



New Mexico Forest and Watershed Restoration Institute Annual Report 2006-2007

Beginnings

The New Mexico Forest and Watershed Restoration Institute (NMFWR I) was formed in 2004 after the passage of the [Southwest Forest Health and Wildfire Prevention Act](#) (PL 108-317). The NMFWR I 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 NMFWR I is to ensure that the best available science is available for use by land managers and stakeholders to implement science-based forest restoration treatments in New Mexico. We seek to fill a critical void that exists between applied and existing scientific findings, and the translation and transfer of that research to inform forest management.

The work plans and agenda for the NMFWR I 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 authorizing legislation, Forest and Watershed Health Plan, and other related links and documents can be accessed on the [NMFWR I web site](#). The NMFWR I works closely with the [New Mexico State Office of Forest and Watershed Health](#) to efficiently share resources and avoid redundancy between the two organizations.

The 2006 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 2006 NMFWRI work plan included the development of capacity (adding personnel and securing an office), developing a consensus in the state with regard to restoration monitoring, and developing a library of case studies for restoration-based prescriptions.

Project 1. Capacity Building

The office space for the NMFWRI was contributed by New Mexico Highlands University in 2005, and several rooms in the Laura Shields Science Building were renovated to prepare for the hiring of [NMFWRI personnel](#). In the fall of 2006, Ken Smith was hired as the director, and in the winter of 2007, Kent Reid was hired as the NMFWRI forester. In 2007, Ron Ortega and Patti Dappen were engaged part-time to work on woody biomass utilization and GIS projects, respectively. All NMFWRI personnel have also supervised forestry students during the summer field season.

Highlands' professors Ken Bentson, Dave Hacker, and Edward Martinez received NMFWRI support in 2006-2007 to work on NMFWRI business before permanent hires were made, and their activities included writing the 2007 work plans (Bentson), job searches (Hacker and Martinez), and NMFWRI-related field projects (Martinez). The NMFWRI also supported two interim directors in 2006, including Dr. Tony Gallegos, who co-authored the 2007 work plan, and José C'de Baca, who represented the NMFWRI at several meetings and participated in the director job search. In addition, six Highlands' students were engaged in projects related to literature searches, water monitoring, forest inventory, and as help for the NMFWRI administrative associate, Josie Lujan. Other costs related to capacity building included the purchase of computer equipment for all permanent employees, as well as field and office equipment and supplies.

In the winter of 2007, the NMFWRI director assembled a [NMFWRI advisory board](#) to review NMFWRI activities and to provide the director with feedback on current activities. This group consists of natural resource professionals representing some of our major stakeholders. The chair of the advisory panel (state forester Butch Blazer) is also the liaison between the NMFWRI stakeholders and Highlands University. The chair of the advisory board will meet with the Highlands' President on an annual basis to discuss the progress of the NMFWRI from the perspective of the state's stakeholders.



The NMFWRI is located on the New Mexico Highlands University campus in Las Vegas, New Mexico.

Project 2. Forest and Watershed Monitoring and the 2007 New Mexico Monitoring Meeting

A major focus of the 2006 work plan was an effort designed to bring New Mexico monitoring practitioners together to help build a consensus about the following:

- 1) which monitoring protocols should be used in specific situations,
- 2) the indicators of ecological health and responses to restoration-based hazardous fuel reduction treatments in ponderosa pine, lower mixed conifer forests, and, piñon-juniper woodlands,
- 3) the thresholds that indicate a need to modify management prescriptions, and
- 4) the time-scale over which monitoring should take place.

From January to June 2007, NMFWRI personnel visited several areas in the state that had undergone forest treatment and discussed monitoring activities with personnel from multiple agencies. There was a clear need to have monitoring practitioners meet to discuss protocols and the formation of a statewide monitoring database. The first in what will likely be a series of meetings will be held on August 20-21 at the Sevilleta Field Station. These meetings will be co-hosted with the [State Office for Forest and Watershed Health](#), which is directed by Susan Rich. The [2007 New Mexico Monitoring Meeting](#) will include 14 speakers from around the state, 50 invitees representing federal, state, tribal, and private land managers, and will conclude with a discussion of the statewide monitoring database. The presentations from this meeting will be made available on the NMFWRI web site, and the results of the discussions will be used to drive the future direction of the statewide database and the subject of the next statewide monitoring conference.

