

**UNIVERSITY OF NEVADA
COOPERATIVE EXTENSION (UNCE)
&
NEVADA AGRICULTURAL EXPERIMENT STATION (NAES)**

**Annual Report
of
Accomplishments & Results**

Submitted April 1, 2004

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PROGRAMS

Overview and Introduction:

Reports are only provided on select program impacts which reflect unique benefits to a diversity of clientele and stakeholders in Nevada. No attempt was made to include all programs or all program impacts since they are too extensive. All programs are based on local or statewide needs assessments.

It should be noted that just about all Cooperative Extension programs have some type of applied “research” component. Cooperative Extension faculty are expected to emphasize researching needs assessments, program impacts, and may use applied research projects to learn new information as well as a teaching tools. All Cooperative Extension faculty must have at least these minimum research components in their programs, and research is a major consideration in annual evaluations for both field faculty and campus based faculty (many of whom also have joint Nevada Agricultural Experiment Station appointments as well).

The research programs of the NAES are integral to the College of Agriculture, Biotechnology and Natural Resources and are associated with the College of Human and Community Sciences, and the School of Medicine. The mission of NAES is to build and support research capacity to advance understanding of biological, environmental, natural resource and social systems to enhance agriculture, community and economic vitality in compliance with State and Federal Legislation. 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.

Goal 1: An Agricultural System That Is Highly Competitive In The Global Economy

Overview: Our Plan of Work (POW) goals are to increase the overall quality and health of Nevada livestock through research and outreach, to understand the quality of plants through basic research and to evaluate and promote improved marketing of Nevada products.

University of Nevada Cooperative Extension (UNCE) education programs have focused on diversified/alternative crops, risk management and animal production efficiency. UNCE campus and field faculty are also part of many NAES research projects in these subjects, and have made extensive use of research findings. As noted in some of the key themes, the dissemination of research information via UNCE educational programs has had an impact on producer’s practices and profits.

NAES research programs have focused on developing alternative crops for Nevada, determining genetic and nutrition factors to enhance the quality of beef products, improving beef cattle reproduction rates to increase profitability, rangeland rehabilitation, improving the economic return in sheep production by emphasizing both wool and meat production and finding niche markets for specialty meat products.

Federal and State Funding by Plan of Work Goals

	<u>Goal</u>	<u>Federal \$</u>	<u>State \$</u>	<u>County</u>	<u>Total \$</u>	<u>FTE</u>
Nevada Agricultural Experiment Station	I	\$395,348	\$2,159,138		\$2,554,486	33
University of Nevada Cooperative Extension	I	\$349,506	\$1,622,033	\$1,778,524	\$3,750,063	38

Theme: Added Value

Issue:

There is significant opportunity to increase wool production in western range sheep production systems; yet, this is not economically feasible if increased wool production is at the expense of lamb production. Today's sheep industry focuses its attention on one of two markets: wool or meat. And, generally producers are forced economically to choose between which market will serve as their primary production system. However, if a producer could capitalize on both markets while using the same animals, production efficiency and net income would greatly improve. What investigators at the University of Nevada are developing is a breeding program that takes the best of both worlds and combines them into a single breed of sheep. This research defines the optimum level of wool production and lamb production per ewe for various range and forage management conditions in the western U.S.

What Has Been Done:

In order to improve wool production, Rambouillet ewes were crossed with pure Merino rams imported from Australia. Over the past 12 years crosses and back-crosses between mixed lambs and pure Merino rams has resulted in over 1600 breeding ewes, rams and replacements, which are approaching purebred Australian Merino status, a known high quality wool producing breed.

Impact:

The genetics of this flock are having a major impact on range sheep production systems throughout the western U.S. range sheep industry. The flock has the highest reproductive efficiency of any Merino flock in the U. S., and is resulting in increased lamb production by buyers that have utilized our genetics. Our 2003 annual sale established a new record high average price for on-ranch performance tested range-ready rams in the U.S.

The wool clip from the flock has topped the U.S. wool market for the last six consecutive years, and continues to improve in production per sheep and quality. Producers utilizing our genetics are also realizing significant increases in wool production and income. A Field Day is held every year in connection with the Annual Ram and Ewe Sale, with attendance ranging from 80 – 120 people. In addition, numerous individual producers and tour groups regularly visit the ranch

The OFDA 2000 was used to evaluate every fleece in the Rafter 7 Merino flock and in 2 other University flocks this first year. Sorting the sheep prior to shearing on the basis of sample data resulting in an over \$3,000 increase in the value of the Rafter 7 wool clip, and similar increases in wool value from the other 2 flocks. The cost of testing was less than \$.25 per sample, or a total cost for Rafter 7 Ranch of \$435.

Source of Funding;

Hatch
State Matching Funds
Edwin L Wiegand Trust Fund

Scope of Impact:

State specific

Themes: Agricultural Profitability/Animal Production Efficiency

Issue:

Management and marketing are key components of success and profitability of any beef cow/calf operation. The choices needed to make accurate decision are complex, difficult and often impractical as most producers know. What producers were asking for was a tool that provided flexibility (based upon management practices selected) in real-time that accurately predicted the economic investment necessary to take an animal from

recently weaned calves to market/breeder standards. Producers needed something that would allow them to play “what if...” and tell them the subsequent effects on their wallets.

What Has Been Done:

What faculty at the University of Nevada developed were three software packages that would enable producers to evaluate various management practices and their potential impacts on profitability. “Feedlot” was design to help producers estimate the economics of retained ownership of yearlings through the a feedlot. The second package “Grassfat” was designed to track your yearling cattle through the pasturing stage of production. And, “Calf back” was designed to track calves after weaning through the production process and allows producers to vertically integrate and diversity their operation while spreading marketing risk throughout the year.

Impact:

This software, available for free at <http://www.ag.unr.edu/cabnr/resources.htm>, lets producers check rapidly many different scenarios and possible prices, costs, etc., and how they will affect profits. Over the last 5 months of 2003, visitors from 35 states and 8 countries have downloaded over 560 copies of the software. Ron Torrell of Fallon, NV claims that by using this software “budgeting your production alternatives can save you money by avoiding costly mistakes”.

Source of Funding;

State Matching Funds

Scope of Impact:

National/International

Theme: Animal Production Efficiency

Issue:

Nevada cattle producers have identified the reproductive management of beef cows and increasing the second conception of beef cows as their highest educational priority. Poor reproductive rates are one of the biggest issues facing the range livestock industry, particularly in dry years and with young cows. Non-producing cows drastically affect agriculture profitability. Failed return conceptions of beef cows are a common occurrence, particularly with young cows on the second and third conception. Research shows that reproduction, or simply weaning a marketable calf, is ten times more important than weaning weights and 20 times more important than carcass traits.

What Has Been Done:

In 2003, University of Nevada Cooperative Extension (UNCE) developed, taught or delivered research-based information on the reproductive management of beef cows. The information was disseminated through a monthly series of “Back to Basics: Reproductive Management of Beef Cows” articles in five agriculture magazines which are conservatively estimated to reach 70,000 readers. The “Back to Basics” series ran in the Cascade Cattlemen which reaches ranchers in California, Oregon, Nevada, Idaho and Washington. It also ran in the Nevada Rancher and the Progressive Rancher. Western Beef producer ran four of the 12 articles and Beef Magazine (a national magazine) ran one of the articles. In addition, “Tips on Improving the Second Conception of Beef Cows,” a three-hour class, was taught at five Cattlemen’s Update locations, reaching more than 350 beef producers. A reproductive disease class was held in Eureka to more than 50 cattlemen, and three field trial demonstrations using a new heat synchronization product was taught to producers in connection with artificial insemination. An additional 100 questions on reproductive management from Western ranchers were answered by phone, face-to-face or by email.

Impact:

Participants (350) of the 2003 Cattlemen's Update program on the Reproductive Management of Beef Cows rated the overall program at 4.8 on a scale of 1 to 5. The two presentations on reproductive management were rated 4.8 for content, relevancy and presentation quality. Editors of the five trade magazines that ran the 12 monthly articles on reproductive management have moved the "Back to Basics" articles from the back of the magazines to the front, and have urged their continuance after letters to the editor praising the series. UNCE has become an "expert" on reproductive management of beef cows, and this program is having an impact on the agriculture industry.

Source of Funding;

Smith Lever Funds
State Matching Funds

Scope of Impact:

Multistate Extension (NV, ID, CA, OR, WA)

Themes: Biotechnology/Diversified-Alternative Agriculture/Plant Genomics**Issue:**

Nevada's arid climate makes it hard for farmers to grow non-native crops. Many farmers in the state rely on alfalfa as their main crop. While alfalfa grows well in Nevada, it uses about 3.5 acre-feet of water per acre each season. That over 1.1 million gallons of water for 1 acre of alfalfa. Nevada's farmers need a crop that grows as reliably as alfalfa, but uses less of the state's limited water supply. Researchers know that wine grapes use little water, but overcoming the challenges of Nevada's harsh climate needed some serious help

What Has Been Done:

Over the past eight years, the University of Nevada, Reno (UNR) has established experimental vineyard in Reno, Minden/Gardnerville, Fernley, Fallon, and Yerington, Nevada to test regional micro-climates effects on grapes. UNR is using several different approaches to developing more stress tolerant wine grape (*Vitis vinifera*) plants including: adapting cultural practices; selecting for more tolerant plant cells; making hybrids of *V. vinifera* with more tolerant native North American species; and using genetic engineering technology to develop more hardy genotypes. In the summer of 2003, the University constructed a research winery at the Valley Road field station. The purpose of the research winery will be to evaluate the chemical characteristics of the wines produced in Nevada.

Impact:

The initial success of the UNR vineyard has generated considerable interest in nearby areas. Northern Nevada can produce excellent quality wines. The sugar to acid ratio of the grape musts for many of the varieties reached the optimum quality value of 30. A 1999 White Riesling made from grapes at UNR by Tahoe Ridge Vineyard and Winery won a silver medal at the Nevada State Fair. Economic predictions indicate that by the 4th year a typical Nevada vineyard produces enough grapes to become profitable. In the 6th year, establishment costs will be paid off (not including equipment and land costs). And thereafter, a grower averages a net return of \$5,680 per acre per year at 2003 prices.

Source of Funding;

Hatch
Nevada Arid Rangeland Initiative
State Matching Funds

Scope of Impact:

State specific

Themes: Biotechnology/Plant Genomics

Issue:

Drought and excessively salty soil are the two most important limiting factors in crop productivity the world over. But for many crops, traditional breeding practices have fallen short of providing real prospects for further improvements in stress tolerance. Hence biotechnologists are studying plants that can cope with extremes, in the hope of finding the secret of their so-called 'osmotolerance' and then incorporating it into more 'osmotically vulnerable' plants.

What Has Been Done:

The Common Ice Plant (*Mesembryanthemum crystallinum*), is an annual. Due to its capacity to change metabolic strategies from C3-photosynthesis to Crassulacean Acid Metabolism (CAM), this succulent adapts well to low and freezing temperatures (to an astounding 10 degrees below zero Centigrade), withstands seawater concentrations in rooting soil, and is extremely drought-tolerant.

Compared to common plants (e.g., corn, maple trees, spider plants), no genetic model exists for CAM plants. To overcome this deficiency, University of Nevada laboratories have initiated a large-scale genetic screening to isolate the Ice Plant's mutants defective in CAM or that are salinity or drought stress tolerance. Since Ice Plant is not a mandatory CAM plant, this pathway should not be essential for normal growth and development of the plant. However, CAM may be essential for long-term survival and reproductive success of the plant under the prolonged conditions of salinity or drought stress encountered in its native habitat. Thus far, more than 20,000 plants have been screened and many putative CAM deficient mutants have been isolated.

Impact:

Our research identifies and characterizes key structural and regulatory components of this important photosynthetic adaptation. Large-scale sequencing efforts and expression profiling using biotechnological techniques like micro-arrays are providing a rich source of sequence information for identifying novel genes or gene family members and expression patterns peculiar to CAM plants.

If these promising but preliminary results can be replicated and expanded upon, the unique CAM mechanisms of desert succulents could open new routes for engineering crops that are better able to cope with the harsh environments of semi-arid and arid regions that must be pressed into agricultural service in order to feed the world's exploding population.

Source of Funding;

Hatch

Experimental Program to Stimulate Competitive Research (EPSCoR)

National Science Foundation – Plant Genome Project

State Matching Funds

Scope of Impact:

State specific, NC-1142

Theme: Diversified-Alternative Agriculture

Issue:

Alfalfa or grass hay production occurs on more than 90 percent of Nevada's irrigated agricultural lands. The lack of alternative crops limits producer alternatives when hay prices fall or input costs such as electricity rise. An increase in higher-value crops or crops that use less water enhances the contribution agriculture makes to rural communities, the state's economy and opportunities for agriculture careers. These factors contribute to a

need for alternative crop research and development for the sustainability of agriculture. University of Nevada Cooperative Extension (UNCE) is taking the lead in developing applied research field trials, which determine the survival and production potential of alternate crops.

What Has Been Done:

The project generating tremendous interest is the testing of the survival and production potential of 14 varieties of premium wine grapes at two vineyards in Churchill County. More than 200 people attended presentations and tours. Six small-scale vineyards have been planted in Churchill, Washoe and Douglas Counties. Initial data, concerning survival and production potential information, should be collected in 2004.

At the Governor's request, a multi-agency group gathered to jump-start a commercial native seed industry in Nevada. There is a big demand for the indigenous product for reseeding burned and depleted rangelands following wildfires. In 2003, UNCE produced a *Field Guide for Collecting Native Seeds in Nevada*; 250 bulletins were distributed to clientele and another 150 at the Intermountain Native Seed Plant Summit. Five workshops were taught to nearly 200 attendees. UNCE assisted a local grower in harvesting and evaluating the first successful planting of native seeds in the state. Three farmers are now growing native seeds to determine their production feasibility.

A successful hybrid poplar trial of 300 trees at the Newlands Agricultural Research Center in Fallon is in its fifth year of production. The trees have grown to heights of nearly 40 feet in this time. There has been interest in the poplar species as a source of lumber products and this is being explored.

A trial was established on a Fallon farm to evaluate the feasibility of growing nursery stock as a new Nevada crop. Twenty-four species of trees and shrubs were planted in 2001, with plantings expanded in 2003 to nearly 2,000 trees.

New seaberry crop trials were established in Churchill and Nye Counties in 2002. This is a moderately sized shrub, widely grown in Europe and Asia, that is extremely hardy and tolerant to salty soils. An additional five varieties were planted in 2003. It takes three years for seaberries to produce fruit in quantity.

A project was initiated to test the production potential of tef, an annual grass that produces seeds to make gluten-free flour. It could be used in rotation with alfalfa. A 7-acre trial was established comparing tef production with sudangrass; the trial will be repeated in 2004.

Partners include the Bureau of Land Management, Nevada Department of Agriculture and private operators.

Impact:

The four-year poplar tree project has demonstrated that survival and production of hybrid poplars in Churchill County is adequate for a viable alternate crop; however, final production and economic data will not be collected before a period of 8-10 years.

In the nursery stock trials, needle-leafed evergreens were found to be unsuitable. The deciduous species fared better and plants will be harvested, starting in 2004.

Source of Funding:

- Smith-Lever Act funds,
- State Matching Funds
- Private funding

Scope of Impact:

- State Specific
- Integrated Research and Extension

Themes: Diversified/Alternative Agriculture

Issue:

Muslims follow a set of rules as to what they eat in their diet. These rules specify the food that is Halal, meaning lawful and must be slaughtered according to Islamic Rites. Wolf Pack Meats is certified by the Islamic Society of North America to be in strict compliance with Islamic law, at every stage of its lamb production and processing operation.

The University of Nevada has found its self in a unique position when balancing research with refuse accumulation. Using sheep as models for human gene therapy and stem cell research, as many as 30 animals per week are culled. The issues arises after culling. What is to be done with the carcasses of old sheep?

What Has Been Done:

After being approached by Reno's Islamic leader, Mike Hendi to consider preparing a portion of the products produced by Wolfpack Meats, the processing plant under went a religious purification. Training was provided by local clerics. The procedure is as follows: the animal must be slaughtered by a Muslim. The animal should be put down on the ground and its throat should be slit with a very sharp knife to make sure that the 3 main blood vessels are cut. While cutting the throat of the animal (without severing it), the person must pronounce the name of Allah or recite a blessing which contains the name of Allah, such as "Bismillah Allah-u-Akbar".

Impact:

Consumers will find the new Halal food choices in two different areas in their grocery stores: the fresh and frozen sections. "We want to help Northern Nevada's growing Muslim community meet challenges of today's lifestyle," noted Wolfpack Meats manager Bob Butler. "First we heard from Muslim consumers that they wanted Halal products that they could use as the starting-point for traditional cuisines." They will now have the flexibility to create a broad range of dishes because of the choice of fresh and frozen meats that Wolfpack Meat offers.

Consumers were also clear that they wanted to obtain their Halal food in convenient mainstream grocery stores, so we introduced a striking new labels and put the foods into local grocery stores" said Mr. Butler. Mike Hendi a local Islamic leader claims that "Muslims are grateful to finally have a choice in Reno". "The shear savings of not having to drive two hours one-way to purchase Halal products is a blessing". If you were to figure in travel cost to make their Halal purchases at the federal rate of 36.5¢/mile, a 240 miles trip would run the driver \$87.6 per trip.

Source of Funding;

State Matching Funds

Scope of Impact:

State specific

Themes: Grazing/Rangeland-Pasture Management

Issue:

A major portion of Northern Nevada has burn over the past several years, severely reducing production capability and greatly impacting natural resources. Reducing the problems caused by the burned areas down to their least common denominator most will agree that three factor always remain. In the short term, the problem is supplying forage to livestock that grazed these lands. For the longer-term, the problems are rehabilitation and prevention of future fires.

While it is standard practice to delay grazing on all burned areas for several years, there is no definitive proof that this is necessary. Depending on the burn intensity, plant growth can be rapid in a short period after a fire and the grazing deferment may not be as necessary as BLM doctrine prescribes. Seeding as rehabilitation

process is a logical conclusion. However because of the large areas affected, and different burn intensities, 100% seeding coverage may not be necessary. Nature has a large capacity to rejuvenate itself. In areas less susceptible to cheatgrass infestation, or where dust problems do not occur, seeding may neither necessary nor desirable. This project investigates the results of seeding and not seeding and subsequent timing of grazing, in a variety of ecological settings.

