

Sustainable Management of Natural Resources

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V(A). Planned Program (Summary)

1. Name of the Planned Program

Sustainable Management of Natural Resources

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	10%		10%	
103	Management of Saline and Sodic Soils and Salinity	5%		5%	
121	Management of Range Resources	20%		20%	
123	Management and Sustainability of Forest Resources	10%		10%	
124	Urban Forestry	5%		5%	
135	Aquatic and Terrestrial Wildlife	10%		10%	
136	Conservation of Biological Diversity	5%		5%	
403	Waste Disposal, Recycling, and Reuse	10%		10%	
405	Drainage and Irrigation Systems and Facilities	10%		10%	
605	Natural Resource and Environmental Economics	15%		15%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	7.3	0.0	14.3	0.0
Actual	4.7	0.0	7.5	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c 220037	1890 Extension	Hatch 255022	Evans-Allen
	0		0
1862 Matching 220037	1890 Matching	1862 Matching	1890 Matching
	0	255022	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

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- Research procedures and technology
- Papers, citations, patents
- Train students
- Dissemination of research results
- Educational workshops
- Conferences
- Commercialization of techniques and products

NMSU research on prairie dogs will contribute to the debate regarding conflicts between conservation of this keystone species, preservation of endangered species and livestock ranching. Researchers believe that these goals are not incompatible and that all can be achieved with wise use of available resources. Likewise research on banner-tail kangaroo rats may yield an approach to prioritize desert grasslands for conservation. Research on carnivore movement patterns and connectivity among protected lands will aid the National Park Service and the New Mexico Game and Fish in the development of management plans for conserving their lands and ensuring connectivity among wildlife populations within the region, as well as potentially informing harvest strategies for both puma and black bear.

NMSU scientists are providing information that will help managers of rangelands in their efforts to increase forage, though water benefits may not justify tree clearing. Increased understanding of surface water-groundwater interactions is an important addition to the knowledge of water budgets in arid region irrigated valleys. Water is diverted from the river into the irrigation system during spring snowmelt. The water seeps from ditches and flooded fields to recharge groundwater, returning to the river after 1-3 months storage underground. At a regional scale, water is saved by underground storage and reduced evapotranspiration losses.

NMSU research has the potential to reduce the adverse impacts of livestock grazing on rangeland soils, vegetation and wildlife. Light stocking leaves more residual vegetation for protection of soils, watershed, and wildlife habitat. Light grazing may allow forage plants to maximize their productivity and it may be more beneficial than grazing exclusion. Light grazing lowers rancher risks and may increase monetary returns over conservative grazing based on preliminary results. This research has the potential to reduce rancher/environmentalist conflicts by providing better technology to maintain and improve vegetation and wildlife habitat. Increased rancher income could reduce rangeland losses to subdivisions and other development. In previous research from this project, we found conservative grazing was advantageous over moderate grazing in terms of maintaining forage production, drought, reducing rancher risk and providing higher net profits.

An economical disposal method for the woody trimmings of pecans is needed because burning causes air pollution problems. Shredding of woody trimmings and incorporation into the orchard is an alternative method of disposal that appears to have no negative impact on soil properties. Amendment with wood chips has shown that the chemical and physical properties of soil are only affected at high rates of application and then only with repeated applications. Many pecan farmers are now chipping their trimming debris instead of burning it after research confirmed how to handle these materials.

Progress has been made on developing effective propagation protocols for many native woody plant species which can be used in disturbed land or riparian restoration/rehabilitation. Also, the previously initiated projects on carbon distribution in pinon-juniper woodlands are being completed and presentation and publication of the results is ongoing. This information will be used to parameterize and assess carbon cycling models developed for other, related ecosystems. The environmental impacts of this research are several fold including developing more efficient reclamation/restoration/revegetation practices and providing the necessary tools (plants) and techniques to improve reclamation success. The increasing occurrence of stand replacing fires in southwestern forests, further emphasizes the need to have both the plant material and technologies to mitigate fire effects and rehabilitate these sites. In terms of the pinon-juniper ecology research, the work performed here will assist land managers in their land management activities by reducing environmental impacts. In terms of the horticultural nursery industry, the use of native plants is a well known aspect of a water conserving landscape.

