

## OVERVIEW

Nevada Cooperative Extension (NCE) and Agricultural Experiment Station (NAES) have worked successfully to build research and education programs based on prioritized issues which address local, regional and national needs. NCE's planning process involves formal input from the broad general public, community decision-makers and other agencies and organizations who work to address similar issues. Programs are very focused on local needs, but knit together to reflect five broad program areas. Children, youth and families is the largest program. All efforts are based upon an ecological model, involving the individual, family and community influences. The second largest programmatic focus of NCE is natural resources. A particular emphasis is water. Other foci are public lands issues and the urban/wildland interface. Educational programs in nutrition, diet and health and sustainable agriculture are conducted in the urban and rural areas respectfully. A new area of emphasis is community sustainability.

The research programs of the NAES are integral to the College of Agriculture and are associated with the College of Human and Community Sciences, and the School of Medicine. Central to the mission is the protection, utilization and management of soil water, air, plant and animal resources, the economic vitality of the agriculture industry, and the quality of the environment. Of equal importance is the utilization of food in health promoting human diets and the social and economic well being of individuals and families. Research is conducted in the laboratories of the Max C. Fleischmann College of Agriculture, Knudsen Resource Center, Howard Medical Sciences, Bureau of Mines building, and the Sarah Fleischmann College of Human and Community Sciences. Six field laboratory sites are also utilized for research, including: Main Station Field Laboratory, which houses the large animal surgical facility and laboratory and the meats laboratory; Valley Road Field Laboratory, which houses the College of Agriculture Equestrian Center; Newlands Research and Extension Center; Gund Ranch Rangeland Research Center; Rafter 7 Ranch Sheep Research Station; and the Jay Dow Sr. Wetlands Research Laboratory.

## PLAN OF WORK

### **CSREES GOAL #1: To Achieve an Agricultural Production System that is Highly Competitive in the Global Economy**

#### Statement of the Issue:

Nevada's landscape is largely arid to semi-arid desert rangelands, with croplands adjacent to the limited number of rivers and streams. The state includes over 70 million acres of land, approximately 87% public land and 13% privately owned. Of the 13% in private farms and ranches, 87% is considered rangeland, 8% cropland, and 5% woodland and other uses. Over 90% of the land in Nevada is

considered rangeland, with approximately 80% available for livestock grazing at certain times of the year.

Livestock, particularly cow-calf operations are the primary agricultural enterprises in Nevada. For the past several years, the cattle producers have experienced a chronic depression of prices. To support ranching as a viable business enterprise in Nevada, NCE has focused its attention on helping producers market as high quality and healthy animals as possible. The foundation of all of these efforts is a three tiered marketing strategy whereby producers separate their cattle and strategically time their marketing. In an effort to meet the increasingly pressing education need of alternative marketing strategies, the principles of the University of Nebraska's agriculture marketing and risk management course have also been adopted. Approximately 20% of most ranches annual income is realized in cull cow sales. In January, 1997, USDA implemented rule changes which made "B" maturity cattle ineligible for Choice grading. These rule changes reduce the value of culled cows by as much as \$150 per carcass. In an effort to minimize this loss, NCE developed a marketing alternative education program.

The alternative marketing strategies identified above are successful only if the animals arrive at the feed lot or other grazing areas in a healthy condition. Thus preconditioning management, enhancing the immune system, and overall stress reduction, is a major focus of all educational programming for livestock producers. As a member of the Animal Extension Research management team, NCE assures incorporation of animal rights and animal welfare issues as part of every lecture and demonstration presented.

The 8% private land considered cropland includes 66% as harvested crops, 26% as pasture, and 8% as idle acres or other uses. Specific crops harvested include 235,000 acres of irrigated alfalfa for hay, 270,000 acres meadow and other hay production, 17,000 acres wheat and barley, 10,000 acres alfalfa for seed production, 8,000 acres for potatoes, and 5,000 acres in garlic, onions and other crops. These figures show that 92% of the cropland produce hay for livestock.

#### Performance Goals, Key Components, and Target Audiences:

There are three primary outcomes expected of both the research and extension aspects of this goal. The first is to increase the overall quality and health of the livestock produced through research and education. Secondly, it is to understand the quality of plants through basic research. Additionally, marketing will continue to be a major focus of education. All educational programming and research is multi-faceted and will be detailed in annual reports. The target audience for educational programming is livestock producers, veterinarians, and agency personnel.

Much of the work to achieve the goal identified above is in the basic research program of the NAES.

- Specific research projects currently addressing this goal include:

STATE PROJECT #	PROJECT TITLE
NEV0032C	Protein Interactions of the Petunia Glycine-Rich Protein
NEV0032E	Use of Transgenic Plants to Study the Regulation of Photosynthetic Carbon Uptake
NEV0032P	Identification Factors from Insect Tissues Which Trigger Nitric Oxide Release in Malpighian Tubules
NEV0032Q	Manipulation of Vitamin E Production in Plants
NEV0032R	Molecular Mechanisms of Chloroplast Division in Higher Plants
NEV0032W	Community Based Non-toxic Bark Beetle Management: Education Research and Implementation
NEV0032X	Molecular Studies of the Regulation of Bark Beetle Pheromone Production
NEV003BP	Apocarotenoid Biosynthesis and Function in Plants`
NEV003BR	Increasing Vitamin E Content of Vegetable Oil by Manipulating Alpha-Tocopherol Methyltransferase
NEV003BS	The Molecular Basis for Photosynthetic Acclimation to Elevated Atmospheric Carbon Dioxide
NEV003BT	Effects of Elevated CO <sub>2</sub> on Mojave Desert Ecosystem
NEV003BU	Molecular Basis for the Regulation of Pheromone Production in Pine Bark Beetles
NEV003BW	Structural Determinants of the Biological Activity of Ryanodine
NEV0532C	A Mathematical Model to Predict Profit Potential & Needed Decision Making Inputs for Various Management & Breeding Programs on Western Ranches
NEV0032F	The Conformation of the Capsular Polysaccharide of the Pathogen <i>Cryptococcus Neoformans</i>
NEV0532H	New Approaches for Red Meat Processing and Distribution
NEV0532J	Improving Nitrogen Utilization in Alfalfa Hay by Ruminants
NEV0532K	Development of an Improved Vaccine for Bovine Trichomoniasis
NEV05338	Labeled Serine Protease Inhibitors as Probes for Activatable Sperm Acrosin
NEV05339	<i>Cryptosporidium</i> Prevalence in Wildlife and Livestock, Water Pollution and Prevention
NEV053HH	The Nutritive Value of Forages for Horses as Affected by Forage Species and the Source of Supplemental Energy

Internal and External Linkages:

Internal linkages include the Nevada Cattlemen's Association, local veterinarians, Nevada Farm Bureau and other agricultural organizations. Multi-state research and integrated extension programs will be administered through the Research Implementation Committee (RIC) and Regional Coordination and Implementation Committee (RCIC) of the Western Association.

Multi-state research programs will be governed through the Western Association of Agricultural Experiment Station Directors (WAAESD), involving peer and program review and subsequent recommendations by the Research Implementation Committee (RIC), a sub-committee of WAAESD.

Coordination of multi-state extension, research and integrated research and extension activities will be governed by the Western Extension Directors (WED) and WAAESD. A peer and program review committee with broad based multi-functional representation entitled *The Regional Coordination and Implementation Committee* (RCIC) will conduct the initial review and make recommendations to WED and WAAESD.

