

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Economic Development with Emphasis in Rural Areas

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
112	Watershed Protection and Management			8%	
122	Management and Control of Forest and Range Fires			15%	
213	Weeds Affecting Plants			7%	
401	Structures, Facilities, and General Purpose Farm Supplies			5%	
601	Economics of Agricultural Production and Farm Management			9%	
605	Natural Resource and Environmental Economics			8%	
607	Consumer Economics			4%	
608	Community Resource Planning and Development			33%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities			8%	
903	Communication, Education, and Information Delivery			3%	
	Total			100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	1.0	0.0
Actual Paid Professional	0.0	0.0	1.9	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	152877	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	156510	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

Nevada scientists will continue to conduct economic analysis of various rural labor and public policy issues, research improving childcare and diverse needs of custodial grandparents in Nevada. Research will continue in economic development through the economic development center and analysis and development of rural health care.

2. Brief description of the target audience

Educators, community leaders, decision-makers, parents, native american organizations and health care organizations.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1220	0	95	0

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

Patent Applications Submitted

Year: 2012

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	0	4	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Peer reviewed scientific journal articles, publications on economic development , presentations at scientific meetings, presentations at stakeholder, Native American, health care organizations, agency and local government meetings.
Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Newsletters Produced

Year	Actual
2012	1

Output #3

Output Measure

- Web Sites Created or Updated

Year	Actual
2012	2

Output #4

Output Measure

- Number of Graduate Students or Post-Doctorates Trained

Year	Actual
2012	0

Output #5

Output Measure

- Leveraged Research Projects

Year	Actual
2012	346850

Output #6

Output Measure

- Manuals and other printed instructional materials produced

Year	Actual
2012	0

Output #7

Output Measure

- Number of Undergraduate Students Involved in Research

Year	Actual
2012	2

Output #8

Output Measure

- Non-Peer Reviewed Publications

Year	Actual
2012	17

Output #9

Output Measure

- Presentations

Year	Actual
2012	15

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Peer reviewed scientific journal articles, publications on economic development, presentations at scientific meetings, presentations at stakeholder, Native American, health care, agency and local government meetings,
2	Food and Agricultural Research Policy for Nevada
3	Determining the Relationships of Rangeland Fragmentation and Rural Nevada's Economy
4	Formation of the Western Nevada Development Program
5	Economics of Rangeland Invasive Weeds Control - A Cost and Benefit Analysis at the Ranch Level

Outcome #1

1. Outcome Measures

Peer reviewed scientific journal articles, publications on economic development, presentations at scientific meetings, presentations at stakeholder, Native American, health care, agency and local government meetings,

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Food and Agricultural Research Policy for Nevada

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Food and Agricultural Policy Research Institute (FAPRI) has served the U.S. Congress since the late 1970s, bringing an independent (out of Government) perspective on national agricultural policy, trade policy and other major issues that come before the Agricultural Committees of the Senate and House. Initially organized by the University of Missouri, Columbia and Iowa State University, other institutions have joined the FAPRI group to provide added capacity associated with specific agricultural commodities and sectors.

UNR, as a partner FAPRI institution, has developed cattle and sheep industry models that separate the regional industry from the rest of the U.S. and world, and will integrate these new more specific models into the FAPRI system, as well as utilize the models for solving regional issues that are important to the management of the public lands and grazing industry.

As the models are completed and they will be incorporated in the FAPRI system supporting the U.S. and World Agricultural Outlook or Baseline, which is used as definitive information by the U.S. Congress, the USDA, and the private sector for agricultural analysis and projections of policy and trade impacts. The requirement for analysis of the domestic and international markets for

crops will place additional requirements on the FAPRI system. These analyses will be different than those for the so called program crops that have traditionally been modeled within the FAPRI system, and will require different policy modeling structures. These structures will relate to impacts of marketing board rules and the inclusion or exclusion of particular producers from these organizational systems.

To address this increased need for sector and policy analysis, the University of Nevada, Reno will move to develop additional modeling capacities for major specialty crops, designing analytical systems that can assist the producers as well as the government in addressing regional, national or domestic and international issues in these markets. The model of a specific specialty crop that is produced primarily in the west developed this year will be used as a template to expand our coverage of specialty crops.

What has been done

The University of Nevada's Center for Economic Development research team completed the Western Livestock Model, showing differential impacts to Western cattle prices. Results showed that looking at only national prices may yield incorrect differential impacts to different regions of the nation from alternative public policies. Econometric models for alfalfa hay are almost completed which will be of interest to Western producers as well as a Western sheep price model.