- Efforts to secure federal funding for irrigation efficiency have been successful for several years. These efforts have complimented research funding for study of efficient irrigation practices. Basic practices of scheduling and metering of irrigation water have expanded significantly statewide. Ag water users have developed broader understanding of basic and technical details of sound practices. Adoption has led to increased productive value of water, lower costs, environmental protection, and conservation.
- Educational programs on various subjects related to field crop and biofuel feedstock production were presented at two producer conferences or field day events. Surveys indicated that 95.5% of attendees had significantly increased in knowledge and that the program was useful. Only 4.5% indicated that they had only 'some' increase in knowledge. 95.0% indicated that they had an improved level of understanding with respect to water conservation as it related to corn and sorghum silage production. Only 5% indicated that they had no improvement in understanding of water conservation. No one indicated that they did not learn anything or that the program was not useful.
- Five workshop/demonstration projects were presented with approximately 30% of the affected producers participating. Of the participants, 75% adopted a brush control program. 25% completed an active brush control project with 10% completing a long term plan for brush control. In the area of salt cedar control, 100% of participants have completed chemical application with 20% involved in the NRCS EQIP program and 80% participation is solely producer financed. Loco

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weed participation was slight with the onset of a drought and the appearance of the striped loco bug. However, 90% of the involved producers practiced stringent monitoring and kept preparations in place for control. 75% of producers were given the opportunity to participate in workshops and up-date meetings concerning loco weed. 100% of these participants indicated that they would up-date their long range plans to include new ideas.

- Agent along with the County Noxious Weed coordinator presented a workshop on "Noxious Weed and Poisonous Plant Management in Sierra County". 95% of those who attended were satisfied with the program and all agreed that they gained knowledge on the topics that were presented.
- 80% of area land managers and owners became very aware of and adopted monitoring systems.
- Two major presentations given during the FY2008 season were, "Compost Quality Measurements / Salts." New Mexico Environment Department Solid Waste Bureau Compost Operators Certification Course on April 16, 2008, and "Soil Salinity and Sodium Issues". 88% said they would probably have their soil tested. 100% said they would change the way they fertilize/use amendments. 72% said they may change the way that they use organic products. 72% said they have a better understanding of New Mexico soil. All respondents said that they learned at least one thing about NM soil.
- The NMSU soil testing lab submitted 892 soils for interpretation. This was approximately 28% more samples than was submitted for the same time period in 2007. All of these soil tests received suggestions on how to manage nutrients for plant production. The evaluation by the participants had the following results:
 88% said they would probably have their soil tested.
 100% said they would change the way they fertilize/use amendments
 72% said they may change the way that they use organic products
 72% said they have a better understanding of New Mexico soil
 All respondents said that they learned at least one thing about NM soil
- Progress was made toward improving the soil test interpretation software. Certified Crop Advisers who use the software have found that they accurately account for nitrogen and have been able to lower soil test nitrate levels to acceptable levels when farmers follow the plan.
- Several CoCoRaHS trainings were given in various locations. The training sessions have allowed us to increase the rain gauge network by 15% and increase monitoring drought conditions through participation in an existing state-wide precipitation monitoring network.

2. Brief description of the target audience

Target audiences include:ranchers, farmers, urban landscapers, park departments, state and federal agencies, private homeowners, and recreational users of parks, forests, and waters.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	0	0	0	0
2008	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2008:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2008	0	54	54

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

The specific output measures will vary according to the specific project being monitored. The development of research procedures and technology, training of students, publishing research papers, and disseminating research results via educational workshops, conferences, and Extension media are important outputs for the various projects falling under this planned program.

Year	Target	Actual
2008	0	0

V(G). State Defined Outcomes

O No.	Outcome Name
1	# of trained professionals
2	# of research publications
3	# of Extension publications
4	% of people adopting NMSU recommendations
5	Successful natural resource management policies implemented

Outcome #1

1. Outcome Measures

Not reporting on this Outcome for this Annual Report

2. Associated Institution Types

3a. Outcome Type:

3b. Quantitative Outcome

Year	Quantitative Target	Actual
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3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
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V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

New Mexico continues in a serious drought, which affects the amount of water available to farmers. Water availability also exacerbates tensions between industry, agriculture, urban and domestic users. Until all water rights have been adjudicated, users remain in a "use or lose" situation regarding their water amounts.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

Retrospective (post program)

Before-After (before and after program)

During (during program)

Time series (multiple points before and after program)

Case Study

Comparisons between program participants (individuals,group,organizations) and non-participants

Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.

Comparison between locales where the program operates and sites without program intervention

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}