration Act and the Healthy Forests Initiative. Precisely how things are changing and the implications for public involvement are unclear to many citizens. The ERI in partnership with others will hold a practitioners workshop for land managers and community practitioners to explain the new authorities and how they are currently interpreted and implemented.
   - One practitioner workshop, ***December 2005***
   - Written guidance on current policy and planning procedures, ***September 2006***
4. The Greater Flagstaff Forest Partnership (GFFP) is an exemplar of community-based, collaborative forestry. Central to the success has been a strong core partnership of the Coconino National Forest, Northern Arizona University and an environmental organization, the Grand Canyon Trust surrounded by a constellation of partners willing to work on the multitude of challenges presented by the forest health crisis.

   The ERI, City of Flagstaff and Coconino County have provided support to GFFP for several years. This not only helps get work done but enables the ERI to investigate the collaborative process and monitor the pros and cons of different approaches to collaboration and the effectiveness of collaboration for getting work done on the ground. Much like the ERI has statistically valid plots for analyzing ecological responses to restoration, the GFFP provides a working lab for analysis of human values and interactions that influence land management. This experience is transferred to other collaborative organizations to make them more effective. The funding and integrated support provided to the GFFP will enable participation in the planning, implementation and coordination of treatments in the Flagstaff WUI and at the landscape level.
   - Annual Performance Review Report, ***December 2006***

**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)e, A(2)b, A(2)e, A(3)a, A(3)b, C(2)a-c, D(1)a-b, D(2)a*

**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)d, A(2)f, A(3)a, A(3)b, C(2)a*

Monitoring and Evaluation Criteria

The Ecological Restoration Institute will provide a report articulating progress on the deliverables on December 31, 2006 and after all funds have been expended consistent with the agreement that accompanies this work plan. The ERI 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.

Fulfilling Duties of the Act

Duties in the Act (PL 108-317)	**Project**			
	1	**2**	**3**	**4**
1. Develop, conduct research on, transfer, promote, and monitor restoration-based hazardous fuel reduction treatments to reduce the risk of severe wildfires and improve the health of dry forest and woodland ecosystems in the interior West;	**x**	**x**	**x**	**x**
2. Synthesize and adapt scientific findings from conventional research to implement restoration-based hazardous fuels reduction treatments on a landscape scale using and adaptive ecosystem management framework;	**x**	**x**	**x**	**x**
3. Translate for, and transfer to affected entities any scientific and interdisciplinary knowledge about restoration-based hazardous fuels reduction treatments;	**x**	**x**	**x**	**x**
4. Assist affected entities with the design of adaptive management approaches (including monitoring) for the implementation of restoration-based hazardous fuels reduction treatments;	**x**	**x**	**x**	**x**
5. Provide peer-reviewed annual reports.				

Appendix A – Needs Assessment

Community-based Forest Restoration in the Southwest: A Needs Assessment

Purpose and method

The goals of this effort were: (1) to characterize community-based forest restoration in the Southwest – how many groups, their characteristics, goals, activities; (2) identify challenges and needs these groups are facing; and (3) identify preferred forms of technical assistance. To answer these questions, we interviewed individuals from 30 communities in Arizona and New Mexico that are involved in forest restoration. Most of these individuals were coordinators or representatives of community groups, but some were private forest contractors or businesspeople.

Characteristics of community-based forest restoration in the Southwest

At the time of the interviews (2002-2003), there were 25 community groups and three regional networks focused on forest restoration or fuels reduction. Three general types of rural southwestern communities are involved in community-based forest restoration efforts, falling generally along ethnic lines: Native American Tribal communities, Hispano land grant communities, and rural, formerly timber-dependent, Anglo-American communities. They commonly focus their forestry efforts on three broad goals: restoration and fuels reduction; economic development; and building social capital.

- **Forest restoration and fuels reduction**: All groups report working toward forest health and forest restoration in some form to meet the goals of improving forest health and reducing the risk of catastrophic fire. For most of these groups thinning to reduce fuel loads and fuel continuity is the primary focus. Roughly a quarter of these groups are also reintroducing fire to fire-adapted forests. Other goals are to:
    - create or improve wildlife habitat;
    - reduce competition or encroachment of excess trees;
    - control exotics and pathogens (particularly mistletoe);
    - and, to improve grasslands.

  Fire risk reduction through fuel reduction and the creation of defensible space are top priorities for many communities. Some communities are also involved in post-fire rehabilitation that includes reseeding, often using native species, but sometimes using non-native annuals to stabilize soils and improve conditions for the reestablishment of native perennials. Rehabilitation also includes the planting of nursery-grown seedlings to encourage reforestation.

- **Economic development and utilization**: Economic development and utilization of thinned by-products are equally important goals of many community-based forestry groups. Specific economic goals include to:
    - provide jobs to local workers;
    - support the economic viability of rural communities;
    - increase the community capacity to do restoration work;

- to produce timber and/or enhance the productivity and health of local timber stands;
- and to improve utilization of restoration by-products.

- **Education and cooperation**: The third category of activities, again equally as important as economic development and forest health, deals generally with education and community organizing. Specifically, this includes public education, youth education, restoration practitioner training, and conflict resolution / collaboration. Specific goals are to:
  - give locals substantive input to restoration goals and outcomes;
  - resolve persistent conflicts between commodity users, environmentalists, community leaders, agencies and forest practitioners;
  - encourage residents and real estate developers to create defensible space; and,
  - reconnect people with the land.

  Strategies used include youth programs such as environmental education curricula, YCC (Youth Conservation Corps) and 4H programs, and apprenticeship and training programs, as well as mutual education. Mutual education involves taking forestry practitioners, stakeholders, and the general public out into the forest to broaden people's perspectives regarding restoration and to allow the public to gain an understanding of the need for restoration and of what restoration management looks like on the ground. In addition, five groups reported that their communities are developing new policies, such as Firewise guidelines or new ordinances requiring fuels reduction on private property.

Challenges and needs

- **Funding** is the number one need. There is a persistent lack of money for community groups to buy the necessary equipment and to pay for the work that needs to be done. Community groups find it hard to maintain needed funds through grants. One community member stated that their greatest need is *"consistent funding and especially consistent funding that does not require non-existent matches."* Several noted that the National Forests or their local forest districts do not have the funding needed to do the work recognized as necessary. Some community groups say they are raising funds for the Forest Service: *"The Forest Service does not have money for implementation, so the community group had to raise money to implement the project."* Said another, *"We want to do a service contract with embedded timber sale, but the Forest Service does not have the money to do it that way, so the community group is fundraising for them."*

- **Policy challenges** are second greatest need. Particular problems include:
  - difficulties dealing with the Forest Service bureaucracy;
  - problems with service, timber sale, and stewardship contracting;
  - failure to complete NEPA review in a timely manner;
  - financing; and,
  - an inconsistent supply of timber which makes economic sustainability particularly challenging.