Statewide monitoring databases

In the spring of 2007, the NMFWRRI provided funds to Rich Schrader of [River Source](#) and personnel from [Natural Heritage New Mexico](#) to initiate efforts to develop a statewide monitoring database. The funds used by River Source will support the initiation and design of a Data Sharing Network that will be assisted by an on-line database for watershed health for citizen science. River Source intends to focus on database design for water chemistry, biology, and physical parameters that watershed groups are currently monitoring or plan to monitor in the near future.

Natural Heritage New Mexico is also using NMFWRRI funding to build a statewide monitoring database that would serve as a clearinghouse for all data collected in the state. This effort will present many challenges in terms of data quality control and formatting, and will likely require the establishment of an independent web site that will require on-going maintenance. In addition to the monitoring database, Natural Heritage New Mexico is also evaluating the specific goals of NMFWRRI as laid out in its work plans with respect to the general IT requirements needed to accomplish these goals. They are also in the process of evaluating the resources required to augment NMFWRRI's IT capacity and will establish funding priorities for these new NMFWRRI IT components.

CFRP multi-party monitoring and CFRP map

Starting in May 2007, the NMFWRRI took the lead 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 NMFWRRI 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 NMFWRRI or contracted personnel will 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 addition to CFRP monitoring, the NMFWRRI provided funds to the [Forest Guild](#) to place the locations and details of all CFRP projects into a geographic information system (GIS) file (shapefile and spreadsheet formats). The end product of this work will be a website-ready map of New Mexico with each CFRP project identified as a point or polygon. Each CFRP would be linked to project details, which would be accessible with a mouse click. This map will be housed on the NMFWRRI website for maintenance purposes, but will be linked to the USFS CFRP website for use by CFRP participants and the general public.



Students from Ruidoso High School learn about field data collection and monitoring for a CFRP project in the Lincoln National Forest (from USFS CFRP office).

Monitoring with the Bureau of Land Management

For this particular project, the NMFWRI has proposed to inventory piñon-juniper (PJ) woodlands at 5 wildland-urban interface sites chosen by [BLM](#) state forester, Dave Borland. These five sites are located at Jog Canyon (Rio Arriba County), Wind Mountain South (Taos County), Zuni Mountain (Cibola County), Piños Altos (Grant County), and Villanueva (San Miguel County).

At each site, the NMFWRI, using contractors, New Mexico Highlands' students, or NMFWRI personnel, will conduct pre-treatment data collection in the form of fixed radius plots and photo points. The NMFWRI will also attempt to estimate volumes of woody biomass in these areas, due to the interest in using PJ as a source for woody biomass energy projects. This project will start in September 2007, and as with the CFRP multi-party monitoring, *this work will be funded separately from the federal SWERI work plan.*

Pre- and post treatment monitoring at the Pritzlaff Ranch

In May 2007, the NMFWRI summer inventory crew (Ron Ortega and two Highlands' students – Roger Griego and Jason Martinez) began to inventory approximately 200 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, map skid trails, mark the stands, and help the Ranch supervisor (Champe Green) manage the thinning contractor. NMFWRI personnel will also conduct post-treatment inventories and assist with post-treatment prescribed fire. The work at the Pritzlaff Ranch is valuable to NMFWRI because it allows us to interact with a private landowner who is interested in restoring his forest to a historical stand density, and with his cooperation, it will enable us to use the forest as a demonstration site for other landowners and forestry personnel.



NMFWRI GIS specialist Patti Dappen and Highlands' students Roger Griego and Jason Martinez collect pre-thinning data at the Pritzlaff Ranch.

In addition to the forest monitoring, the NMFWRI has engaged 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 has established several sampling points on the river and will be analyzing water samples for various elemental concentrations. She will also examine river turbidity and invertebrate biodiversity across the seasons. The objective of this work is to collect baseline data at the Ranch and to examine if thinning and burning operations impact water quality in the primary river running through the Ranch.