- Nevada is an active participant in COIN, a long-standing group of community and campus-based faculty from California, Oregon, Idaho, Nevada (thus COIN) and now Utah who leverage each other's strengths to address issues related to livestock operations. They have an e-mail service on which questions may be posted. Responses are made by a person with appropriate expertise and experience, but available to all for mutual learning. The group meets on an annual basis to further share expertise.
- Western Cow/Calf Handbook and Cattle Producers Library Committee – Faculty from Nevada, California, Colorado, New Mexico, Montana, Utah, Idaho, Washington, Oregon, Wyoming have collectively developed and updated this handbook, considered a leading reference manual (recently converted to CD ROM with search capabilities) for Western US livestock producers. This effort also contributes to the national Beef Cattle Database.
- A SARE project initiated by the University of Arizona deals with sustainable livestock operations under drought/arid conditions. Nevada works with the Walker River Paiutes directly and contributes knowledge of watershed management to the group.
- NAES participates in the following multi-state research projects:

MULTI-STATE PROJECT #	PROJECT TITLE
NC-142	Regulation of Photosynthetic Processes
NE-184	Development of New Potato Clones for Environmental and Economical Sustainability in the Northeast
W-45	Environmental Transformation, Exposure, and Effects of Pesticide Residue
W-130	Freeze Damage and Protection of Horticultural Species
W-112	`
W-150	Genetic Improvement of Beans ( <i>Phaseolus Vulgaris</i> ) for Yield, Pest Resistance and Food Value
W-177	Enhancing the Global Competitiveness of U.S. Red Meat
W-189	Natural Products Chemistry as a Resource for Biorational Methods of Insect Control

- NAES Multi-state Coordination includes participation in the following Western multi-state Coordinating Committee(s) (WCC's):

WCC #	WCC PROJECT TITLE
WCC-55	Rangeland Resources Economics and Policy

Allocated Resources:

The Nevada Agricultural Experiment Station allocates 24% of its budget to address the issues of Goal #1. The breakdown between Federal/State is as follows:

<u>Federal</u> 5%	<u>State</u> 19%	<u>Total</u> 24%
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Extension Professional FTE: 5.35

Extension Federal, state and county funding allocated to goal: \$1,062,240

**CSREES GOAL #2: A Safe, Secure Food and Fiber System**

Statement of the Issue:

According to the Centers for Disease Control, over 6.5 million people each year suffer foodborne illness and over nine thousand people die. Outbreaks of foodborne illness throughout the nation have raised consumers concerns regarding the safety of the food supply. Another indicator of consumer's needs related to food safety are the telephone calls received by NCE. It is estimated that 25-50 percent of all calls for information on nutrition, diet, and health is related to safe food handling and storage practices. Another source of information on nutrition and food safety is the news media. In a recent survey of over 1200 Nevadans, 40.5 percent of respondents (n=1213) reported that their usual source of nutrition information was magazines, newspapers, television, or radio.

NCE has a long history of working with childcare providers of all sizes. Based upon the results of a formal needs assessment, a major educational undertaking over the next several years will be the development, implementation and evaluation of food safety programming for child care providers.

Food processing plants are required by USDA to write and adhere to a Hazard Analysis Critical Control Point (HACCP) plan. In previous years, very large plants were required to meet this requirement. This current year, medium-size plants are required. In 2000, the small plants must come into compliance. In Nevada, there are approximately 30 small and very small meat-processing plants. Unlike large and medium-size plants, small and very small plants generally do not have the flexibility associated with larger staffs. As such, HACCP training and plan development will require more intensive hands-on

assistance. Work in this area will be designed to provide support in the way of training and in individual development of an acceptable HACCP plan for Nevada's small and very small operations.

To determine additional food safety needs, an assessment of primary care physicians of the education needs of their patients will further guide NCE's programming in the next several years.

Performance Goals, Key Program Components, Target Audiences:

The overall goal of all research and educational programs, is prevention of food-borne illnesses. All educational programming and research are multi-faceted and will be detailed in annual reports. The target audience for educational programming is child-care providers and parents of young children, owners of small and very small meat processing plants, and the general public.

- Specific research projects currently addressing this goal include:

STATE PROJECT #	PROJECT TITLE
NEV0032W	Community Based Non-toxic Bark Beetle Management: Education Research and Implementation
NEV0034B	The Conformation of the Capsular Polysaccharide of the Pathogen <i>Cryptococcus Neoformans</i>
NEV0532M	Epidemiologic Study of Food-borne Pathogen Shedding by Cull Cattle in the Great Basin
NEV05339	Cryptosporidium Prevalence in Wildlife and Livestock, Water Pollution, and Prevention

Internal and External Linkages:

- Internal linkages include the Nevada Cattlemens Association, local veterinarians, Nevada Farm Bureau and the State Board of Agriculture.
- Multi-state research programs will be governed through the Western Association of Agricultural Experiment Station Directors (WAAESD), involving peer and program review and subsequent recommendations by the Research Implementation Committee (RIC), a sub-committee of WAAESD.
- Coordination of multi-state extension, research and integrated research and extension activities will be governed by the Western Extension Directors (WED) and WAAESD. A peer and program review committee with broad based multi-functional representation entitled *The Regional Coordination and Implementation Committee* (RCIC) will conduct the initial review and make recommendations to WED and WAAESD.
- In conjunction with USDA, FIIS Personnel, University of Nevada, Reno Meats Laboratory faculty and staff have participated in HACCP training to *Train the*

*Trainer*, and will initiate teaching and evaluation seminars for local meat plant operators in Nevada.

- NAES faculty and staff in conjunction with an animal pharmaceutical company are evaluating cattle pour on insecticides for parasite control. They are also working with UC Davis studying EBA and prevalence in wildlife and livestock.
- NAES participates in the following Multi-state Research projects:

MULTI-STATE PROJECT #	PROJECT TITLE
S-278	Food Demand, Nutrition and Consumer Behavior
NE-184	Development of New Potato Clones for Environmental and Economical Sustainability in the Northeast
W-150	Genetic Improvement of Beans ( <i>Phaseolus Vulgaris</i> ) for Yield, Pest Resistance and Food Value
W-189	Natural Products Chemistry as a Resource for Biorational Methods of Insect Control`

NAES Multi-state Coordination includes participation in the following Western Coordinating Committee(s) (WCC's):

MULTI-STATE COORD #	PROJECT TITLE
WCC-39	Coordination of Sheep and Goat Research and Education Programs for the Western States

Allocated Resources:

The Nevada Agricultural Experiment Station allocates 5% of its budget to address the issues of Goal #2. The breakdown between Federal/State is as follows:

<u>Federal</u>	<u>State</u>	<u>Total</u>
1%	4%	5%

Extension Professional FTE: 5.07

Extension Federal, state and county funding allocated to goal: \$1,006,646

**CSREES GOAL #3: A healthy, well-nourished population.**

Statement of the Issue:

According to the Nevada Hospital Association, over 60 percent of hospital costs in Nevada are directly attributable to lifestyle or behavioral choices such as smoking, chronic drinking, poor diet, poor weight management, and lack of exercise. The leading cause of death in Nevada is heart disease, followed by cancer, respiratory disease, stroke, and motor vehicle accidents. Further, deaths from liver disease, lung cancer, and pulmonary disease are among the highest in

the country. This is a reflection of the higher number of smokers and the high rate of chronic drinking.

The Behavioral Risk Factor Survey (BRFS) provides estimates of high-risk behaviors among the adult population in the U.S. The Center for Disease Control has coordinated the survey since 1982. Since 1991, Nevada has participated in this survey. Obesity is associated with a number of chronic diseases including coronary heart disease, diabetes, and cancer. 20 to 25 percent of Nevadans are at risk for being overweight. Males, older adults and those with lower education levels are more likely to be overweight. Hypertension or high blood pressure affects 21 percent of Nevadans. Since obesity and hypertension are related, it is not surprising that the groups at higher risk are similar. Increasing age and lower education levels are positively related to high blood pressure.

Dietary characteristics, including dietary fat and fruit and vegetable intake were assessed also. Dietary fat was assessed using a series of questions regarding the frequency of eating certain types of high-fat foods. This information was then used to identify those at the highest risk with regard to total fat intake. Those with the highest intake, defined here as those who fell above the 75th percentile, include males, younger adults, and those with less education. Residents in the rural counties reported a slightly higher intake as well; 29 percent of rural respondents fall above the 75th percentile compared to 20 percent in Washoe County and 27 percent in Clark County. Further, it is estimated that 76 percent of Nevadans do not meet the National Cancer Institute recommendation of five servings of fruits and vegetables each day. Those with an income less than \$20,000 and young adults are least likely to meet this goal.

