New Mexico Forest and Watershed Restoration Institute

Annual Report 2007-2008

Formation of the Southwest Ecological Restoration Institutes

The New Mexico Forest and Watershed Restoration Institute (NMFWRI) was formed in 2004 after the passage of the Southwest Forest Health and Wildfire Prevention Act (PL 108-317). The NMFWRI is partnered with similar institutes in Arizona (Ecological Restoration Institute) and in Colorado (Colorado Forest Restoration Institute), and together, the three organizations are named the Southwest Ecological Restoration Institutes (SWERI).

Meeting stakeholder needs

The overall goal of the NMFWRI is to ensure that the best available science is available for use by land managers and stakeholders to successfully implement forest restoration treatments in New Mexico. The work plans and agenda for the NMFWRI are based on the duties and purposes outlined in the authorizing federal legislation, the recommendations found in the New Mexico Forest and Watershed Health Plan, stakeholder requests from meetings held across the state in 2005, and through conversations with natural resource professionals in the field. The NMFWRI works closely with New Mexico's Forest and Watershed Health Office (FWHO) to efficiently share resources and avoid redundancy between the two organizations. The NMFWRI advisory board, which consists of natural resource professionals representing some of our major stakeholders, meets twice annually to review the NMFWRI activities and to provide the director and staff with feedback on current or potential projects.

