

FY 2020 Annual Report of Accomplishments and Results

Nevada

University of Nevada, Reno Cooperative Extension

University of Nevada, Reno Agricultural Experiment Station

I. Report Overview

The NIFA reviewer will refer to the executive summary submitted in your FY 2020 Plan of Work located in the Institutional Profile. Use this space to provide updates if needed.

1. Executive Summary (Optional)

The University of Nevada, Reno Cooperative Extension (herein referred to as “Extension”) and Agricultural Experiment Station (herein referred to as “Experiment Station”) are reporting against the 2020-2024 Plan of Work.

The critical issues: 1) Sustainable Dryland Agriculture; 2) Natural and Environmental Resources; 3) Horticulture and Food Systems; 4) Health, Nutrition and Food Safety; 5) Community and Economic Development; and 6) Children Youth and Families.

The rationale for these critical issues is as follows:

Sustainable dryland agriculture is the application of plant and animal production practices in dry areas of the world where lack of moisture limits crop production. Nevada is the driest state in the nation. Growing a strong agriculture economy in the driest state requires research and extension programs addressing topics such as pest management, efficient irrigation, sustainable range management, alternative crops for high-desert areas, agricultural entrepreneurship, business and financial management, and risk management for producers.

Issues that impact Nevada’s **natural and environmental resources** include drought, floods, watershed and riparian management, wildfires, invasive species, noxious weeds, and conservation wildlife and their associated habitats. Protection and management of these resources is necessary to the economic and ecological well-being of the state.

With respect to **horticulture and food systems**, there is a growing interest in locally grown food. As such, research and science-based education for growing in Nevada’s climate and soils is needed for successful backyard gardens and urban farms to grow produce locally and alleviate the impact of food deserts in Nevada. This will help improve food security and contribute to economic development.

Improving the **health** of all Nevadans and making available a safe and nutritious source of food are critical issues. A priority of the state is reducing the risks and behaviors that contribute to chronic disease with an emphasis on decreasing obesity through increased physical activity and the promotion of healthy diets. Contributing to this problem, over 12% of households in Nevada are food insecure, where access to healthy food is limited or uncertain.

Nevada is the seventh largest state in the country in terms of land mass and one of the least densely populated states. The culture and economics of rural Nevada are vastly different from that of the two metropolitan areas – Clark and Washoe counties. Clark County alone represents over 73 percent of the state’s total population and approximately 70 percent of total business licensees. As such, improving the **economic and community development** of rural areas as well as business development in urban areas are strategic priorities in Nevada.

Nevada ranks 46th among the 50 states for children’s well-being. Issues in the state affecting **children, youth, and families** include early literacy, science and math proficiency, college readiness, healthy child and adolescent development, and domestic violence. Children need safe environments for optimal social, emotional, physical, and cognitive development – inclusive of the family, child care facility, and school setting.

Nevada’s Extension programs directly impacted the lives of over 481,810 youth and adults. Indirect methods were designed to reach every Nevadan. Highlights of successful projects that cut across these critical issues include:

- Native Waters on Arid Lands enhanced climate resilience of agriculture water resources on reservation lands.
- Nevada Risk Management Education increased ranchers and farmers knowledge about agricultural risks, profitability and sustainability, and access to available insurance programs.
- Agriculture: Living Beyond the Pandemic is a short-term program offered to producers and interested individuals that provided insight into what was happening in agricultural sectors during the pandemic, and solutions for longevity and sustainability after the pandemic.
- The Great Basin Research and Extension Center was established to serve as a model sustainable dryland agriculture nationally and internationally and address the related issues of sustainable grazing management of dryland rangelands, livestock, crop production under water-limited environments, and alternative water and irrigation strategies for crop production.
- Addressing Human Health Impacts from Emerging Contaminants in Reclaimed Water to Enhance its Use for Urban and Peri-Urban Agriculture improved knowledge, skills and capacity to practice sustainable agriculture and water management to enhance the nation’s food security and water resiliency.
- Collectively, Rangeland Resources and Natural Resources Education, Sagebrush Cache Project, and Native Plant Materials in Nevada, improved rangeland and natural resource management, increased use of native plants for landscaping and in rangeland restoration projects, and developed effective sagebrush restoration tools, protocols, and recommendations.

- Living with Drought improved knowledge of drought, monitoring, and planning for drought and its impacts.
- Living with Fire helped residents prepare for wildfire and reduced wildfire threat to homes and communities.
- Consumer horticulture programs, such as Master Gardener and Grow Your Own Nevada, increased residents' knowledge and skills related to home horticulture throughout the state to produce more locally grown foods.
- Commercial Landscape Horticulture improved the knowledge and skills of entry level landscape workers, increased use of water efficient landscaping, and provided certification to nursery workers and landscapers.
- Integrated Pest Management increased awareness, understanding, and adoption of integrated pest management and pesticide safety principles by private citizens, Master Gardeners, and Green Industry professionals.
- Nevada Radon Education increased knowledge and testing of radon – a cancer causing gas – among residential and commercial homeowners, residents, real estate agents, and builders, led to mitigation efforts, and increased the number of homes built radon resistant.
- Through the Healthy Kids, Healthy Start and Health Kids, Healthy Schools multi-level approaches preschool and elementary school children's knowledge about healthy eating improved, consumption of fruits and vegetable increased, and physical fitness and activity improved. Additionally, early childcare centers and schools adopted new or improved practices, professional's and educator's knowledge and skills improved, and the systems and policies supporting children's healthy behaviors for obesity prevention were positively affected.
- Targeted senior programming, such as Healthy Aging, increased strength, coordination, balance, healthy food consumption, and food resource management among seniors improving mortality and independent living.
- Expanded Food and Nutrition Education Program (EFNEP) improved diet quality, physical activity, and food security within insecure food populations to reduce the risk of negative physical and mental health problems among adults.
- Nevada Economic Assessment Project provided county, state, and federal agencies, and their partners, with quantitative and qualitative baseline data and analyses to better understand each county's demographic, social, economic, fiscal, and environmental characteristics. Data is used for land use and project planning, grant writing, and overall policy assessment.
- Business development classes taught small business owners about fundamental business concepts and helped small businesses develop strong relationships with resource partners and remain resilient during the pandemic.

- Collectively, parenting programs, such as Let's Discover STEM, Little Books and Little Cooks and Family Storyteller, targeting preschool and early elementary school children and families equipped families with the confidence and skills to support early literacy, school readiness, and STEM education, as well as increased children's interest and emerging STEM skills, literacy, and school readiness.
- Nevada 4-H Youth Development worked with over 100 different organizations/agencies to deliver high-quality youth development programs to over 10% of Nevada's youth. 4-H offered club-based, school-based, afterschool-based, camp-based, special interest-based, and video/web-based programming. Youth thrived and reported improved life skills development and academic achievement and motivation that support a successful transition to adulthood.
- Workforce Preparedness for Early Childhood professionals improved workforce skills among professionals and center directors, provided certificate programs, successfully prepared graduates for the Child Development Associate credential, and improved the quality of care in Nevada's early child care settings.
- The Workforce Development program for teens and adults developed critical and transferable soft skills to help individuals succeed in work, such as communication, decision making, leadership, and critical thinking. Participants learned how to fill out a job application, write a resume, interview, and select proper work attire. Participants also learned job readiness skills as well as career awareness and exploration to build confidence to pursue STEM careers.

This past year, Nevada Agricultural Experiment Station (referred to as "Experiment Station" throughout this report) contribution to the NIFA 2020 Annual Report will focus on select programs that reflect the unique benefits to a diversity of clientele and stakeholders in Nevada.

This past year, the Experiment Station formula-funds grant program included Hatch, Multi-State, McIntyre-Stennis, and Animal Health funding opportunities, driven by peer and stakeholder review, and embraces the Federal-State partnership directed by the Hatch Act and subsequent Farm Bill provisions.

One of Experiment Station's state performance metrics is external funds leveraged per dollar of formula funds funding. In 2020, \$2.01M in federal-state appropriations were leveraged by faculty to generate \$5.8M in external fund (a return of \$2.84 for every \$1 invested). Our faculty published 88 peer-review journal articles, trained 115 graduate and 135 undergraduate students, gave 111 presentations, and filed for 2 patents.

Highlights of successful projects that cut across our planned programs include:

Sustainable Dryland Agriculture

- Identification of molecular mechanisms for salinity and boron tolerance in tomato grown in Nevada.

- Optimizing quinoa grown under different heat wave intensities.
- Developing stress-tolerant sorghum for Northern Nevada's climate.
- Advancing precision agricultural production methods for grain sorghum yield and quality using variable-rate irrigation.
- Understanding the role of a naturally occurring pesticide found in carrots and improving commercial crops resistance to fungal infections like stem rot & blossom blight
- Developed numerous protocols of detecting mercury and its biological available form (methylmercury) in agricultural crops (rice) and forest (aspen & pine trees).
- A series of 25 videos were created to facilitate wine grape growers in Nevada's semi-arid climate.
- Improving Teff's ability to withstand Nevada's environment to be used as a forage, fodder, and highly nutritious, low-gluten grain crop
- Research to lower stress hormones in cattle at the time of slaughter.
- Understanding the consequences of agriculture intensification in livestock's water supply and how much plastics and other plasticizers are actually present.
- Testing virtual fencing for increased livestock management flexibility on Nevada's open rangeland.

Natural and Environmental Resources

- Characterizing the shifting role of wildfire in dryland ecosystem and watershed processes.
- Identifying optimal seedling traits for high-elevation Great Basin pine trees (bristlecone, limber & whitebark).
- To support forest management and conservation activities, our team has/is identifying aspen populations under active decline and those that may be particularly susceptible to climate change.
- Identify thresholds of Nevada alpine forests' tolerance to climate, disturbance, and extended drought.
- Developing a greater understanding of the consequences of salinization in Nevada's rivers while improving the ability of managers to remediate our rivers.
- Pheromone research to improved bark beetle management.
- Using tree-ring data and satellite imagery to reconstruct historical dryland carbon storage at local, regional and continent scales.
- Conserving soil carbon and sage grouse habitat by assessing the impact of degradation and restoration in Great Basin meadows.
- Cultivating mule deer mountain mahogany habitat after removal of pinyon pine and juniper.
- Identification of migration corridors and movement patterns of American Pronghorn populations identified as top priorities for Nevada.

- Investigating the impact of methylmercury on waterfowl population with implications for human health and water management in arid environments.
- Developing decision support tools for management of wild horses on public lands in the arid west using ecological assessments.

Health, nutrition and food safety

- Micro-RNA expression in meats and its role in modulating human health and disease.
- Health benefits of bioactive compounds found in garlic, onions, leeks, chives, scallions, and shallots.
- Understanding how Obesity Change Heart Enlargement and Stiffness Genetically.
- Understanding the effects of viscous fibers (that sit in your gut) on blood potassium levels after a meal in patients on dialysis.
- Improving the research capacity of the currently neglected mosquito species *Culex spp.* and their molecular involvement with the viruses they host (e.g., West Nile, California and St. Louis encephalitis).

Community and economic development

- Analyzing economic impacts in changes to public-lands policies pertaining to sage grouse habitat designation.
- Developed a State of Nevada Fiscal Social Accounting Matrix (SAM) model and then a county based Fiscal SAM that is being used to estimate economic and fiscal distributional impacts of alternative public land management policies at the state and county level.

II. Merit and Scientific Peer Review Processes

The NIFA reviewer will refer to your 2020 Plan of Work. Use this space to provide updates as needed or activities that you would like to bring to NIFA's attention.

Process	Updates ONLY
1. The <u>Merit Review Process</u>	No updates
2. The <u>Scientific Peer Review Process</u>	No updates

III. Stakeholder Input

The NIFA reviewer will refer to your 2020 Plan of Work. Use this space to provide updates as needed or activities that you would like to bring to NIFA's attention.

