

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

**Annual Report  
of  
Accomplishments & Results**

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# PROGRAMS

## Overview and Introduction:

Reports are provided on select program impacts which reflect unique benefits to a diversity of clientele and stakeholders in Nevada. These were selected because of the impacts demonstrated, and/or to show the diversity of programs and audiences served. 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 “research” component. Cooperative Extension faculty are expected to emphasize researching needs assessments and impacts of programs, and may use applied research projects as 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 Experiment Station appointments as well). Many state specialists are also on joint NAES appointments.

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, developing new markets for beef products, improving sheep management strategies to increase profitability, improving the nutritional quality of beef products and extending the shelf life of meat products.

### **Federal and State Funding by Plan of Work Goals**

	<b>Goal</b>	<b>Federal \$</b>	<b>State \$</b>	<b>County</b>	<b>Total \$</b>	<b>FTE</b>
Nevada Agricultural Experiment Station	I	304,866	1,592,316		1,897,182	32
University of Nevada Cooperative Extension	I	339,847	1,447,189	1,540,364	3,327,400	38.75

**Theme: 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 will increase the contribution agriculture makes to the state's economy and the opportunities for agriculture careers. These factors contribute to a need for alternative crops research and development for the sustainability of agriculture.

**What Has Been Done:**

Field trials determine the survival and production potential of the alternative crop in question. A successful hybrid poplar trial of 300 trees at the Newlands Research Center in Fallon is in its third year of production. The trees grew to heights of more than 20 feet. The trial was expanded in 2001 with 100 trees planted in Pahrump.

A three-acre wine grape trial on a Fallon farm, consisting of 10 wine grape varieties from Washington, tests the viability of 300 plants. Water use is being studied to determine the amount of water required to raise grapes in this area. The feasibility of establishing a malting barley industry in Nevada was launched in 1999 with a series of grower meetings. Anheuser-Busch Company has helped establish preliminary plantings.

A nursery stock 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, consisting of nearly 750 bare-root plants, were planted in 2001. An irrigation/bee population management project for alfalfa seed continues at Newlands, and a warm-season hay and pasture grass trial continues.

**Impact:**

Nearly 3,000 poplar trees were planted in 2001, indicating a large interest in their potential as an alternative crop. The Kennametal Company in Fallon planted 40 acres of hybrid poplars and other species on local farms in a carbon sequestration program aimed at removing enough carbon from the atmosphere to balance that emitted from their national operations.

The initial information collected on the grape and nursery stock projects indicates average first-year survival rates in excess of 90 percent for the varieties planted. The grapes used 20 percent of the water needed to grow alfalfa in the Fallon area. The malting barley program resulted in the planting and evaluation of 540 acres in Pershing and Humboldt Counties in 2001. Preliminary evaluations of the grasses indicate that more than 50 percent of the seeded varieties may be feasible for future production.

The three weather stations installed played an important role in the alternative crop enterprises in that climatic data is the first information necessary to evaluate a potential new crop. The stations help improve water management, determine if frost protection is necessary, manage insect pests based on growing degree-days and improve harvest timings. This is the first time local farmers with access to the Internet have had climatic data to assist them with their crops.

**Source of Funding:**

- Hatch Act funds
- Smith-Lever funds
- State Matching funds
- Cooperators

**Scope of Impact:**

- State Specific
- Integrated Research and Extension

**Theme: Animal Production****Issue:**

After a needs survey of Nevada cattlemen in 1998, UNCE educational programming concentrated on marketing alternatives for range livestock and bringing new technology and communication systems to the agriculture community. The knowledge, experience and expertise of university faculty, local veterinarians, industry representatives and the ranchers themselves have been integrated and applied through a variety of methods including a new Coffee Shop e-mail exchange.

### **What Has Been Done:**

UNCE specialists have taken the traditional producer coffee-shop discussions into cyberspace. Extension Coffee Shop is a free, online, subscription-only e-mail question and answer service for western livestock producers. The service allows producers to chat online not only with UNCE specialists, but also with other experts and producers. It enables operators to get instant answers to questions such as when to wean, what to feed spayed heifers, whether cows need salt, and how to harvest irrigated pastures. Producers stay on the cutting edge of the cattle industry and get up-to-date production and marketing information right in their office.

To subscribe, producers send an e-mail message to: [torellr@unce.unr.edu](mailto:torellr@unce.unr.edu); once registered, questions are sent to [extensioncoffeeshop@unr.edu](mailto:extensioncoffeeshop@unr.edu).

### **Impact:**

After three years, the Extension Coffee Shop subscription list is 200 strong and growing. Subscribers range beyond Nevada into California, Oregon, Washington, Idaho, Montana, Utah and around the country as well. Education has reached many people with little effort or expense, and the multiplier effect is enormous. Spin-offs include the Nevada Cattlemen's Association newsletter, "Sage Signals," which features a topic of discussion every month from Coffee Shop, and articles in national beef magazines gleaned from the discussions. Clint Peck, a writer for *Beef*, the leading trade magazine with a 100,000 national circulation, picked up a topic and included it in his article, "Protein Blocks – are they the best choice for broken-mouth cows?"

All surveyed subscribers said that some aspects of discussions and information taught on Extension Coffee Shop have been implemented in their operation. Of the information implemented, producers say the new practices have either made life easier and more enjoyable, or improved the profitability of their ranch. One rancher saved \$11,500 after using information on pricing protein supplements. After a discussion on postpartum supplement and its effect on second conception, some producers saved \$10,000.

### **Sources of Funding:**

Smith-Lever funds  
State Matching funds

### **Scope of Impact:**

Multistate Extension (CA, OR, NV, WA, ID, UT, MT and probably more!)

### **Theme: Animal Production Efficiency**

### **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 10 years crosses and back-crosses between mixed lambs and pure Merino rams has resulted in approximately 50% of the 1000 ewe flock are approaching purebred Australian Merino status, a known high quality wool producing breed.

41 Australian Medium Woolled Merino X Rambouillet ram lambs were used to evaluate the effect of the breeding program on carcass measurement, closely trimmed primal cut percentages, chemical analysis of rib chop and wool production traits. Lambs were slaughtered at 32 kg, 45 kg, or 54 kg. Carcass measurements were not significantly ( $P > .1000$ ) affected at any slaughter weight with the exception of flank streaking score ( $P = .0186$ ) at 54 kg. Closely trimmed primal cut percentages were not significantly ( $P > .1000$ ) affected by the program at 45 kg. At 54 kg the program significantly enhanced percent shank, rib and breast and kidney ( $P = .0035, .0485, .0006$ , respectively). Chemical composition of rib chops were not significantly ( $P > .3000$ ) altered by the program. Clean wool produced and fiber diameter were significantly ( $P = .0121$ , and  $.0240$ , respectively) improved by the breeding program.

### **Impact:**

By taking advantage of the breeding program being developed on University of Nevada's research ranches producers are able to add value to their sheep production system. Evidence of the effectiveness of this research program are clear. By improving genetic stocks, University of Nevada's Merino X Rambouillet hybrid flocks are producing a 90% cleaner wool than the national average and a 15% improvement over indigenous Australian flocks. Lamb production has also improved significantly through our breeding program. Ewes are averaging 25% more pounds of lamb per ewe over the western U.S. average and almost 2 times the pounds of lamb/ewe when compared to Australian Merino flocks. To improve the quality of sheep production nationally, annual ram sales are being hosted allowing ranchers access genetically selected animals, with over 200 producers, researchers, and educators visiting the research ranch since 1999.

### **Funding Source:**

Federal: USDA - Hatch Act

State: Nevada Agricultural Experiment Station, Nevada Cooperative Extension

Other: Edwin L Wiegand Trust Fund

**Scope of Impact:** Western Region

### **Theme: Risk Management**

#### **Issue:**

The beef cattle market is cyclic--cattlemen make money in the up years and lose money in the down years. When the Chicago Mercantile Exchange added stocker cattle (500-pound calves) as a broad commodity, livestock marketing became manageable from conception to yearlings to the finished product. Nevada producers need a way to stay in business and avoid the pitfalls of down years. CME futures contracts can offset price fluctuations, but ranchers need help in understanding the market.

#### **What Has Been Done:**

UNCE developed a year-long Risk Management program, "Inside Beef," that teaches futures and options techniques to ranchers. Ranchers negotiate futures and options through the CME to avoid the ups and downs of industry prices. Hands-on classes in Nevada and Idaho involve participation in monthly marketing meetings, futures and options exercises, how to determine breakeven production costs, the USDA grading system, the IBP grid and a consigned cattle experiment. After negotiating several trading exercises, ranchers consign some of their cattle to group ownership and compete for real. In the fall of 2000, 472 head of preconditioned and weaned Nevada, Idaho, California and Oregon calves belonging to 66 Western producers were consigned to "Inside Beef." They were fed against the June 2001 live cattle fat contract, and futures and options were implemented on the multi-ownership pen of cattle.

**Impact:**

The program resulted in a \$43 per head net income as a result of the implemented risk management strategies. Fifteen of the participants have gone on to implement futures and options on all their cattle. The result of the program has been an average ranch net income of an additional \$20,000 per year. The program's success was published in *Beef* (January 2002), a national magazine with a 100,000 circulation, as well as Nevada agricultural newspapers.

**Sources of Funding:**

Smith-Lever funds  
State Matching funds  
USDA Risk Management Agency funding

**Scope of Impact:**

Multistate Extension (ID, NV, CA, OR)

**Theme: Adding Value to Agriculture Products****Issue:**

Cull cows are often overlooked as an important source of income to the cow-calf enterprise. Depending upon the relationships between cull cow and calf prices and the herd-culling rate, cull cow receipts generally account for 15 to 30 percent of income from the cow-calf enterprise. However, some producers give little attention to this source of income and ways of enhancing it. For many producers, cull cows are sold at the time they are culled from the herd. Much of this culling is done in the late fall soon after calves are weaned.

**What Has Been Done:**

In the fall of 2000, 41 cull cows from three participating Nevada ranches were placed on feed as a demonstration of an alternative marketing method for cull cows. The cows were fed for 88 days and marketed on the rail.

**Impact:**

Participants realized a \$39 per head advantage through this marketing method. The results of the trials were presented to 425 participants at the 2001 Cattlemen's Update program. Participants evaluated the presentation at 4.8 on a 1 to 5 scale, the highest evaluation of all the presentations. The 2001 needs assessment and impact survey revealed that participants have implemented this marketing strategy and are taking advantage of the \$39 per head marketing option.

**Sources of Funding:**

Smith-Lever funds  
State Matching funds

**Scope of Impact:**

State Specific

**Theme: New Uses for Agricultural Products****Issue:**

When UNR's Wolf Pack Meats looked to foodservices for upcoming trends, bacon and eggs continue to pop up as breakfast's classic combo. However, just as morning diners have awakened to a new world of premium coffees, they are beginning to rethink the meaty part of the meal.

**What Has Been Done:**

Over the past year and a half, students in the tutelage of faculty and staff have scrutinized the Reno food industry in search of open niches. One of the glaring results of these surveys was the predominance of pork in the breakfast industry, while beef held only a meager share.

Through careful evaluation of product allocation, a number of cuts of beef were selected for their nutritional value and low market representation to be included in the development of breakfast alternatives. Three products were developed base upon the selection of cuts: beef bacon, beef ham and beef sausage. To make these products more appealing to the breakfast consumer, the strategies of brown' and server, precooked meat was adopted.

With a new product line established, measures were taken to train students in the new food processing techniques along with focusing attention on how to market new products, through advertisement campaigns, media participation, retailers and wholesales incentives, and consumer taste tests.

**Impact:**

Nevada's beef producers through this program now have the potential of gaining a share of the lucrative 36 billion dollar breakfast industry. While sales of alternative breakfast meats are far surpassed by classic breakfast meats, the growing demand for leaner meals dictates unconventional approaches. "Initially, I wasn't a big fan of beef for breakfast," says Mike Guzman, a general manager for Scolari's meat & seafood department, "but when I first tasted (the peppered beef bacon), I went nuts. The flavors are wonderful...People get upset if we run out."

The consumer is not the only benefactor of the new produces. The whole endeavor was choreographed to give UNR students hands-on training in meat technology, product development and commercial marketing and retail sales. Susan Casey, president of UNR's Collegiate Cattlewomen, said that "Without a state-of-the art facility like UNR's Wolf Pack Meats, students like myself would never come into contact with real-world industrial food processing and marketing."

Wolf Pack Meats is one of the leading national educational facilities where students get first hand experience in production to retail distribution. Within Nevada's meat processing circles, Wolf Pack Meats is also unique in that it processes all its product on site. Providing students the opportunity to participate in the pre-processing procedures that are part of every abattoir. As one student put it "We were involved from conception to consumption". If student participation continues at its present rate, 35-40 students per year will gain valuable experience through programs like "Beef, It's what's for breakfast" says professor Thomas Ringkob a meat technology professor at UNR.

**Funding Source:** Nevada Agricultural Experiment Station, Nevada Beef Council

**Scope of Impact:** State Specific

**Theme: Adding Value to New and Old Agricultural Products**

**Issue:**

Meeting consumer expectations for product quality and consistency (particularly for healthiness) has been identified as a high priority by the U.S. beef industry. According to results of a recent consumer survey (1998), three primary factors that would motivate consumers to purchase more beef at retail markets are "lower retail beef prices," "improved product quality and consistency at the same price," and "improvements in the eating experience." When asked about the use of certain genetic tools to enhance beef's quality and consistency, most consumers indicated that they would buy beef that had been modified, if the treatment improved product quality.

The American diet tends to be deficient in conjugated linoleic acids (CLA), a type of fat that is vitally important for the health of the brain and nervous system and for numerous biochemical processes, including those that protect us against heart disease and cancer. Previous research has shown that grass-fed beef are much richer in CLA than the fat from animals that have spent many weeks in the feed lot. This notion has led to our investigations into special diets for beef cattle to raise the levels of CLA in their fat.

**What Has Been Done:**



The main objective of this investigation was to determine the effects of beef cattle breed (Red Angus and Tarentaise) and finishing diet (high-grain or high-forage, with or without vitamin E supplements) on beef quality. Specifically, investigators wanted to identify breed differences in beef quality under different dietary conditions and to identify dietary ingredients that increase concentrations of desirable fatty acids in general, and conjugated linoleic acid (CLA) in particular, in beef without affecting overall quality.

Thirty-two beef steers were used in a completely randomized design experiment. Four dietary treatments were evaluated. Steers from each breed were assigned at random to each dietary treatment. The steers were removed from feed but allowed access to water 12 to 24 hours pre-harvest. A multitude of measurements were taken to determine beef quality.

**Impact:**

This project demonstrated that fish oil supplementation improved fatty acid composition of the loin strips (longissimus muscle). Specifically, investigators found on average 66% higher concentrations of the cancer fighting molecules “conjugated linoleic acid” - also known for reducing the risk of heart disease. These findings suggest that there's enough essential fatty acid in the lean tissue to meet 25-50% of the normal daily requirements for humans who consume this beef.

"We know we can increase the conjugated linoleic acid levels in beef," says lead investigator Hussein S. Hussein. "More importantly, this might help us improve the public's perception of beef if we can produce a generally leaner, more tender product that is high in conjugated linoleic acid. We're giving consumers a choice."

Tarentaise steers' feedlot performance and fatty acid composition of the loin strips were not affected by breed. Tarentaise steers had heavier carcasses, larger loin strip area, less back-fat thickness, lower marbling scores, and better yield grade than the Red Angus steers

**Funding Source:**

State: Nevada Agricultural Experiment Station

**Scope of Impact:** National

**Theme: Adding Value to New and Old Agricultural Products**

**Issue:**

Numerous factors can alter the value of beef, but none influences consumer selection of beef more than eye appeal. Consumers continue to prefer beef that has a bright, cherry-red color of lean. The National Cattlemen's Beef Association reported that deviation from a bright cherry-red color of lean is responsible for an annual loss of \$520 million to the beef industry, simply due to shortened case-life. In an attempt to capture a portion of this annual loss, researchers University of Nevada have explored the possibility of enhancing retail case-life through modified atmosphere packaging.

**What Has Been Done:**

This project proposes to use new approaches to carcass evaluation, processing, and distribution of lamb. Color images of transverse sections of the carcass at the shoulder and loin area were collected and through the use of image analysis software, images were broke down into color spectrum maps of lean and fat. The lean to fat ratios were then correlated with yield grade, retail cut-out, and retail carcass value.

The lamb processing system has evolved into a case-ready controlled atmosphere packaging program. The lamb is over wrapped on polystyrene trays so the stores only have to run the trays through the wrapping machine for pricing and code dating. The retail product is processed in a chamber vacuum machine equipped with a chip which allows multiple flushes of CO<sub>2</sub>. The boxed product (master packs) are delivered to the supermarket central warehouse and delivered to individual store once a week in refrigerated trucks.

**Impact:**

Modifying a packages interior environment is a relatively new technology for maintaining quality and prolonging the shelf life of food products. Controlled atmosphere packaging, combined with chilling, resulted in shelf-life extension up to 3 months for lamb products. Local supermarket manager Jim Scazonin may have put it best “This new packaging program **extended shelf life, retained flavor and color, improved product appearance, expanded distribution capabilities and fewer product stales and returns.**” Our research also shows that placing lamb cuts into a CO2 environment within 2 hours of processing inhibited microbial growth, increased vitamin and nutrient retention, and reduced oxidation and rancidity – both being important for preventing distasteful meat flavor and would be more important for grass-fed beef and cow beef where off- flavors of meat can be a major problem. Local indicators in retail sales of lamb in Northern Nevada suggest that since attempts at prolonging shelf-life and greater color retention lamb sales have increased 300% over the past five years. “The lamb industry would benefit nation wide from this value-added approach” says UNR lead investigator Thomas Ringkob.

**Funding Source:**

Federal: USDA - Hatch Act

State: Nevada Agricultural Experiment Station

**Scope of Impact:** National

## **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 through vitamin supplementation.

### **Federal and State Funding by Plan of Work Goals**

	<b>Goal</b>	<b>Federal \$</b>	<b>State \$</b>	<b>County</b>	<b>Total \$</b>	<b>FTE</b>
Nevada Agricultural Experiment Station	II	67,046	365,207		432,253	6
University of Nevada Cooperative Extension	II	84,407	359,434	382,576	826,417	8.86

## **Theme: Food Accessibility and Affordability**

### **Issue:**

Diseases of the reproductive organs in cattle usually develop so gradually that they go unrecognized until the disease is well established in the herd. Infected animals usually are not dying; in most cases, especially in males, they do not even appear ill. Some animals never show symptoms of the disease, yet remain a major threat to the rest of the herd because they carry disease organisms.

To prevent reproductive diseases, producers must always be on guard and practice good management techniques such as isolating newly acquired cattle and treating when needed. Currently, the only commercially available cures for cattle *Tritrichomonas foetus* (a reproductive diseases) are post diagnosis treatments. Our objective is to produce a prophylactic treatment (vaccine) for this disease.

### **What Has Been Done:**

The objective of this research was to continue investigating the antigenic and immunological basis of productivity increases resulting from a *Tritrichomonas foetus* vaccine. Specifically, we were interested in determining the extent of local immune response, the identity of protective antigens, and the feasibility of developing a DNA library of the organism. We found that there is substantial development of an antibody response in cervico/vaginal mucus following vaccination. Although total immunoglobulin concentrations did not elevate following vaccination, *Tritrichomonas foetus* specific antibodies increased significantly. These antibodies were found to react strongly with a conserved series of membrane glycoproteins which offer possible antigens for an improved *Tritrichomonas foetus* vaccine. Additionally, a DNA library of *Tritrichomonas foetus* mRNAs was produced in the "Lambda ZAP" cloning system. This library was be screened for *Tritrichomonas foetus* protein production and for its ability to initiate an immune response when utilized as a DNA immunogen.