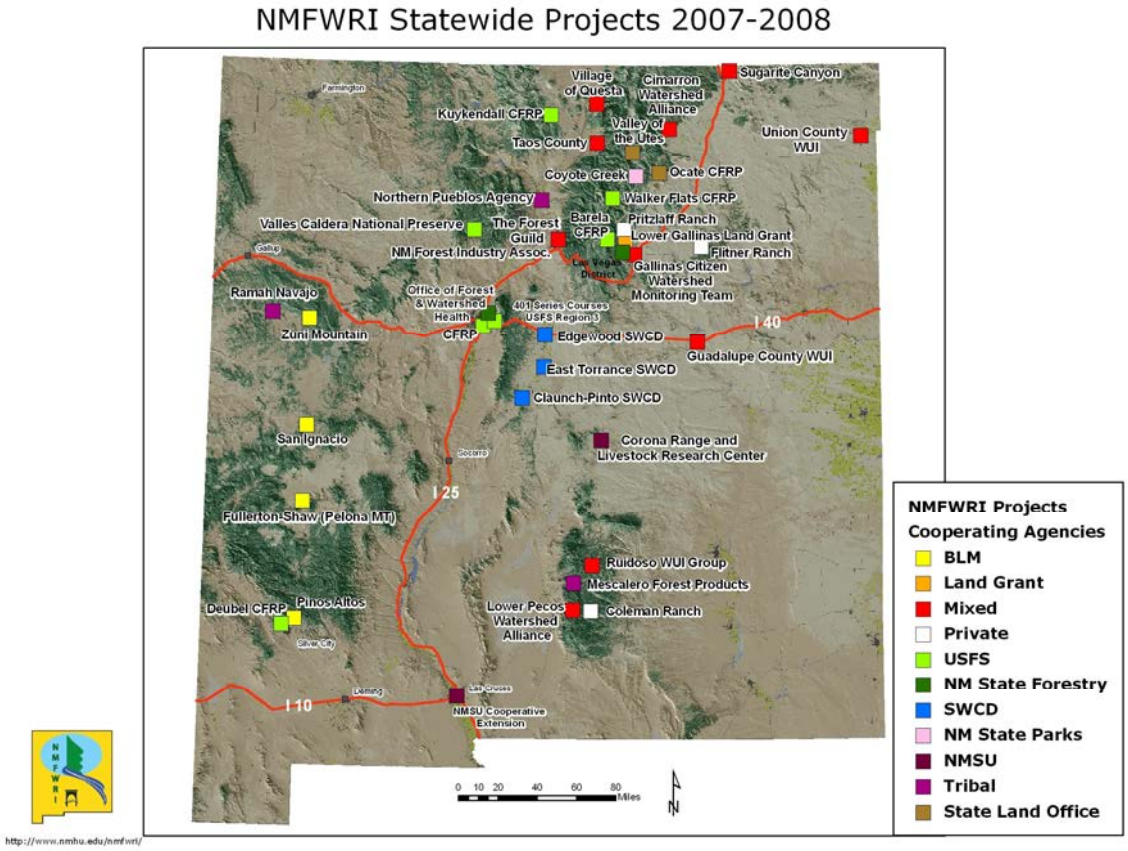
The 2007 federal work plan

The annual NMFWRI federal work plan is proposed by NMFWRI personnel, reviewed by the SWERI development team, revised, and then reviewed and approved by the SWERI executive team. Both the development panel and the executive team are comprised of natural resource professionals from a variety of federal, state, and tribal entities. A list of the executive and development team personnel is located at the SWERI web site. The major goals of the 2007 NMFWRI work plan included the development of

a consensus in the state with regard to restoration monitoring, examining restoration-based hazardous fuels reduction prescriptions for ponderosa pine, lower mixed conifer forests, and piñon/juniper across the state, and providing technical assistance for communities and restoration collaboratives.

2007 – 2008 NMFWRI Projects

During the 2007 fiscal year (July 2007 – July 2008), the NMFWRI participated in approximately 35 projects involving 11 land management entities across the state. Time commitments for these projects ranged from a few hours (making maps or GPS training) to multiple weeks (field monitoring and data analysis). In the 2007 fiscal year, the NMFWRI was staffed with 6 full-time employees. In addition to the full-time staff, we employed two Highlands' undergraduates and a Masters' student during the school year, and five undergraduates during the summer of 2008. We also engaged nine contractors to help us complete several of our projects.



In the past year, approximately 40% of our annual budget was derived from our federal base budget (to address our SWERI work plan), 40% came from the New Mexico state legislature (via Highlands University), and 20% came from project specific contracts. *It is important to note that in this annual report, we will address how we met the goals and objectives of our annual 2007 SWERI work plan. Because our personnel, students, and contractors are supported by all of these funds, most of these projects were completed*

with the assistance of federal and state funds as well as project specific contracts. We will make special note of projects that were supported primarily by state or project specific funds.

Project 1. Develop a Consensus on Ecological Restoration Monitoring

Statewide Monitoring Meeting and a Web-based Clearinghouse

In August 2007, the NMFWRI co-hosted a statewide meeting of monitoring practitioners (50 attendees) at Sevilleta. This 1.5 day meeting consisted of 17 presentations by monitoring practitioners from a variety of forested ecosystems across the state and a prolonged discussion about the utility of developing a statewide monitoring database. All the presentations from this meeting were summarized and placed on the NMFWRI web site (Forest and Watershed Monitoring Meeting). The minutes of the discussion that was focused on the monitoring database were distributed by email to all attendees and were also included in the event summary on our web site.

Although the practicality of developing a maintaining a statewide monitoring database was not deemed feasible at the Sevilleta meeting, most of the participating stakeholders agreed that a statewide watershed clearinghouse (as called for in the state's watershed health plan) was a good idea. In addition, the FWHO's Public Outreach Task Force identified the watershed clearinghouse as a priority. In the spring of 2008, the NMFWRI and the FWHO executed a Joint Powers Agreement to develop a web-based watershed clearinghouse, and this web site will eventually contain links, postings, and videos related to monitoring protocols in use across the state. The FWHO and the NMFWRI are currently designing a map of the clearinghouse and we hope to send out a RFP in the fall of 2008 to start construction of the web site. *Participation at these planning meetings was supported by federal funds, but the funding for the clearinghouse will come from the Division of Forestry.*

Collaboration with the Cimarron Watershed Alliance and in the Estancia Basin

In addition to statewide clearinghouse effort, the NMFWRI contributed funds and personnel to the development of an online watershed project map in a collaboration with River Source and the Cimarron Watershed Alliance. The NMFWRI will also help maintain this site (Tracking Watershed Health) in the coming year. *This support came primarily from our state funding.*

In 2008, the NMFWRI began to chair the meetings of the Estancia Basin Monitoring Steering Committee, which is comprised of the three Soil and Water Conservation Districts in the basin (Claunch-Pinto, Edgewood, and East Torrance) and representatives from cooperating agencies (State Forestry, Environment Department, NRCS, USFS, Chilili Land Grant). Besides chairing the meetings, NMFWRI personnel are closely interacting with the SWCA consulting group as they conduct a thinning monitoring project throughout the basin. We are also helping the three districts map their prior thinning projects (Estancia Basin Thinning Map) and we are building property ownership maps to identify possible areas for contiguous thinning treatments in the East Mountains.