Stakeholder Input Aspects	Updates ONLY
1. Actions taken to seek stakeholder input that encouraged their participation with a brief explanation	No updates
2. Methods to identify individuals and groups and brief explanation.	No updates
3. Methods for collecting stakeholder input and brief explanation.	No updates
4. A Statement of how the input will be considered and brief explanation of what you learned from your stakeholders.	No updates

IV. Critical Issues Table of Contents

No.	Critical Issues in order of appearance in Table V. Activities and Accomplishments
1.	Sustainable Dryland Agriculture
2.	Natural and Environmental Resources
3.	Horticulture and Food Systems
4.	Health, Nutrition and Food Safety
5.	Community and Economic Development
6.	Children, Youth and Families

V. Activities and Accomplishments

Please provide information for activities that represent the best work of your institution(s). In your outcome or impact statement, please include the following elements (in any order): 1) the issue and its significance (e.g. who cares and why); 2) a brief description of key activities undertaken to achieve the goals and objectives; 3) changes in knowledge, behavior, or condition resulting from the project or program’s activities; 4) who benefited and how. Please weave supporting data into the narrative.

No.	Title or Activity Description	Outcome/Impact Statement	Critical Issues/No.
1.	Native Waters on Arid Lands	Enhancing resiliency of agriculture (food, crops and livestock) on reservations of the Great Basin region is especially challenging due to declining surface and groundwater supplies and the increased risk of extended droughts. Increased temperatures further stress Indian farming and ranching in this region due to lower soil moisture content, crop failures, desertification, and vegetation loss. Additionally, historical federal policies have created a complex land tenure system on reservation lands that directly impacts tribes’ agricultural water access, use, and planning efforts. While American Indian farm and ranch operations contribute significantly to	Sustainable Dryland Agriculture

		<p>the economic base of rural reservations, opportunities exist to increase the profitability and sustainability of operations.</p> <p>The goal of Native Waters on Arid Lands – a multi-state, integrated research and Extension program – is to increase the climate resilience of tribal agriculture and water resources on American Indian lands of the Great Basin and Southwest. Additional goals are to support tribal college efforts to strengthen teaching, research, and outreach expertise on reservation lands. As such, the target audience is Native American federally-recognized tribal nations within the Great Basin and American Southwest region, in addition to faculty, staff, and students at 1862 and 1994 institutions.</p> <p>Research and Extension experts from 1862 and 1994 land grant institutions partner with tribal communities to assess the impacts of climate change on future water supplies, identify barriers and solutions, and evaluate and prioritize actions to enhance the climate resiliency of tribal agricultural water resources and food systems. A participatory research approach ensures that the local knowledge and perspectives of tribal communities remain at the forefront of the project, providing for social learning while protecting Native American cultural traditions and sensitive information.</p> <p>Due to the pandemic the project team was not able to travel and the annual tribal summit was not held. Instead, the team conducted weekly virtual meetings to network NIFA program leaders and project team members with tribal leaders to collect information about the impacts of COVID-19 on tribal farmers, ranchers and communities and identify actions that the team and federal sponsors can take to lessen the impacts of the pandemic. The project team also developed an Extension publication to disseminate the results from the 2016-2017 summit related to assessing tribes’ climate data and information needs, and produced a referred journal article to disseminate findings from this ongoing program to professionals. The team also led the creation of a section on Economic Development on reservation lands across the US as part of the Status of Tribes and Climate Change (STACC) Report.</p> <p>From these efforts over 350 adults benefited from direct extension methods. Complete data on the project is located at: http://nativewaters-aridlands.com/</p> <p>Long-term project goals are to continue to identify and address science information needs to support tribes in efforts to sustain or adopt innovative strategies to enhance the climate</p>	
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		resilience of agricultural water resources and food systems. Accomplishing these goals will serve to build the capacity of tribal communities to prepare for a changing climate while improving quality of life on reservation lands.	
2.	Nevada Risk Management Education	<p>Second to mining, the livestock, forage, and specialty crop industries in Nevada comprise an essential component of the economic stability in rural communities. According to the most recent Nevada Agricultural Statistics Report, 95% of all land in Nevada is devoted to farming and ranching activities (79% rangeland, 13% cropland). The 2017 U.S. Census of Agriculture reports, that there are 6,128,153 land in farm acres in Nevada producing cattle and/or hay including alfalfa, timothy, and other hay products. The census also reported that the size of farms decreased from 2012 to 2017 with a focus more on smaller acreage production. Cattle and calves rank number one in cash sales for Nevada at \$247,173,000.</p> <p>The Nevada Risk Management Education Program is an integrated research and extension program run in partnership with the United States Department of Agriculture, Nevada Department of Agriculture, American Indian Tribes, Nevada Cattlemen's Association, Nevada Farm Bureau, and Nevada Agricultural Foundation. The program teaches commercial, beginning, socially disadvantaged, and transitioning farmers and ranchers in Nevada about current federal crop/livestock and revenue insurance programs. This program utilizes risk management education tools to ensure the competitiveness of Nevada agricultural operations in future markets and educates producers about crop/livestock insurance programs to help minimize agricultural risk. It also provides insights as the Farm Bill and its potential impact on Nevada's farmers and ranchers.</p> <p>There were 850 producers reached through the Nevada Risk Management Education program. An additional 2,000 adults were reached through indirect extension methods. Notable activities include:</p> <ul style="list-style-type: none"> • The Cattlemen's Update provided current research-based information about important management practices and issues in the Great Basin region that may affect the efficiency, productivity, profitability, and sustainability of the state's cattle production businesses. The five-day event was held at eight different locations virtually due to COVID-19. The sessions focused on animal health, livestock processing and slaughter, economic overview of agriculture in Nevada, and rangelands and rangeland management. 408 livestock producers attended statewide. Nineteen percent of the 	Sustainable Dryland Agriculture

		<p>respondents reported that they would save over \$900 because they attended the Update, and an additional 19% reported the update was worth \$100-500. Overall, 41% of producers reported that they will make changes or take actions in their work based on the increase in knowledge they received at the update.</p> <ul style="list-style-type: none"> • The Nevada Agricultural Outlook Conference brings agriculture producers, USDA agencies (FSA and NRCS), county and city officials, Small Business Administration (SBA), and the Nevada Governor’s Office of Economic Development (NVGOED) together to discuss the Nevada economy, agriculture economics, unemployment, and a subgroup to work on specific agriculture issues in Nevada. There were nine different meetings. Additionally, seven editorials about risk management and COVID-19 market disruptions were published in the Progressive Rancher. • Given the travel and meeting restrictions of the COVID-19 pandemic, a series of eight agricultural podcasts were developed. The podcasts covered forecasts of agricultural prices and impacts of COVID-19 on Nevada's agricultural local markets. They also covered information as to federal programs to assist Nevada agricultural producers during the COVID-19 pandemic. • The Nevada Tribal Advisory committee moved to a virtual platform utilizing Zoom due to COVID-19 for its quarterly meetings, and there was one tribal risk management workshop held via zoom with participants from the Walker River Reservation, Fallon Reservation, Pyramid Lake Reservation, Duck Valley Reservation, and the Southfork Reservation. There were two different meetings coordinated that focused on getting information out to tribal producers on the use of CARES Act funds under the US Treasury guidance, USDA programs available under the CARES Act, and assisting with record keeping strategies so that they could apply for funding. During the second meeting, it was discovered that tribes were not utilizing available CARES Act programs and Extension put two different Indian tribes in contact with Farm Service Agency personnel so that producers could apply for the Coronavirus Food and Agricultural Assistance Program (CFAP) and receive compensation due to disruptions in ag supply chain. Extension worked with and assisted the Walker River Paiute Tribe Water Resources Department for justifications to utilize CARES act funds for irrigation operation and maintenance fees and irrigation infrastructure under their \$22 million CARES Act 	
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		<p>allocation. The justification was shared nationally with other Tribes through Indian Land Tenure Foundation.</p> <p>Overall, from this program it is expected that informed decisions regarding markets, pricing and production based on strong financial analysis will lead to sustainable agricultural practices and enhanced quality of life for farmers and their surrounding communities.</p>	
3.	<p>Addressing Human Health Impacts from Emerging Contaminants in Reclaimed Water to Enhance its Use for Urban and Peri-Urban Agriculture</p>	<p>Wastewater from domestic and industrial sources has the potential to provide both water and nutrients to support agriculture that is within close proximity to urban areas. Due to its close proximity to consumers, urban agriculture is an important economic driver and also enhances food security. Direct wastewater reuse for agriculture is limited in the United States. Currently, wastewater is treated for key constituents and some inorganic/organic chemicals; however, further treatments may be required to remove additional pollutants that could be potentially harmful to the ecosystem or human beings even at low concentrations.</p> <p>This project addresses the knowledge gap by investigating the possible use of reclaimed water in urban irrigated agriculture and identifying any potential human health impacts and necessary mitigation measures. The objectives of the project are: (1) Identify chemical contaminants in reclaimed water used for urban and peri-urban irrigated agriculture (forage crop and animal production); 2) Determine pathways (namely water, soils, and sediments) of contaminant entrainment into agricultural products; 3) Determine associated human health risks; 4) Develop strategies for mitigation of those health risks over the agricultural production chain; 5) Educate undergraduate, graduate and post-graduate students to increase knowledge, skills and capacity to practice sustainable agriculture and water resources management for enhancing food security and water resiliency; 6) Integrate research with Extension outreach to educate and enhance decision-making capacity of agricultural producers, water reclamation facility and water utility staff, and affected stakeholder communities and policy makers.</p> <p>A team of UNR and Experiment Station scientists partnered with Extension to implement this integrated research, education, and Extension project to identify, minimize, and mitigate health impacts from emerging contaminants in reclaimed water, potentially enhancing its use for urban and per-urban irrigated agriculture. Researchers developed methods to identify emergent chemical contaminants in reclaimed water and solid media; identified emergent chemical contaminant levels in reclaimed waters; developed methods to conduct greenhouse experiments to measure uptake of emergent contaminants by agricultural produce; educated</p>	<p>Sustainable Dryland Agriculture</p>

		<p>four graduate students and approximately 250 producers about the significance of reclaimed water for urban agriculture; and integrated science research with Extension outreach through initiating the development of a series of peer-reviewed Extension publications. Information was also disseminated through Extension’s website. Other common venues of disseminating the information (e.g., field days) did not occur this year due to the pandemic.</p> <p>In total, 250 agricultural producers received education through direct extension methods. The results will enhance the decision-making capacity of: Agricultural producers concerning the benefits and risks associated with reclaimed water use; water reclamation facility and water utility staff about the potential risks and mitigation needs and methods to improve suitability of reclaimed water for use in irrigated agricultural production; and stakeholder communities and policy makers about the feasibility and benefits/risks of using reclaimed water resources for irrigated agriculture. Improved knowledge, skills, and capacity to practice sustainable agriculture and water management will enhance the nation’s food security and water resiliency.</p>	
4.	Agriculture: Living Beyond the Pandemic	<p>The COVID-19 pandemic created numerous disturbances in the agriculture and food sectors, which resulted in food shortages and price increases on the retail side. To better understand what was happening, and why it was happening Extension put together a webinar series to help people navigate these unknown times.</p> <p>Agriculture: Living Beyond a Pandemic was a series of eight sessions. Five of the webinars were delivered on a weekly basis, and the remaining three were delivered on a biweekly basis. The topics included: Agriculture risk and law; meat packers, pricing, and availability; backyard poultry production; pork industry update; dairy: milk dumping and National Dairy Month; Doc Talk; home meat processing; and stress and mental health wellness. The target audience was producers and the general public. Each webinar was 45 to 90 minutes long, depending on engagement from the audience.</p> <p>The eight sessions resulted in a total of 6,449 minutes of view time on the Douglas County Extension Facebook page, which is 107 hours of time people have spent watching this content. Additionally, through Facebook, these sessions reached 3,195 people, had 98 reactions, 197 comments, and were shared 33 times. Testimonials include: <i>"I have been able to share factual information about several of the sessions with co-workers and others..."</i>, <i>"The poultry session was very good and we have implemented a few changes to our set up as a result of watching the</i></p>	Sustainable Dryland Agriculture