Ongoing programming to address lifestyle and behavioral choices have focused on prevention of heart disease and diabetes. The diabetes prevention program assists members of the minority population at risk for diabetes mellitus make appropriate lifestyle modifications to prevent or delay the onset of the disease and/or its complications through education and awareness. The faith community and physicians are used to reach populations at risk for heart disease.

Although most data is derived from adults, food habits are established early in life. Needs assessment data indicate that families with limited resources are at high risk for poor nutrition that may put them at immediate risk to the cognitive and physical development of their children, and long-term risk for chronic diseases such as heart disease, diabetes, and cancer. While many agencies/organizations provide nutrition education to this clientele, there is no statewide mechanism to facilitate programs for families with limited resources. Thus the Nevada Nutrition Network, including representatives from all Nevada agencies/organizations that provide nutrition education, was formed to develop a statewide Food Stamp Nutrition Education Plan to increase the consumption of low-fat, calcium-rich foods by school-age children, initially focusing on adolescent girls (12-15 years) since they appear to be at greater risk. Focus groups have helped shape the educational program, which is currently being designed for implementation and evaluation.



Nevada's senior population has increased nearly twice as fast as the state's population over the past ten years, with 61 percent of senior citizens residing in Clark County. Health concerns largely relate to the high cost of health care providers, medication and health insurance. Other health concerns include availability and quality of health care, including the availability of program and services which are prevention oriented.

It is estimated that 20 percent of males, 17 percent of females, and 25 percent of children in Nevada are medically uninsured. These children are less likely to receive routine or preventive medical care. Further, when a family member is ill, an inability to pay often prevents them from seeking care until the illness has become very serious. Nine out of every ten pediatricians surveyed indicated that children from low-income families have difficulty accessing primary health care, citing inability to pay as the most important reason. To improve health care, almost half were in favor of school-based clinics.

Early and high quality prenatal care is an effective means of improving pregnancy outcome. It is estimated that for every dollar spent on prenatal care, ten dollars are saved on infant care. In Nevada, unfortunately, only 71 percent of pregnant women receive adequate prenatal care. According to the American Public Health Association, this is among the worst rates in the country (44th), although the proportion of women receiving care during their first trimester has increased from 24.7 percent in 1984 to 28 percent in 1990. Household income is believed to be the single most significant barrier to receiving early and effective prenatal care.

Low birth weight is defined as a birth weight of less than 2500 gm. Mothers most likely to have low-birth weight infants are also more likely to live in poverty, receive little or no prenatal care, have a low level of education, be unmarried, and be a member of a racial minority. The age of the mother is also related to low birth weight. Very young women as well as older mothers are more likely to give birth to a low birth weight infants. Low birth weight infants are more likely to have learning and developmental disabilities that require long term specialized health care services. Low birth weight is usually related to prematurity and retarded intrauterine growth. It is estimated that cigarette smoking alone accounts for 20-30 percent of low birth weight infants. Alcohol and other substance abuse also cause adverse birth outcomes.

Nevada has several long-standing programs targeting pregnant and parenting teens. These efforts will continue into the future. In addition to preventing low birth-weight, these program also work to prevent child abuse and neglect, which is a major concern of public and private agencies. Occurring in all segments of society, all cultures, and at all socio-economic levels across the world, the concern in Nevada is justified based on the high rates of child abuse and neglect. Over the last 10 years, the child abuse and neglect rate in Nevada has quadrupled and is one of the highest in the country --- one report for every 40 children. While many feel that the news media, movies, gangs and drugs are the

cause of increased violence, the reality may be much more complex. The roots of violence may be directly tied to the violence that people experience while growing up. Thus, many argue that the roots of violence lie in the basic family unit and its modes of functioning.

Precipitating factors cited include marital problems, alcohol/drug dependency, insufficient income, inability to cope and other stress factors. Teen parents are particularly vulnerable for abuse and neglect. These young women are more likely to experience unemployment, poverty, family violence, and poor health than older parents. Fourteen- percent of households in Nevada receiving Aid to Dependent Children are headed by mothers less than 20 years of age. In 1988, 375 substantiated cases of child abuse and neglect were by natural parents less than 20 years of age. Prevention of family and community violence has been a long-standing educational effort of NCE. Mandatory training is included in the orientation for all NCE volunteers, staff and faculty who work with youth. This same training is conducted for agencies, organizations and community groups throughout the state. Violence prevention has been a focus of many of our youth development efforts.

In addition to targeting parents of young children, for ten years NCE has received funding through the Nevada State Licensing Bureau to develop, implement and evaluate curricula for child care providers. Each year a different topic is identified and programming is developed, implemented and evaluated for effectiveness.

#### Performance Goals, Key Components, and Target Audiences:

Examples of strategies and potential action and approaches to achieve the goal:

- Research to better understand and education that focuses on establishing healthy lifestyle habits, including diet, exercise and prevention of smoking among the following groups:

- Elementary and middle school-aged children
- Adolescents
- Adults at worksite settings
- Seniors

- Biochemical and behavioral research to elucidate factors relating to chronic diseases, including but not limited to diabetes, heart disease, pulmonary disease and cancer, coupled with education to reduce the burden of the disease among populations displaying their greatest incidence.
- First-time parents gain an understanding of vital pre- and postnatal needs of mothers and their infants through behavior-focused education.
- Prevention of child abuse and neglect is a major education/research undertaking for all adults who are responsible for children. Child care

providers, first-time parents, volunteers and adult mentors are specifically targeted.

- Violence prevention for all ages is the subject of both education and research.

- Specific research projects currently addressing this goal include:

STATE PROJECT #	PROJECT TITLE
NEV0032F	The Conformation of the Capsular Polysaccharide of the Pathogen <i>Cryptococcus Neoformans</i>
NEV0032Q	Manipulation of Vitamin E Production in Plants
NEV0032V	Role of Shhngolipids in Apoptosis: Do W3 Fatty Acids Alter the Function of the Sphingolipids
NEV0032Z	Cellular Mechanisms of Insulin Action
NEV0034A	Genetic Regulation of Axon Guidance in the Embryonic Brain
NEV00368	Natural Products Laboratory – Searching for New Treatments for Cancer
NEV003BK	The In Vivo Role of Zanthophylls in Lhc Structure and Function
NEV003BR	Increasing Vitamin E Content of Vegetable Oil by Manipulating Alpha-Tocopherol Methyltransferase
NEV00715	Evaluation of Cardiovascular Risk Reduction Strategies for the Worksite
NEV003716	Nutrition for Independent Living: A Key to Reducing Health Care Cost
NEV00717	Optimal Combination of Antioxidants for Attenuating the Risk of Cardiovascular Disease
NEV00718	Short Term Work Place Exposure: Environmental – Tobacco – Smoke
NEV00719	Factors Influencing the Intake of Calcium Rich Foods Among Adolescents
NEV00720	Environmental Transformation, Exposure & Effects of Pesticide Residues
NEV00722	Use of the School Environment to Reduce Obesity Risk Among Middle School Students in Nevada
NEV00723	Identifying and Mediating Inappropriate Herbal Use Among the Elderly
NEV0532F	Modeling the Effects of Environmental Stresses on Oocysts of <i>Cryptosporidium Parvum</i>
NEV0532M	Epidemiologic Study of Food-borne Pathogen Shedding by Cull Cattle in the Great Basin

#### Internal and External Linkages:

One of the primary internal linkage is the Nevada Nutrition Network, which includes representatives from NCE, NAES, NV Bureau of Family Health Services, NV Dept of Education, Dairy Council of Utah/Nevada, NV Dept of Human Resources, Clark County School District, Washoe Health System, NV Dept of Human Resources, WIC, Inter-Tribal Council of Nevada, Inc., Clark County Health District, Community Food Bank of Clark County, and Sierra Health Services. This group has been formed to conduct nutrition education in middle schools. These same groups are included in other nutrition education programs.