In a separate collaboration in the basin, NMFWRI personnel and students collaborated with personnel from the Region 3 USFS supervisor's office and the Mountainair Ranger District to conduct three days of post-fire monitoring in the Ojo Peak Fire. The objective of this work was to obtain baseline data so that we can observe how the trees affected by this dormant season burn will respond in the coming months and years.

NMFWRI student intern Estevan Martinez at the Ojo Peak post-fire inventory.

Monitoring in the Collaborative Forest Restoration Program

The NMFWRI is the coordinator of the multiparty monitoring training and technical assistance that is provided to the US Forest Service's Collaborative Forest Restoration Program (CFRP). *It is important to note that the funding for this effort is separate from the funds received for the NMFWRI federal work plan, but the deliverables and required work is related to the objectives in the authorizing legislation and the current work plans*. In this role, the NMFWRI or contracted personnel facilitate multiparty meetings for CFRP grantees, help grantees develop a project-specific monitoring plan, provide on-site training in data collection for CFRP team members, youth groups, or others who will be gathering monitoring data for the project, and provide assistance with data analysis and final report writing.

In the last 6 months of 2007, the NMFWRI and its contractors wrote and published three white papers for CFRP grantees that 1) emphasized the need to integrate prescription writing with a site's monitoring plan, 2) covered important social and economic issues in landscape restoration, and 3) proposed a CFRP wildlife monitoring protocol. These papers were disseminated at the 2008 CFRP annual meeting and are posted on the NMFWRI web site as part of the New Mexico Forest Restoration Series (working papers 1-3).

In the first 6 months of 2008, the NMFWRI and its multiparty monitoring contractors (a five person team) undertook a project to identify which of the 102 projects that have been funded since CFRP's inception could be included in a 15 year monitoring effort that is called for in the CFRP authorizing legislation. These recommendations (including approximately 20 projects across multiple jusridictions and forest types) will be delivered at an August 2008 CFRP sub-committee meeting and a white paper that will detail the selection of these projects and suggested indicators for the 15 year monitoring sites will be delivered to the CFRP coordinator in December 2008.

In addition to the CFRP technical assistance, the NMFWRI works off our federal and state funds to collaborate with several projects on monitoring (pre- and post-treatment inventory). This past year, we have inventoried treatment areas and sent summary reports to Ralph Barela (Johnson Mesa), Danny Kuykendall (Tres Piedras), and Dennis Trujillo (Ocate). We are also preparing to collaborate with new CFRP grantees including Chacon and Sons (Tres Ritos), the Eastern Gila Livestock Association (Gila NF), and the Alamo Navajo.

Monitoring with the Bureau of Land Management and the Bureau of Indian Affairs

Over the past year, the NMFWRI and its contractors have conducted pre- and post-treatment monitoring in piñon-juniper (PJ) woodlands at four sites chosen by the BLM state forester, Dave Borland. These five sites included Zuni Mountain (Cibola County), Piños Altos (Grant County), San Ignacio (Catron County), and Fullerton-Shaw (Pelona Mountain, Catron County).

At each site, the NMFWRI, using contractors, New Mexico Highlands' students, or NMFWRI personnel, collected inventory data in the form of fixed radius plots and photo points. *These projects started in September 2007 and this work was funded by the BLM.*

NMFWRI staff and Highlands' students (Jason Martinez, Estevan Martinez, and Roger Griego) at the BLM Fullerton-Shaw unit in May 2008.

In April 2008, the NMFWRI staff, in coordination with Jon Martin of the BIA and the staff of the Northern Pueblo Agency, participated in a FFI training with the natural resource staff from the San Ildefonso Pueblo. During this two day event, the participants learned how to use the Department of Interior's FFI protocols, and the NMFWRI has used the protocols during the BLM monitoring and at other sites.

FFI protocol training at the San Ildefonso Pueblo with staff from NMFWRI, the BIA, and the Northern Pueblo Agency.