		<p><i>session", "Your series was very timely", and "They [the speakers] provide comfort and reassurance when we are unsure of our mental state."</i></p> <p>This short-term program offered producers and interested persons insight into what was happening in agricultural sectors during the pandemic, and solutions for longevity and sustainability after the pandemic.</p>	
<p>5.</p>	<p>Establishment of the Great Basin Research and Extension Center</p>	<p>Drylands are defined as areas where the lack of moisture limits crop and/or pasture production during part of the year, and generally occur in arid, semi-arid and dry sub-humid regions of the world. Drylands constitute about 41% of the earth's land surface, including most of Nevada. Over 2.5 billion people, or 30% of the world's population, including most of the world's poor, live in drylands and face several common challenges including desertification, salinization, soil nutrient depletion, poor water quality, invasive species, declining biodiversity, and soil erosion.</p> <p>The College of Agriculture, Biotechnology & Natural Resources' new Great Basin Research and Extension Center (GBREC) in Eureka County was created to address such issues at state and international levels. The GBREC is Nevada's showcase, as much of the world looks like this, and the knowledge we generate here will be useful throughout drylands of the world. The GBREC in Eureka County has begun operations in a new initiative for rural Nevada. It will address the related issues of sustainable grazing management of dryland rangelands, livestock, crop production under water-limited environments, and alternative water and irrigation strategies for crop production.</p> <p>The enterprise is on a 644-acre ranch in Diamond Valley near the town of Eureka, along with several grazing permits on Bureau of Land Management lands in the Diamond and Fish Creek Mountains surrounding Diamond Valley.</p> <p>At the center of the operation is the world-renowned Rafter 7 herd of sheep, which was purchased by the University. The sheep are both purebred Merinos and Rambouillet/Merino crossbreeds that were initially developed about 30 years ago at the University in order to improve the national and State of Nevada sheep industry. The sheep are extremely well adapted to rangeland production and to producing fine wool despite the harsh climate. Genetically, the herd has made major contributions to Western U.S. and international sheep industries.</p> <p>The Center held the annual Rafter 7 sheep auction, which attracted buyers from around the world. Of the approximately 1,800 head of sheep in the herd, 230 sheep were up for sale.</p>	<p>Sustainable Dryland Agriculture</p>

		<p>Numerous Buyers at the Rafter 7 Ram sale expressed their gratitude of the University purchasing and maintaining the genetic availability to the industry and for recognition of the value of the sheep industry. Many in the farming sector have expressed their appreciation of the Center and the potential benefits of direct applied research on crops and limited water availability for Diamond Valley and Nevada.</p> <p>Sales from the sheep will help fund more research, more programming through Extension and other projects that will adapt to the needs of the community. For example, a soil health program was established at the BREC through inter-seeing annual triticale and winter wheat to increase carbon and forage production. Also a precision agriculture production methods for grain sorghum research project was initiated.</p> <p>The Center will ultimately include an administration, teaching and laboratory facility; herder and labor housing; refurbished domestic/stock well and water system; modernized irrigation facilities; and a redesign and reconfiguring of sheep corrals. The ranch has three 120-acre pivot sprinklers producing alfalfa hay and other forage crops, a cattle feedlot, and a dryland crested wheat pasture.</p>	
6.	Establishing And Testing New Field Facilities In Nevada To Support Genomics-Assisted Approaches To Breeding Abiotic Stress-Tolerant Sorghum	<p>Grain sorghum is the fifth most important grain crop in the world in terms of total production. It is a biofuel, animal feed, and gluten-free “ancient grain” in the US, and a key subsistence crop throughout sub-Saharan African and India. Drought, heat, and soil salinity are major stresses that limit crop production in Nevada either by directly inhibiting plant growth or by reducing pollen fertility and therefore seed set and grain yield.</p> <p>This new method cheaply and quickly creates a genetic fingerprint of population structure and genetic diversity in any species with a reference genome. This will help germplasm conservation efforts to monitor the genetic diversity of curated accessions and it will help plant breeders make sure there is enough genetic diversity in their populations to create good heterogeneity and yield gains over time.</p>	Sustainable Dryland Agriculture
7.	Improving Teff Grass: A Forage, Fodder & Highly	<p>As the driest state in the U.S., all crop production in Nevada relies upon supplemental irrigation, so improving the drought tolerance of food and forage crops is an important goal for regional agriculture to maximize productivity while protecting limited water resources. Teff is a warm</p>	Sustainable Dryland Agriculture

	Nutritious, Low-Gluten Grain Crop	<p>season, C4-photosynthesis grass that is gaining popularity in the U.S. as a high-quality summer forage, fodder, and grain.</p> <p>The screening of the USDA-ARS Teff Grass accessions (<i>Eragrostis tef</i>) under acute and chronic water-deficit conditions allowed for the identification of more drought tolerant accessions of Teff for more seed and hay production under conditions with limited or intermittent water availability.</p> <p>Researchers have created a high-quality, chromosome-level assembly of an elite, drought-tolerance Teff accession through a combination of next-generation, short-read, high-throughput sequencing, long-read sequencing, and Hi-C chromatin proximity sequencing.</p>	
8.	Multi-state (NE1720) Evaluation of Winegrape Cultivars and Clones	<p>Global warming is increasing chaotic weather events, especially the incidence of drought across the world, making water scarcity a major agricultural problem. Therefore, crop water use efficiency is an important research priority. Grape production is one of the most important agricultural commodities in the USA. Cultivated grapevines originated from and grow well in a Mediterranean type climate; they are relatively tolerant to drought as compared to many other economic plant species.</p> <p>A workshop series of 25 videos were created to facilitate Nevada’s wine grape growers on everything from basic biology of the plant, to selecting the most appropriate varieties, to factors affecting fruit yield in arid and semi-arid climates.</p>	Sustainable Dryland Agriculture
9.	Phosphorus Removal from High Desert Rangelands Historically Irrigated with Reclaimed Wastewater	<p>The utilization of reclaimed wastewater is a suitable and sustainable approach to agriculture production in water-scarce regions. However, even though the wastewater is treated to reduce nutrient concentration such as phosphorus, the 10,600 to 14,006 m³ of water applied per hectare per year on grass and alfalfa hay crops in Nevada can lead to soil phosphorus buildup over an extended period.</p> <p>Researchers have found that a mixture of grass (tall fescue) and legumes (alfalfa) in ratios between 50:50 to 75:25 safeguards the environment from phosphorus buildup, which in turn reduces agricultural runoff.</p>	Sustainable Dryland Agriculture

<p>10.</p>	<p>Field Trials of Camelina sativa Cultivars for Biomass to be Used in Biofuel under Irrigated Conditions in Nevada</p>	<p>Camelina or False Flax is a promising oilseed crop used for dietary oil and as a biofuel feedstock. Camelina is a highly adaptable, cool season crop that can be grown on marginal lands with minimal inputs, making it potentially suitable for growth in Northern Nevada and other cooler and drier semi-arid regions of North America. A five-year (2011 to 2015) field trial was conducted to evaluate the seed yield, oil content, and oil and biodiesel production potential of eight C. sativa cultivars in semi-arid regions of Northern Nevada.</p> <p>The seed yields of this study fall within the ranges of yields reported in both the irrigated and rainfed locations of the Western United States. Based on the seed yield, oil, and the estimated oil and biodiesel productivity reported in this study, Camelina can be grown successfully with supplemental irrigation in semi-arid environments like Nevada.</p>	<p>Sustainable Dryland Agriculture</p>
<p>11.</p>	<p>Conjunctive Management in the Humboldt River Basin</p>	<p>Groundwater pumping by junior water rights holders in the upper Humboldt River Basin is depleting surface flows in the river and conflicting with their senior water rights. The state engineer, has identified conjunctive management of ground and surface water in the Humboldt River Basin as one of (if not the) major water management challenges facing the state. The Division of Water Resources (DWR) has contracted with a team of researchers to provide the science necessary to develop and defend new policy initiatives to address the problem. This team includes numerous researchers from Desert Research Institute and the U.S. Geological Survey, along with a faculty from UNR Extension.</p> <p>UNR Extension is providing economic analysis to estimate the economic costs of water supply reductions for agricultural producers in the Humboldt River Basin in order to support DWR's conjunctive management of ground and surface water in the region. These estimates will be used to help the Nevada DWRs make informed policy decisions and may be used to set fees in future mitigation schemes. DWR commissioned the analysis in order to better inform their policy-making, as well as to help assure water managers, agricultural producers, irrigation districts, and other interested parties in the Humboldt River Basin that any future policy to address conjunctive management is equitable and based on credible science.</p> <p>Economic models were developed of a cow-calf ranch and an alfalfa hay farm that use water for irrigation through consultation with farmers and ranchers in the Humboldt River Basin. The models were used to calculate the economic value of an acre-foot of water not received due to interference with upstream groundwater pumping. The results were summarized in a report to DWR on the economic costs of water supply interruptions for a cow-calf ranch and alfalfa hay</p>	<p>Natural and Environmental Resources</p>

		<p>farm that are representative of operations in the Humboldt River Basin. The report details the economic value of water under a range of assumptions about an operations characteristics (e.g., size, water rights holdings) and the magnitude and duration of the water supply interruption. Results were presented in the report at a Nevada Association of Water Resources meeting and a Humboldt River Basin Water Authority Meeting. UNR Extension faculty are in the process of developing a new scope-of-work with the DWR for phase two of the project to start in spring 2021.</p> <p>The primary benefit to the public is that this analysis will help support DWR develop policy to address a significant and growing water management issue affecting one of the most important river basins in the state (the Humboldt River Basin is the largest basin contained entirely within the state of Nevada). Secondary benefits are that the economic models of the cow-calf ranch and alfalfa hay farm can be used to address other policy issues, such as changes in public land policy, and that the economic models of the impact of water supply interruptions on agricultural operations could be adapted to address similar issues in other areas of the state or country.</p>	
12.	Rangeland and Natural Resources Education	<p>Among those who use and manage Nevada’s rangelands there is incomplete knowledge about how plants grow and respond to grazing; the forage utilization concept; the processes of vegetation change and management; managing vegetation to reduce the risk of catastrophic fire; habitat elements important for managing sage-grouse; and monitoring management outcomes. This incomplete knowledge results in substantial conflict among the general public, interest groups, land users and land managers for how to use, allocate and manage rangeland resources. Rangeland management decisions that do not incorporate the full research base can adversely affect the range livestock industry, a suite of wildlife species, other resource attributes, and local economies that depend upon access to federally administered rangelands. Many of the rangeland management issues in Nevada also occur globally.</p> <p>The Rangeland Resources and Range Management Program is an integrated research and Extension activity that occurs in Nevada, adjacent states, and at International levels. The target audience is county residents along with state and federal land management and wildlife agencies, livestock producers, domestic and foreign agency resource management staff and administrators, policy developers, and individuals/organizations interested in rangeland resources. Educational programming provides research-based information to address range management issues and continuing education for users of rangeland resources.</p>	Natural and Environmental Resources