Highlands' students Amina Sena and Gabriel Esquivel collect water samples and GPS points along the Sapello River at the Pritzlaff Ranch.

Monitoring on the Estancia Soil and Water Conservation District, Coyote Creek State Park, and on Ocate State Lands

In April 2007, Stan Bulsterbaum of the Claunch-Pinto Soil and Water Conservation District requested NMFWRI participation in the review of proposals for a long-term monitoring project in the Estancia Basin. The NMFWRI now holds a seat on the Estancia Basin monitoring project steering committee, and NMFWRI personnel will be involved in the establishment of the monitoring sites and work conducted in the basin. The monitoring contractor, SWCA, has been asked to present this innovative project at the August monitoring meeting at Sevilleta.

NMFWRI personnel have also initiated conversations with Steve Cary of New Mexico State Parks, and Jim Norwick and Mark Meyers of the State Land Office to set up pre-treatment monitoring sites in Coyote State Park and state lands in northern New Mexico. Pre-treatment monitoring in Coyote State Park will take place in July 2007 and will be coordinated with the Las Vegas State Division of Forestry Office. Pre-thinning inventory on state lands near Ocate may take place in July (on a CFRP project location).

Project 3. Restoration-based prescriptions

One of the initial efforts of the NMFWRI was to collect information on fuels treatments in southwestern, and especially New Mexican, ponderosa pine and lower mixed conifer forests, and piñon-juniper (PJ) woodlands. One idea that is stressed in the scientific literature is that fuels treatment, while beneficial to human communities and helpful in maintaining forest health, is not necessarily restoration. Thinning for fuel treatment may not preserve historic structure, and in the short term, may increase fine fuels. In contrast, ecological restoration refers to the process of assisting the recovery of a degraded ecosystem, moving it from where it is, onto a trajectory that is closer to the historical range of variability. Historically, fire was an important natural element in southwest forests, burning excess production and maintaining structure in the stand, without burning up watersheds.



Thinned stand on a residential property near Ruidoso. Note the separated tree crowns and the healthy grass cover. The original stand was dense piñon and alligator juniper beneath an open overstory of young ponderosa pine. Treatment removed two-thirds of the stems in the stand, but less than half of the biomass.

Restoration has become such a part of the thinking of foresters and other land managers that they try to incorporate restoration principles into anything they do. Except for possibly piñon-juniper woodland in the wildland-urban interface (WUI), thinnings designed by professionals primarily for fuel treatment also take into consideration wildlife, recreation, and historic forest structure. Because this is the case, much can be learned from their experience. What they are applying on the ground can be checked against published research, but in many cases, they are ahead of the research. A survey of published papers, most of which describe studies outside of New Mexico, augmented with current field practices, almost all within New Mexico, is at the core of this task and is in preparation.

On-the-ground visits with the following organizations provided information, and in many cases, examples of prescriptions for this effort.

Las Vegas District, NM Division of Forestry, Las Vegas
NMSU Cooperative Extension, Las Cruces
Sacramento Ranger District, Lincoln National Forest, Cloudcroft
Capitan District, NM Division of Forestry, Capitan
Southeast Area Office, NRCS, Carrizozo
Pritzlaff Ranch, San Miguel County
Cimarron District, NM Division of Forestry, Ute Park
Sugarite State Park, Raton
Vermejo Park Ranch, Raton
Bernalillo District, NM Division of Forestry, Bernalillo
Silva Ranch, McKinley County
Santa Fe National Forest
Socorro District, NM Division of Forestry, Socorro
HH Ranch, Socorro County
Mt Taylor Ranger District, Cibola National Forest, Grants
Santa Fe Office, The Nature Conservancy
Jemez Ranger District, Santa Fe National Forest, Jemez Springs
Valles Caldera National Preserve, Jemez Springs

The findings and recommendations for fuels treatments of this project can not be summarized in this short space, but each forest type deserves a brief mention. A piñon-juniper woodland may seem simple in one spot, but over a landscape it gets complicated, and not much consensus about the type exists among specialists. However, we are able to make good recommendations in the WUI and in areas of juniper invasion into grassland. The ponderosa pine type is the most studied and varies little geographically, and we can make good recommendations covering a wide variety of potential goals, including fire treatments. Mixed conifer is more complicated than the PJ type, varies within New Mexico from north to south, and the survey contains recommendations based on NM State Forestry and Cooperative Extension experiences.