Results

National beef and range beef price models were developed as well as sheep pricing model. The models were incorporated into the FAPRI Group and used for price projection workshop for the U S Congress. Also a Western alfalfa hay model has been developed. Results have been presented to US Congress and Nevada Cattlemen's annual meeting.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management

Outcome #3

1. Outcome Measures

Determining the Relationships of Rangeland Fragmentation and Rural Nevada's Economy

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In 2000, it was estimated that approximately 84% of the land area in the state of Nevada was under federal ownership. Although Nevada is the seventh largest state in the nation geographically, it would rank as the tenth smallest state if all federal lands were deducted from its total. Therefore, changes in public land management policies will impact the county economies in the state of Nevada.

With changing public land management policies toward ecosystem management, the mix of public land users has changed as well. The redirection of resources away from traditional uses could have significant impacts on local Nevada economies.

The goal of this proposal is to determine whether rangeland fragmentation is causing economic impacts and the extent of the related individual and cumulative impacts.

What has been done

The University of Nevada's economic development team has completed their optimization model which includes farm-level linear programming profit maximizing component and an input-output model has been constructed for Nevada. The team has developed an interregional fiscal social accounting model. This model derived impacts of reduced public land grazing in rural Nevada and accompanying impacts to urban Nevada. They have also developed an integrated ranch level linear programming, a stochastic rangeland fire model, and an integrated ranch level and Social Accounting Matrix model to estimate economic and distributional impacts of changes in public range grazing. Lastly, a supply determined interregional SAM model has been developed. From all these models, a paper was developed to estimate the distributional impacts of reduced public land grazing in rural Nevada on rural and urban Nevada.

Results

This project essentially is a policy-oriented regional project and the short-term outcomes are primarily decisions made by various government or policy groups related to public lands and their relationship to local communities and states. In many cases, the information and data provided as a result of this project are used as the primary source of data in the decision-making process.

The analysis of intensive management has provided federal land managers with a clearer understanding of their duties and responsibilities and provided state managers with a better understanding of the laws that constrain their federal counterparts.

Wildfire limits ranchers access to public grazing land and causes the economic losses of \$20 million ~ \$65 million per year in the near future, equivalently about 0.2%~0.5% of the total value of regional production. The value of agricultural and hay production decrease by \$1.7 million ~ \$5.1 million directly due to wildfire and indirectly due to reduction of cattle sector production.

Results of Elko County Commissioner's Office study have been accepted as input by U.S. Forest Service in their development of an EIS. These finds have led to an additional study to estimate the county-wide economic impacts of rangeland fires in Elko County, as well as a study investigate potential economic impacts of changes to Elko and Eureka counties from proposed changes in the 1872 Mining Law.

The study has been accepted by BLM offices for incorporation into rangeland plans. In addition, study and procedures are being incorporated into Rangeland Five studies.

4. Associated Knowledge Areas

KA Code	Knowledge Area
122	Management and Control of Forest and Range Fires
601	Economics of Agricultural Production and Farm Management
605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development

Outcome #4

1. Outcome Measures

Formation of the Western Nevada Development Program

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Western rural places were originally settled by people whose livelihoods depended upon natural resource extraction (mining, timber harvest, fisheries, etc.). In an increasingly integrated global economy, farm employment has declined by 70%, and other resource industries have declined by 50% since 1900s. Traditional jobs in resource extraction and manufacturing have largely been replaced by service industry jobs.

Entrepreneurism offers a solution to rural economic challenges. Entrepreneurism takes place when individuals mobilize their assets, capital, and networks to meet market demands.

Communities play a role in fostering the emergence of entrepreneurial activity. If community networks are diverse and dense, and if there is a sense of shared risk, entrepreneurs are more likely to take risks that may result in success.

The goal will be to provide a platform for focused community development leading to strengthened rural economies.

What has been done

The University of Nevada's Center for Economic Development research team completed socio-

economic data analysis for the Stronger Economies Together workshops. This data was shared with participants in the Western Nevada Development district. Publications were made and a final strategic plan was adopted for the Western Nevada Development District.

Results

An outcome was the development of a strategic regional economic development plan for the Western Nevada Development District. Also with understanding of regional economic linkages, Washoe County, Nevada is now a member of the Western Nevada Development District.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
605	Natural Resource and Environmental Economics
607	Consumer Economics
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
903	Communication, Education, and Information Delivery

Outcome #5

1. Outcome Measures

Economics of Rangeland Invasive Weeds Control - A Cost and Benefit Analysis at the Ranch Level

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The fact that there is variation among rangeland landscapes, ecological conditions and ranch types suggests that a ranch-level model for assessing strategies for invasive weeds and rangeland management effort would generate different outcomes if parameterized to accommodate various combinations of conditions. Development of policies to engage public and private partnerships to address the invasive weed problem across the Great Basin requires an ability to predict how variations among ranch types and rangeland conditions generate variation in

economic incentives across private ranchers.