  For example: *"The Forest Service is under criticism from practitioners who are afraid to invest in equipment when bidding is different depending on the forest*

and line officers. The process is not clear and forest managers don't understand how to be proactive and streamline procedures."

According to another: *"It's been virtually impossible to get the Forest Service to think of this as anything but a timber sale, but the wood really has no market value."*

Seven groups report writing their own management prescriptions and fulfilling NEPA requirements on their own. Said one, *"Thinning contracts are so small that we are limited in the amount of resources we can take out. Everyone wants to clean up the forest, but they don't allow the contracts to go through because the NEPA studies are not being done. All of that kind of bogs everything down."*

Specific challenges include getting the State government to recognize infrastructure and funding needs and the astronomically high workman's compensation rate. High labor and equipment costs combined with an unpredictable supply of material makes the creation and sustaining of infrastructure virtually impossible: *"Banks and financial institutions want 5-10 years, guaranteed. The Forest Service and even the BIA at this point have not stepped up and made that commitment. You can't do anything without a commitment."* There is also a need for technical assistance with federal contracts and applications: *"If you really wanted to do something that could help us or help other rural communities - take the money and set up a website and have in there the excel spreadsheets templates for determining cost per unit. Have in there a glossary of financial terms, a glossary of forestry terms, [contract administration details]..., templates for filling out a 428, for filling out a 429. Because do you think these small rural communities have any idea how to do those federal applications? That would be worth its weight in gold."*

- **Utilization & marketing** are important aspects of creating and sustaining an economic base for restoration work. There is a need to know what kinds of utilization opportunities exist, and how well they are working. There is also a need for marketing assistance and expertise to help locate or create markets for what are often niche products or products derived from low-quality wood. *"There is just no way for us to be able to move that product…We don't have a lot of markets out there for smaller products."* A common database or information pool to link product suppliers with product purchasers would go a long way toward improving marketing and economic feasibility.

- **Collaboration & conflict resolution** are important issues as well. Many groups are particularly challenged by an inability to engage some environmental advocacy organizations; these groups report ongoing conflict and animosity with environmentalists. According to one, *"It has been my experience that radical environmentalists do not wish to communicate with rural, forest-dependent communities. My perception is that they continue to do what they have done in the past in the federal courts. … Some communities have tried to collaborate with [these groups] in the past with the outcomes being very negative … there was a hidden agenda [on the part of the environmentalists]."* Another said they *"can't work with position-based environmental organizations with rigid no-cut positions."*

Community forestry groups are also interested in learning how to better work with agencies. Respondents report challenges due to conflict within their communities (for example, between long-standing residents and newcomers), extreme conflict between communities and some environmental groups, and lack of cooperation from the Forest Service: *"Our community group and environmental groups came to tentative agreement on a restoration project, but then the agency chose a different alternative – as a result, we lost the support of both the local environmental interests and the people who were in favor of forest restoration to help the economy."* According to another group, *"The USDA Forest Service is by far the biggest block to getting the project going. It is not a priority for the district so they've put no personnel or dollars toward the project."* At times challenges with the agency and with environmental organizations become intertwined, as in an example where the Forest Service wouldn't commit to a wood product supply because of *"environmental politics, because environmentalists think that if you commit supply you are bringing in big business."*

- **Restoration best practices** and restoration research findings are of interest to some groups, but many also note that they pretty much have things under control and aren't looking to adopt someone else's theory and techniques. Most groups, however, are willing to take scientific information into consideration, given that it is understandable and practical: *"Make scientific information understandable to homeowners. We're not interested in scientific research."*

- **Public education** is a significant challenge. Education is particularly needed to help homeowners understand the need for thinning and the importance of defensible space. There is a sense that homeowners are still building houses in the middle of the forest and don't want to cut any trees, and that any forest management is perceived negatively: *"New arrivals into the WUI don't want to see a single tree cut, even in doghair. It's a complete misunderstanding of what constitutes a healthy forest. They don't have a clue."*

  Communities are using several strategies to address public misinformation and apathy these include:
  - working through schools;
  - training children;
  - developing demonstration sites;
  - organizing field trips for adults to see these sites;
  - organizing volunteer work days; and,
  - organizing monitoring projects.

  "We've got to get the kids back out into the woods and teach them what forestry really is, because they're not learning it in their classroom studies. … The teacher needs to be educated, and so do the students."

Preferred information formats

- **Technical assistance and peer-to-peer learning.** By far the preferred way of getting information is individual, face-to-face consulting. Several respondents stressed that communities' information needs are highly site-specific and quite technical: advice, oversight on treatments and monitoring, outreach on best

practices. *"Bring in a 3rd party (from outside the community) to talk about forest ecosystem functions and natural processes."* Some are also interested in having speakers available for public education forums. Others recommended providing technical assistance to the agencies: *"Train the forestry staff to have a broader perspective, maybe show different management scenarios and outcomes and educate the public about forest ecology."*

- **Newsletters and direct mail**. If face-to-face, site-specific input is not available, the next best option is a newsletter or short technical guides sent by direct mail. Email and web sites are not recommended, as many working in this field either do not have Internet access or don't have time to consult online material. People say they prefer a document they can take with them into the field and pass on to others. The exception to this rule are the coordinators of established community groups, who spend more time in the office than do the practicing foresters. Respondents emphasized that these publications should be "short and skimmable [sic]." In terms of content, these publications should "highlight success stories; show different examples of community-based restoration, focus on education"; "could use an information piece explaining where the Forest Service in this region stands on forest restoration. Seems like their direction has changed."

- **Workshops, field tours, & conferences**. There is some interest in workshops and field tours, though several mentioned time cost and cite an inability to get away from work: *"In my business, one day of missed work equates to a $1,000 investment. If I were to invest that much money into advertising, I'd expect a $50,000 return. What kind of return can I expect from a workshop?"* Others indicated they would attend if the time away from work isn't too great and if the work is relevant. Many want to see what others have done and what their experiences are, if these others are working on similar issues. Some indicated the usefulness of getting individuals together who share a functional interest: to visit each other's sites and discuss new ideas about equipment or worker management. A few mentioned the importance of mutual education, of agency and private practitioners learning together and sharing experiences.

