



Forest Plan

Monitoring and Evaluation Report

Lincoln National Forest Fiscal Year 2002

The U. S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital and familial status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD). To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

Introduction

The purpose of this report is to inform the Forest Leadership Team, other Federal, State, and local agencies, Indian tribes, and the public of the progress the Lincoln National Forest has made toward Forest Plan implementation and ecosystem management.

The report is a continuation of the 2001 monitoring report, and includes past and present monitoring activities. This report provides a summary of monitoring activities for fiscal year (FY) 2002. If additional information is needed, please refer to Appendix A or contact the Forest.

Setting the Context

Community Vitality – In the Southwest, we continue to see a shift in trends that affect Forest Plan direction, goals, and objectives. Demographics are shifting to an older-aged population. This trend includes an overall transition from a public that desires emphasis on commodity-oriented (useful) products and services, to a public that wants programs and program delivery to be amenity-oriented (pleasant and attractive).

We are also seeing a continual increase in visitors of all ages. Results of this trend shift will include an increase in the kind and number of recreational opportunities available. Visitors are expecting better access to the Forest and we are continuously increasing accessibility to better meet the various needs of the public.

Forest Plan implementation has been flexible in meeting many of Southwestern society's changing trends. However, an increase in administrative appeals and litigation demonstrates that improvement in Plan direction can guide resolution of many changing needs.

Specific human dimension program areas needing future analysis and possible modification at Plan revision are:

- Transportation System and Roads Analysis
 - o What roads and trails will be available for public use or additional resource needs?
 - o What uses will be allowed and are we considering all uses to protect resources?
 - o What right-of-ways are needed?
 - o How can we better manage off-road-vehicle use?
- Public Land Use, Land Exchanges, and Special Uses
- Allowable Sale Quantity of Wood Products

- Economical Availability and Utilization of Small-diameter Wood Products
- Recreation Opportunities
 - o Are developed recreation sites adequate in kind and number?
 - o Are the variety and number of dispersed recreation opportunities adequate?
 - o What are our existing and future maintenance obligations?
- Heritage Resource Management
 - o What National Register sites established since 1986 need to be incorporated?
 - o What standards and guidelines developed since 1986 need to be incorporated as appropriate?
- Elk and Livestock Forage Competition
- Water Yield, Water Quality, and Water Use
- Wildland-urban Interface Management
- Re-introduction of Native species (Rio Grande Cutthroat trout, beaver, Desert Bighorn sheep) to the Forest

Land Health - The evolution toward an ecosystem management approach refocused the Lincoln's sensitivity to ecological issues at the landscape level. Coupled with human dimension trends, ecological issues brought needed Plan modifications to the forefront. Ecosystem management concepts upon which Plan Revision will be built include: 1) an increase in the number of listed threatened and endangered plants and animals, 2) an increase in knowledge of the function, processes, and interrelationship of ecosystems, and 3) a recognition that thresholds exist beyond which those ecosystems may no longer be sustainable.

Specific Plan modifications to be considered during Plan Revision are:

- Watershed
 - o Strengthening ecological objectives
 - o Clarifying existing and desired conditions of riparian habitats
 - o Clarifying achievable standards and guidelines
- Fire
 - o Incorporating natural fire into the appropriate ecosystems
 - o Emphasizing wildland-urban interface
- Range and Wildlife
 - o Reassessing wild ungulate and livestock management
- Invasive plants
 - o Incorporating treatment accomplishments

- Forest health
 - o Identifying areas with more urgent resource needs
 - o Describing baseline forest health conditions
 - o Strengthening tools to address resource needs
- Threatened, Endangered and Sensitive plants and animals
 - o Evaluating trade-offs of single-species management in the context of a whole ecosystem
 - o Continuing to keep plants and animals from becoming threatened or endangered
- Re-introduction of Native species

Monitoring Results

Introduction

The Lincoln National Forest monitoring and evaluation program has two components--informal and formal monitoring. Monitoring results have been summarized below and additional information can be found in Appendix A.

Informal Monitoring

Informal monitoring is conducted during administrative and operational activity field visits. Although the majority of the monitoring is conducted by Forest employees, our partners and publics also participate in monitoring activities. Below is a summary of some informal monitoring activities during FY 2002.

Restoring Ecological Functionality

Annual inventory, maintenance, and monitoring continued on wildlife improvement projects funded by the SIKES Habitat Stamp Program. Approximately 150 maintenance worksheets documenting condition and success or failure were submitted for FY 2002. Documentation includes: the status of drinkers, water flow, enclosure fences, and area grasses; livestock and game-animal use; and stream flow with the number and size of fish.

Invasive-plant-population monitoring on the Smokey Bear Ranger District involved looking for changes in current densities as well as new infestations. The Smokey Bear Ranger District treated 1,500 acres of invasive plants and report plant densities are on the decline. Although the treatments were successful in most areas, some areas required additional treatments.

All-terrain-vehicle (ATV) usage on non-motorized trails has increased. In some cases, the public (including private landowners around and within National Forest land) are making their own roads and causing resource damage. Although we have signed many

of the areas, the majority of the signs continue to be destroyed. In response, we have increased Forest Service presence during high-use times.

Contributing to the Economic Vitality of Communities

The Mescalero Apache Tribe purchased the White Sands Forest Products Sawmill in Alamogordo, NM. Now known as the White Sands Sawmill, the mill uses area lumber to produce construction-grade 2x4s. Through a Forest Service Economic Action Program grant awarded to Otero County, the existing sawmill has been retrofitted to update obsolete equipment and add the capability to produce 2x6, 4x4, and 6x6-inch lumber and process smaller-diameter trees (down to 4-inch diameter material). These improvements resulted in 50 additional jobs.