### **Impact:**

The vaccine developed in University of Nevada, Reno's laboratories is currently the only prophylactic treatment for prevention of *Tritrichomonas foetus* reproductive disease. This vaccine protects from 30% to 60% of infected pregnant heifers from trichomonal abortion. Informal surveys have shown that Nevada ranchers are

using the vaccine. If only 30% of infected heifers are protected, vaccination provide an economic benefit of approximately \$950,000 per year to Nevada cattle ranchers.

**Funding Source:** Federal: USDA - Hatch Act  
State: Nevada Agricultural Experiment Station

**Multi-State Research Project Number:** W-112

**Scope of Impact:** National

**Theme:** *Food Safety*

Issue:

No sheep producer needs to be reminded that mastitis causes heavy financial losses. Surveys show mastitis is the major reason for culling ewes (46%), well ahead of barrenness (37%). Added to this are the large number of ewes that die as a result of acute mastitis. And the damage doesn't stop there. The costs of antibiotics, the labor associated with treatments and fostering, reduced lamb growth rates and increased lamb mortality ...the list goes on. To top it all off, treatment is rarely 100% successful, but early detection is the key to at least saving the ewe. The diagnosis of clinical mastitis is straightforward. Something is obviously wrong and it is easy to see. But with subclinical mastitis, the problem is detection.

**What Has Been Done:**

This study was conducted using repeated sampling to access the incidence of subclinical mastitis (an invisible form of mastitis) in ewes over a lactation period. Somatic cell counts (SCC) of Rambouillet ewes were examined at 20 days postpartum. Ewes were then selected and categorized as having low or high SCC. Udder halves, rather than individual ewes, were reclassified as control or SM based on SCC values for each sampling period. Milk samples were collected at 30, 60 and 90 days + 1.6 day postpartum. Milk samples were collected at 0, 2, 4, and 6 hours and additional samples obtained at 12, 18, and 24 hours at 90 day postpartum. At 0 hours, a sample was collected, the udder was milked out and milk was allowed to accumulate over the sampling period. Samples were examined using differential fluorescent staining and flow cytometry to quantify the total SCC. These data suggest that it is difficult to identify all ewes with subclinical mastitis using repeated sampling measures over the lactation period because disease status varies.

**Impact:**

What researches at the University of Nevada, Reno have found is that "flow cytometry" is proving to be the tool of choice for identifying ewes plagued with mastitis infections undetectable by visual inspections (a.k.a. subclinical). Flow cytometry is a means of measuring certain physical and chemical characteristics of cells or particles as they travel in suspension one by one past a sensing point. This new technique is allowing UNR scientist to count somatic/udder cells - udders consistently demonstrating low udder cell counts throughout lactation can be considered mastitis free, whereas high udder cell counts could be considered to have chronic subclinical mastitis.

Most would agree that an applicable and affordable management practice to reduce the amount of subclinical mastitis would be advantageous to the sheep producer. With the assistance of UNR, Nevada's sheep producers can test for subclinical mastitis for as little as \$1.00 per ewe.

**Funding Source:**  
Federal: USDA - Hatch  
State: Nevada Agricultural Experiment Station

**Scope of Impact:** National

**Theme:** *Food Quality*

**Issue:**

Consumers judge beef by its color. Although beef loses its eye appeal long before it actually loses its wholesomeness, shoppers assume it's past its prime when the color is not bright red. Retailers must commonly discount such packages by up to 50% to salvage some value before the remainder is discarded. The National Cattlemen's Beef Association estimated losses range from \$60 to \$156 per 1,000 pounds of beef sold. In an attempt to capture a portion of this annual loss, researchers at the University of Nevada have explored the possibility of enhancing retail case-life through dietary supplementation of antioxidants such as vitamin E

**What Has Been Done:**

The objective of our research was to develop desirable beef products with less than 30% of calories from fat for domestic markets and to extend shelf-life of beef for domestic and international markets. To achieve this goal scientist at University of Nevada began supplementing vitamin E to finishing ration at the rate of 500 I.U. for 100 days before slaughter.

The effects of supplementing at rates of 0 or 500 IU/animal/day of vitamin E for the last 100 days of the finishing period on retail beef case-life were observed using image analysis software. Obtainable case-life was prolonged ( $P < 0.05$ ) by feeding supplemental vitamin E for ground beef (by 9 h), steaks from the clod (9 h), ribeye (14 h), strip loin (8 h) and inside round (17 h) and for roasts from the inside round (5 h). Packages discounted were decreased ( $P < 0.05$ ) by feeding supplemental vitamin E for ground beef (7 percentage points), for steaks from the clod (7 percentage points), ribeye (2 percentage points), strip loin (3 percentage points), tenderloin (2 percentage points) and inside round (4 percentage points) and from roasts from the inside round (14 percentage points). This study indicated that supplementing cattle with vitamin E improved case-life and decreased discount percentages of retail beef products.

**Impact:**

In the current investigation, supplementation of cattle (i.e., 500 IU/animal/day for 100 days) with vitamin E extended the case-life of retail beef cuts under commercial conditions. Case-life enhancement was achieved in all sub-primal cuts with chuck and round cuts as well as ground beef showing the most benefit. Implementation of this technology costs the feeder approximately \$4.00 per animal with an ultimate savings of between \$30.00 and \$35.00 per carcass marketed through retail operations.

**Funding Source:**

Federal: USDA - Hatch Act

State: Nevada Agricultural Experiment Station

**Multi-State Research Project Number:** W-177

**Scope of Impact:** National

**Theme: Food Quality****Issue:**

The beef industry is a staple of Nevada's economy. Ranchers across the state are dependent upon consumer beef consumption for their livelihood. But consumers have become more wary toward beef in recent years. Worries about cholesterol, fat intake and *E-coli* and other bacterial infections from beef products in recent years have scared some consumers away. The demand for beef has been declining. Ranchers need a way to assure consumers of the high quality and safety of their product and bring beef back to the dinner table. Also, many buyers of feeder cattle are seeking out Beef Quality Assurance (BQA) certified, source-verified calves. With some of the most highly regarded branded beef product lines, such as Nebraska Corn Fed Beef, the only cattle eligible for enrollment are BQA-certified calves. Beef Quality Assurance education has become a national initiative and top priority through the National Cattlemen's Beef Association.

**What Has Been Done:**

The Nevada Beef Quality Assurance Educational Program was introduced to Nevada ranchers in 2000. Establishing the BQA-certified program in Nevada opens up a market outlet for those progressive cattlemen who become certified. BQA programs teach cattle producers 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. BQA programs were created 10 years ago by the National Cattlemen's Beef Association with a goal of producing quality beef that maximizes consumer confidence in the product. Participating cattlemen work closely with veterinarians, scientists and other specialists to keep cattle healthy. BQA safety requirements exceed standards established by the Federal government, and most graduates of the program produce safer, better quality beef after completion. Three levels of classes are taught through BQA and each completed level increases the producer's knowledge of safety and quality.

**Impact:**

Thirty cattle producers attended the first level one Nevada BQA program in 2000, completed the class and received a certificate for their completion. In 2001, Level One Certification was included in the annual Cattlemen's Update. More than 100 Nevada cattle producers were certified statewide, leading to the assurance that every animal which leaves their operations has been managed and treated correctly. This is to insure that when the animal leaves the ranch to go to the next link in the beef-production chain, it will be a fault-free product for the finishing touches. The lessons the cattlemen are taught will directly affect the wholesomeness and safety of their beef products and the eating satisfaction of the eventual consumers. Increased consumer satisfaction leads to increased consumer confidence in beef products and, in turn, increased demand.

**Sources of Funding:**

- Smith-Lever funds
- State Matching funds
- Other USDA agency grants

**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 diabetes) among youth. 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. The “Chef’s for Kids” nutritional program has been especially success over many years. Finally, UNCE faculty have conducted research to determine how educational programs (such as “Calcium, It’s Not Just Milk) impact calcium intake of youth. Special efforts have been made to reach minority audiences.

NAES research has focused on nutritional intervention strategies with dietary fat to assist in the treatment of human cancers, evaluating environmental tobacco smoke damage and protection through nutritional supplementation with anti-oxidants, and developed a health at work program to prevent coronary heart disease.

#### **Federal and State Funding by Plan of Work Goals**

	<b>Goal</b>	<b>Federal \$</b>	<b>State \$</b>	<b>County</b>	<b>Total \$</b>	<b>FTE</b>
Nevada Agricultural Experiment Station	III	122, 809	578,038		700, 847	14
University of Nevada Cooperative Extension	III	81,775	348,229	370,684	800,652	13.64

### **Theme: Human Nutrition**

#### **Issue:**

One of Michelle Beaver’s chief fears about going to college is gaining weight, or what some call the "Freshman 15." The 17-year-old Las Vegan isn't alone, as thousands of high school graduates head for college to juggle a heavy academic load, a new social life -- and a college cafeteria with its smorgasbord of light and not-so-light foods.

The stress of handling rigorous studies and being away from parents for the first time, in an environment with unlimited access to food, can quickly result in weight gain. And if freshmen use food to soothe emotional needs instead of hunger, putting on 15 pounds is quite possible. Fortunately, the skills for managing weight are no secret!

#### **What Has Been Done:**

Developed in cooperation with the University of Nevada’s Wellness Program, Nutrition professor Marsha Read conducts workshops aimed mainly at dormitory students who are eating away from home for the first time.

In Read’s workshop, she explains how “All-you-can-eat” dining halls, weekend parties, skipping meals due to busy schedules (and then bingeing later), late-night pizza runs, and stress eating all contribute to excess pounds put on by first-year students. Through a multitude of examples Read demonstrates how it takes 3,500 extra calories to gain one pound of fat and when broken down, that's just 145 extra calories per day (above the U.S. average daily consumption) to gain 15 pounds of fat over one year.

Read's advises students to avoid the dreaded "freshman 15" by simply: 1) Keep up with the physical activity that you did in high school, or at least replace it with some other type of physical activity. 2) Walk to class instead of getting a ride or taking the shuttle. 3) Skip desserts and excess breads at meal times. 4) Cut down on high calorie drinks such as soda. Avoid the 32-ounce cups and learn to drink smaller beverage portions. 5) Lower your intake of alcohol and be aware of the late night munchies that usually occur after a night of drinking. 6) Take advantage of the salad bar where there are many low-fat food selections such as fresh vegetables, fruit and protein sources. 7) Eat a power breakfast with some low-fat protein and a starch. This will

increase the body's metabolic rate and help control weight gain. 8) Eat frequently but in small amounts. 9) Avoid fried foods.

**Impact:**

"Most freshmen do gain weight, whether it's five or 15 pounds," claims registered dietitian Marsha Read. "Part of the problem is they forget the little things do add up." The four extra cookies or the two frozen yogurts with tasty, sugary sprinkles a student may grab heading out of the dining commons or The Cellar by Manzanita Lake during one week could add up to six pounds a year, Read said. "And, if you quit walking 30 minutes a day, that would account for an extra three pounds" gained per year, she said. "There's nine on the way to 15 for the year."

It has been almost 5 years since the first "Freshman 15" workshop sponsored by UNR's Wellness Program and over 5,500 students have passed through UNR's dormitories, Dr. Read's target audience. Exactly how many students to heed of Dr. Read's words of wisdom is difficult to calculate. However, Pre-Vet major Amanda Ciliax is living testimony that Dr. Read's workshop changed her life.

"All through high school I was very active in sports and did not worry about my weight. I wasn't thin, but I wasn't overweight. When I came to college, I attended the 'Freshman 15' workshop thinking if nothing else, I could maintain my present weight. Adopting most of the workshops strategies, I discover to my surprise by the end of my freshman year I had lost 7 pounds, my body fat was down to 10% and I felt GREAT!

**Funding Source:** State: Nevada Agricultural Experiment Station

**Scope of Impact:** State Specific

**Theme: Human Health**

**Issue:**

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. This determination was based on low intakes of calcium among other nutrients in girls in this age group. If calcium needs are not met during this critical developmental state, the risk of osteoporosis increases in later life.

**What Has Been Done:**

The Nevada Nutrition Network is a statewide coalition of public and private partners established in 1996 to create, implement and evaluate a nutrition program/campaign for food stamp recipients and/or those eligible for food stamps in Nevada. As a team, the NNN developed a school curriculum for science classes, media activities and an extensive evaluation plan to address the issue of calcium intake among 11- to 14-year-old children. The program was launched in January 2000 with classroom instruction implementation and a media campaign in two middle schools. Special events to reinforce curriculum concepts were held at both schools. Food sampling events and science curricula focused on calcium, home and careers and a scavenger hunt reached 10,000 students. Thousands of students and adults were reached through radio ads and outdoor posters. A calcium-fortified orange juice taste-testing event was conducted at one school to determine the acceptance of this type of juice in the target audience.

**Impact:**

The total number of students who completed both pre-and post-tests was 646. In 2001, two middle schools were used to implement the calcium curriculum, one in Clark County and one in Washoe County.

Questions about radio ads, print media (billboards, bus stop shelters and posters), a scavenger hunt, taste-testing events, science lessons and promotional prizes were included in the post-test. The results suggest that exposure and participation were relatively high and although attitudes were not highly changed, knowledge did increase.



The orange juice taste-testing event was attended by 293 students. Each student sampled orange juice with and without calcium fortification. For three parameters evaluated (color, taste and texture), the calcium-fortified juice received a significantly higher rating than the non-fortified juice. This information was used to support a change in purchasing standards for the school district so that calcium-fortified orange juice would be allowed for distribution. In 2001, Washoe County School District Nutrition Services did, in fact, change the orange juice they serve to calcium-fortified orange juice in all schools.

This program reached a high proportion of the target audience. It resulted in positive changes in participants' knowledge about calcium requirements and food sources of calcium. With respect to food choices, the participants' responses at the post-test suggest that students were more often choosing the target foods. The students who indicated a high level of knowledge about food sources of calcium had a significantly higher intake of the target foods.

**Sources of Funding:**

- Smith-Lever funds
- State Matching funds
- USDA Food Stamp Program

**Scope of Impact:**

- State Specific
- Integrated Research and Extension

**Theme: 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.

**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 research being conducted at UNR, decided to take matters into his own hands, and began taking fish oil supplements 18 months ago in hopes of 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."

**Funding Source:** State: Nevada Agricultural Experiment Station, University of Nevada, Reno

**Scope of Impact:** National

### **Theme: Human Health**

#### **Issue:**

Public exposure to environmental tobacco smoke (ETS) or side-stream cigarette smoke has become an issue of national concern. The potential health hazards from ETS are currently being investigated and publicly debated. A report citing 1985 population survey data identified Nevada as the state with the highest rate of smokers. A recent study by the Centers for Disease Control and Prevention cited Nevada as the state with the highest rate of tobacco related deaths in 1990.

ETS contains many compounds which are harmful through their production of toxic forms of oxygen. These oxygen forms can cause biological damage leading to various disease states, such as cancer or cardiovascular disease. We have previously shown in animals that short-term exposure to ETS causes biological damage by these same toxic oxygen forms. We are now interested in finding out whether or not vitamin supplements known for their antioxidant properties can protect/rectify damage caused by ETS.

#### **What Has Been Done:**

This study analyzed blood samples obtained from non-smoking human volunteers who are exposed to ETS in the workplace and compare the oxidative stress in these samples to those obtained from workers in ETS free environments. We also tested whether antioxidant supplementation can moderate any increased oxidative stress due to workplace ETS exposure. These studies will be highly significant in that they will allow us to assess whether workplace exposure to ETS does result in increased oxidative stress and therefore greater health risks.

The first objective was to test whether short-term exposure to environmental tobacco smoke (ETS) resulted in oxidative DNA damage (formation of 8-hydroxy-2'-deoxyguanosine) to mouse heart, liver or lung tissues. The results from these studies showed that short-term exposure to ETS cause oxidative damage to nuclear DNA in lung, heart, and liver tissues of mice. Multiple exposures to the 30-minute ETS regime resulted in even greater oxidative DNA damage. This DNA damage has been identified in the etiology of a number of chronic diseases and is consistent with the number of chronic diseases associated with exposure to ETS.

The second aim of this project was to test whether non-smokers exposed to ETS in the workplace had greater oxidative stress/damage than those non-smokers not exposed to ETS in the workplace and whether antioxidant supplementation could reduce any increased oxidative stress. The non-smokers, workplace ETS exposed group, were supplemented with an over the counter antioxidant complex for 60 days and tests were done to see whether this could reduce their oxidative stress/damage. Each of the two groups consisted of 37 individuals, men and women in approximately equal numbers. Two blood draws were conducted within 12 hours of the individual last work shift and analyzed for various markers of oxidative stress and ETS exposure.

The results of these studies showed that the group exposed to ETS in the workplace did indeed have greater exposure to ETS (blood nicotine levels). This group also had increased antioxidant enzyme activities which suggest increased oxidative stress. Most significant however was the increase in oxidative DNA damage in the ETS exposed group in comparison to the non-exposed group. A toxic carcinogen (8-hydroxy-2'-deoxyguanosine) levels were 63% greater in the exposed group, thereby demonstrating a significant increase in

oxidative DNA damage in this group. The ETS-exposed group was then provided with a 60-day supply of an antioxidant formula consisting of 3,000 mg of b-carotene, 60 mg of vitamin C, 30 I.U. of vitamin E, 40 mg of zinc, 40 mg of selenium and 2 mg of copper. After the 60 day supplementation, blood samples were again drawn and the results were compared with the pre-supplementation values. A 62 % decrease in oxidative DNA damage was observed after supplementation. Lipid peroxidation as well as antioxidant enzyme activities were decrease as well. These results demonstrate that the use of antioxidant supplementation can help to lower at least some of the oxidative damage caused by exposure to ETS.

**Impact:**

Environmental tobacco smoke (ETS) is an important indoor air pollutant that has been associated with increased risk of cancer and coronary heart disease. This is the first study to look at the effect of ETS exposure in the workplace and to provide evidence that antioxidant supplementation may be beneficial. Our research showed that employees exposed to ETS had a 63% increase in DNA damage over their non-exposed counterparts. Supplementation of antioxidant vitamins did prove to provide some measure of safeguard against ETS. Those who took the supplement saw a 62% decrease in DNA damage. With ETS accounting for approximately 12.5% of Nevada’s smoking related deaths at a medical cost of \$35,000,00 per year, implementing vitamin supplements program could save the state million.

**Funding Source:** Federal: USDA - Hatch Act

**Scope of Impact:** National

**Theme: Human Health**

**Issue:**

In Nevada, more than 60 percent of hospital costs are attributable to negative lifestyle choices, including those that increase the risk of coronary heart disease (CHD) — the leading cause of death in the state. Nevada’s Behavioral Risk Factor Survey showed that citizens are at high risk for CHD because of sedentary lifestyle (48% t), cigarette smoking (30%), obesity (22%), high blood pressure (21%) and elevated cholesterol (20%), second highest in the U.S. Nationally, despite educational efforts, seven million Americans are affected by CHD, and 26 million workdays are lost annually due to the disease.

**What Has Been Done:**

Investigators at the University of Nevada armed with employee assessments collected over the past two years that included behavioral, physiological and psychological measures, developed an educational program specifically for the worksite. The goal of the program, entitled "Health at Work" (HAW), is to provide employees with skills necessary to reduce their risk for coronary heart disease. HAW uses a lesson-based approach taught by dietitians, exercise physiologists and social workers to promote healthful food choices, physical activity and stress management practices. Some of these include meal planning and preparation, eating away from home, principals of physical fitness, avoiding exercise-related injuries, progressive muscle relaxation and the importance of social support.

