NEW MEXICO FOREST AND WATERSHED RESTORATION INSTITUTE

ANNUAL REPORT

2009-2010

Prepared and submitted by

Andrew Egan, Director, NMFWRI

With contributions from staff of the NMFWRI

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TABLE OF CONTENTS

THE NEW MEXICO FOREST AND WATERSHED RESTORATION INSTITUTE

Background. The Federal Southwest Forest Health and Wildfire Prevention Act of 2004 (Public Law 108-317) established the Southwest Ecological Restoration Institutes (SWERIs) *to demonstrate and promote the use of adaptive ecosystem management to reduce the risk of wildfires, and restore the health of fire-adapted forest and woodland ecosystems of the interior west.* The purposes of the Act include: *to enhance the capacity to develop, transfer, apply, monitor, and regularly update 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.* No other agencies or organizations in the southwest US have this federal mandate nor play such a strong and unique role in fire mitigation and public safety, forest health and restoration, technical assistance and outreach, and restoration-based economic development.

One of three restoration institutes established by the Act (partner institutes are the Ecological Restoration Institute, housed at Northern Arizona University, and the Colorado Forest Restoration Institute, housed at Colorado State University), the New Mexico Forest and Watershed Restoration Institute (NMFWRI) is housed at New Mexico Highlands University, home of the only Bachelor of Science in Forestry program in the state. Widely known and highly regarded throughout New Mexico and the southwest region, the NMFWRI provides outreach services and technical assistance that enable watershed restoration on forest and landscape levels not available elsewhere in the state. Importantly, the NMFWRI is looked upon to fulfill the role as a neutral broker of partnerships and collaborations among multiple land management agencies, watershed interests and stakeholders to achieve restoration objectives across jurisdictions and landscapes. While other entities involved in restoration have funding and regulatory roles related to land management, the NMFWRI does not have a financial stake in any project and does not have any authority or role related to compliance. The NMFWRI, therefore, provides neutral, practical advice and facilitation and can comment fairly and impartially on positions held by all stakeholders.

NMFWRI areas of expertise. NMFWRI's five-person professional staff brings specific expertise, education, and experience in the following areas: remote sensing and spatial data analysis, GIS/GPS, mapping, forest inventory, forest operations and wood products, social dimensions of natural resource management, and silviculture. The NMFWRI represents the state's only dedicated capability for supporting the spatial data analysis needs of external stakeholders – public, tribal, or private. The NMFWRI also represents the GIS/GPS capacity for Highlands University and for most of northern New Mexico, and partners with other entities in the state, such as New Mexico Tech and New Mexico State University, to solve problems related to forest and watershed restoration. This includes expertise that the NMFWRI provides to the Bureau of Geology and the Aquifer Mapping Program at NM Tech, and forestry expertise to NMSU's Range Improvement Task Force. NMFWRI's GIS work unit also provides help with maps and other geographic information to New Mexico groups engaged in forest restoration

and land management, but who are too small to maintain their own GIS capability. These groups include soil and water conservation districts, municipalities, private groups and individuals, and tribal organizations.

In some cases, the Institute's areas of expertise are unique in the state. For example, as the state struggles to create employment and rejuvenate its forest products industry, no other outreach organization in New Mexico has expertise in forest operations, wood products, and forest worker safety. The NMFWRI has provided technical assistance to individual, tribal, and collective forest industry interests – including the New Mexico Forest Industries Association. In addition, the NMFWRI has helped develop capacity, expertise, and employment in the forestry sector, perhaps most notably through its partnership with the Alamo Navajo School Board, Inc., where the NMFWRI has been instrumental in (a) reducing the workers compensation rates of forest workers there from 27 to 13.5 percent; (b) helping to develop sustainable employment in forest restoration; and (c) working with the Alamo Navajo Community develop a thriving and sustainable primary wood processing economy that is being used as a model for forest restoration-based enterprises in the state. Moreover, the NMFWRI has played a key role in developing indicators for assessing the social and economic effects and benefits of forest restoration practices, including metrics for restoration-based employment.

FY 2009-'10 budge and work plan. In FY 2009-'10, approximately 40 percent of the NMFWRI's budget derived from federal appropriations; 40 percent from state appropriations; and the remaining 20 percent from contracting for restoration-related services ranging from technical assistance with GIS to the development of socio-economic indicators for CFRP projects. The total federal appropriation for the NMFWRI during FY 2009-'10 was $250,000.

The Institute's revised federal FY 2009-'10 work plan was divided into four project areas:

1. Technical Assistance for Communities and Restoration Collaboratives;
2. Ecological restoration monitoring, restoration-based prescriptions, and water budget after forest restoration;
3. Stewards of Place; and
4. Outreach, continuing education, and forest worker safety trainings

In *Section One* of this annual report, each of these four projects is accompanied by project descriptions and specific deliverables, with side-by-side comparisons of specific work that the Institute has completed associated with each proposed deliverable. However, while the focus of this annual report is the Institute's commitments and work completed vis-à-vis its federal FY 2009-'10 work plan, in order to paint a comprehensive picture of the Institute's work during the past fiscal year, this annual report also outlines work accomplished using state appropriations and contracting. Therefore, additional work accomplished by the NMFWRI that complements and/or is outside of the federal work plan for FY 2009-'10 is outlined in *Section Two* of this document.

SECTION ONE

RECAPITULATION OF NMFWRI'S FY 2009-'10 FEDERAL WORK PLAN AND ASSOCIATED WORK ACCOMPLISHED AND DELIVERED

Project 1: Technical Assistance for Communities and Restoration Collaboratives

One set of identified needs revolves around tools and information that are useful for communities, agencies, and collaborative restoration groups. Projects need to be coordinated over multi-jurisdictional boundaries to achieve forest and woodland restoration on a landscape scale. This type of organization and mapping will also assist the forest products industry in estimating potential wood supplies over several years. A new agreement among USDA-Forest Service Region 3, New Mexico NRCS, and NM State Forestry has selected the Gallinas watershed for a landscape-scale, cross-jurisdictional restoration effort. The Gallinas River watershed is the drinking-water watershed for Las Vegas, and the only source of water for the city; a large crown fire in the area would be disastrous. The NMFWRI will be heavily involved in the restoration of this watershed from the beginning.

The NMFWRI has become a valuable mapping resource for small government agencies, non-profit organizations, private landowners, and local field offices of larger government organizations that have little or no in house GIS and GPS capabilities. Land managers throughout the state need help with map making to create a visual representation of past projects and to help prioritize future projects. NMFWRI's staff expertise and GIS/GPS infrastructure has allowed it to be very responsive to ad hoc request for support from these organizations.