Multi-state research programs will be governed through the Western Association of Agricultural Experiment Station Directors (WAAESD), involving peer and program review and subsequent recommendations by the Research Implementation Committee (RIC), a sub-committee of WAAESD.

Coordination of multi-state extension, research and integrated research and extension activities will be governed by the Western Extension Directors (WED) and WAAESD. A peer and program review committee with broad based multi-functional representation entitled *The Regional Coordination and Implementation Committee* (RCIC) will conduct the initial review and make recommendations to WED and WAAESD.

- NAES participates in the following multi-state research projects:

MULTI-STATE PROJECT #	PROJECT TITLE
W-45	Environmental Transformation, Exposure, and Effects of Pesticide Residue
W-191	Factors Influencing the Intake of Calcium Rich Foods Among Adolescents

Allocated Resources:

The Nevada Agricultural Experiment Station allocates 11% of its budget to address the issues of Goal #3. The breakdown between Federal/State is as follows:

<u>Federal</u>	<u>State</u>	<u>Total</u>
3%	8%	11%

Extension Professional FTE: 5.40

Extension Federal, state and county funding allocated to goal: \$1,072,167

**CSREES GOAL #4: To achieve greater harmony (balance) between agriculture and the environment.**

Statement of the Issue:

Nevada's landscape is largely arid to semi-arid desert rangelands, with croplands adjacent to the limited number of rivers and streams. The state includes over 70 million acres of land, approximately 87% public land and 13% privately owned. The two primary government land management agencies, BLM and USFS, are responsible for management of approximately 76% of Nevada's land. Of the 13% in private farms and ranches, 87% is considered rangeland, 8% cropland, and 5% woodland and other uses. Over 90% of the land in Nevada is considered rangeland, with approximately 80% available for livestock grazing at certain times of the year.

Nevada, with a population of approximately 1.3 million, is the fastest growing state in the nation. Over 94% of the people live in cities larger than 25,000 population. Approximately 5,500 people, or less than 1% live on Nevada's 2,700 farms and ranches. Nevada's population, therefore is simultaneously one of the most urbanized of all states and is also considered frontier, with less than 6

persons/square mile. Further, less than 25% of the state's citizens are native born.

Decisions about the utilization of natural resources, particularly public lands and water, have major impacts on ecosystem sustainability as well as the socioeconomic wellbeing of current and future generations. Yet views of what constitute appropriate land and natural resource use are increasingly polarized. Federal initiatives for natural resource management often shift with the latest election. Violent protest against the federal agencies responsible for the management of over three quarters of the Great Basin is an indication of local frustrations and of the potential volatility of the situation. Vandalism of rural properties and equipment sometimes occurs as an expression of hostility toward the multi-generational agricultural lifestyles.

There are clearly unanswered questions about ecosystem itself and, indeed, we continue to try to shed light on these critical issues. However, in the early 1990's we recognized that the traditional scientific/technical approach to natural resource management was inadequate to simultaneously address management objectives, public needs, and community values. A multi-state, multi-disciplinary team, involving faculty from the social, economic, biological, and ecological sciences began working with local communities to develop, test, and implement decision-making processes for the utilization of natural resources that result in agreements that sustain social, economic, biological, and physical systems for this and future generations. These efforts complement the on-going CRMP (Coordinated Resource Management Program) efforts.

An extensive review of scientific work show that the Great Basin rangeland resource has changed significantly over the past 150 years. The change has resulted in a reduction in plant species diversity and a movement toward extensive monocultures of pinion juniper and larger scrub species rather than mosaics of grassland savannas and shrubs. In addition, alien plant species that can form extensive monoculture plant communities are becoming ever-larger components of the Great Basin environment. The effect of this trend is a reduction of forages for a diverse population of wildlife and domestic livestock. In turn, this change is reducing the economic sustainability of the Great Basin livestock industry and the continued sustainability of recreational activities developed around wildlife.

The Nevada Arid Rangelands Initiative proposes to coordinate the activities of the Federal and State agencies to address the highest priority issues and concerns relating to the management and protection of our public lands and natural resources, and the rural families and communities most dependent on them. The Initiative will be a coordinated mix of research, education and action programs. The leadership of the agencies will establish program priorities and commit resources. Other public and private organizations with expertise or a stake in the Initiative programs will be invited to participate in planning and implementation.

The primary defining characteristics of Nevada and its quality of life are its mix of and rangelands and mountains, its scarce natural resources such as water, and its abundance of precious metals to support its mining industry. Approximately 87% of its over 70 million acres are in the public domain; therefore, all Nevada citizens are stakeholders in the management and uses of our rangelands and forest lands. Nevada has a higher percentage of its land classed as and rangeland than any other state.

Recent research by College of Agriculture and Cooperative Extension scientists clearly indicates that our rural communities and families are viewed as the primary caretakers of our Nevada public lands. Other studies are documenting that our rural families, communities and counties are economically at risk. It is imperative that the University community and the various Federal and State agencies that are either responsible for or their programs impact our public lands must work together to protect both our public lands and natural resources and the people that are dependent on these resources for their economic health and well being.

The Nevada Arid Rangelands Initiative respectfully requests a federal annual appropriation of \$1,000,000 and pledges that these funds will be significantly leveraged with the resources of the agencies and organizations that are a part of the Initiative team. One-half of the budget request will be used to strengthen our expertise in addressing Initiative concerns, and one-half will be used to directly support and implement Initiative programs.

About 17 million acres of public rangelands have been invaded by noxious weeds, quadrupling over the last decade. The potential economic impact is in the hundreds of millions of dollars each year. In addition to rangelands, noxious weeds are increasingly becoming a problem on forestlands, agricultural lands, and wetlands throughout Nevada. Survey results indicate that 63.6% of respondents strongly agree that control of noxious weeds on public and private rangelands is a high priority educational issue.

To address this issue, NCE initiated and organized the Nevada Weed Management Association. Now operating under the Nevada Division of Agriculture, this effort has spawned a very active invasive noxious weed management program for land managers across the state.

To provide better information for noxious weed management decisions, a natural resource GIS effort combines all available natural resource information to help in solving a number of natural resource issues. Noxious weed infestations are being mapped and digitized for easy sharing. Updates are scheduled annually. Weed management efforts have been developed and coordinated between landowners and land managers. Educational programs have been developed, including alternative steps toward solutions.

Topographically, Nevada is characterized by isolated, long, narrow, roughly parallel mountain ranges and broad, intervening, near flat valleys and basins.

Often designated as the Basin and Range Province, drainage flows to enclosed basins rather than to the sea. For water planning and management purposes, the USGS and Nevada Department of Conservation and Natural Resources have divided the state into discrete hydrologic units. Fourteen major hydrographic regions, each comprised of major drainage basins, have been delineated. There are six rivers of consequence, the Colorado in the south, and the Snake, Humboldt, Truckee, Carson and Walker Rivers in the northern portion of the state. In addition to the limited rivers in Nevada, Lake Tahoe has been the focus on considerable federal, state and local governmental attention in recent years.

The quality of surface water has been improving, primarily due to the removal and more stringent standards of point sources, but non-point sources contribute large sediment and nutrient loads to surface water. Specifically, urban runoff and storm drains are serious sources of pollutants. The improper use and disposal of household pesticides and fertilizers is also a significant threat to water quality. The non-point source load from agricultural land is 95% from irrigation and is delivered relatively constantly to the river throughout the irrigation season. Each of these problems continues to be the focus of educational endeavors.

With a dry climate and an average of only nine inches of precipitation per year, Nevada is the most arid state in the country. Of the total annual precipitation, approximately 10 percent accounts for stream runoff and groundwater recharge, with the remainder lost through evaporation and transpiration. To compound the situation, drought is a relatively common situation in the West. Nevada has experienced above normal precipitation in the past several years, but this is following an extended drought period during the late 1980's and early 1990's. Because of periodic drought cycles, efficient water use is an ongoing goal of Nevada's water quality program. The primary focus is urban landscape, which represents over fifty percent of water usage in the Las Vegas area. Of equal importance, successful water conservation and reuse programs can delay or eliminate the need for costly capital improvement projects.