		<p>Activities include:</p> <ul style="list-style-type: none"> • Presentations about the interaction of grazing and plants, ecological history of wildfires in Nevada, food security and the need to improve rangelands in Central Asia, post-fire costs for cattle producers to over 85 individuals. • Participation in collaborative planning meetings for the Kings River and Jordan Meadows collaborative planning groups. • Virtual meeting organized for 100+ participants on topics such as strategic conservation planning with state and federal agencies and NGO's, Soil Health, Pinion /Juniper management, and Riparian management. • Provided conservation and agricultural practices information to over 150 producers and citizen-based conservation organizations. • Worked in partnership with the Results Oriented Grazing for Ecological Resilience (ROGER) group and two local permittees in the development of objective based grazing systems to allow greater flexibility in grazing management to achieve greater ecological conditions. • Extension faculty co-organized and presented at Free Roaming Equids and Ecological Sustainability Network (FREES) annual summit in Cody, WY (hybrid in person and virtual format) reaching over 500 people to achieve the goal of "healthy herds on healthy rangelands." • Extension is leading a team in the development of a Cooperative Permittee Monitoring Handbook for training permittees, and land management agency range staff in developing and establishing a grazing management monitoring program. The purpose of monitoring is to determine if current management actions are maintaining or improving resource conditions. As monitoring increases, it is anticipated that management actions will improve and subsequently resource conditions. This manual is wanted by BLM for use in the Objective Based Grazing project with 5 ranches participating in NV. BLM has expressed desire for this training manual to become the model for the Great Basin area. 	
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		<ul style="list-style-type: none"> • Initiated the Conservation Action Planning process in seven conservation districts to document the results of the Resource Needs Assessments completed in 2019. • Provided ongoing facilitation leadership to the Rangeland and Habitat workgroup (multi-state) to: a) Identify common misperceptions regarding federally defined Wild Horse and Burro habitat conditions; and b) Identify ecological and cultural “hot spots” 100 people. • Reviewed BLM’s proposed changes to grazing regulations and provided 10 pages of comments to the Humboldt County Commission, for a joint submittal to the BLM. Comments focused upon proposed changes that did not match with published literature or ecological realities on rangelands in Nevada. • In an integrated research project, Extension and Experiment Station faculty reviewed over 100 research articles to offered a new interpretation of evidence that challenges long-held assumptions regarding range management in the West. The journal publication is in press. • To help the US Farm Service Agency implement its Non-Insured Disaster Assistance Program, Extension faculty completed a statewide Forage Production/Loss Assessment (exclusive of Clark County). The FSA uses this report to determine eligibility for insurance payments, which have ranged from none to 1 million dollars or more per year. Numerous areas across Nevada suffered forage losses of 35 to almost 70%, and only a about 7 locations had near average to slightly above average precipitation. • Extension and Experiment Station faculty are working together to address fine fuels management with dormant season livestock grazing. A manuscript was published about the influence of dormant season grazing on seedbank size for cheatgrass, which documented large statistically significant declines in soil seedbanks of cheatgrass with continued dormant season grazing, and near complete restoration of seedbanks when grazing ceases for only one season. <p>Through improving rangeland management decisions the range livestock industry, a suite of wildlife species, other resource attributes, and local economies are positively affected.</p>	
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<p>13.</p>	<p>Sagebrush Cache Project</p>	<p>Within the sagebrush steppe ecosystem, sagebrush plants influence a number of ecosystem properties, including nutrient distribution, plant species diversity, and soil moisture and temperature. Sagebrush is also a critical habitat component for a number of sagebrush-associated wildlife species. Recent increases in frequency and size of wildfires and associated annual grass expansion within Wyoming big sagebrush communities have increased the need for effective sagebrush restoration tools and protocols.</p> <p>The sagebrush cache study started in 2016 as a partnership between Extension and the USDA. The investigators used modified “pile seeding” to enhance sagebrush establishment from seed in islands. Sagebrush seeds naturally disperse in late fall or early winter, and artificial seeding on snow has been successful in some areas. Sagebrush seeds tend to germinate where snow accumulates, so soon after snowmelt the researchers used cut sagebrush plants both as the source of sagebrush seed and as a means of trapping snow for enhanced germination. The study’s primary objective was to evaluate the fall placement of Wyoming big sagebrush plants, harvested at near seed-ripe, in recently burned areas.</p> <p>Results demonstrate that permanently staking several sagebrush branches (i.e., can’t move) with many viable seed stalks on recently burned areas can substantially increase the number of sagebrush seedlings compared to the standard broadcast seeding method or no seeding at all, when winter and spring precipitation are well above average. There were far fewer seedlings present on plots established in 2017 when precipitation was near average and snowfall was a less prevalent form of the precipitation. The initial success in the spring of 2017 was followed by substantial loss of seedlings in the following years. The study design did not allow for identification of definitive cause for seedling decline but incidental observation indicated the likely cause was browsing from rodents and antelope.</p> <p>The Northeastern Nevada Stewardship group and the Lincoln County Conservation District have established additional study sites in Elko and Lincoln counties to test the technique across other sagebrush species and locations. Extension faculty collected seedling counts at seven study sites in Elko county. As a follow-up to this work, Extension faculty collaborated with the USFS, NDCNR, and NDF to select a site for the first large scale implementation of this sagebrush seeding technique. Approximately 1,500 sagebrush carcass caches were established in 2020 in the first large scale implementation of the technique. In partnership with the NV Conservation Districts, Extension will monitor a large subset of these across the entire area in 2021 and</p>	<p>Natural and Environmental Resources</p>
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		<p>subsequent years to enhance our understanding and accuracy of the nine recommendations we have developed.</p> <p>Data and observations obtained from seeding technique will be summarized and submitted for publication in 2021 and will include a suite of recommendations developed to date. Land managers have yet another tool for establishing islands of sagebrush in burned areas. These islands would presumably become seed sources for gradual colonization of sagebrush into larger areas for postfire rehabilitation.</p>	
<p>14.</p>	<p>Native Plant Materials in Nevada</p>	<p>Nevada is the driest state in the nation, and landscape water use accounts for more than two-thirds of residential water use. Use of low-water-requiring native plants in landscapes can reduce water needs and support native pollinators and other wildlife. Further, adopting the “watershed approach” to landscaping can make the best use of water delivered by irrigation and natural precipitation and support wildlife populations, including pollinators.</p> <p>Native plants and seeds are favored by many Federal, State, and private land managers in Nevada. Selecting appropriate native plant materials for restoration, rehabilitation, and/or reclamation projects can improve the survival rates of plants and, in turn, improve the likelihood that projects will be successful at restoring desired ecological function. More and more, empirical research shows the superiority of applying locally-adapted or genetically-appropriate native plant materials over non-native alternatives in restoration projects, especially in the harsh, semi-arid rangeland environments of Nevada. The availability and cost of locally-adapted native plant materials, however, are persistent obstacles to their widespread use. The most significant native plant materials (NPM) challenge facing Nevada – and the western United States more broadly – is ensuring the supply of large quantities of NPMs needed to rehabilitate hundreds of thousands of acres in large wildfire seasons. Supplying large quantities of NPMs requires that more desired species be produced under cultivation.</p> <p>Extension participated in two different collaborative groups to address these needs.</p> <p>First, Extension participate in the Nevada Native Plant Partnership. Working in partnership with the U.S. Fish and Wildlife, BLM, U.S. Forest Service, Nevada Department of Agriculture, Nevada Department of Wildlife, Natural Resource Conservation Service, Nevada Division of Forestry, Great Basin Institute, The Nature Conservancy, and Walker Basin Conservancy the effort aims to increase the use of genetically-appropriate native plant material in rangeland restoration</p>	<p>Natural and Environmental Resources</p>

		<p>projects. The target audience for this work is agricultural producers who are either growing or interested in growing native plant materials, federal and state land managers using native seeds in restoration projects, and federal and state agencies interested in supporting the native plant materials industry. Extension faculty provided economic analyses to support the overall goals of increasing the supply and lowering the cost of native plant materials for restoration projects in Nevada and supporting the development of native plant materials industry in Nevada.</p> <p>Major accomplishments of the partnership include:</p> <ul style="list-style-type: none"> • The Nevada Seed Strategy (Strategy), prepared by the Nevada Native Seed Partnership (NNSP), was finalized and aims to increase the availability and use of native seed for rehabilitation, reclamation, and restoration treatments. The Strategy identifies specific activities that address bottlenecks within the native seed system and attempts to clarify and coordinate the value each stakeholder can bring towards improving native seed use. By working together, the Strategy integrates the needs of state, federal, and private seed users with researchers developing new varieties, increasing our basic understanding of plant biology, and developing restoration technology with industry seed suppliers that produce native seed in quantities needed for large scale revegetation that uses the right seed in the right place at the right time. • The Nevada Shared Stewardship Executive Committee unanimously agreed to include the Strategy as one of the strategies and plans referred to in the Shared Stewardship Agreement in recognition of its importance in conserving, protecting, and improving landscape health through ecological restoration, supporting agricultural and rural economies, and reducing the risk and mitigating the effects of wildfire. • The 4th Annual Nevada Native Seed Forum was held. This forum gathered stakeholders from both the public and private sectors to discuss the science behind native seed and the development of local strategies to expand the native seed market in Nevada. • The U.S. Fish and Wildlife Service (USFWS), BLM, UNR Extension and TNC collected data from three experimental seedings on the Winnemucca BLM district to compare seed mixes made from locally-collected and seed zone-matched sources collected through the Seeds of Success program to the partially-native seed mixes made from the best available standard cultivars. 	
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15.	Living with Drought	Stakeholders need research-based information to understand drought, information on Nevada’s drought status, essential research, and tools that can be used to help address and assess the impacts of drought in Nevada.	Natural and Environmental Resources

		<p>The goal of Living with Drought is to promote understanding through stakeholder outreach, information sharing, and education. Additional objectives of the program are to: Forge local, state, regional, and national connections and partnerships; build a network of reliable weather observers and regular landscape condition monitors; share local knowledge with others and communicate key issues of concern; and utilize local-scale observational data to support the data needs (e.g., improved spatial and temporal resolution of precipitation, vegetative condition, drought impacts) of resource managers, farmers, and ranchers. The target audience for the program is Nevada’s general public, farmers, ranchers, natural resource managers, and stakeholders in Nevada, and the Truckee and Colorado River watersheds.</p> <p>Education occurs primarily through the Living with Drought website (https://livingwithdrought.com/), which provides current drought status information, drought-related resources, and tools that can be used to help monitor, address, and mitigate the impacts of drought. Individuals can report directly through the Drought Impact Reporter, which is linked to the Living with Drought website. The website has had 8,200 page-views. A representative from the Nevada Department of Agriculture stated, “... the [Living with Drought] site has been so helpful.”</p> <p>Additional program activities included:</p> <ul style="list-style-type: none"> • Ongoing collaborations with colleagues from the State Climate Office, National Weather Service Offices, Desert Research Initiative, and others to coordinate strategies for success and opportunities for engagement. • Attended meetings with various stakeholders and the public to promote the program with other potentially interested groups/constituencies. • Interviews with media outlets. • Participated on the steering committee for the California-Nevada Drought Early Warning Network (CA-NV DEWS), which is part of the National Drought Resilience Partnership. • Attended monthly CA/NV US Drought Monitor calls. • Participated on the Nevada Drought Assessment team, which is working with the State Climate Office, Nevada Dept. of Water Resources, and the lead for State of Nevada 	
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		<p>Climate Initiative (initiated by Gov. Sisolak in 2020) to develop strategies to respond to the current drought.</p> <ul style="list-style-type: none"> • Partnered with the Southwest Extension Climate Science Partnership, which is an inter-state collaboration to develop climate-change preparedness and mitigation content that Cooperative Extension faculty can incorporate into existing and emerging programming. • Participated in the Drought Learning Network (DLN) working group and Projections to the People (P2P) sub-working group. • Participated in the Southwest Region Climate Hub. • Served as the Nevada State Co-Coordinator for the Community, Collaborative, Rain, Hail, and Snow (CoCoRaHS) network, a grassroots citizen-science collaboration that provides a platform for volunteers to map and measure daily precipitation using low-cost equipment and an interactive website. • Developed four Extension publications. <p>Through these activities 54 people received direct education and 100 people indirect education. The impact of this program is greater information and outreach, increased statewide monitoring and research data, and supply augmentation and long-range planning, including water reuse.</p>	
16.	Living With Fire	<p>Wildfires are increasingly common and catastrophic across the western United States and recently across the world (e.g., 2019-2020 Australia Bush Fires). The state of Nevada is known for some of the largest rangeland fires in the country. The cause of large wildfires is multi-faceted and complex. Decades of complicated land management history (e.g., fire suppression, grazing, logging, etc.) has created landscapes that are no longer resilient to disturbances like fire. Residential and urban developments interspersed on the border and throughout wildlands has increased both the frequency of fire ignitions and the effects of wildfires as they consume more property and impact human health and safety. Climate change and increases in the frequency of extreme events (e.g., drought, rain-on-snow events, flooding) exacerbates this already complex situation. Areas of particular vulnerability are in the wildland-urban interface, which is the border between communities and surrounding forests or rangelands. Government agencies, community leaders, and academics have urged a call-for-action to increase education and implementation of fuels management projects and homeowner/community-driven</p>	Natural and Environmental Resources