In cooperation and collaboration with National partners, the Forest worked to obtain grant dollars for wildlife habitat improvement work. During FY 2002, the Forest was granted \$46,680 from the Rocky Mountain Elk Foundation and \$6,000 from the National Wild Turkey Federation (NWTF). In addition, wildlife biologists hosted the Western States National Wild Turkey Federation Annual Meeting in April 2002. This meeting and associated turkey hunting trips by the NWTF members and staff contributed economically to the Village of Cloudcroft.

Helping Communities Protect Themselves from Threats

Due to the continued drought conditions and the effects on National Forest land, most of the Forest was closed to the public from May 22 - July 12, 2002. To better respond to community needs, local communities and sheriffs' offices helped patrol Forest land and worked collaboratively with the Forest to keep the public informed prior to and during Forest-fire closure. We also increased our signing to include flashing information signs along major highways. During that time, monitoring was increased in Forest campgrounds and dispersed recreation areas, and along Forest roads and trails. The majority of the public were receptive to the closure--understanding the need to protect the Forest and private lands due to the dry conditions.

Providing Quality Leadership

In 2002, the National Fire Plan was integrated with local communities'/governments' management plans. Several community-based fire and rural community planning groups convened. The groups in Ruidoso, Cloudcroft, and Timberon were the most active. Interaction led to projects designed to meet specific community needs. The Natural Resource Conservation Service, Forest Service, State and county governments also partnered to support hazard reduction projects on private land. Some partnership projects are listed below.

- Within the Ruidoso area, work continued with the Urban Forester on cooperative ventures and planning. We entered into formal agreements to reduce hazardous fuels in and around the Village of Ruidoso.
- As part of the Cloudcroft community interaction with project planning, the Trestle, Exchange, and Bailey thinning projects were completed. In addition, local volunteer

fire departments were trained in Wildland fire tactics, and we worked jointly on the development of staging areas and communications plans for initial fire attack within the interface. In cooperation with unincorporated subdivisions within the Forest boundary, hazard fuels reduction work began on private land. The Natural Resource Conservation Service and Wyden Amendment funding were used to fund fuels reduction projects.

- In cooperation with the Timberon community, McGregor Bombing Range and the Bureau of Land Management a remote community fire plan was developed.
- A 6,000-acre prescribed fire directly south of the remote community of Queen NM, (on the Guadalupe Ranger District) was highly supported by area residents. The prescribed fire, clearing done by volunteers around the private-land boundary, and past mechanical treatments completed the Queen WUI projects.

Formal Monitoring

Formal monitoring is conducted in accordance to monitoring plans at the project or program levels, and during administrative and operational activity field visits. Some examples of formal monitoring activities conducted during FY 2002 are listed below.

Restoring Ecological Functionality

Management Indicator Species (MIS)--Forest Plan monitoring occurred for seven of the nine management indicator species on the Lincoln National Forest during 2002. A summary can be found in Appendix A.

Water and Watershed— Actions conducted by the Forest have both a direct and an indirect impact on the protection or improvement of water quality from a sub-watershed scale to a landscape scale. As part of the agreement with the State of New Mexico under the Non-Point Source Program of the Clean Water Act, the following activities were reported in FY 2002.

- A Forest-wide list of eligible rivers, and their outstanding remarkable values and potential classification were identified and documented for future analysis.
- A Forest-wide Roads Analysis was conducted to identify where future road management situations could hinder attainment of State water quality standards.
- The Rio Peñasco Phase II Environmental Assessment was completed in April 2002 and includes the assessment of the Rio Peñasco and La Luz sub-watersheds. Covering approximately 161,000 acres, this area encompasses 14 management areas that are described in detail in the Land and Resource Management Plan, pages 84-110. Approximately 50,170 acres of Forest Service managed land were selected for a direct effects analysis. However, when analyzing cumulative effects a larger analysis area was utilized to address various resource issues. A copy of the document can be found on the Forest internet website www.fs.fed.us/r3/lincoln.

- The Upper Rio Peñasco Watershed Project on the Sacramento Ranger District was completed in FY 2002. Ten sites covering approximately six miles were selected for improvements or upgrades. Improvements included: replacing old culverts with large box culverts, constructing fences and wetland protection berms, raising road beds, and installing wire-enclosure ripraps. Post-summer monsoon monitoring of the area was conducted on improved road and spring-drainage functionality, and to assess current riparian conditions using photo points and site inspections.

Fire and Rehabilitation—As the drought continues, so do catastrophic fires. The Scott Able and Cree fires in 2000 brought first-hand experience of how devastating fire can be to mountain communities. In 2001, the Forest experienced the Homestead fire and the Peñasco Fire in 2002.

Scott Able Fire--Within the Scott Able fire area, a four-year plant species study was initiated in FY 2002. The annual assessment involved collecting species data (plant community composition) in both the unburned and burned areas.

Wildlife monitoring within the Scott Able fire area during FY 2002 included: five contracts, one interagency agreement, and two cooperative agreements. The work involved implementation of new monitoring or the continuation of existing monitoring of eight groups of wildlife including: butterflies, Sacramento Mountain Salamander, bats, Aquatic Wildlife, Mexican Spotted Owl, Goshawk, birds and small mammals. A summary of findings by the contractors and cooperators can be found in Appendix A.

Cree Fire Area--Within the Cree fire area on the Smokey Bear Ranger District, a one-year study was conducted during FY 2002 to collect specimens of each plant species (all plants) and describe burned and unburned plant communities. The results will be used in the Turkey/Gavilan Assessment in FY 2003.

Peñasco Fire --The Peñasco wildfire began on April 20, 2002, and spread through Curtis, James, Cox, and Rio Peñasco Canyons—burning 15,024 acres on both Forest Service and private land.