Because Nevada's water resources are so limited, ground water reserves are of immense importance. Principal ground water aquifers are basin-fill deposits, carbonate rocks and, to a lesser extent, volcanic rock. The basin-fill aquifers are composed primarily of alluvial and colluvium deposits that partly fill the basins. Although industrial and fuel leaks threaten groundwater, they are more appropriately addressed by regulatory agencies than education. However our research program is playing an important role in this arena.

Many urban and rural residents rely on water from wells and if ground water becomes contaminated, it is nearly impossible to clean it up. Septic tanks are very widely used method of sewage disposal in rural and suburban areas of the state. They are seldom carefully designed, constructed, and maintained and the result is often problems with water quality. Indeed, contamination of shallow wells by septic tanks has occurred in several locations. Because contamination of shallow wells by septic tanks has occurred in several locations, homeowners with domestic wells and septic systems are a target audience for education.



Availability of water has always been a controlling factor in the settlement and growth of Nevada. Water is used by virtually every sector of the state economy,

e.g. public supply, rural domestic, irrigation and livestock, industrial and mining, and thermoelectric. In 1990 irrigation accounted for 83 percent of the total water withdrawals. Although agriculture is the largest water user, its overall contribution to the state's economy continues to decline. With the growth rate concentrated in the urban areas and periodic droughts, Nevada continues to experience tension among water users. Nevada water law is founded on the doctrine of prior appropriation whereby the first user of water from a watercourse acquires a priority right to the water and to the extent of its use. All water rights are considered real property and thus are conveyed by deed. Water rights can be bought and sold and the location and type of use changed. Because water allocation is so complicated and tensions continue, despite legal settlements being enacted, Nevada's water quality program focuses on public participation in water policy issues.

In addition to issues related to water quality, in recent years there has been an escalation of property loss due to wildland fires. Primary reasons include an increased number of people living in forested areas and long-term forestry practices of fire suppression. In Nevada, this situation is most prominent in the eastern Sierra front and in the Lake Tahoe Basin, but is also emerging as a concern in southern Nevada. The importance of the issue was elevated during the presidential summit in the summer of 1997.

To reduce the impact of the inevitable wildfire, Nevada's educational and research program for the past several years has focused on improving forest health, particularly in the area at the urban wildland interface. Efforts have included homeowner education on defensible space and general forest health, and interagency collaboration to reduce conflicting regulations and codes, particularly those that attempt to address water quality and in turn increase the risk of catastrophic fire. The other purpose of interagency collaboration is to better coordinate agency activities, including education. Begun in the Lake Tahoe Basin, the program has been expanded to the entire eastern slope of the Sierras and possibly in the Mt. Charleston area of Southern Nevada.

#### Performance Goals, Key Components, and Target Audiences:

Through the deliberate incorporation of diverse and often conflicting interests, the goals of the community-based decision-making for natural resources are threefold:

- To catalyze decision-making processes that build communities and produce sustainable agreements;
- To facilitate the development of innovative collaborations for the conservation and enhancement of natural resources through strategies that balance individual, family and community needs and values with environmental stewardship that sustains our public lands for future generations;

- To analyze and strategically confront barriers (legal, political, bureaucratic, scientific, etc.) to the implementation of community decision-making and collaborative utilization models for public lands.

- There are four goals of Nevada's water quality program:

Surface water quality protection.

Ground water protection.

Public participation in water policy issues.

Efficient water use.

- Specific research projects currently addressing this goal include:

STATE PROJECT #	PROJECT TITLE
NEV00054	Evaluation of Sheep Grazing to Create Fuelbreaks Along the Urban/Wildland Interface
NEV0032W	Community Based Non-toxic Bark Beetle Management: Education Research and Implementation
NEV0032X	Molecular Studies of the Regulation of Bark Beetle Pheromone Production
NEV0032Y	The Role of UDP-Glc Dehydrogenase in Cell Wall Biosynthesis and Plant Growth
NEV003BB	Cytochrome P450 in Hydrocarbon Biosynthesis: Potential for Insect Control
NEV003BT	Effects of Elevated CO2 on Mojave Desert Ecosystem
NEV05136	Trend Analysis Methods of Nevada Water Resources
NEV05142	Valuing the Non-market Impacts of Grazing on U.S. Forest Service Lands
NEV05146	Valuing Water-based Recreation in Northwestern Nevada: Issues in Using On-site, Mail and Telephone Surveys
NEV05189	Development of Input-output Model for the Newlands Irrigation District
NEV05190	Feasibility of Alternative Water Charging Structures for the Newlands Project
NEV05191	Designing A Water Bank Within the Walker River Basin of Nevada and California
NEV05193	Estimating the Change in Economic Value of Fire Effects on Forest Recreation
NEV05198	Western Region Evaluation of Social and Economic Impacts of Public Lands
NEV0522A	Federal Lands and Great Basin Wildlife: Patterns of Extinction, Restoration and Change
NEV0522C	Salinization of Great Basin Wetlands
NEV0522F	Livestock Management in a Montane Riparian Ecosystem: Effects on Vegetation
NEV0522L	Improved Characterization and Quantification of Flow and Transport Processes in Soils
NEV0522N	Gamma Scale (Landscape Scale) Analysis and Monitoring of Multiple Resources on Rangelands of the...
NEV0522S	Population Genetics of the Tui Chub (Gila Bicolor) in Nevada: A Model of Aquatic Biodiversity
NEV0522T	Calibration and Testing of a Nutrient Cycling Model in Eastern Sierran Forest Ecosystems
NEV0522V	Reforestation of Acidic Sierra Nevada Surface Mines with Jeffrey Pine
NEV0522X	Formation and Mineralization of Stable Soil Organic Matter in Wetlands and Riparian Areas of Nevada
NEV0522Y	Sediment Trapping and Channel Changes by Post-drought Riparian Vegetation
NEV0523B	Effects of Prescribed Burning on Nutrient Cycling, Biodiversity and Public Perception as a Best Management Practice for Range & Forest Watersheds
NEV0523C	Wildfire Threat Reduction Along the Sierra Front
NEV0523F	Modeling the Effects of Environmental Stresses on Oocysts of Cryosporidium Parvum
NEV0523G	The Wildland-urban Interface in the Great Basin: Can Large Carnivores be Sustained?
NEV0523H	Field Utilization of the Shallow Saline Aquifer in Clark County Nevada as an Urban