		<p>defensible space projects to reduce fire risk and prepare communities for the eventuality of fire in their backyard.</p> <p>The mission of the Living with Fire (LWF) program is to provide recommendations to residents on preparing for wildfire and reducing wildfire threat to homes and communities. Since its inception in 1997, LWF has created materials for residents that have been shared and applied to fire-prone regions throughout the country. LWF provides resources to homeowners, educators, community groups, and firefighting professionals to improve defensible space, ensure homes have proper building materials, manage native and non-native vegetation, and prepare for evacuation. Through community outreach events, educational workshops, peer-reviewed publications, social media and television and radio interviews, the LWF team brings the most up-to-date information on wildfire preparedness to Nevada residents and others across the country.</p> <p>The educational efforts of LWF reached 35,681 direct contacts, and an additional 3,218,036 indirect contacts through the website and social media. 3,076 people participated in virtual and in-person teaching events on topics such as animal services and disaster preparedness, creating effective defensible spaces, and retrofitting your home to increase wildfire survival. Post-workshop evaluations indicated that participants increased their knowledge and willingness to act on new knowledge and change behavior.</p> <p>Additional activities include:</p> <ul style="list-style-type: none"> • Extension organized and led the Nevada Network of Fire Adapted Communities Summit. The NNFAC Summit evaluated a larger breadth of data including community needs as well as intended actions taken. 41% of respondents strongly agreed and 59% agreed that they had an increase in knowledge after attending the Summit; 64% agreed that they had a better understanding of how the Firewise Program can be used in Nevada (which is a new program being implemented through the Fire Adapted Nevada Initiative). Participants were asked what kind of action they were going to take because of their attendance (to measure intended behavioral change). A sample of responses are as follows: <i>“Focus efforts and education on ember defense”</i>, <i>“Already fixed some of the vulnerabilities of our home!”</i>, <i>“Review the Firewise USA program requirements to ... use</i> 	
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		<p><i>in our neighborhood”, and “Plan some community events to create a network of volunteers”.</i></p> <ul style="list-style-type: none"> • For Nevada Wildfire Awareness month LWF staff created the common message and graphic for the campaign through collaborative stakeholder engagement with 22 partner agencies. The theme was <i>“Wildfire Knows No Boundaries. Make Yours.”</i> Over 6,740 materials including publications, banners, posters, PSEs, and billboards were distributed throughout Nevada. A Facebook Live Series of workshops focused on cutting-edge topics in wildfire prevention and preparedness. Topics included: 1) NV Energy Public Safety Power Outages, 2) BLM, US Forest Service, and Nevada Division of Forestry fire restrictions in Nevada, 3) Nevada Network of Fire Adapted Communities informational presentation, 4) National Weather Service fire weather outlook, and 5) noxious weed and cheatgrass removal. • A multistate partnership involving Extension in California and Nevada, along with Cal Fire and the Tahoe Resource Conservation District created a 20-page technically illustrated guide (SP-20-11) describing how to retrofit homes to wildfire. UNR Extension also co-organized three home retrofit workshops: 1) one geared towards the public; 2) one for building professionals; and 3) one for fire professionals. These virtual workshops were attended by 1,265 people from Nevada, California, Colorado, Wyoming, Washington, Texas, and Utah. Forty percent of participants learned that defensible space inspections are free in the Lake Tahoe Basin, and 37% learned that there are free chipping programs available. Thirty-four percent of respondents said that they did not know what to do to retrofit their homes and the presentations were able to educate them about easy next steps. Seventy-eight percent of participants responded that they were more comfortable with home retrofitting concepts after the workshop. Seventy percent of participants said that they learned information that they did not already know as a result of attending the workshop. Participants were asked what kind of action they were going to take as a result of their attendance. A sample of responses are as follows: <i>“Bring these new resources to my fire safe council”, “Use this information to educate my immediate neighbors”, “Feel better about speaking with the public and doing on-site inspections”, and “I am going to work with members of my community to start a mitigation and hardening program”.</i> 	
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		Long-term goals of this program are to change human behavior regarding defensible space, improvements on homes, more wildfire resilience, and wildfire preparedness that will result in less destruction for individuals, families, and communities.	
17.	Development of a prototype simulation model for Great Basin vegetation transitions	Researcher developed an integrated geodatabase and web GIS for the Walker River Basin, Nevada - bringing together spatial data from a variety of agencies and research groups into a single unified geodatabase. The geodatabase is intended to serve as a single source of data for riparian and river restoration projects in the Walker River Basin. This geodatabase is being made fully available through the internet as an interactive web GIS application. The web GIS interface provides non-GIS users easy to use access to data and geographical analysis. One of the most promising features of the web GIS is that it will incorporate our riparian restoration decision support system. Users will be able to identify and weight different restoration objectives which will be rendered real-time within the web GIS.	Natural and Environmental Resources
18.	Fall-Grazing and Grazing-Exclusion Effects on Cheatgrass Seed Bank Assays in Nevada	<p>In winter-dominated areas of the Great Basin and Intermountain West, it is imperative that all management tools and methodologies be available for use in order to manage invasive annual grasses, especially since there are no intrinsic constraints to invasion for many ecological sites.</p> <p>The fall cattle grazing relationship to cheatgrass seed bank assay numbers identified in this study provides insight into the practice as a cheatgrass (fuels) management method.</p> <p>Fall cattle grazing has a significant upside potential as a landscape-scale, contributive cheatgrass management method. Neither the research nor the management communities have found any tool that can eliminate cheatgrass at the landscape level, let alone regional levels.</p> <p>The management of propagules (the next generation) is one component for managing cheatgrass, and hopefully benefiting desired species, across time. The infrastructure is in place and does not depend on the vagaries of federal, state, and municipal funding as other tools do. Fall cattle grazing is a tool that can be used to help manage cheatgrass seed banks.</p>	Natural and Environmental Resources
19.	Master Gardener	Horticulture continues to be one of the most popular home activities in the nation. Master Gardener volunteers are a critical component of horticulture programs in every land-grant university. Through an intense program of basic horticulture training and continuing education, Master Gardeners provide science-based horticulture information to Nevadans. They expand	Horticulture and Food Systems

		<p>the reach of Extension horticulture professionals and create a vital link between the university, Extension, and the general public.</p> <p>Extension has 362 certified master gardeners. 45 new volunteers were certified over the last year. Master Gardener trainings are offered annually. Each Master Gardener completes a 50 hour course (or 80 hours, depending on the county), passes a comprehensive final, and contributes at least 35 hours annually on approved volunteer activities. Each Master Gardener must complete at least 15 hours of continuing education annually.</p> <p>Certified Master Gardeners teach classes; answer consumer questions through email, over the phone, and in person; support youth horticulture, community gardens and horticultural events; conduct workshops, lead demonstrations at demonstration gardens and orchards; and act as docents at public parks, among other activities. In total Master Gardeners reported 8,966 hours of volunteer time, which translates to a value of \$243,876 (value obtained from Independent sector.org.). 36,959 people received horticulture education through direct extension methods and 31,915 contacts were made through indirect extension methods. Some noteworthy activities included:</p> <ul style="list-style-type: none"> • Horticulture staff, including Master Gardeners, assisted 3,124 clients with horticulture questions. • Horticulture staff responded to 282 eXtension “Ask-An-Expert” questions. • 150 Victory Garden Start-up Kits were distributed in the community at the start of COVID-19 in March. Vegetable seeds, potting mix, plant containers and full instructions comprised each kit. • In Nye County, Master Gardeners host the local Farmers' Market (open every Saturday weather permitting) and distribute research-based Fact Sheets & Special Publications, and answer Horticulture questions. • In Nye County, vegetables harvested from the demonstration vegetable garden were donated to local Food Banks through a partnership with the Nye Communities Coalition "Gleaning" Program. 	
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		<ul style="list-style-type: none"> • In Nye County, Master Gardeners advise/troubleshoot irrigation and volunteer planting native pollinator-plants at Discovery Park. • In Washoe County, the Home Horticulture Certificate program (prerequisite to the Master Gardener program) provided eight virtual 3-hourclasses, including Native Plants, Landscape Water Efficiency, Turfgrass Management, Soils, Container Gardening, Nuisance Pests, and Integrated Pest Management. Between 65 and 77 people attended each class. 24 community members completed and earned their Home Horticulture Certificate (first step toward becoming a certified Master Gardener). 28 Home horticulture certificate awardees (4 from the 2019 class) went on to complete the Master Gardener training. • In Clark County, "Gardening on the Surface of the Sun" was open to the public and mandatory for anyone who planned to become a Master Gardener. "Gardening on the Surface of the Sun" total attendance was 4,799. • Master Gardener community outreach includes the Community Newsletter, the Master Gardener Newsletter, and social media. The community newsletter has over 3,100 subscriptions. The Facebook page has over 4,500 followers; 20,000 engagements and total public reach of over 200,000. <p>Extension has a sustained program of diverse committed volunteers that provide accurate, university-based scientific horticulture information to the gardening public. The long-term impact is improved horticulture practices statewide, more locally grown foods, and reduced food deserts and food insecurity in Nevada.</p>	
20.	Commercial Landscape Horticulture	<p>There is an identified need for more professional education in the green industry, including landscape architects. Surveys of local green industry professionals in Nevada further indicate a desire by the industry for one-day seminars, nursery worker training, and continuing education opportunities for professional certification. Topics deemed important to the industry include diagnosing plant problems, plant insects and diseases, plant identification, integrated pest management, weed management, soil fertility and plant nutrition, native plant landscaping, pesticide certification/safety training, and pruning. The industry has recently expressed the need to focus on landscape water conservation issues and more professional certification options.</p>	Horticulture and Food Systems