**Impact:**

Significant improvement resulted among participants in their perceived ability to reduce their CHD risk. Nearly 90% of participating employees better understood their CHD risk. The classes and counseling resulted in significant reduction in dietary fat intake, and participants were more physically active. More than 80% said “the program improved their ability to maintain healthy lifestyle changes”. Anecdotal Impact: "This program probably saved my life!" said Charlyn Nishuichi, 45, accounts payable clerk in the No. Las Vegas Cashman store. Her blood pressure — which soared over 200 — was brought under control by referral to a doctor and medication. "I went from 250 to 195 pounds, eat a low-fat diet and exercise five days a week," said Chuck Denshire, 46-year-old service supervisor in Cashman’s Sparks outlet. "It changed my life."

**Funding Source:** Federal: USDA - Hatch Act

State: Nevada Agricultural Experiment Station, Nevada Cooperative Extension

**Scope of Impact:** National

**Theme: Human Health**

**Issue:**

In 2000, more than 58,000 Nevada adults (4.4 percent 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. The prevalence of diabetes in the U.S. increased from 1.5 million in 1958 to 16-million in 2001. 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 cost of diabetes in Nevada in 2000 was \$665 million in 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 the clients and the community.

**What Has Been Done:**

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 of diabetes by making lifestyle modifications to prevent or delay the onset of diabetes and/or its complications, increasing physical activity and adopting healthy eating habits. Four culturally sensitive curricula were developed that teach risk-factor awareness, healthy food identification and preparation, lowering fat intake guidelines and exercise benefits: *An Ounce of Prevention: African American; Native American; English Version for Hispanics* and *Mas Vale Prevenir: Version en Espanol*. More than 650 Las Vegas residents have completed the program, taught by three bilingual teachers. In 1999, An Ounce of Prevention was expanded through a train-the-trainer component. More than 30 community health representatives from Native American communities and volunteers from health committees from African American churches were trained to deliver this program in their own communities.

**Impact:**

Evaluation indicates that 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 650 clients, a medical savings of more than \$4.8 million was achieved.

In 2001, a Diabetes Risk Reduction Campaign was undertaken utilizing social marketing strategies to develop a health communication message targeting the Spanish-speaking Hispanic population who may have no health insurance in one Las Vegas zip code. A telephone survey determined these individuals underestimate the seriousness of diabetes. Radio and print ads were developed. The goal is to develop, implement and evaluate a multimedia campaign that communicates the seriousness of diabetes and any elevation in blood glucose to this vulnerable group.

**Sources of Funding:**

Smith-Lever funds

State Matching funds

Nevada State Health Division/CDC Funds

## **Scope of Impact:** State Specific

### **Theme: Human Nutrition & Human Health**

#### **Issue:**

Research has shown that if school-age children—particularly those from families with incomes at or below poverty level—get a healthy jump-start on nutrition, their cognitive and physical development will be on course for life. And they will be at lower risk for developing chronic conditions such as heart disease, cancer and diabetes later in life.

#### **What Has Been Done:**

UNCE collaborated with the Fraternity of Executive Chefs of Las Vegas and developed Chefs for Kids, a nutrition education curriculum that was implemented in nine “high-need” schools. Many of the youth qualify for free and reduced-priced meals and are from low-income families, some even living in homeless shelters. Every week, educators teach first- and second-grade students about where food comes from, how to create a healthy meal and how to establish good eating habits. Students also learn about healthy food combinations and how to choose foods that provide the greatest overall benefits. The chefs spend 300 hours yearly preparing much-needed breakfasts for the students with food donated by local restaurants and markets. The program is partially supported by a social function that raises about \$50,000 a year in private funds. To reach a 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 instructional television, augmenting a classroom curriculum developed by UNCE nutritionists. More than 2,000 copies of the curriculum were distributed in Nevada and elsewhere. Teachers nationwide may access the lesson plans for this unique educational program at: [www.chefsforkids.org](http://www.chefsforkids.org)

#### **Impact:**

Now in its 12th year, the Chefs for Kids program has reached more than 12,000 students. An evaluation was completed with 194 fourth and fifth grade students. Of the 194 students, 91 participated in the program and 103 did not. The evaluation showed that, three years after completing the course, participating students retained information learned. Sixty-five percent of participating students correctly categorized foods by food groups with no errors. Only 39 percent of non-participating students could place all foods with no errors. When compared with students who had never received the Chefs for Kids program, basic food knowledge was greater in the participants than in non-participants. Forty percent of participating students could classify a tomato as a fruit compared with only 25 percent of the non-participating students. Of that 25 percent, only half the students could explain that the classification as a fruit was due to the presence of seeds. Over 90 percent of the participating students could identify the presence of seeds as a classification factor. Forty-five percent of participating students mentioned stronger bones and teeth in connection with calcium intake. Only 30 percent of non-participating students could identify the connection.

Classroom teachers have said that a secondary benefit of the program is that it helps Spanish-speaking students build upon their English-language skills. The program builds thinking skills by using age-appropriate hands-on activities the students enjoy. All video curriculum respondents found the components to be educational, hold students’ interest and be age-appropriate; all said they will use the program again. The areas most helpful are the Food Guide Pyramid, the five food groups and eating a balanced diet.

#### **Sources of Funding:**

- Smith-Lever funds
- State Matching funds
- Clark County funds
- Private 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 have had a significant impact on people’s awareness and preparedness for wildfires. 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. Extension’s demonstration of the use of sheep grazing to reduce fuels in the urban-wildfire interface (“Only Ewes Can Prevent Fires”) has not only received positive responses from city homeowners, but has been adopted by other communities and agencies to reduce fuels where chemical and mechanical and prescribed burning methods are not appropriate.

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. Additionally, having education programs for rural public community water supply operators has been important.

NAES research has focused on pheromone protection of forests from bark beetle damage, compatibility of wildlife and livestock on irrigated pastures, developing a bioreactor to clean up the Leviathan Mine and arsenic and mercury contamination from mining in Nevada watersheds.

### **Federal and State Funding by Plan of Work Goals**

	<b>Goal</b>	<b>Federal \$</b>	<b>State \$</b>	<b>County</b>	<b>Total \$</b>	<b>FTE</b>
<b>Nevada Agricultural Experiment Station</b>	<b>IV</b>	<b>547,775</b>	<b>2,649,179</b>		<b>3,196,954</b>	<b>56</b>
<b>University of Nevada Cooperative Extension</b>	<b>IV</b>	<b>341,569</b>	<b>1,454,522</b>	<b>1,548,168</b>	<b>3,344,259</b>	<b>57.37</b>

### **Theme: Wildfire Science & Management - Yard Waste/Composting**

#### **Issue:**

Residents in Douglas County, Nevada always knew their homes were in danger of being destroyed by wildfire, but didn’t always know how they could help prevent the destruction. Wildfires threaten the dry county all through the summer months and attack homes with a ferocious appetite. More than 600,000 acres of Nevada were consumed by wildfires in 2000, and homeowners were looking for a way they could stop the fires from destroying their homes. By eliminating excess vegetation around a home, its survivability during a wildfire increases. Few homeowners are quick to rid this vegetation though. Most don’t know what to remove, how to remove it or where to dump it.

#### **What Has Been Done:**

Cooperative Extension educators developed Compost Your Combustibles in 1999 to address these obstacles in Douglas County. Partnerships were formed with local fire districts, governmental agencies, refuse companies and composters. The program teaches property owners about defensible space practices and vegetation management at free neighborhood workshops, provides free disposal of vegetation at several convenient drop-off locations and transports the vegetation to an operation that recycles it to make compost. The goal of the program is to eliminate excess vegetation around homes and stop homeowners from burning the vegetation and creating new hazards to the environment. In 2001, two evening workshops were conducted to help homeowners understand the principles of defensible space and the details of the fuels recycling program. Collection sites were opened and used by residents.

**Impact:**

In 2001, 465 tons of wildfire fuel was collected and recycled. For the 2000 and 2001 compost collection years under the Nevada Department of Environmental Protection grant, 1,911 tons of wildfire fuel were recycled. That's 1,911 tons that weren't burned or dumped. Burning produces smoke, releases pollutants into the air and poses additional fire hazards. Local fire departments were happy to report a dramatic reduction in burn permit requests since the program's start. Eastfork Fire Districts have expressed a willingness to continue with the administration as long as funding remains available because of the program's popularity. The areas most affected by fire hazard areas have come to expect the service. Compost your Combustibles built partnerships, heightened wildfire awareness, and changed homeowner practices, awareness and responsibility.

**Sources of Funding:**

- Smith-Lever funds
- State Matching funds
- Douglas Disposal, Inc.
- East Fork Fire and Paramedic District
- Full Circle Compost
- Nevada Department of Environmental Protection
- Sierra Front Wildfire Cooperators

**Scope of Impact:** State Specific

**Theme: Wildfire Science & Management**

**Issue:**

Wild land fires in Nevada are increasing in number, size and severity. The result is that more than 2 million acres have burned in the past few years. Annual weeds such as cheat grass and mustards are invading the burned areas, preventing the reestablishment of native species. The fires are not only destroying the health of rangelands, but threatening people and houses as the urban-wild land interface expands. Fuels management and rehabilitation after the fires are critical to solving this growing problem. After fires go through areas where there is no livestock to reduce fuel loads, the vegetation is gone and seeds are scarce. Livestock can be a wildfire-threat reduction tool and help replenish seed supplies and drive down the cost of native seeds.

**What Has Been Done:**

In collaboration with other agencies, Cooperative Extension and the Experiment Station conducted a project to evaluate the effectiveness and practicality of controlled sheep grazing (only ewes can prevent forest fires and increase seed supplies). The sheep were brought in to create a fuel break along the urban-wildland interface of Carson City on C-Hill, an area known for its propensity to burn. Three hundred and fifty ewes grazed a 200-foot wide, 2.5-mile long corridor divided into 20 mini-pastures for one month in the spring and fall.

In 2001, sheep were used on a field trial north of Battle Mountain to test the theory that they can be used to control annual weeds and increase seeding success after a fire. The UNCE team collected data on weed control success and seeded plant species survival.



**Impact:**

The sheep at C-Hill reduced the amount of wildfire fuel from 700 to 2,000 pounds per acre, depending upon the treatment. In addition, 71 to 83 percent of fine fuels, which burn easily, was removed; the height of fine fuels was cut reducing the length of flames during fires; and cheatgrass was trampled, also reducing the fire hazard. Nearly 90 percent of adjacent homeowners supported the project and preferred the sheep to other methods of creating fuel breaks. The results indicate that controlled sheep grazing is an effective and acceptable tool to create fuel breaks along the urban-wildland interface. The “ewes” story received national media coverage including a story by Paul Harvey, an article by nationally syndicated columnist Baxter Black, articles in numerous major newspapers and more than 19 stories in local newspapers. The Carson City Fire Department was awarded \$200,000 to reduce fuel loads, including using sheep to graze a firebreak along the entire western side of the city. The use of livestock to help solve environmental problems such as those related to fire has increased in other states in the West and on a national level. The long-term results of livestock fuel reduction have been the use of livestock to regenerate seeds and vegetation.

**Sources of Funding:**

- Smith-Lever funds
- State Matching funds
- Hatch Act funds
- Bureau of Land Management
- Natural Resources Conservation Service
- Nevada Division of Forestry

**Scope of Impact:** State Specific

Integrated Research & Extension

**Theme: Wildfire Science & Management****Issue:**

Living with Fire 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. In 1999, fire consumed nearly two million acres of Nevada’s rangelands; in 2000, an additional 600,000 acres went up in smoke. More acres burned in Nevada during the 1990s than in the previous 40 years combined.

**What Has Been Done:**

The collaborators focus on pre-fire activities that improve the survivability of people and homes. During 2001, “Nevada Burning” was developed with KOLO-TV and outside funders. The half-hour television special aimed at increasing the public’s understanding of the costs and solutions to Nevada’s wildfire issue.

The popular *Living With Fire* tabloid was distributed throughout the Truckee Meadows and featured on media web sites during the Martis Fire. Workshops continued to assist homeowners in adopting defensible space techniques.

The non-profit Nevada Fire Safe Council, established after the first Fire Forum with representatives from 23 private and governmental agencies, hired an executive director and began community level Fire Safe Councils in Holbrook, Glenbrook and the Virginia City Highlands.

**Impact:**

Nevada Burning was aired four times in Nevada, one in primetime after Monday Night Football. It received attention from the Governor and other elected officials and natural-resource agencies, who forwarded copies of

the videotape to the Secretary of the Interior and the Congress. The program received the Silver Spike Award of Excellence from the Public Relations Society of America, Sierra Nevada Chapter.

More than 1.5 million copies of *Living with Fire* have been distributed since 1999, making it possibly the most widely distributed such piece in the country. Nevada's fire program coordinator received one of ten Bronze Smokey Bear Awards given annually by the U.S. Forest Service, the Advertising Council and the National Association of State Foresters. The award recognizes "sustained, outstanding, statewide service in wild land fire prevention over a minimum of two years."

The Fire Safe Highlands, created in Virginia City in 2001, applied a community approach to reducing the wildfire threat through education and collaboration. The collaborating groups increased water storage capacity by 30,000 gallons for firefighting, achieved defensible space practices in more than 60 homes, and established a fuel demonstration site in the community.

**Sources of Funding:**

- Smith-Lever funds
- State Matching funds
- Bureau of Land Management
- KOLO-TV
- Nevada Division of Forestry
- Nevada Insurance Group
- Sierra Front Wildfire Cooperators

**Scope of Impact:** Multistate Extension – NV, CA

**Theme: Wildlife Management and Sustainable Agriculture**

**Issue:**

Since over 75% of the wetlands remaining in the U.S. are on private lands, and the conventional wisdom has been that livestock and wetlands were incompatible. The J. Dow Wetlands Research Facility (JDW) is typical of many Great Basin ranch locations in that it lies in a river/lake basin with relatively shallow water table, and natural on-site grazing must be subsidized through irrigation or a supplemental feed program. Typical of wetlands developed anywhere in the Great Basin, JDW has considerable benefit to a wide variety of wildlife species including a number that are rare, threatened or endangered, as well as others with economic value, e.g. waterfowl. By monitoring the impact of irrigated pastures on wildlife, our scientists are drafting recommendations for ranchers, resource management and government officials in how best to establish alternative incomes.

**What Has Been Done:**

This project is exploring to what degree livestock grazing is compatible with pasture management practices designed to enhance water bird populations. Specifically, we are looking at the impact of irrigated pastures on wildlife production in proximity to wetlands. This ambitious goal is being carried out by studying how timing of grazing affects bird/mammal use and productivity on irrigated pastures; with economic models being developed based upon different management grazing strategies on Great Basin irrigated pastures.

The relationships among soil type, land form, and grazing regime to forage production and cattle weight gain, and to wildlife populations (both birds and mammals), are being explored on twelve 10-acre irrigated pastures at UNR's managed Great Basin wetland research site (JDW). Fieldwork for the 2000 season consisted of monitoring bird numbers within the 10-acre pastures among four treatment regimes; irrigated, grazed early, irrigated, grazed late, irrigated, ungrazed, non-irrigated, ungrazed. Biweekly point counts were used to determine species diversity and density. Nest searches were used to determine nesting species, density and success. Results will form the basis for related economic models detailing costs/benefits of this type of operation.

**Impact:**

Initial results show that water bird populations were dramatically enhanced ( 171% Grazed, 43% Ungrazed) on irrigated pastures, while nesting densities skyrocketed (200+ % Early Grazed, 400+ % late Grazed, and 33% Ungrazed).

Diversified ranching programs involving irrigated pastures are poised to offer financial benefits outside of traditional thinking. Given the fact that in Nevada alone there are about 58,000 hunters including up to 17,000 waterfowl hunters, and that these waterfowl hunters now pay up to \$30,000 to join duck clubs (plus up to \$3000 per year annual dues) to gain waterfowl hunting privileges at the few available hunting sites, a diversified ranching management program such as we are developing has great potential for subsidizing the economies of regional ranchers and at the same time, augmenting populations of wetland wildlife.

**Funding Source:**

Federal: USDA - Hatch Act

State: Nevada Agricultural Experiment Station, Nevada Arid Rangeland Initiative

**Scope of Impact:** Western Region

**Theme: Riparian Management Water Quality**

**Issue:**

Before 1998, watershed management efforts on Nevada's Carson River were limited to isolated groups in each of the river's five counties. After the flood of 1997, agency representatives and members of the upper and middle Carson River groups expressed the need for more communication throughout the whole watershed. On a river tour in 1997, U.S. Senator Richard Bryan recommended that groups on the Carson cooperate and speak with one voice. For decades, property owners and governmental entities have defended their own interests along the river without an understanding of the entire river system. The Carson has long been plagued with intermittent flooding and mercury deposits left over from the Comstock mining era that have impacted fish and other wildlife.

**What Has Been Done:**

Cooperative Extension obtained a grant to hold the first major watershed conference on the Carson River. More than 250 people participated and learned how issues of water quality, water quantity, floodplain management and wildlife habitat can be managed in an integrated fashion. Both Nevada U.S. Senators gave speeches to standing-room-only crowds. At the end of the two-day conference, participants voted to form a council of citizens and agency personnel to coordinate management of all facets of the river system. The Watershed Coordinating Committee is the resulting group that monitors the progress of integrated watershed management begun at the conference. Out of this group came six working groups that work on individual issues such as water quality, public outreach education, land-use planning, and urban and municipal water supply. The group met every month in 2001 and participated in two raft trips to map the constraints of the channel to improve water quality. The committee also received funding to conduct studies on the sources of pollutants such as phosphorus. A speaker from the U.S. Fish and Wildlife Service and a Utah geomorphologist led a field trip along the river to see what would be needed to set up a cold fish hatchery in Carson Valley.

**Impact:**

A regional, tri-county water management agency, the Carson Water Subconservancy District, has taken responsibility for facilitating an integrated watershed management and planning process. The conference coalition, led by Cooperative Extension, has remained active as a steering committee for this effort. The coalition has helped the CWSD obtain funding to hire a watershed coordinator. A larger group of 60 people meets semi-annually to keep communication channels open. This group has adopted a mission, vision and guiding principles for the integrated watershed management process. The results of both the guest speaker and the field tour were written up and distributed to the Carson River Coalition. Thirty-five people attended the trip and their findings were passed on to the CRC, and through them to dozens of property owners and county

officials. The coalition is preparing to increase free and open public discussion through this sort of communication.

**Sources of Funding:**

- Smith-Lever funds
- State Matching funds
- Carson River Subconservancy District
- Natural Resources Conservation Service
- State of Nevada
- USDA Emergency Management Funds

**Scope of Impact:** State Specific

**Theme: Drought Prevention & Mitigation**

**Issue:**

Given the tremendous population growth in Southern Nevada, where Clark County (Las Vegas) has a population of 1.6 million which grows by 5,000 per month, water usage and conservation is an increasingly important issue. With the desert environment and demands on limited water resources, there is a critical need to have people adopt appropriate water conservation and protection programs. The Commercial Water Conservation Training Program is designed to address this issue.

**What Was Done:**

In the past four years, more than 1,100 professionals have been educated in water conservation and protection, IPM, and the use of native and other water efficient plants. In 2001, over 350 commercial clients and 50 college students from the Green Industry attended the three-day, fifth annual Desert Green Conference where 36 classes were offered. Over 60% of those who attended this conference came from the Southern Nevada area. Over 300 participants attended 36 classes, the equivalent of nearly 12,000 classroom hours. Fifty college students from four states took part in the second Green Industry Career Day as part of the conference. This is an expanding portion of the conference, with more colleges participating each year. UNLV participated for the first time this year.

Up-to-date, continuing education for master gardeners (15) was provided through this programming. 100 clientele participated in the CEU Pesticide training, with 80 students from three states receiving credits.

**Impacts:**

A 10-month post survey 20% (n=37) revealed:  
62% (n=23) of the clientele were landscape maintenance and/or government employees.  
73% (n=19) gained knowledge that they are still using to better conserve and protect water.  
21% (n=9) are planting more drought-tolerant and/or native plants.  
49% (n=18) improved their horticultural knowledge by attending this conference.  
Because of these changes in horticultural practices, there has been a positive impact on the environment, especially in the area of water conservation.