What Has Been Done:

The study area is a fire impacted BLM permit site. The affected area was divided into 4 large blocks for multiple research purposes. Each of the pastures had similar representatives of vegetation, soils, topography, riparian areas, fire intensity, precipitation zones, and historical wildlife and livestock use. The major design components are seeded and unseeded areas and grazed and ungrazed areas. The grazing treatments were implemented in year one preceding the fire. Stocking rate were designed to achieve 50 percent utilization. Approximately 200 AUMs were used, although this number fluctuated to match the forage produced due to rainfall and growing conditions. Varying the number of cattle and the time they are allowed to graze were used to achieve the 50 percent utilization rates. Representatives from UNR and BLM worked together to collect the monitoring data to ensure useful data for both parties. Animal (weight change, body condition score change -for both cows and calves in cow/calf pairs), vegetation (primary productivity, plant density, plant cover, species composition), and economic performance (cost return analysis, comparison impact analysis, firm to community level impacts) criteria were used to evaluate the relative success of the treatments. These criteria will provide the basic information to answer some of the questions concerning timing of grazing and fire rehabilitation procedures, as well as suggest future areas of research.

Impact:

Unprecedented wildland fires have had major impacts on vegetation systems throughout the Great Basin. Nursing northeastern Nevada, as well as other burned states, back to ecological health will be a monumental task requiring ongoing commitment from the public, land users and governments as well as long-term funding. However, to accept the status quo of “No Grazing for 3 Years” without proper scientific proof, could potentially bankrupt many ranchers dependant on BLM grazing permits.

Our research shows that much of Nevada’s burned rangeland could sustain grazing with no significant losses to plant diversity or density. It also indicates that the value of output per AUM to be \$35.35. This value corresponds to the dollar amount that each AUM contributes to the range cattle sectors total gross value of production (or gross value of output). The total AUM's lost due to wildfire in the five hardest hit counties during 1999 wildfires are estimated to be 133,819, resulting in a direct impact to the livestock sector of \$4,730,051. Much of this cost could have been avoided if BLM’s blanket strategy was not employed.

Source of Funding;

Nevada Arid Rangeland Initiative
State Matching Funds

Scope of Impact:

State Specific

Goal 2: Safe And Secure Food And Fiber System

Overview: Our POW goal is to conduct research and outreach programming to prevent food borne illness in Nevada.

Data from Nevada research has been incorporated into the Nevada Beef Quality Assurance Program as well as the Hazard Analysis and Critical Point (HACCP) management program to improve consumer confidence in Nevada's beef industry. Food safety is also a part of all nutrition and food preparation training conducted by UNCE under Goal 3.

UNCE faculty were instrumental working with the Nevada Cattleman's Association to introduce and teach education programs related to the Beef Quality Assurance Program to help improved food safety. In the past year, the Beef Quality Assurance has expanded in numbers, and to the next level of certification among producers.

NAES research has focused on livestock health and improved nutritional quality of meat products.

Federal and State Funding by Plan of Work Goals

	<u>Goal</u>	<u>Federal \$</u>	<u>State \$</u>	<u>County</u>	<u>Total \$</u>	<u>FTE</u>
Nevada Agricultural Experiment Station	II	\$7,881	\$ 507,349		\$515,230	12
University of Nevada Cooperative Extension	II	\$322,516	\$1,496,770	\$1,641,176	\$3,460,462	59

Themes: Foodborne Pathogen Protection

Issue:

In 1982, the clinical importance of verotoxin-producing *Escherichia coli* (VTEC) was recognized when *E. coli* 0157:117 was isolated from human stools during an outbreak of food-borne illness associated with the consumption of improperly cooked ground beef. Because slaughtered cull cows contribute significantly to the ground beef supply they are considered a food safety risk factor if they harbor VTEC. It has become apparent that the epidemiology of food-borne diseases has changed rapidly over the past two decades as new pathogens emerged, well known pathogens increased in prevalence, and other organisms previously considered opportunistic pathogens have developed highly pathogenic strains. In order to protect today's consumers, considerable research is required to understand the life history of these pathogens and determine best management strategies that reduce infectious outbreaks.

What Has Been Done:

The objective of this study was to assess prevalence of verotoxin-producing *Escherichia coli* (VTEC) in culled beef cows at the time of shipping to slaughter. Based on the microbiological methods, 154 initial isolates representing samples from each of the eight ranches in Nevada were selected and screened for verotoxicity. Seventeen isolates (i.e., 11% of the total tested) were confirmed to be verotoxic. These findings indicated that testing culled beef cows at the time of shipping to slaughter revealed the presence of several VTEC strains in the cows' feces. Of these, several strains (i.e., O8:H, O141:H, and O157:H7) are known to cause human illnesses. Potential microbiological hazards for food-borne illnesses from culled dairy cows were found to also be similar to those of culled beef cows because they also enter the food chain as ground beef.

Impact:

Of the 97.3 million cattle in the United States, approximately 6 million cows are culled annually due to decreased production, health problems, or reproductive inefficiency. Because these cows enter the food chain as ground beef, it is important to understand their carriage of dangerous strains of *E. Coli*.

Because culled beef cows enter the food chain as ground beef, determination of infected cows before shipping to slaughter can provide significant benefits to the beef industry. Isolation of such cows and subjecting them to pre-harvest (e.g., water trough cleaning, use of feed additives or probiotics, proper manure handling,

changing feeding regime, and feeding specific dietary ingredients) and/or post-harvest (e.g., trimming, spraying with sanitizers, and hot-water washing of the carcass) control measures would assure safety of their beef and the beef from other animals slaughtered and processed at the same packing facilities.

Source of Funding;

Integrated Research, Education, and Extension Competitive Grants Program
State Matching Funds

Scope of Impact:

National

Theme: Food Quality/Food Safety

Issue:

The beef industry is a staple of Nevada's economy, and ranchers across the state are dependent upon consumer beef consumption for their livelihood. But the American consumer has become more wary of beef in recent years. They have demonstrated that the safety and quality of the food they eat is one of their top priorities. It is the responsibility of beef producers to ensure that every animal has been managed and treated correctly, and by doing so, producers are securing a bright future for the industry. Beef Quality Assurance (BQA) education has become a national initiative and top priority of the National Cattlemen's Beef Association (NCBA). It is a necessary step to ensure the industry's success.

What Has Been Done:

BQA programs teach cattle ranchers in all 50 states about animal genetics, cattle handling, feed purchasing, record keeping, testing and other procedures to produce beef without residue of animal health products or pesticides. Since 2000, University of Nevada Cooperative Extension (UNCE) has taught safety and quality assurance practices exceeding federal standards to more than 500 Nevada beef producers in workshops, during conventions and in chute-side, on-ranch situations. UNCE specialists use a 44-page, Nevada-based BQA reference book, computer technology and CD information provided by the NCBA, to teach BQA principles. Participants work closely with veterinarians, scientists and other specialists to keep cattle healthy, improving overall quality and consumer confidence.

Local partners include the Nevada Beef Council, Nevada Cattlemen's Association and Nevada Department of Agriculture.

Impact:

More than 300 Nevada cattle producers have received national level 1 certification in the BQA program; more than 40 have become level 2 certified. This program will directly affect the wholesomeness and safety of their beef products and the satisfaction of consumers. As the level of confidence in beef products rise, the demand is also expected to increase. An informal post survey conducted by the Nevada Cattlemen's Association shows that 90% of participants who became certified have changed the way they process cattle. The BQA program in Nevada is part of a national effort which has resulted in a 25 percent reduction in the amount of injected site lesions due to improper vaccination protocol on beef cattle.

Source of Funding:

Smith-Lever Act funds,
State Matching Funds
USDA Risk Management Agency
USDA Food Safety Inspection Service

Scope of Impact:

State Specific

Goal 3: Healthy, Well Nourished Population

Overview: Our POW goal is to conduct research to better understand healthy life style habits, and educational programs that focuses on healthy life style habits.

Many studies have documented the impact of nutrition on learning and health problems such as obesity among youth, diabetes, heart disease, hypertension and stroke among minorities as well as other adults. Therefore, major UNCE programs have been directed at improving the nutritional knowledge and eating behaviors of youth, especially those from minorities or limited resource families. Special efforts have also been made to reach minority audiences in these programs and examples are given below.

NAES research has focused on nutritional intervention strategies with dietary fat to assist in the treatment of human cancers and research on humanizing organs in sheep tissue through stem cell implantation.

Federal and State Funding by Plan of Work Goals

	<u>Goal</u>	<u>Federal \$</u>	<u>State \$</u>	<u>County</u>	<u>Total \$</u>	<u>FTE</u>
Nevada Agricultural Experiment Station	III	\$145,358	\$1,311,757		\$1,457,115	33
University of Nevada Cooperative Extension	III	\$ 183,856	\$ 853,263	\$935,583	\$1,972,702	23

Themes: Human Health

Issue:

Cancer accounted for over 500,000 deaths in 2000 making it the second leading cause of death in the US. Several studies and numerous observations have shown that incidence and mortality of cancer is lower in Eskimo populations of Alaska and Greenland and the general population of Japan. Why are these population different? Scientists at University of Nevada feel that the answer lies in their predominately fish diets.

What Has Been Done:

Our laboratories have reported that diets rich in omega-3 fatty acids (fish and algae oil) significantly depressed the growth in athymic (nude) mice of human mammary carcinoma-MX-1, human colon carcinomas WiDr and Colo-205, human prostate carcinoma PC-3, human pancreatic carcinoma AsPc-1 and human ovarian carcinoma NJ8-97. In addition, we demonstrated that dietary fish oil improved the responsiveness of human mammary carcinoma MX-1 to chemotherapy with doxorubicin, mitomycin C and cyclophosphamide by enhancing drug activating enzymes within the tumors. The toxicity of cyclophosphamide was significantly depressed towards the host athymic (nude) mice by feeding fish oil compared to feeding corn oil.

We are currently following up on these exciting observations by investigating a variety of nutritional intervention strategies to improve the management and treatment of several types of cancer in laboratory animals with the ultimate goal to translate these animal findings into clinical trials. In addition, we continue to investigate the mechanism of growth inhibition induced by dietary fish oil. Preliminary findings from in-vitro and in-vivo studies indicate that the omega-3 fatty acids induce programmed cell death within the tumor. Our current work is focused on the biochemistry and molecular biology of tumor suppressor genes and proteins. In 2004, the first human clinical trials will begin.

Impact:

Encouraging results from nutritional intervention studies employing laboratory animals have shown that dietary algae and fish oil significantly depresses the growth of a variety of cancer tumors (mammary, colon, prostate, ovarian, and pancreatic) and inhibits metastasis (invasion of other organs/tissues). Human colon cancer growth in mice was depressed by 90% by feeding a diet rich in omega-3 fatty acids (8% corn oil + 16% golden algae oil) compared to a high fat diets (24% corn oil) . Similarly, colon cancer growth was depressed by

75% when mice were fed a high fish oil diet (8% corn oil + 16% fish oil) compared to 24% corn oil fed controls.

A terminal lung cancer victim learned of the privy to research being conducted at UNR and decided to take matters into his own hands, began taking fish oil supplements 18 months ago in hopes extending his life. His doctor in May 2001 reported that: "CT scans and X-ray analysis revealed a 66% decrease in size of lesions throughout both lungs. For a patient originally given only a few fleeting months to live, these finds are extremely encouraging."

Source of Funding;

Hatch
State Matching Funds

Scope of Impact:

National

Themes: Human Health

Issue:

It's bad news, says your doctor. Your liver is failing. So he extracts stem cells from your bone marrow and injects them into a sheep fetus while it is still in the womb. When the sheep is born, much of the animal's liver will consist of your own cells - ready to be harvested and given back to you. This dream therapy is still years off, if it happens at all, but the first steps have already been taken by a team led at the University of Nevada, Reno.

What Has Been Done:

UNR researchers original goal was to see if unborn children with genetic defects could be treated by injecting healthy stem cells into the fetus. This is still his main aim, but while doing animal experiments he realized the technique could also be used to grow "humanized" organs. Researchers first showed that when human stem cells extracted from bone marrow are injected into sheep fetuses, the human cells become part of the heart, skin, muscle, fat and other tissues. But the numbers of human cells were very low. In recent months, the team has now managed to produce sheep-human chimeras with a surprisingly high proportion of human cells in some organs. With recent results showing between 7 and 15 per cent of all the cells in the sheep's livers are human. In some special cases the human liver cells cluster together to form functional, fully human liver units, which could be transplanted whole as auxiliary organs.

Impact:

If perfected, the technique could overcome some of the big stumbling blocks facing researchers who want to make tissues and organs for implants. It might yield significant quantities of just about any kind of cell or tissue, for instance, with no need to fiddle about with different culture conditions or growth factors. Instead, the host animal's own developmental program guides the injected human stem cells into their final roles. "We take advantage of the growing nature of the fetus," Dr. Esmail Zanjani says.

It would also allow doctors to obtain immune-compatible cells without having to create human embryos by therapeutic cloning. Human cells could be separated from the animal ones simply by modifying existing cell-sorting machines. Providing the method really does produce normal human cells, they would not be rejected. And any stray animal cells would be killed off by the recipient's immune system.

Source of Funding;

State Matching Funds
National Institution of Health

Scope of Impact:

National

Theme: Human Health/Human Nutrition**Issue:**

Data from The Centers for Disease Control and Prevention indicate that minority populations have a disproportionately high incidence of chronic diseases such as cancer, diabetes, heart disease, hypertension and stroke. Modifying the associated risk factors can reduce the incidence of these diseases. A Clark County community health survey revealed that two-thirds of respondents feel the ability to shop for and prepare healthful foods has a positive impact on their health. Forty percent report having high blood pressure, 40% have a history of diabetes and 28% report high cholesterol.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) developed several Clark County programs to meet these needs. The first, Food for Health and Soul, seeks to decrease the risk of chronic disease by encouraging families to modify their favorite recipes, decreasing sugar, fat, salt and sodium and increasing fiber-rich ingredients during preparation. In 2003, more than 200 participants were reached through seven churches, one library and one community center. Twenty-five health coordinators have been trained to teach this curriculum in the Las Vegas faith community. The classes include a presentation, lesson handouts, food preparation ideas and food tasting.

The second program, The Healthy Hearts Project, creates awareness of cardiovascular disease risk factors, providing educational programming to increase knowledge and build skills to bring about behavior changes to decrease these risks, as well as addressing barriers to seeking and practicing preventive medical care among African Americans. This collaboration between UNCE and the Community Partners for Better Health Coalition developed an action plan that creates awareness of “controllable” risk factors for cardiovascular disease and addresses cardiovascular disease disparity among African Americans. Healthy Hearts includes regular radio talk shows, newspaper articles, recipes distributed through churches, newsletters distributed to churches and healthcare facilities, and billboards and bus shelter posters. Workshops are offered on the risk and prevention of diabetes and hypertension and increasing physical activity. More than 1,000 participants attended classes in 2003, with an additional 400 participating in exercise programs.

Impact:

More than 200 Food for Health and Soul participants completed pre- and post-tests. They changed stages during the workshops, moving from contemplation to food preparation, action and maintenance. About 80% of participants found the workshops and presenter to be excellent; 94% intend to use the information; and 98% will encourage others to attend the workshops.

Surveys in the Healthy Heart program test the impact of the awareness activities. In 2003, more than 700 awareness surveys were collected at 20 locations within the three targeted zip codes. People who had heard of the program found the information very useful; the highest number of respondents had heard the talk show; and those who tried the recipes said they would make them again. More than 60 surveys taken after diabetes sessions revealed a knowledge retention rate of 59%. More than 100 participants in a hypertension workshop reported a 61% retention rate, and behavior changes related to fat and sodium intake. In physical activity programs, participants showed a 30% improvement in exercise behaviors.

Source of Funding:

Smith-Lever Act funds,

State Matching Funds

USDA Food and Nutrition Service (Food Stamp Nutrition Education Program),

Centers for Disease Control and Prevention

Scope of Impact:

State Specific

Theme: Human Health/Human Nutrition**Issue:**

Childhood and adolescence are the critical periods for development of good health practices; many health behaviors established in childhood persist in adulthood. Because many chronic diseases are attributable to poor diet, physical inactivity and overweight, it is essential to start good health practices as early as possible. Although there is little data specific to Nevada, the National Center for Health Statistics' publication, *Health, United States, 2003*, showed that in 1999-2000, the prevalence of overweight and obesity among American adults was 65%, 15% of children ages 6-11 and 16% of adolescents ages 12-19. Individuals from lower socio-economic status are more likely to be overweight or obese than those of higher socio-economic status.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) collaborated with The Fraternity of Executive Chefs of Las Vegas and developed a nutrition education curriculum that promotes practices engendering lifelong, healthy lifestyles in children. Chefs for Kids teaches nutrition to children ages 6-8 in nine Clark County "high needs" elementary schools.

Every week, educators teach second-grade students about the origin, use and need for food. Students also learn about healthy food combinations and choosing foods that provide the greatest benefit to their bodies. The curriculum is tailored to the needs and abilities of the children. Additionally, the chefs donate 300 hours yearly preparing much-needed breakfasts for the students at each participating school, with food donated by local properties and purveyors. The program is partially supported by a social function that raises about \$50,000 yearly in private funds.

Chefs for Kids has reached more than 14,900 students since its inception. To reach an even broader audience, UNCE collaborated with KLVX, the Las Vegas public television station, and developed "Adventures with Chefs for Kids," a series of five videos featuring puppets. The videos were transmitted to all Clark County first-grade classrooms through the instructional television system, augmenting a classroom curriculum developed by UNCE nutritionists. More than 2,100 copies of the curriculum were distributed in Nevada and other states. Teachers nationwide may access the lesson plans for this unique educational program at www.unce.unr.edu/publications/Chefs/Chefs4Kidsintro.doc

Impact:

Teachers and students have reacted positively to Chefs for Kids. There is a high level of interest and participation in classroom activities, and both students and teachers have been motivated to make healthier choices. Evaluation has shown that children are retaining knowledge learned throughout the school year. They were asked to write a brief definition of "variety," and explain why they need to eat many different kinds of foods. Seventy-two percent of children were able to list favorite foods with zero or only one error. When defining "variety," 73% described it as eating many different things or many different kinds of foods. As evidenced in a snack evaluation, children chose an average of one more healthful snack from pre- to post-test. Anecdotal evidence indicates that teachers were motivated as well. One teacher said that, when planning class celebrations, she consciously places more importance on students bringing healthful snacks to share.