		<p>The commercial landscape horticulture programs target green industry professionals, including nursery workers and owners, arborists, pesticide applicators, landscapers, irrigation specialists, and landscape designers and architects. Within the commercial landscape horticulture programming are:</p> <ul style="list-style-type: none"> • Green Industry Basic Training Program (providing Nursery Worker Certification) • Green Industry Continuing Education Series • Qualified Water Efficient Landscaper (QWEL) Training and Certification Program <p>Northern Nevada’s Green Industry Training Program provided basic training to 53 people in a course consisting of 8 classes for entry-level industry workers. Topics included plant diseases, insect identification, woody plant pruning, soils and water management, garden center basics, weeds and weed law, turfgrass management, and integrated pest management (IPM) and pesticide safety. Participants were asked to rate their understanding of the topic before and after the class. All gains in confidence were significant at $p < 0.001$. 29 out of the 30 attendees who took the certification exam to be Nursery Worker Certified received a passing score of at least 70%. Additionally, three advanced classes for continuing education credits for certification and licensing through the Green Industry Continuing Education Series were provided reaching 242 people.</p> <p>The Qualified Water Efficient Landscaper (QWEL) program, a training and certification approved by the Environmental Protection Agency as a WaterSense program, consisted of 21 hours of classroom training, a hands-on water audit, and the certification exam. Topics include training on water-efficiency in the landscape including information on sustainable landscapes, soils, irrigation systems and irrigation auditing, troubleshooting, and maintenance. This year, the training was held as a hybrid in-person and Zoom training due to COVID-19. Fifteen people attended the program. In addition, trained industry instructors for QWEL produced QWEL-related educational YouTube videos, and updated and published the "Landscaping in the Truckee Meadows" for use in industry and homeowner landscape horticulture programs. Participants were asked to rate their understanding of the topic before the program and after the program. All gains in confidence were significant at $p < 0.001$. 11 of 13 attendees who took the QWEL certification exam passed at 70% or above.</p>	
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		<p>The Green Industry Training programs provide Workforce Development training for Nevada's nurseries and landscape companies. There is no horticulture degree provided at any college or university in the state of Nevada. Extension programs fill that gap, and provide horticulture training to individuals who go on to work in the industry, enhancing the knowledge of employees, the quality of their work, and the profitability of local green industry businesses.</p> <p>The commercial landscape horticulture programming is designed to increase the skill level of entry level workers by providing classes, certifications, and continuing education opportunities, and increasing professionalism by training existing workers to use scientifically based and sustainable practices, including landscape water conservation in their work.</p>	
21.	Grow Your Own, Nevada!	<p>The USDA's 2014 survey on food deserts in the United States showed that Nevada had food deserts in 40 of 687 census tracts with 154,623 Nevadans living in low-income food deserts. With an increased interest in locally grown food, science-based education for growing in Nevada's climate and soils is needed for successful backyard gardens and urban farms to grow produce locally and alleviate the impact of food deserts in Nevada.</p> <p>Grow Your Own, Nevada! is a statewide horticulture education program that provides information to homeowners who desire to become successful backyard food producers in Nevada's unique high-desert climate. The program consists of eight two-hour sessions and covers topics including edible landscaping, soils, irrigation and fertilization, raised-bed gardening, hoop house growing, composting, fruit tree selection and pruning, weeds, growing grapes, insects, growing garlic, greenhouses, integrated pest management, and backyard livestock. Topics were selected based on responses from the most recent program evaluation where participants are asked what additional topics interest them.</p> <p>Across the state, 484 people attended the online Grow Your Own, Nevada! classes. Attendees participated at 15 locations statewide (including California residents). Participants who attended the program were asked to rate their understanding of the of the topic before and after the class. All knowledge gains were significant at $p < 0.001$. Testimonials from program participants include: <i>"Thanks for the exceptional program", "I have been attending ALL these presentations and have learned so-o-o- much", "The entire GROW YOUR OWN, NV program is absolutely fantastic and so practical! I have found ALL of the presentations so very well organized and so very useful in my struggle to work with Mother Nature in my garden!"</i></p>	Horticulture and Food Systems

		<p>It is expected that the program will increase local food sustainability as measured by an increase in the number of families involved in backyard food production or community gardens and decrease in the number and size of "food deserts" in Nevada. Especially during the time of COVID-19, this program provided gardeners with tools to give them greater food security. This is critical as supply chains and availability to fresh food were limited by the impact of the COVID-19 virus on Nevada's food supply.</p>	
<p>22.</p>	<p>Integrated Pest Management (IPM)</p>	<p>Studies have shown that homeowners use as much as ten times more pesticides per acre on their lawns as farmers use per acre of agricultural land. As such, it is important provide education to improve the safety of pesticides used on agricultural and recreational lands, and to decrease pesticide use in urban environments by increasing awareness and adoption of IPM by professionals and the general public.</p> <p>The University of Nevada, Reno Extension IPM program seeks to increase awareness and adoption of the principles of Integrated Pest Management (IPM) and Pesticide Safety on agricultural and recreational lands and in home and commercial landscapes to manage pests efficiently while protecting human health and the environment. To do this IPM and pesticide safety education is incorporated into the basic training programs for Master Gardeners and Green Industry professionals, who then extend their knowledge to the community. Faculty also provide continuing education on IPM and Pesticide Safety to agricultural producers, Recreational Lands Professionals, and Certified and Licensed Pesticide Applicators.</p> <p>Extension activity methods varied from direct education, including multi-state activities, to sharing information through social media. Some of the activities included:</p> <ul style="list-style-type: none"> • Home Horticulture/Master Gardener IPM training consisted eight, 3-hour classes (24 hours of instruction). • General public IPM instruction consisted of the Bartley Ranch Gardening in Nevada Series (Washoe County only) and the Grow Your Own, Nevada! program (statewide). The Bartley Ranch Series offered five classes; the Grow Your Own, Nevada! program offered 16, 1.5-hour classes (24 hours of instruction). 	<p>Horticulture and Food Systems</p>

		<ul style="list-style-type: none"> • Four webinars were offered by a joint collaborative agreement between University of Nevada, Reno Extension, Utah State University and Montana State University. These 4 webinars had a national reach of 589. • The Noxious Weed Field Guide was updated and 2,148 copies have been distributed throughout the state to Extension offices for distribution within their counties and Eastern Nevada Landscape Coalition and Nevada Department of Transportation for distribution through their channels. • Pesticide Applicator Continuing Education Credits were offered through Eastern Landscape Coalition, Green Industry Training, Green Industry Continuing Education Series, Nevada Landscape Association annual conference, and two statewide Pesticide Safety Education Program workshops. A total of 32 Continuing Education Units were offered. (Total Contacts: 1,199). • The online Nevada Certified Pesticide Applicator Safety Training Course, housed on the eXtension Campus website at https://campus.extension.org/course/view.php?id=1586, was accessed by 214 unique individuals. • The online Nevada Integrated Pest Management Continuing Education Unit course, also housed on the eXtension Campus website at https://campus.extension.org/course/view.php?id=1586, was accessed by 36 people to obtain CEUs. • Faculty participated in the multistate project meeting for WERA 1017: Coordination of Integrated Pest Management Research and Extension/Educational Programs for the Western States and Pacific Basin Territories and presented the results of our IPM activities. • Faculty attended the national IPM and Pesticide Safety Education Program (PSEP) Stakeholder Workgroup meetings. • Faculty held a two-day pesticide training for 10 people offering 6 CEU's for certified pesticide applicators in So. Nevada. 	
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		<ul style="list-style-type: none"> • Four-hour pesticide CEU training held for raining held for farmers and ranchers in Pershing County – topics included: habitat management in alfalfa; priority weeds in Pershing County; New Paraquat/Gramoxone training requirements; rangeland weed management. Eight hours of CEU training offered statewide through online training. The training reached 45 people. • Faculty assisted with data analysis for a national survey on the impact of changes to the Extension IPM Implementation Program. • Faculty represent Nevada on IR-4 and share information on pesticide needs or request new projects/the pesticide needs of Nevada’s stakeholders. • Faculty were fundamental in getting approval for the emergency use of Afidopyropen (Sefina) for control of blue aphid in alfalfa (food/feed use). Faculty worked directly with Nevada Department of Agriculture, Extension Educators, Crop Consultants, Industry stakeholders, and several growers and helped Nevada Department of Agriculture to submit an emergency pesticide exemption request to the U.S. Environmental Protection Agency (EPA) for permission to use Sefina on alfalfa to combat blue aphid outbreaks. An application was submitted to the EPA requesting section 18 of the Federal Insecticide, Fungicide and Rodenticide Act for the insecticide Sefina, which was granted. As a result, it is expected 25,000 acres of alfalfa will be treated in Nevada. • Consultations were provided to seven producers on pest problems in various crops, in addition to emergency pesticide exemption for Sefina with several key stakeholders in Nevada. • Faculty are leading IPM implementation in Agronomic crops in Nevada. • Faculty presented the basics of IPM education (crop diversification) to 20 farmers at a field day event. • Faculty published 10 bilingual fact sheets and 8 educational videos (4 in English/4 in Spanish) to support IPM education programs. • Faculty published a fact sheet on crop diversification. 	
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		<ul style="list-style-type: none"> • Faculty published a fact sheet on insect pests (aphid). • Faculty authored 11 educational newsletters related to pest management issues that were published in local and regional media. • The UNR Extension IPM website, manageNVpests.info, was accessed by 5843 total visitors, with 7627 total web hits. • The PSEP website, nevadapesticideeducation.info, was accessed by 3821 total visitors, with 6622 total web hits. • A total of 4892 television PSA were purchased on major local networks and targeted cable channels during the spring, with free spots donated by the vendor. Total views were 1,243,240 for the adult audience 25-54 in age. <p>In total, through this program, 1,257,864 people were reached through indirect Extension methods and 2,245 people through direct Extension methods work (5,477 direct contacts). Results indicate that there is greater awareness and understanding of IPM and Pesticide Safety principles by private citizens, and a greater adoption of such strategies by Master Gardeners and industry professionals. When participants attending PSEP workshops were asked how much profit per acre could be realized from attending this program, their responses ranged from \$1.00 - \$5.00 per acre (participants represented a total of 6,700 acres). Additionally, emergency-use approval for Sefina on alpha will prevent alfalfa yield loss.</p> <p>Through this increased knowledge, it is expected that there will be adoption of increasingly higher level IPM and Pesticide Safety strategies as professionals and private citizens gain a deeper understanding of the IPM system and pesticide use. As IPM is adopted, long-term outcomes are expected to include improved water quality due to reduced input of pesticide residues, greater capacity for the Green Industry to meet customer demand for lower risk pest control strategies, improved profitability of industry, and overall improved quality of life in Nevada due to reductions in pesticide use.</p>	
23.	Nevada Radon Education Program	Radon is a naturally occurring radioactive gas that has no odor, color, or taste and is produced by the breakdown of uranium in soil, rock, and water. Uranium is found in all soils and in higher concentrations in granite, shale, and phosphates. As it decays into radon gas, it moves through the soil into the atmosphere, where it is harmlessly dispersed in outdoor air or can enter	Health, Nutrition & Food Safety

		<p>buildings through the foundation and become trapped inside. When it enters a building, it can accumulate and present a health risk for occupants. Radon is classified as a Group A carcinogen, a substance known to cause cancer in humans. Next to smoking, scientists believe that radon is associated with more lung cancer deaths than any other carcinogen. More than 20,000 Americans die of radon-related lung cancer each year, making it the leading cause of lung cancer in nonsmokers. Not everyone exposed to radon will get lung cancer, but the greater the radon level and the longer the exposure the greater the risk of developing lung cancer.</p> <p>The Nevada Radon Education Program is a partnership with the Nevada Division of Public and Behavioral Health along with several other organizations (e.g., American Lung Association, Nevada Cancer Coalition, Renown Lung Institute) to educate Nevadans about the health risk posed by elevated levels of radon in the dwelling, so citizens can make informed decisions to lower their risk. The program seeks to educate all Nevadans: Current and prospective homeowners and renters, building industry (builders, code officials, builder associations, building departments), real estate industry (realtors, mortgage companies, buyers, sellers, landlords), policymakers (state, county, city, town and regional boards), other health professionals (cancer coalitions, hospitals, the medical community, public health), radon industry (certified testers, mitigators, home inspectors), and school-aged youth, teachers, and parents.</p> <p>The Nevada Radon Education Program's efforts reached 3,118 youth and adults through 71 presentations, training to realtors and other educational classes, 6 tabling events, and a poster contest for youth. Through these activities, and others, the total number of kits distributed was over 3,173. Additionally, indirect education to over 219,000 youth and adults occurred through newspaper articles, distributed publications, exhibits, TV reports, PSAs, website, and social media.</p> <p>Behavior changes are reflected in the number of test kits used, along with the number of homes mitigated, tested during real estate transactions, and built radon resistant. 47% of test kits distributed were used. The number of reported homes mitigated was 182. The total number of reported homes tested for radon in a real estate transaction was 752. And, the total number of reported homes built with Radon-Resistant New Construction (RRNC) technique was 25.</p> <p>The Nevada Radon Education Program is improving the health of Nevada citizens by providing information that they can make informed decisions. The ultimate value of the program is that</p>	
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		it's saving lives by reducing health risks due to radon causing lung cancer, which improves the overall life expectancy and reduces costs to society.	
24.	Healthy Kids, Healthy Start	<p>Almost one-third of children in America are overweight or at risk for becoming overweight, increasing their probability of developing chronic illnesses such as high blood pressure, high cholesterol, and Type 2 diabetes. The national prevalence of obesity among preschool-aged children (2–5 years) is 14%. In Nevada, 33% of children entering kindergarten were obese (21%) or overweight (12%). Nevada estimates the cost associated with treating conditions related to overweight and obesity is \$337 million annually. According to the 2020 National Kids Count Data, Nevada ranked 46th (among 50 states) for children's overall well-being. In response, Nevada AB152 was passed in legislation requiring each licensee that operates a child care facility, other than an accommodation facility or a child care institution, to provide a program of physical activity that meets specific criteria.</p> <p>Educating young children about healthy eating and being physically active, is key to long-term success and targeting prevention of obesity. Systematic reviews of early efforts to improve nutrition and increase physical activity in preschools have been met with limited success, especially in regards to physical activity where studies have shown that increased time alone may not be sufficient to increase the activity levels of children. This demonstrates the need for intentional teacher-led activities and strategic adult involvement in teaching children movement is critical in promoting physical activity and targeting obesity.</p> <p>Healthy Kids, Healthy Start (HKHS) integrates nutrition, feeding, physical activity, child development, family dynamics, and the role of caregivers and teachers together into one comprehensive program addressing childhood obesity and healthy development. The target audience is preschool-aged children, their primary caregivers, and their preschool administrators, teachers, and teacher's aides. Approaches include center development, capacity building, professional resources, indirect and direct education, and community-based outreach such as the Healthy Kids Festival. Due to COVID-19 direct education and community-based outreach events were limited.</p> <p>Extension utilizes two curriculum for Direct Education:</p> <ul style="list-style-type: none"> • The All 4 Kids curriculum in early childhood centers. All 4 Kids takes a multi-dimensional approach to childhood obesity that incorporates learning activities, music and dance to 	Health, Nutrition & Food Safety