Collaboration with Private Property Owners

In June-July 2008, , the NMFWRI inventory approximately 70 acres of a ponderosa pine dominated forest at the Pritzlaff Ranch, which is located north of Las Vegas. The objective of this work is to document forest conditions prior to thinning, mark the stands, and help the Ranch supervisor manage the thinning contractor. NMFWRI personnel will also conduct post-treatment inventories and assist with post-treatment prescribed fire. *This project was primarily supported with state funding*.

In addition to the forest monitoring, the NMFWRI continued to engage Dr. Edward Martinez and a Highlands' masters student, Amina Sena, to conduct water quality monitoring in the Sapello River, which runs through the Ranch. Ms. Sena completed her MS thesis and the Biophilia Foundation will continue to conduct water quality sampling at the Ranch. *This project was primarily supported with state funding*.

The NMFWRI and the Biophilia Foundation also co-sponsored a beaver workshop (live trapping) in September 2007 in collaboration with local landowners Jim and Georgia Snead.

Following two site visits to the Coleman Ranch in the fall of 2007, the NMFWRI teamed up with the Lower Pecos Watershed Alliance and New Mexico Tech University in the

development of a project designed to examine how thinning in a mixed conifer stand would impact surface and subsurface water flow. The NMFWRI conducted a pre-treatment inventory over the 600 acre stand in June 2008, and the maps and data from this work will be summarized for the project partners in July 2008. *This project was partially supported with state funding*.

Project 2. Examining Restoration-based Prescriptions

Our charge is to promote the restoration of three plant communities – ponderosa pine forests, Southwestern mixed conifer forests, and piñon-juniper woodland. In the Southwest, and especially in New Mexico ponderosa pine and piñon-juniper, restoration means the reintroduction of low-intensity fire into the ecosystem. In most cases, vegetative structure will need to be manipulated by removing some trees from the stand before fire can be reintroduced safely. Thus, one of our major tasks is to produce prescriptions that blend recommendations for restoration and fuel treatments, which will then be adapted and applied to the unique conditions of each stand and watershed. In addition, we are tasked with getting the research community and practicing land managers to communicate with one another about current trends in forest research and management.

Increasing communication between researchers and managers

In early 2008, the NMFWRI co-hosted a statewide meeting of practitioners and scientists to discuss management of mixed conifer and aspen in New Mexico (75 attendees). The goal of this meeting was to expose land managers to the current research focused on the types of natural disturbance occurring in this forest type, and for the research community to hear about on-going management practices throughout New Mexico. Presentations covered the gamut from treatment impacts on wildlife, to insect and disease problems, to stand treatments and the results from those treatments. Presenters were from NM State Forestry, USDA-Forest Service, the forest research community, the forest-owning public, and included participants from Arizona and Colorado. A synopsis of the mixed conifer/aspen ecology and management meeting is posted on our website.

Advertising current prescriptions in use throughout the state

In 2007, the NMFWRI started to compile a catalog of forest prescriptions that were applied to the landscape in different regions and ecosystems of New Mexico. These case studies provide an easily accessible place for stakeholders to review the types of prescriptions that are applied by forest managers. We continued this effort in FY08, and when possible included economic data (costs per acre) to supplement the prescription information. The majority of the case studies posted on our website deal with fuel treatments. This year, we expanded the prescriptions covered to include those that fight pest infestations, specifically dwarf mistletoe on ponderosa pine. However, as we worked on this task, we became aware of and were greatly impressed with existing collections of information restoration and fuel treatments. Specifically, we liked Graham and others (2004) "Science basis for changing forest structure to modify wildfire behavior and severity," (published as Gen. Tech. Rep. RMRS-GTR-120) as well as Hunter and others (2007) "A comprehensive guide to fuels treatment practices for

ponderosa pine in the Black Hills, Colorado Front Range, and Southwest," (published as Gen. Tech. Rep. RMRS-GTR-198). The Graham et al. publication was synthesized and placed on our web site (Science basis for changing forest structure).

Early versions of our workplans indicated that the NMFWRI would collect and make available existing prescriptions for fuels treatments and restoration. While these two publications do not focus exclusively on New Mexico, they are comprehensive in scope and excellent in quality, to the extent that the thoughts in our old workplans have lost their urgency and reason for being. In the future, we will encourage the distribution of these publications in place of the collection of prescriptions we originally envisioned, while continuing to expand our collection of New Mexico case studies posted on our website.