Source of Funding:

Smith-Lever Act funds,
State Matching Funds
Fraternity of Executive Chefs of Las Vegas
Private Donations

Scope of Impact:
State Specific

Theme: Human Health/Human Nutrition/Birth Weight

Issue:

The prevalence of childhood obesity has dramatically increased nationwide. The underlying causes are many, ranging from genetic propensity to socioeconomic, cultural and environmental influences resulting in unhealthful eating and physical activity practices. A person's relationship with food and physical activity begins in infancy and is molded during childhood. It goes beyond food selection, preferences and quantity. It goes to the very core of adult-child interactions based on either trust (potentially supportive) or control (potentially damaging).

What Has Been Done:

Given the multi-dimensional causes of childhood obesity, educational programs are composed of a group of efforts under the Childhood Obesity Prevention in Nevada umbrella. No one program can achieve the overarching goal to reduce the incidence of childhood obesity; thus, the issue is addressed with a multi-pronged approach. University of Nevada Cooperative Extension (UNCE) efforts focus on adults who directly feed children (i.e., parents or childcare providers) or those who work with these adults (health professionals). Enough is Enough is a program that demonstrates to low-income parents the appropriate portion sizes for young children through a visual teaching tool. *Tummy Talks*, a children's storybook relating the concept of self-regulation of food intake to preschool children, was completed and pilot tested; 25,000 copies were printed.

Nurturing Partners' concepts are taught in schools and homes. UNCE staff facilitate changes in knowledge, attitude and practices of teens regarding nutrition, health and parenting issues. The lessons include making healthful food and nutrition choices, maternal health care, infant care skills, child development, personal development, and financial and home management. Teens (ages 10 to 19) were selected because of the high birth rate in this population in Nevada and Las Vegas. The staff works in alternative high schools to bring core program elements to parents or prospective parents. Weekly classes were presented to more than 5,200 teens at 11 schools in 2003. Home visitations continue to support the most vulnerable pregnant teens.

Community partners are the Clark County high schools, the local WIC agencies, UMC Family Resource Center, Probation Judicial Studies and Child Haven.

Impact:

The parents who read *Tummy Talks* reported they were able to interpret the messages, and were willing to read it to their child often. In turn, the children were able to articulate what the book was about and even suggested some titles.

In the Nurturing Partners high school classes, students answering the surveys revealed a statistically significant improvement in nutrition knowledge. Following the program, the majority of pregnant teens delivered healthy infants, with a mean birth weight of 6 lbs. 9 oz. Most mothers attempted to nurse their babies.

Source of Funding:

Smith-Lever Act funds,
State Matching Funds
USDA Food Stamp Program, State of Nevada Health Services WIC Division

Scope of Impact:
State Specific

Theme: Human Health/Human Nutrition

Issue:

In 2000, more than 96,000 Nevada adults (6.7% of the population) were diagnosed with diabetes. An additional 600,000 people were at risk for diabetes because of age, obesity, sedentary lifestyle and ethnicity. Diabetes is also the leading cause of heart disease, disproportionately affecting diverse populations. Individuals of Hispanic origin are twice as likely, African Americans 1.7 times as likely and Native Americans, 2.8 times as likely to develop diabetes as non-Hispanic whites of similar age.

The direct cost of hospitalization for diabetes in Nevada in 2000 was about \$721 million, not including outpatient medical care and loss of productivity. Individuals with diabetes spend \$7,400 more annually on health care than those who do not have the disease. Preventing diabetes translates into huge medical savings to patients and the community.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) developed An Ounce of Prevention, a diabetes prevention program targeting Hispanics, African Americans and Native Americans who are at an increased risk for developing the disease. Lessons in both English and Spanish help clients learn how to reduce their risk by: making lifestyle modifications to prevent or delay the onset of diabetes and its complications; increasing physical activity; and adopting healthy eating habits.

Four separate, culturally sensitive curricula were developed and published: *An Ounce of Prevention African American*; *Native American*; *English Version for Hispanics*; and *Mas Vale Prevenir: Version en Espanol*. Nearly 1,000 Las Vegas residents have completed the program taught by three bilingual teachers. An Ounce of Prevention was expanded through a train-the-trainer component; 32 Native American health representatives and African American church volunteers have now been taught how to educate others about diabetes.

Impact:

Program participants were assessed on a variety of measures including knowledge about diabetes, knowledge of risk factors associated with diabetes, dietary behaviors and physical activity before and after delivery of the curriculum. Evaluation indicates the diabetes program resulted in both knowledge gain and behavior change among participants.

Recognition of factors that contribute to the development of diabetes was increased, and a heightened awareness of lifestyle factors related to risk reduction (i.e., physical activity and energy intake) was documented. Participants increased their physical activity through walking and using stairs more often. They decreased their dietary fat intake by modifying food preparation techniques.

By helping prevent diabetes in more than 800 clients, a medical savings of more than \$5 million was achieved.

Source of Funding:

Smith-Lever Act funds,
State Matching Funds
Nevada Health Division/CDC

Scope of Impact:

State Specific

Theme: Human Nutrition

Issue:

A needs assessment identified target audiences and educational priorities for eligible food stamp recipients in Nevada. The assessment determined there was a need to increase the consumption of low-fat, calcium-rich foods among children (particularly females), ages 11-14 years. Children in this age group have lower intakes of calcium, among other nutrients. If calcium needs are not met during this critical development stage, the risk of osteoporosis increases in later life.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) established the Nevada Nutrition Network (NNN), a statewide coalition of public and private partners, to create, implement and evaluate a nutrition program that reflects the principles of social marketing for those eligible for food stamps. The NNN developed a school curriculum for science classes and home and career classes, along with media activities and an extensive evaluation plan with the goal of increasing calcium intake among 11-14-year-old children.

The program was launched in 2000 and repeated in 2001, 2002 and 2003 with classroom instruction in two middle schools – one in Las Vegas and one in Sparks. Special events to reinforce curriculum concepts were held at both schools. Sampling of calcium-rich foods allowed students to become familiar with foods such as string cheese and yogurt. A mass media campaign, “Calcium, Its NOT Just Milk,” was conducted in both markets in 2000 and 2001, including posters, bookmarks, billboards, bus stop shelters and radio spots recorded by the students themselves in local stations. A more limited campaign was held in 2003.

Impact:

The campaign has reached approximately 2,650 students over the past four years. Pre- and post-tests conducted with the middle school students suggest the program was successful in enhancing knowledge of food sources of calcium, the perceived importance of eating calcium-rich foods and relative calcium requirements.

In 2003, a 16-item instrument was conducted pre- and post-program to evaluate students’ knowledge, attitudes and consumption of calcium-rich foods. There was a significant knowledge gain in six of 10 questions in the post-test over the pre-test. There was a trend toward more frequent selection of calcium-rich foods after the intervention, with an increase in eight of the nine calcium-rich foods. There were significant increases in the reported selection of cheese, ice cream, frozen yogurt, pudding and milk.

Also in the post-test, 63% of students agreed that, “The food tasting events encouraged me to eat more calcium-rich foods.” Eighty-two percent agreed that, “After learning about the importance of calcium in my science class, I try to include more calcium-rich foods in my diet.”

The Calcium curriculum was taught to middle school science teachers in the Clark, Nye and Lincoln County School Districts at a summer institute. It is also available on the Internet for all Clark County school teachers.

Source of Funding:

Smith-Lever Act funds,
State Matching Funds
Food Stamp Program, Food and Nutrition Services, USDA

Scope of Impact:

State Specific
Integrated Research and Extension

Theme: Human Nutrition

Issue:

As the cornerstone of the USDA's nutrition assistance programs, the Food Stamp Nutritional Education Program (FSNEP) plays a vital role in helping to improve nutrition in the nation, particularly among low-income individuals.

The "Community Partnerships: Nevada's Incentive Program" was designed to expand the reach of Nevada's part in the FSNEP through partnerships with other agencies and organizations that reach low-income audiences.

The goal of the program is to increase the variety and number of nutrition education programs that benefit food stamp recipients and other low-income audiences throughout Nevada. To accomplish this goal, the University of Nevada, Reno and the Nevada Division of Welfare are working together to help local agencies initiate or expand nutrition education programs in their communities and to provide the infrastructure necessary to receive additional federal funding.

What Has Been Done:

To date University of Nevada (UNR) has developed a web site on Nevada's FSNEP that serves as means of sharing information about the program, local and federal guidelines, up-dates, existing FSNEP programs and grant resources. UNR representatives have met with representatives of the Nevada Welfare Division to ensure that the Plan is consistent with the needs of Nevada's Food Stamp Program clients along with consulting with support staff from other states to learn more about ways to expand the FSNEP within Nevada. Information about the Incentive Program was sent to 600 potential collaborators throughout state, county and city offices informing them about the opportunities to expand nutrition education programs for Food Stamp Program clients.

During the first few years of the program, the University of Nevada took advantage of the incentive program and developed or expanded six programs that educated Nevadans in everything from nutritional curriculum in our elementary schools to showing senior citizen how to maintain a higher quality of independent living. In 2003, UNR has added Clark County Health District (Las Vegas) to the Nevada's Incentive Program as a partner. This was and especially big moment for the program because CCHD focuses heavily on lower income schools.

Impact:

The CCHD/FSNEP 2003 partnership facilitated more than \$46,000 in federal reimbursement for nutrition education activities in Clark County alone. The FSNEP has had direct contact with over 74,000 food stamp recipients and another 170,000 through mailings and other mass media avenues. The program has become so successful that Nevada's Department of Welfare is hiring a Nutrition Specialist – the first in Country. UNR's Dr. Jamie Benedict states that "Using food stamps, though distributed through the welfare office, is more of a nutritional issue than most people realize. In general, folks who rely on food stamps fall into the 'At Risk' health category. And by improving their overall health, one only needs to follow the logic to see positive results."

Source of Funding;

Nevada Welfare Division
State Matching Funds

Scope of Impact:

State specific

Goal 4: Greater Harmony Between Agriculture And The Environment

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

- 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
- To analyze and strategically confront barriers to implementation of community-based decision-making and collaborative utilization models for public lands

Given the nature of Nevada, water and wildfire related educational programs have been a primary focus of the University of Nevada Cooperative Extension Service (UNCE). In both of these areas, UNCE faculty have made a significant impact and received local and national recognition for their efforts.

In the “living with fire” educational program, UNCE faculty continue to have a significant impact on people’s awareness and preparedness for wildfires. The program has grown and expanded each year, and many request are received for materials and assistance from other states as well as from the Federal level. This is an integrated research-extension effort, and has led to statewide cooperation and involvement of Federal, state and local organizations concerned with wildfire prevention and preparedness.

Water quality is a concern for both urban and rural communities in Nevada. Major UNCE efforts have been devoted to working with local groups and organizations to reduce non-point source pollution, and to clean up various waterways. Because of the Fallon cancer cluster, significant water research and education efforts have been undertaken in the Fallon area. Additionally, having education programs for rural public community water supply operators has been important.

NAES research has focused on predicting hazardous spills in local water supplies, evaluating livestock grazing for vegetation management, compatibility of wildlife and livestock on irrigated pastures, arsenic and mercury contamination from mining in Nevada watersheds, using NAES field labs to conserve municipal water supplies, and evaluating various range management systems for post wildland fire grazing.

Federal and State Funding by Plan of Work Goals

	<u>Goal</u>	<u>Federal \$</u>	<u>State \$</u>	<u>County</u>	<u>Total \$</u>	<u>FTE</u>
Nevada Agricultural Experiment Station	IV	\$464,792	\$2,530,391		\$2,995,183	52
University of Nevada Cooperative Extension	IV	\$221,657	\$1,028,696	\$1,127,942	\$2,378,295	17

Themes: Biodiversity/Rangeland-Pasture Management

Issue:

The general dogma in curlew behavior – a bird listed by USFW as “of concern species” with only an estimated 20,000 remaining worldwide – is an animal that will nest only in wet meadows with short-grass and no shrubs, e.g., prairies. These environmental factors help mitigate the physiological constraints of an extremely long fledgling period, exposing chicks to all sorts of dangers. When compared to Nevada’s common shore birds, the curlew typically requires double the time to fledge (70 days). The USFW states that the major threat to curlews is degradation of their native grassland breeding habitat. However, recent observations have found hundreds of curlews living in Eastern Nevada. A sage-brush community, with little to no water. What has brought these birds to Nevada?

What Has Been Done:

Over the past 2 years University of Nevada researchers in cooperation with local ranches of the Humboldt and Ruby valleys have developed a grazing strategy that reduces Nevada's curlew population risk of survival. Grazing cattle in low-land valley pastures during the fall/winter months, moving the cattle off the pastures for spring/early summer months, using annual snow melt runoff to irrigate pastures and waiting until mid-July to cut a single hay crop. To gain a better perspective of how these management practices might help curlew populations, UNR scientist conducted annual censuses that determined not only total numbers and nesting success, but how many birds decided to return to Nevada as apposed to some other traditional spring breeding ground.

Impact:

Over the past few years, ranchers along the Humboldt and Ruby valleys with guidance from UNR researchers have begun a management practice that has greatly enhanced Eastern Nevada's curlew population. A species of bird typically found in the teens can now be found by the hundreds. An site loyalty is proving to be nearly 100% by returning breeding pairs each year. By grazing cattle in the winter and moving them to higher pastures in the spring/summer, flood irrigating with winter runoff, and not cutting the pastures for hay until July, curlew parents are now rearing 100+ chick per year. An outcome that has generated heavy interest form USFW officials and environmentalist alike.

Source of Funding;

Nevada Arid Rangeland Initiative
State Matching Funds

Scope of Impact:

State specific

Themes: Biological Control/Natural Resource Management**Issue:**

Large areas of Nevada rangelands are now dominated by cheatgrass (*Bromus tectorum*) an introduced annual. The negative impacts of cheatgrass are many. It has been shown to displace native perennial grasses on undisturbed sites. It is poor quality forage for most wildlife species and livestock. It grows prolifically in the normally sparse interspaces between native shrubs and grasses. This growth habit creates a continuous fuel load which dries rapidly in early summer. The result is a significant increase in the number of fires and a subsequent decrease in the fire return interval which eliminates many desirable perennial plants.

Rehabilitation of these rangelands requires a combination of cheatgrass control followed by reseeding with adapted plant species. Mechanical control of cheatgrass by mowing, disking, or burning has been shown to be relatively ineffective. The most successful controls currently in use involve spraying the cheatgrass with herbicides. While this method has shown good success, herbicide use is controversial and expensive.

What Has Been Done:

A study was conducted on BLM land in the Elko district that was a cheatgrass dominant site. The different planting strategies (disk and drill vs. sheep grazing and trampling in the seeds) were compared using various seed mixtures in spring and fall plantings. Sheep grazed sites were grazed at least two seasons to control cheatgrass re-growth.

Impact:

Sheep grazing of cheatgrass plots for 2 growing seasons following broadcast seeding of native grasses and shrubs was effective in controlling competition from cheatgrass, with the restored plant community being

approx. 90% native plants and 10% cheatgrass. When conventional disking and drilling of natives seeds was used, more native seeds germinated, but the plant community was approx. 90% cheatgrass and wild mustard.

The results of this project indicate that using sheep grazing to trample in seeds and control recruitment of invasive species merits further evaluation as a restoration treatment on cheatgrass infested rangelands

Source of Funding;

Hatch

Nevada Arid Rangeland Initiative

State Matching Funds

Scope of Impact:

State specific

Theme: Drought Prevention & Mitigation/Water Conservation/Recycling

Issue:

The Las Vegas Valley is one of the fastest growing areas in the nation with 4,000 to 6,000 new residents moving in each year. The area is also one of the driest in the nation. The increased water demand due to the population rise is expected to overtake current water allocations in the next few years. Up to 65% of potable water is used to irrigate residential landscapes. Rising water costs and legislation are forcing people to manage water more efficiently, such as desert landscaping, and are encouraging managers of large landscape areas to use poorer quality water for irrigation. Many golf courses and other large turfgrass areas will be converted to reuse water (treated sewage effluent) in the next 10 years. However, using reuse water has been shown to damage golf course foliage.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) addresses these challenges through extensive education and research efforts. Seven-week, hands-on landscape retrofit classes show homeowners how to create desert landscape designs that conserve water and energy. A course in the management of reuse water in urban landscapes is also offered to personnel who manage large turfgrass areas; materials cover health issues, regulations, cost/benefits and best management practices. Research projects complement the classes. Nine Las Vegas golf courses are involved in a UNCE research project to help them transition to using reuse water. Now in its seventh year, the Desert Green Conference educates commercial clientele and others, including Master Gardeners, who have an interest in water-conservation issues. Further education is accomplished through publications, the mass media and email, targeting homeowners and professionals.

Impact:

Thirty-six students in the landscape retrofit classes who completed residential landscapes in Clark County were documented by the Southern Nevada Water Authority to have an overall water savings of 42%, or more than 5 million gallons per year. The landscapers also saved more than \$7,800. More than 350 commercial clients attended the 2003 Desert Green Conference. The Desert Bioscape Program: A Sustainable Urban Environment taught more than 320 Master Gardeners and 250 commercial clients, with 95% responding favorably to the holistic concept. Eighty-seven percent of students are implementing desert bioscape practices to create a more environmentally friendly yard.

Several research projects evaluate the sensitivity of trees to the application of sewage effluent on large turf areas. The first phase of the foliar damage study investigated the impact of applying reuse water via sprinkler irrigation directly to the canopies of 20 ornamental trees. An extensive plant list has been developed for managers to select the best trees for exposure to effluent, along with a visual damage index rating system. The plant list will be expanded to include 20 shrub and groundcover species. Based on foliar damage ratings,

managers will know which species may require changes in irrigation management and which to select as replacement species.