After the fire, the burned area emergency rehabilitation (BAER) team was quickly mobilized to assist in the completion of fire rehabilitation projects in the watershed before monsoon flooding began. In partnership with the Forest, private landowners, the communities of Cloudcroft and Mayhill, Otero County, the Natural Resource Conservation Service, New Mexico State Forestry, Soil and Water Conservation District, Youth Conservation Corps, New Mexico State Highway Department, and local fire departments worked to stabilize the burned area. During rehabilitation efforts, approximately 8,500 acres (3,000 acres of private land, 5,500 acres of National Forest land) were reseeded. Sixteen miles of channel work included installation of 210 log silt dams, 22 machine tanks, 85 wooden trash racks, and 165 earthen check dams for a total of 482 structures. In addition, 200 acres were straw mulched (3000 bales aerially applied), and 30,000 yards of silt were removed from the Curtis Canyon Dam. We found dams and other rehabilitation work to be effective at slowing water flow



from rushing through canyons during monsoon rains. Monitoring included meetings with local landowners to address concerns of silt and debris clogging irrigation ditches. Overall, landowners were pleased with the effectiveness of the dams.

The picture to the left was taken after the installation of a wooden trash rack within the burned area.

The picture to the right shows the effectiveness of a wooden trash rack.

Where potential problems were noted, appropriate action was taken to help avoid damage. In addition, vegetation-response monitoring showed grasses and small shrubs recovering in many areas.

Partnerships--We are working more collaboratively with local fire departments on fire prevention--we learn about structural fire and they learn about natural fire. Also, Forest employees are interfacing more with local communities and incorporating work into the Fire Wise Program. Volunteer fire departments are more involved and we are sending Forest representatives to other fire department meetings. This has led to forming multi-agency fire department groups. As a multi-agency group, we work together on presentations at city council meetings and schools.



Range Program— Range Settlement Agreement monitoring is conducted three times a year—1) in April prior to livestock occupying the area, 2) during mid-season for cover of the vole (prey species for the owl), and 3) to check forage utilization (how much did the animals eat). During FY 2002, all allotments monitored were on the Sacramento Ranger District. This type of monitoring allows the District to make changes to their annual plans for the next season. Range-use monitoring results showed all but one allotment being close to or meeting capacity. Additional information can be found in Appendix A.

Contributing to the Economic Vitality of Communities

Grants and Agreements--The effects of State and Federal grant funds continue to stimulate and protect the communities surrounding the Lincoln National Forest. Table 4 shows grant funds used to strengthen the economic diversity of our community while protecting ourselves from wildfire. Awards totaling \$175,000 are being used for the removal and utilization of small-diameter trees.

Table 4. State and Federal Grants

State Grants 2001-2002

Western State Foresters' Wildland-Urban Interface

Otero County \$366,400 77 Projects

Lincoln County \$477,700 185 Projects

Federal Grants 2001-2002

Lincoln National Forest

Collaborative Forest Restoration \$893,500

Rural Community Assistance

- Economic Action Program \$735,000

- Community Planning \$ 60,000

Roads and Facilities--During FY 2002, the Forest conducted an analysis of Forest development roads, maintenance level 3, 4, and 5 (passenger car roads); some level 2 roads (high clearance that are arterial or collector roads); public and private roads on National Forest lands; and roads on our existing inventory. The analysis period covered a 20-year outlook on needs, effects, and implications. A copy of the Roads Analysis can be found on the Forest internet website www.fs.fed.us/r3/lincoln.

Recreation Program--Sixteen of the 108 significant caves were monitored during FY 2002. There were no illegal entries nor vandalism documented during the year, and recreational caving continued under the permit system. However, some caves (Three Fingers, Virgin, Madonna, and Wonderland) were closed to recreational caving while restoration was conducted.

Helping Communities Protect Themselves from Threats

In FY 2002, communities surrounding the Lincoln National Forest received grants under the National Fire Plan to reduce the risk of catastrophic fires and restore forest health. Technical staff from the Smokey Bear District worked collaboratively with small businesses, public land managers, and the Mescalero Apache Tribe to thin trees, transport small diameter wood, and utilize the materials for wood products. Small businesses received funding for producing animal bedding, compost, and firewood. The Village of Ruidoso used grant funds to thin and restore forest conditions at Grindstone Lake and Eagle Creek.

Communities in the Sacramento Mountain District developed Economic Action Plans and Fire Plans. Timberon identified economic and natural resource issues, priorities, and recommendations to guide them in the future. A grant-writing workshop focused on locating potential grant sources, proper organization of proposals and follow up after proposal submission was offered to the local communities. Otero County completed a Fire Plan to protect the Mountain communities of Cloudcroft, Timberon, Weed, Mayhill, and others. The Plan outlined the Incident Command System and evacuation procedures in the case of natural disasters.



Wildland Urban Interface (WUI) treatments within the Ruidoso WUI boundary, Smokey Bear Ranger District, include: approximately 5,997 acres treated in the Perk Grindstone area, 5,903 in the Eagle area, and 13,324 in the Gavilan area, and 9,103 in the Turkey area. In addition, the Mescalero Apache Tribal land treatment included 5,231 acres of over story and 513 acres of under story thinning.

The Guadalupe Ranger District continues to provide a slash pit to local and surrounding communities. The easy disposal of fuels has helped to encourage private landowners to clean and clear their property. The community response is considered outstanding and positive. Jim Pryor, Queen Volunteer Fire Dept. Chief, is also monitoring the pit use and told us that the communities are being very responsible in using the pit. No trash has been found, the private landowners are appreciative of the Forest Service's partnership efforts to help them clear and clean their land. Private landowners look at the Forest Service as a good partner. Mr. Pryor described that when a problem is detected that both the private landowners and the Forest Service work together to solve the problem.

In accordance with the National Fire Plan, the Regional Fuels Monitoring Program operates in cooperation with the Forests in the Southwestern Region. Beginning in May 2002, the New Mexico Fuels Monitoring Team installed 71 fuels monitoring points in the 16 Springs WUI area on the Sacramento Ranger District. Plots were placed in various vegetative types on approximately 19,200 acres. The data collected during the installation of the monitoring points represent, in many cases, extreme conditions created by disturbance of the natural fire regime. Inventory and monitoring in this WUI area will enable land managers to monitor effects on landscape disturbances, adjust prescriptions, and incorporate findings into future land management plans. Since the effects of fire continue to change the vegetative composition of the landscape, long-range monitoring will help track negative and positive responses to mechanical treatments, and natural and prescribed fires.