**Sources of Funding:**

- Smith-Lever funds
- State Matching funds
- Other Grants

**Scope of Impact:** Multistate Extension – NV, UT, AZ, CA, ID

## **Theme: Water Quality**

### **Issue:**

Nonpoint-source water pollution is considered to be the most poorly controlled type of water- quality contamination occurring in the nation. Because sources are diffuse and difficult to trace, it is essential to educate residents of every watershed about their role in decreasing NSP through simple actions they can take on their properties and in their daily life. Steamboat Creek is the single largest tributary source of pollution to the Truckee River in western Nevada. Local irrigation practices can result in leaching of nutrients and erosion of soil particles, potentially resulting in increased pollutant loads to the Truckee River via return flow from Steamboat Creek and other tributaries. Washoe County identified stream protection and pasture improvement as two of the three key pollution-prevention options of the region's Water Quality Attainment Program in the 1993 Regional Water Supply and Quality Study. The Truckee River/Steamboat Creek watershed is the top priority in Nevada's ranking of watersheds in the 1998 Clean Water Action Plan.

### **What Has Been Done:**

The Small Ranch Water Quality Program teaches owners of small-acreage properties in south Washoe County practices that can help reduce nonpoint-source water pollution using a series of educational tools and assistance in implementing best-management practices and completing demonstration projects. The goal is to help residents change their land-management practices to prevent NSP. It is the first comprehensive, long-term, one-on-one water quality program for this audience in the Intermountain West. Educators teach classes, outdoor workshops, publish a monthly newsletter and the *Small Ranch Manual*, provide one-on-one site visits and do free drinking water analyses. They provide homeowners with information to allow them to make informed choices about their use of water, waste removal and other agricultural practices. Participation in the program is voluntary, and stresses personal and community benefits to participants.

### **Impact:**

Forty-three private wells were sampled in east Washoe Valley during 1999 and 2000, examining trends in concentrations of nitrates and fluoride to determine if changes occur that may impact human health. Seventeen of these wells exceed the drinking water standard for nitrates; an additional five exceed the standard for fluoride. The average nitrate concentrations increased in 19 wells, suggesting the rise may be due to contamination from animal wastes and/or septic systems. After testing, homeowners received assistance in re-mediating the problems through site visits and workshops.

In 2001, this program was expanded to other Western states through a comprehensive *Living on the Land: Stewardship for Small Acreages* curriculum. Under Nevada's leadership, professionals from eight western states developed these training materials and assistance in targeting and reaching this growing audience. The curriculum consists of lesson plans, hands-on activities and 15 PowerPoint lessons targeting goal setting, property inventory, soils, water, plants and animals. Nearly 700 copies of the curricula or CDs have been distributed.

Also in 2001, the first Steamboat Creek Watershed Conference was organized and held in Reno, with 117 residents attending. On a scale of 1 to 5, participants rated the conference 4.7; two action groups have resulted, including a stream watchers group.

### **Sources of Funding:**

- Smith-Lever funds
- State Matching funds
- Nevada Department of Environmental Protection
- Sustainable Agriculture Research and Education Professional Development Program

**Scope of Impact:** Multistate Extension – NV, CA, OR, WA, UT, ID, CO, MT

**Theme: Water Quality**

**Issue:**

Rural communities depend upon public water supplies that must conform to Federal requirements related to certification and plant operation. Most such public water supplies 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, especially those that are related to regular administrative functions and management. When out of compliance, such systems may be fined, which may raise the cost of water in rural communities.

**What Has Been Done:**

Technical Assistance for Public Water Supplies in Nevada provides videoconferencing training sessions for public water supply operators in rural Nevada; maintains and updates a web site aimed at providing information about water supply operation and water quality; and develops and distributes materials, including a mobile public-information booth, to answer questions and concerns about public water supplies.

The primary method of education is videoconferencing; secondary method includes classroom lectures and meetings. To date, eight workshops have been held, reaching more than 230 people representing 45 communities throughout Nevada. A large proportion of those who attend are from small to very small water systems.

**Impact:**

In post-workshop evaluations, 92 percent of participants said the material was appropriate. Overall, 75 percent of participants rated the workshops good to very good. Eighty-six percent would attend videoconference classes in the future in lieu of traveling to a seminar, and 85 percent would recommend them to friends. The students who took the workshops had a pass success rate on the statewide certification examination of 92 percent, compared to the overall 87 percent average pass rate for three testing sessions.

**Sources of Funding:**

- Smith-Lever funds
- State Matching funds
- ACR Associates
- Nevada Bureau of Health Protection Services
- Nevada Department of Environmental Protection
- Nevada Rural Water Association
- Rural Community Assistance Corporation

**Scope of Impact:** State Specific

## **Theme: Water Quality**

### **Issue:**

Industry, labor, government, and environmentalists agree on one issue: that acid mine drainage is the number one environmental problem facing the mining industry. Acid mine drainage occurs when sulphide-bearing minerals in rock are exposed to air and water, changing the sulphide sulphur to sulphuric acid. This acid can dissolve heavy metals found in waste rock and tailings such as lead, zinc, copper, arsenic, selenium, mercury, and cadmium, into ground and surface water. Acid mine drainage and heavy metals pollution can poison ground and drinking water. It can also destroy aquatic life and habitat.

Sulfate-reducing systems have the potential to remediate acid drainage at abandoned mine sites by reversing the oxidation processes which are responsible for creation of the acidic water and release of the metals. In this process, a carbon source is used to biologically reduce sulfuric acid to hydrogen sulfide, followed by precipitation of divalent metals (and others) as metal sulfides. This process raises the pH of the water and effectively removes most metals, and also reduces sulfate concentrations.

### **What Has Been Done:**

For the completed project, University of Nevada scientists have developed a sulfate reducing bioreactor for use as treatment systems for acid mine drainage, utilizing inexpensive alcohols (methanol, ethanol and ethylene glycol) as carbon sources that can be dripped into bioreactors. Renovation of the existing bioreactor consisted of installing a synthetic liners to reduce infiltration, retrofitting the reactor with larger diameter pipes to prevent clogging and improve flow distribution, and installing a flow control devices to improve hydraulic control of the system. To date, investigators have demonstrated that each of these alcohols can serve as a carbon source for sulfate reduction in laboratory studies. A pilot scale bioreactor at the Leviathan Mine, nickel, zinc and copper have been effectively removed from an acidic stream and iron and sulfate concentrations have been substantially decreased in the effluent.

### **Impact:**

This bioreactor has been demonstrated to effectively treat a major source of water pollution from acid mine drainage in the western United States. At a cost of about \$2.00 per day to treat roughly 6000 gallons of water (the maximum flow from Leviathan Mine), owners could effective treat this facility for the next thousand years and still not have spent as much as some lime treated facilities, the previously least expensive method. Other major benefits of this procedure is that bioreactors can be sized to handle a variety of waster water flow rates; and, it is a continuous feed process where lime treatments are applied repeatedly as lime is lost to seasonal runoffs.

**Funding Source:** State: Nevada Agricultural Experiment Station

**Scope of Impact:** California and Nevada

## **Theme: 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 1987, 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. Most recently, the installation of 13,750 linear feet of 30 inch ductile main line, 11,880 linear feet of C900 12 inch PVC irrigation pipe, 26,300 linear feet of 8 inch C900 PVC irrigation pipe, 22,500 linear feet of 2 inch stock water pipe, 700 4 inch risers, 34 frost free hydrants and an addition 20.25 mile wheel line sprinkler assemblies to complement the existing 24 wheel line assemblies. When construction is completed in Spring 2002, implementation of this water reuse irrigation system releases the 1,100 acres property from reliance on the Truckee River for irrigation needs.

**Impact:**

Nevada's Agricultural Experiment Station 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, approximately 6.5 million gallons per day, dependency on the Truckee River for irrigating the ranch is resigned. This translates into over 3,600 acre feet per summer of pristine Sierra-Nevada runoff remaining in the Truckee River, an environmentally sensitive waterway populated with various sport and endangered species.

**Funding Source:** State: Nevada Agricultural Experiment Station

**Scope of Impact:** Nevada

**Theme: Water Quality****Issue:**

Heap leach methods for recovery of precious metals has received wide use only in the past 15 years, although developed in the 1960s through the 1970s. This relatively recent technology has allowed extraction of low-grade oxide ore that previously was not economically feasible to mine. In many areas, particularly in Nevada, heap leach methods have been a major reason for the large expansion of the gold mining industry. Operated as zero discharge facilities, Nevada mining companies have extracted between one and two billion tons of ore in heaps.

These heaps are operated as long as precious metals can be economically recovered. When the costs for operating the heaps exceed the precious metals values, closure of the heaps is initiated. Cyanide applications are discontinued and the water draining from the heaps is recycled to the tops of the heaps until the weak acid dissociable cyanide concentrations are low and the pH of the fluid is brought down to less than nine. Other constituents, however, may remain in the heaps, including arsenic, selenium, cyanide complexes, and sulfate. As rain and snow penetrate heaps over the years and decades ahead, these contaminants can potentially migrate through the heap, necessitating appropriate management.

**What Has Been Done:**

The objective of this research project was to investigate how large scale precious metals mining affects the Humboldt River watershed, which presently produces over half of the U.S. production of gold. Specifically, investigators were investigating the long-term chemistry and environmental risk of large pit lakes that will form after the mines close, the long-term drainage from cyanidization heaps and the economic effects of long-term alteration of the watershed.

An important component of subsurface phase of the research is the development of predictive models to estimate both the flux and concentration of arsenic emanated from typical heap leach piles and waste rock dumps during mining activities and following mine closure. For this effort, a fully coupled unsaturated flow and transport solver combined with a reaction path geochemical model was adapted to heap leach and waste rock dump environments. UNSATCHEM is an unsaturated flow and transport solver that has been modified to



model the carbonate system. This code has been used to simulate the unsaturated flow and transport behavior of field scale heaps. These simulations modeled a 50 meter tall heap immediately after production ceased. The heap was subject to 10 cm/yr of meteoric water infiltration with an initial heap pH of 10.0. These simulations were run out to 100 years.

All of the data have been collected for this project, including data for a recreational analysis of the Rye Patch Reservoir, a programming model to allow estimation of impacts of flow changes on the Humboldt River, and the contingent valuation study. The recreation data are mostly at the county level of aggregation. The former data were scant for the Humboldt River Basin and had to be supplemented using crop data for Southern Idaho, which is similar in many ways to this region. The contingent valuation data set is smaller than desired, but low response rates across the State of Nevada were anticipated.

**Impact:**

Currently, protection of surface and groundwater quality is a critically important part of mine closure. Results compiled from this project indicate that allowing water to flow through heap piles only contributes to increased level of toxic compounds in the ecosystem. From the economic standpoint, continuing to pump groundwater across heap piles will cost in the neighborhood of \$1 million per month. This value indicates that the total cost of surface flow programs (agricultural irrigation) is not large enough to make a pumping or flow enhancement program successful in the Humboldt River Basin.

This project is affecting how closure of mines are being conducted in Nevada. This project has also received a substantial amount of interest in the regulatory and mining communities, through the development of the pit lake workshop. The proceedings of the workshop on *Closure, Remediation and Management of Precious Metals Heap Leach Facilities* was published to allow all not in attendance the opportunity to benefit from these finds.

**Funding Source:** Federal: USDA - Hatch Act

**Scope of Impact:** State Specific

**Theme:** Water Quality

**Issue:**

With Nevada/California leading the U.S. in numerous metal productions, a major concern is over the amount of heavy metals in Nevada's streams from mining. The Upper Carson River Basin is heavily contaminated with mercury due to mining of the Monitor Mining District, CA (concentrations > 100 ppm in some watersheds). Currently numerous projects are focusing on the Carson River Superfund site. Thus, the focus of this project is on characterization of mercury concentrations in the tributaries of the East Fork of the Upper Carson River including Mountaineer, Poison, Leviathan, Bryant, Barney Riley and Cottonwood Creeks and East Fork of the Carson River. This data will be used to assess the sources (both natural and anthropogenically) of mercury to the drainage basin and the potential impact of mercury on aquatic organisms in the Mountaineer watershed relative to the severely anthropogenically impacted Leviathan watershed.

**What Has Been Done:**

Researchers at the University of Nevada, Reno determined mercury concentrations and discharge at sampling points three times a year during Spring runoff, during base flow and in the late summer early fall when flows should be lowest. These data were then used to assess the mercury being transported to the Carson River by the Upper Carson watershed. Next, research teams assessed the form of the mercury being transported by determining if the mercury is dissolved or particulate bound, and at a few sites whether methyl mercury was present and measured total mercury concentration in sediments at all water sampling sites as well as methyl mercury at select sites. To determine organic contamination aquatic insects from Poison and Upper Mountaineer Creek were collected. Sample sites were selected that allowed investigators to assess the impact associated with natural enrichment of mercury versus anthropogenic enrichment of mercury.

**Impact:**

Since the early 1980's California taxpayers have spent about \$7 million on the Leviathan Mine cleanup, while owners have spent an additional \$6.5 million. With the new acceptable mercury limit of 12 nanograms per liter being implemented by the California Ecological Health Criteria, total cost of cleaning up Leviathan mine are estimated to loom around \$140 million.

Data collected by the University of Nevada demonstrated that watersheds surrounding the Upper Carson River are naturally enriched with mercury, ranging anywhere from 2 to 12 nanograms per liter. Before mercury concentrations can be reduced or mitigated with remediation activities proposed for the Leviathan mine, cleanup officials need to re-evaluate the tolerable level of mercury in this watershed. Understanding the ambient levels of mercury in this situation could save millions of dollars that are lost only a few hundred feet down stream.

Officials interested in ambient levels can now access the "Mercury in the East Carson River" database (MECR) devised to provide guidelines from which the contribution of mercury by the disturbed Leviathan mine site are compared to those that are naturally mercury-enriched areas. From the social standpoint this database is also providing a framework for assessing the potential impact of mercury on the Washoe Tribe who have the closest downstream community on the Carson River above Carson City at Dresslerville, Nevada.

**Funding Source:** Federal: USDA - Hatch Act, DOI - USGS

**Scope of Impact:** State Specific

**Theme: Forest Resource Management****Issue:**

Bark beetles are the most destructive pests of saw timber and pulpwood in the United States and are responsible for the loss of billions of cubic feet of coniferous timber each year. During the last decade their depredations have been particularly severe in western Nevada and California, where the normally high biotic stress on conifers due to bark beetle colonization has been exacerbated by an extended drought. Bark beetles have caused direct economic losses, altered timber management strategies, and have created excessively high fuel loads, thereby increasing the chances for catastrophic forest fires. In the Tahoe Basin, bark beetles have killed almost 33% of the conifers during the past six years, especially Jeffrey pine and white fir. In some areas, 75% of the trees have been killed by bark beetles.

With increasing public concern about the use of toxic pesticides to control insects and other pestiferous organisms, resource managers are turning toward other techniques of integrated pest management. Some of these techniques are "hi-tech", such as the use of odors called semiochemicals, and in particular, pheromones, to manipulate the behavior of insect pests. With these non-toxic and biodegradable chemicals, insects can be lured into traps or foiled into wasting energy that they normally need for locating food and mates.

**What Has Been Done:**

University of Nevada researchers have determined that certain odors (pheromones - chemical signals used in insect signaling) can be used as a biological control tool to safe guard our forest. Scientists have determined that insect tree devastation begins when several bark beetles attack a drought weakened tree and begin to emit a blend of aggregation pheromone molecules that lures other beetles of both sexes to the tree. Evidence has shown that subsequent gallery construction and feeding activities of large numbers of beetles generally results in the tree's death due to deterioration of the nutritive tissue below the bark surface. Our investigators have recently cloned a key regulatory enzyme in the production of aggregate pheromones with a number of other regulatory enzymes partially cloned. Our research group has now focused on these enzymes as potential targets for disruption of the pheromone biosynthetic pathway.

UNR has determined that pheromone precursor production in male *Ips paraconfusus* bark beetles is closely associated with flight muscles in the meta-thorax. Another discovery moving UNR scientists one step closer is that aggregation pheromone of bark beetles accumulates in the hindgut and is released while male beetles feed

on the phloem (bark tissue) of their host tree. Studies are now underway to pinpoint the exact location of pheromone synthesis within the insects.

A different avenue of promising research has scientist at UNR investigating other categories of pheromone produced by bark beetle predators for potential use in directing predators to beetle-infested trees.

**Impact:**

Thus far, researchers at the University of Nevada have fashioned weak congregating pheromone cocktails that attract hungry bark beetles. These cocktails are now being explored in mass trapping experiments with pine bark beetles and have resulted in millions of insects attracted specifically into traps and away from trees. Another promising project is attempting to synthetic produce pheromones that attract males away from females that are willing to mate, causing a reduction in mating.

Though the investment cost to develop these environmentally benign methods of managing pest is substantial, commercial cost of many products are now as low as \$0.25 per trap. Taking into consideration that from 1996 to 1998 five interstate forest fires in eastern Sierra Nevada forests chronically infested with bark beetles claimed \$40 million in housing and property damage, timber loss, and soil stabilization costs. California Department of Forestry Andrea Tuttle stated that “investing into this line of research will only save dollars for both California and Nevada in the long run”.

**Funding Source:**

Federal: USDA - Hatch Act

State: Nevada Agricultural Experiment Station

**Multi-State Research Project Number:** W-189

**Scope of Impact:** Western Region

## **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.

Nevada faculty have designed a Managing Natural Resource Disputes program designed to educate citizens, decision makers and resource managers regarding collaborative processes and their role in managing disputes over use of natural resources. As a result, our stakeholders are gaining the social skills to facilitate disputes over usage of our public lands.

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.

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 range management systems for post wildfire grazing as well as the financial impact of rangeland fires on Nevada cattle operations. In addition, recreational valuations in Nevada have been determined to provide an economic impact of recreation on rural communities.

### **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	221,103	757,428		978,531	9
University of Nevada Cooperative Extension	V	464,621	1,978,521	2,105,905	4,549,047	68.52

### **Theme: Literacy - Youth At Risk**

#### **Issue:**

Washoe County, in western Nevada, has a highly transient population, and certain 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 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. Children who have strong interpersonal skills and support are less likely to participate in risky behaviors such as drug use and sexual activity.

#### **What Has Been Done:**

Funding was obtained to conduct after-school programs at six high-risk elementary schools that serve 235 low-income and homeless youth. The children receive a snack and help with their homework and participate in other activities including reading and educational games. The 4-H After-School Club focuses on math, reading and science skills as well as social skills such as conflict resolution, self-responsibility, cooperation and communication. In addition, 400 children participate in the Summer Discovery program at three sites, focusing on the same skills.

**Impact:**

Data analyses indicate the program has significantly improved the reading grades of kindergarten through second-graders, and social skills have increased in all grade levels of participants.

**Sources of Funding:**

Smith-Lever funds  
State Matching funds  
Nevada Community Development Childcare Block Grant  
Reno Housing Authority

**Scope of Impact:** State Specific

**Theme: Literacy****Issue:**

The foundation for literacy is built during the preschool years. A preschool child between the ages of 1 and 6 who spends 15 minutes a day reading with an adult will have 455 hours of individual reading instruction before entering school. This reading time fosters children's interest in reading and builds confidence, while at the same time eliminates some of the severe consequences of poor literacy skills including 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. Parents who speak Spanish as their primary language cannot always teach their preschoolers English because of possible limited language skills. Breaking the cycle is important to insure that both English- and Spanish-speaking 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 Cooperative Extension, KNPB-TV, Washoe County Libraries and the Washoe County School District, creates an opportunity for parents and young children to interact around literacy and language activities.

Family Storyteller is a series of workshops targeting families at risk for low literacy and related problems. The program has been conducted at 48 different sites in Nevada with 537 families participating. While Family Storyteller helps all families, it is specifically designed for parents with limited language skills and limited children's literature at home. The workshops include a 10-minute video viewing, book-reading techniques, practice time for reading to children and other literacy activities.