Project one deliverables outlined in the FY 2009-'10 work plan:	**Activities completed during FY 2009-'10**
1) **The close involvement with the collaborative effort to restore the Gallinas River watershed.** The NMFWRI's role will vary as needed, but can include at least mapping services, prescription development, public education, and monitoring.	**The NMFWRI has maintained the western San Miguel County fire history map and updated the map with new fire and treatment data from NMSF and USFS.** **The NMFWRI Director is a member of the Board of Directors of the Hermit's Peak Watershed Alliance (HPWA), whose main focus is the Gallinas Watershed.** **A NMFWRI GIS staff member is a member of the HPWA's Technical Team.**

2) **The development of project maps for stakeholders throughout the state.** Anticipated activities include continued support to thinning project mapping and noxious weed map creation for several soil and water conservation districts, updates to a forest industry map for the NM Forest Industry Association, property and resource maps for the Biophilia Foundation (Pritzlaff Ranch), updates to the Taos County Community Wildfire Protection Plan maps, and project maps for various Collaborative Forest Restoration Program grantees and local watershed groups. As awareness of this service grows, additional requests will be filled on a case-by-case basis.	**The NMFWRI provided maps to a number of entities and activities, including:** • **Taos CWPP** • **Questa CWPP** • **Edgewood SWCD** • **East Torrance SWCD** • **Claunch-Pinto SWCD** • **Tierra Y Montes SWCD** • **Forest Guild** • **NMHU ITS** • **Alamo Navajo** • **Citizens Watershed Monitoring Team** • **NMFIA** • **Biophilia Foundation (Pritzlaff Ranch)** • **Sapello Watershed Group** • **Dan Flinter (Private Landowner)** • **NMSU Cooperative Extension** • **Michael Benjamin CFRP** • **NMSF Forest and Watershed Health Office** • **NMHU Students and Faculty** **See Appendix A for an elaboration on numbers of maps and stakeholders benefitted.**

Project 2: Ecological restoration monitoring, restoration-based prescriptions, and water budget after forest restoration

In December 2008, the NMFWRI released a report dealing with long-term monitoring of New Mexico's CFRP. This report, independently written by a group of contractors, identified a minimal set of ecological indicators for measurement and a set of 20 projects for long-term monitoring, and recommended that the measurements should be collected and stored in a manner that can be easily shared. The NMFWRI has been identified as the most appropriate place for collection and maintenance of these data, and more immediately, the organization that should remeasure the plots. This task is new, on a timetable, and support is being diverted to it from other projects. Financial and staffing support will need to increase significantly in the future.

In 2009, The NMFWRI continued its pre-treatment monitoring. This effort establishes semi-permanent plots and inventories pre-treatment vegetation, wildlife, and surface fuels. GIS and GPS are used to plan the locations of these plots and to provide the required precise plot positions, so they can be revisited for post-treatment and long-term monitoring. The NMFWRI maintains all monitoring data in electronic form in order to make them most useful and accessible to researchers and project managers. Data are provided upon request and will eventually be hosted on the NM Forest and Watershed Portal. The

NMFWRI has the capability to conduct assessments of timber supply for specific areas. In FY2010, the NMFWRI will continue to make these services available to all land managers to the extent our reduced budget allows, and these data will be used to track the success of prescriptions.

In 2008-09, the NMFWRI conducted the pre-treatment measurements on a 900-acre parcel in the Sacramento Mountains on a project designed to quantify water budgets in a mixed conifer thinning. The NMFWRI is partnering with multiple state and federal agencies as well as two universities on this project. The NMFWRI will continue this monitoring and collaboration.

Project two deliverables outlined in the FY 2009-'10 work plan:	**Activities completed during FY 2009-'10**
1) Begin the long-term repeat monitoring of CFRP treatment areas. Begin studying the needs and implications of long-term data collection and storage.	**The NMFWRI performed the five-year monitoring on the following CFRP projects:** • **La Jicarita, Walker Flats** • **Santa Fe County Fire Department WUI, Arroyo Hondo** • **Turkey Springs, Ruidoso Downs** **These three reports have been completed, submitted to USFS, and posted on the NMFWRI website (see sidebar, p. 8).** **Two additional long-term monitoring projects were confronted by unexpected logistical challenges – including ambivalence on the part of the original grantees and issues with tract access and access to original CFRP reports – and will be completed this winter/spring.**
2) **Support of pre- or post-treatment monitoring on thinning projects across the state.** This work includes selection of monitoring plot locations for all NMFWRI projects within project-defined parameters, measurements, creation of project field maps and maps for project final reports for NMFWRI monitoring projects, and entering field data for NMFWRI monitoring projects to create FFI database- and Microsoft Excel spreadsheet-based summary statistics, and support to organizations doing monitoring and analysis.	**Data, maps, and reports for pre- and post-treatment monitoring for NMFWRI projects have been provided to collaborators (Figure 1, p. 9). Project datasets have been assembled on CD disks and in electronic format and are available so that project data can she shared easily upon request.** **The NMFWRI's involvement with the forest restoration at Sugarite State Park continued during 2010. This work is aimed at the watershed for Raton, and is complicated by overlapping jurisdictions, cross-state communication, local government problems, and diverging ideas on fuels treatments. Our principle contributions are advice on restoration prescriptions and monitoring. Other collaborators include State Parks, the City of Raton's Water Department, D.B. Stephens, Four**

	Corners Institute, NM State Forestry, Colorado State Forestry, and the Colorado Division of Wildlife. **Other projects NMFWRI carried out this year were:** • **Patrick Griego, pre-treatment, CFRP, Gallinas** • **Dennis Trujillo, post-treatment, CFRP, Ocate** • **Forest Service stand exam, pre-treatment, cooperating with the Forest Service, Bluewater** **The NMFWRI also carried out extensive pre- and post-treatment monitoring in Grant and Catron Counties under contract to BLM.**
3) Continue vegetation monitoring on the Sacramento Mountains water budget collaborative project.	**All pretreatment monitoring for this project was completed in FY2009. NMFWRI is now awaiting completion of treatments, which have been delayed, before initiating post-treatment monitoring. Additional pretreatment data summaries and GIS data were provided to collaborators during FY10.**

Forest Restoration Prescriptions and Monitoring – The CFRP and the NMFWRI. In addition to its commitment to pre- and post-treatment of CFRP monitoring projects and outreach to CFRP grant recipients, the NMFWRI has begun the process of long-term monitoring of CFRP projects as a way to enhance our understanding of project effectiveness and treatment maintenance cycles. Results have been posted on the NMFWRI website. In 2011, the NMFWRI will pilot restoration monitoring workshops in order to build external capacity in this important area.

In 2010, the NMFWRI engaged in the development of socio-economic indicators for CFRP projects, as well as indicators for bosque restoration projects. In addition, the NMFWRI conducted a study aimed at better understanding the degree to which wildlife is considered during the monitoring of CFRP projects.