Source of Funding:

Smith-Lever Act funds,
State Matching Funds
Local Water Authority

Scope of Impact:

State Specific
Integrated Research and Extension

Theme: Endangered Species/Natural Resource Management

Issue:

The multiple use of rangeland resources requires balancing of the various uses on both public and private lands. This balancing between resources and economic interests has always been a source of conflict in Nevada, sometimes leading to violence and litigation. University of Nevada Cooperative Extension (UNCE) has long been recognized as an expert in the facilitation of local and regional disputes over the use of resources, particularly involving livestock and wildlife interactions. The sage grouse population, once estimated to be 2 million in the West, has dipped to 250,000 or less. When groups threatened to list the species as endangered, Nevada Governor Kenny Guinn instituted a Sage Grouse Initiative with the goal of maintaining or increasing the numbers to prevent negative economic, recreational and other land-use impacts. He brought various interest groups together to develop and implement a 20-year statewide conservation program to balance the need for sagebrush habitat, sage grouse populations and economic activities.

What Has Been Done:

The Governor's Sage Grouse Conservation Team asked UNCE to provide group facilitation and technical input for six local planning groups that are developing local sage grouse conservation plans. These local plans represent the needs and aspirations of area residents and are being developed through a public participation process facilitated by a team of UNCE educators. In 2001, the facilitation team was trained; the team and other UNCE resource people participated in the Governor's kick-off conference attended by 150 people. The geographically assigned communities continued their meetings in 2002 and 2003. A draft conservation plan was produced in the Bistate (Nevada/California) Planning Group that identifies current habitat conditions, sage grouse risk factors and strategies to enhance their populations. Other groups are making progress toward their conservation plans; final plans are to be completed by June 2004. A Sage Grouse Symposium is set for March 5-6, 2004 to honor the many volunteers involved in the planning process.

Impact:

This is a unique partnership and has been a public-awareness opportunity for UNCE to utilize its ability to meet a critical community and statewide need and contribute to the resolution of a high-profile, public-policy issue. It could be a model for the West in dealing with natural resource issues. The process has brought varied interests together and built productive working relationships. Doug Busselman, member of the Governor's team, remarked, "Cooperative Extension facilitators and technical experts are making a valuable contribution in educating and helping volunteers stay engaged when the going might get tough." The development of a 20-year plan will conserve sage grouse and sagebrush ecosystems, resulting in social, economic and environmental impacts.

Source of Funding:

Smith-Lever Act funds,

Scope of Impact:

State Specific

Themes: Grazing Water Quality/Nutrient Management

Issue:

Reduced water quality in high altitude pristine environments such as the Sierra Nevada has been attributed to increased algal growth caused by nutrient inputs in surface and groundwater from disturbance and development. As a result, hundreds of thousands of taxpayer dollars are currently being spent on litigation trying to settle disputes between environmental, residential and commercial interests. In order to live in harmony with each other, as well as with the natural environment, we must first identify specific cause/effect interactions that result in environmental degradation. Few studies have addressed the natural pollution potential of pristine sub-alpine forested watersheds. This research identifies the pollution potential from natural contributions of soluble inorganic and organic nitrogen and phosphorus. The study involves the field collection of natural groundwater recharge from snowmelt and summer precipitation, and the laboratory leaching of intact soil cores taken from forested, open and riparian areas of the Sierra Nevada. Findings will also apply to other high altitude environments throughout the State, and greatly assist in the resolution of conflicting natural resource values.

What Has Been Done:

Two pristine locations were selected for study: Little Valley, NV and Incline Creek, Nevada. Areas of specific investigation within each general location consisted of forested, open and riparian watershed conditions. In situ colloid-bound Nitrogen (N) and Phosphorus (P) in soil solution during saturated groundwater recharge from spring snowmelt and high intensity summer precipitation were measured using zero tension lysimeters. The in vitro discharge of colloid-bound N and P under saturated flow conditions were characterized by analyzing the outflow effluent during leaching of intact undisturbed soil columns. In vitro distribution and discharge of colloid-bound N and P under vadose conditions through sectionable undisturbed soil columns were similarly characterized by analyzing the sectional distribution and the outflow effluent during unsaturated water flow. The resulting data base was incorporated into a newly developed transport model for predictive estimation of colloidal-bound N and P discharge phenomena.

Comprehensive intact core soil samples were taken throughout the Incline Creek watershed. Each sample was leached under laboratory conditions within 48 hours of sampling and interval leachate samples were collected and analyzed for inorganic and suspended/dissolved-organic N and P. Data then underwent statistical examination for interpretive analysis. Future efforts include examination of the effects of fire on physio-chemical nutrient transport processes.

Impact:

Rivers and lakes are central to the lives and livelihoods of Nevada and Californians. We depend upon our rivers and lakes to supply drinking water, irrigate farmland, and generate electricity. We also value our rivers and lakes for their ability to support an intricate web of biologically significant communities and to provides us with places of beauty to recreate. Increasingly, Nevada and Californians recognize the need for diligent stewardship of natural river and lake processes to maintain these vital resources.

Carried by runoff, plant nutrients such as nitrogen and phosphorus can enter the water, promoting algae and other aquatic plants to grow rapidly and become nuisances or result in low levels of dissolved oxygen, killing fish. To effectively control water quality, it's best to develop and implement a river, lake and watershed management plan. For such a plan to succeed, basic research like this project are required. Without it officials are forced to make uninformed discussion for controlling nutrient input.

Source of Funding;

Hatch
State Matching Funds
Multistate W-188

Scope of Impact:

State specific

Themes: Global Change and Climate Change**Issue:**

A defining feature of the last 2 million years of earth's history as well as of our modern society has been environmental change: natural phenomena have caused large and often abrupt shifts in earth's climate between glacial and interglacial stages, and the industrial revolution and explosive growth in human population have caused rapid, global increases in atmospheric CO₂, nitrogen deposition, and land disturbance. Although we now recognize and have some understanding of how these environmental changes occurred, we know very little about how these environmental changes will affect arid land plants and plant-mediated process.

What Has Been Done:

A University of Nevada researcher is conducting a joint project with the Desert Research Institute and the University of Nevada, Las Vegas to improve our understanding of how desert ecosystem will respond to increase atmospheric CO₂ levels. To examine the response of a desert ecosystem to elevated CO₂, the three groups established the Nevada Desert FACE (free-air CO₂ enrichment) Facility in southern Nevada. Measurement we obtained from above-ground production during a two year growing season while continuously maintaining the atmospheric CO₂ at 30% greater than normal. The cumulative increase in biomass was significantly higher (roughly double) in elevated CO₂ treatments than control treatments. This investigation also found that above ground production and seed rain of Red Brome (an exotic, invader species) increased threefold over that of native annuals in elevated CO₂ treatments.

Impact:

"In a lot of ways the experiment we're doing is a look into the future, and the future doesn't look so good," Professor Bob Nowak said. "What we are already seeing in the northern Nevada Great Basin with cheatgrass, we are going to see more and more in southern Nevada in the Mojave with red brome."

The problem with increased atmospheric CO₂ lies in the fact that not all plants can compete for resources equally. The data indicates that exotic grasses like Red Brome will quickly invade places (3 times greater) like the Mojave and Sonoran desert, converting a desert ecosystem into grasslands driving out the presently dominant desert shrubs. Thus, creating similar fire hazards to those of northern Nevada and the Great Basin, with the invasion of cheatgrass. Consequently, elevated CO₂ might enhance the long-term success and dominance of exotic annual grasses in arid regions. This shift in species composition, driven by global change, has the potential to accelerate the fire cycle, reduce biodiversity and alter ecosystem primary production, nutrient dynamics and landscape water balance in the deserts of western North America.

Source of Funding;

Department of Energy
State Matching Funds
Nevada Arid Rangeland Initiative

Scope of Impact:

Multistate (Arizona, California, Nevada, Utah)

Theme: Integrated Pest Management/Pesticide Application

Issue:

Central Nevada forage growers, particularly those in the Diamond Valley, have suffered severe losses in their timothy hay crops from tiny mites. The few control agents now available for timothy hay are expensive and require a special use permit. University of Nevada Cooperative Extension (UNCE) identified a critical need to obtain registration for pesticides suitable for use on cool season grasses to control the mites. In 2003, the UNCE soil and water specialist was asked to become the Nevada liaison for the IR-4 program. IR-4 is the only publicly funded program in the U.S. that conducts research and submits petitions to the Environmental Protection Agency (EPA) for registration of pest control agents on specialty crops. These high value/low acreage crops comprise 40% of U.S. agricultural production, or a value of \$40 billion. IR-4 was organized by the USDA and land-grant universities in 1963 to address the chronic shortage of pest control options for minor crops and to generate research needed by EPA to register products for labeling. IR-4 is closely tied with the national Integrated Pest Management (IPM) program.

What Has Been Done:

The UNCE soil and water specialist met with the Nevada Hay and Forage Growers Association (NHFGA) to identify potential products for submission to the IR-4 research program that would control the damaging mites. The team identified three potential pest control agents for submission in 2003. IR-4 has funding to initiate research on only 15 new fungicides, insecticides and herbicides each year; however, the miticide Acramite put forward by Nevada was selected as one of these 15 top priorities out of 350 requests nationwide. Acramite is used to control plant feeding mites. IR-4 researchers will develop residue and tolerance data for the miticide, beginning in Spring 2004.

Nevada partners include the NHFGA and Nevada Department of Agriculture.

Impact:

It will take three years for the testing of the miticide by IR-4 researchers; the chemical product would be available for use under the new label authorization after that time. In the meantime, Nevada organized a coalition of faculty from western states to identify additional needs and develop appropriate programs. The Arid Southwest IPM Network, comprised of Nevada, Arizona, California and New Mexico, was organized and received a regional IPM grant. Nevada also formed a partnership with Utah State University to conduct pest management programs and research. They recommended another pest control agent, Dimilin, important for the large Nevada alfalfa industry, to IR-4; trials should also begin on this chemical in 2004.

The new regional collaborations will culminate in an IPM information network. It will be used to identify regional IPM needs, develop pest management strategic plans and establish priorities for future funding. It will also include a web site that will serve as the primary information source related to IPM functions for this multi-state project.

Source of Funding:

Smith-Lever Act funds,
State Matching Funds
Federal IPM Grants from USDA/CSREES

Scope of Impact:

Multistate Integrated Research and Extension (NV, CA, AZ, NM, UT)

Themes: Land Use/Water Quality

Issue:

Communities in arid regions of the world are increasingly turning to water reclamation and reuse to stretch water supplies. Through water reuse, communities can keep water tables from dropping and water resources from shrinking.

With ever-increasing demands upon limited water resources, increasing costs for water treatment, and more stringent effluent disposal regulations, it makes sense to consider reusing treated wastewater for beneficial purposes. Also, as urban populations increase, the need for more creative solutions to stretch water supplies has led to new technologies and more possibilities for water reuse.

What Has Been Done:

Starting in 1997, the Nevada Agricultural Experiment Station and the City of Reno started a pilot reuse project on 150 acres of NAES forage and perennial pastures. Over time, a non-looped, effluent reuse sprinkler system was pieced together with above ground flow line to irrigate 350 acres. In 2002, the installation of 13,750 linear feet of 30 inch ductile main line, 11,880 linear feet of 12 inch PVC irrigation pipe, 26,300 linear feet of 8 inch PVC irrigation pipe, 22,500 linear feet of 2 inch stock water pipe, 700 4 inch risers, 34 frost free hydrants were installed. And an addition 20.25 mile wheel line sprinkler assemblies to complement the existing 24 wheel line assemblies. Construction was completed in 2002, thus releasing the 1,100 acres property from reliance on the Truckee River for irrigation needs.

Impact:

Nevada Agricultural Experiment Station's Main Station Research Laboratory, an 1,100 acre ranch located in the heart of Reno, Nevada is doing its part in the effort to conserve regional water supplies. Through the reuse of municipal and industrial wastewater, NAES has reduced local treatment facilities impact on the Truckee River.

In 2003, over 4.5 million gallons per day (spring through fall) of pristine Sierra-Nevada runoff remained in the Truckee River as the NAES ranch released its dependency on standard water rights to the river. By diverting effluent to the ranch, over 3.625 million pound of dissolved solids did not enter the river. That is equivalent to 188 large dump truck loads of waste not polluting Reno's water supply.

Source of Funding;

State Matching Funds

Scope of Impact:

State specific

Theme: Natural Resource Management/Land Use

Issue:

Throughout the West, population dynamics are changing. As communities grow, the land at urban fringes is being rezoned from large agricultural enterprises to smaller, one to 40+ acre parcels that maintain some agricultural uses while attracting a more diverse ownership. More than half of Nevada's farms comprise less than 10 acres. The challenge is how to reach this audience and teach them the importance of land stewardship. Local and regional impacts on soil and water resources often increase as larger parcels are rezoned into small acreage parcels. This is due to increased densities of wells and septic systems, a rise in amounts of impervious surface, and the owners' lack of knowledge and experience with integrated pest management and forage and grazing management techniques. Changes in land management may also result in accelerated rates of soil erosion, increases in nutrient loads, pesticides and total dissolved solids in surface and groundwater supplies.

What Has Been Done:

Under the leadership of University of Nevada Cooperative Extension (UNCE), a team from eight Western states spent 18 months developing a curriculum – *Living on the Land: Stewardship for Small Acreages* -- for teaching small acreage owners how to attain their property goals while protecting soil, water, plant, animal and other natural resources. The manual contains lesson plans, hands-on activities and 15 PowerPoint lessons. The team trained 50 Cooperative Extension and natural resource agency professionals from western states, who in turn implemented the program in their respective states.

In Nevada, the curriculum was also applied to educate landowners in the Carson Valley to help improve water quality in the Carson River, on the Environmental Protection Agency's 303(d) Impaired Waters List because of its turbidity, temperature and phosphorus levels. More than 900 homeowners participated in 19 workshops in 2003.

Local partners are the Nevada Department of Environmental Protection, Carson Valley Conservation District and Western Nevada Resource Conservation and Development.

Impact:

Since the successful training of Western participants, more than 940 copies of the *Living on the Land* curriculum have been distributed to 42 states and four foreign countries. The curriculum was featured in the Sustainable Agriculture Research and Education (SARE) Program's 2003 Annual Report as one of 12 best projects. More than 100 respondents to a curriculum evaluation represented 26 states and Australia. Water quality is the most common resource issue driving programming (72%); the most frequently used lessons are those on water and soils. More than 3,000 students have been taught using parts of the curriculum. One respondent who used the entire curriculum noted, "I've been doing small-acreage programs since 1981, and this is the first program where we're seeing the actual outcomes within a year's time."

Source of Funding:

Smith-Lever Act funds,
State Matching Funds
Nevada Department of Environmental Protection
Sustainable Agriculture Research and Education Program

Scope of Impact:

State Specific

Theme: Natural Resource Management/Sustainable Agriculture**Issue:**

Washoe, Shoshone and Paiute Indians live on 26 reservations and colonies in Nevada. Their population is in excess of 10,000 people utilizing more than 1.2 million acres of trust land, clustered over a rural region of 100,000 square miles. The Nevada Extension Indian Reservation Program (Nevada EIRP) facilitates the economic well-being of Indian people through agriculture and natural resource adult and youth education under the direction of University of Nevada Cooperative Extension (UNCE). Agriculture represents the primary economic activity for 13 out of the 26 reservations and colonies, with alfalfa hay and livestock being the most important commodities. Every reservation and colony in the state deals with natural resource concerns, including water quality and weeds. For youth education, Nevada EIRP focuses on two tribes that live on a large portion of the tribal land base in northern Nevada. The reservations include the Walker River Paiute and Pyramid Lake Paiute; UNCE provides youth education such as 4-H and youth needs assessments.

What Has Been Done:

In order to provide an avenue for Indian producers to communicate with professionals and each other regarding agriculture and natural resource issues occurring on Indian reservations, UNCE developed annual summits. The 2003 Summit included a workshop/tour focused on beef quality assurance and small business development; the other workshop focused on water quality, streams and waterways. Ninety people attended the three-day event.

In 2003, pesticide applicator training took place on the Walker River reservation, with five certifications approved by the Nevada Department of Agriculture. A soils workshop was held on the Pyramid Lake reservation, with four Indian producers learning the details of crop fertilization and plant growth. A cattle clinic, with 23 attendees, was held on the Walker River reservation to present the raising of cattle on 20 acres or less with a rotational grazing system. Grazing goats on the Tamarisk weed was also presented to the cattlemen, resulting in 2,000 goats brought in by the Bureau of Indian Affairs to eat Tamarisk on the reservation.

4-H participation on the Pyramid Lake reservation consisted of six clubs, with an enrollment of 60 youth. Fourteen children were sponsored for 4-H Camp from the Pyramid Lake and Walker River reservations, with assistance from private donors and the tribes.

The *Calming the Waters* curriculum, an amply illustrated, 128-page book, focuses on conflict resolution of water issues, beginning with the history of the Paiute. The bulletin, now in Pyramid Lake Junior and Senior High Schools, Yerington Intermediate School and Schurz Elementary School, has been forwarded to all reservation schools.

Impact:

Formal evaluations of the sustainable agriculture classes held on the reservations revealed that those who attended gained knowledge of sustainable rangeland practices. Evaluation of the presentations averaged 1.68 on a scale of 1 (excellent) to 5 (poor). A group of nearly 40 Native American producers representing six tribes increased their awareness of the environmental, economic and social impacts resulting from unmanaged invasive species.

Source of Funding:

- Smith Lever Funds
- USDA-CSREES EIRP funds
- State Matching Funds
- Western SARE EIRP Grant

Scope of Impact:

State Specific

Theme: Water Quality

Issue:

For years, nitrates and phosphates have been effective in lawn and garden fertilizers by providing grass and shrubs with life-giving nutrients. However, the accumulation of these fertilizers can eventually leach through the soil to invade lakes, streams and reservoirs. Loading our water sources with these particular chemicals generally results in two unfavorable consequence: the excess phosphorus typically results in “blooms”. A phenomenon that is characterized by excessive growth/death of aquatic plants and algae, depriving fish and other aquatic animals of oxygen. Likewise, nitrates finding their way into public water supplies are ingested by infants or young farm animals and changed into dangerous nitrates, which can seriously affect the blood's ability to release oxygen.