STATE PROJECT #	PROJECT TITLE
NEV0523J	Salinization of Great Basin Wetlands
NEV0523K	Sensing/Geographic Information Technology for Fire Fuel Modeling and Simulation
NEV0523L	Responses of Aridland Plants to Environmental Changes
NEV052BP	Mining Waste-Core Analytical Laboratory
NEV052DH	Field Performance of Containerized Jeffery Pine as Affected by Controlled Release Fertilization
NEV052DL	Restoring Riparian Ecosystems
NEV052DU	A Hidden Component of Wetland Fragmentation
NEV052EI	Biological Consequences of Losses of Large Carnivores
NEV052EK	Protocol for the Evaluation of Pesticide Photodegradation
NEV052EL	Utilization of Saline Aquifer in Las Vegas Nevada
NEV052EV	The Effects of Changing Precipitation on Soils and Water
NEV052EZ	Remediation of Acid Mine Drainage at the Leviathan Mine
NEV052FA	Geochemical, Biological and Economical Effects of Arsenic and other Oxyanions
NEV052FB	Hydrology for Establishing and Maintaining Riparian Vegetation in Appropriate Fluvial
NEV052FD	Light Induced Mercury Volatilization from Substrate
NEV052FP	Inter-comparison of Methods for Determination of Mercury Flux from Terrestrial Landscapes
NEV052FR	Trifluoroacetic Acid: Its Environmental Occurrence and its Effect in Biota in Seasonal Wetlands
NEV052FU	Foliar Damage to be Associated with Irrigation of Treated Sewer Effluent
NEV052FV	Effects of Exploitation Rates on Coyote Population Ecology in Agroecosystems
NEV052FX	Remote Sensing Technologies
NEV052FY	Instream Flow Requirements for Supporting Riparian Ecosystems
NEV052GA	Hydrologic Sciences Graduate Student Internships with the Sierra Army Depot
NEV052GB	Vegetation Classification, Fuels, Mapping and Relative Fire Risk Modeling
NEV052GC	Watershed Hydrologic Risk Assessment
NEV052GG	Salinity Management in Western Wetlands: Effects of Irrigated Agriculture on Avian Diversity
NEV052GI	Relationships between Hydrologic Regimes, Channel Geomorphology and Vegetation Regimes
NEV052GK	Constructing a Long Term Ecological Research Program at the Nevada Test Site
NEV052GL	Quantifying the Magnitude of Stream Incision During the Last 100 Years
NEV052GN	Roles of Plants in the Closure and Monitoring of Radioactive Waste Management Sites Landfills at the Nevada Test Site
NEV052GQ	Behavioral Consequences of Realization and Restoration of Mammalian Predation as Selective Pressure
NEV052GR	Agricultural Pesticide Impact Assessment in Nevada
NEV052HA	A Multi-level Approach to Modeling Ground and Surface Water Exchange in Agriculturally-dominated Settings
NEV052HB	Carson River Superfund Site: Methylmercury Formation and Degradation in Sediments of the Carson River System
NEV052HE	Best Management Practices for Enhanced Forage Production and Water Quality Protection
NEV053AC	Pasture Management in the Truckee Meadows

### Internal and External Linkages:

Because all of the educational efforts are both collaborative and community-based, internal and external linkages are extensive. Most involve NCE and NAES faculty, federal public land managers, state agencies, non-profit environmental groups, the livestock industry, and agricultural associations. Specific linkages will be described with the annual report on the specific programming.

Multi-state research programs will be governed through the Western Association of Agricultural Experiment Station Directors (WAAESD), involving peer and program review and subsequent recommendations by the Research Implementation Committee (RIC), a sub-committee of WAAESD.

Coordination of multi-state extension, research and integrated research and extension activities will be governed by the Western Extension Directors (WED) and WAAESD. A peer and program review committee with broad based multi-functional representation entitled *The Regional Coordination and Implementation Committee* (RCIC) will conduct the initial review and make recommendations to WED and WAAESD.

- Walker River Basin Watershed is located in both California and Nevada. Faculty from the two states, Walker River Tribe water engineer, USGS, and local NRCS agents, have joined together to develop a flood management education program for the water users along the length of the river.
- The sustainable agreements work involves faculty from California, Idaho, Oregon, Utah, and New Mexico.
- NAES participates in the following multi-state research projects:

<b>MULTI-STATE PROJECT #</b>	<b>PROJECT TITLE</b>
NC-142	Regulation of Photosynthetic Processes
W-45	Environmental Transformation, Exposure, and Effects of Pesticide Residue
W-133	Benefits and Costs
W-188	Improved Characterization and Quantification of Flow Transport Processes in Soils
W-189	Natural Product Chemistry as a Resource for Biorational Methods of Insect Control
W-190	Water Conservation, Competition and Quality in Western Irrigated Agriculture
W-192	Rural Communities and Public Lands in the West: Impacts and Alternatives

- NAES multi-state coordination activities includes participation in the following Western Coordinating Committees (WCC's):

MULTI-STATE	PROJECT TITLE	
COORD #		
WCC-11	Spatial Distribution of Water, Salts, and Plant Response when Irrigating with Saline Water	

Allocated Resources:

The Nevada Agricultural Experiment Station allocates 44% of its budget to address the issues of Goal #4. The breakdown between Federal/State is as follows:

<u>Federal</u>	<u>State</u>	<u>Total</u>
7%	37%	44%

Extension Professional FTE: 18.79

Extension Federal, state and county funding allocated to goal: \$3,730,744

**CSREES Goal #5: To enhance economic opportunities and the quality of life among families and communities**

Statement of the Issue:

Nevada continues to be the fastest growing state in the nation. In 1990, the population of Nevada was 1,201,833 persons, representing a 50 percent increase from 1980. Most of the states' growth is the result of immigration with nearly a third of new residents coming from California. The statewide population density is 10.2 persons/square mile (the national average is 61 persons/square mile). The majority of the population resides in Clark County (61.7%) and Washoe County (21.2%) and these figures are expected to increase with the 2000 census figures. The remainder of the state is sparsely populated with 11 counties considered *frontier* (less than 6 persons/square mile), and four counties considered *rural* (more than 6 persons but less than 10/square mile). With nearly 90 percent of the states' population located in two metropolitan areas, Nevada is the tenth most urbanized state in the country.

Nevada's economy is expanding much faster than the national economy. State taxable sales have grown between 8-13%, gaming revenues between 5-8%, and industrial employment was in the 6.5-7.2% range. Combined with a low inflation rate, the growth rates for taxable sales and gaming revenues indicate significant growth in real terms. Most of the growth is concentrated in southern Nevada where new mega-resort casinos continue to be built and taxable gaming revenues and taxable sales have continued their increases. Northern Nevada has experienced meaningful growth in taxable sales and employment, but gaming activities declined during 1996. From projections by Western Blue Chip (1997), Nevada can look forward to sustained economic growth, though the growth rate will decline from rates achieved in the past.

Nevada's growth has been driven by internal and external forces. Internally, construction spending remains the locomotive of growth; externally, Nevada has benefited from growth at the national level and to a lesser degree, an inflow of

workers and businesses from California. This inflow of workers and businesses is likely to slow down as recovery in California takes hold, but the slower inflow will be compensated by the more general stimulus Nevada will get from a California recovery.

Recent national and international occurrences have impacted growth in Nevada. The collapse of Asian monetary systems and the gold market have been felt in this state. The price of gold has decreased to below \$300 per ounce, seriously impacting many of Nevada's frontier counties.

Economic impact studies and subsequent education and community leadership efforts will continue to be undertaken to help Nevada communities cope with their specific economic situations.

It is estimated that 10.2 percent of Nevadans live in poverty. The fastest growing segment of the population living in poverty is single women with dependent children. According to the 1990 Census, 27.6% of Nevadans were less than 20 years of age. Most are white (72%). However, compared to the state as a whole, a greater proportion of youth are ethnic minorities. Fourteen-percent are Hispanic, 9 percent are African-American, 3 percent are Asian, and 2 percent are Native-American. It is estimated that 15.2 percent of children in Nevada live in poverty. This is a significant increase from 6.3 percent in 1980.

Nevada also has one of the highest rates of working women. In 1990, 63 percent of women were working outside the home. Likewise, Nevada has one of the highest rates of single-parent households. There are approximately 83 licensed childcare facilities in Nevada. It is unknown how many children are in unlicensed care. However, according to a 1988 study, 90% of home care providers are unlicensed and 37 percent of children under five are cared for in home care setting. Better quality centers seem to have long waiting lists. Since research has shown that parents regularly turn to their child care provider for parenting information, providers will continue to be used as volunteers in distributing NCE parenting information.

Additionally, childcare providers are targeted with programming. For ten years NCE has received funding through the Nevada State Licensing Bureau to develop, implement and evaluate curricula for child care providers to improve the overall quality of childcare available to Nevada parents. Each year a different topic is identified.

Public education remains an important issue due to crowded classrooms and high dropout rates. In 1989, only 60 percent of estimated eligible Nevada students graduated. The Nevada Literacy Coalition estimates that over a quarter of a million Nevada adults and youth lack adequate literacy skills. The coalition defines literacy as a person's possession of the essential skills and knowledge in speaking, reading, writing English and performing arithmetic operations, at levels which allow competent functioning. Among at-risk students, reading skills have been shown to be the best predictor of later successful adult adjustment. Nevada employers identify a lack of basic literacy skills as impacting the productivity of their companies.