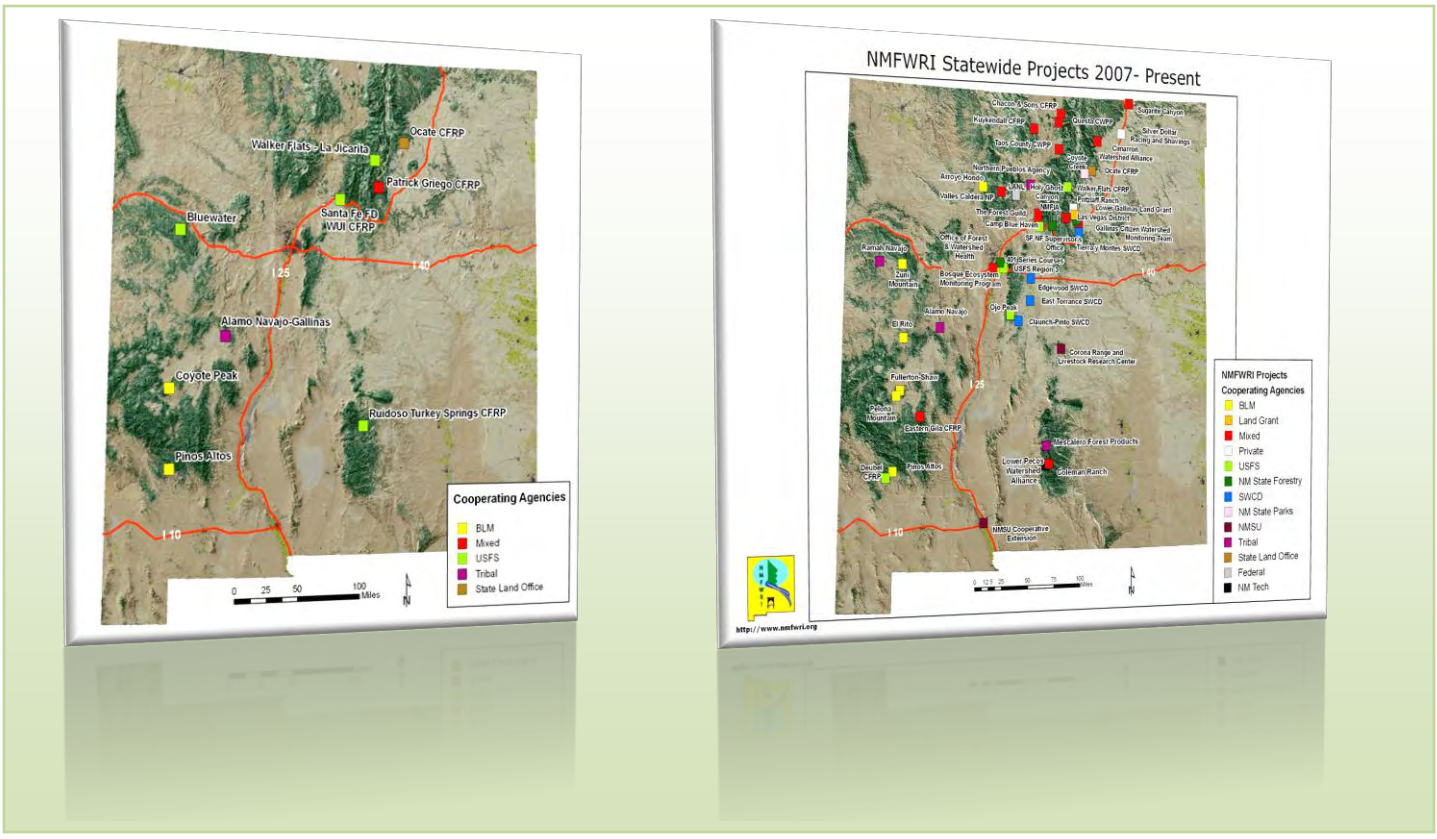


Figure 1. Left: Locations of CFRP monitoring conducted by the New Mexico Forest and Watershed Restoration Institute in 2010. The NMFWRI also provided additional technical assistance to many monitoring efforts in the state in 2010. Right: Locations of NMFWRI projects and activity, 2007-2010.

Project 3: Stewards of Place

The "stewards of place" model reflects a return to the roots of traditional regional universities as learners as well as teachers; publically engaged to tackle the myriad of challenges facing communities and regions of which universities are a part. The NMFWRI operates through Highlands University, which as a "stewards of place" university has a century-long history of public engagement. This stewardship includes a wide variety of outreach activities, applied research, service learning, and collaboration with a wide range of local stakeholders to identify societal problems, explore potential solutions and test those solutions through on-the-ground application.

Because the NMFWRI understands the importance of stewardship of place, the NMFWRI will support a "stewards of place" model wherever it is implemented. The latest project in this model is the Implementation of Restoration-based Treatments at the Landscape Scale. This project involves the four northern Arizona national forests and will likely have a special emphasis on the Coconino National Forest and the Kaibab National Forest. This project was begun in FY 2008, continued in FY 2009 and will likely move into the execution phase in FY 2010. This project appears under the same title in the annual work

plans of ERI and CFRI. The ERI will be the lead institute, with NMFWRI and CFRI as close collaborators. Each institute will utilize its expertise to contribute to the successful execution of the deliverables specified here, especially to the preparation of a robust, relevant landscape restoration handbook. The NMFWRI anticipates several trips to Arizona to become familiar with the area, which will help handbook preparation.

The Statewide Strategy for Restoring Arizona's Forests and the Wood Supply Study have opened a window of opportunity for advancing to project-level planning and on-the-ground treatment implementation. This project seeks to "capture the moment" and actualize the science-driven, broad-based public agreement that emerged from these recent efforts.

For this effort to be successful, best available science across disciplines (ecological, social, political, and economic) must be readily accessible to a wide cross-section of restoration stakeholders to include the Forest Service. The three institutes of SWERI are poised to provide that science-support for accelerating restoration at the landscape scale.