- One approach would be a joint workshop or training for Forest Service personnel and community members on contracting and NEPA processes*: "If the Forest Service does it internally, nobody from the public will come in. But if we do it community-based, then the key people from the public will come in, and they'll say, 'oh, I didn't know we could contract this way.' And they won't let it drop. I guarantee you once they learn something new that can help wood move, they won't let it drop. They'll hound the Forest Service to get it done."*

- **Regional directory or network.** There is limited interest in either a directory or a regional network; most say they are already well networked or that they wouldn't use it. Some are interested in a directory of service providers, such as consultants, contractors, and others with specific expertise that they can go to for help with specific needs.

Appendix B – Specific Land Manager Needs	
Specific Need	**Although Much Remains to be Done, The Ecological Restoration Institute has Made Major Progress in Meeting Many Specific Land Manager Needs**
A.) Will the activities described in the Institute's work plan: (1) enhance the capacity to develop, transfer, apply, monitor, and regularly update practical science-based forest restoration treatments that will reduce the risk of severe wildfires, and improve the health of dry forest and woodland ecosystems in the interior West; Examples of specific land manager needs: (a) Define stand/patch structure and disturbance regimes as related to reference conditions, at the landscape scale by vegetative cover type, that represent ecological functionality.	ERI has a strong program in meeting this need. To date we: 1. have determined reference conditions of forest structure (and in most cases, fire regime) on the Coconino National Forest (Bar-M Canyon, Fort Valley, and San Francisco Peaks), Mt Trumbull, Grand Canyon, Kaibab National Forest (Grandview + N. Kaibab R.D.), and Camp Navajo. 2. are using the historical Woolsey plot network to reconstruct early twentieth century forest structure on the Coconino, Prescott, Gila, Cibola, Lincoln, Carson, and Santa Fe National Forests. 3. are measuring the effects of ecological restoration treatments on ecological functionality including, for example, vegetation structure and function, fuel loading and fire behavior, hydrologic processes, soil processes, wildlife habitat, insect populations, and biodiversity. 4. measured modern long-needled pine reference sites which have ongoing frequent fire regimes for forest structure and fire processes in northern Mexico and at Grand Canyon. **5.** have initiated new studies focused on: a)reference conditions for understory plant communities and b) pinyon-juniper ecosystems. Studies are published within two years of data collection and developed for interpretation for managers in Working Papers, continuing education workshops, and input to GIS data layers, as well as on the internet.
(b) Develop a process to prioritize restoration treatments as related to risk for both wildland urban interface and landscape scale ecosystems.	The ERI has worked with collaborative groups to prioritize restoration treatments in the wildland: urban interface and in landscape scale assessments. 1. The ForestERA (Forest Ecosystem Restoration Analysis) Project is a science-based landscape-level prioritization process in the region that is open to broad participation. It has been supported largely by ERI, and has led to interjurisdictional planning efforts over 2.2 million acres on the western Mogollon Plateau, provided science for the

	development of several CSPP's, supported fire planning on the Mogollon Rim District of the Coconino N.F., and provided data, tools, and a process for evaluating the cumulative effects of numerous project-level plans in northern Arizona. 2. The ERI worked with the Arizona and New Mexico state wide forest/watershed restoration advisory councils to develop principles for prioritizing projects. 3. The ERI has given testimony and presentations to Congress, legislatures, the Western Governors' Association, and state and federal agency leaders from the local to the national level on our results from treatment prioritization projects.
(c) Develop/study fuels and restoration treatments that support other land management objectives and not strictly fuels/restoration objectives.	The ERI has focused most of its efforts on interdisciplinary approaches to develop information that supports the broad goals of ecosystem management. For example: 1. all of our work is focused on determining the effects of a range of treatments on ecological conditions essential to determining effects on resource values. 2. our Long-term Ecological Network studies include not only strict sense restoration treatments but a range of other treatments designed to meet other landscape management objectives. 3. our work includes wildlife studies in partnership with Arizona Game & Fish (Mt. Trumbull: deer, turkeys, squirrels, herpetofauna, birds) and others (invertebrates, butterflies, passerine birds, turkey habitat). 4. Virtually all our landscape-scale studies and replicated experiments include comprehensive study of understory plant communities and exotic species
(d) Address uneven-aged silivicultural systems and not just even-aged management.	ERI has partnered in: 1. the establishment and measurement of restoration experiments following an uneven-aged approach in Fort Valley and Centennial

	Forest, Arizona. 2. a major study since 2003 on effects of the Rodeo-Chediski fire traces fuel-reducing effects of landscape-scale uneven-aged treatments on White Mountain Apache Tribal lands.
(e) Develop/study and propose fuels and restoration treatments that allow for both commercial and noncommercial harvest.	The Ecological Restoration Institute: 1. has developed treatments on the Coconino, Kaibab, Apache-Sitgreaves, Gila, and San Juan National Forests, plus BLM and Arizona State Lands, all of which included commercial and noncommercial harvest. 2. has supported research and development work on the economic impacts of alternative harvesting systems and wood utilization techniques. 3. has only two exclusively noncommercial experiments, both of which were small-scale treatments in the Gus Pearson National Area and at Grand Canyon National Park. 4. The ForestERA Project includes spatial planning tools that allow users to model treatments developed by ERI and others across large areas, thereby examining anticipated effects on fire hazard, wildlife habitat, and watershed values.
(f) Determine natural ranges of variability and stand dynamics including historical representation of Pinyon-Juniper ecosystems.	All Ecological Restoration Institute study sites serve to determine ranges of variability in current and past stand dynamics and to communicate the results to managers and stakeholders. Key examples include: 1. the Gus Pearson Natural Area (initiated 1992), Mt Trumbull (1995—led to the construction of new facilities for researchers and visitors to see this remote restoration example), and the Greater Flagstaff Forests Partnership sites (1997) near Flagstaff. Similar work in Pinyon-Juniper ecosystems are now under way. 2. A new initiative (the Rapid Assessment program) is designed to quickly determine ranges of variability and stand dynamics and demonstrate techniques to local partnerships. 3. studies of thinning and slash treatment responses and background ecological restoration information (ranges of variability, changes