Providing Quality Leadership

The Guadalupe Ranger District and the Bureau of Land Management have a successful "service first" partnership. They deal with State and local partners as "one voice." The partnership shares services, expertise, and operations; and, they have one joint position that helps share resources on project work. The "service first" partnership has held at least five training sessions; is sharing geospatial data, expertise, and training; and has

established a very effective unified fire organization command structure that was able to respond to three different fires on other agency land.

We conducted 90 field studies on 12,732 acres to identify and evaluate archeological sites. Several archeological sites were identified and the majority of them determined eligible for the National Register of Historic Places. Approximately 28 archeological sites on Forest land were monitored and stabilized, rehabilitated, or protected.

Evaluation

What was Learned

Lack of wildlife use in habitats along roads can be correlated to the level of road use received over a period of time. Low-use roads tend to have wildlife using road-side habitats more frequently than roads with high-traffic volumes. This situation was evident during the FY 2002 Forest-fire closure. Based on observations by law enforcement personnel, wildlife were seen frequently along roads and crossing roads during the fire closure compared to fewer observations when the Forest was open and public road use was higher.

Improvements to both the Upper and Lower Fir Campgrounds did not adequately address erosion control and re-vegetation. Monitoring of these two areas showed little vegetation in the immediate area and erosion problems requiring retaining walls to hold back the mud. Adjustments were made and all future campground reconstruction will incorporate what was learned from the reconstruction of these two campgrounds.

During Forest-fire closure, most Forest campgrounds were closed while the Sacramento Ranger District campgrounds with campground hosts remained open. Campground hosts were instrumental in enforcing restrictions forbidding other Forest access and hiking. The hosts worked with the publics on the additional restrictions. We found that leaving these developed campgrounds open helped to meet some of the publics needs. And, even with the extra restrictions being enforced and monitored, having some of the area open allowed the public opportunities to stop and ask questions about the fire danger and Forest-fire closure.

Several of the caves on the Guadalupe Ranger District are showing considerable improvement and are looking better than they have in decades. This is primarily due to the tremendous amount of time and energy that caring cavers have contributed over the past years. We will continue to make training available to cavers interested in becoming certified as trip leaders for trip-leader caves. We are also anticipating moving forward with the Cave Stewardship Program where interested, trained volunteers become cave stewards and lead trips into trip-leader caves.

On the Guadalupe Ranger District under-thinning of the pinyon/juniper was monitored to assess what was left after first treatments. We found the slash distribution correctly working as mulch. However, it takes two to three years for the taller grasses to re-

generate and we are seeing a more diverse population of larger grasses. Due to the drought and a normal limited wet season, the grass species are incapable of producing to their capacity.

The New Mexico Department of Game and Fish, and the Guadalupe Ranger District are monitoring mule deer and their habitat quality. We have identified large areas for potential habitat that are limited by water due to the drought.

With the drought situation, we found an increase in the cutting of enclosure fences this year. The fencing is intended for wildlife and to keep cattle out. In response, we have increased our monitoring of these areas.

We made adjustments in the Kuenzler monitoring on the Guadalupe Ranger District. We found monitoring done by a small crew was not as effective as one person doing extensive monitoring.

Woodland management continues to be a challenge. To reach the preferred suppression level with the pinyon/juniper type, we have confirmed it takes three to four treatments over a period of years.

Pine beetle and other bug infestations are a big concern. In the spring of 2002, the Capitan area on the Smokey Bear Ranger District was extensively evaluated and confirmed to be drought stressed. It was later checked in July and bug infestations were found in many of the drought-stressed trees. At that time, it was estimated to be 1,000 – 1,500 acres and spreading. Almost all species are being affected by an infestation. In response, we have accelerated fuelwood sales to reduce the number of trees competing for water and nutrients. However, in some of the WUI areas, we are finding bugs in downed trees moving to live trees.

Key Findings and Forest Supervisor's Certification

The Lincoln National Forest continues to adapt management practices based on what we have learned through monitoring and evaluation of Forest resources.

During fiscal year 2002, a two-state, three National Forests, 17-county partnership was forged to deal with issues related to forest restoration and create a safer wildland-urban interface. Management Indicator Species were re-evaluated, contract specifications were adapted to better meet objectives, and specific human and physical/biological dimension program areas were identified as needing additional analysis and possible modification during Plan revision.

Since implementation of the Lincoln's Land and Resource Management Plan in 1986, four corrections and eleven amendments were completed. Corrections and amendments include the Southwestern Region "Final Environmental Impact Statement, For Amendment of Forest Plans"; to incorporate Mexican spotted owl and Northern goshawk management direction. The most recent amendments modified the Mexican spotted owl monitoring program and established management prescriptions for river segments eligible for suitability analysis as wild and scenic rivers.

In addition, the Plan guided successful implementation of many wildland-urban interface thinning projects during fiscal year 2002, especially in areas requested by the Village of Cloudcroft and the Ruidoso Wild-land Urban Interface Group.

Due to new Congressional direction, the Lincoln National Forest Land and Resource Management Plan revision processes are scheduled to begin in 2008.

The Lincoln National Forest Plan as amended is sufficient to guide management of the Lincoln National Forest over the next year. As identified in this document, changes will be necessary at Plan revision.

/s/ Jose M. Martinez
JOSE M. MARTINEZ
Forest Supervisor

6/27/2003
Date

Appendix A

Informal Monitoring

Baseline inventories, and implementation, effectiveness, and validation monitoring are four broad categories or stages monitored. For the past 10 years, some of these types of monitoring activities have been documented on Forest monitoring forms. A summary of the past 10 years monitoring worksheets is listed below followed by additional monitoring activities conducted during FY 2002.