What Has Been Done:

State of the art statistical computer models were developed that estimated current levels of nitrogen and phosphorus as well as forecast the water use patterns in the Reno-Carson area and water quality trend in Truckee and Carson rivers. By using numerous sites along the two rivers over a period of 17 years to sample water quality, the models are calibrated to factor in seasonal variations in flow rates along with population growth, agricultural runoff. Research information generated from this project would be significant in planning for conserving and managing our limited water resources.

Impact:

The results calculated over an 10 year period indicate that nitrogen levels in the Truckee River are generally decreasing while phosphorous levels are above EPA recommended safe levels and appear to be on the rise. The water quality models developed at UNR are now gaining State notoriety and are being used in identifying important in-stream processes affecting river water quality, predicting the impact of future development schemes on river quality, and evaluating alternate quality control strategies for improving river water quality. In addition, all analytical software developed for this project have generously been made available on-line for free download.

Trend analysis of Nevada water resources is essential for making short-and long term projections of water supply requirements and also in generating information for policy-related matters. By discerning information on water quality trend, one can determine whether a given water resource is improving, deteriorating, or remaining stationary under current conditions. Therefore, management and policy decisions can be developed and re-evaluate, on an iterative basis, to allow changes or corrections in the management strategy to be implemented as needed.

Source of Funding;

State Matching Funds

Scope of Impact:

State specific

Themes: Water Quality**Issue:**

In rural areas, small urban centers are often surrounded by dispersed residences. The small urban centers may be served by public water supplies, while the outlying single homes rely on private domestic wells. Because of economies of scale and federal and state requirements, public water systems may provide water that is of substantially different quality than that obtained from private wells. Churchill County, Nevada has approximately 25,000 residents and slightly more than half (13,500) rely on private domestic wells for water supply.

The quality of water throughout the county has been a topic of over 70 newspaper articles in the past five years. Given the many and highly publicized studies of arsenic occurrence in groundwater, it was widely believed that residents with private domestic wells either did not consume well water or applied treatment to well water to remove arsenic prior to consumption.

What Has Been Done:

Participants were recruited from throughout the county by responding to direct solicitations from a research team and by responding to flyers directly distributed to businesses in Churchill County and to many homes. Residents were offered an incentive to participate. Participants who answered a questionnaire completed at the residence and allowed collection of a tap water sample were given a Routine Domestic Analysis (value of \$100, provided by the Nevada State Health Laboratory – a certified public drinking water analysis facility).

Results of the completed survey indicate that a majority of those who rely on private water supplies in rural Nevada are exposed to concentrations of arsenic that exceed the pending standard for public drinking water supplies. Other findings indicate that, although treatment in general appears to decrease the risk of being exposed to high concentrations of arsenic, it is clear that application of any treatment appears to encourage consumption, in spite of the fact that some treatments may be ineffective in decreasing concentrations of arsenic. This indicates a misunderstanding about the expected performance of different types of treatment. The results indicate that treatment may instill unwarranted confidence in water supplies, relative to federal standards for arsenic, in spite of the fact that slightly more than 50% of respondents were consuming higher concentrations of arsenic than will be allowed in public water supplies.

These results have prompted the University to hire a full time, resident, water supply specialist for Churchill County, Nevada. His mission being to educate rural Nevada citizens about the dangers of domestic water supply's heavy metals.

Impact:

In spite of plentiful publicity about arsenic and the health effects of consumption, residents who are self-supplied appear to ignore risks associated with consumption and take few precautions to reduce the risks. Although representatives of county, state and federal agencies were of the opinion that rural residents were not likely to be exposed to high concentrations, the results demonstrate that exposure to greater than 10 ppb concentrations was quite prevalent.

Our finds also suggest that filtration systems may lead to a false sense of security that is reflected in the high likelihood that those who apply any type of treatment are much more likely to consume water from household taps than those who do not apply treatment.

To date UNR's team of experts have conducted over 160 personnel consultations. Providing assistance in interpreting water sample results, helping design a filtration system that address both technical as well as economic aspects of treating dangerous water supplies.

Source of Funding:

Nevada Arid Rangeland Initiative
State Matching Funds

Scope of Impact:

State specific

Theme: Water Quality

Issue:

The increasing complexity of compliance with regulations related to drinking water supply system management is overwhelming for those who operate the smallest of Nevada's public water supply systems. Yet rural communities depend upon public water supplies that must conform to Federal requirements related to certification and plant operation, and to keep their drinking water safe. Most of these small public water suppliers have limited resources, and are located far from training centers that offer assistance useful for passing certification examinations. Operators and managers also have difficulties meeting operating requirements, particularly those related to regular administrative functions and management. When out of compliance, these systems may be fined, which may raise the cost of water in rural communities.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) developed the Statewide Education for Water Treatment Plant Operators program to meet these needs. It delivers information about public water supply operation and management using videoconferencing facilities throughout Nevada. The target audience includes operators of the smallest water supply systems, usually serving fewer than 500 people. About 60 percent of the

state's public water systems are in this category. Thirty workshops have been held since 2000, with more than 1,100 participants through 2003 at 18 different sites. Topics taught include water sampling techniques, jar testing, water chemistry, aquifers and well sites, chemical handling, and arsenic treatment and options. Instructors include faculty from the University of Nevada and other public and private partners.

A special, four-hour distance education session is designed to help operators prepare for the certification examination. The class is held a day before the state certification examinations are administered. Water operators attend the review and take exams at five Nevada locations the following day. Information is presented on treatment techniques, distribution basics, policies, safety and management, and math for treatment and distribution operators. Instructors also provide test-taking tips to build confidence.

Program partners are the Nevada Division of Health, Nevada Department of Environmental Protection, Rural Community Assistance Corporation, Nevada Rural Water Association, and Nevada Drinking Water and Wastewater Training Coalition.

Impact:

A review of the certification examination passing rate reveals that water operators who took the class prior to the exams had a passing success rate of 92%. This is notably higher than the average 84% success rate for the entire group that took the examination in 2002. Additionally, 81% of responding participants rate the course good or very good; they requested more workshops on a wide variety of drinking water issues.

Source of Funding:

- Hatch Act funds,
- Smith-Lever Act funds,
- State Matching Funds
- Nevada Department of Human Resources Health Division

Scope of Impact:

- State Specific
- Integrated Research and Extension

Theme: Water Quality

Issue:

Much of the Fallon area's water supply has been documented to contain arsenic levels in excess of that allowed by the Safe Drinking Water Act. Residents are asking for information on the long-term health effects of exposure to inorganic arsenic. In 2002, tungsten levels in the local drinking water supply and citizens' blood serum and urine were found to be elevated. DDT and DDE have also been found in the blood of local residents at levels 10 times the national average. Many citizens in Churchill County are concerned about the safety of public and private water supplies. University of Nevada Cooperative Extension (UNCE), in an effort to help the community address this issue, is conducting research and providing educational programs related to water quality and human health.

What Has Been Done:

There are approximately 4,500 private wells that provide domestic water for approximately 10,000 of the 23,000+ residents of Churchill County. A recently completed sampling survey of private wells by UNCE and Nevada Agricultural Experiment Station researchers indicates that concentrations of arsenic in groundwater supplies used for private domestic wells exceed federal drinking water standards in 85% of wells sampled. In some cases, concentrations of arsenic are more than 100 times that allowed in public drinking water supplies. However, there is no clear indication that all residents with private wells consume water.

This study will continue through 2005 to: characterize the exposure to arsenic through private water supplies; examine the potential for fluctuations in the type and concentration of arsenic in private, domestic

wells; and disseminate information about water quality and treatment through the long-time UNCE Nevada GOLD (Guarding our Local Drinking Water) program where trained volunteers help residents understand the significance of arsenic exposure and select appropriate treatment devices or alternative supplies.

In a second study begun in 2002, UNCE recruited more than 900, 20-year Churchill County residents 45 years or older to complete a 90-minute health analysis, including giving blood, urine, toenail and water samples. Conducted by the Environmental Protection Agency (EPA), the research is designed to determine the potentially chronic health effects of long-term exposure to inorganic arsenic in the water supply.

Impact:

In the first study, arsenic concentrations in water from private wells was found to exceed the federal drinking water standards in the majority of samples collected. These results are consistent with samples taken previously by the U.S. Geological Survey. In the outreach component of this study, a water education specialist was hired and a “learning center” established in UNCE’s Fallon office. Studies are ongoing to determine the effect of reverse osmosis water treatment for removing arsenic in private wells.

In the second study, the recruitment of 900 participants (in just a few weeks) was deemed a success due to media coverage and word of mouth from the Nevada GOLD volunteers. This is the largest study of its kind in the U.S. In a follow-up survey, nearly 100% of participants said they want to help the community better understand their water; 87% indicated they were worried about their personal health and that of their family and friends. The results of the study will be announced by the EPA in 2004.

Source of Funding:

Hatch Act funds,
Smith-Lever Act funds,
State Matching Funds
U.S. Environmental Protection Agency, USDA

Scope of Impact:

State Specific
Integrated Research and Extension

Theme: Water Quality/Soil Erosion/Natural Resources Management

Issue:

Lake Tahoe has been losing its world-renowned clarity at the rate of over a foot a year for more than 30 years. The loss of water quality and clarity can be attributed almost entirely to human impacts. There is an urgent need to educate residents and visitors about the relationship between their daily activities and the loss of valued resources. Most polls say that people want to protect their environment, but don’t know how. Educators, agency staff and community leaders recommended increased and continued outreach education to motivate homeowners to support restoration projects and implement Best Management Practices (BMPs) on their property.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) joined University of California Cooperative Extension to form The Lake Tahoe Environmental Education Coalition (LTEEC), a collaboration of 30 agencies, educational organizations and non-profits interested in improving the effectiveness of environmental education throughout the Tahoe basin. Activities in 2003 include the continuation of the quarterly newsletter reaching 600 working group members, and the development of an educational media campaign -- The Lake Tahoe Report -- 90-second news reports aired weekly on KOLO-TV and KOH radio, accompanied by companion newspaper articles. LTEEC sponsored 51 community events, involving 4,350 participants. Just some of these are: Erosion Control and Best Management Practices Workshop for contractors; Environmental Film Festival; Earth Day

Festival; Snapshot Day citizen water quality monitoring; Lake Tahoe science symposia; and Tahoe Forest Stewardship Day.

The popular *Home Landscaping Guide for Lake Tahoe and Vicinity*, a 150-page, illustrated publication, was updated with recent local regulations and an additional 10,000 copies were printed in 2002 and disseminated in 2003.

Impact:

Enhanced education was measured by pre- and post-tests at workshops, with an average 73% pre-test score followed by an average 88% post-test score, an improvement over 2002. The Lake Tahoe Report is seen by 40,000 people nightly, 10,000 of whom live in the Tahoe Basin. Also during 2003, 2,087 site evaluations were conducted by the Partners in Conservation staff; 1,192 Certificates of Completion were issued by the Tahoe Regional Planning Agency (TRPA), double the 2002 figure. The *Home Landscaping Guide* won a first place (gold) award in the Long Publication Category from the national Association of Natural Resource Extension Professionals. It is more difficult to measure program impacts on overall water quality; however, the 2003 Secchi depth reading (average 78 feet) was the best on record since 1992. The UC-Davis Research Group said the new finding could mean that science-based recovery projects (BMPs) in the region are making a difference.

Funding:

USDA Forest Service, Sierra Club, Incline Village General Improvement District, Nevada State Lands, U.S. EPA “Enviro Ed”

Source of Funding:

Smith-Lever Act funds,
State Matching Funds

Scope of Impact:

Multistate Integrated Research and Extension (NV, CA)

Themes: Wetlands Restoration and Protection

Issue:

With the launch of “no net losses” of wetlands, put forward in 1989, wetland construction, conservation and restoration have become a growing issue across the US. Here in the Great Basin not only are these issues of concern, but preservation also plays an important role in a region that received on average less than nine inches of rain per year.

With the donation of 1360 acre of marginal wetlands in 1993, the University assumed the role of caretaker for the J. Dow Wetlands Research Facility. This facility maintains twelve artificial lakes that are used for research along with providing habitat for thousands of animals. Unfortunately, the lakes are not water tight and electric pumps are required to maintain water levels. A costly operation to sustain over the long haul.

What Has Been Done:

By taking a page straight out of Central America’s history books, the J. Dow Wetlands research team utilized local cattle for what they do best, tromping around. Once the wetland had gone almost completely dry, straw was brought in and spread across the wetland basin. Cattle were then turned out onto the wetlands and driven back and forth until the straw and mud were thoroughly mixed. This procedure was then repeated and then left to dry, essentially creating an adobe style catch basin.

Impact:

With the “no net loss” mandate strongly motivating interested parties to resolve the J. Dow Wetlands retention problem, exploiting basic building techniques has proven to be both a salvation for the ecosystem and

an inexpensive approach to wetland restoration. When comparing the original bottom against straw fortified basins the J. Dow Wetlands now holds water with 40% greater efficiency. This in turn reduced pumping cost through drought periods by over \$1,000. And weighed against the alternatives (i.e., plastic sheets or sprayed in pond liners) the wetlands saved over \$100,000 in restoration costs.

Source of Funding;

State Matching Funds

Scope of Impact:

State specific

Theme: Wildfire Science & Management

Issue:

Living with Fire (LWF) is a comprehensive, multi-agency project aimed at teaching homeowners how to live more safely in the high wildfire-hazard environment of the eastern Sierra Nevada. The collaboration is enhanced by the Sierra Front Wildfire Cooperators, a group of 12 Nevada and California firefighting agencies, who came together to help communities prepare for dangerous wildfires. The importance of wildfire education was identified in a 1997 needs assessment involving local fire officials. Between 1999 and 2001, fire consumed 3.2 million acres in Nevada. More acres burned in Nevada during the 1990s than in the previous 40 years combined.

What Has Been Done:

The collaborators focus on prefire activities that reduce the wildfire threat around homes, thus improving the survivability of those homes and occupants. During 2003, University of Nevada Cooperative Extension (UNCE) produced and distributed nearly 200 LWF comprehensive workbooks to fire prevention agencies statewide; UNCE gave workshops at six locations. The free curriculum materials include a CD with an animated PowerPoint presentation, a script, short video showing fire behavior and workshop handouts. UNCE developed five versions of the materials to address different vegetation types and geographic conditions.

The popular *Living With Fire: A Guide for the Homeowner* tabloid continues to be distributed locally and throughout the West and nation.

The non-profit Nevada Fire Safe Council continues to assist the state's high fire-hazard communities in reducing the wildfire threat.

Impact:

The LWF workshop materials are being used by fire agency personnel and Fire Safe Councils in Nevada and other states to teach homeowners (150), who have rated the materials as "highly effective." When asked if the homeowners implemented the LWF recommendations as a result of the presentations, 44% said "yes." Of those who hadn't, 40% planned to implement defensible space as a result of the workshops. UNCE received a Gold (first-place) Award for Mixed Material from the national Association of Natural Resource Extension Professionals.

More than 1.6 million copies of *Living with Fire* have been printed; 16 customized versions of the tabloid have been created. In a survey, the publication received an average rating of 4.7, with 5.0 as "outstanding."

To date, the Nevada Fire Safe Council has acquired \$2.5 million in grant funds, and established 18 chapters in seven counties; there are more than 500 paid members. This concept was endorsed by Nevada Governor Kenny Guinn and U.S. Senator Harry Reid at a news conference announcing a large grant. One chapter, The Fire Safe Highlands, has reduced fuels by more than 400,000 cubic feet, and conducted other community action projects totaling nearly 7,000 volunteer hours. The group is now operated entirely by residents.

Source of Funding:

Smith-Lever Act funds,
State Matching Funds
Department of Interior Bureau of Land Management

Scope of Impact:

State Specific

Themes: Wildlife Management/Biodiversity**Issue:**

The habitat of Lake Tahoe bears is not defined by their once-expansive range high in the Sierra Nevada or the thousands of acres of piney forests at the base of the snowy peaks. Here, the black bear's domain can be measured in city blocks. A year-round supply of garbage has lured the beasts from the vast wilderness to the streets that ring this resort area better known for drawing tourists to its pristine blue waters, its casinos and its ski runs that plunge toward the shoreline.

In settling into the easy life, the Tahoe bear has altered its hibernation cycle, taken to prowling the graveyard shift and grown fatter than your average bear and the consequences are sometimes deadly.

What Has Been Done:

UNR scientists working with the Wildlife Conservation Society, tracked 59 radio-collared bears from 1997 to 2002. In 2001, researchers followed 10 bears living in the backcountry on the edge of the Great Basin near Lake Tahoe — prime black bear habitat — and 10 bears that had relocated to towns such as Incline Village, NV to determine activity patterns over an average 24 hour period.

Impact:

Bears in the wild spent more than 13 hours a day roaming the woods foraging for food. Bears near the easy pickings of convenience stores and fast-food shops spent only about 8 1/2 hours a day moving about. This reduction in activity along with increased caloric intake has resulted in individuals weighting as much as 600 lbs. i.e., twice the average weight. The extra body fat on the less active bears also means they have little reason to hibernate and because the urban bears' food supply is constant, they spend an average of 42 fewer days in winter dens, if any. Finally to avoid human confrontation when dumpster diving most urban bears have become nocturnal. A major attribute to the increased black bear mortality along Sierrian highways.

Through the research efforts conducted at UNR, scientist are attempting to change local ordinances around Lake Tahoe, mandating pear-proof garbage containers for homes and businesses. While working on educational programs designed to educate and reduce potential conflicts between humans and bears.

Source of Funding;

Hatch
State Matching Funds

Scope of Impact:

Multistate (NV, CA)

Goal 5: Economic Development and Quality of Life for People and Communities

Overview: Our POW goals in rural economic development include conducting research and subsequent education for decision-makers on changing economic dynamics for their communities, developing leadership opportunities for community decision-makers, establishing and evaluating innovative decision-making models and extending research results in educational programs to stakeholders. In the area of youth and family development our POW goals include educating parents regarding quality childcare, conducting research and outreach on youth at risk, and conducting research and outreach learning on literacy.