Project three deliverables outlined in the FY 2009-'10 work plan:	**Activities completed during FY 2009-'10**
1) A report from an analysis of the approaches used to develop strategically located ecological restoration treatments that simultaneously restore forest health and reduce the risk of unnatural fire.	**NOTE: This project was cancelled, allowing the NMFWRI to shift resources and expand its activity related to the other three work plan project areas.**
2) A document describing the design for a landscape restoration handbook – an illustrated guide describing decision support information approaches and lessons learned useful in collaborative, place-based restoration workshops and agency trainings.	**NOTE: This project was cancelled, allowing the NMFWRI to shift resources and expand its activity related to the other three work plan project areas.**
3) A document describing a design of an adaptive management approach that includes ecological and social monitoring of restoration treatments on a landscape scale.	**NOTE: This project was cancelled, allowing the NMFWRI to shift resources and expand its activity related to the other three work plan project areas.**

Project 4: Outreach, continuing education, and forest worker safety trainings

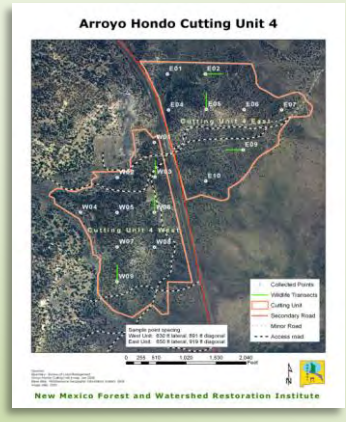
In 2007, the NMFWRI hosted a statewide meeting of monitoring practitioners that identified the need for a monitoring information clearinghouse so they could access information about other projects in the state, as Well as technical information related to monitoring practices in New Mexico and beyond. As one part of this need, the NMFWRI provides technical assistance to the New Mexico Forest Industry Association (NMFIA) to improve its internet capabilities and to identify the network of forest related businesses in New Mexico. The NMFWRI will maintain NMFIA's member and business directories and website, and take care of their GIS needs. Maintenance of our own NMFWRI website has passed from the University to the NMFWRI, and it will continue as a means to provide exposure and information-sharing to the public and NMFWRI collaborators.

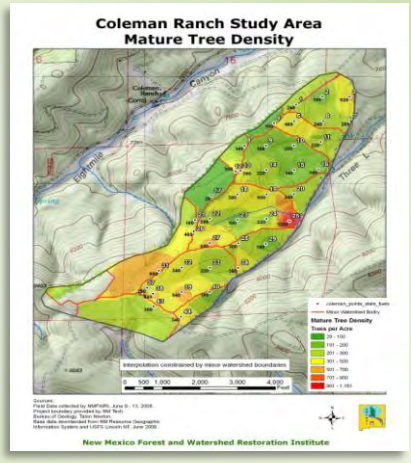
Each year, the NMFWRI is presented with various opportunities to give short-term training or continuing education on a variety of subjects, ranging from monitoring to GIS to basic forest ecology. For example, the NMFWRI is the center of GIS and GPS expertise on the NMHU campus and in northern New Mexico, and is seen by many federal, state, and educational agencies as the logical place to host educational and training activities. As the NMFWRI demonstrates the value of GIS and GPS to the many governmental and non-governmental entities with which it collaborates, these organizations have requested training as they establish or improve their own GIS and GPS capabilities. Increasing and better organized community-level involvement in monitoring and restoration activities has resulted in the need for more consistent training in all aspects of this work. In addition, the NMFWRI envisions an introductory one-week course on natural resources restoration for schoolteachers. This work plan includes funds for the equivalent of a one-week training sessions, with subject matter as requested.

Project four deliverables outlined in the FY 2009-'10 work plan:	**Activities completed during FY 2009-'10**
1) **Creation and maintenance of a website for the NMFIA** that includes an online directory and interactive map describing forest related businesses in New Mexico. Continue other support to NMFIA, including collaborating in training for forest workers and solving mutually identified problems.	**A website was created for the NMFIA at http://www.nmfia.net/. A hardcopy map and database have been developed, identifying forest related business in New Mexico.** **In addition, the NMFWRI provided state funding that supported the activities of the Executive Director, and State Forestry funding passed-through the NMFWRI to fund the Forest Worker's Safety Certification program.** **The NMFWRI participated in a planning session with the NMFIA Board in early July and facilitated the completion of NMFIA's strategic plan.** **NMFWRI has assisted with the NMFIA forestry sector capacity study, including executing phone surveys of NM loggers and primary and secondary wood processors, as well as initial analysis of the data.**

2) **Management of the NMFWRI web page** to provide access to information about NMFWRI projects and personnel and ensure information is accurate and current.	**The NMFWRI website is being updated on a continual basis to provide current information on NMFWRI activities.** **In addition, the NMFWRI developed a website called "Restoration Roundtable," where stakeholders can post working papers and white papers on matters related to forest restoration.** **CFRP long-term monitoring reports and data are now available on the NMFWRI website.**
3) **Development of a comprehensive GIS extension program.** This includes teaching selected GIS and GPS lessons in natural resources courses, and various short courses and workshops open to NMHU students and faculty. Rapid fielding of new, complex GPS receivers is expected to increase the demand for this service.	**The NMFWRI assisted NMSF is developing a GIS-based treatment database for the East Manzano Mountains.** **In addition, the NMFWRI provided an intense, two-week, 3-credit hour GIS course to federal wildland firefighters, conducted GIS assistance visits to three soil and water conservation districts and BIA's Northern Pueblos Agency.** **The NMFWRI also provided GIS assistance to local US Fish and Wildlife Service personnel and assisted NMHU students and faculty with various lessons and GIS technical support.**

Outreach and technical assistance. The NMFWRI has engaged in a variety of outreach and technical assistance projects, especially in the areas of restoration monitoring and prescription development and providing maps and GIS products to restoration stakeholders.





SECTION TWO

OUTLINE OF WORK ACCOMPLISHED BY THE NMFWRI IN ADDITION TO THAT PROPOSED IN ITS FY 2009-'10 FEDERAL WORK PLAN

The following outlines work conducted by the NMFWRI that complements or is in addition to that outlined in the NMFWRI's federal FY 2009-'10 work plan and not directly funded through its federal FY 2009 -'10 work plan. This section is divided into three parts: (1) activities and projects in which the NMFWRI has been involved and for which there are specific, tangible deliverables; (2) NMFWRI's role in CFRP and CFLRP projects; and (3) meetings, trainings, workshops, and conferences during the past fiscal year that the NMFWRI has participated in, conducted, and/or sponsored.

PART 1. Activities and projects in which the NMFWRI has been involved and for which there are specific, tangible deliverables.