Teens who drop out of high school face enormous odds for achieving financial success in life. Over their lifetime, high school dropouts will earn only about 75% as much as high school graduates, and less than half of what college graduates are likely to make during their lifetime. Nevada high school dropout rates ranks the state 20<sup>th</sup> in the nation in graduation rates. Over 200,000 Nevada adults lack a high school diploma and school retention will continue to be a primary focus of educational efforts.

According to the Nevada Department of Education's biennial survey, many Nevada youth use or abuse alcohol and/or other drugs. Eighty-six percent of twelfth graders reportedly have consumed alcohol, 51 percent have used tobacco, 37 percent have used marijuana or cocaine, and 30 percent have used other drugs (e.g., depressants, opiates, hallucinogens, etc). Alcohol continues to be the major drug of choice at all grade levels in Nevada. Even at grade six, 43 percent of students' report having consumed alcohol. Alcohol consumption is related to suicide, motor vehicle accidents, and violent behavior.

Violence, especially among young people, is more common in the US than any other industrialized nation in the world. Young men are especially at risk, for they are four times more likely to be murdered than young men in the next most industrialized nation and 40 times more likely than young men in Japan. Nevada, with the highest juvenile detention rate in the country, currently leads the nation in high school dropout rate and ranks eighth in teen violent death rate.

The issue of teenage pregnancy deserves special attention. Nevada ranks among the top ten states with regard to the rate of teenage pregnancies. In Eleven percent of all live births in Nevada are to teen parents. All teenage pregnancies are considered high risk for medical complications. Additionally, pregnancy as a teenager has long lasting implications for both mother and child. Pregnancy is the most often listed reason for dropping out of school. Eighty percent of pregnant teens dropout with only half of those returning and eventually completing their high school education. These young women are then more likely to experience unemployment, poverty, family violence, and poor health. Fourteen percent of households in Nevada receiving Aid to Dependent Children are headed by mothers less than 20 years of age.

### Performance Goals, Key Components, and Target Audiences

Strategies and potential action and approaches to achieve the goal include:

- Research and subsequent education for decision-makers on the changing economic dynamics and their implications for their communities.
- Leadership development opportunities for community decision-makers.
- The creation, implementation and evaluation of community decision-making models.
- Education for individuals to gain control over their present and future economic situation.
- Education for parents in the selection of quality childcare.
- Education and evaluation research targeting the most vulnerable youth to increase their capacity related to life skills.

- Research and education on literacy.
- Specific research projects currently addressing this goal include:

STATE PROJECT #	PROJECT TITLE
NEV00621	Who's Minding the Children: The Use of Guidance Techniques in Child Care Programs
NEV00622	Children's Functioning Following Divorce: Development of a Predictive Model
NEV00624	The Prevention of Child Maltreatment in Nevada: A Longitudinal Comparison
NEV00625	Literary Development in Young Children: An Exploratory Study of the Foundations of Literacy
NEV00627	The Family Story Teller: An Educational and Research Family Literacy Project for At Risk Families
NEV00722	Use of the School Environment to Reduce Obesity Risk Among Middle School Students in Nevada
NEV00723	Identifying and Mediating Inappropriate Herbal Use Among the Elderly
NEV05141	Assessing Competition in Nevada's Gaming Markets and Impacts on Rural Areas
NEV05174	University Center for Economic Development
NEV05189	Development of Input-Output Model for the Newlands Irrigation District
NEV05193	Estimating the Change in Economic Value of Fire Effects on Forest Recreation
NEV0523B	Effects of Prescribed Burning on Nutrient Cycling, Biodiversity and Public Perception as a Best Management Practice for Range & Forest Watersheds
NEV0523G	The Wildland-Urban Interface in the Great Basin: Can Large Carnivores be Sustained?
NEV0523H	Field Utilization of the Shallow Saline Aquifer in Clark County Nevada as an Urban Irrigation Source
NEV052FU	Foliar Damage to be Associated with Irrigation of Treated Sewer Effluent
NEV0532C	A Mathematical Model to Predict Profit Potential & Needed Decision Making Inputs for Various Management & Breeding Programs on Western Ranches
NEV0532E	Best Management Practices for Enhanced Forage Production and Water Quality Protection
NEV0532K	Development of an improved Vaccine for Bovine Trichomoniasis
NEV053AC	Pasture Management in the Truckee Meadows
NEV053HH	The Nutritive Value of Forages for Horses as Affected by Forage Species and the Source of Supplemental Energy

#### Internal and External Linkages:

Because all of the educational efforts are both collaborative and community-based, internal and external linkages are extensive. Economic development efforts always include local formal and informal decision-makers, local government, state government, and frequently federal agencies, such as the Small Business Development Center. Most children, youth and family efforts involve NCE and NAES faculty, local school districts, state agencies, juvenile justice system, parks and recreation departments, non-profit youth serving organizations, and frequently local businesses.

Multi-state research programs will be governed through the Western Association of Agricultural Experiment Station Directors (WAAESD), involving peer and program review and subsequent recommendations by the Research Implementation Committee (RIC), a sub-committee of WAAESD.

Coordination of multi-state extension, research and integrated research and extension activities will be governed by the Western Extension Directors (WED) and WAAESD. A peer and program review committee with broad based multi-functional representation entitled *The Regional Coordination and Implementation Committee* (RCIC) will conduct the initial review and make recommendations to WED and WAAESD.

- NAES participates in the following multi-state research projects:

MULTI-STATE PROJECT #	PROJECT TITLE
NE-162	Assessing Competition in Nevada's Gaming Markets and Impacts on Rural Areas
S-278	Food Demand, Nutrition and Consumer Behavior
W-112	Molecular Probes for Diagnosis and Identification of the Etiology of EBA
W-192	Rural Communities and Public Lands in the West: Impacts and Alternatives
W-193	Resilience to Violence Among At-Risk Youth

- NAES multi-state coordination includes participation in the following Western Coordinating Committee(s) (WCC's):

MULTI-STATE COORD #	PROJECT TITLE
WCC-39	Nutritional Management Strategies to Increase Lean Lamb and Wool Reduction Efficiency
WCC-98	Analysis of Adolescent Outcomes in a Model of Risk Prevention

Allocated Resources:

The Nevada Agricultural Experiment Station allocates 16% of its budget to address the issues of Goal #5. The breakdown between Federal/State is as follows:

<u>Federal</u>	<u>State</u>	<u>Total</u>
3	13%	16%

Extension Professional FTE: 25.38

Extension Federal, state and county funding allocated to goal: \$5,039,185

## STAKEHOLDER INPUT PROCESS

Cooperative Extension is establishing a statewide Citizens Advisory Committee that will represent a diverse cross section of stakeholders from both rural and urban communities.

When faculty supported by NCE funding are hired, they are expected within their first year to conduct a formal needs assessment in order to identify critical

agricultural (as defined in Subtitle C, Sec. 221.a.8) issues. For Extension Educators, a very broad, community-based assessment is expected. For Area Specialists, a broad, issue-based assessment is expected. State Extension Specialists are charged with compiling local needs assessments and adding statewide data and impacts. Indeed, one of the criteria for annual performance evaluation is effective assessment of need. Following the initial needs assessment, faculty are required to continually assess need and periodically conduct a needs assessment in a similar manner as expected of newly hired faculty. As a result, all of our major educational programs are the result of formal needs assessments. The data collected by NCE is also used as the basis for broad Nevada Agricultural Experiment Station research priorities.

In Addition, the Director of the NAES has traveled throughout the state and conducted a series of townhall meetings with various stakeholder groups. This stakeholder input has resulted in the development of a new initiative for the Nevada Agricultural Experiment Station, Nevada's Arid Rangeland Initiative. In addition, the College of Agriculture and the Nevada Agricultural Experiment Station has an expanded broadly based Citizens Advisory Committee to obtain stakeholder input from a wide spectrum of our stakeholders.