	since settlement, and restoration treatment responses) in Pinyon-Juniper ecosystems was initiated in 2002.
(2) synthesize and adapt scientific findings from conventional research programs to the implementation of forest and woodland restoration on a landscape scale; Examples of specific land manager needs: (a) Identify the appropriate application of restoration treatments at the landscape scale.	1. ForestERA is major regional example, as existing data are analyzed in tandem with remote imagery, allowing landscape-level inference across hundreds of thousands of acres that have not been intensively studied. In this way, scientific information gained at specific study sites can be integrated and applied across larger areas, with known levels of statistical accuracy and uncertainty. 2. ERI has also conducted analysis of fuel treatments and potential fire behavior in the Flagstaff/San Francisco Peaks region.
(b) Promote agreement on what treatment prescriptions are appropriate spatially and temporally across the landscape using an integrated approach across a wide variety of disciplines.	1. Examples of integrated planning include participation with local collaborative groups (e.g., the Greater Flagstaff Forests Partnership, Mt. Trumbull landscape, the Natural Resource Working Group) and statewide efforts in New Mexico and Arizona. 2. The ForestERA Project brings diverse constituencies together to discuss treatment prescriptions and priorities, using map-based data and analysis to explore these issues and incorporate diverse information and values into the planning process. Participatory processes have led to surprisingly high levels of agreement regarding treatment prescriptions across large (2-million-acre +) areas in northern Arizona.
(c) Develop a geospatial analysis process to strategically place landscape restoration and wildland urban interface protection treatments to optimize patch dynamics and buffer infrastructure	The Ecological Restoration Institute: 1. participates in the development and application of the GIS based decision support tool, ForestERA, on strategic placement of restoration treatments to achieve multiple land management objectives. 2. analyzes fuel treatments and potential fire behavior in the Flagstaff/San Francisco Peaks region. 3. ForestERA is a major regional example, allowing planners to work with scientists and citizens to develop restoration plans and compare alternative scenarios at the landscape scale. Only in landscape-level analyses can patch and boundary dynamics be analyzed explicitly,

	and these are key to the rigorous examination of cumulative effects. ERI has also conducted analysis of fuel treatments and potential fire behavior in the Flagstaff/San Francisco Peaks region.
(d) Develop experimental designs with plot, site or area level sampling for research that is hierarchical and therefore easy to aggregate for extrapolation to the landscape scale.	Monitoring at the Ecological Restoration Institute is **scaled** from stand level units (scale 10-100 acres) up to large treated/control landscapes (1,000+ acres) and regional scale measurements and GIS-based analysis (1,000,000+ acres).
(e) Develop innovative methods to present synthesized scientific information in a way that is easily accessed by the intended user (field specialist and first line managers)	Information is presented at professional meetings and developed for **interpretation for managers** in Working Papers, continuing education workshops, and for input to GIS based decision tools, as well as for distribution on the internet.
(f) Develop a series of demonstration sites that illustrate a variety of proven scientific methods to address various management issues;	All restoration sites serve a demonstration purpose, but **key examples** include: 1. the Gus Pearson Natural Area (initiated 1992). 2. Mt Trumbull (1995—led to the construction of new facilities for researchers and visitors to see this remote restoration example). 3. the Greater Flagstaff Forests Partnership sites (1997) near Flagstaff. 4. the seven (to date) Long-term Ecological Restoration Network sites 5. new initiatives to quickly demonstrate techniques to local partnerships is the **Rapid Assessment program**, setting up side-by-side treatment examples throughout the Region.
(g) Determine the effects of anthropogenic influences as they relate to restoration treatment efficacy.	**Further clarification is needed to understand the specific desired outcome**
(3) facilitate the transfer of interdisciplinary knowledge required to understand the socioeconomic and environmental impacts of wildfire on ecosystems and landscapes; Examples of specific land manager	The ERI supports the development the interdisciplinary knowledge to accomplish restoration. Examples include: 1. Workshop in September 2003 to identify barriers and solutions to the success of collaborative forestry 2. A survey synthesis (in review) that identifies both issues of understanding and areas of support by the public. It will reveal where

needs: (a)Define the relevant social, economic, and ecological factors associated with the wildfire and restoration programs.	more education is needed for the general public 3. Ongoing support for efforts to utilize wood and develop a restoration work force. Support given to the Americorps program in 2001 launched a successful program of training and work experience that continues today. 4. In 2003 the ERI subcontracted with the NAU School of Forestry for a cost/benefit analysis of restoration for the Western Governor's Association 5. ForestERA incorporates ecological factors and social values in the development of a planning process that address explicit tradeoffs in forest management.
(b) Design and convene collaborative forums to build a common vision on the socioeconomic and environmental impacts of wildfire, and the increase in ecological services that can result from forest restoration treatments.	1. The ERI provides service to fourteen communities throughout the Southwest who seek to develop collaborative approaches for forest restoration. 2. The ERI participates in state (Forest Health Oversight Council, Forest Health Advisory Council) and regional organizations working to accomplish restoration. **3.** The ForestERA project has convened over a dozen workshops and planning efforts, and contributed to dozens of working meetings that address these issues in an inclusive manner.
(c) Format data and information for technology transfer so that it is compatible with Agency corporate information systems and the standards of the Federal Geographic Data Committee (FGDC).	ForestERA data is available in ArcGIS data formats that are compatible with spatial analytical software platforms in use throughout the Forest Service, BLM and other federal and state agencies. Data produced by ForestERA meet FGDC metadata standards, and most include explicit accuracy assessments. Ongoing training efforts and tool development allow increasingly easy exchange of information through tools to guide reprojections, transformation between raster and vector data formats, and other potential hurdles to information exchange and technology transfer.
(d) Develop innovative methods to transfer the scientific results that are being funded through the National Fire Plan and Joint Fire Sciences Program;	The 2005 work plan specifically addresses this challenge by taking work previously funded by the Jt. Fire Science Program and translating it for broad application. The ERI will examine other studies produced by the JFSP and consider options for synthesis and interpretation for the land management

	community in future years
B.) Does the work plan demonstrate how the Institute will collaborate with Federal agencies to: (1) use ecological restoration treatments to reverse declining forest health and reduce the risk of severe wildfires across the forest landscape; and (2) design, implement, monitor, and regularly revise representative wildfire treatments based on the use of adaptive ecosystem management; Examples of specific land manager needs: (a) Identify a range of suitable treatments and their appropriate application including costs, advantages and disadvantages, and application guidelines.	The ERI is in the process of developing a series of working papers that will provide a side-by-side analysis of the known outcomes of several popular restoration treatments. These will be published and sent to our extensive list of land managers and available on our website. Treatments for analysis include: Strict sense restoration (pre-settlement), related treatments that leave higher levels of basal area, the natural processes model, and multi-aged group restoration treatments. This product has been requested by almost all stakeholders involved in restoration.
(b)Deliver mechanisms that would disseminate information on suitable treatments including written materials, on the ground workshops, and collaborative pilot projects with practitioners.	The ERI has produced 10 working papers on subjects relevant to restoration, will conduct 11 continuing education workshops for land managers, communities and other stakeholders in FY 2004 and will follow those workshops with on-site visits to critique treatment design.
(c)Design approaches to adaptive management that includes collaboration, multi-scale monitoring, and spatial and ground-based monitoring systems. Develop assessments, plans and NEPA related documents that identify	The ERI is developing a section on our website designed to serve the needs of planners and environmental review.