Project	Description	NMFWRI Role/Deliverables	Comments
Estancia Basin Watershed health, restoration, and Monitoring Project (EBWHRM)	Evaluate the effects of thinning programs and other treatment options on groundwater recharge, vegetation, wildlife, and other resources within the Estancia Basin. The study evaluates four test sites in ponderosa pine and piñon/juniper forests. This is a cooperative effort among the Edgewood, East Estancia, and Claunch-Pinto Soil and Water Conservation Districts. Funding is provided by the New Mexico Water Trust Board and the US Forest Service (via NMSF).	Facilitated meetings, evaluate treatment prescriptions, provide technical inputs on monitoring project. Provided maps, GIS/GPS training, and data management support. Non-voting member of team.	Often described as a model for collaboration in natural resources management. NMFWR is paid $5000/year for its services.
Greater Rio Grande Watershed Alliance	Collaboration between Soil and Water Conservation Districts, Pueblos, agencies and stakeholders working to restore riparian ecosystems in the Rio Grande Watershed in central and northern New Mexico.	GIS and Mapping Support, POC for monitoring. Serve on technical committee that will recommend projects and procedures.	NMFWRI will manage monitoring efforts. Scope of this effort needs to be defined.
Forest and Watershed Health Information Clearinghouse (aka "The Portal")	Provides centralized access to ecological, socio-cultural and economic information related to restoration and maintenance of New Mexico forests and watersheds. The clearinghouse functions as a library as Well as a shared workspace. Shared workspace will also enhance collaboration, training, and knowledge among those involved in forest and watershed restoration.	Funded by NMSF through NMFWRI. Provide technical inputs and system administrator support.	The Clearinghouse is a joint project of New Mexico State Forestry and the New Mexico Forest and Watershed Restoration Institute, pursuant to the state's Forest and Watershed Health Plan.
CFRP Socio-economic indicators	There has been increasing interest in the social and economic dimensions of CFRP and other restoration projects.	The NMFWRI is developing socio-economic indicators for CFRP projects.	Final report: March 31, 2011.
CFRP Bosque Monitoring Handbook	2010 CFRP conference attendees identified that current CFRP monitoring protocols are deficient for assessing Bosque environments. NMFWRI received funding from USFS to develop guidelines for Bosque	Publish guidelines – in progress	Final report: March 31, 2011.

	monitoring suitable for CFRP projects.		
SW Fire Science Consortium	Way for managers, scientists, and policy makers to interact and share science in ways that can effectively move new information to management practices. The Southwest is one of the most fire-dominated regions of the US, but limited in terms of regional organizations focused on fire research and information dissemination. In the Southwest there are many localized efforts to develop scientific information and to disseminate that to practitioners on the ground, but these initiatives are often not well coordinated or aware of all the information and resources that are available. The real need for a consortium is to help bring these parallel efforts together to be more efficient and inclusive. NMFWRI also seek to link the academic community and the management community in educating future fire professionals with up-to-date science as well as practical experience.	Serving on governing board.	Board consists of representatives from federal agencies, AZ and NM state agencies, NAU, NMFWRI, ERI, Forest Guild,
"401" courses	In 2004, the United States Department of Agriculture Forest Service and the Department of the Interior began implementing the Interagency Fire Program Management Standard. This standard, to be implemented by October 2010, defines qualification standards for the GS-0401 series fire management positions. Included in the qualification standard is the requirement for a natural resources sciences related degree or at least 24 semester credit hours of college course work that include upper division courses in a natural resource sciences related discipline. To help working wildland firefighters attain this qualification, the New Mexico Highlands University Natural Resources Management Department has been offering a series of lower and upper division credit courses in fire management and ecology. These intensive, three-credit-hour, two-week courses are offered at the Highlands University campus.	Coordinated, taught, two week, intensive 3-credit hour GIS courses for federal fire fighters.	The program that established these courses has been discontinued.

Alamo Navajo CFRP	Complex project designed to establish some level of economic development around forestry, giving seasonal fire crew work in the off season, improve educational levels in the community,	Assisted with monitoring, GIS, and reporting support. In addition to these efforts, in 2010 the NMFWRI entered into a formal agreement with the ANSBI to (a) develop capacity in all phases of forestry restoration; (b) develop a model for forest restoration economies; and (c) outreach to other communities and individuals to help them develop similar enterprises in order to further enable restoration efforts (see Sidebar, p. 21). The NMFWRI has also continued to provide on-the-ground training to members of the /Alamo Navajo Community in the extraction and primary processing of restoration thinning.	Used as a template for similar effort in Manzanos. Need to improve monitoring skills.
CFRP	CFRP projects around the state. Addressing ecological restoration, economic, and educational development goals.	Provided mapping and data analysis support to NMFWRI monitoring activities. Also provided direct support to grantees. Maintained static and online maps of CFRP project locations. In addition, the NMFWRI established or remeasured plots for vegetative monitoring for the following projects during 2010. The projects are listed by principle contact, project funding source, and location.	Bringing together diverse stakeholders such as USFS, DOD, State gov't, tribes, land grants, and private industry that often had a history of antagonism.

		• Patrick Griego, CFRP, Gallinas; • Dennis Trujillo, CFRP, Ocate; • La Jicarita, CFRP 5-yr remeasure, Walker Flats; • Santa Fe County Fire Department WUI, CFRP 5-yr remeasure, Arroyo Hondo; • Turkey Springs, CFRP 5-yr remeasure, Ruidoso Downs; • BLM pre-treatment, Pinos Altos; • Forest Service stand exam, Bluewater; • BLM pre-treatment, Coyote Peak; and • BLM post-burn, Fullerton Canyon.	
CFLRP	Landscape-scale collaborative projects that address ecological restoration and regional socio-economic objectives.	Provided mapping support and inputs to development of monitoring objectives.	Bringing together diverse stakeholders such as USFS, DOD, State gov't, tribes, land grants, and private industry that often had a history of antagonism.
NM Statewide Assessment	The data of the New Mexico Statewide Natural Resources Assessment were organized around eight core data themes suggested in the 2008 Farm Bill. The eight core data themes include: Fish and Wildlife Habitat (Biodiversity), Development Risk	Served on technical committee. Participated in workshop that established final prioritization to elements of the assessment.	Data gaps are now being analyzed and strategies to fill those gaps must be developed.