UNCE's Project MAGIC (Making a Group and Individual Commitment) educational program was designed to teach at risk teens the skills necessary to become productive members of society. A decline in per capita incarceration was observed in those counties where MAGIC was implemented, and among youth participating. Project MAGIC has been expanded to new areas and from rural to urban counties, and to Reservations. Results of this program have shown a dramatic reduction in the % of youth returning to the juvenile justice system. Because of its success, the program has expanded into additional communities in Nevada.

Literacy programs have been important for the development of good parenting skills, as well as for helping youth. This has been especially important for families where English is a second language. After school and other programs where students can receive help with studies have also been important.

Nevada scientists have evaluated the financial impact of rangeland fires on Nevada cattle operations and skyrocketing utility bills. In addition, recreational valuations in Nevada have been determined to provide an economic impact of recreation on rural communities due to river volume changes resulting from mining gold. In addition we have had the benefit of increased security at our Valley Road Field Lab by providing boarding and staging areas to the Reno Police Department horses at our equestrian center.

Federal and State Funding by Plan of Work Goals

	<u>Goal</u>	<u>Federal \$</u>	<u>State \$</u>	<u>County</u>	<u>Total \$</u>	<u>FTE</u>
Nevada Agricultural Experiment Station	V	\$253,395	\$356,816		\$610,211	7
University of Nevada Cooperative Extension	V	\$ 249,313	\$1,157,042	\$1,268,670	\$2,675,025	43

Theme: Aging/Consumer Management

Issue:

More than 25 percent of the 75,000 new Clark County residents each year are seniors. With the majority of elderly residents relative newcomers, many lack the traditional support structures associated with work and family. The elderly have the potential to make great contributions to the community or to overwhelm state and local budgets with medical and social service costs. The National Institutes of Health estimate that delaying nursing home entry nationwide for just one month would save the country \$3 billion annually. Equally important is the potential to facilitate successful aging and extend seniors' independent living status, a crucial potential quality-of-life benefit of the University of Nevada Cooperative Extension (UNCE) Seniors CAN program.

What Has Been Done:

Seniors CAN is a life skills educational program to improve older adults' quality of life and help them maintain their independence. Program objectives are to utilize the well-documented advantages of lifelong learning to enhance their sense of control over life, decrease loneliness and improve participants' self-esteem, which research demonstrates leads to improved health outcomes. Using the train-the-trainer teaching model, volunteer instructors – including graduate students, senior center directors, social service providers and older

adult peer educators -- were recruited and trained to expand the program. The program also has steadily expanded nationwide.

The curriculum includes 15 lessons on nutrition, personal safety, food safety, finance, general health and productivity. In 2003, expansion continued into the Spanish-speaking community and low-income housing sites, utilizing the Spanish-language curriculum. Seniors CAN was taught by UNCE staff and six volunteer instructors at nine sites in urban and rural Clark County. To meet the needs of the rapidly growing Hispanic population, two bilingual instructors taught the program in Spanish at two senior centers.

The seniors who completed the program are ethnically and economically diverse. The majority live on less than \$20,000 a year, with 36 percent under \$10,000. The mean age is 74. By the end of 2003, more than 300 participants had completed the four-month program, with nearly 300 others attending from one to 10 classes. In 2003, 19 copies of the curriculum were sold to universities and senior service agencies in nine states.

Impact:

Comparisons between pre- and post-test scores for all participants who completed Seniors CAN show statistically significant improvements in mastery or sense of control and a decrease in loneliness. Participants reported they apply program information into their everyday lives on a lesson-by-lesson basis, and wellness-related behavior changed as a result of their participation. Many report the education gave them “more control of their lives,” a program goal directly related to the theoretical model connecting learning with self-efficacy.

Source of Funding:

Smith-Lever Act funds,
State Matching Funds

Scope of Impact:

State Specific

Themes: Agricultural Financial Management

Issue:

Management and marketing are key components of success and profitability of any beef cow/calf operation. The choices needed to make accurate decision are complex, difficult and often impractical as most producers know. What producers were asking for was a tool that provided flexibility (based upon management practices selected) in real-time that accurately predicted the economic investment necessary to take an animal from recently weaned calves to market/breeder standards. Producers needed something that would allow them to play “what if...” and tell them the subsequent effects on their wallets.

What Has Been Done:

What faculty at the University of Nevada developed were three software packages that would enable producers to evaluate various management practices and their potential impacts on profitability. “Feedlot” was design to help producers estimate the economics of retained ownership of yearlings through the a feedlot. The second package “Grassfat” was designed to track your yearling cattle through the pasturing stage of production. And, “Calf back” was designed to track calves after weaning through the production process and allows producers to vertically integrate and diversity their operation while spreading marketing risk throughout the year.

Impact:

This software, available for free at <http://www.ag.unr.edu/cabnr/resources.htm>, lets producers check rapidly many different scenarios and possible prices, costs, etc., and how they will affect profits. Over the last 5 months of 2003, visitors from 35 states and 8 countries have downloaded over 560 copies of the software. Ron Torrell

of Fallon, NV claims that by using this software “budgeting your production alternatives can save you money by avoiding costly mistakes”.

Source of Funding;

State Matching Funds

Scope of Impact:

National

Theme: Child Care/Conflict Management

Issue:

Given that many children spend a majority of their days in childcare, there is a need to provide developmental literacy and language-rich environments in childcare programs. The quality of childcare is directly impacted by the education and training of child caregivers. The 2002 Nevada Childcare Work Force Study found that only 16% of responding caregivers have two or more years of early childhood education. They also found that Nevada has a 45% turnover rate for childcare givers; turnover has been found to be detrimental to the quality of childcare. Agencies that had provided training in the past are no longer offering workshops for caregivers. There is a need to improve the health, safety and overall well-being of Nevada children in child care.

What Has Been Done:

These initiatives were established by the Maternal and Child Health Bureau and the Nevada Department of Human Resources, Welfare Division: (1) Assure quality in child care by training child caregivers, and conduct a comparison study between Nevada and national regulations and performance standards; (2) Facilitate linkages between child care agencies in the state; (3) Improve access to health services for children in child care, particularly health insurance; (4) Improve child caregivers’ knowledge through self-study guides.

University of Nevada Cooperative Extension (UNCE) plays an integral role in increasing the availability of education for caregivers statewide, thus, increasing the quality of care received by thousands of Nevada children. Results of a recent focus group indicate that UNCE is still very much needed as a primary provider of caregiver training.

UNCE’s free workshops and the Caring4Kids modules enable caregivers to quickly get the training they need. In 2003, a curriculum focusing on anger management for child caregivers was developed, implemented and evaluated by UNCE. More than 220 caregivers, each caring for an average of 29 children, for a total of nearly 6,400 children, participated in 13 workshops across Nevada.

Caring4Kids is a series of training modules, including videos, self-study guides and tests, that are free and available at 65 Nevada public libraries, Cooperative Extension offices and other locations. Modules on Cognitive Development and Food Safety in Childcare Settings are currently available and approved for three hours of childcare training; additional modules are in progress.

Impact:

Evaluations of the anger management workshops indicate that the caregivers made significant gains in knowledge of the components of anger management. Ninety-five percent gave the program a rating of 4 to 5 in helpfulness; 98% gave the instructors a rating of 4 to 5.

In a recent independently conducted childcare workforce study, more than half the center and home caregivers in Nevada reported participating in UNCE workshops.

The Caring4Kids modules have been checked out in libraries more than 1,400 times. The majority of participants (93-99%) indicated they plan to continue, implement or increase the use of nearly all strategies provided in the modules.

Source of Funding:

Smith Lever Funds
State Matching Funds

Scope of Impact:

State Specific
Integrated Research and Extension

Theme: Children, Youth & Families At Risk**Issue:**

Nevada has one of the highest per capita juvenile incarceration rates in the nation. State and county costs for incarceration of Nevada juveniles is on the increase. Currently, the average cost to incarcerate a juvenile is \$84 a day with a seven-month average stay. Several Nevada studies indicate that taxpayers support community-based, prevention programming. In a survey of Nevada's rural counties, 71% of the local population indicated support for increased spending for programs that might prevent juvenile crime. A statewide survey of all adjudicated youth in state-run juvenile detention facilities found that few alternatives to detention exist.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) developed Project MAGIC, a collaborative prevention program to help juvenile offenders leave the criminal justice system and become productive members of society. The program, originally designed for rural, entry-level juvenile offenders and their families referred through probation, has expanded to urban and Indian Reservation populations including part of Idaho. The after-school program is conducted three times a week over an eight-week period. The youth learn communication, self-concept, team building, problem solving and decision-making, self-responsibility, conflict resolution, aspiration building, goal setting and community leadership. The parent sessions include the same life skills.

The Las Vegas program targets entry-level juvenile offenders ages 11 to 18 and their parents; they are court-ordered to participate. Volunteer alumni of this urban program are peer facilitators who assist the staff in program delivery, which also includes an anger-management component.

There are currently nine Nevada sites which conduct Project MAGIC programs. Partners include school administrators, juvenile court judges, probation department personnel and others concerned about the welfare of young people.

Impact:

The national award-winning Project MAGIC has graduated more than 1,000 juvenile offenders in rural counties who have not reentered the justice system, saving taxpayers an estimated \$5.4 million in incarceration costs for the 18 percent who statistically would have re-offended. A follow-up study of 100 teen graduates shows they increased their skills in decision-making, conflict resolution, goal setting and communication. Follow-up interviews of youth a year later reveal they are using program strategies to stay out of trouble with the law. Further, 95% of parents of juvenile offenders participated in educational meetings, reporting significant gains in knowledge.

The 338 rural youth participating in 2003 improved their portfolio scores by 90% in knowledge and abilities in the life skills taught. Before the program: 45% of youth reported their parents asked about their homework, compared to 72% after the program; 51% indicated their parents knew where they were, compared to 69% after the program; 58% said they had been in a fight in the last 30 days, compared to 20% after the program; 39% indicated they had a fiery temper, compared to 18% after the program.

In Las Vegas in 2003, 139 youth received certificates of completion, representing a 92% completion rate; only seven youth had increased levels of involvement with the justice system post-program. The juvenile offenders rated their mean life skills with a score resulting in a 34% improvement; 34% reported hardly missing

school, compared to 69% after the program; 32% said their interests did not include use of drugs or alcohol, compared to 75% after the program.

Source of funding:

- Smith-Lever
- State matching funds
- CSREES Competitive Grant
- Bureau of Alcohol and Drug Abuse Block Grant

Scope of Impact:

Multistate Integrated Research and Extension (NV, ID)

Theme: Community Development

Issue:

The Laughlin, NV and Bullhead City, AZ area is considered one of the fastest growing rural regions in the nation, with a 65% population increase between 1990 and 2000. Managing growth in population and diversifying the economic base is the primary goal for the region. To achieve this goal, community leaders from both cities and surrounding communities requested that University of Nevada Cooperative Extension (UNCE) provide leadership and technical assistance programming to: create and maintain a community-based advisory committee; locate and analyze economic, fiscal and social data; build community awareness of economic, fiscal and social indicators; measure economic leakage and develop strategies to improve local spending; improve local business retention and identify expansion opportunities; and conduct needs assessments to improve quality of life.

What Has Been Done:

UNCE developed and implemented a five-year program, including the establishment of a 15-member regional advisory committee. In 2003, UNCE conducted workshops that identified and targeted priority issues. As a result, new community members joined the committee. A multi-regional technical economic model was developed and updated using primary data collection and newly released census data. UNCE also collected, analyzed, published and presented socioeconomic trend data, including more than 25 demographic and economic indicators.

During 2003, the major policy issue was the potential for a Jet Ski ban on Lake Mohave, which would have a negative impact on the region, particularly during the summer season. UNCE collaborated with University of Arizona Cooperative Extension (UACE) to find answers to the question, “What is the total regional economic impact from water-based recreation?” A comprehensive water recreation tourism assessment and impact analysis was conducted, involving water recreation, business operator and National Park Service surveys. Results were: The region serves 578,093 water recreation visitor days, supporting \$48.7 million of economic activity, including \$11.5 million in personal income and 571 jobs.

Impact:

In 2003, using a 5-point Likert Scale, advisory committee members were asked to rate UNCE’s overall program. The results are: program content and applicability to regional community (4.82), presentation of materials and subject matter (4.78), increased awareness and subject knowledge (4.73) and future application for managing the regional community (4.70). These scores were higher than the 2002 scores.

The above-mentioned data on the regional economic impact from water-based recreation were used to educate the National Park Service, and ultimately assisted in a decision not to ban Jet Skis on Lake Mohave.

In addition, UNCE and UACE programming assisted with the selection of complementary industry and community amenities that improved the region: (1) Laughlin Bay Marina Development, a 32-acre, \$100 million project; construction began in late 2003; (2) Bureau of Reclamation Recreational Regional Project, a plan to

develop 2,000 acres of public land with trails, river walk, events center, golf course and cultural interpretation sites; a \$13 million grant application was submitted; (3) Lake Mohave Improvement Recommendations, including paving, additional launch lanes and slips; improvements have been started; and (4) New business expansion and introduction, including Home Depot, Smiths, Safeway, In & Out Burger and Cascade Tissue Group, collectively supporting more than 300 new jobs.

Source of Funding:

Smith-Lever Act funds,
State Matching Funds

Scope of Impact:

Multistate Integrated Research and Extension (NV, AZ)

Theme: Literacy – Youth & Adults

Issue:

The foundation for literacy is built during the preschool years. This reading time fosters children's interest in reading and builds confidence, while helping to eliminate some of the severe consequences of poor literacy skills, including lack of grade retention, school failure, school dropout, delinquency, unemployment and underemployment. The Nevada Literacy Coalition estimates that nearly 25 percent of youth and adults in the state have inadequate literacy skills, placing Nevada's children at extremely high risk for developing illiteracy related problems in the future. Forty-seven percent of 4th-grade students are below basic reading level. The percentage of Spanish-speaking immigrants is expected to increase in Nevada over the next 25 years, and so it is likely that ever-larger numbers of children who are English language learners and at risk for low achievement will be entering schools. Parents with limited language skills cannot always teach their preschoolers. Breaking the cycle is important to ensure that preschoolers have reading skills in order to succeed.

What Has Been Done:

Family Storyteller is a literacy program aimed at encouraging and training parents to play a vital role in the literacy development of their children. The program, developed by University of Nevada Cooperative Extension (UNCE), KNPB-TV, Washoe County Libraries and Washoe County School District, creates an opportunity for parents and young children to interact around literacy and language activities. It is designed especially for families that may have limited language skills and few children's books at home. Family Storyteller is a six-week series of workshops targeting families at risk for low literacy and related problems. Each workshop includes a 10-minute video viewing, book-reading techniques, practice time for reading to children and other literacy activities. The program also expanded to Las Vegas, where it is taught in both English and Spanish – in homes and group settings, such as libraries, childcare centers, Classroom on Wheels and elementary schools.

In 2003, Family Storyteller was conducted at 9 sites reaching 62 families. In addition, UNCE trained volunteer workshop facilitators, reaching 67 people. A new collaboration was created with the Children's Cabinet to reach all Washoe County School District Pre-Kindergarten sites; at-risk families were reached at 21 sites. In Las Vegas, the program was taught to 572 parents (418 Hispanic) and 1,418 children (1,096 Hispanic).

Cuentos en Familia, the pilot program for English language learner parents and their 3- to 7-year-old children continued in 2003. It enhances the traditional six workshop sessions to help parents learn to read the children's books in English, three new videos of parents and children reading together, and new take-home packets of books and literacy extender activities. Workshops were conducted with 129 families at 16 sites; expansion through train-the-trainer workshops will begin in Spring 2004.

New in 2003 was the Native American Storyteller Project, a 10-week pilot on the Pyramid Indian Reservation. Four Children's Cabinet staff reached 26 families at 3 sites. Efforts are underway to expand to three additional reservations, and to include more culturally sensitive materials.

Impact:

Program evaluations statewide show that after participating, parents and children read together more often. Their literacy and language activities increased, and parents used the skills taught in the program more often. Children's literacy and language skills have improved as a result of Family Storyteller.

Preliminary evaluation of Cuentos en Familia indicates that parents have: become more comfortable reading books to their children; noticed their children learning new English words and having better attitudes toward books; learned new positive guidance techniques.

In the Native American project, parents' ratings of the major components ranged from 4.66 to 4.88, and they rated the literacy enhancement activities from 4.60 to 5.

Source of Funding:

Smith Lever Funds
Hatch Funds
State Matching Funds

Scope of Impact:

State Specific
Integrated Research and Extension

Theme: Parenting**Issue:**

Nevada has one of the highest rates of child abuse in the country – one report for every 40 children. Research shows that poverty, inadequate health care, single and teenage parents and substance abuse are all correlated with the problems of child abuse and neglect. Home visitations and group parenting classes promote positive parenting practices and improve child health and development, thereby preventing child abuse and other negative childhood outcomes. Key personnel in collaborating agencies named parent education as one of the three top social-service needs; they refer clientele to the University of Nevada Cooperative Extension (UNCE) Partners in Parenting (PIP) program. It is the only intensive, long-term, ongoing parenting outreach program in southern Nevada.

What Has Been Done:

Partners in Parenting provides educational programming for first-time mothers, childcare providers and English- and Spanish-speaking parents of infants and toddlers. Multiple strategies are used to educate the public in reducing child abuse, increasing child literacy, educating childcare providers and providing a safe, healthy childhood environment for Nevada's children so they grow into responsible, productive citizens. PIP is the umbrella for Nuevas Familias, Children's Literacy and Childcare Provider Training. Various curricula, in both English and Spanish, are used by the PIP staff. What began as a voluntary, home-visitation program has expanded to group classes in order to reach more people. The class curricula consist of: Fun to Play (young parents interact with their children); West Educational Child Development (child brain development); RETHINK (anger management training); SIDS (Sudden Infant Death awareness); and *Little Lives* newsletters (age-paced monthly newsletters).

In 2003, a total of 345 PIP educational programming classes were taught, reaching more than 7,350 English- and Spanish-speaking participants in group classes and home visits. About a third more Spanish-speaking families participated than English-speaking families. *Little Lives* age-paced newsletters for new parents, in both English and Spanish, were sent out monthly; a total of 113,000 were distributed statewide in 2003.

Impact:

Evaluations of all programs showed significant gains in subject knowledge, including basic parenting skills, increasing parent/child interaction, understanding more about child development and learning how to RETHINK and control anger.