management options based on thresholds, monitoring trigger points and critical indicators to invoke adaptive management options.	
(d)Determine effectiveness of treatments to maintain or reestablish native vegetative communities associated with historical disturbance regimes.	The ERI assesses treatment effectiveness for re-establishing native vegetative communities at all monitoring sites.
C.) Will the activities described in the work plan assist land managers: (1) treat acres with restoration-based applications; (2) use 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— (a) the National Fire Plan; (b) the report entitled `Protecting People and Sustaining Resources in Fire-Adapted Ecosystems-A Cohesive Strategy' (65 Fed. Reg. 67480); and (c) the report entitled `10-Year Comprehensive Strategy: A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment' of the Western Governors'	As of March 31, 2004, the ERI is or has been involved with planning on 686,353 acres that will result in treatments on 184,441 acres. The number of acres treated will increase as additional acres in the planning process are identified for implementation. The ERI has also financially and intellectually supported the ForestERA decision support tool which prioritized treatments on 2.2 million acres of the Western Mogollon Rim. The Eastern Mogollon Rim will be prioritized by December 31, 2005 See page 5 of this report for a detailed analysis of the requirements of major policy documents. The ERI actively supports the land management objectives articulated in these policies by: producing and transferring the best available science to land managers and other stakeholders, supports community collaboration with technical advise, multi-party monitoring training and rapid ecological assessments. As described above, the ForestERA project provides tools for developing, analyzing, displaying, and transferring information in forms that are easily understood and interpreted (principally via maps)

Association? Examples of specific land manager needs: (a)Develop and deliver long distance learning and short courses for college credit in the Biological Sciences and other subjects for Interagency Fire Management Program certification from the technician to professional series; and	
(b)Promote the development of a network or clearinghouse for storing, retrieving and distributing relevant restoration information to the public, research and management community.	1. The ERI maintains a robust website with an attached library. This provides access to all ERI peer-reviewed and popular publications. Data is stored using university protocols. 2. The ForestERA does this for the western Mogollon Plateau region of northern Arizona, as evident at the project web site: www.forestera.nau.edu
(D) Will the Institute: (1) 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 Examples of specific land manager needs: (a) Provide Collaborative Forest Restoration Program (CFRP) grantees, grant applicants and their partners with current scientific information and assist in the design, implementation and monitoring of	Since the start of the CFRP project (Oct. 2003) the ERI in collaboration with others has completed the following: 1. 6 handbooks - distributed to all grantees & others interested in multiparty monitoring of restoration projects 2. 7 training workshops for CFRP grantees (over 100 representatives from 36 projects have attended at least 1 training) 3. 10 youth trainings in ecological monitoring field methods (over 150 youth trained) 4. 1 teacher training (incorporating CFRP monitoring into their curriculum) 5. 23 projects received direct technical assistance The ERI has also made presentations about this program at various workshops and conferences:

forest restoration and small diameter utilization projects implemented under the CFRP.	1. Consortium for Research on Community-Based Collaboratives Workshop (June 04) 2. Riparian Restoration Conference at San Juan (July 04) 3. Southwest Sustainable Forestry Partnership (Sept 04) 4. National Network of Forest Practitioners Annual Workshop (Nov. 04) 5. County Partnership in Restoration Conference (March 05) 6. Environmental Conflict Resolution Conference (May 05)
(b) Improve the capacity to utilize excess woody material by developing and improving on existing technologies and evaluating the impacts of state and federal incentive programs.	The ERI is working with the Greater Flagstaff Forest Partnership and Economic Council to characterize the local and regional wood supply and putting it in a form appropriate for purposes of business promotion in the Region
(2) 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. Examples of specific land manager needs: (a) Develop a variety of products (brochures, posters, displays, popular articles, media pieces, demonstration plots or areas, public conferences, workshops and forums) to provide information on the role of fire, fire management, and the need for active restoration efforts;	The ERI has actively engaged in every forum articulated in this example. For example some of the deliverables articulated in the FY'04 cost-reimbursable agreement include: 1. 6 working papers 2. 2 white papers 3. 11 continuing education workshops 4. 22 forest visits to critique projects 5. two book chapters or technical reports on pinyon/juniper restoration 6. 3 rapid assessments 7. one landscape assessment 8. the FY'05 work plan serves this objective in Goal 2.

(b) Deliver information to the public that follows Agency direction and policy regarding publication and video production standards, and is congruent with Agency communication plans. Evaluate Information that may relate to pending decisions prior to releasing it to the public.	**Further information is needed to understand the specific outcome**

Appendix C – Charter

Charter for the Southwest Ecological Restoration Institutes

This Charter clarifies the goals, duties and operating procedures for the SOUTHWEST ECOLOGICAL RESTORATION INSTITUTES, and their respective states, as envisioned in PL 108-317. This Charter is entered into by and among the Governors of the States of Arizona, Colorado and New Mexico, and the Presidents of Northern Arizona University, Colorado State University and New Mexico Highlands University, on behalf of their respective governing boards, hereafter referred to collectively as "the Parties".

1. PURPOSE

A. The purpose of the SOUTHWEST ECOLOGICAL RESTORATION INSTITUTES ("SWERI") is to bring the unique strengths of the member universities, individually, collectively and in cooperation with other institutions to help support land managers and their collaborators working to achieve comprehensive ecological restoration treatments on the ground.

B. To assure that ecological restoration treatments are effective and efficient, the Institutes identified by PL 108-317 will develop, translate and transfer practical, operation-oriented scientific knowledge to land managers, collaborative community groups and others who cooperate in the design and implementation of ecosystem restoration treatments. A key mission is to assure, through systematic collaboration and coordination of resources, that all levels of government and stakeholders from the local to the state, regional, and national levels have the best information available to ensure that collaborative ecosystem restoration treatments are implemented in the most effective and efficient manner for restoring the ecological, economic, and social integrity of the greater ecosystems of the Interior West.