	(Potential), Economic Development (Potential), Forest Health, Fragmentation, Green Infrastructure, Water Quality and Supply, and Wildfire Risk. For each core data theme, models were developed and served as the foundation for identifying the priority landscapes within New Mexico for the Statewide Strategy and Response Plan.		
Biophilia Foundation (Pritzlaff Ranch)	The primary mission of the Biophilia Foundation is to support efforts that protect, restore, enhance, and preserve wildlife habitat for all species of native plants and animals. The Pritzlaff Ranch serves as a resource for the education and training of private citizens, public school students and teachers, university students, local landowners and business managers, and professional forest workers on topics of conservation and sustainable management of forests and watersheds.	Provided infrastructure maps, thinning management maps, and mapping support to prescribed fire operations. Assisted researches with maps, GIS data, and monitoring. Created a historical aerial photo study of the ranch.	New ecological projects manager in place. Need to reestablish relationships.
Wind River Ranch	The mission of the Wind River Ranch Foundation is to conserve wild landscapes in northern New Mexico through ecological restoration, research, and education.	Supporting student research activities. Providing GIS and mapping support.	Ranch may transfer to USF&WS, with additional education mission.
Las Vegas NWR	Situated on a high plateau where the Great Plains, the Rocky Mountains and the Chihuahuan desert come together, Las Vegas National Wildlife Refuge provides habitat for a diversity of plant and animal life. Established for migratory birds traveling along the Central Flyway, this 8,672 acre refuge is comprised of native grasslands, croplands, marshes, ponds, timbered canyons and streams which provide important habitat for over 254 species of birds.	Provided maps for refuge management, fire management, and visitor services. Support was also provided to MaxWell NWR, a subordinate unit to the LVNWR.	Almost all work was accomplished by student intern. LVNWR provided plotter paper and ink cartridges.
Storrie Project	The Storrie Project Water Users Association is a group of irrigators and other landowners near Las Vegas who share water from the Gallinas River through a network of ditches, pipelines, and reservoirs.	Provided image and topographic map of the project.	Almost all work was accomplished by student intern. This is the first comprehensive map of the project area within recent memory.
Taos County	This planning document lays out the vulnerabilities	Provided map updates to WUI	Taos County recently hired a GIS

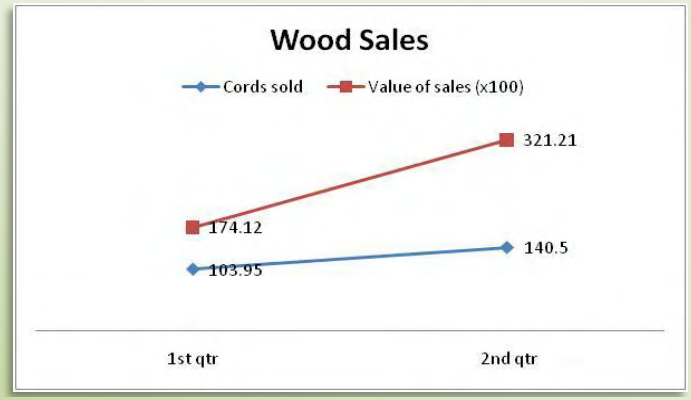
Community Wildfire Protection Plan	of Taos County communities to wildfire and begins a strategy to mitigate the risk of wildfire.	boundaries and thinning project.	specialist who will be able to take on most of NMFWRI's GIS support. Expect some new requests related to restoration planning and treatments.
Gallinas fire history mapping	Comprehensive map of western San Miguel County focused on the Gallinas Watershed and adjacent watershed. Shows fire history, past, present, and future vegetation treatments, WUIs and other planning areas, and critical infrastructure.	Build and maintain map. Gather data from various entities working in the area.	May evolve into an atlas due to volume of data and variety of themes.
Citizens Watershed Monitoring Team	CWMT performs long-term ecological monitoring of plant communities, river and riparian health and specialize in wildlife monitoring including birds, beaver, butterflies, elk and amphibians in our local watersheds. Engages in various public and educational outreach activities.	Created maps for annual Christmas Bird Count, annual Butterfly count, and for 319-project proposal.	Group is evolving into a traditional watershed group. Has obtained organic GIS/GPS capability through 319 grant funding.
Tierra Y Montes SWCD	Local Soil and Water Conservation District. Supporting forest and stream restoration projects in the region.	Provided maps in support of several projects and presentations.	May collaborate on historical aerial photo study.
NMHU Student and Faculty support	NMHU Natural Resources students and faculty frequently request GIS assistance for classes and projects.	Taught classes and workshops. Assisted students and faculty with creating maps and posters. Some projects included bathymetric mapping of Peterson Reservoir, researching and downloading imagery, guest lecturing in classes, creating maps for archeology filed work and classes.	NMHU now has a minor and certificate program for GIS.
Indigenous knowledge	There has been increasing interest in indigenous knowledge related to watershed management and processes, especially as they pertain to the control and use of fire; land use practices	The NMFWRI is documenting indigenous knowledge in the Upper Gallinas Watershed, with the intention to expand the study to, first, northern NM and, later, to other watersheds/communities in NM.	This is an ongoing project that is now part of NMFWRI's federal work plan.
IT Support	Maintain GIS/Remote Sensing software licenses, maintain plotter, provide general computer support, and submit ITS work orders when problems occur with computers.		

BLM Albuquerque District Vegetation Delineation Project	The BLM Albuquerque District has identified a need for improved delineation between forested and non-forested lands in their district.	Developed an automated approach to delineate forest and woodland stands on BLM lands near the Malipais Region in Cibola and Catron Counties. Definiens eCognition software was used to in the analysis of 2010 SPOT imagery (Système Pour l'Observation de la Terre, French Remote Sensing Satellite). Stands were delineated within 12 digit HUC boundaries and given FORVIS codes provided by BLM. Landfire data was used to populate information on the stands providing dominate vegetation species and percent canopy cover attributes.	NMFWRI are currently finishing up the project and are writing up the final report. Data will be provided as shapefiles with associated metadata.
BLM Taos District Vegetation Classification Project Development	The BLM Taos District desires a detailed vegetation map to support various management activities.	As a result of work that was done for the BLM forest stand delineation project, the NMFWRI was contacted to do possible work for the Taos BLM district. They desired a detailed vegetation classification for San Juan County. Before contracting a project, the NMFWRI is testing an area to be classified using one foot true color ortho-imagery for San Juan County. A small study area was selected to test the methodology using Definiens eCognition.	At the moment NMFWRI are still testing the methodology but hope to have preliminary results by February.
BIA Training	Bureau of Indian Affairs Northern Pueblo Agency supports several Pueblos in various aspects of natural resources management, including mapping and restoration monitoring.	Traveled to the Bureau of Indian Affairs Northern Pueblo Agency offices to help their Forestry Division with GIS and GPS support. Assistance was provided with their Trimble and Garmin GPS units. Help was also given using ArcGIS software to make basic maps.	The Northern Pueblos would like further help with GPS and GIS support.

NMFIA Economic Analysis	The NM Forest Industry Association is developing a directory of businesses that utilize wood products. It has also been working on an analysis to support obtaining preferred status for NM business in USFS contracting.	Printed the most recent NM wood manufactures map and provided copies of our most recent excel files. Maps and data were provided in both hardcopy and digital formats. Maps and statistical data were provided for the economic analysis study. The NMFWRI also aided the NMFIA with the conduct and analysis of their capacity survey and the development of their strategic plan.	