A new pilot program for English as a Second Language (ESL) parents and children was designed to evaluate family literacy programs for Spanish-speaking parents enrolled in the Northern Nevada Literacy Council's ESL program and their 3- to 7-year-old children. The program involves 16 sessions over eight weeks and includes parent and child workshops, free children's books, and materials to complete literacy activities at home. Added features include eight 90-minute sessions to help parents learn to read the children's books in English, and eight 90-minute videos for children to enrich their English language and literacy skills. A new videotape on reading will be developed for Spanish-speaking clientele.

**Impact:**

The success of Family Storyteller is evaluated by seven new assessment techniques designed to measure the quality of parent skills in reading to children, changes in frequency of parent- child reading and child engagement in the reading process. These techniques require few reading and writing skills to complete. Researchers also conducted pre- and post-interviews with parents and children in their homes. Results indicate that all parents rated the major component of the workshops either a 4 or 5 on a scale from 1 to 5 with 5 being

extremely satisfied. Pre- and post-assessments revealed significant increases in the amount of time parents read with their children, their enjoyment of reading with their children and their use of 14 parenting reading techniques. Children had significant gains in their enjoyment of reading with parents and their understanding of print concepts. Evaluation of the ESL pilot is underway using procedures such as interviews with parents, pre- and post-assessments of parent's gains in English literacy skills, and pre- and post-assessments of children's language proficiency and print awareness.

Thirty English and 19 Spanish copies of the curriculum were purchased by agencies outside Nevada; an article on the program was published in the *Journal of Extension*; and the program was featured in the *Nevada Adult Basic* newsletter.

### **Sources of Funding:**

- Smith-Lever funds
- State Matching funds
- Hatch Act funds
- Robert Z. Hawkins Foundation
- Nevada Literacy Council
- University of Nevada College of Human/Community Sciences
- Washoe County Libraries
- Washoe County School District

**Scope of Impact:** Integrated Research and Extension

### **Theme: Youth At Risk**

#### **Issue:**

Nevada has the third highest per capita juvenile incarceration rate in the country, costing taxpayers an average \$30,000 per year for each juvenile. Several Nevada studies indicate that taxpayers support prevention programming. In a recent survey of Nevada's rural counties, 71 percent of the local population indicated support for increased spending for programs that might prevent juvenile crime. A recent statewide survey of all adjudicated youth in state-run juvenile detention facilities found that few alternatives to detention exist.

#### **What Has Been Done:**

Project MAGIC (Making A Group & Individual Commitment) gives juvenile offenders a chance to change. MAGIC is a collaborative prevention program designed to help juvenile offenders leave the criminal justice system and become productive members of society. Entry-level juvenile offenders and their parent/guardian(s) are court-ordered to participate. The youth learn skills that will help them break the cycle of further involvement with the juvenile justice system. They are less serious offenders who have the ability to function in group settings. Sexual or violent offenders are not admitted to the program.

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 and goal setting. The parent sessions include the same life skills.

In the community service component, the teens organized and distributed gifts to families, planned a dance, sponsored a basketball tournament, picked up garbage, cleaned and painted a city park, planted flowers, took pets to seniors, and many other activities.

#### **Impact:**

Project MAGIC has graduated 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 re-offend. A follow-up study of 100 teen graduates shows they increased their skills in decision making, conflict

resolution, goal setting and communication. Ninety-five percent of parents participated in the program, with significant gains in their parenting knowledge. There was a 12 percent decrease in the number of program graduates who indicated their families insulted and yelled at each other, and a 48 percent decrease in graduates who indicated their families have serious arguments.

Due to its success, Project MAGIC has expanded to Las Vegas, where 2,500 youth are processed through probation each month. Many of these offenders fit the profile for referral. Since the program started there, 104 youth have graduated and received certificates. Among the first-year graduates, probation reported that only two alumni exhibited behaviors serious enough to warrant increased levels of involvement with the justice system.

The program has also expanded to the Duck Valley Indian Reservation. Power-up Corp, a private group, donated \$45,000 in computer equipment and training to the reservation, one of 27 sites selected nationwide and one of four in the West as a CSREES "New Community." Project MAGIC has also expanded to Tonopah, a rural community in central Nevada.

Youth participating in 2001 MAGIC consisted of 121 males and 45 females. Of the 166 participating youth, 96 were white, 26 were Hispanic, 17 were Native American, 26 were Black, and 1 Asian. The average age of the youth was 14. Of the 166 youth participating in MAGIC, 160 completed pre/post-testing and are included in the results. The juvenile offenders progress was evaluated using 4 different pre- and post-test measures. The youth completed a self-evaluation and a portfolio. The youth also completed a drug and alcohol survey. Parents of the juvenile offenders rated their child's behavior before and after the program. Percentage improvements indicate positive trends in the following areas studied:

1. Self-Evaluation: The juvenile offenders rated their life skills as a 53% improvement on the self-evaluation.
2. Portfolio: The juvenile offenders portfolio scores improved from before the program began to after program completion at a 48% increase in their knowledge and abilities in the life skills areas taught.
3. Drug, alcohol and smoking survey results: Before the program, 58% of the program participants indicated they currently use marijuana. After the program, 12% of the students in the program indicate they will continue using marijuana in the future. Before the program, 72% of the program participants indicated they currently use alcohol compared to, 33% who indicate they will drink in the future. Before the program, 56% of the program participants indicated they currently use tobacco and 42% indicate they would continue smoking in the future.
4. Improved Attitude and Involvement in School: Before the program 69% of the program participants indicated they planned to stay in school compared to 87% who planned to stay in school after the program. Before the program started 60% of the program participants participated in one or more activities compared to 75% that participated in one or more activities after program completion.

**Sources of Funding:**

- Smith-Lever funds
- State Matching funds
- USDA's Children, Youth and Families at Risk Fund

**Scope of Impact:** State Specific

## **Theme: Youth At Risk**

### **Issue:**

The *Middle-level Retention Alternative* (MLRA) program is designed to establish an alternative program which assists students who are “in risk” of eighth grade retention.

### **What Has Been Done:**

The program designates at least one class at each participating middle school. Students who are on track to be retained are eligible to participate in these classes. The MLRA classes maintain a lower class size. The instructors use a variety of methods to bring students up to grade-level proficiency. The goals of this program are to:

1. Establish an organized alternative program at each of the targeted middle school sites;
2. Encourage each school site to adopt research-proven methods;
3. Improve participating student performance;
4. Decrease retention of program participants.

Cooperative Extension assisted in the organization, development, and evaluation of this program. Site visits are made to 10 sites, during which administrators, teachers, and students are interviewed. Information is also passed along about current best practices and future trainings. Four best practices discussions were held at training workshops with teachers and administrators, which were attended by 45 teacher participants (23 teaching hours).

### **Impact:**

#### SHORT-TERM:

- ⊗ 88% ( $N=41$ ) of workshop participants reported that they “agreed” or “strongly agreed” with the statement, *I have learned something from this workshop that will help me be more effective with my students.*
- ⊗ 90% ( $N=41$ ) of workshop participants reported that they “agreed” or “strongly agreed” with the statement, *I have learned something from other teachers at this workshop that will help me be more effective with my students.*
- ⊗ At year three of the program, 100% of responding teachers ( $n=11$ ) reported using at least one of the prescribed researched-based methods “often” or “very often”.

#### medium-term

- ⊗ Four different schools, through their own evaluation efforts, found that participating students increased their attendance and grade point average during their participation in the program.
- ⊗ In student interviews, nearly 78% ( $N=23$ ) of the students interviewed reported that they were improving their grades as a result of the program.

#### long-term

- ⊗ Over three years, students who participated in the program had significantly ( $F=7.69, p<.001$ ) higher grades as compared to a contrast group of students ( $n=813$ ).
- ⊗ Over three years, students who participated in the program had significantly ( $F=2.51, p<.089$ ) higher math test scores as compared to a contrast group students ( $n=813$ ).
- ⊗ Of the total number of the 480 participants in the program over 3 years, only 10 were retained at 8<sup>th</sup> grade.

### **Sources of Funding:**

Smith-Lever funds  
State Matching funds  
School District funds  
Grant

**Scope of Impact:** Integrated Research and Extension



## **Theme: Youth At Risk**

### **Issue:**

Child abuse is a very real problem for Nevada. In 1998, 4,743 reported occurrences of child abuse were substantiated by social workers. This makes Nevada one of the nation's most susceptible states to incidences of child abuse. Most of those cases were reported by people who work closely with children. Teachers, counselors, health care workers and caregivers are all valuable sources in detecting child abuse. Many organizations employ adult and teen workers and volunteers to work with children. They may suspect when child abuse is occurring, but often don't know how to report it. These youth workers need to be educated about the signs and symptoms of child abuse and how to react and report when child abuse is suspected. The prevention of family and community violence was identified in Nevada needs assessments as an area of prime concern. The state has very high rates of these devastating interactions. Childcare providers and youth workers are mandatory reporters of suspected child maltreatment. Ten years ago, no training existed for childcare providers or youth workers, such as 4-H leaders, in Nevada.

### **What Has Been Done:**

UNCE is known for its program to help people report suspected cases of child abuse and neglect. Youth specialists developed a three-hour curriculum for youth workers and others, a three-hour workshop for childcare providers, a curriculum guide and a self-study guide to help youth workers and volunteers recognize and report suspected child abuse. Professionals train youth staff, volunteers, administrators, child caregivers, crisis line staffers and firefighters. *Child Abuse Recognition and Reporting* is a 50-page guide that introduces workers to the many facets of child abuse. It helps youth workers learn the potential indicators of child abuse, how to respond to a disclosure from a child and where and how to report their suspicions to authorities. Each chapter features a comprehensive quiz at the end that allows youth workers to monitor their retention of information. The book is available for purchase for \$5 or is available in PDF format or in an interactive version at: [www.unce.unr.edu/publications/child.htm](http://www.unce.unr.edu/publications/child.htm)

### **Impact:**

Youth workers who are more informed about child abuse are able to provide safer and more secure environments for the children they help. The guide is an effective learning tool because users must answer questions to ensure they understand and are retaining the material. The web-based self-study guide allows workers to study at their own pace and monitor their progress. The guide was first created for volunteers working in UNCE programs such as 4-H, but its success has made it popular with other industries as well. Social-service agencies, district attorneys and health care providers throughout Nevada, other states and other countries have adapted the program to train their employees to be on the lookout for signs of child abuse.

In 2001, the self-study guide received the Western Regional NEA4-HA Communicator Award for an outstanding educational piece. The guide is now required training for all UNCE staff and volunteers. Additionally, it has been purchased by many other states and accessed on the web site by 22 states and at least five other countries. It was approved for childcare provider training by the Nevada State Childcare Licensing Bureau.

Furthermore, the curriculum guide, childcare provider curriculum and self-study guide have been evaluated and found to significantly increase the participant's knowledge regarding recognizing and reporting suspected child maltreatment.

### **Sources of Funding:**

- Smith-Lever funds
- State Matching funds

**Scope of Impact:** State Specific

## **Theme: Community Development**

**Issue:**

Eureka County, situated in central Nevada with a population of 1,500, is susceptible to traditional boom-or-bust economic conditions. Mining and agriculture provide the tax base for this rural community, but in recent years both gold and livestock prices have been fluctuating, and there has been a downward trend in mining activity. Current and past needs assessments show a need to move toward a more diversified economy.

**What Has Been Done:**

The Eureka Board of County Commissioners asked the local UNCE educator to help develop an entity that would assist the county in developing and diversifying the economy. The educator researched state and federal laws, developed bylaws, recruited directors and helped establish a new entity, the Community Development Corporation to provide a revolving loan base to increase economic activity in Eureka County. The CDC's mission is to develop and finance economic diversity within the rural community without sacrificing social and traditional values. The CDC also aims to stop the constant flow of in-and-out migration in the county.

**Impact:**

On behalf of the CDC, the UNCE educator prepared and submitted a grant application for \$1,000,000 for use as revolving loan funds for economic development and diversity. The county commissioners not only approved the corporation's mission, by-laws and board of directors, but it also granted the requested funds to stimulate economic development. Businesses seeking financial support have a lending institution within the county they can work with to secure at least partial funding. The UNCE educator is one of seven board members who evaluate loan applications. He is the liaison between the board, the County Commissioners, the Economic Development Council and the public. He meets with prospective business developers to make them aware of opportunities. UNCE also brought in support from the University Center for Economic Development to develop a research project involving target industry analysis of the county. CDC began accepting, evaluating and funding viable economic projects in 2000. The efforts resulted in an increase in three full-time jobs and 1,000 hours of part-time labor in the community. The revolving fund generated an additional \$45,000 in resources.

**Sources of Funding:**

- Smith-Lever funds
- State Matching funds
- Eureka Conservation District
- Eureka County grant funds

**Scope of Impact:** State Specific

**Theme: Community Development****Issue:**

Often referred to as bedroom communities, Laughlin, Nevada and Bullhead City, Arizona are actually separate communities in different states divided by the Colorado River. Governmentally, the towns operate independently, but economically and socially, they are very dependent upon each other. Laughlin is dependent on Bullhead City for its employment base and Bullhead City is dependent on Laughlin for household incomes that support their local economy and the social demands of an entire area. Increased legalized tribal gaming in neighboring states has increased the need for the cities to respond to threats to their primary industry: tourism. In order to enhance communication and move the communities forward, they needed to develop a better collective understanding of their economic and social interdependence. The outcome would produce a basis for making future community decisions and provide methods for addressing community issues.

**What Has Been Done:**

In order to help the two communities better interact, a University of Nevada Cooperative Extension economist facilitated round-table meetings of political leaders, key business executives and social agencies from

both communities. He helped them with a six-step strategic-planning process and taught them research methods to measure the economic and social linkages and how to interpret the technical information. He organized a 14-member advisory committee with equal members from both communities. He conducted training workshops and led the planning process. The key issues identified were economic linkage, tourism development and childcare. Community-wide presentations were then delivered via public-access television and newspaper articles.

**Impact:**

By assessing the importance of tourism in the region, community leaders have been successful in raising nearly \$18 million for Needles Highway improvements. These efforts also resulted in a successful Nevada Legislative Bill (AB 465) introduction in 2001 authorizing the use of these funds across state lines. The communities of Laughlin and Bullhead City have improved economic leakage through community education efforts using various media channels (print, PSAs and local TV). The \$0.52 local spending leakage in 1999 improved to \$0.48 local spending leakage in 2001. This improvement is also a direct result of working with businesses to adjust their operations to meet local consumer needs.

Cumulative impacts since the introduction of this program include continued comprehensive retail leakage community education; child care demand analysis that resulted in the construction of a new 24-hour childcare facility; tourism, economic and fiscal impact assessment for the National Gaming Commission; place of residence impact on community analysis; and road improvement that will be completed in the coming years to better serve the tourism market.

**Sources of Funding:**

- Smith-Lever funds
- State Matching funds
- Western Rural Development Center

**Scope of Impact:** Multistate Extension – NV, AZ

**Theme: Aging - Family Resource Management**

**Issue:**

More than 25 percent of the 80,000 new Clark County residents each year are senior citizens. The majority of all elderly residents in Clark County are relative newcomers, arriving within the last 10 years, and many of them lack the traditional support structures associated with work and family. Community-based educational programming was needed to provide the tools to meet the quality of life needs of southern Nevada seniors, especially those needs that relate to an independent lifestyle. Educational programs are needed to extend independence by enhancing coping skills.

**What Has Been Done:**

The Seniors CAN program was created to meet these needs. It is a community-based educational program for older adults taught in community centers in urban and rural Clark County. The program is designed to enhance mental acuteness, self-esteem and wellness, thus improving their quality of life. The curriculum includes 15 lessons on nutrition, personal safety, food safety, finances, health and productivity. Topics selected to be most useful for quality and control of life include strategies to cut costs of food and general living expenses, the importance of a healthy diet and hydration and techniques to reduce accidents, short-term illnesses, crime victimization and consumer fraud. Program participants also receive information on local, state and federal programs and the importance of productivity through volunteer work or employment.

Participants meet once a week for 16 weeks to discuss information that will enhance their knowledge, cognitive skills and ability to maintain independence. The program also aims to improve participants' quality of life by decreasing loneliness and perceived stress.

**Impact:**

In the first two years of the program, older adults attended more than 1,500 teaching hours. More than 80 students completed the entire four-month program (approximately 35 classroom hours per student) including pre- and post-testing. Approximately 50 other students attended at least 12 of the classes. The audience included students from diverse ethnic and economic backgrounds. The Hispanic population was underrepresented, and programs were not being instituted at centers where there were large Spanish-speaking populations. In 2001, a bilingual volunteer was hired to translate materials and teach Hispanic seniors in Spanish. The preliminary data shows a trend toward decreased loneliness and an increased sense of skills among participants. Male students showed a marked reduction in both stress and loneliness. A number of participants reported exercising more and being more aware of what they eat and how it affects their health. Many participants report that the education gave them “more control of their lives.”

**Sources of Funding:**

Smith-Lever funds  
State Matching funds

**Scope of Impact:** State Specific

**Theme: *Impact of Change on Rural Communities***

**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.

**Funding Source:**

Federal: USDA – Hatch Act

State: Nevada Agricultural Experiment Station, Nevada Arid Rangeland Initiative

**Scope of Impact:** Western Region

**Theme: Impact of Change on Rural Communities****Issue:**

During 1999, northern Nevada experienced one of its worst fire years ever with over 1.6 million acres burned. Estimates of the damage are still being tabulated. However, we know that the economic and environmental impacts of these fires are staggering. Direct economic impacts include things such as fire suppression efforts, lost forage and grazing, lost infrastructure such as fences and other physical structures, and reseeding efforts. Many impacts are unknown at the current time, but will contribute to the total economic impact. Examples of unknown impacts are loss of wildlife and recreation, erosion, loss of life along major traveled interstates and highways, increased maintenance on roads and interstates to keep them cleared, and decreased ecological state of the land. This project is an attempt to provide information relating to economic impacts from the 1999 Rangeland wildfires.

**What Has Been Done:**

Impacted landowners in Humboldt, Pershing, Eureka, Lander, and Elko Counties were surveyed and data collected utilizing a survey form developed in Eureka County.

**Impact:**

The economic impact on Humboldt, Pershing, Eureka, Lander, and Elko Counties due to the rangeland wildfires experienced in the summer of 1999 were estimated to be \$13 million or more. Impacts include lost grazing, rebuilding structures and fences, soil conservation efforts, and reseeding burned rangeland. The long-term solution includes management and seeding rangeland with perennial bunchgrass and shrubs. Although this will not eliminate the fire cycle, it will reduce it.

**Funding Source:**

Federal: USDA - Hatch Act

State: Nevada Arid Rangeland Initiative

**Scope of Impact:** State Specific

## **Theme: Tourism**

### **Issue:**

Current gold mining technology in the Great Basin is based upon large open pit gold mines that may extend 800 feet below the water table and cover over 500 acres of surface area. This technology requires enormous quantities of water to be discharged from the pits to allow mining to continue. This “dewatering” process required temporary groundwater rights to be granted by Nevada’s State Water Engineer to gold mining companies in Northern Nevada’s Humboldt River Basin. The magnitude of dewatering poses significant externalities on other water users within the basin. For a period of approximately fifteen years, in-stream flows in the Humboldt River Basin will double due to water discharges from pit dewatering. Similarly, downstream users may lose during the post-mining period as massive quantities of water are diverted to fill the abandoned open pits.

### **What Has Been Done:**

A multiperiod programming model was developed to estimate the expected impacts of changes due to flow perturbations resulting from mine dewatering and subsequent filling of pit lakes. The model is thus driven by farmer planting decisions, which are in turn based on expectations of water supplies over the year.