Thinned ponderosa pine after a prescribed burn. The original stand was an even-aged stand without much vertical structure. Pritzlaff Ranch, San Miguel County.

A goal of this work is to develop a web-based library of case studies of treatments applied to forests across the state. Although this is a work in progress, the case studies will be accessible on the NMFWRI web site, and the intent is to give forest managers a place to go when they would like to obtain information regarding prescriptions used in similar vegetation types across the state. An example of the format for these case studies can be accessed via the [prescriptions](#) link on the NMFWRI site.

Other 2006 – 2007 projects

The NMFWRI is funded by federal and state appropriations, and several projects over the year were primarily supported by state funds. These projects included the woody biomass utilization, landscape-scale planning, educational activities and outreach, the planning of a state watershed forum, participation in a developing EPSCoR proposal, funding the executive director of the New Mexico Forest Industry Association, participation in the Forest Restoration Principles/Biomass Task Force, and the recruitment of the Southern Plains Network to the Highlands campus.

Woody biomass utilization

NMFWRI personnel have participated in the first two woody biomass meetings organized by Rebecca Rizutti of Senator Jeff Bingaman's office, and will continue to participate in these sessions as these meetings develop. In addition, NMFWRI personnel are starting to build a web-based directory of forest products companies, wood processors, and thinning contractors in the state, in an effort to update a directory that was last published in 1998 by State Forestry.

NMFWRI personnel are also negotiating with Highlands and Luna Community College administrators to develop a vocational forestry program at Luna. This program would utilize forestry equipment originally purchased through CFRP and state funds several years ago. We are also looking into the possibility of using this equipment as an

education tool for Highlands' students, especially with regard to the pick-up and sawmill delivery of wood that is felled in small woodlots in the vicinity of Las Vegas.

Landscape-scale planning and watershed-based mapping

NMFWRI personnel attended several meetings in the Gila and Santa Fe National Forest supervisor's office to discuss the need for landscape-scale planning and stewardship contracting. The NMFWRI is still exploring ways to assist the Silver City Ranger District with mapping or other future needs, and will continue to meet with Gila personnel in the near future. The NMFWRI staff is currently participating 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. In addition, the Soil and Water Conservations Districts in the Estancia Basin has expressed a need for help with mapping project areas in the basin, and the NMFWRI will address this need in the coming year.

Educational activities and outreach

From January to June 2007, the NMFWRI worked with Denise Atencio of the Region 3 supervisor's office to arrange several continuing education courses for [the federal 401 series](#) fire fighting personnel at the Highlands campus. Highlands' faculty, staff, and administration also participated in this effort. Six classes will be offered by Highlands over the next two years, and the initial class will be offered in fall 2007.

In March 2007, the NMFWRI hosted a two hour meeting of Las Vegas area educators involved in natural resource based projects (14 people from 8 schools and agencies). This meeting was designed to promote future collaboration between groups. We are currently working with Las Vegas resident Herman Lucero to identify Las Vegas area schools for new projects and to apply for grants to develop or complement existing environmental programs in the Las Vegas area.

In March 2007, the NMFWRI co-sponsored two forest fire modeling workshops in Santa Fe and Las Vegas (40 total attendees) with Dr. Carl Fiedler of the University of Montana.

In June, the NMFWRI hosted four groups of high school students over four days at the Pritzlaff Ranch in collaboration with the Ben Altamirano Leadership Institute at Highlands' University. The goal of these sessions was to introduce students to the concept of forest and watershed management, and to have them interact with NMFWRI personnel and Highlands' faculty (Dr. Edward Martinez).

NMFWRI personnel also 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.

Planning of a statewide watershed forum

Over the past several months, NMFWRI personnel have participated in planning sessions and contributed to the development of the agenda for a statewide watershed forum that will take place in spring 2008 in Albuquerque. The lead organizations for this forum include the New Mexico Surface Water Quality Bureau, the State Office for Forest and Watershed Health, and the New Mexico Department of Agriculture.