Restoration-based Economic Development – The Alamo Navajo Partnership. In the Fall, 2010, a formal partnership was signed by the ANSBI and the NMFWRI to develop a model for business and job creation related to forest restoration by providing training in restoration monitoring, forest worker safety, harvesting processes, firewood processing, and lumber manufacturing. As part of the partnership, the ANSBI and the NMFWRI will collaborate on two workshops each year on some aspect(s) of restoration-based business development, including: firewood processing; forest products marketing; utilization of small-diameter thinnings; harvest system safety and efficiency; and capacity building in forest restoration.

During the first quarter, workers from the Alamo Navajo Community harvested, yarded, cut to length and split wood from restoration thinnings. The wood yard was maintained by a six-person crew with two splitters. All loading was done by hand. During the second quarter, additional NMFWRI equipment was available in the field and in the wood yard. Although learning to use the new equipment has taken some time, productivity has already increased, with approximately 40% more cord wood being shipped during the second quarter of production.



PART 2. NMFWRI activity related to the CFRP and CFLRP in the past year.

Collaborative Forest Restoration Program (CFRP)

CFRP – grant application support . NMFWRI supported the CFRP grant application for the following projects. The projects below are listed by how far they advanced in the selection process, main contact, organization, project name, and NMFWRI's commitment.

Proposals withdrawn before being presented to the Selection Panel:

- Jim Dorn; New Mexico Forest Industry Association; *Reliable Supply, Sustainable Harvest, and Coordinated Marketing - Building a Brighter Future for New Mexico's Forest Industry;* participate in a Forest Coalition process in any of the New Mexico National Forests

- John Ussery; Northern NM College; *Sustainable Careers from Forest Restoration*; forest monitoring training to project participants

- Mike DeBonis; Forest Guild; *Benefit–Cost Evaluation Tool for Evaluating Forest Restoration Projects and Investments*; committed to participating on the Review Team

Proposals formally evaluated but not selected for funding:

- Dan Campbell; City of Raton Water Department; *State Park at Sugarite*; the baseline vegetation and wildlife monitoring (money budgeted)

- Gail Campbell; Alamo Navajo School Board, Inc.; *Multi-Jurisdictional Collaborative Analysis*; commit to working with SWCA to assist ANSBI to provide training to crew members to enable those crews to implement vegetation surveys and endangered species studies

- David Old; Old Wood; *Advanced Manufacturing of Flooring from Small Diameter Timber;* closely involved with the socio-economic monitoring during the three years of this project.

- Alonzo Gallegos; Caja del Rio Majada Cooperative; *Santa Fe River Area Restoration*; commit to doing the ecological monitoring

Proposals selected for funding:

- Herman Vigil; H.R. Vigil Small Products; *Forest Restoration, Capacity Building, and Community Sustainability in Black Lake*; working with the Forest Guild and State Land Office to involve NMFWRI interns in data collection for NEPA

- Rudy Jaramillo; Jaramillo & Sons; *Quality Environment and Economic Sustainability Project*; participation in the multi-party monitoring team

- Andy Chacon; Andy Chacon Forest Restoration Company; *El Ritito Forest Health Restoration Project*; active participation in the multi-party monitoring team, led by the Forest Guild, including the compensated participation of students. NMFWRI also committed to assisting with developing treatment prescriptions and providing existing ecological data.

- Anne Bradley; The Nature Conservancy; *Jemez Mountain Salamander*; vegetative sampling for habitat characterization (money budgeted)

- Patrick Griego; Griegos Logging LLC; *Las Vegas (Gallinas) Municipal Watershed WUI Fuels Reduction Project*; committed to lead the multi-party monitoring team, and to collect the data for the ecological and socioeconomic monitoring

- Dennis Trujillo; Southwest Wood Products; *Walker Flats Watershed Improvement – Final Phase;* participation in the multi-party monitoring team (money budgeted)

Collaborative Forest Landscape Restoration Program (CFLRP)

SWJM – proposal preparation, public meeting. For almost 4 years, the NMFWRI has been involved in a group that called itself the Southwest Jemez Partners, made up of the Valles Caldera National Preserve, the Santa Fe National Forest, the Nature Conservancy, Jemez Pueblo, and NMFWRI, and organized to look at managing the eastern half of the Jemez River watershed as a whole. When the Collaborative Forest Landscape Restoration (CFLR) Act was passed and external funding became a possibility, the group decided to submit a proposal under the CFLR Program. Our expectation was that the NMFWRI could not put together a successful proposal in the time allowed, but that this first year would be a learning year for the partners.

From that point on, VCNP and particularly the Santa Fe National Forest dedicated significant resources to this effort, and the staffs demonstrated an exemplary level of expertise. Significant input was solicited from the public, and significant resources were promised from partners (agencies, pueblos, organizations) associated with the area and its surroundings. A proposal was submitted that planned for thinning, reintroduction of prescribed fire, and in-stream restoration on a 210,000-acre landscape with boundaries very similar to those first discussed four years ago. In mid-August, the Southwest Jemez Mountains project was selected for CFLR funding, ranking third out of the ten proposals funded nationally. At year's end, the NMFWRI is taking a leading role in establishing the monitoring protocols for vegetation across the project area.

In addition, the NMFWRI is participating in the recent development of the Zuni Mountain CFLRP project proposal.

PART 3. Meetings, trainings, workshops, and conferences during the past fiscal year that the NMFWRI has participated in, conducted, and/or sponsored.

- *Las Vegas thermal biomass conference presentation*. In January in on the NMHU campus, Forest Guild convened a three-hour evening meeting of people interested in thermal biomass in the Las Vegas area. The NMFWRI presented an overview of the wood supply, focusing on biomass, within a 50-mile radius. The values were from the FIA database.

- *Forest Service national Planning Rule.* As part of its effort to revise the Planning Rule under which it operates, the Washington Office of the Forest Service held a one-day roundtable in Albuquerque in late April. The NMFWRI participated in the Industry and the Traditional Uses breakout discussions.

- *Presentation at Pritzlaff*. The Biophilia Foundation held a one-day conference on forest management in northeast New Mexico in late May. The program included a 2-hour visit to the NMFWRI restoration demonstration area at Pritzalff Ranch. Conference participants were mostly local, but included people from Arizona and Connecticut.

- *SNMFWRIRI/RMRS*. In January, the three SWERI institutes met in Fort Collins with a group from the Rocky Mountain Research Station. Over three days, this group of about 17 people discussed regional implementation needs, and how those needs could be addressed by research and SWERI. A spreadsheet was developed that listed all the potential projects, which organization would directly address the needs, and how the RMRS/SWERI collaboration might work. The information from this spreadsheet was used to develop our Federal FY 2010 final work plan.

- *319 grant applicant support*. Every year, the Surface Water Quality Bureau of the NM Environment Department awards money from the federal EPA to do in-stream restoration work; these projects are commonly referred to as 319 Grants. Three different groups asked us to be part of their 319 grant applications this past year, two on the Rio Gallinas and one on the Rio Santa Barbara. One of the proposals on the Rio Gallinas was successful, submitted by the Citizen's Watershed Monitoring Team, with our role supporting GIS and mapping.