Table 1. Number of Informal Monitoring Activities from Monitoring Worksheets

YEAR	BASELINE	IMPLEMENTATION	EFFECTIVENESS	VALIDATION	TOTAL
1993	14	45	33	0	92
1994	16	28	55	0	99
1995	27	58	34	5	124
1996	44	65	49	2	160
1997	30	85	19	5	139
1998	52	128	135	2	317
1999	3	145	36	3	187
2000	15	94	36	5	150
2001	2	137	0	0	139
2002	9	138	14	0	161

The worksheets are only one way of documenting monitoring activities. Other types of monitoring are often documented in news releases, various reports, and presentations. Below are a few examples of documented monitoring in FY 2002.

Transportation maintenance needs are often reported by the public or counties. Informal road maintenance monitoring included reviewing maintenance done by Otero and Lincoln Counties. Effectiveness monitoring included: soil stabilization, new culvert installation, road closures, and signing. Where necessary, Cooperative Agreements between the Forest Service and the Counties were modified.

The Lincoln National Forest is working collaboratively with the Guadalupe Mountain National Park and Penn State University on a fire frequency study. Penn State will be providing the data collection on the southern end of the Guadalupe Ranger District. This historic fire regime study focuses on the National Park.

The Silver Saddle and Apache Campgrounds on the Sacramento Ranger District were upgraded to improve accessibility. A new overlay treatment was used to resurface

roads instead of the traditional gravel. The overlay treatment consisted of a half-inch slurry mixture topped with a gravel mix to compact the area.

We have not received formal feedback from the public on the new handicapped accessible campgrounds and picnic-area facilities. However, monitoring of the facilities is showing the publics are utilizing them. In 2003, the Forest will conduct a recreation-use survey that will provide up-to-date information on how our publics respond to their recreation experiences.

The Trestle Recreation Area on the Sacramento Ranger District continues to be a popular place to hike and picnic. Public response to recreation activities in the Trestle area has led to the improvement and extension of a trail. The Millennium II Volunteer Group will triple the length of one trail to a site overlook and will eventually convert the trail to a handicap-accessible trail.

The Harkey Bridge construction over Highway 82 was completed by Rails to Trails in FY 2002. This bridge helped to complete a 7.2-mile loop trail route in the Cloudcroft area. The bridge helped to solve some safety issues in that area because hikers can now cross the highway above the traffic.

In partnership with the State, New Mexico Museum of Space History, and the Rails to Trails organization, a trail was planned and will be constructed on State property near Indian Wells Street in Alamogordo, NM. The trail will go over a hill to Forest Service land near Dry Canyon. A memorandum of understanding will allow a partnership in the trail construction and nature signing, and public parking at the New Mexico Museum of Space History parking lot.

A trail to the Alamo Canyon area and Forest land was blocked by a private landowner. In an agreement with the City of Alamogordo, the trail was rerouted by the City through City property to make the trail available to the public.

Developed recreation site boundaries are not fenced, therefore, leaving site boundaries undefined. We found this to be a problem during the Forest-fire closure. Although the Forest was closed, some campgrounds (with campground hosts) on the Sacramento Ranger District were left open to the public. However, hiking and access from the campgrounds into the Forest were not permitted. Campground hosts found it difficult to limit the public to the interior perimeter of developed sites. In response, we are experimenting with graveling some nature trails around picnic and campground areas. Some of the graveled pathways will serve as developed-site boundaries. The gravel helps to better define paths and has helped reduce the publics establishing their own trails. Hosts are reporting an increase in trail usage due to the gravel surface.

Public relations monitoring has helped to determine an increase in the Forest's involvement among our various publics, and with other agencies and local communities. Some examples of public relations work are:

- Employees are making presentations on wildlife, range, and natural and prescribed fire; and, they are working with the public on defensible space. Where possible, we are assisting in meeting some public needs including slash pits, fuelwood areas, and cleanup opportunities.
- We have numerous interagency fire-prevention school programs. We participate in providing displays and speakers to schools, and participate in parades and other community events. These programs have allowed us to increase occurrence quality, leverage dollars and personnel, and improve our effectiveness and efficiency within local communities. Forest employees participate in high school and college Career Days, and as judges for school science fairs.
- In response to the increased public interest in prescribed fire, we are increasing our public-relations activities and improving public-relation work. We are informally monitoring the publics' perception of controlled burns.
- The Guadalupe Ranger District has entered its fourth year in working closely with children's organizations. The District works to teach children, students and scouts about science. They also help teachers gain a better understanding of the importance of science to the environment and its effects on communities.
- The Forest participated in the Ninth Annual Fishing Day along with the Village of Ruidoso Park and Recreation Department, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Wal-Mart, Western Auto, and Flies Incorporated. Our employees worked with over 200 youth and adults to introduce children to the joys of fishing and the great outdoors.

Scientific and Technical Assistance

Biologic prospecting of cave resources for research is a growing concern. Federal agencies are currently awaiting direction on how to administer biologic prospecting. This process will require changes in monitoring of the cave resources. Research continues in the La Cueva de las Barrancas Cave. Instruments were placed in the cave to record temperature and humidity. Studies continue on its microbiological content, and chemical and geological existing conditions. Photo monitoring within the cave shows human visitor impacts, water levels, and cave formation growth.

The Rocky Mountain Research Station conducted a pilot study as part of a Coordinated Management, Monitoring, and Research Program designed to assess the effects of forest thinning in the Rio Peñasco Watershed, Sacramento Ranger District, on focal wildlife species and their habitat. Objectives of this pilot study were to (1) finalize selection of treatment and paired control areas given occupancy by Mexican spotted owls during the 2002 breeding season, and (2) quantify food and den selection by Mexican wood rats, the owl's preferred prey.