Post-optimality analysis will determine the effects of alternative flow regimes upon recreational users’ valuation of water-based activities at Rye Patch. In addition, the impacts of imposing a minimum volume of 3,000 acre feet, suggested by officials of Nevada’s Department of Wildlife, were derived to determine benefits to regional recreational users as well as costs on downstream irrigators.

### **Impact:**

Nevada ranks third in the world in gold production and these mines have been disposing of 445,000 acre-feet of ground water per year. Approximately 65% of this water is discharged into tributaries of the Humboldt River. This discharge would be worth approximately \$223 million if valued at \$500 per acre-foot, the current price paid by the U.S. Fish and Wildlife Service to purchase water rights from farmers in a nearby irrigation districts.

However, the major objective of this project was to quantify the losses to downstream users because of rigidities that prevent their ability to take advantage of the increased in-stream flows resulting from mine dewatering. Consequently, estimates were modeled on the premise that 3 acre-feet water right limit were relaxed to 3.112 acre feet (divvying newly available water across total irrigated acres equally). This 3.7% increase in water usage by farmers has the potential to generate \$39.3 million over a 5 years period because of higher valued, more water intensive cropping patterns.

The potential for increasing recreational values also exists under the mine dewatering phase with additional institutional changes. Specifically, Nevada wildlife officials maintain that a 3,000 acre-foot minimum volume should be established to avoid loss of the sport fishery at Rye Patch reservoir. Imposition of this requirement has no impact on agricultural irrigation values during the mine dewatering phase. Annual visitor values increase an average of \$1,823 during dewatering with the minimum volume constraint.

The results of this economic analysis clearly indicate that lack of institutional flexibility may limit the ability of downstream users to enjoy temporary gains from the increased flows during gold mining activities.

### **Funding Source:**

Federal: USDA- Hatch Act, Environmental Protection Agency

State: Nevada Agricultural Experiment Station

**Scope of Impact:** State Specific

## **Theme: Tourism**

**Issue:**

Recently, the public management of rock climbing access in designated wilderness areas has been an issue of considerable national controversy. On June 1, 1998, the U.S. Forest Service (USFS), under the U.S. Department of Agriculture (USDA), announced intent to implement a policy restricting the way climbers could recreate in wilderness areas. The USFS proposal would prohibit the use or placement of fixed climbing anchors in designated wilderness areas. Accordingly, climbers would not be allowed to use or place fixed protective gear for ascending and descending climbing routes safely. The normative implication of this institutional change is that a resource user group (rock climbers) would lose access privileges in wilderness areas. It should also be noted that other federal and state public land agencies, including the National Park Service and the Bureau of Land Management, have proposed similar rules regarding rock climbing access on public lands.

Changing the USFS's position on rock climbing in wilderness areas requires that a prima facie case be made. This requires substantiating sufficient evidence that the USFS proposed policy constitutes a major regulatory change and imposes significant economic losses on climbers that warrant consideration in benefit-cost analysis. If annual losses to climbers due to the USFS proposed policy exceed \$100 million, the USFS is restricted in its ability to finalize its rule and would be required to conduct a benefit-cost analysis comparing economic losses to climbers with benefits of wilderness preservation.

**What Has Been Done:**

University of Nevada's investigators in conjunction with those elsewhere, determined whether the USFS proposed policy constitutes a major regulatory change. Specifically, test the hypothesis that the non-market values for the loss of climbing access in wilderness areas are less than \$100 million annually. To implement the modeling strategy, this study uses original survey data on trip-taking behavior for 597 U.S. climbers; the data account for 12,952 trips to 60 nationally dispersed climbing areas.

In this study, a national-level repeated nested random utility model is developed and used to simultaneously predict demand for climbing and site choice using a multiple decision process. First, the decision process is structured to repeatedly capture a climber's decision to take a climbing trip during the season of interest. Second, if a climber chooses to take a climbing trip, she then selects a climbing region. Regional nesting is useful because it allows for greater flexibility in modeling substitution among climbing sites. Finally, after deciding a region, a climber selects a site. The model results show that this nesting structure is appropriate to characterize the when and where to take an outdoor rock climbing trip.

By simulating the removal of sites from the climber's choices of places to climb, the model predicts economic change associated with loss in climbing access national sites. The welfare amounts indicate that climbers highly value climbing in wilderness areas. One estimate of economic losses to climbers associated with the loss in climbing access to USFS wilderness areas is near \$100 million. The magnitude of these losses suggests that the USFS proposal to ban access meets the definition of a major regulatory change. Further a scope analysis reveals that the economic losses to climbers increase significantly with increasing reductions in climbers' choices of sites. Thus, if the USFS proposal to ban access has any precedent-setting impact on other federal and state agencies, then losses to climbers would grow substantially.

**Impact:**

This research makes several contributions. First, while many studies have estimated recreation demand, this is the first study to apply the repeated nested random utility model to estimate demand for rock climbing and to predict the national economic losses associated with loss in climbing site access. Most existing recreational demand studies evaluate regional demand for regional sites. Since climbing alternatives are scarce relative to other activities (i.e., require very specific topographical conditions), and since climbers may live in areas not conducive to climbing, a regional study is not appropriate. The most conservative estimate of the aggregate economic losses to climbers associated with the loss in climbing access to US Forest Service wilderness areas is \$92 million.

Given the growing concerns over rock climbing impact on public lands, the results from this study may provide useful input to public land agencies attempting to balance climbing with other uses of public lands. Finally, by implementing better management plans that allow outdoor recreation in conjunction with protection

of wilderness areas, the public will gain access to resources that otherwise may be deemed off-limits to climbers. Policies that flow from these results may change usage patterns for generations to come.

**Funding Source:** USDA - Hatch Act

**Multi-State Project Number:** W-133

**Scope of Impact:** National

**Theme: Tourism**

**Issue:**

Understanding the economic impact of recreation at rivers and lakes is important to all who live, work, and play around these waters. One way of investigating the real value of public recreation areas to recreators is based on travel costs. Travel costs to and from each recreational site serve as a proxy for the site's price in determination of the relationship between price and quantity. Quantity demanded versus a "price" provides a traditional demand relationship, and with it a value for the consumer's net benefit. This net benefit is called consumer surplus. Currently, public recreation areas in the Walker River Basin, Nevada do not charge a market price for admission. Hence, assessing the real value of these public recreation areas to recreators must be approximated through their recreational behavior.

**What Has Been Done:**

In this project we estimate the recreational resources of Walker Lake, Walker River, and other waters in the Walker River Watershed.

A survey of 487 Walker River Basin recreators included a section of questions designed to gauge contingent behavior. Specifically, respondents were asked how their trip-taking behavior would change contingent upon a change in site characteristics. Would, for example, a respondent take more or fewer trips to a lake or river if the water level were much higher or lower than at present?

To address this question in the Walker River Basin, surveys included computer enhanced pictures of Walker Lake representing the lake at approximately 20% higher and 20% lower than base 1996 levels. Considering the altered lake levels, recreators were asked: Would trips to Walker Lake increase, decrease, or stay the same? Would trips to waters directly upstream from Walker Lake, such as Walker River, Twin Lakes, Topaz Lake, Weber and Bridgeport Reservoirs increase, decrease, or stay the same?

Results from the survey of 487 Walker River Basin recreators were used to approximate recreational demand for Walker Lake and Topaz Reservoir.

An economic modeling process was used also to estimate "welfare loss." This measure reflects how much the average recreator in the sample would be willing to pay per trip to prevent complete elimination of the option to recreate at that site or to prevent lower water levels by 10% across all three seasons at the site.

**Impact:**

Walker Lake, sometimes referred to as a "dying" lake, is the subject of much controversy, as indicated by the fact that the Walker River Paiute Tribe and Mineral County are asking courts to open the water rights-governing Decree C-125 to allow more water to flow to the lake. Regular (every year) increases in flows cannot come without costs to up-stream users, as the water in the Walker River watershed is already over allocated.

Approximately 56% of the respondents surveyed said their number of trips to Walker Lake would increase with higher water levels while 53% would decrease their trips with lower lake levels. More than half of the respondents said that their number of trips to upstream sites would stay the same in the event of higher or lower lake levels at Walker Lake. The results indicate that a hypothetical 10% decrease in water levels over all



seasons at Walker Lake would decrease the original number of trips taken by the sample population by 31% or from 1483 to 1029 total trips.

If Walker Lake, Nevada were eliminated, the average welfare loss is \$50 per trip. For Topaz Lake, Nevada, the loss is \$20 a trip. The average annual loss per individual in the sample varied from about \$210 at Walker Lake to around \$40 at Topaz Reservoir. The model indicated a welfare loss of approximately \$56 per trip if Bridgeport and Twin Lakes were eliminated. The total welfare loss to the 467 sample recreators if Walker Lake recreation were eliminated in 1996 would have ranged from \$56,000 to \$100,000 depending on the type of model used. Similarly for Topaz Lake, the total annual loss for the sample would range from \$17,000 to \$24,000.

Additionally, the model was used to estimate recreation value per acre-foot at different sites and seasons. The results in an annual per acre-foot value for water at Walker Lake of \$18 per acre foot, or less when evaporation is taken into account. Using the same technique to measure recreation value per acre-foot at Topaz resulted in a much higher value, \$180 per acre-foot.

Estimates of value of water for recreation versus varying water levels at Walker Lake are complicated when considering the possibility of a corresponding major change in habitat for fish and birds. If due to lower lake levels the fishery were on the verge of being completely lost, the value of the water that it would take to prevent such a loss might be quite a bit higher than the values reported above. This is because total recreation value would be influenced by the possible welfare losses that would correspond with the site elimination scenario rather than the water level reduction scenario.

Suppose nearly all the recreation value of Walker Lake is connected to the fishery and bird habitat. If, say 70,000 extra acre-feet prevent this loss, this water could have a value to recreators of as much as \$100 per acre-foot.

**Funding Source:** USDA - Hatch Act

**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. During 2001, this committee has met twice to provide broad guidance on UNCE programming and policies, and to serve as a sounding board for setting program priorities. It has already met once in 2002.

In 2000, UNCE administration also initiated a series of statewide “community stakeholder meetings,” and has continued them in 2001. 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 past year, 10 “community stakeholder meetings” were held and involved over 150 individuals. Additional “community stakeholder meetings” are scheduled for 2002. This information is being used for developing both local and statewide programming.

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, all of UNCE’s major educational programs are the result of formal needs assessments. The data collected by UNCE is also used as the basis for broad Nevada Agricultural Experiment Station research priorities.

## **PROGRAM REVIEW PROCESS**

There have been no significant changes in the program review process since the last 5-Year Plan of Work.

## **EVALUATION OF THE SUCCESS OF MULTI AND JOINT ACTIVITIES**

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 process. 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.

Integrated and multistate programs have generally realized the outcomes/impacts expected by this date. Since they are in different stages of development, not all programs have reached the stage where full impacts/accomplishments may be expected. The multi-state research program and Western Coordinating Committee projects are reviewed by RCIC (which is represented by 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. All current projects are progressing well.

Both UNCE and NAES have a long history of integrated and multistate programs/activities. 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.

In addition to the successes listed in the accomplishment section for each integrated project/program, we have extended a new approach to encourage an improved integration between the NAES and UNCE. In 2001, we created a joint funding mechanism between extension and research for integrated activities, and proposals were requested. The intent of this Request for Proposals is to facilitate and support joint research-Extension programming between UNCE and NAES to benefit the people of Nevada. Proposals were solicited, and were reviewed by a committee of deans and department chairs from Colleges of Agriculture, Human & Community Sciences, Cooperative Extension and the Experiment Station. Eight (8) small one-year projects/programs were funded to stimulate combined research and Extension activities between UNCE and NAES, and included faculty from the Colleges of Agriculture and Human & Community Sciences. Projects funded include those to 1) help initiate or facilitate start up of a new integrated project/program; 2) enhance an existing project in new ways; 3) plan for future projects; 4) secure future project support from other sources; 5) build awareness or 6) provide “one time” funding for a new or expanded piece of a larger on-going project. All of these approved projects include a partnership/collaboration between campus-based NAES faculty (from the Colleges of Agriculture, and Human & Community Sciences) and community based Cooperative Extension faculty, and address issues important to our stakeholders. These projects were funded through FY2002.

## **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 of Program	2001	2002	2003	2004	2005	Statement of Progress
Agriculture/Natural Resources	5,030.83	5,426.29	5,643.34	5,869.07	6,103.83	Educational efforts are centered on effective Agriculture/Natural Resources (A/NR) and Community Rural Development (CRD) and administrative responsibilities including management of staff, volunteers, physical facilities, and budget to assure impact. Within each program are several educational concentrations divided between youth and adult audiences. The A/NR program that I developed is primarily focused on youth and is in a variety of cycle stages. The Livestock segment, primarily addressed through 4-H Club work, is associated with Soils & Range and is well-established and showing impact. The Soils segment is well established and showing some long-range impact. The Range portion, being taught and evaluated statewide using the new Range Manual (SP-01-04), is also established and showing impact. The Wildlife segment, while being taught, is still in development phase. Adult focus is primarily reactive, with classes offered as requested, as most of the agriculture and natural resource issues are addressed through the CRD Program. The youth CRD program is implemented through 4-H and Job Readiness Classes. Both are in the evaluation and impact stage. 4-H is essentially inherited, while I developed Job Readiness. The CRD adult program provides a variety of educational offerings to key community leaders, generally in informal settings, in order to facilitate community collaboration to address issues. Overall the adult programming is in the implementing stage,

Title of Program	2001	2002	2003	2004	2005	Statement of Progress
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Agronomics	27,202.95	29,262.17	30,432.65	31,649.96	32,915.96	<p>The University of Nevada has not provided agronomic expertise related to alfalfa production (Nevada's # 1 cash crop) for a number of years. While alfalfa research from other geographical regions can sometimes be replicated under Nevada conditions, there is an identified need to carryout separate and independent educational and research programs that address Pershing County's unique climatic and soil conditions. Therefore, based upon the identified needs of Pershing County alfalfa producers, a major portion of my educational programming efforts involves alfalfa hay and seed research and demonstration projects.</p>
Animal Health Beat	16,244.59	17,185.70	17,873.13	18,588.05	19,331.58	<p>An outreach service of the University of Nevada Cooperative Extension and The College of Agriculture, Biotechnology, and Natural Resources providing abstracts of current veterinary literature for veterinary practitioners, veterinary technicians, Cooperative Extension faculty, and people concerned about the care and welfare of animals.</p> <p>WEB FORMAT</p> <p>Articles: Abstracts and practical animal care information will be posted weekly. Current postings will be available for 3 months. All of the information will be indexed.</p> <p>Archives: Older postings will be archived at the end of each month.</p> <p>Search: A search engine is provided as a means for querying articles based up on keywords.</p> <p>Discussion A bulletin board where you the reader can post questions or comments and respond to previous submissions.</p> <p>General information: Publications and programs available for anyone needing curriculum materials or prepared power point presentations.</p> <p>Comments: Designed for submission of case reports or animal care concerns that reporters would like posted on the Current Articles page. All materials and question will</p>

<b>Title of Program</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
Beef Quality Assurance (Dissemination Phase)	14,875.96	15,729.96	16,359.15	17,013.52	17,694.06	I taught over 100 Nevada Cattlemen and level 1 Nevada Beef Quality Assurance certified them at the Nevada Cattlemen's Association annual meeting and Cattlemen's College program held in Elko and at three statewide BQA programs held in the Nevada communities of Gardnerville, Orovada and Elko.
Carson River Watershed Education Program	16,638.70	17,692.69	18,400.40	19,136.41	19,901.87	This program supports and informs the Carson River Watershed Coalition, a multi agency cooperative and collaborative group that Extension helped to found as an outcome of the 1998 Carson River Conference, organized and funded by Cooperative Extension's John Cobourn. The need for outreach education and a collaborative approach to watershed management were identified by US Senator Richard Bryan in 1997 and corroborated by a the vote of the conference audience at the end of a facilitated decision making process in April, 1998.
Cattlemen's Update	10,829.73	11,457.13	11,915.42	12,392.04	12,887.72	Cattlemen's Update is an annual educational program offered by the University of Nevada for beef cattle producers. Program topics speak to current beef cattle production management issues in the Great Basin region affecting profitability and product quality. Subject matter selection is based on a needs assessment of Nevada beef cattle producers and on concerns and trends expressed by the leaders of the beef cattle industry in the United States.
Commercial Water Conservation Training Program	19,600.77	21,064.57	21,907.15	22,783.44	23,694.77	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. This program is in its fourth year, and is moving toward maintenance. Each year the program is evaluated, reviewed, modified, and revised according to the needs of the clientele

Title of Program	2001	2002	2003	2004	2005 Statement of Progress
Community Economic Development	19,994.38	21,571.04	22,433.88	23,331.23	<p data-bbox="1476 167 1969 431">My teaching has been guided by the rapidly changing economic conditions in Southern Nevada. Since 1990, Nevada's population has increased nearly 68 percent approaching 2.1 million people in 2000 (Nevada State Demographer). Southern Nevada, including the counties of Clark, Lincoln, Nye, and Esmeralda represent nearly 71 percent of the states total population. The changes in population and demographics throughout Southern Nevada have challenged several communities, groups and individuals to respond to critical issues important to their overall well-being.</p> <p data-bbox="1476 435 1969 971">Since 1996, I have developed and implemented a new Community Economic Development Educational Program in Southern Nevada. This program follows a community based educational model that provides communities, groups, and individuals learned skills and tools for responding to critical community issues and needs. Two dynamic interactive teaching modules have been developed to be responsive to audiences with varying levels of knowledge and needs. Each module is designed to create a specialized learning atmosphere by providing applied mentoring opportunities that lead to successful applications. Module one teaches the basic principles for organizing, developing, implementing, and evaluating community/organization based strategic plans. A six-step process is taught and applied at the community level. Module two teaches critical thinking techniques and application through applied community analyses. Both basic and advanced analytical methods are offered depending on the issues and knowledge level of the audience. Under each module, targeted audiences independently apply lessons learned using my guidance and mentoring assistance when requested.</p> <p data-bbox="1476 974 1969 1237">This educational model has been applied in four Southern Nevada communities. Each of these communities is unique in that the issues, goals, and objectives are different requiring program flexibility and adaptability. The following pages provide a brief snapshot of my Community Economic Development Educational program and the impact it has had on communities in Southern Nevada. My teaching is separated in two sections (1) Community Economic Development Education and (2) Issue Based Technical Assistance Education.</p>



<b>Title of Program</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
Cow Calf Handbook	8,663.78	9,165.71	9,532.34	9,913.63	10,310.17	The cow calf handbook is the definitive beef cattle production handbook in the west. This committee meets once a year to update the book and add new
Cow/Calf Handbook (Western Beef Resource Committee)	4,199.48	4,458.09	4,636.42	4,821.88	5,014.75	The cow/calf handbook is the definitive beef cattle production handbook in the west. This committee meets once a year to update the book and add new information to it.
CYFERnet Youth Editor	11,679.57	12,405.71	12,901.94	13,418.02	13,954.74	CYFERnet is a national network of Land Grant university faculty and county Extension educators working to support community-based educational programs for children, youth, parents and families. Partners in CYFERnet include Family Consumer Science; 4-H Youth Development; Communications and Information Technology programs and staff at county, state, and federal levels of the Cooperative Extension System. CYFERnet brings together the best children, youth and family resources of all the public land-grant universities in the country and makes them available electronically through the CYFERnet website. As the appointed Editor for the Youth and Teen component, I provide leadership to the Youth Editorial Board, as well as oversight of the structure and content of the youth component. This includes the solicitation, review, and posting of materials on the CYFERnet site.