- *Jemez Mountain Salamander*. The US Fish and Wildlife Service expects to list the Jemez Mountain Salamander as an endangered species at the end of its current review process. The NMFWRI participated in workshops earlier this year on JMS habitat and biology, which lead to our inclusion in a CFRP proposal on the JMS, successfully lead by The Nature Conservancy (see below).

- *Natural Heritage Conservation Act*. The Natural Heritage Conservation Act passed the NM Legislature during the 2010 Regular Session, and was signed by the governor in March. It allows the Energy, Minerals, and Natural Resources Department to allocate funds for on-the-ground treatments and for conservation easements. The NMFWRI participated in a series of public meetings to set the rule for deciding how the money would be distributed. That rule became effective in mid-July.

- *WHEP with NMSU at VCNP*. Every year, the national 4H program holds a national invitational competition for high school students. This year, it was held at Valles Caldera National Preserve, organized by Cooperative Extension at New Mexico State University. The NMFWRI provided funding support to NMSU during the organizational phase of the Wildlife Habitat Evaluation Program (WHEP), and presented to the approximately 200 students and advisors at Valles Caldera on vegetation management for restoration.

- *WHO-CG meetings*. The NMFWRI participated in all the quarterly meetings called by the Watershed Health Office of State Forestry. These meetings contribute greatly to the coordination of restoration work among state and federal agencies across New Mexico.

- *Watershed Forum presentation*. The NMFWRI provided significant funding and organizational support to the second Watershed Forum, held in September. In addition, The NMFWRI took advantage of this Forum's emphasis on upland (as contrasted to in-stream) restoration, and during a plenary session presented on different thinning guidelines for restoration of ponderosa pine.

- *Claunch-Pinto training course*. As part of training their work crew, the Claunch-Pinto Soil and Water Conservation District asked us to repeat our standard course, Introduction to Natural Resource Management. For a week in February, the NMFWRI led about 20 men in classroom and field exercises in basic ecology, basic tree growth, management policy, and land and plant measurements. The course was held in and around Mountainair, which received significant snowfall during the week. The class showed their dedication to the course by having perfect attendance despite the resulting bad road conditions.

- *SAF National Convention*. This year, Albuquerque hosted the annual National Convention of the Society of American Foresters. SWERI was given an entire afternoon session to talk about their work; the NMFWRI presented on the Mountainair "Project", the collection of medium and small treatments centered on the northern Mountainair Ranger District. In addition, the NMFWRI assisted with the mediated poster session, arranging the moderators across two days. The NMFWRI also collaborated with the other SWERI institutes in an exhibitor's booth.

- *Prescribed Fire Council*. One of the significant developments this year for forest management in New Mexico was the establishment of the New Mexico Prescribed Fire Council. It arose out of a meeting in August 2009, when a representative of the National Coalition of Prescribed Fire Councils came to New Mexico to promote the idea of an organization to exchange information about and encourage the use of prescribed fire. The NM Prescribed Fire Council was established at a meeting of the major stakeholders – USDA-Forest Service, BLM, State Land Office, State Forestry, Forest Guild, BIA Navajo, Santa Clara Pueblo, The Nature Conservancy, and Vermejo Park – in July, when officers were elected and by-laws were adopted. It held its first annual meeting in October, with about 80 attending, and tripling the number of involved organizations. An NMFWRI staff serves as the organization president, and it has formally affiliated with the National Coalition of Prescribed Fire Councils.

- *Smoke Rule*. Every five years, the federal EPA requires a state to revise its rules regarding the emission of smoke from outdoor fires. Beginning in April, the NMFWRI participated in the review and rewriting of New Mexico's rules regarding public notification, scheduling, and reporting of wildfire and prescribed fire. The effort was lead by the Environment Department's Air Quality Bureau, and other participants included USDA-Forest Service, USDI (represented by BLM), NM Department of Agriculture, NM Pecan Grower's Association, NM State Forestry, the NM Chapter of the American Lung Association, and the NM Task Force on Multiple Chemical Sensitivities. The last comments on the revised Rule were collected just as the year ended.

- *Woody biomass*. The NMFWRI Assisted NM State Forestry staff and a consultant on Picuris Pueblo's business product venture of woody biomass products by reviewing on-site work stations and providing recommendations for improving out-put on marketable products. In addition, the NMFWRI was represented at the 2010 Oregon Logging Conference that focused on woody biomass.

- *NM Resource Advisory Committee*. The NMFWRI was represented on the Northern NM Resource Advisory Committee. The committee's purpose is "to enhance local community collaboration with federal land managers by proposing, reviewing and making recommendations regarding proposed projects that will benefit resources on national forest land in Cibola, McKinley, Mora, Rio Arriba, San Miguel, Sandoval, Taos and Torrance Counties. In addition, the projects help provide employment opportunities in local communities."

- *Monitoring training*. The NMFWRI presented a three day NMFWRI forest post-monitoring training activity to three members of the Kuykendahl CFRP crew. In addition, the NMFWRI conducted three days of pre-thinning forest monitoring/training work for the US Forest Service Blue Water, Red Canyon, Cibola District.

APPENDIX A: Maps and GIS and GPS products delivered by the NMFWRI in 2010

Maps were provided by the NMFWRI in 2010 as follows:

Project/Entity	Number of products
Taos CWPP	10
Peñasco CWPP	6
Estancia Basin Watershed Health…	6
Tierra Y Montes SWCD	7
NMHU ITS	2
Alamo Navajo	6
Citizens Watershed Monitoring Team	30
NMFIA	4
Biophilia Foundation (Pritzlaff Ranch)	50
Dan Flinter (Private Landowner)	15
NMSF FWHO	2
NMHU Students and Faculty	6
Greater Rio Grande watershed Alliance	8
NM Watershed Forum (NMED)	4
Las Vegas NWR (USF&WS)	45
Wind River Ranch	6
Storrie Project	6

GIS Data Sets of various types were provided in 2010 to the following:

Entity
USFS
BIA
Biophilia Foundation (Pritzlaff Ranch)
Forest Guild
NMSF
BLM
NM Tech/Bureau of Geology

GIS and GPS training and outreach were provided in 2010 as follows:

Entity/Activity
GIS and GPS lessons for NMHU courses
GIS Course for federal wildland firefighters (401 series)
Estancia Basic SWCDs
Individual GPS and GIS training for NMHU students/faculty
Tierra Y Montes GIS and GPS field support
Biophilia Foundation GIS and GPS Support
GIS and GPS lessons for NMHU courses
GIS Course for federal wildland firefighters (401 series)