In the Fun to Play component, parents learn ways to play and interact with their children to increase the amount of positive parent/child interactions. In a survey, parents increased their level of understanding before the workshops from a 2.7 rating (on a 5-point scale) to 4.7 after the workshops; they also demonstrated a 4.7 confidence in their ability to use the material from the workshops.

In the anger management for parents classes, parents' understanding before the workshop was rated 1.9, increasing to 4.6 after the workshops; their confidence in using the materials was a 4.6.

A quantitative, five-state study of the *Little Lives* newsletters indicated that parents report using the newsletter and changing their behavior as a result. A follow-up study, using Nevada's Central Registry for Child Abuse and Neglect, showed that none of the participants had substantiated child maltreatment reports, while a high percentage of participants were at elevated risk for maltreatment.

Source of funding:

Smith Lever Funds
State Matching Funds

Scope of Impact:

State Specific
Integrated Research and Extension

Themes: Promoting Business Programs**Issue:**

Reno, Nevada has been known for decades as the "Biggest Little City in the World". And the reason why? Tourism. With tourism being Reno's principle revenue source, dealing with large numbers of people should be one of our top priorities. From the crowd-control standpoint, the standard methods were used (i.e., police and security officers on foot, bicycle and car) and proved effective. But growing concern was mounting from the public relations perspective and the city wanted to move towards using mounted police. But with budgets the way they are and building facilities to accommodate the animals out of the question, the city need help

What Has Been Done:

Located just five minutes walk from the heart of downtown Reno, the University of Nevada's Equestrian Center is providing, free of charge, a state-of-the-art equine facility to the Reno police department's horse unit. In addition, the University provides professional riding trainers and medical expertise.

Impact:

For the past eleven years UNR has been providing the Reno Police Department with a state-of-the-art facility in close proximity to downtown Reno. Saving the City over \$3360 per year. Jim Overton, mounted police officer states that "Keeping the horses together and close at hand, cuts down on travel time, which in turn provides for extra patrol time.

Generally, horses are more visible and give officers a better view of what is going on. "One horse has the same effect as five officers on foot," says Overton. Which on a national average saves taxpayers an estimated \$73/hour in officer pay. "Plus, having a horse standing among a crowd of rowdies tends to reduce misbehaving."

Possibly the greatest benefit to the horses, Overton says, is visibility and the public relations that the horses build. The conspicuousness of the horses reassures people of the presence of police in the area. Chief of Police

Jerry Hoover states that “the police department is just beginning to realize the benefit of the horses and public relations remains the most outstanding attribute of the Horse Mounted Unit.”

The Horse Mounted Unit has been referred to as a "million dollar public relations tool", with good reason. The horses are easily approached, and they're friendly...and, as the saying goes in mounted circles, "you can't pet a patrol car!"

Source of Funding;

State Matching Funds

Scope of Impact:

State specific

Theme: Youth At Risk/Workforce Preparation

Issue:

Student dropout is one of the most alarming problems in Las Vegas. The dropout rate during the 1997-98 school year was 11.8 percent, compared to the national average of 4.6 percent. Students who drop out have lower learning levels, high unemployment and greater criminal involvement. Clark County businesses are concerned their future employee pool will not be adequate. Students need to see there are other options besides dropping out of school. Researchers found that an interactive, multimedia curriculum is more learner-directed, thus increasing the youths’ sense of control and motivation to learn, and promoting greater retention and depth of knowledge than more traditional methods of education.

What Has Been Done:

What Will You Do? is an interactive, multimedia CD-ROM created by University of Nevada Cooperative Extension (UNCE), students and teachers from the Clark County School District (CCSD) Advanced Technology Academy, and Community College of Southern Nevada (CCSN). Other partners are Job Corps, CCSD Adult Education, Nevada Partners, CCSN Earn and Learn and CCSD Alternative Education. Getting the right information is hard for teens once they drop out, so the CD-ROM takes a student – via the use of interesting and interactive multimedia elements -- through a series of good and bad advice around dropout-related issues such as pregnancy, disliking school and job opportunities, and the consequences of each advice.

In 2003, more than 400 youth volunteer hours were clocked on this project. The faculty producer directly administered the CD-ROM to nearly 400 “high-risk” youth at six of the school district’s most “at-risk” high schools; he also presented the program at two local events and three national conferences.

Also in 2003, a new online family education game was produced, called the Family Space Adventure, designed for parent education.

Impact:

The CD-ROM, and accompanying lesson plans, has been widely distributed to Clark County high schools and libraries for students to use on their own, and has also been administered in person at high-risk schools, accompanied by small group discussions and/or counseling. In three-month follow-up interviews, 70% of students responding reported that because of attending the training, they learned “much” or “very much” about programs that will help them get a degree; 79% said that because of attending the training, they are “much” or “very much” more likely to graduate; and 56% said that because of attending the training, they had enrolled in a program that would help them get a degree.

Source of Funding:

Smith-Lever Act funds,

State Matching Funds

Private Businesses (MGM Hotel/Casino, Mirage Hotel/Casino)

Scope of Impact:

State Specific

Theme: Youth Development - 4-H/Children, Youth & Families At Risk**Issue:**

Washoe County, Nevada, has a high transient population and some schools have a particularly high concentration of low-income and transient families. Children 6- to 12-years-old need supervision after school while parents are at work. Parents with low or poverty level wages often cannot afford childcare for their school-age children. All children face risks as they grow and develop, but children who live in low-income housing or are homeless may be at higher risk for participating in risky behaviors. These children can benefit from positive, nurturing interactions with caring adults. Children who have strong interpersonal skills and support are less likely to participate in risky behaviors, such as drug use, early sexual involvement and dropping out of school.

What Has Been Done:

University of Nevada Cooperative Extension (UNCE) developed the 4-H After School Club (ASC) to teach children basic life skills including math, reading, science, positive communication, goal setting, self-responsibility, decision-making and good nutrition. Youth who have these life skills are less likely to participate in risky behaviors. Additionally, the program helps youth complete their homework by providing quiet space, materials, support and encouragement. The program is based on research, child development theories and a respect for each youth's ability to make choices that are healthy and respectful of others.

The 4-H ASC is an educationally focused program for low-income and homeless youth, ages 6 to 12. Grant funding was obtained to conduct the programs at six sites at high-risk elementary schools in Washoe County and Reno Housing Authority community rooms. The children receive a snack and help with their homework, and participate in other activities including reading and educational activities. Literacy skills are emphasized. Also offered are family centered activities such as family nights and a family newsletter, written in both English and Spanish. The youth participate in community activities, such as building flower and vegetable garden beds in the Master Gardener program, clean-up projects and canned food donations. Staffing opportunities have been expanded through university student work-study and internships, offering students real-life experiences before entering the workforce. In 2003, 18 staff provided the program for more than 680 youth.

Program partners include the Reno Housing Authority, Washoe County School District and the Dreamcatcher 21st Century Program.

Impact:

Previous evaluation of the 4-H ASC has shown a significant increase in some children's reading grades and improvement of social skills for participants of all ages.

Six-year-old Ostkai Garcia commented, "It's fun...I learn to write something and I also learn to respect my school."

During 2003, major restructuring of the program and increased collaboration occurred at all sites.

Source of funding:

Smith-Lever
State matching funds

Scope of Impact:

State Specific

STAKEHOLDER INPUT PROCESS

In 2000, UNCE established a statewide Advisory Committee that represents a diverse cross section of stakeholders from both rural and urban communities, including minorities. This Advisory Committee has met at least twice a year since 2001 and continues to review UNCE programs and provide suggestions on additional program opportunities. It provides broad guidance on UNCE programming and policies, serves as a sounding board for setting program priorities, and has helped obtain support for UNCE from key state and county elected officials.

In 2000, UNCE administration initiated a series of statewide “community stakeholder meetings.” These have continued on an annual basis and will be continued again in FY06. In addition to the general public, “key community stakeholders” from each individual community/county are invited to participate in an open meeting with all of UNCE administration (Dean/Director, Assistant Director, Area Directors, Fiscal Officer, Communications Specialist, AA/EEOC Officer). At this meeting, comments, suggestions and issues/concerns are solicited from participants. The focus is on issues/concerns as they relate to UNCE programs and the University of Nevada overall. This information is being used for developing both local and statewide programming, and is posted on the web at:

<http://www.unce.unr.edu/what's%20new/Community%20Tour%20Survey.pdf>. Information is used in strategic planning and in program planning. It has also been shared with colleges and departments at the University.

Within their first year of being hired, UNCE funded campus based faculty are expected to conduct a formal needs assessment in order to identify critical issues in their subject matter area. 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 of the above formal processes for stakeholder input, all of UNCE’s major educational programs are based on one or more needs assessments. UNCE has also used this information in strategic planning for the future. The data collected by UNCE is also used as the basis for broad Nevada Agricultural Experiment Station research priorities. In addition, NAES has conducted “rural tours” into the state and met with county and municipal decision makers, agriculture producers, state and Federal agency personnel and local high schools to obtain input into our research program. A newly formed citizens advisory committee meets quarterly and provides insight into NAES and College of Agriculture, Biotechnology and Natural Resource programming. Finally, the NAES has created a web page at <http://www.ag.unr.edu/naes/index3.htm> to connect stakeholders with campus faculty and Nevada Dividends, an impact database that is useful for establishing accountability.

PEER AND PROGRAM REVIEW PROCESS

There have been no significant changes in the peer and program review processes used by UNCE or NAES since the last 5-Year Plan of Work. These same procedures will continue to be used.

EVALUATION OF THE SUCCESS OF MULTI AND JOINT ACTIVITIES

As outlined in the previous POW, and will continue for FY05 and FY06, University of Nevada Cooperative Extension (UNCE) and the Nevada Agricultural Experiment Station (NAES) work together to build multistate, multi-institutional and multidisciplinary activities, and joint research and extension activities which address critical issues of strategic importance as well as those identified by stakeholders. All activities/programs of UNCE and NAES match needs/issues identified in the stakeholder input processes. Additionally, these activities/programs also address needs common to under-served/under-represented populations of the state, as well as activities/programs specific to the needs of these audiences.

For almost a decade, Nevada Agricultural Experiment Station (NAES) and University of Cooperative Extension (UNCE) 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*. These efforts of both UNCE and NAES are continuing. NAES has used the program priorities established by and needs assessments conducted by UNCE faculty as an initial guide in allocating their research funds. Collaboration with community-based faculty and developing research components to Extension programs has been openly endorsed.

UNCE 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 has hiring faculty trained at the doctoral level to ensure a scholarly approach to its work.

Integrated and multistate programs have generally realized the outcomes/impacts expected. The multi-state research program and Western Coordinating Committee projects are reviewed by RCIC (which is represented by both Extension and Research) for progress during the course of the project/program and at project termination. The reviews are documented and housed at the executive director's office in the western region. This process will continue to be used. Additionally, UNCE faculty and campus faculty on UNCE appointments are expected to demonstrate program results/impacts as part of their annual evaluations. Therefore, peers and administration both have an opportunity to review impacts/results of all UNCE programs.

Both UNCE and NAES have a long history of integrated and multistate programs/activities. In fact, many of the State Specialists with UNCE appointments also have NAES appointments so that their research is closely related to their educational programming. Integrated and multistate programming is increasingly the result of more proactive processes, and has helped to identify ways for cooperation even outside of specific programs. For example, UNCE has continued an arrangement with Utah State University Extension for their Dairy Specialists to provide dairy programming in Nevada.

MULTISTATE EXTENSION ACTIVITIES

See Appendix “A” for Multistate Extension Activities with brief statements on the progress to date of each planned multistate Extension program or activity. This reported is generated from a database and formatted consistent with Form CSREES-REPT (2/00), Supplement to the Annual Report of Accomplishments and Results.

INTEGRATED RESEARCH AND EXTENSION ACTIVITIES

See Appendix “B” for Integrated Extension Activities with brief statements on the progress to date of each planned multistate Extension program or activity. This reported is generated from a database and formatted consistent with Form CSREES-REPT (2/00), Supplement to the Annual Report of Accomplishments and Results.

See Appendix “C” for Integrated Activities of the Nevada Agricultural Experiment Station (Form CSREES-REPT (2/00), Supplement to the Annual Report of Accomplishments and Results).

**University of Nevada Cooperative Extension
Multi-State Extension Activity**

Title	2003	2004	2005	2006	2007	Statement of Progress/Description
4-H After School National Leadership Team	\$21,754.26	\$22,406.89	\$23,079.10	\$23,771.47	\$24,484.61	Designing 4-H After School programs, policies and procedures for national effort. The objectives of 4-H Afterschool are to increase the quality and availability of after-school programs; increase the numbers of 4-H members and volunteers; increase the usage of 4-H curricula among youth in after-school programs; increase the knowledge and skills of after-school staff; and increase awareness of 4-H.
4-H USDA Military Program	\$12,282.71	\$12,651.19	\$13,030.73	\$13,421.65	\$13,824.30	Programs to integrate 4-H Military youth from Sierra Army Depot into the Washoe County, Nevada 4-H program.
Adolescent Suicide Risk & Peer Related Violent Behaviors	\$6,308.83	\$6,498.09	\$6,693.03	\$6,893.82	\$7,100.63	An effort to look at suicide risk factor and violent behavior in youth at risk and to apply in developing programs for at risk youth.
Age-paced parenting education	\$13,669.65	\$14,079.74	\$14,502.13	\$14,937.19	\$15,385.30	Reaching parents just when they need information has proven to be an effective method for helping parents understand their baby's development, nurture the new child, prevent child abuse, provide age appropriate learning activities, and support spousal relationship. Considerable work has gone on and is continuing at state and national level with regard to age-paced parenting programs.
Carson River Coalition	\$9,194.04	\$9,469.86	\$9,753.96	\$10,046.58	\$10,347.98	The Carson River Coalition is the first in the country of its size to implement an entire watershed plan. Agencies, individuals, counties, ranchers, recreationists and others are involved in this nationally recognized project to improve and sustain watershed health. The Carson River Coalition's goal is to raise the awareness of the Carson River Watershed and educate people on how their behavior impacts the watershed, and then to change that behavior for the better.
COIN	\$8,050.96	\$8,292.49	\$8,541.26	\$8,797.50	\$9,061.43	COIN is short for California, Oregon, Idaho, and Nevada and is a network of Extension Specialists and Extension Educators in those states plus Utah for the purpose of sharing information on programs.
Commercial Water Conservation Training Program (Desert Green)	\$13,346.84	\$13,747.25	\$14,159.67	\$14,584.46	\$15,021.99	The Commercial Water Conservation Educational Program is designed to educate commercial clientele in the Green Industry as well as others who have an interest in water conservation issues.
Desert Bioscape	\$13,346.84	\$13,747.25	\$14,159.67	\$14,584.46	\$15,021.99	Desert Bioscape is a program that takes a holistic approach to the conservation of natural resources in the urban setting. The goal of this program is to teach homeowners and commercial clientele to conserve water and energy, reduce pesticide and chemical fertilizer use, and promote wildlife habitat in a sustainable manner.
Diabetes Risk Reduction Campaign	\$6,824.41	\$7,029.14	\$7,240.01	\$7,457.21	\$7,680.93	This study used social marketing strategies to develop a health communications message targeting the Spanish-speaking Hispanic population in Las Vegas, Nevada. Specifically, to develop, implement and evaluate a multi-media

Title	2003	2004	2005	2006	2007	Statement of Progress/Description
						campaign to communicate diabetes risk reduction strategies to this vulnerable group. As a result of that success, this social marketing/media campaign was also implemented in Elko County including Wendover, UT.
Dairy Outreach Program	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	Joint cooperative program to share resources for dairy producers in both states.
Extension Coffeeshop and C.O.I.N. Programs	\$14,368.13	\$14,799.17	\$15,243.15	\$15,700.44	\$16,171.45	The University of Nevada Cooperative Extension (UNCE) Coffeeshop e-mail exchange, functions as the vital link between producers and the information they need. The C.O.I.N. e-mail group serves as a technical resource for information.
Lake Tahoe Environmental Education Coalition (LTEEC)	\$16,694.33	\$17,195.16	\$17,711.01	\$18,242.34	\$18,789.61	The Lake Tahoe Environmental Education Coalition (LTEEC) was founded in 1999 and is a collaboration of 24 agencies, educational organizations, and non-profits who work together to improve the effectiveness of environmental education throughout the bistate Tahoe Basin.
Lake Tahoe Report Media Campaign	\$16,694.33	\$17,195.16	\$17,711.01	\$18,242.34	\$18,789.61	The Lake Tahoe Environmental Education Coalition (LTEEC) has teamed up with KOLO-TV News Channel 8 to present a new weekly series titled "The Lake Tahoe Report," that will explore environmental issues at Lake Tahoe. Reno's ABC affiliate will present 90-second environmental news segments weekly during the evening news. These segments began airing February of 2003 during the 5 PM news broadcast.
Laughlin and Bullhead City Regional Community Economic Development	\$13,348.77	\$13,749.23	\$14,161.71	\$14,586.56	\$15,024.16	Community Economic Development continues to be a priority for the regional economy. Over the past six years, in collaboration with the University of Arizona Cooperative Extension (UACE), UNCE's efforts focus on programming to address regional economic development retention and expansion opportunities.
Livestock Grazing For Vegetation Management	\$30,210.38	\$31,116.69	\$32,050.19	\$33,011.70	\$34,002.05	Over 250 people from 17 states and Canada attended a conference titled "Livestock Grazing for Vegetation Management" in Reno, NV on September 24-25. Speakers from both the scientific community and prescribed grazing practitioners discussed how prescribed grazing can be used to meet specific ecosystem management objectives
Living on the Land: Stewardship for Small Acreages	\$9,989.84	\$10,289.54	\$10,598.23	\$10,916.18	\$11,243.67	This project developed a curriculum and training for NRCS, Conservation District, and Extension personnel in eight western states who work with small acreage owners. The curriculum was based on key natural resource issues (goal setting, soil, water, plants and animals) and was reviewed by 17 professionals. Included are 15 PowerPoint lessons with lesson plans and evaluation tools, and an instructor's guide. Over 940 copies of the curriculum have been distributed to date to 42 states and 4 foreign countries. The curriculum is continuing to be updated.
MAGIC	\$38,443.03	\$39,596.32	\$40,784.21	\$42,007.74	\$43,267.97	Expand juvenile delinquency programs to additional new communities and work toward sustainability of on-going programs. This program has nine on-going sites, including reservations in both NV and ID. The program expanded into Lovelock and Hawthorne. MAGIC is the first Extension program in Hawthorne, and was a priority community based upon the desire to begin collaborative work in that community as a stepping-stone to introduction of additional Extension programming
Marketing Alternatives of	\$11,550.76	\$11,897.28	\$12,254.20	\$12,621.83	\$13,000.48	Nevada cattle producers identified marketing alternatives of beef cattle as a high