C. The SOUTHWEST ECOLOGICAL RESTORATION INSTITUTES are established by Northern Arizona University, Colorado State University and New Mexico Highlands University. The respective states will be involved and represented, at a minimum, by their State Foresters. The institutes will have many diverse stakeholders who are involved in the design and implementation of ecological restoration treatments in frequent fire forests and associated woodlands. These stakeholders may include when appropriate, but are not limited to: the federal land management agencies; state governments; tribes; elected officials; local governments; and nongovernmental entities that include collaborative community groups and environmentalists, the Western Governors' Association, and business.

D. The SOUTHWEST ECOLOGICAL RESTORATION INSTITUTES has no regulatory authority and recognizes that all legal authority is reserved by its members in

accordance with existing law. It also recognizes that the institutes, by virtue of their affiliation with universities, may have duties beyond those specified in this agreement.

2. BACKGROUND

A. The need for restoring ecosystem health in the Southwest has been evident for decades, especially for its ponderosa pine and drier mixed conifer forests. As a result of disruption of the natural frequent fire regime and past harvesting and grazing practices, forests became dense and vulnerable to unnaturally severe, stand-replacing fires. In many watersheds, over 90% of these forests are considered at moderate or high risk for crownfires due to dense stand structure and accumulated fuels. Fire acreage and size have been steadily increasing, culminating in the largest fire in southwestern history, the 468,000-acre Rodeo-Chediski fire in 2002, a fire that devastated watersheds and economies over an entire region. Entire states and regions are now at risk of losing the ecological and environmental benefits of greater ecosystems at the scale of millions of acres.

B. Many managers, from resource specialists to land managers, feel that science shows that thinning, burning, and other forest restoration techniques can be effective in restoring forest health and reducing the threat of unnatural fire in the frequent fire forest types of the Interior West. A central question is how to use the best science to get restoration done in the most effective and efficient way possible, while learning how to improve our treatments as we move forward. Although there are clear needs for the discovery of additional scientific information, the flood of existing scientific literature, the disconnected sources of information, and the complexity of environmental analysis can overwhelm the resources of practitioners, stakeholders and decision-makers. Wildland ecosystems and their dependent human communities are the ultimate victims if managers cannot mobilize the critical information for rapid, thorough, and scientifically defensible environmental analysis.

3. STRUCTURE

A. Goals and Legislative Intent

3.1. Goal. The goal of the SOUTHWEST ECOLOGICAL RESTORATION INSTITUTES is to obtain, summarize, and transfer relevant and accurate scientific information to managers and other key stakeholders.

3.2. Legislative Purpose of PL 108-317 as published is:

8. To enhance the capacity to develop, transfer, apply, and 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;

9. To synthesize and adapt scientific findings from conventional research programs to the implementation of forest and woodland restoration on a landscape scale;

10. To facilitate the transfer of interdisciplinary knowledge required to understand the socioeconomic and environmental impacts of wildfire on ecosystems and landscapes;

11. To require the institutes established under this Act to collaborate with Federal agencies--
    i. to use ecological restoration treatments to reverse declining forest health and reduce the risk of severe wildfires across the forest landscape;
    ii. to design, implement, monitor and regularly revise wildfire treatments based on the use of adaptive ecosystem management;

12. To assist land managers in--
    i. treating acres with restoration-based applications; and
    ii. 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--
        1. 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 ;
        2. the report entitled `Protecting People and Sustaining Resources in Fire-Adapted Ecosystems-A Cohesive Strategy' (65 Fed. Reg. 67480); and
        3. The National Fire Plan.

13. To 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

14. To 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.

B. Duties

3.3. Institutes. Each Institute shall engage in the following activities to the extent funding for such activities has been appropriated pursuant to PL 108-317 or is otherwise made available:

a. Provide an annual work plan as a condition to receive federal funds for each fiscal year **on a date to be determined by the US Department of Agriculture-US Forest Service in consultation with the Department of the Interior.** The work plan will follow the template provided by the Secretaries.

    i. The annual work plans will be developed in consultation with the Secretary of Agriculture/US Forest Service, the Secretary of Interior,

the State Foresters and the stakeholders as described in paragraph 1.C above.

ii. The work plans will contain assurances and performance measures that are satisfactory to the Secretaries and reflect that the activities will serve the legislative purpose of PL 108-317

b. Develop, conduct research on, transfer, promote, and monitor ecosystem restoration treatments including restoration-based hazardous fuel reduction prescriptions to reduce the risk of severe wildfires and improve the health of dry forest and woodland ecosystems in the Interior West;

c. Synthesize and adapt scientific findings from conventional research to implement restoration-based hazardous fuel reduction treatments on a landscape scale using an adaptive ecosystem management framework;

d. Translate for and transfer to affected entities any scientific and interdisciplinary knowledge about restoration-based hazardous fuel reduction treatments;

e. Assist affected entities with the design of adaptive management approaches (including monitoring) for the implementation of restoration-based hazardous fuel reduction treatments;

f. Provide for continuing education, formal coursework, and public education as necessary and useful;

g. Convene one or more meetings among the Institutes annually to share lessons learned and to coordinate activities so as to avoid undesirable duplication;

h. Subject to the availability of federal funding, convene, state-by-state, one or more meetings annually of the stakeholders identified in paragraph 1.C above to: define and prioritize science needs; identify and prioritize information needs that can be synthesized from existing information; and, identify audiences that will benefit from the services provided by the Institutes. If a representative body able to perform these functions already exists in the state, an Institute may use its services to fulfill this requirement;

i. Provide peer-reviewed annual reports to the university presidents, the Governors, the Secretary of Agriculture and Chief of the Forest Service and Secretary of Interior;

i. For purposes of this Charter, peer review means a meeting of the stakeholders identified in paragraph 1.C to review the annual report and work conducted by each institute.

ii. The annual peer-review will be conducted by October 31 following the end of the federal fiscal year. A final report will be prepared by December 31st of the same year.

j. Notwithstanding any provision of this Charter to the contrary, no institute shall be prohibited from performing its duties described herein and other functions by contracting for their performance.

3.4. States. The state funding for the Institutes required under this Section 3.4 may be provided by the annual University budget or funding for the Institutes may be provided by other sources as may be available and appropriate. Each state:

a. Shall provide facilities for the institutes; and

b. Shall provide state funding to support a portion of the operations of the institutes.