From March 1 to September 17, approximately 8,600 person hours were devoted to this study by Rocky Mountain Research Station personnel. Data were collected from June 1 to September 17. The combined effort resulted in (1) at least one survey visit to 100 (88%) of 113 sites historically occupied by Mexican spotted owls, (2) establishment of 14 live-trapping grids, (3) capture of 770 small mammals during 2,333 trap nights, (4) location and measurement of 83 dens used by 42 Mexican wood rats, and (5) sampling of 166 habitat plots. Findings include:

- Of the 100 owl territories surveyed, number of young produced was determined for 30 pairs of spotted owls. Annual reproductive output was 1.4 young per pair adequately checked, indicating a high reproductive year similar to 1991 and 1996. Deer mice appeared abundant and were the most frequently consumed prey by Mexican spotted owls. In contrast, density of Mexican wood rats was low but comprised the most biomass consumed by these owls. Patterns of prey abundance and use by Mexican spotted owls were similar to findings from previous years of study. Anecdotal observations of Mexican wood rat habits and habitat conditions at the eight study plots were consistent with our original prediction that the owl's habitat can be improved through silvicultural prescriptions. Reducing tree canopy cover likely will increase production of food plants for Mexican wood rats.
- We met most planned objectives and learned a number of lessons from this investigation. Greater effort will be needed to collect reproductive data for a large sample of Mexican spotted owls. Survey effectiveness could be improved by starting earlier in the owl's breeding season and hiring additional surveyors. Both remedies can be facilitated by securing long-term funding because reliance on yearly allocations has prohibited early hiring of large crews. Increasing the number of live traps and especially habitat samples per live-trapping grid will be necessary to improve precision in estimates of small mammal abundance and key habitat parameters.

Formal Monitoring

Management Indicator Species (MIS)--Forest Plan monitoring occurred for seven of the nine management indicator species on the Lincoln National Forest during 2002. All five management indicator bird species were monitored forest-wide for the second consecutive year. Two of the four mammal species, deer and elk, are monitored annually by the New Mexico Department of Game and Fish through aerial surveys. The Red Squirrel and Mexican Vole were not monitored because population trend monitoring has never been conducted on the Red Squirrel, and the Mexican Vole has not been monitored since 1996.

Table 2 shows the updated results of habitat and population trend monitoring for each Forest management indicator species based on 2002 and includes events such as the 2002 Peñasco Fire.

Table 2. Summary of Habitat and Population Trend Monitoring for Nine Management Indicator Species, Lincoln National Forest.

Forest Management Indicator Species	Habitat Trend	Population Trend
Rufous-Crowned Sparrow	Stable	Upward ⁰
Eastern Meadowlark	Upward	Downward ⁰
Mule Deer	Stable	Downward ³
Plain (Juniper) Titmouse	Stable	Upward ⁰
Pygmy Nuthatch	Downward	Stable ⁰
Elk	Downward	Downward ³
Hairy Woodpecker	Downward	Stable ⁰
Mexican Vole	Upward	Unknown ¹
Red Squirrel	Downward	Unknown ²

⁰Bird population data collected on Forest under a CCS agreement with S. West (2002)

¹Lack of current data, last data collected in 1996, too old for trend analysis (Ward, 2000)

²Lack of current data, no data for Red Squirrel on Lincoln National Forest

³Mule Deer and Elk Population trend based on New Dept. of Game & Fish (2002)

Scott Able Fire Wildlife Monitoring--Wildlife monitoring within the Scott Able fire area during FY 2002 included: five contracts, one interagency agreement, and two cooperative agreements. The work involved implementation of new monitoring or the continuation of existing monitoring of eight groups of wildlife including: butterflies, Sacramento Mountain salamander, bats, aquatic wildlife, Mexican spotted owl, goshawks, birds and small mammals. Below is a summary of findings by the contractors and cooperators.

- Five goshawk post fledging family areas (PFA's) were monitored during the 2002 field season. No goshawks were found within the Scott Able fire area. Monitoring of the five PFA's will continue in fiscal year 2003.
- A total of 10 Mexican spotted owl PAC's were monitored. Two of the ten PAC's were monitored formally and the other eight were monitored informally. Of the 10 PAC's monitored, only one PAC was occupied and produced no young. There was no reproduction found in the area.
- Bird monitoring for the Scott Able fire area began in the fall of 2001 and was completed at the end of FY 2002. This was the first year of a five-year contract. Bird monitoring was conducted along six survey transects (three walking transects and three driving transects) in order to obtain as complete coverage of the fire area as possible. All routes were surveyed during the fall, winter, spring and summer seasons. Relative abundance was recorded for bird species during each season. Fall monitoring detected a total of 46 species. The Dark-eyed Junco was the most abundant species, followed by the Mountain Chickadee. Winter monitoring detected a total of 14 species. The Dark-eyed Junco was the most abundant species, followed

by the Mountain Chickadee and Common Raven. Spring monitoring detected a total of 46 species. The Western Tanager was the most abundant species, followed by the Dark-eyed Junco and Steller's Jay. Surveys during the breeding season (spring and summer) detected the most species with a total of 54. Overall, the most abundant species during the breeding season was the Dark-eyed Junco, followed by the House Wren and Mountain Chickadee. Monitoring also detected two Management Indicator Species; the Hairy Woodpecker and Pygmy Nuthatch. In addition, the Three-toed Woodpecker, an uncommon species to the Lincoln National Forest, was found at four of the six survey transects. This Woodpecker likely moved into the fire area due to the large number of snags.