Title of Program	2001	2002	2003	2004	2005 Statement of Progress
Economic Diversification Through Education and Horticultural Marketing	12,094.67	12,772.67	13,283.58	13,814.92	<p>14,367.52 The Cooperative Marketing Act of 1926 mandates that USDA "promote the knowledge of cooperative principles and practices and cooperate in promoting such knowledge with educational and marketing agencies, cooperative associations, and others. Simply Hawaii is an agricultural cooperative, assisted in its development by USDA Rural Development, (the first hybrid cooperative in the United States) representing the horticultural industry for the entire state of Hawaii. Its main objective is to market, promote, sell and establish a nationwide distribution of horticultural products unique to the tropics. Simply Hawaii approached me for help in their decision where to locate a port of entry and distribution nation-wide for their horticultural products. My future plans contributing toward the success of this type of Cooperative venture:</p> <ul style="list-style-type: none"> <li>Identify problems with plant material in acclimating to a desert environment</li> <li>Conduct educational programs addressing the use and care and handling of tropicals</li> <li>Conduct seminars to stimulate interest and knowledge at the professional level</li> <li>Mass media educational efforts</li> <li>Develop local cooperatives marketing locally produced goods using Simply Hawaii as a template.</li> </ul> <p>The introduction of these products will give the professional a larger plant palette to work from and more creativity while it will give the consumer more choices in the same price ranges as before.</p>
Emerging Animal Diseases	8,663.78	9,165.71	9,532.34	9,913.63	<p>10,310.17 Emerging animal diseases have been discussed and emphasized historically by the animal health extension specialist. This topic is now a formalized extension program. Significant disease issues occurred during 2001 including Foot and Mouth Disease, Bovine Spongiform Encephalopathy (Mad Cow Disease), Anthrax, and West Nile Encephalitis. The scope of this program is to educate producers about each disease, report on all epidemiological aspects the diseases, review the economic implications on US and Nevada agriculture, and to outline the planned responses by Cooperative Extension, the Nevada Department of Agriculture, and USDA-APHIS- Veterinary Services. The cornerstone to early detection and diagnosis is producer awareness and appropriate response when signs of disease are observed.</p>

<b>Title of Program</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
Extension Coffeeshop	25,705.68	27,187.09	28,274.57	29,405.56	30,581.78	Extension Coffee Shop is a subscribed e-mail list designed to link and provide an instant two-way communication network for livestock producers. The on-line system is a question-and-answer service that relays answers to one-on-one livestock production marketing question to 200 producer subscribers.
Horticulture Education	1,241.53	1,317.09	1,369.77	1,424.57	1,481.55	This program consists of general climate sensitive horticultural information delivered by a variety of educational methods. Landscape and garden plants and products are expensive. Residents who obtain and use local planting/growing information are more likely to be successful.
Improving Child Care Quality/Accessibility	20,941.77	23,356.14	24,290.39	25,262.00	26,272.48	Research indicates that the quality of early care and education programs for children have an impact on school readiness and success, peer relationships, and adult achievement. Previous studies have shown that the majority of programs are of poor quality. Nevada Cooperative Extension, HDFS, and the state as a whole have developed a number of initiatives to improve the quality and availability of early care and education in Nevada.
Inside Beef and Risk Management (Dissemination and Impact Phase)	14,875.96	15,729.96	16,359.15	17,013.52	17,694.06	The 66 participants attended a monthly marketing class in one of five Nevada communities and one of two Idaho communities. The basics of futures and options, how to determine break-even production costs, the USDA grading system, the IBP grid, and retained ownership was taught. Ranchers learned first hand how to implement risk management on their cattle.
Internal Parasite Evaluation Program	8,663.78	9,165.71	9,532.34	9,913.63	10,310.17	The goal of this program is to evaluate the existence of bovine, ovine, and equine sub clinical and clinical parasite infestations plus evaluation of preventive and treatment programs for cooperative extension faculty, individual veterinarians and producers.

<b>Title of Program</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
Lake Tahoe Environmental Education Coalition (LTEEC)	1,663.87	1,769.27	1,840.04	1,913.64	1,990.19	LTEEC aims to fill the important niche of coordinating outreach education to the general public or the “grass roots” citizens. The role of LTEEC in reaching out to the general public is to get environmental educators at Lake Tahoe working together in a mutually supportive collaboration to increase the overall impact of educational activities.
Living on the Land: Stewardship for Small Acreages	16,065.08	17,290.34	17,981.96	18,701.23	19,449.28	Small acreage landowners have a significant impact on the condition of soil, water, plants, and other natural resources through their cumulative effects. As the population increases, with more and more residents now “living on the land” who were formerly disconnected from the land, there is a huge demand for information and technical assistance to help them “do the right thing” for their wildlife, land, and water resources. Current efforts to address this audience in the western states have largely been fragmented, with varying success. Using the successful “Small Ranch Water Quality Program” from Nevada Cooperative Extension as a model, a team of professionals from eight western states have developed training materials and assistance in targeting and reaching this growing audience to help them become good stewards of the land. The curriculum consists of an instructor’s guide and fifteen PowerPoint lessons targeting goal setting and property inventory, soils, water, plants, and animals. Lesson plans, resource lists, hands-on activities, and evaluation materials are included.
Living with Fire	20,014.10	21,397.32	22,253.21	23,143.34	24,069.08	LWF is a comprehensive, multi-agency project aimed at teaching people how to live more safely in the high wildfire hazard environments of the eastern Sierra Front.
MAGIC	26,767.69	28,453.43	29,591.57	30,775.23	32,006.24	

<b>Title of Program</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
Marketing Alternatives of Cull Cows: A Case Study and Cattlemen's Update Program. (Dissemination and	3,718.99	3,932.49	4,089.79	4,253.38	4,423.52	Cull cows are often overlooked as an important source of income to the cow-calf enterprise. Depending upon the relationships between cull cow and calf prices, and the herd-culling rate, cull cow receipts generally account for 15-30 percent of income from the cow-calf enterprise. However, some producers give little attention to this source of income and ways of enhancing it. For many producers, cull cows are sold at the time they are culled from the herd. Much of this culling is done in the late fall soon after calves are weaned.
Parenting Support/Child Abuse and Neglect Prevention	10,470.89	11,678.07	12,145.19	12,631.00	13,136.24	Parents face many challenges in attempting to raise healthy, responsible, and competent children. Because of the demands for parenting education and support, many NCE faculty are engaged in various forms of parenting education with a multitude of delivery systems. In addition, Nevada has a high incidence of child abuse and neglect compared to other states. Because child maltreatment can have traumatic and long-lasting effects, NCE continues to promote programs to prevent abuse and neglect as well as to help people recognize and report suspected cases. My work with Area faculty and community agencies continued this year in parenting and child abuse prevention, with some new projects underway as well.
Prison Horticulture	9,724.28	10,113.25	10,517.78	10,938.49	11,376.03	Horticulture in Prisons in Southern Nevada trains inmates of two women's prisons (one medium/maximum security, one minimum security) using the Master Gardener Curriculum. It interacts with the job readiness program of the Department of Correction to aid participants in exploring horticultural careers.

Title of Program	2001	2002	2003	2004	2005 Statement of Progress
Program: Water Conservation in Urban Landscapes	9,071.00	9,579.51	9,962.69	10,361.19	<p>10,775.64 This educational program closely parallels our research programs in water conservation and the use of recycled and saline water for irrigation. Three educational activities were directed at water conservation educational programming in 2001:</p> <p>1. I am marketing Landscape Retrofit classes into rural areas and other arid states</p> <p>1995: I developed a seven -week, landscape design curriculum and taught homeowners how to:</p> <ul style="list-style-type: none"> <li>o create landscape designs that conserve water and energy</li> <li>o select appropriate plant materials</li> <li>o calculate potential water use from their landscape design and compare to turfgrass landscapes</li> </ul> <p>1997: I taught a Master Gardener how to teach the class using my curriculum.</p> <p>1999: I taught Landscape Retrofit to the Arizona Cooperative Extension Master Gardeners</p> <p>2000: I expanded Retrofit to five locations in Arizona and it was made a permanent class.</p> <p>2001: I tested the classes in Moapa for transferability to rural areas where 24 students enrolled; 20 students finished the class in Las Vegas</p> <p>2. Irrigating Landscapes With Recycled Water classes will graduate 12 students for 2001</p> <p>1997: We developed a course outline and curriculum for teaching poor quality water management.</p> <p>1997 – 2001: One seven-week class is taught per year and this year’s class will finish in January, 2002.</p> <p>3. Irrigation Management was taught to professionals and homeowners in a variety of methods</p> <p>2001: Irrigation management was taught through Fundamentals of Horticulture classes, seminars, newspaper articles, and at conferences. Lectures were accompanied by distribution of fact sheets and Power Point presentations represent methods of delivery.</p> <p>Instructor, January, 2001. Basics of Irrigation. Nevada Department of Transportation.</p> <p>Invited Speaker, February, 2001, Irrigation Fundamentals. Nevada Landscape Association Annual Conference.</p> <p>Invited Speaker, February, 2001, Basics of Drip Irrigation, Nevada Landscape Association Annual Conference.</p> <p>Instructor, Twice in 2001, Irrigation Unit, Fundamentals of Horticulture classes.</p>

<b>Title of Program</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
Tahoe Basin Noxious Weed Management	2,677.51	2,881.72	2,996.99	3,116.87	3,241.55	Noxious and invasive weed infestation has been documented in the Lake Tahoe basin, specifically <i>Lepidium latifolium</i> (tall whitetop) and <i>Centaurea maculosa</i> (spotted knapweed). Tall whitetop is a non-native weed from Eurasia that has invaded sensitive wetland and riparian sites in the western United States. The unchecked invasion of riparian areas along the Truckee River east of Reno raised concerns that similar areas at the lake could also be lost to tall whitetop, with resultant increases in erosion due to its non-fibrous root system and impairment of water quality. This program facilitates a coordinated, basin-wide approach to invasive weed management, involving volunteers in weed identification, mapping, and mechanical control, and training agency personnel in integrated weed management techniques. Over 60 sites infested with tall whitetop have been identified, mapped, and appropriate controls implemented, with a net decrease of 80% in infested acreage. A Tahoe Basin Weed Taskforce has been established to coordinate efforts by various governments and agencies.
Tall Whitetop Initiative	2,928.25	3,191.05	3,318.69	3,451.44	3,589.50	In 1999, the Nevada State Legislature asked University of Nevada Cooperative Extension to lead a two-year Tall Whitetop Initiative that would enhance public awareness and education and motivate people to report infestations and help control or eradicate the noxious and invasive weed.

<b>Title of Program</b>	<b>2001`</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
Teaching Environmental Horticulture Through Mass Media	9,071.00	9,579.51	9,962.69	10,361.19	10,775.64	<p>In 1995 I began writing weekly articles for the View section of the Review Journal, using science-based information and soliciting questions from the readers rather than use a "recipe driven" format. The goal of this program has been to teach readers "why and how" of desert horticulture and in so doing positively impact the environment and improve their quality of life.</p> <p>1995 -1999: I researched and published weekly articles answering questions derived from Master Gardener (MG) phone logs and published them with a distribution of over 200, 000 homes.</p> <p>2000: my articles used in Moapa newspaper through Cooperative Extension</p> <p>2001 my articles were sent via email for use in: newspapers/newsletters in: Moapa, Pahrump, Utah and Arizona through Cooperative Extension training nursery personnel at Plant World, Star and Ladybug nurseries web based publishing at Plant World Nurseries where they are archived MG t raining in Las Vegas and Pahrump</p>
The Home Landscaping/Backyard Conservation Working Group	16,638.70	17,692.69	18,400.40	19,136.41	19,901.87	: This is an interagency cooperative group and a sub-group of the Lake Tahoe Environmental Education Coalition (LTEEC). I founded this sub-group at the same time I founded LTEEC. There are five active agency partners in addition to Cooperative Extension. They are the Tahoe Regional Planning agency (TRPA), the USDA Natural Resources Conservation Service, the Nevada Tahoe Conservation District, the Tahoe Resource Conservation District (CA) and the Incline Village General Improvement District's Waste Not Program.
Tools of the Trade	3,730.44	3,879.65	4,034.84	4,196.23	4,364.08	This is a 3 hour marketing presentation designed to give non-profit managers tools to better promote their programs and efforts.

<b>Title of Program</b>	<b>2001`</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
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<b>Title of Program</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
University Center for Economic Development	40,448.48	43,668.73	45,415.48	47,232.10	49,121.38	The University Center for Economic Development is an extension outreach program that assists local and county economic development authorities and governments in understanding national, state and local economic trends, estimate potential impacts from outside changes, and assist in developing local economic development strategies. Activities of the University Center this year were to provide analysis for industrial targeting, estimate potential impacts of reallocation of surface waters and changes in public land policies, and potential development of local commercial, health and tourism sectors.
Urban Horticulture Education	11,191.31	11,638.96	12,104.52	12,588.70	13,092.25	I teach classes in water quality, urban ecosystem management, and wildfire to the general public and to Master Gardeners. I also teach via a weekly newspaper column. IPM classes provide information on appropriate safe pesticide use to improve water quality and watershed health, training volunteers to work in their
<b>Grand Total</b>	431,329.49	460,859.40	479,293.78	498,465.54	518,404.16	518,404.16

# Appendix "B" University of Nevada Cooperative Extension Integrated Activity

<b>Title of Program</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
4-H Impact Assessment: Life skills Learned and Management Goals (2001)	2,005.97	2,150.56	2,236.59	2,326.05	2,419.09	A research program to assess the impacts of 4-H on life skills learned and management goals.
4-H Youth Development Evaluation & Training	1,934.87	2,055.16	2,137.37	2,222.86	2,311.78	This is a youth development training program offered by a team of Extension faculty to all interested faculty, staff and collaborators. In addition, a team of faculty have been involved with an evaluation of 4-H programs in each interested county via surveys of leaders and parents.
Agronomics	18,026.05	19,390.59	20,166.22	20,972.87	21,811.78	The University of Nevada has not provided agronomic expertise related to alfalfa production (Nevada's # 1 cash crop) for a number of years. While alfalfa research from other geographical regions can sometimes be replicated under Nevada conditions, there is an identified need to carryout separate and independent educational and research programs that address Pershing County's unique climatic and soil conditions. Therefore, based upon the identified needs of Pershing County alfalfa producers, a major portion of my educational programming efforts involves alfalfa hay and seed research and demonstration projects.
Arsenic in private drinking water supplies in Churchill County, Nevada	2,984.54	3,318.42	3,451.16	3,589.21	3,732.78	Provides sampling information and technical assistance through the Nevada GOLD program that is part of University of Nevada Cooperative Extension's Churchill County office.

<b>Title of Program</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
Beef Cattle Management by Computer Simulation	3,975.41	4,220.23	4,389.04	4,564.60	4,747.18	: Cattle producers have many options open to them in there management plans. It is however, very costly to implement a plan and then find that it doesn't work. A series of management simulation software has been developed (and more in development) to test management plans before implementation on individual ranches. This allows managers to make more informed decisions and reduce financial risk
Beef Quality Assurance (Dissemination Phase)	9,857.56	10,423.47	10,840.40	11,274.02	11,724.98	I taught over 100 Nevada Cattlemen and level 1 Nevada Beef Quality Assurance certified them at the Nevada Cattlemen's Association annual meeting and Cattlemen's College program held in Elko and at three statewide BQA programs held in the Nevada communities of Gardnerville, Orovada and Elko.
Calcium: It's Not Just Milk!	9,308.10	10,002.17	10,402.26	10,818.35	11,251.09	The goal of this program is to increase consumption of calcium-rich foods among low-income middle school children. It includes several components: 1) a media campaign to increase awareness of the variety of tasty calcium-rich foods available to teens and the importance of consuming such foods, 2) a science curriculum related to calcium and osteoporosis, and 3) school events and displays that reinforce the program message.
Cattlemen's Update	7,176.32	7,592.08	7,895.76	8,211.59	8,540.05	Cattlemen's Update is an annual educational program offered by the University of Nevada for beef cattle producers. Program topics speak to current beef cattle production management issues in the Great Basin region affecting profitability and product quality. Subject matter selection is based on a needs assessment of Nevada beef cattle producers and on concerns and trends expressed by the leaders of the beef cattle industry in the United States.

<b>Title of Program</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
Child Abuse Recognition and Reporting	4,024.23	4,249.55	4,419.53	4,596.31	4,780.17	Nevada Cooperative Extension is know for its program to help people report suspected cases of child abuse and neglect. Professionals train youth staff, volunteers, administrators, child caregivers, crisis line staffers and firefighters. They have published a curriculum and self-study guide (available in PDF form on the UNCE web site and are developing a web-based, interactive program.
Child Care Nevada	4,024.23	4,249.55	4,419.53	4,596.31	4,780.17	Nevada ranks 47th in the nation in the quality of child care and Extension would like to improve this figure. People who work with children, if properly trained, can help put a halt to child abuse. Specialists have educated more than 6,000 caregivers. They have received three grants to 1) develop a child care facility rating system, 2) develop a self-study guides, and 3) to develop, present and evaluation 3 hour workshops annually for 13 years.
Child Care Provider Training	7,085.10	7,625.90	7,930.94	8,248.18	8,578.10	Today, more American children are being cared for by paid providers than by relatives. The predominance of non-relative care in the last decade has alerted consumers, governments, and the research community to the possibly damaging effects of poor quality care on children's development (Scarr, 1998). National, state and local needs assessments have shown that Nevada ranks very low in the nation in providing quality childcare (Young Children, Journal of the National Association for the Education of Young Children, May 2000 and Working Women, 1999). In Nevada, childcare providers must receive 12 hours per year of educational childcare training.
Coordinated Management of Noxious Weeds in the Walker River Basin and Carson River (1999 to present)	4,011.95	4,301.13	4,473.17	4,652.10	4,838.18	A research and education program to investigate the infestation level of Tall Whitetop in the Walker River Basin, educate landowners about this wee species, and form partnerships to abate this weed basin-wide.

<b>Title of Program</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
COPIN (Childhood Obesity Prevention in NV)	27,474.68	29,345.87	30,519.70	31,740.49	33,010.11	Given the multi-dimensional causality of childhood obesity, this "program" is actually composed of a group of efforts linked together under the COPIN umbrella. No one program can achieve the overarching goal to reduce the incidence of childhood obesity. Efforts focus on adults who either directly feed children (e.g. parents and childcare providers) or those who work with these adults (e.g. health professionals).
CYFERnet Youth Editor	7,739.47	8,220.65	8,549.48	8,891.46	9,247.11	CYFERnet is a national network of Land Grant university faculty and county Extension educators working to support community-based educational programs for children, youth, parents and families. Partners in CYFERnet include Family Consumer Science; 4-H Youth Development; Communications and Information Technology programs and staff at county, state, and federal levels of the Cooperative Extension System. CYFERnet brings together the best children, youth and family resources of all the public land-grant universities in the country and makes them available electronically through the CYFERnet website. As the appointed Editor for the Youth and Teen component, I provide leadership to the Youth Editorial Board, as well as oversight of the structure and content of the youth component. This includes the solicitation, review, and posting of materials on the CYFERnet site.
Diabetes Risk Reduction Campaign	1,861.62	2,000.43	2,080.45	2,163.67	2,250.22	Social marketing strategies are being used to increase awareness of the seriousness of diabetes among Latino residents of one zip code in Clark County, NV. The specific goal is to decrease the impact of the disease on this vulnerable group by encouraging appropriate self-care (e.g., maintaining safe blood glucose levels). Members of the target audience are reached through print and broadcast media. The program "message" was formulated using results of a random telephone survey of residents in the targeted zip code, as well as focus group findings with Spanish-speaking Latino adults. The campaign will end in Spring, 2002. Impact will be evaluated by recontacting the participants of the original telephone survey to assess changes in knowledge and awareness.