Title	2003	2004	2005	2006	2007	Statement of Progress/Description
Beef Cattle						priority educational need. Every fall tens of thousands of Nevada cattle find their way to central California where they are over wintered on grass prior to entering the feedlot. California buyers look to Nevada for large volumes of uniform, truckload lots of cattle. Many Nevada producers do not know the buyers, what they look for in a calf, the desired weight, or delivery dates. Many California buyers do not know Nevada cattlemen and the constraints in providing the desired product.
Partners in Conservation Subgroup of LTEEC	\$16,694.33	\$17,195.16	\$17,711.01	\$18,242.34	\$18,789.61	This group has been actively cooperating to reach out to Lake Tahoe homeowners to teach them how to implement best management practices (BMPs). The installation of BMPs on all private properties at Lake Tahoe is Project #16 in the Lake Tahoe Environmental Improvement Program (EIP). The EIP has been endorsed by all state, local and federal agencies at Tahoe as the indispensable restoration plan for the lake.
Regional Teaching of Horticulture Through Mass Media: Community Audiences	\$6,430.41	\$6,623.32	\$6,822.02	\$7,026.68	\$7,237.48	The goal of this program has been to teach via mass media the “why and how” of desert horticulture aimed at improving residents quality of life while impacting the environment responsibly (appropriate water use, minimum fertilizer and pesticide applications, and appropriate horticultural management). This has spread to other counties in southern Nevada, Utah and Arizona through extension agents serving those areas..
Sustainable Biodiversity/Multiple use of Rangelands	\$8,465.98	\$8,719.96	\$8,981.56	\$9,251.01	\$9,528.54	This sustainable biodiversity/multiple use of rangelands program emphasized a balance between wildlife habitat/diversity and livestock forage production. A total of 432 people were taught during 20 instructional presentations to diverse audiences comprised of land users, resource professionals, and youth.
Trade Adjustment Assistance Program for Nevada	\$2,321.50	\$2,391.15	\$2,462.88	\$2,536.77	\$2,612.87	This program provides education and financial benefits to farmers and fisherman adversely affected by trade restrictions globally..
Tahoe Basin Weed Coordinating Group	\$9,989.84	\$10,289.54	\$10,598.23	\$10,916.18	\$11,243.67	The Tahoe Basin Weed Coordinating Group consists of landowners and managers, regulatory agencies and residents working together to share information and resources to achieve effective weed control in the Lake Tahoe Basin.
Water Conservation in Urban Landscapes	\$6,430.41	\$6,623.32	\$6,822.02	\$7,026.68	\$7,237.48	The overall goal of this program is to teach residents and landscape professionals different options that can reduce dependence on potable water for irrigation and still maintain high quality landscapes. This educational program closely parallels our research programs in plant water use and the use of poor quality water for irrigation.
Western Community Vitality Initiative	\$13,348.77	\$13,749.23	\$14,161.71	\$14,586.56	\$15,024.16	UNCE’s faculty have worked collaboratively with the Western Rural Development Center (WRDC) to develop an introductory/overview training for extension field faculty in the western states. These efforts have resulted in planning the first regional training to be held February 2-6, 2004 in Las Vegas.
Western Farm Marketing Committee	\$2,321.50	\$2,391.15	\$2,462.88	\$2,536.77	\$2,612.87	Develop educational materials for producers concerning marketing issues in the western states.
Working with Teens National Youth Dev Study	\$24,795.05	\$25,538.90	\$26,305.07	\$27,094.22	\$27,907.05	National team effort to study & evaluate programs working with teens.

Title	2003	2004	2005	2006	2007	Statement of Progress/Description
Total	\$346,875.90	\$357,282.18	\$368,000.65	\$379,040.68	\$390,411.89	

**University of Nevada Cooperative Extension
Integrated Extension Activity**

Title	2003	2004	2005	2006	2007	Statement of Progress/Description
Adolescent Suicide Risk & Peer Related Violent Behaviors	\$6,308.83	\$6,498.09	\$6,693.03	\$6,893.82	\$7,100.63	An effort to look at suicide risk factor and violent behavior in youth at risk and to apply in developing programs for at risk youth.
Age-Paced Parenting Education	13,669.65	14,079.74	14,502.13	14,937.19	15,385.3	Reaching parents just when they need information has proven to be an effective method for helping new parents understand their baby's development, nurture the new child, prevent child abuse, provide age-appropriate learning activities, and support the spousal relationship. Considerable work has gone on at the state and national levels with regard to age-paced parenting programs.
Alternative Agriculture Production In Nevada (Nursery Stock Production)	\$2,925.99	\$3,013.77	\$3,104.18	\$3,197.31	\$3,293.23	This multi-year project is testing survival and production of several different trees and shrubs. The species being tested are commonly used in landscape plantings in Nevada. Data is being collected on survival and growth rates to determine if nursery stock production is feasible in Western Nevada.
Alternative Crop Production In Nevada (Native Seed Production)	\$2,925.99	\$3,013.77	\$3,104.18	\$3,197.31	\$3,293.23	This project is aimed at increasing the production of native seed in Nevada through collections and field production. It is being completed cooperation with the Bureau of Land Management and private producers. Currently 3 producers are producing seed and approximately 250 Extension bulletins on seed collection have been distributed to interested clientele.
Alternative Crop Production In Nevada (Poplar Tree Production)	\$2,925.99	\$3,013.77	\$3,104.18	\$3,197.31	\$3,293.23	This project is testing the survival and production of poplar trees for various uses in Nevada. It is a multi-year project as poplar trees require approximately 10 years to mature. Several years data concerning survival and growth rates have been collected to date.
Alternative Crop Production In Nevada (Seaberry Production)	\$2,925.99	\$3,013.77	\$3,104.18	\$3,197.31	\$3,293.23	This project is testing the survivability and production of seaberry. Seaberry has numerous commercial uses throughout the world and is extremely hardy and salt tolerant. Ten varieties were planted in 2002 and 2003. Production data will start to be collected in 2005.
Alternative Crop Production In Nevada (Tef Production)	\$2,925.99	\$3,013.77	\$3,104.18	\$3,197.31	\$3,293.23	This project is testing the production potential of tef. Tef is an annual grass that produces seed used to make flour which is gluten free and used in producing injera, flat bread important to Ethiopians. A large producer of tef requested research testing this plant as he requires additional acreage in Nevada to meet demand.
Alternative Crop Production In Nevada (Wine Grape Production)	\$7,314.98	\$7,534.43	\$7,760.46	\$7,993.27	\$8,233.07	Several premium wine grape varieties (14) are being grown on 2 separate vineyards in Churchill County. The survival and production of each variety is being evaluated. Production figures will not be collected until 2004 at the earliest. Wine will be produced from each variety in order to determine potential quality and salability. The project is a multi-year effort that will continue until at least 2007.

An Ounce Of Prevention: A Program To Help People Reduce Their Risk Of Diabetes	\$3,435.64	\$3,538.71	\$3,644.87	\$3,754.22	\$3,866.85	This program educates and motivates clients to make lifestyle modifications to prevent or delay the onset of diabetes and/or its complications and studies factors that help in making lifestyle changes.. It targets people at high risk for developing diabetes: those who are over forty-five years of age; members of an ethnic or racial minority (Hispanic Native American or African American); those who are overweight or obese; those who have a family history of the disease; and women who have delivered a baby weighing nine or more pounds at birth. English and Spanish-language materials and innovative lessons address modifiable risk factors and how to access the health care system.
Bee Population Management	\$19,792.09	\$20,385.85	\$20,997.43	\$21,627.35	\$22,276.17	Establish the relationship between bee population density and rate of pollination and/or yield.
Calcium, Its Not Just Milk	\$3,435.64	\$3,538.71	\$3,644.87	\$3,754.22	\$3,866.85	A needs assessment conducted in 1997 identified target audiences and educational priorities for food stamp-eligible recipients in Nevada. It was determined there was a need to increase consumption of low-fat calcium-rich foods among children (particularly females), ages 11-14 years. The Nevada Nutrition Network (NNN), a statewide coalition of public and private partners, was established to create, implement and evaluate a nutrition program/campaign that reflects the principles of social marketing for food stamp recipients and/or those eligible for food stamps throughout the state. The "Calcium, It's Not Just Milk" program's on-going focus is to increase awareness, knowledge, and skills among the target audience (middle school students) related to increasing consumption of foods with calcium.
Child Care Nevada	\$10,322.13	\$10,631.79	\$10,950.74	\$11,279.26	\$11,617.64	Thousands of young children are in the care of someone other than their parents or other family member everyday in Nevada. The quality of child care impacts children, their families and communities. Caregivers need training and education to provide quality child care. UNCE has offered training to improve the quality of child care in Nevada for 16 years. We do this by developing, implementing and evaluating research based curricula for child care givers.
Control Of Tall Whitetop Along A Riparian Corridor	\$30,210.38	\$31,116.69	\$32,050.19	\$33,011.70	\$34,002.05	Cull mature ewes were used to graze tall whitetop in the vegetative state on approximately 40 acres of the Ralph and Elmira Copeland farm along the Truckee River north of Wadsworth, NV on the Pyramid Lake Indian Reservation. Grazing was from April to November, with approximately 12 ewes removed for slaughter each week, and the grazing period ending when all ewes were slaughtered. Sheep controlled the tall whitetop, not allowing any seed head formation throughout the season, and gained an average of 30 lb per ewe during the grazing period. It is expected that it will take at least 3 years to completely control the tall whitetop by 1) depleting root reserves and plant re-growth and 2) preventing establishment of new plants from the latent seedbed.
Cuentos En Familia	25,299.22	26,058.2	26,839.95	27,645.15	28,474.5	This was the third year for piloting and evaluating the Family Storyteller English Language Learner (ELL) project for Spanish-speaking parents and their 3-7 year old children.

Desert Bioscape	\$13,346.84	\$13,747.25	\$14,159.67	\$14,584.46	\$15,021.99	Desert Bioscape is a program that takes a holistic approach to the conservation of natural resources in the urban setting in both research and outreach efforts. The goal of this program is to teach homeowners and commercial clientele to conserve water and energy, reduce pesticide and chemical fertilizer use, and promote wildlife habitat in a sustainable manner.
Diabetes Risk Reduction Campaign	\$3,435.64	\$3,538.71	\$3,644.87	\$3,754.22	\$3,866.85	This study used social marketing strategies to develop a health communications message targeting the Spanish-speaking Hispanic population in Las Vegas, Nevada. The goal was to develop, implement and evaluate a multi-media campaign to communicate diabetes risk reduction strategies to this vulnerable group. A media campaign was developed, focus tested, piloted, and evaluated. As a result of that success, this social marketing/media campaign was implemented in Elko County including Wendover, UT.
Feasibility Study For Nevada Wildland Seed Producers	\$1,887.77	\$1,944.40	\$2,002.73	\$2,062.81	\$2,124.69	This program funded by the USDA will conduct a feasibility study on marketing and processing opportunities for Nevada Wildland Seed Producers.
Foster Youth Independent Living	\$4,015.43	\$4,135.89	\$4,259.97	\$4,387.77	\$4,519.40	This program teaches life skills to foster youth who are preparing to leave foster care due to attaining the age of majority. Program staff assists youth in developing a transitional living plan that allows them to successfully transition to an independent living status. Program staff also conducts workshops in developing life skills such as nutrition, money management, workforce preparation & college readiness (includes training in how to apply for financial aid). Research in effectiveness of methods and youth changes is being conducted.
Healthy Child Care Nevada	\$7,827.02	\$8,061.83	\$8,303.68	\$8,552.79	\$8,809.37	There are three major thrusts associated with this grant-funded program: establishing a Child Care Health Consultation network in Nevada, a study of the National Health and Safety Performance Standards compared with the Nevada Child Care Licensing Regulations, and enrolling children in the Children's Health Insurance Program through child care providers.
Invasive Weed Management	\$16,001.43	\$16,481.47	\$16,975.91	\$17,485.19	\$18,009.75	Invasive plant species continue to increase in Nevada. This program is aimed at slowing the invasion and spread of noxious, invasive plants in Nevada. The program uses field trials, demonstrations, workshops, presentations and printed materials to educate the general public. The public is encouraged to report new invasive weeds and control those found on property that they control.
Magic	38,443.03	39,596.32	40,784.21	42,007.74	\$43,267.97	Expand juvenile delinquency programs to additional new communities and work toward sustainability of on-going programs. This program has nine on-going site, including reservations. Research on impact and effectiveness of program methods are being studied as well.
Parenting Education And Support	\$7,827.02	\$8,061.83	\$8,303.68	\$8,552.79	\$8,809.37	Primary efforts in parenting focused on: 1) facilitating a meeting of UNCE faculty working in this theme area (with Evans) 2) working with off-campus faculty on program development, and 3) state and national endeavors related to age-paced parent education curricula and support for at-risk families. Research in effectiveness of change is being conducted. Research on impact and effectiveness of program methods are being studied as well.

Parenting From Prison	\$14,148.98	\$14,573.45	\$15,010.65	\$15,460.97	\$15,924.80	Parenting From Prison is a parenting class offered at the Silver Springs Conservation Camp, minimum security prison for women and at the Nevada State Prison, medium security prison for men in Carson City. Participants are inmates who expect to be reunited with their children or children of another person upon release. The class focuses on ways to maintain or strengthen relationships, by learning parenting and communication skills, as well as learning developmental norms and age-appropriate guidance methods. Research on impact and effectiveness of program methods are being studied as well.
Parenting Issues At Ridge House	\$10,322.13	\$10,631.79	\$10,950.74	\$11,279.26	\$11,617.64	Ridge House is a transitional shelter for recently incarcerated men and women with substance abuse issues. Residents of Ridge House participate in numerous classes during their 3 month stay. Parenting Issues is a weekly 90 minute class that meets for 6 weeks for all parents. Parenting Issues focuses on typical development and guidance, impact of parental incarceration on children, communication skills and reconciliation issues. Research on impact and effectiveness of program methods are being studied as well.
Potential Revegetation Practices For Disturbed Arids Lands	\$17,091.64	\$17,604.39	\$18,132.52	\$18,676.50	\$19,236.80	This project is evaluating the potential for using 1 year old native shrubs in revegetating disturbed arid lands in Nevada. The use of a water absorbing polymer mixed in the soil at planting to increase planting success is being evaluated in this project. Results will be used in educational programs for land managers.
Renewable Energy Feasibility Study	\$1,887.77	\$1,944.40	\$2,002.73	\$2,062.81	\$2,124.69	Received \$20,000 grant from the Nevada Division of Energy. We will gather information on alternative energy sources as well as conducting feasibility studies for the implementation of alternative energy sources.
Restoring Rangeland Health	\$11,552.83	\$11,899.41	\$12,256.39	\$12,624.08	\$13,002.80	The rangeland health program focused on noxious weed management and revegetation. A total of 265 adults and 355 youth were taught about weed management via 11 slide presentations, field tours, demonstration projects and hands on activities. The annual “woad pulls” and other educational programs have served as catalysts that have changed community awareness and attitudes, spawning increased action; this is evidenced by formation and accomplishments of 3 local weed activist organizations, including the recently formed Elko County Cooperative Weed Management Area.
Sustainable Biodiversity/Multiple Use Of Rangelands	\$14,639.68	\$15,078.87	\$15,531.24	\$15,997.18	\$16,477.10	The sustainable biodiversity/multiple use of rangelands program emphasized a balance between wildlife habitat/diversity and livestock forage production. Besides research programs, a total of 432 people were taught during 20 instructional presentations to diverse audiences comprised of land users, resource professionals, and youth. I taught agency specialists, Native Americans, and ranchers.
Wildfire Fuels Management/Post Fire Rehabilitation	49,161.05	50,635.88	52,154.95	53,719.60	55,331.18	This project is using intensively managed livestock grazing as a tool to reduce wildfire fuels, and improve post fire seeding success. After 3 years of study the study results indicate that livestock can significantly reduce annual plant populations, but that grazing did not increase seeding success.
Totals	\$348,185.80	\$358,631.35	\$369,390.24	\$380,471.98	\$391,886.13	

**NEVADA AGRICULTURAL EXPERIMENT STATION
ATTACHMENT TO FORM CSREES-PLAN (2/03)
INTEGRATED ACTIVITIES (HATCH ACT FUNDS)**

TITLE OF PLANNED PROGRAM/ACTIVITY	Actual	Estimated			
	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Freeze damage and protection of horticultural species	12,318	43,911	30,410	22,808	-
Genomics studies in plants, insects, infectious pathogens and vertebrates	190,373	-	-	-	-
Understanding and enhancing intergenerational literacy in ESL families	30,064	14,814	-	-	-
Adolescent suicide risk and peer related violent behaviors	31,841	15,752	11,814	-	-
Improving quality of child care in Nevada: Continued explorations	33,265	13,136	-	-	-
Modifying milk fat consumption for enhanced manufacturing qualities and consumer acceptability	25,335	-	-	-	-
Statewide survey of elementary school employees	10,215	20,388	11,213		
Strategic development of a competitive grape industry in Nevada	89,828	23,375	21,525	-	-
Modeling the effects of environmental stresses on oocysts	15,762	-	-	-	-
Vegetation management along a riparian corridor	30,744	24,500	24,500	-	-
Rural communities and public lands in the West: Impacts and alternatives	2,084	21,850	22,060	16,545	-
Characterization of flow & transport processes in soils at different scales	481	54,222	54,732	41,049	-
Nevada beef cattle: Marker assisted selection	18,497	84,103	55,244	7,875	-
Additional projects to be approved in years 2003-2006	-	-	-	109,859	198,136
TOTALS	490,807	316,051	231,498	198,136	198,136