C. Charter Implementation

3.5. Coordinating Committee. There is hereby created a Coordinating Committee whose membership and purposes shall be:

a. The Coordinating Committee shall consist of the Executive Director(s) of each Institute, the State Forester from each state, a designated representative of each state Governor and a representative of the Western Governors Association.

b. The primary purpose of the Coordinating Committee is to implement the purposes and intent of this Charter by providing management and administrative guidance on matters affecting all the Parties.

c. The Coordinating Committee shall adopt its own procedures and determine the frequency of its meetings.

d. Examples of matters affecting all the Parties include, but are not limited to:

a. Establishing protocols for communications among all three Institutes;
b. Identifying opportunities for leveraging resources;
c. Addressing common interests and opportunities for mobilizing critical information for rapid, thorough and scientifically defensible environmental analysis;
d. Determining how the Institutes should collectively model collaboration as a primary value.

e. Subject to the availability of funds, each Institute will fund its own participation in the annual meeting, travel, communications and incidental expenses of the Coordinating Committee.

4. Amendment

This Charter may be amended only by an instrument in writing executed by an authorized representative of each Party.

5. Termination

If, as a result of the monitoring and evaluation five years following enactment of PL 108-317, the Secretary, in consultation with the Secretary of the Interior, determines that an Institute does not qualify for further Federal assistance under this Act, the non-qualifying Institute shall receive no further Federal assistance under this Act, and shall cease to be a Party to this Charter, until such time as the qualifications of the Institute are reestablished to the satisfaction of the Secretaries.

6. Participant signatures

NOW, THEREFORE, in consideration of the mutual promises set forth above, the undersigned Parties do hereby execute this Charter, which shall become effective on the date on which it has been signed by all Parties.

On behalf of the States:

Governor Janet Napolitano, Arizona	Date
Governor Bill Owens, Colorado	Date
Governor Bill Richardson, New Mexico	Date

On behalf of the Institutes:

John Haeger, President, Northern Arizona University	Date
Dr. Larry Edward Penley, President, Colorado State University	Date
Manny Aragon, President, New Mexico Highlands University	Date

Appendix D – Response to Development Team Review (May 17-18)

University of Northern Arizona Ecological Restoration Institute

Strengths

1. The budget format generally follows the suggested SF424 format.
2. The work plan comes the closest to addressing key points identified in legislation.
3. Continuity between this work plan and previous ones.

Weaknesses

1. Unit costs are lacking for non personnel line items (i.e. supplies and travel).
   - See revised budgets on pages 20-25
2. The collaborative efforts lack detail on who will be involved.
   - Previous work with CFRP has been deleted.
3. It is not clear in the work plan how the technical papers and workshops will result in technical assistance on the ground to implement forest restoration projects.
   - See page 3, . Improving the knowledge base of practitioners will be accomplished through an active analysis of scientific information within the framework of land manager realities. The information will include an explicit articulation of science-based actions that can accomplish land management objectives. Central to the proposal is a commitment to develop effective communication approaches for land managers and stakeholders, these include: continuing education, user friendly GIS-based decision support tools, and written and electronic products that will result in the transfer of knowledge to practitioners.
4. The table in Appendix D, on specific land management agency needs, focuses on past accomplishments rather than the proposed work plan activities.
   - The Appendix shows both current work plan and previous year activity. This was done so that the reader could see that the proposed Work Plan is only one part of a series of activities that are underway or have been completed by the ERI.

Recommendations

1. Cross communication between universities should be highlighted in the documentation
   - See page 3, The three universities identified in the Southwest Forest Health and Wildfire Prevention Act of 2004 are implementing a series of actions to ensure coordination and complementarity of action. On June 13, 2005 the Governors and university presidents signed a Charter Agreement (Appendix E) that establishes a framework for the universities to work together. In addition, the institutes will meet in Flagstaff, Arizona in July 20-22 to discuss roles and responsibilities.
2. Be explicit about what ecotypes are in each Project
   - See page 3, The projects pertain to ponderosa pine ecosystems unless otherwise noted.
3. Emphasize the development of prioritization tools and activities over assessments
   - See Goal Two, prioritization goal is emphasized
4. Include a range of suitable treatments and associated costs

- The ERI is doing this already with previous funding. The results can be found in our Working Paper Series at www.eri.nau. We will also post a comparative analysis on our website in the next six months

5. Utilization element should be included in the work plan
   - See page 15, Goal Four, number 1
6. Include a local economic development element to be reflected in the proposed activities
   - Goal four incorporates economic development by assisting in the Greater Flagstaff Economic Council to attract wood utilization businesses
7. When projects are implemented they should attempt to utilize material
   - The ERI projects are usually done under an applied operational framework. Therefore, the cutting is usually done under private contract. This was a central frustration of timely treatment implementation at the Mt. Trumbull research site. Never-the-less it is very important and we are committed to seeing the wood utilized.
8. Develop a timeline with benchmarks for deliverables presented in a table format describing who, what, when, and product/outcome completion date
   - See page 18
9. Develop forest restoration treatments in the context of existing guidelines and Regional variation, for example - for Mexican Spotted Owl, goshawk and old growth management.
   - The ERI is presently working with the Prescott National Forest on a Rapid Assessment that will lead to treatment design that conforms to the MSO guidelines. Dr. Tom Sisk (ForestERA) and Dr. Reed Noss (UCentral Florida) are using the GIS based ForestERA treatment prioritization tool to explore restoration treatment design in the context of MSO habitat. We are also in the planning stages for analyzing the relationship between the Goshawk Guidelines, their effectiveness for protecting the species and their impact on the quality and effectiveness of restoration treatments. The ERI will produce a status of knowledge document that analyzes current land management definitions and management for old growth in the Southwest.
10. The 3 institutes develop a synthesis of current knowledge on effects of restoration treatments on Mexican Spotted Owl, goshawk, and old growth.
    - See above, this is an integrated activity with #10.
11. Include an Appendix that addresses each of the weaknesses and recommendations.
    - Done
12. Format data and information for technology transfer so that it is compatible with agency information systems and the federal geographic data committee standards.
    - The ForestERA project follows all agency protocols (Goal Two)
13. Delete non federal portion column in budget sheet.
    - Done
14. Add sentence to budget narrative about other funds being used.
    - See page 19, "This program of work is also supported with state funds to maximize leverage and value to all ERI customers (land managers, communities and stakeholders).