Creating demonstration sites

Much of what we have done to date is built on existing restoration prescriptions, and on allowing people to become informed enough to decide which best fits their needs. Two major sets of guidelines, ERI and Northern Goshawk, are promoted as techniques to restore ponderosa forests of the Southwest. A potential problem with both these sets of guidelines is they largely ignore the high-grading that has occurred, which took the better trees and left the poorer ones. Thus, a third standard for restoration prescriptions could be based on genetics. This prescription would cut the crooked, diseased, excessively limbed trees, and leave the straighter, faster-growing, clean-boled individuals.

In June of last year, the NMFWRI marked a 10-acre demonstration area in a ponderosa pine stand on the Pritzlaff Ranch outside of Las Vegas. Areas of equal size were marked according to ERI, Northern Goshawk, and genetic restoration standards, and are large enough for visitors to enter them and see what results would look like on a stand basis. The ERI and Northern Goshawk plots exhibit the group-and-opening structure characteristic of historic ponderosa pine stands: the ERI plot has groups containing trees of the same size, and the Goshawk plot contains groups with trees of the same size within the group, but with groups of different sized trees. In this demonstration of a genetic prescription, trees were left or cut without concern for clumps or openings. Thinning of this stand was not completed until the summer of 2008. Four formal groups have visited this demonstration site since it was marked, and additional informal visits have been made by interested individuals.

Project 3. Providing Assistance to Restoration-Based Collaboratives

Landscape-scale planning

In the summer and fall of 2007, the NMFWRI staff participated in a series of meetings hosted by the Santa Fe National Forest in an effort to explore the possibility of developing a multi-jurisdictional stewardship contract in northern New Mexico. Starting in the summer of 2008, the NMFWRI and other entitites contacted potential partners in the Gila, Santa Fe, and Lincoln National Forests with regard to the development of proposals related to the Landscape Restoration Act of 2008. A series of regular meetings between the Santa Fe National Forest and the Valles Caldera National Preserve are now

scheduled in preparation for the passage of the Act. The NMFWRI will continue to seek ways to get potential partners together to discuss landscape-scale treatments across multi-jurisdictional landscapes.

As previously mentioned in the monitoring section, the NMFWRI has also worked with the three Soil and Water Conservation Districts in the Estancia Basin to build project maps and to prioritize thinning regions in the coming years. The NMFWRI is also working with the Tierra Y Montes Soil and Water Conservation District and the Las Vegas State Forestry office to build a project map (primarily thinning projects) of the Gallinas Watershed.

NMFWRI personnel also assisted several counties (Taos, Guadalupe, Union, Village of Questa) with mapping needs during the development of their Community Wildfire Protection Plans.

Forest economics and New Mexico State University

Over the past year, the NMFWRI and Dr. Red Baker of the NMSU Cooperative Extension Agency have worked together to intiate the development of a forest research and extension network in New Mexico. As an initial effort, both NMFWRI and NMSU are working through their respective university administrations to approach the state legislature for funding of two positions, one based in Las Cruces (forest ecology) and one based in Las Vegas (forest economics). These two new hires would be expected to cooperate with each institution and would be tasked with addressing some pressing research and extension needs throughout the state. In addition to this initiative, the NMFWRI and NMSU will be working together on a newly funded CFRP that is partially designed \to develop desk guides focused on the development of restoration-based businesses in remote areas.

Educational activities and outreach

From October 2007 to February 2008, the NMFWRI worked with Highlands' faculty and staff and the Region 3 supervisor's office to deliver four courses for the federal 401 series fire fighting personnel. Approximately 16 firefighters from four states attended the courses, and Highlands' is preparing to offer an additional three courses in the upcoming fall and winter.

Federal firefighters that attended the second 401 series short course, Natural Resource Ecology, at Highlands University.

The NMFWRI also sponsored a four day training of trainers at the Pritzlaff Ranch in April 2008. The NMFWRI contracted with the Game of Logging to instruct five New Mexico-based personnel in an effort to update the state's working safety program. The NMFWRI will continue to work with the state's safety advisory board to update and improve this program.

NMFWRI hosted a Game of Logging training for New Mexico-based thinning contractors at the Pritzlaff Ranch in April 2008.