Thus, what are the costs to Nevada ranchers of rangelands infested with invasive annual weeds, what does it cost ranchers to battle invasive weeds and what are the expected returns at the ranch level for investments in reducing the impacts of invasive weeds? How do these costs and benefits vary with ranch type, vegetation conditions, and biophysical rangeland characteristics as they vary throughout the state? The purpose of this research is to generate the means to answer these questions by developing a sophisticated ranch simulation model that takes into account the ranch-level dynamics of cow-calf operations, the dynamics of economic conditions, and the dynamics of ecological conditions of rangelands.

What has been done

UNR's team of talented economists have developed conceptual models to estimate costs and benefits of invasive weed management, and have implemented the application of these models to (1) non-market valuation of environmental costs and benefits from public lands, (2) benefits and costs for a demonstration ranch, (3) development of policies and institutions to coordinate management goals and actions among private ranchers and public sector rangeland managers, (4) measurement of benefits and costs of invasive weeds management by private sector cooperators in five watersheds in the Great Basin, and (5) compilation of research results of these projects in a decision support tool that addresses spatial variations in vegetation and private and public benefits of the ecosystem.

Results

This is the first dynamic optimization model of resource management that allows for the possibility that only a portion of the system crosses an irreversible ecological threshold, and where there are both reversible and irreversible thresholds.

These innovations permit analysis of a situation characteristic of western rangelands, where at the landscape level a patchwork is observed where some rangelands have crossed an irreversible ecological threshold to an annual grass dominated state while others have not - even while similar livestock management rules and environmental conditions occur; and where management effort can be expended to maintain healthy rangeland and to rehabilitate degraded rangeland that risks crossing an irreversible threshold.

Ecological models for a wide variety of ecosystems predict that changes in management and/or environmental conditions result in non-linear, discontinuous changes in plant community structure, with multiple stable states existing under similar ecological conditions. Our analysis has provided insight into dynamic economic modeling of ecosystems with similar characteristics.

The model considers ecosystem management where management and natural triggers (wildfire and invasive annual grasses) cause rapid shifts between ecological states (where some are reversible and others not) involving significant economic costs. The focus of ecosystem management and policy in these situations is to avoid undesirable transitions between states. Our framework allows analysis of regulation/policy to avoid undesirable transitions in an optimization model that accounts for the manager's private economic incentives.

Many ecosystem management problems consider areas so large that it is not appropriate to assume that transitions between ecological states affect the entire area. When the area managed is a mosaic of lands in different ecological states, the land manager's decision problem involves determining how best to direct management resources and effort to rangelands in different states. This research analyzes this aspect of ecosystem management in the context of a dynamic optimization model.

4. Associated Knowledge Areas

KA Code	Knowledge Area
122	Management and Control of Forest and Range Fires
401	Structures, Facilities, and General Purpose Farm Supplies
601	Economics of Agricultural Production and Farm Management
605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Programmatic Challenges

Brief Explanation

Another year of State budget shortfalls continue to narrowed the breadth of NAES's research programs. Fewer research projects will be supported and recruiting graduate students will be difficult.

The Experiment Station is still trying to recover from the 31 hard money positions lost after the 2010 circulation review. Until a number of critical areas are re-staffed our economic development program will be severely diminished.

Our economic development program was one of the hardest hit after circular review. The department Resource Economics was closed and with that the loss of 11 faculty positions. Three faculty were retained and transferred to the College of Business while holding partial experiment station appointments. This has resulted in very limited output.

The circular review has also produced a number of administrative issues that contribute to the outcomes of our Ag program: the potential merger with Cooperative Extension, all faculty changing from 12 month to 9 month appointments, and the uncertainty regarding administrative changes (Dean/Director).

V(I). Planned Program (Evaluation Studies)

Evaluation Results

- Leveraged over \$340,000 in extramural funding
- Published four peer-reviewed journal articles
- 15 presentations to Western Nevada Development District and Stronger Economies Together workshops

Key Items of Evaluation

The economic models developed and refined have been incorporated into the Food and Agricultural Policy Research Institute baseline projections for the Western U.S. cattle and alfalfa sectors, as well as by U.S. Forest Service in their development of an EIS in Northern Nevada.