- FY 2002 was the second year of butterfly monitoring and covered 16,000 acres of the Scott Able wildfire. The objectives were to determine which butterflies occur in the wildfire area, what host plants are being used by the butterflies, and what nectar sources are being used by adult butterflies. In addition, a trend and change of butterfly species will be tracked over the five years of monitoring. A total of 67 butterfly species were observed and confirmed in the study area. This is a change from 2001 of two additional species. The 67 species were made up of a total of 1,208 individual butterflies that were recorded at the 26 monitoring sites established in 2001. Individual butterflies were down from 3,362 in 2001 to 1,208 in 2002, even with 50% more monitoring time in 2002 than in 2001. Low numbers were likely due to low soil moisture conditions during the previous winter and into spring and summer. Additional monitoring will take place in 2003 to further define trends in butterfly numbers and to better understand relationships between wildfires and butterfly occurrence.
- The Sacramento Mountain Salamander was monitored to evaluate the impact of fire on the relative abundance of salamanders and their terrestrial arthropod prey base. Fiscal year 2002 was the second year of a five-year monitoring period. Eighteen study sites were monitored (six sites in low burn areas, six sites in burned areas, and six control sites). One control site was dropped in 2002. Information collected at each site includes UTM coordinates, elevation, aspect, and slope. Soil samples were collected at each of the 18 study sites to determine pH values and arthropod sampling was conducted using pitfall traps. Results of the monitoring indicated that soil pH dropped in the burned and low burn sites, but still remained higher than the pH on the control sites. PH values on the burned sites are expected to approach those on the control sites within five years. Results for salamander abundance found a total of 58 salamanders at the 18 study sites (up from 53 in 2001), with the highest number found on the low intensity burn sites and the fewest number on the control sites. In 2003, monitoring within the Scott Able Fire will continue to monitor arthropod abundance and diversity, salamander abundance, soil pH, and test out more pitfall trap methods.
- Bat monitoring was conducted in 2002 as the second year of a five-year effort to detect bat use and trend within the Scott Able Fire area. Bat monitoring was conducted using mist nets, acoustical surveys, and roost surveys. Mist netting was

conducted at eight sites from June 19th to August 28th. Mist netting resulted in capturing 265 bats representing eight different bat species. Information gathered from mist netting in future years should help in determining changes in bat species composition and abundance in the fire area. The acoustical surveys resulted in 34 hours of monitored bat activity and 186 bat echolocation calls recorded. The mean number of bats detected was slightly higher in unburned areas (37) than in burned areas (30). Roost site surveys were also conducted using radio telemetry techniques on pregnant or lactating females. A total of three lactating female bats were fitted with radio transmitters, one Long-legged Myotis, one Big Brown Bat, and one Occult Little Brown Bat. Of the three bats fitted with transmitters, only one bat was later found via radio telemetry. The one Long-legged Myotis was found roosting in two different roosts. Data on abundance, trend, and roost site preference will be monitored.

- Aquatic habitat and wildlife were inventoried and monitored for a second year in the Scott Able fire area. In order to monitor changes and trends over time for assessing the effects of the fire, the aquatic habitats and the composition of aquatic fauna communities were evaluated. Twelve sites were sampled in the fire area. Drought conditions resulted in drying of aquatic habitat at Wood Tank in the spring of 2002 and the seep at Aspen Spring during the summer of 2002. No aquatic habitat was found at the Agua Chiquita Creek or Seep Spring monitoring sites. Fourteen new taxa were found in 2002. And, species richness and diversity indices were generally higher in 2002 than in 2001. Construction of ponds and enclosure fencing resulted in improved habitat conditions at both the Pendleton and Pepper Springs. The general trend apparent in 2002 was one of recovery and increasing diversity of aquatic organisms in the Scott Able Fire area. A total of 37 taxa were identified at the 12 monitoring sites. Monitoring at all 2002 sites will continue in 2003.
- The purpose of small mammal monitoring in 2002 was to obtain information on small mammal assemblages, compare data to 2001 results, and to establish the effects of the Scott Able fire on small mammals through 2005. Ten trapping areas were randomly established within and adjacent to the fire area. A total of six species of mammals were captured in 2002. Trapping success was up from 2001 (5.3%) to 17.1% in 2002. In 2001, 108 individuals were captured in burned areas, and 243 individuals were captured in 2002. In unburned areas, 98 individuals were captured in 2001, and 43 individuals were captured in 2002. The number of small mammals captured in burned areas increased from 2001 to 2002. In unburned areas, the number of small mammals captured decreased from 2001 to 2002 by half.
- Through Regional Office Wildlife Habitat Relationship funding, a study was initiated on the ecology of the Sacramento Mountains Checkerspot butterfly. The multi-year study found that butterfly densities or abundance varied by the method used. In regards to population structure, the study found that the Checkerspot butterfly fits the definition of a metapopulation, in that the butterfly will become extinct on some areas while at the same time occupy and establish new populations in another area. The study also revealed new information on the life span of adult butterflies and their movements. During the mark-release-recapture portion of this study, the researchers found adult

butterflies have an average life span of approximately eight to nine days. Adult butterflies move relatively short distances, and this may be a reason why suitable habitat patches remain unoccupied. Adult butterflies were found to travel from 460 to 890 meters or 0.28 to 0.55 miles.

Wildlife Program— Non-fire wildlife-related monitoring included: butterflies, owls and goshawks, salamanders, neotropical migrant birds, bats, and small mammals.

During FY 2002 at least two salamander studies were conducted. The first study was a continuation of an existing study to determine the effects of timber harvests on the Sacramento salamander. We found the salamander fully recovers in seven years. The second study was to determine the effect of fire on the salamander. The results of this study will be released in FY2003. In addition to the studies, approximately 32,000 acres of salamander habitat were monitored.

We found butterflies to only be using mature plants and occurrences were found in high-use recreation areas. We found owls along the Sacramento River Road construction area were remaining and were not changing their habitat with the road equipment present. However, in areas with motorized trail use, approximately 10 known owls moved their nesting location.

The Forest has a total of 136 Mexican spotted owl (MSO) preferred activity centers (PAC's). In FY 2002, 111 PACs (600 acres each) and approximately 18,500 additional acres were monitored for the presence of owls. There was no evidence of new owl PAC's. However, 47 young owls were found among the existing PAC's. To meet the Mexican Spotted Owl Recovery Plan monitoring requirements, new microhabitat plots are established each year and existing plots monitored to determine effects of each phase of ground treatments within habitat areas.