NMFWRI personnel participated in the New Mexico Forestry Camp, a five-day outdoor workshop for 13 to 17 year olds which is held at Rancho del Chaparral Scout Camp in the Jemez Mountains near Cuba, New Mexico.

The NMFWRI is working with the Community Services Division of the Alamo Navajo to prepare an informal two week short course about forestry and natural resource management for their personnel. The Alamo Navajo received a new CFRP grant this year, and the goal of this grant is to build a natural resource division on the reservation. The Alamo Navajo have asked NMFWRI to participate in both their educational initiatives as well as several thinning projects.

NMFWRI personnel also worked closely with three Highlands' professors to modify or improve GIS and GPS lessons and laboratories throughout the 2007-2008 school year.

NMFWRI personnel attended meetings and participated in field events sponsored by the Gallinas Citizens Ecological Monitoring Team.

Planning of a Statewide Watershed Forum and the New Mexico Forests and Climate Change Meeting

Over the past year, NMFWRI personnel have participated in planning sessions and contributed to the development of the agenda for a New Mexico Watershed Forum and the New Mexico Forests and Climate Change meeting that will take place in October and November 2008, respectively, in Albuquerque.

The New Mexico Forest Industry Association (NMFIA)

Throughout the year, the NMFWRI provided funding to enable the NMFIA to retain an executive director. Due to the high cost of forest treatments in the state ($600-1400/acre), the NMFWRI will continue to work to build a forest products industry that is capable of utilizing small diameter wood. The growth of this industry association is vital to the future success of forest restoration across the landscapes of New Mexico in an economically responsible manner.

Los Alamos Laboratory, the Biophilia Foundation and Biochar

The NMFWRI has provided funding (student intern) in an on-going collaboration between Highlands University, NMFWRI, Los Alamos, and the Biophilia Foundation to examine the impacts of using biochar developed from logging slash on soil chemical and physical properties. These partners will be incorporating this charcoal into soils at the Pritzlaff and Wind River Ranches this summer and then will follow the soil and plant response over time. *Student support for this project came from state funds*.

Entities requesting assistance from the NMFWRI in 2007-2008

As part of our annual review, each member of SWERI is asked by the federal development team to list the entities that requested assistance over the past year. For the NMFWRI, this included four CFRP grantees (Ralph Barela, Mick and Berta Duebel, Dennis Trujillo, Danny Kuykendall), approximately 10 CFRP grant proposals (four funded), the Santa Fe National Forest supervisor's office, the New Mexico Forest and Watershed Health Office, the NM State Land Office (Ocate and Angel Fire), the BLM state forester, the Pritzlaff Ranch and Biophila Foundation, the Claunch-Pinto Soil and Water Conservation District, the Edgewood Soil and Water Conservation District, the East Torrance Soil and Water Conservation District, the Northern Pueblo Agency, Santa Domingo Peublo (GIS), US Forest Service Region 3 Fire Management (401 series courses), the New Mexico Forest Industry Association, the Flitner Ranch (Las Vegas), the Lower Pecos Watershed Alliance (Coleman Ranch project), the Gallinas Watershed Association, the Cimarron Watershed Association, USFS Region 3 Silviculturalist, NMSU/Corona Ranch (aerial monitoring), and Highlands University natural resource faculty.

Looking ahead: Highlights of the federal 2008 work plan and other projects for 2008 - 2009

The NMFWERI will continue our work with ecological restoration monitoring and restoration-based prescriptions in 2007-2008. We will also examine ways to incorporate

the issues of climate change, carbon sequestration, and woody biomass utilization into our future activities and further these discussions among the forestry community in the state. In addition, we will continue to provide technical assistance to communities or collaborative groups that request our aid. The NMFWRI will continue to participate in the pre-planning stages of a potential landscape restoration project in and around the Santa Fe National Forest, and continue to seek ways to aid the Gila and Lincoln National Forests or other stakeholders in their planning processes. We will continue our efforts to build a watershed portal in collaboration with the Forest and Watershed Health Office, and we will seek ways to organize and construct a spatial analysis center at Highlands University. Finally, we will continue to work with state forestry and NMSU to seek ways to build a statewide forestry extension and research program in New Mexico.

Highlands' student Brenda Fonju learning to navigate with GPS equipment on a piñon-juniper site near Las Vegas.