Finally, during the peer review process for new NAES Hatch, Multi-state, McIntyre-Stennis and Animal Health projects, stakeholders have been included (where appropriate) on the peer-review team. This committee makes the final recommendations regarding project approval and funding to the Department Chair who then forwards the recommendations to the Director for final approval and funding allocations.

The specific methodology used in assessing needs varies, but it uniformly consists of formally obtaining direct input from people. This data is juxtaposed against secondary data to validate the critical nature of the issues named by people. Additionally, collaboration with other agencies and organizations with similar goals and serving similar populations is an expectation for all programs. It is not uncommon for focus groups to be used to obtain a very in-depth understanding of the issue and the population affected.

## **PEER AND PROGRAM REVIEW PROCESS**

### NAES Scientific Peer Review Process:

Technical review is best served when the expertise on the panel is closely aligned to the discipline of the proposal thus technical review is the responsibility of the departments.

The departmental technical review panels are comprised of a minimum of four members, two from the department, excluding the department chair; and two from outside the department, including an extramural reviewer with experience reviewing research proposals for national agencies. The Associate Director and Chair serve as a hoc members of the technical review committee. To standardize

organizational structures and operating procedures between departments, the Associate Director chairs the meeting of the NAES Administrative Committee.

The departmental technical review committee is responsible for conducting a technical review of the proposals, rating the proposals, providing a brief justification of the rating, providing detailed written critique from each reviewer, and a panel summary to be shared with the principal investigators (P.I.).

The department technical review committee submits to the Department Chair a priority rating of the proposals, a brief justification of the rating and a copy of the individual review comments and panel summary that will be shared with the P.I. The Chair forwards to the Associate Director 1) a priority ranking of the proposals, 2) a brief justification of the ranking of the proposals, 3) the final department technical review committee's recommendation, 4) a copy of the individual review comments, 5) a technical panel summary, and 5) any other comments or recommendations. The Associate Director and Director obtain input to evaluate and rank the proposals on relevance of the proposed research to the stakeholders of the State of Nevada. A brief critique on State relevance is shared with the P.I. The Director and Associate Director construct the final ranking of all proposals.

#### Program Review Process:

A working group process has been utilized to conduct a comprehensive review of NCE programming statewide. The committee included a cross section of program specialists as well as citizen representatives. Their review and subsequent recommendations are providing a roadmap for increasing program efficiency and effectiveness. A multi-prong approach is taken to program review. Annual peer review provides overall analysis and feedback on programs, while subject matter teams provide more in-depth feedback on proposed and ongoing programs. When appropriate, a collaborative program committee is involved in design, implementation and evaluation of a program. Programmatic review is often coupled with the needs assessment process to review ongoing programs and determine whether they should be continued, modified or discontinued.

#### Multi-state Research and Extension Activities:

Effective October 1, 1998, the Hatch Multi-state Research Fund replaces the Hatch Regional Research Program. The Hatch Multi-state Research Fund must be used for research employing multidisciplinary approaches to solve research problems that concern more than one State. For such research, state agricultural experiment stations must partner with other experiment stations, the ARS and/or other colleges or universities.

The research focuses on a specific and important problem of concern to two or more states; and the research is planned and conducted as a concerted effort in which the participating scientists are mutually responsible for accomplishing the objectives. A formal research plan is required and undergoes scientific peer review as required by law.

The funds appropriated under the Hatch Act for the support of cooperative multi-state research are administered by CSREES. These projects often are called "Multi-state Research Projects". Multi-state research may be financed with funds from any source. The establishment of a multi-state project requires the preparation and approval of a research project outline. The Research Implementation Committee (RIC) conducts the peer review and administrative review process and makes recommendations to WAAESD. The contents of the outline and approval are described in the WAAESD Supplementary Manual.

The RCIC process will be utilized for identification of multi-state activities.

In the Western Region, the WDA and WED have established the Regional Coordination and Implementation Committee (RCIC), which has been delegated the responsibility for development, review, evaluation and recommendations to the SAES and SCES directors on all aspects of western regional integrated research and extension activities. Programs may involve one or more functional areas, i.e., research, extension, academic programs, or international programs. RCIC will annually develop a portfolio of approved and active regional efforts. RCIC will provide oversight and accountability in compliance with AREERA requirements for accomplishments and resource committee reporting. RCIC will annually conduct a survey and report to the directors on newly emerging issues that require multi-state coordination. RCIC will serve as a clearinghouse for acute problems and issues that require multi-state consideration. RCIC will develop strategies to encourage multi-state integrated efforts. RCIC will utilize the services of OWDA for logistical support, administrative oversight and record keeping.

The RCIC membership consists of two members each from WDA, WED, and one member each from the Western Academic Program Directors, International Programs, Board on Human Sciences, CSREES, ARS, Forest Service, National Association of Professional Schools of Forestry (NAPFSC), and Veterinary Sciences.

## **DEVELOPMENT OF MULTISTATE COORDINATED ACTIVITIES (WCC'S)**

Western Coordinating Committees (WCC's) provide a mechanism for addressing critical regional issues where cross-functional integration and/or multi-state cooperation is required. The work of Western WCC's can be classified into the following three categories:

1. Fully integrated research and extension programs with clearly defined, impact oriented objectives, where research results are effectively embodied in educational efforts to assist those in need.
2. Multi-state educational programs with clearly established, outcome oriented, goals where research results are already available. Knowledge is conveyed utilizing methodology which results in increased understanding and effective resolution of identified needs.

3. Multi-state research coordination resulting in increased communication between faculty, avoidance of unnecessary duplication and gained efficiencies in the use of resources and shared ideas.

WCC's will also explore and develop new and expanded multi-state, integrated efforts in the Western Region. Faculty working on similar issues in states outside of the Western Region may also be invited to participate.

## **INTEGRATED RESEARCH AND EXTENSION ACTIVITIES**

For almost a decade, Nevada Agricultural Experiment Station (NAES) and Cooperative Extension (NCE) have complied with the intent of Congress to *integrate agricultural research, extension and education functions to better link research to technology transfer and information dissemination activities*. Initial efforts have been made by both. NAES has used the program priorities established by and needs assessments conducted by NCE faculty as an initial guide in allocating their research funds. NAES further created a means by which community-based NCE faculty (and faculty from other parts of the university) have successfully competed for Hatch funds. Collaboration with community-based faculty and developing research components to Extension programs has been openly endorsed. Health at Work and Healthy Families Nevada are two examples.

NCE likewise has made specific efforts. Scholarship has long been recognized as an expectation of community-based faculty. All major programs are grounded in research theory and deliberate attempts are made to include campus-based faculty who hold joint Extension and Experiment Station appointments in their overall design. Programs are rigorously evaluated so as to contribute to the knowledge base of theory in practice. Not only are campus-based faculty expected to be involved in the evaluation design, increasingly Extension is hiring faculty trained at the doctoral level to ensure a scholarly approach to its work.

A further step came in Spring, 1997 when NAES and NCE initiated an effort to even more deliberately link the research and extension functions through projects reviewed and approved by a group of citizens. Faculty from at least one campus department and one extension area submitted project ideas that reflect several ideas: 1) add a research piece to an ongoing extension project, 2) add an educational component to ongoing research, 3) explore an unanswered question through both research and education.

The NAES/NCE request for proposals (RFP), was sent to all NAES and NCE faculty. The proposals were initially reviewed by the NAES/NCE administrative teams. They were then reviewed by a panel of stakeholders who interacted with the administrative teams. This committee made final recommendations to the Director of the NAES and the Director of NCE.

Four projects were funded at equal levels by NAES and NCE and are listed below:

- Community Based Non-Toxic Bark Beetle Management: Education and Implementation in the Tahoe Basin.
- Effects of Prescribed Burning on Nutrient Cycling, Biodiversity, and Public Perception as a Best Management Practice for Range and Forested Watersheds at the Urban Wildland Interface.
  - The Family Storyteller.
  - Wildfire Threat Reduction Along the Sierra Front

Nevada Cooperative Extension and the Nevada Agricultural Experiment Station will continue developing integrated activities.