		<p>teach preschool children about nutrition, physical activity, and healthy living. The school-based version includes a 21-lesson curriculum. Materials are sent home weekly to inform parents about what their preschoolers have learned. In addition, separate facilitated discussions are conducted with parents and staff to enhance understanding of their child's development and how these issues impact their behavior. Parents attend three All 4 Kids Family Events to gain further understanding and implement healthy eating and physical activities at home. Preschool center staff also attend training to reinforce a healthier and more active learning environment. The All 4 Kids curriculum was delivered 19 times at 4 sites reaching 312 preschool children and 30 parents (4 family events). Post-test results were not obtained due to COVID-19.</p> <ul style="list-style-type: none"> • Little Books and Little Cooks is a 7-week parent education program for preschool-age children (3-5 years old) and their parents designed to promote health eating, as well as family literacy, parent-child interaction, and child's school readiness skills. During the program, children and parents come together to learn about healthy eating and nutrition, gain positive parent-child interaction skills, and practice school readiness skills by reading children's books about healthy eating/nutrition and cooking/eating every week. Each weekly 2-hour session features new topics, a new book about healthy eating, and a new recipe (cooking). Lessons include: MyPlate, cooking with Kids, introducing cultural foods, feeding, hunger and fullness, picky eating, and fruits and vegetables. The program was offered in Nevada's two urban counties, Washoe and Clark County, and Lincoln County. Bilingual workshops were conducted at at-risk elementary schools, libraries, Head Start sites, community sites, and virtually. Faculty and staff conducted the program series eleven times reaching 130 adults and 162 children. As a result of COVID-19, Extension offered 43 virtual LBLC parenting workshops (one-time) and 385 families participated in the workshops. In addition, Extension developed 28 LBLC Youtube videos and 274 individuals watched those videos. 56 Facebook posts and 26 Instagram posts on healthy eating messages or physical activities and reached 3,490 individuals. <p>After participating in the program, 87% of parents and children demonstrated proper handwashing procedures as described on the handout, 77% of children and parents matched the foods to the food group, and 71% of Families used MyPlate to make food choices more regularly. Several parents' feeding practices were improved: 1) parents encouraged child's involvement in meal planning and preparation ($t = 2.42, p < .05$); 2)</p>	
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		<p>parents do not use food as a reward for child behavior ($t = 5.02, p < .001$); 3) parents help child try new foods ($t = 4.54, p < .001$); 4) parents actively demonstrate healthy eating for the child ($t = 3.41, p < .01$); 5) parents allow the child control of his/her eating behaviors and parent-child feeding interactions ($t = 1.95, p = .05$); 6) parents don't pressure the child to consume more food at meals ($t = 7.75, p < .001$); and 7) parents make healthy foods available in the home ($t = 5.95, p < .001$).</p> <p>Children also showed a significant decrease in their picky eating behaviors ($t = 2.56, p < .05$). Parents reported that they read more books about healthy eating and nutrition with their children ($p < .001$) and they now have more books about healthy eating and nutrition at home ($p < .05$). It was observed that the children significantly improved their cooking skills between pre-test and post-test observations ($p < .001$): Wash hands for 20 seconds, measure ingredients, peel fresh produce, cut with a plastic or dull knife, grate cheese or vegetables, stir or spread ingredients, arrange foods on a plate, follow steps in the recipe, clean up after cooking, wash dishes, set the table and clear the table after eating. There was also a significant improvement in positive parent-child interactions during cooking ($p < .05$): giving choices, responding, sustaining a child's interest, modeling and praising.</p> <p>Indirect Education:</p> <ul style="list-style-type: none"> • The Healthy Kids Resource Center webpage had an indirect education reached 10,294 unique users and 14,325 pageviews. • COVID-19 adaptations included creating, publishing and conducting 39, 30-minute PA/nutrition lessons on Facebook Premiere with 3,266 total views and potential reach of 1,727 individuals. • The Healthy Kids Facebook page and Healthy Kids Early Start Facebook page which increases knowledge related to physical activity and nutrition resources with ECE audiences had 1,415 followers (3% increase from last year). 	
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		<p>Policy, Systems, and Environmental (PSE):</p> <ul style="list-style-type: none"> • HKES worked with 18 centers to improve access and appeal for nutrition and physical activity; 17 sites made at least 1 environmental or systems change, totaling 33 changes with a total reach of 2,310. • NAPSACC self-assessment tools were implemented in 16 new licensed child care facilities to assess physical activity needs and areas of improvement and develop strategies to improve programming in early childhood settings; action plans were implemented at all new sites and at 6 renewed sites ongoing with support from 14 established champions (dedicated advocates) in early childcare centers. • Healthy messaging boards were displayed in 9 early childhood sites (1 new site) reaching 684 participants (child/parent pairs) and 95 teachers. • Physical activity prompts (playground stencils) were installed at 6 early childhood sites providing increased physical activity to 395 children. • Efforts were made to improve training and emphasis on formation of wellness committees at each site as well as establishing meaningful relationships between Extension Staff and ECE site staff prior to PSE implementation. • A series of videos were developed for virtual demonstrations in early childhood centers, https://youtu.be/Nqetvu41-44. Gardens can now be installed in local childcare centers using the garden demonstration video to assist center directors on choosing a garden style most suitable based on their budget and facility size and design. The demonstration model continues to be replicated uniquely in other ECE settings as an integrated, holistic approach to educating children and their caregivers about making healthy food choices, increasing fruit and vegetable consumption and being physically active in a garden. • 2 new gardens were installed reaching 94 children. • Statewide PSE training for 12 staff members throughout the year including All 4 Kids curriculum train-the-trainer, Minnesota Healthy Communities PSE Training, CATCH curriculum train-the-trainer, and garden technical training from Extension Horticulture team. 	
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		<ul style="list-style-type: none"> • 7 physical activity/nutrition/garden trainings were conducted for early childhood professional capacity building reaching 63 teachers. Additional nutrition and physical activity trainings were developed and approved through the Nevada Registry. They were offered online for required childcare hours resulting in 3873 certificates issues. <p>Community Outreach:</p> <ul style="list-style-type: none"> • HKES team partnered with the Nevada Children’s Institute for Research & Policy to offer produce market at Step Up for Kids (287 children). <p>Through these and other efforts, Extension reached 1,318 individuals through direct education methods (3,240 youth contacts; 5,039 adult contacts) and 3,087 youth and 21,783 adults indirectly. This program will decrease the number of young children in Nevada (rural and urban) who are at risk for obesity reducing the financial burden of the overall health care system (including Medicaid).</p>	
25.	Healthy Kids, Healthy Schools	<p>The 2016 Community Health Assessment for Southern Nevada provided the basis for the 2016 Community Health Improvement Plan (CHIP) to be implemented from 2016-2020. One of the three priority areas is the reduction of risks and behaviors that contribute to chronic disease with an emphasis on reducing obesity rates through increased physical activity and the promotion of healthy diets. With respect to diet, the two main objectives focus on increasing the number of people meeting daily fruit and vegetable serving recommendations and decreasing consumption of sugary beverages. In Southern Nevada, children experienced a 25% food insecurity rate indicating limited access to healthy foods; about 40% of adolescents consumed less than one serving of fruits or vegetables daily; nearly 14% of adolescents consumed sugary beverages at least once daily, and 27% adolescents were classified as either overweight or obese. Multiple partner agencies have committed to align their strategic plans with the CHIP in order to coordinate actions to help improve outcomes in these priority areas.</p> <p>Additionally, the USDA requires all schools that participate in federal child nutrition programs such as the National School Lunch Program to implement a School Wellness Policy (SWP), which includes meeting 3 goals focused on nutrition promotion and education, physical activity, and other school-based activities that promote student wellness. This is an unfunded mandate that could make a considerable difference in the school wellness environment depending on each school's ability to implement the SWP.</p>	Health, Nutrition & Food Safety