15. Make a demonstrated effort to seek out projects and activities, making contact and incorporating groups and individuals associated with and affected by ecosystem management.
    - Our needs assessment activities planned for the next year will seek to do this
16. Be more specific regarding the points at which the land management agencies should be involved in the collaborative activities. For example, how is GFFP relevant to the specific purposes of the Act.
    - See page 16
17. Look to state & private landowners to facilitate treatment implementation and technical assistance i.e. the national tree farm organization.
    - Where appropriate we will attempt to collaborate with private landowners
18. Add a table describing how each proposed activity specifically addresses land manager needs.
    - Done, See Page 18
19. Add an Executive Summary describing specific deliverables.
    - Done, See Page 3
20. Cross communication between universities should be highlighted in the documentation.
    - See number one above. This is redundant
21. Page 6, 3rd paragraph, include other land agency guidance (BLM etc) not just NFS.
    - Done, See page 8
22. Page 6, 4th paragraph, change 'FS and other' to 'public and private'.
    - Done
23. Page 7, paragraph under big box, item 1. replace 'characteristic' with 'results'
    - Done
24. Page 5, item 5, replace 'short' with 'timely'
    - See Page 9, Done
25. Page 7, #1, demonstration site add 's' to site
    - See Page 9, done
26. Page 7 bottom-8 top, to be useful also need to include behavior and effects.
    - See Page 10, done
27. Page 10, item 1, bullet 2, add to Region 3 ' BLM state directors'
    - See Page 12, done
28. Page 10, last paragraph take out word 'to'
    - Done
29. Page 11, copy of analysis of survey results, not just results
    - Done
30. Page 12, rapid assessments, where does agency fire regime/condition class assessment (FRCC) fit in here?
    - Rapid assessments are localized estimates of reference conditions, fire regimes etc. This is different than the FRCC which is generalized information
31. Page 13, underneath box, where does statement come from – 'federal agencies criticized for failure to collaborate' this should be identified where it came from or re worded, or stricken or removed.
    - Done, it came from the WGA but we can leave it out without changing the content

32. Page 14, item 3, first sentence - strike 'and new field guidance'.
    - Done
33. Page 14, item 3, one practitioner workshop, this might be a good selling point, and might want to do more. Clarify who this workshop is for.
    - The workshop is intended for community stakeholders and land managers. Depending upon feedback it may be offered in the future for other audiences.
34. Page 18, 2nd table, goal 2, delete budget verbiage 'required for every year of the grant'.
    - Done
35. The working papers and rapid assessment activities need to clearly be in response to land management agency needs.
    - These products are explicit responses to requests for information or identified information needs
36. When protocols and assessments are proposed, coordinate with agency contacts regarding existing protocols and areas of possible overlap.
    - This concern was articulated with regard to the Rapid Assessments conducted by the ERI. The staff at the ERI who conduct these assessments are aware of this concern and will work with the Forest Service to ensure that their work is complementary to existing activities and meets standards for the agency.
37. Page 8, item 4, delete 'unforeseen' and further describe proposed activity and identify the stakeholders who have requested this product.
    - Done

General Panel Comments:

1. The institutes should also explore innovative approaches to specific land management issues.
    - The Institutes will actively pursue different approaches to research and solve land management issues.
2. Follow-up on conference call between FS and institute financial people regarding financial instrument (indirect costs).
    - The ERI is actively working with the Forest Service contracting professionals to execute the FY 2005 funding. The Colorado and New Mexico Institutes will also do this to receive 2005 funds.
3. Add a table describing how each proposed activity specifically addresses land manager needs.
    - See page 18, Done
4. The scope of all 3 institutes needs to be defined in order to avoid duplication and increase synergy between the institutes and land management agencies. The role of the institutes should be more clearly defined as described in the Southwest Forest Restoration Institute (SWFRI) charter.
    - The Institutes will meet in Flagstaff on July 20-22 to clarify roles and direction.
5. There needs to be a path identified for practitioners to be able to ask questions.
    - The annual work plan peer review is an opportunity for stakeholders to identify information needs. In addition to this formal activity, activities such as continuing education workshops and other outreach activities will provide informal opportunities to collect information.

Appendix E – Response to Development Team Review (June 27, 2005)

University of Northern Arizona Ecological Restoration Institute

1. ERI needs to coordinate closely with Forest Service Region 3 (specifically Peter Gaulke) and Forest Service Region 2 (specifically Wally Murphy) in the revision of existing Mexican Spotted Owl, goshawk and old growth Forest Plans.
   - The ERI is presently working with the Prescott National Forest on a Rapid Assessment that will lead to treatment design that conforms to the MSO guidelines. Dr. Tom Sisk (ForestERA) and Dr. Reed Noss (UCentral Florida) are using the GIS based ForestERA treatment prioritization tool to explore restoration treatment design in the context of MSO habitat. We are also in the planning stages for analyzing the relationship between the Goshawk Guidelines, their effectiveness for protecting the species and their impact on the quality and effectiveness of restoration treatments. The ERI will produce a status of knowledge document that analyzes current land management definitions and management for old growth in the Southwest. The ERI will involve Peter Gaulke and Wally Murphy in the existing plans.
2. Involve Bill Block (Rocky Mountain Research Station) in the synthesis of current knowledge on Mexican Spotted Owl, goshawk and old growth.
   - Bill Block will be involved in the planning and implementation of projects related to these topics.
3. Involve CSU and Forest Service Region 3 on selecting a date to discuss data formatting and technology transfer.
   - All parties will be included in selected an appropriate date.
4. ERI needs to work with McKinley Ben Miller (BLM) to clarify FRCC and its relationship to the existing work plan.
   - Wally Covington and/or his staff will discuss the requirement of the FRCC with McKinley Ben Miller.
5. ERI is to coordinate with Karen Short (BML LANDFIRE) and Dan Crittenden (Washington Office – FS LANDFIRE)ERI to ensure there is no overlapping in proposed protocols or assessments.
   - Doc Smith and/or his staff will discuss any proposed protocols or assessments with Karen Short or Dan Crittenden.
6. ERI is to clarify how and when the 'practitioner help desk' will be developed and when personal technical assistance visits will be provided.
   - Page 12, item 10, The 'practitioner help desk' will be available at http://www.eri.nau.edu/ by December 2005. ERI is currently in the process of recruiting regional experts and developing the framework for the webpage. Doc Smith and/or his staff currently provide personal technical assistance on a need basis.
7. Page 15, item 3, add 'fire effects' to the paragraph
   - See page 15, done.