While conducting MSO surveys, other owl species are often found within the Forest. Table 3 shows the FY 2002 monitoring results for detected raptors and owls.

Table 3. Raptor and Owl Monitoring Results

Flammulated	Great Horned	Saw Whet	Pygmy	Long Eared	Northern Goshawk
29	9	8	13	2	2

Botany/Rare Plant Program--For 13 days during the FY 2002 field season, the Rare Plant Program had a detail crew of five botanists and one wildlife crew trainee. They conducted surveys for the Regional Forester's Sensitive Plant species on the Rio Peñasco Phase II Wildland/Urban Interface project in areas scheduled for FY2003 implementation. The crew located populations of six sensitive plant species and one new site for the threatened Sacramento Mountain thistle.

Surveys were also conducted for Range analyses and project-level clearances for the following federally listed and Forest Service Sensitive Plant species: Kuenzler's cactus,

Bigelow's clematis, scarlet penstemon, White Mountain larkspur, Wright's marsh thistle, Wooton's hawthorn, and the Sacramento prickly poppy. Findings include:

- Kuenzler's cacti were found in locations beyond its previously understood range and at higher elevations than in the past. One district reported seeing the plant uprooted and partially eaten.
- No Bigelow's clematis was found during surveys of historic and potential new sites. We have determined that this species should be removed from the R3 Sensitive Plant List for the Lincoln National Forest.
- Extensive populations of scarlet penstemon were located. We recommended this species be removed from the R3 Sensitive Plant List.
- Healthy existing populations of White Mountain larkspur were found, as well as 12 new populations. We recommended this species be removed from the R3 Sensitive Plant List.
- Only one location for Wright's marsh thistle could be found on the Forest. This location will be managed to protect its spring habitat from disturbance.
- Wooton's hawthorn surveys located several new populations and confirmed that it should remain on the R3 Sensitive Plant List.
- Monitoring of the federally endangered Sacramento prickly poppy found serious declines in the number of plants. Surveys in six historically occupied canyons located only three plants. Plants exist in two other canyon systems but experience problems with seedling establishment during the spring droughts. Plants continue to be lost to highway maintenance activities along a Federal highway.
- Plant surveys were conducted in the Ellis Canyon fuelwood area. Sensitive Plant populations were flagged to protect them from disturbance.

Range Program--Elk and cattle utilization, and range structure monitoring was conducted during the year. Findings include heavy elk use in some areas such as those with short, tender grasses. Several pastures (approximately 1,500 acres) in the Bud Holland and Snow Canyon areas were treated by cutting and hauling pinyon/juniper from allotment areas. In addition, commercial timber sales were awarded on approximately 800 of the 1,500 allotment acres--the remaining 700 acres were cut and burned.

Range monitoring on the Smokey Bear Ranger District included monitoring nine allotments (125,720 acres) for percent utilization, range conditions, and whether any changes were needed to numbers of head grazed or grazing schedules. Range permittees also monitored their allotments and, in some cases, removed livestock.

Range soil condition analyses were conducted on the McCollaum and Montgomery allotments. The analyses involved evaluation of soil conditions to determine grazing capability and suitability.

Vegetation Program—Basic tree information was gathered through intensive “stage 2” surveys on approximately 50,000 acres. This type of survey helps support most of the resource programs by providing baseline information for the planning of future on-the-ground treatment activities.

Insect and disease monitoring shows all species are being impacted by bug infestations, the ongoing drought, and the high number of trees per acre.

Vegetation browse monitoring is being done annually to check results against our browse-opening objectives within the pinyon/juniper tree types. To date, we appear to be meeting our objective. However, a number of small juniper sprouts are returning. In response, we have proposed a new project to go back into these areas and treat to reduce the juniper sprouts. A copy of the assessment document can be found on the Forest internet site www.fs.fed.us/r3/lincoln.

Other Monitoring Activities

Three caves had seasonal closures for biological concerns. The majority of the cave monitoring and restoration work on the Guadalupe Ranger District was done by the High Guads Restoration Project. These cavers contributed approximately \$60,000 worth of volunteer efforts and expertise toward restoration, trail delineation, monitoring cave conditions, impact mapping, and bat exit counts. Other groups contributed approximately 700 hours toward cave management projects. Informal monitoring reports were received on monitoring activities within some of the Forest caves. Monitoring efforts included inspection of cave, trail, and entrance conditions. Illegal entries, temperature and humidity readings, bat exit counts, and insect, bird, and bat findings were documented. The Forest continues to plan the survey and inventory of the numerous small caves on the Forest.

On the Smokey Bear Ranger District, a 14.5-mile inventory was conducted to determine stream health and suitability for the potential reintroduction of the Rio Grand Cutthroat trout. Along the Rio Bonito drainage, suitability was also determined for the reintroduction of beaver.

The Sacramento Ranger District is using the “sweet smelling technology” (SST) in some of their restrooms. The product is an improvement over older, existing methods but the publics continue to complain about the smell. Adjustments are being made to test other biodegradable chemicals to suppress the odors. We are applying what is learned to other restroom facilities.

The Forest continues to work closely with rural volunteer fire departments on training. This has allowed the rural fire departments to provide quality support in the absence of our fire support units.

On-going monitoring of personal and commercial fuelwood areas includes: checking status and condition of the cutting units, determining if cutting unit boundaries are being observed, and ensuring contractors are adhering to contract specifications. In most cases, contractors are following contract specifications and no problems were noted. In areas of concerns, adjustments were made and future work was more closely monitored.

Approximately 8,000 acres of prescribed fire treatment were monitored for effectiveness. Findings included a reduction in overall pinyon/juniper canopy cover demonstrating objectives were met.

We have three weather stations on the Forest. They are used to monitor fire danger incidents, weather trends, etc. We have approximately 10 years of data from the Apache Point site.