Participation in a new EPSCoR proposal

The NMFWRI has participated in planning sessions and proposal review for an upcoming New Mexico EPSCoR proposal that will address how climate change impacts the snow-pack and water supply in the Rio Grande Basin. Dr. Al Rango of the [Agricultural Research Service](#) (based at NMSU) is currently the lead contact for this work, and the NMFWRI has been most involved with the educational component of the proposal, which is led by Dr. Stephanie Bestelmeyer of the [Chihuahuan Desert Nature Park](#).

The New Mexico Forest Industry Association (NMFIA)

In the spring of 2007, the NMFWRI provided funding to assist the NMFIA in obtaining an executive director (Naomi Engelman) and to assist the NMFIA with the following:

- to establish the NMFIA as a domestic non-profit organization in the state of New Mexico,
- to submit an application for a federally recognized tax-exempt non-profit organization, and
- to provide representation of NMFIA at key meetings around the state.

Due to the high cost of forest treatments in the state (\$1000-1400/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 is vital in applying forest treatments across the landscapes of New Mexico in an economically responsible manner.

Participation in the Biomass Task Force and Restoration Principles Group

Although the New Mexico Biomass Task Force had already developed the [New Mexico Forest Restoration Principles](#), NMFWRI personnel participated in the March 2007 meeting that dealt with piñon-juniper management issues. In addition, NMFWRI funds were used to pay for Dr. Bill Romme of the Colorado Restoration Institute to: 1) visit several sites in Lincoln County, NM, where tree densities have increased dramatically during the past 100-150 years, as evidenced by comparisons of historic and recent photographs, 2) to help the Biomass Task Force to produce a suitable vegetation classification for the state, and 3) to help foster development of a research agenda that will clarify historical fire regimes and the mechanisms of recent vegetation change in south-central New Mexico.

Bringing the Southern Plains Network to Highlands

In an initial effort aimed at building a core of land management entities at Highlands (with missions similar to the NMFWRI), the [Southern Plains Network](#) of the National Park Service was recruited to establish an office on the Highlands campus. SPN personnel will come to Las Vegas in late June 2007. In addition, NMFWRI personnel are negotiating Highlands' membership in the [Cooperative Ecosystems Study Unit Network](#) (Great Plains CESU) to facilitate applied research between the SPN, the NMFWRI, Highlands University, and other federal land management agencies.

Entities requesting assistance from the NMFWRI in 2006-2007

As part of our annual review, each member of SWERI was asked by the federal development team to list the entities that requested assistance over the past year. For the NMFWRI, this included five CFRP grantees (David Old, Ralph Barella, Mick and Berta Duebel, Dennis Trujillo, Danny Kuykendall), the Santa Fe National Forest supervisor's office, the New Mexico Forest and Watershed Health Office, NM State Forestry Las Vegas District, the NM State Land Office, NM State Parks, the BLM state forester, the Pritzlaff Ranch, the Claunch-Pinto Soil Conservation District, US Forest Service Region 3 Fire Management (401 series courses), the New Mexico Forest Industry Association, the New Mexico Biomass Task Force, and the Las Vegas Wood Cluster.

Looking ahead: Highlights of the federal 2007 work plan and other projects for 2007 - 2008

The NMFWRI 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 multi-jurisdictional stewardship contract in and around the Santa Fe National Forest, and continue to seek ways to aid the Gila National Forest or other stakeholders in their planning processes. We are particularly interested in building more relationships with stakeholders outside of our home base in northern New Mexico.

Using state funds, the NMFWRI will continue to develop an online directory for forest products companies and thinning contractors, as well as seek ways to develop new educational initiatives in the Las Vegas area and beyond. We are also interested in finding an individual who can assist us in developing an oral history of fire, grazing, and forest management in the forested areas of the state. Finally, we will continue to work on marking and thinning a private forestry demonstration area in collaboration with the Pritzlaff Ranch and the Biophilia Foundation.



The upper reaches of the Gallinas Watershed, near Hermit's Peak.