<b>Title of Program</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
Eastern Nevada Landscape Coalition	7,307.14	7,728.12	8,037.25	8,358.74	8,693.09	The Eastern Nevada Landscape Coalition has been organized as a diverse, representative group to work with the BLM and other agencies on the Eastern Nevada Landscape Restoration Project. I currently serve as chair of the research and education committee, with Bob Wilson providing leadership to the education sub-committee.
Economics of Weed Control (1999 to present)	802.39	860.23	894.63	930.42	967.64	A research and education program which examines and illustrates the costs and benefits of controlling noxious weeds.
Extension Coffeeshop	9,857.56	10,423.47	10,840.40	11,274.02	11,724.98	Extension Coffee Shop is a subscribed e-mail list designed to link and provide an instant two-way communication network for livestock producers. The online system is a question-and-answer service that relays answers to one-on-one livestock production marketing question to 200 producer subscribers.

Title of Program	2001	2002	2003	2004	2005	Statement of Progress
Facilitation and Process for Community Input into Wilderness Area Designation	2,230.80	9,012.43	9,372.93	9,747.85	10,137.76	County Commissioners from Lincoln, Nye and White Pine Counties approached Cooperative Extension to play a role as facilitator to plan for wilderness designation. Commissioners were concerned that the Wilderness Study Areas within the Ely District of the BLM (which is located in all three counties) were ready for review and proposed legislation as Wilderness Areas. The Ely BLM District finished their final review of the Study Areas and have made recommendations as to which areas should or should not be designated as Wilderness, where boundaries should be changed to allow for proper management, and provided rationale for these recommendations. The county commissioners wanted local citizens to discuss these areas and give input pertaining to their use and impacts to the communities. Cooperative Extension was asked to facilitate the discussions and help the citizens of these counties to create final boundaries and criteria for Wilderness Areas to be drafted into national legislation as designated Wilderness. My role in this effort has been at the request of the County Commissioners due to my past experience in such issues in Wyoming. I have aided our rural Extension Educators in process formation and facilitation techniques and skills. I have been the contact for this process in Clark County with environmental organizations, explaining the intent and process, and soliciting participation. I have presented an educational presentation on the Wilderness Act, its history, status and process of designation to our Extension Educators and the local citizens in Ely.
Family Literacy	13,877.08	15,476.96	16,096.04	16,739.88	17,409.48	Previous research has shown that a number of Nevada's children start school not read to learn. Research indicates that when children are not read to and exposed to book-related language learning before they enter school, the children are more apt to have difficulty learning to read and tend to fall behind in other subjects. Numerous efforts within Extension and through other agencies are aimed at improving family literacy and children's school readiness.
Food for Health and Soul	9,308.10	10,002.17	10,402.26	10,818.35	11,251.09	The purpose of this program is to decrease risk for chronic disease by encouraging African-American families to modify their food preparation practices by decreasing fat, saturated fat, and sodium; and increasing fiber-rich ingredients. The program utilizes a peer-education model and is taught primarily through African-American faith communities.

<b>Title of Program</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
Grandparents Raising Grandchildren	1,207.27	1,274.86	1,325.86	1,378.89	1,434.05	Nevada Cooperative Extension is know for its program to help people report suspected cases of child abuse and neglect. Professionals train youth staff, volunteers, administrators, child caregivers, crisis line staffers and firefighters. They have published a curriculum and self-study guide (available in PDF form on the UNCE web site and are developing a web-based, interactive program.
Human Services	7,510.86	8,079.41	8,402.59	8,738.69	9,088.24	A 1998-99-community needs assessment (Fact Sheet 99-29) identified human services as a program priority. Therefore, I am increasing my collaborative efforts with Area and State Specialists to address issues related to 4-H, youth development, and work force preparation.
Identification, Biology, Ecology, Impacts, and Control of Invasive Terrestrial Plant Species	2,974.40	12,016.58	12,497.24	12,997.13	13,517.02	Southern Nevada is experiencing an increase in the number and rate of spread of numerous plant species that are considered foreign and invasive. These weeds are coming to the area from other states and countries. This situation has the potential to create a variety of problems for the area including: 1) tremendous costs associated with mandated control; 2) loss of property values; 3) changes in physical and biological processes to ecosystems and watersheds; 4) habitat destruction; 5) loss of biological diversity; 6) loss of aesthetics, and 7) loss of recreational opportunities. Although invasions of some of these species are rather new and relatively easy to control, there exist many unanswered questions as to how and why these species are gaining a foothold in the southern Great Basin and Mojave Desert. I made numerous field trips to various sites in the Southern Area to review the extent of the weed situation. I reviewed the research that is being conducted in the area by UNR, UNLV, U.S. Geological Survey (USGS), and Bureau of Land Management (BLM) to gain an understanding of our level of knowledge of specific species, their ecology, impacts and control. There is a need to educate the public and provide research that aids in our understanding of these plants for future prevention and control.



<b>Title of Program</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
Inside Beef and Risk Management (Dissemination and Impact Phase)	9,857.56	10,423.47	10,840.40	11,274.02	11,724.98	The 66 participants attended a monthly marketing class in one of five Nevada communities and one of two Idaho communities. The basics of futures and options, how to determine break-even production costs, the USDA grading system, the IBP grid, and retained ownership was taught. Ranchers learned first hand how to implement risk management on their cattle.
Internal Parasite Evaluation Program	5,741.06	6,073.66	6,316.61	6,569.27	6,832.04	The goal of this program is to evaluate the existence of bovine, ovine, and equine sub clinical and clinical parasite infestations plus evaluation of preventive and treatment programs for cooperative extension faculty, individual veterinarians and producers.
Invasive Weed Education	10,086.64	10,554.46	10,976.64	11,415.70	11,872.33	Teach about the environmental impact of invasive weeds and work toward solutions to the problem
Living with Fire	13,262.35	14,178.95	14,746.11	15,335.95	15,949.39	LWF is a comprehensive, multi-agency project aimed at teaching people how to live more safely in the high wildfire hazard environments of the eastern Sierra

Title of Program	2001	2002	2003	2004	2005	Statement of Progress
Local Planning Efforts for Threatened and Endangered Species Conservation – Sage Grouse ( <i>Centrocercus</i> )	2,230.80	9,012.43	9,372.93	9,747.85	10,137.76	<p>Several efforts have begun in southern Nevada to address plant and animal species of concern. Two Habitat Conservation Plans (HCP) with the U.S. Fish and Wildlife Service (USFWS) are underway in Clark and Lincoln Counties and have created opportunities for local communities to address conservation of various plant, bird, and fish species that are threatened or endangered. These plans are an effort to protect species of concern through habitat mitigation efforts.</p> <p>My participation in these efforts has been technical in nature, providing assistance to planning groups and committees regarding ecological considerations for species and their habitats. The town of Beatty also has been addressing conservation efforts for the Amargosa Toad with habitat improvement and economic development as goals. I participated in meetings and presented at a workshop in Beatty, providing technical expertise in local habitat planning efforts. Additionally, the State of Nevada, through the Governor's priorities, began a statewide conservation planning effort for the Sage Grouse. This effort delineated six planning areas in Nevada and California to create opportunities for Nevadans to participate in habitat and population planning to increase bird populations and possibly prevent listing under the Endangered Species Act. Cooperative Extension was asked statewide to assist these planning efforts with technical, educational and facilitation inputs. Although the only county in Nevada that Sage Grouse do not occur is Clark County, my contacts and partnerships here are extremely relevant and political in nature for the entire state. My participation in this effort for Lincoln County includes the southern-most part of the birds' range and is part of the planning area for White Pine County. I am using my technical expertise in habitat planning based on previous work with this species and similar upland game bird species in Colorado, Wyoming and Idaho. Additionally, my role will also be as facilitator for conservation planning meetings in the area.</p>
Managing Natural Resource Disputes and Public Issues Education	4,011.95	4,301.13	4,473.17	4,652.10	4,838.18	<p>A research and education program designed to educate lay audiences about natural resource disputes and how to constructively manage such disputes.</p>
Middle-level Retention Alternative (MLRA)	8,005.25	8,593.59	8,937.33	9,294.82	9,666.62	<p>The Middle-level Retention Alternative (MLRA) program is designed to establish an alternative program which assists students who are "in risk" of eighth grade retention.</p>

<b>Title of Program</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
Moving Ahead: Preparing the Youth Development Professional	2,012.12	2,124.77	2,209.77	2,298.16	2,390.08	In 2000 the statewide UNCE Youth Development Training Team, Molly Lathum, Eric Killian, Marilyn Smith, Jill Tingey and I attended a 40-hour training sponsored by the USDA and the United States of America Department of the Army. In 2001, the UNCE Youth Development Training Team conducted a needs assessment with UNCE Extension Educators regarding presentation of the training for UNCE Youth Development Professionals. The result was that our team of five prepared, presented, and evaluated a three-day training for UNCE Youth Development Professionals. The workshops were offered in Winnemucca (N=35), Las Vegas (N=20) and Reno (N=50). Evaluation of the training indicated that participants made a significant gain in knowledge on all 16 items of the evaluation survey.
Multimedia Interactive Curriculum	8,005.25	8,593.59	8,937.33	9,294.82	9,666.62	This program entails developing interactive multimedia curriculum for different populations.
Nevada Beef Quality Assurance	5,741.06	6,073.66	6,316.61	6,569.27	6,832.04	The Goal of BQA is to ensure the consumer that all cattle shipped from a beef production unit are healthy, wholesome, source verified and meet the food safety standards established by government regulations. In addition best management practices are recommended to improve the health of beef cattle and to add value to the end product.
Parenting from Prison	16,096.92	16,998.20	17,678.13	18,385.25	19,120.66	Parenting From Prison is a program designed to help incarcerated mothers learn parenting skills that will help them do a good job of parenting while they are in prison and as they return to full-time parenting upon release. Evaluation shows they are learning skills to improve their parenting skills.

Title of Program	2001	2002	2003	2004	2005	Statement of Progress
Parenting Issues at Ridge House	8,048.46	8,499.10	8,839.06	9,192.63	9,560.33	Extension has developed, presented and evaluated a program for residents at Ridge House, a transitional shelter for recently incarcerated women and men with substance abuse problems. The participants learn about child development, guidance techniques, communication skills, reunification and to deal with the impact of incarceration and substance abuse on their children and family.
Parenting Support/Child Abuse and Neglect Prevention	6,938.54	7,738.48	8,048.02	8,369.94	8,704.74	Parents face many challenges in attempting to raise healthy, responsible, and competent children. Because of the demands for parenting education and support, many NCE faculty are engaged in various forms of parenting education with a multitude of delivery systems. In addition, Nevada has a high incidence of child abuse and neglect compared to other states. Because child maltreatment can have traumatic and long-lasting effects, NCE continues to promote programs to prevent abuse and neglect as well as to help people recognize and report suspected cases. My work with Area faculty and community agencies continued this year in parenting and child abuse prevention, with some new projects underway as well.

<b>Title of Program</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
Partners in Parenting Program	10,627.65	11,438.86	11,896.41	12,372.27	12,867.16	<p>Evaluation reports and case studies of interventions for at-risk populations suggest that a variety of positive short term and long term outcomes, with implications for cost savings, can be achieved through early intervention home visiting for children and families” (Best Practice Briefs, Michigan State University, 2000). Continued research has shown that poverty, inadequate health care, single and teenaged parents, and substance abuse are all correlated with the problems of child abuse and neglect. Home visiting and group parenting classes promote positive parenting practices and improved child health and development, thereby preventing child abuse and other poor childhood outcomes.</p> <p>Partners in Parenting Programming (PIPP), formerly titled Healthy Families Nevada (HFN), curriculum is modeled after the Healthy Families America initiative to establish an intensive, voluntary home-visiting system for new, first time parents to help their children get off to a healthy start. PIPP promotes positive parenting and child health and development, thereby preventing child abuse and other poor childhood outcomes. The 23 basic parenting classes may be presented in one-on-one home visits or in group classes. Although needs assessments (see below) verified that PIPP was relevant and addressed a community need by being the only intensive, long-term, on-going parenting outreach program in Southern Nevada, the decision was made that the program needed to reach more people through group classes, thereby phasing out the home-visiting section of PIPP. Home visits ceased when the evaluation funding</p>
Post Wildland Fire Management Systems	1,987.71	2,110.11	2,194.52	2,282.30	2,373.59	<p>Unprecedented wildland fires have had major impacts on vegetation systems throughout Northeastern Nevada. This project is a research/extension project for management of public lands after fire. There are several important problems investigated by this project, principally timing and management of grazing after a fire and also the effect of seeding and not seeding, in a variety of ecological</p>
Precision Farming and Water Stewardship (2000 to present)	4,011.95	4,301.13	4,473.17	4,652.10	4,838.18	<p>A research and education program designed to examine the benefits and costs of precision farming in proactively managing water quality on farms and ranches.</p>

<b>Title of Program</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
Precision Irrigation of Alfalfa	1,305.43	1,357.64	1,411.95	1,468.43	1,527.16	This is a research project that is focused on the collection of weather and soil data in established alfalfa. By correlation of this data to the irrigation program and yield it is hoped that more efficient irrigation practices can be developed
Program Development Research Education for Organizations (PDREO)	8,005.25	8,593.59	8,937.33	9,294.82	9,666.62	This program involves a two-pronged approach to educating the social service sector about program development research (PDR), incorporating both formal and informal educational methods. The first part of the program involves educational workshops and discussion sessions. The second part of the program involves intensively working with a particular organization or program to educate the organization or program about program development research.
Program Development Research Education for Organizations: Clark County Youth Service Assessment System	1,934.87	2,055.16	2,137.37	2,222.86	2,311.78	This program is part of a larger project, directed by Randy Brown, to educate the social service sector about program development research (PDR), incorporating both formal and informal educational methods. Specifically, this component is designed to increase Clark County Youth Services' ability to design and apply program development research (needs assessment and evaluation systems and methods). The project is designed to improve the agencies capacity to assess and evaluate current and prospective services. In addition, a goal is to increase the agency's understanding of youth development and effective knowledge of working with youth. In addition to these programming activities, we have used the data for research outcomes.
Rangeland Health	6,641.57	6,701.55	6,969.61	7,248.40	7,538.33	My rangeland health program focused on noxious weed management and revegetation. A total of 190 adults and 840 youth were taught via slide presentations, field tours, demonstration projects, and hands-on activities. The FFA student whose project biological weed control project I directed won a third place national award and received an \$8,000 university scholarship

<b>Title of Program</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
Sustainable Biodiversity/Multiple Use of Rangelands	9,962.35	10,052.33	10,454.42	10,872.60	11,307.50	The sustainable biodiversity/multiple use of rangelands program emphasized a balance between wildlife habitat/diversity and livestock forage production, and proper functioning condition of riparian areas. A total of 360 people were taught during 20 instructional presentations to diverse audiences comprised of land users, resource professionals, and youth. I developed, directed, and co-taught a "train-the-trainer" workshop for UNCE facilitators of statewide local sage grouse conservation planning groups. I also coordinated, facilitated, and co-taught 2 "train-the-trainer" 3-day workshops in order to establish a new statewide 4-H Wildlife Habitat Evaluation Program.
Team Nutrition	1,861.62	2,000.43	2,080.45	2,163.67	2,250.22	Team Nutrition is a USDA initiative developed to help schools implement the School Meals Initiative for Healthy Children. The mission of Team Nutrition is as follows: "To improve the health and education of children by creating innovative partnerships that promote food choices for a healthful diet through media, schools, families and communities." As director of the UNCE Team Nutrition Program, my goals has been to provide training and educational resources, and foster community partnerships that would result in sustainable nutrition education programs/efforts. Currently, there are three on-going efforts that I am involved with. These include, the Team Nutrition Bulletin, the Team Nutrition Partners Program, and the Team Nutrition Challenge. Each is briefly described below.
University Center for Economic Development	26,803.21	28,937.11	30,094.60	31,298.38	32,550.31	The University Center for Economic Development is an extension outreach program that assists local and county economic development authorities and governments in understanding national, state and local economic trends, estimate potential impacts from outside changes, and assist in developing local economic development strategies. Activities of the University Center this year were to provide analysis for industrial targeting, estimate potential impacts of reallocation of surface waters and changes in public land policies, and potential development of local commercial, health and tourism sectors.

<b>Title of Program</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Statement of Progress</b>
Using Sheep for Controlling Cheatgrass and Planting Perennial Plant Species on Degraded Rangelands	1,305.43	1,357.64	1,411.95	1,468.43	1,527.16	This is a research project exploring the use of late fall and early grazing of sheep to simultaneously remove germinate cheatgrass and enhance the germination of seeded perennial plant species. Additionally a variety of seed mixtures and cultural practices are being utilized to maximize germination and survivability of desired species.
Walker River Basin Advisory Committee Project (1998 to present)	4,011.95	4,301.13	4,473.17	4,652.10	4,838.18	A research and education program designed to manage the dispute involving water quality and allocation issues in the Walker River Basin.
Walker River Water Bank Project (1997 to present)	4,011.95	4,301.13	4,473.17	4,652.10	4,838.18	A research and education program designed to determine the feasibility of water banking as a tool to address the water dispute in the Walker River Basin
Wastewater Management	18,942.97	19,958.09	20,756.41	21,586.67	22,450.14	The wastewater management class has been developed to transfer current information and knowledge on the safe use of poor quality waters for irrigation purposes to potential end users. The class presents information on 1) The current water balance for the Las Vegas Valley, 2) How sewage effluent is treated, 3) Health related aspects to using reuse water, 4) Site visit to the wastewater treatment plant and a visit to the University of Nevada's foliar damage research site, 5) A discussion of the good bad and ugly of using reuse water, 6) County, state and federal regulations and 7) The economics of using poor quality water. The class is geared toward urban landscape managers (golf courses, schools, parks, hotels and resorts). An assessment of student knowledge pertaining to reuse water prior to the class is obtained as is an assessment of knowledge gained after the class has been completed (questionnaires).
<b>Grand Total</b>	<b>Grand Total</b>	<b>Grand Total</b>	<b>Grand Total</b>	<b>Grand Total</b>	<b>Grand Total</b>	
<b>Grand Total</b>	368,017.55	414,651.37	431,237.42	448,486.92	466,426.40	





**ATTACHMENT TO FORM CSREES-PLAN(2/01)  
INTEGRATED ACTIVITIES (HATCH ACT FUNDS)**

<b>TITLE OF PLANNED PROGRAM/ACTIVITY</b>	<b>FY 2001</b>	<b>FY 2002</b>	<b>FY 2003</b>	<b>FY 2004</b>	<b>FY 2005</b>
Freeze damage and protection of horticultural species	33,583	33,583	25,187		
Genomic studies in plants, insects, infectious pathogens and Vertebrates	78,532	78,532	58,899		
Improving quality of child care in Nevada	19,971	14,978	0		
Use of school environment to reduce obesity risk among middle school students in Nevada	18,005	13,504	0		
Rural economic development: Alternatives in the new competitive Environment	17,364	13,023	0		
Water conservation, competition and quality in western irrigated Agriculture	45,340	34,005	0		
Rural communities and public lands in the west: Impacts and Alternatives	17,364	17,364	13,023		
Sediment trapping and channel changes by post drought riparian Vegetation	23,543	17,657	0		
Modeling the effects of environmental stresses on oocysts of cryptosporidiumn parvum	28,675	28,675	21,506		
Field scale utilization of the shallow saline aquifer in Clark County	22,455	16,841	0		
Rural communities and public lands in the West: Impacts and Alternatives	15,195	11,396	0		
Improving nitrogen utilization in alfalfa hay by ruminants	21,612	21,612	16,209		
Modifying milk fat composition for enhanced manufacturing qualities	18,911	18,911	14,183		
Understanding & enhancing intergenerational literacy in ESL families	0	15,000	15,000	11,250	
Modifying milk fat composition for enhanced manufacturing qualities	17,025	17,025	12,769		
Additional projects to be approved in years 2002-2005			125,000	300,000	325,000
<b>TOTALS</b>	<b>377,575</b>	<b>352,107</b>	<b>301,777</b>	<b>311,250</b>	<b>325,000</b>