		<p>The Healthy Kids, Healthy Schools (HKHS) multi-level programming in elementary schools is guided by the socio-ecological model. This theoretical framework helps illustrate how factors at different levels in a system can work to influence individual behavior, such as individual factors, settings, sectors, social and cultural norms, and values – thus helping identify points where interventions may be made. The interventions used in the HKHS program are designed to target different levels along the Spectrum of Prevention, an evidence-based tool that acknowledges that the most effective prevention programs consist of more than just education. The tool endorses activities that when performed together work synergistically to create a greater impact than when done in isolation, including strengthening individual knowledge and skills, promoting community education, educating providers, fostering coalitions and networks, changing organizational practices, and influencing policy. The target audience for HKHS is the school district community, including staff, students, and their families.</p> <p>HKHS team strengthened individual knowledge and skills through the following:</p> <ul style="list-style-type: none"> • Direct nutrition education (Pick a Better Snack monthly lessons) to 4,498 2nd and 3rd grade students in 42 schools and 223 classrooms in Clark, Lincoln, Lyon and Washoe County. Pre-test evaluations were implemented; however, due to COVID-19 school closures post-test evaluations were not able to be implemented. • Kids Cook cooking class series consisted of 3 filmed culinary lessons using peer (youth) instructors provided asynchronously to 47 youth at two different Boys and Girls Club locations. • As part of a multi-state Extension effort, established an afterschool 4-H Club <i>Student Nutrition Advisory Council</i> consisting of 5th graders at Rex Bell Elementary School as a collaboration among the 21st Century Community Learning Center program, the 4-H Youth Development Program, and Health & Nutrition HKHS team. This 4-H Club, meeting virtually, provides 4-6 students with biweekly short nutrition and physical activity lessons and food demonstrations to build their skill set so they may advocate for student wellness at their school. Post-test data is not available yet and will be reported in 2021. <p>HKHS promoted community education through the following:</p> <ul style="list-style-type: none"> • Indirect nutrition education to at least 2,719 parents in Clark County through the distribution of bilingual newsletters and bingo cards to all students participating in the 	
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		<p>Pick a Better Snack program. The bingo cards provide families with an opportunity to do physical activities and consume fruits and vegetables to complete a “bingo”, which the student can exchange for a small educational reinforcement. There was a 21% return rate for bingo cards.</p> <ul style="list-style-type: none"> • Chef demonstrations in the classroom or cafeteria to 4,147 students at 9 Clark County schools. After the COVID-19 school shutdowns, the chef demos were moved to live and recorded social media demonstrations totaling 5,348 views. Chef Suzy’s Culinary Demonstrations made a total of 23,049 contacts. • Other promotion (marketing) activities included: Coordinating, promoting and assisting with 8 schoolwide hot breakfasts for 5,071 students and 667 school staff, 2 nutrition booths to support a school wellness night event, and the distribution of MyPlate placemats to all of the students. <p>HKHS educated providers through the following:</p> <ul style="list-style-type: none"> • Led 2 separate coaching series for 25 SNAP-ED partners using the UMN Systems Approach PSE 10-session training. Led a 3-hour virtual workshop titled, <i>The SNAP-ED Way: Building Comprehensive Nutrition and Physical Activity Programming in Extension</i> for 49 participants around the state. Results of the retrospective pre- and post-survey ($N = 19$) indicated that average knowledge level for 8 learning objectives was 3.4 (moderate) pre- as compared to 4.2 (high) post-session. As a result of the workshop, 79% of survey participants responded affirmatively about intending to strengthen their collaborations with other SNAP-Ed implementing agencies. All participants reported the information was easy to understand, and overall satisfaction with the quality of the workshop was 3.3 (satisfied) on a scale of 1 (not satisfied) to 4 (very satisfied). • UMN Systems Approach PSE Coaching Series for SNAP-ED partners (2 series were given for a total of 10 sessions and 30 participants). In a retrospective pre- and post-survey, 88% of survey respondents agreed or strongly agreed that the coaching sessions enhanced their understanding of the online PSE modules; 94% feel better equipped to initiate a PSE conversation with a community partner. Testimonials from participants: <i>“The coaching sessions gave me ideas and direction to add PSE to my SNAP-Ed sites. As a result, I started a wellness committee [at] one of the sites”</i> and <i>“The coaching sessions</i> 	
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		<p><i>were very helpful. The discussions were productive, and I believe everyone gained something from them."</i></p> <ul style="list-style-type: none"> • Created a 6-week, 12-lesson series called <i>Lettuce Cook Together</i>, for use by teachers providing afterschool enrichment activities as part of the 21st Century Community Learning Center program. A three-hour training was delivered to 20 teachers representing 10 schools in Clark County. In a retrospective evaluation, all survey respondents reported receiving all needed resources to teach the afterschool cooking classes; all felt equipped or prepared to teach; all teachers stated the training goals and objectives were clearly stated; average rating of the training was 4.9 (scale of 1-5, one being needs improvement and 5 being excellent). As a result of the training, the program was implemented at 9 schools and reached 214 students. • Educational sessions (<i>Enhancing Fruit and Vegetable Tastings in the Classroom</i>) to 112 teachers who participated in Green Our Planet Teacher Trainings in their GOP STEAM 101 virtual workshops, totaling 6 classes. Using a post-session survey, 98% of teachers reported feeling moderately to very confident they could pair nutrition education with fruits and vegetables offered to students, as compared to 2% that rated their confidence from not to somewhat confident. Teachers reported how likely they were to use fruit and veggie cards and scorecards with their students if they were made available - 60% very likely, 26% somewhat likely, 14% neither likely or unlikely, and 0% unlikely or very unlikely. • Provided two educational sessions via webinar in Spanish to 25 <i>promotoras</i> (peer community health workers) in the Vision y Compromiso Promotoras Network in Los Angeles County, Central Coast Region and Las Vegas, Nevada. The sessions focused on the impact of sugar on health, and the importance of getting your flu shot. • Provided a ninety-minute continuing education session focused on senior food insecurity for health professionals as part of the Sanford Center's Geriatric Lecture Series with 103 people in attendance. Participants were asked how they would use the information provided during the training. A majority (65%) reported that they would use the information to educate their patients, with 47% reporting that they would use the information in a personal manner, and 44% reporting that they would share the information in an informal manner. In addition to these ways of spreading the 	
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		<p>knowledge presented at the conference, 36% reported that they would interact differently with their patients as a result of the information, 33% reported that they would educate other health care professionals, 18% reported that they would provide treatment in a different manner, and 8% reported that they would expand and/or revise their treatment protocols.</p> <p>HKHS fostered coalitions and networks through the following:</p> <ul style="list-style-type: none"> • Support of the Pathways from Poverty Initiative, a collaborative effort to reverse adverse generational trends related to crime and poverty within a 2-mile radius in the Las Vegas Metropolitan Police Department’s Northeast Area Command and Clark County Commission District B through regular meeting attendance, support of outreach events, and inclusion of their 2 elementary schools in the HKHS programming. • Active participation in the Partners for a Healthier Nevada (PHN) coalition, PHN School Wellness Taskforce, CHOLLA (Connecting Hands Offering Lifelong Learning Adventures) Coalition, and Rex Bell Elementary School 21st Century Community Learning Center Advisory Board. <p>HKHS changed organizational practices through the following:</p> <ul style="list-style-type: none"> • Technical assistance and resources to support school wellness activities for 26 Clark County elementary schools with the potential to impact 11,393 students. • Systems changes encouraged by the HKHS team and implemented in schools, such as the closure of a Snack Shack that sold unapproved foods, replacement of food incentives/rewards with toys for classroom treasure boxes, the addition of Extension-led nutrition education, extra-curricular physical activity, and stocking a library with books promoting physical activity and healthy eating. • Environmental changes encouraged by the HKHS team and implemented in schools, such as the purchase of portable playground equipment to support physical activity during recess and the distribution of water bottles to the entire school population to support water consumption. 	
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		<p>HKHS influenced policy through the following:</p> <ul style="list-style-type: none"> • Completion of 4 School Physical Activity and Nutrition Environment Tool (SPAN-ET) Assessments in Clark County schools to help school administrators identify and act upon several opportunities to improve their school nutrition and physical activity environments. Washoe County completed 4 bringing the statewide total to 22 completed assessments (12 in Clark, 4 in Washoe, and 6 in Lyon). These completed assessments will serve to create School Wellness Action Plans once schools reopen to guide future activities and Extension support. <p>Through this multi-level approach 7,144 unique people were reached through direct extension methods for a total of 1,023 direct adult and 41,888 youth contacts. Indirect extension methods reached 18,453 youth and 18,453 adults. Overall the Healthy Kids, Healthy Schools program improved health-promoting dietary and physical activity behaviors, especially fruit and/or vegetable intake, in the school setting, and supported implementation of the School Wellness Policy. This effort has the potential to reduce obesity rates and associated chronic diseases by establishing healthy habits early.</p>	
26.	Healthy, Sustainable, Resilient Food Systems	<p>The state of Nevada relies heavily on imported food. This leaves Nevada vulnerable to disturbances in the food system that could have drastic effects on residents, restaurants, and other businesses. As it stands now, over 17% of households in Nevada are food insecure, where access to food is limited or uncertain. Also, 1 in 8 people struggle with hunger. A comprehensive and interdisciplinary approach to increase food security can provide economic benefit to the state through the development of new industries and, relatedly, income and job creation.</p> <p>The Healthy Sustainable Resilient Food Systems (HFS) is an emerging program developed to help increase access to healthy food in the community. Foundational principles are built upon four areas that are interrelated, including nutrition and health, social, cultural, and ethical capital, environmental stewardship, and economic vitality. Educational programming is targeted to food system stakeholders (e.g., producers, food-related job creators, consumers, legislators) and residents as they are all eaters, a vital part of the food system.</p> <p>The program goals are to improve the food system by:</p>	Health, Nutrition & Food Safety

		<ul style="list-style-type: none"> • Implement a community food system needs assessment with participation from the Southern Nevada Food Council (SNFC) Steering Committee. • Increase awareness of the relationships between diet, health, food production, environment, population and equity among the community. • Promote engagement in the SNFC, the local food policy council. • Promote healthier food retail, such as farmers markets. <p>Below are highlights from this program:</p> <p>1) Healthy Eating on a Budget: The Eat Smart Be Active curriculum was delivered in 8 consecutive days to 57 adult participants at Nevada Department of Welfare and Supportive Services in two urban counties: Washoe and Clark. The Adult Behavior Checklist (survey) was used to assess behavioral changes from pre- to post-intervention. Following are results:</p> <ul style="list-style-type: none"> • Retention: 49% (29 participants) completed the program. • Diet Quality: 86% of participants showed improvement in one or more diet quality indicators (i.e., eating fruits, vegetables, red and orange vegetables, dark green vegetables, drinking less regular soda (not diet), drinking less fruit punch, fruit drinks, sweet tea, or sports drinks, and cooking dinner at home). • Physical Activity: 71% of participants showed improvement in one or more physical activity behaviors (i.e., exercising for at least 30 minutes, doing workouts to build and strengthen muscles, or making small changes to be more active). • Food Safety: 71% of participants showed improvement in one or more food safety practices (i.e., washing hands before preparing food, washing all items and surfaces after cutting raw meat or seafood, not thawing frozen food at room temperature, or using a meat thermometer). • Food Security: 43% of participants showed improvement in one or more food security indicators (i.e., not eating less than you wanted, so there was more food for your family or having enough money to get food for your family). 	
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		<ul style="list-style-type: none"> • Food Resource Management: 71% of participants showed improvement in one or more food resource management practices (i.e., cook dinner at home, compare food prices, plan meals before shopping, look in refrigerator or cupboard before shopping, or make a list before shopping). <p>Additionally, the <i>“Eat Healthy Be Active” Facebook page</i> had a total reach of 3,914 people and 406 likes. This social media page is primarily targeted to Healthy Eating on a Budget program participants with the aim of reinforcing positive dietary and physical activity behaviors.</p> <p>2) SNAP Into Farm Fresh Foods promoted healthier food retail through supporting policy, systems, and environmental changes consisted of providing technical assistance to farmers market managers, promoting National Farmers Market Week with a social media campaign, and staffing a SNAP central terminal booth at three farmers markets in Clark County.</p> <p><i>SNAP Into Farm Fresh Foods indirect education</i> was provided to 617 SNAP-eligible participants through nutrition education booths at eight farmers markets and three Wellness Wednesday events and farmers market booth giveaways, at three markets in Clark County. Direct education was provided to 78 SNAP-eligible adults before the COVID-19 shutdown. Because the educational sessions are one-time lessons, participants are followed up with a post-evaluation 6 months later to determine if desired behavioral changes persist.</p> <ul style="list-style-type: none"> • Healthy Eating: 52% of participants showed improvement in one or more diet quality indicators (eating fruits and/or vegetables more often); 46% reported intentions or set goals to eat fruit or vegetables more often each day • Food Resource Management: 37% of participants showed improvement in one or more food resource management practices (shopped more often at farmers markets, shopped more often for fruits and vegetables); only 5% reported intentions or set goals to buy fruits and vegetables using Double Up Food Bucks (a SNAP nutrition incentive program) • Physical Activity and Reduced Sedentary Behavior: 42% of participants showed improvement in physical activity behaviors (amount of 1-hour or more physically active 	
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		<p>days in 1 week); 49% reported intentions to set goals to increase physical activity and leisure sport.</p> <p>3) Food Preservation Program: Master Food Preserver course: Twenty-nine people completed the virtual series from start to finish. The course was seven weeks long, with bi-weekly 3-hour long lessons; 14 became certified and another 15 received a Certificate of Completion. Participants reported high knowledge gains and high interest in the topic after taking a class. The Certified Master Food Preservers provided technical assistance, resources, and hands-on training emphasizing USDA food-safety guidelines. Despite COVID-19, the program reached 1,049 contacts with the public and provided 10 face-to-face workshops to the community.</p> <p>Other activities were numerous and include presentations at associations and meetings, including a presentation on Early Childhood Garden-Based Nutrition Program at a Farm to Summer meeting and virtual presentation for the Child and Adult Care Food Program. Twelve monthly Fitness Minute segments focused on fitness and nutrition were filmed and aired on local TV receiving 381 views. Publications included newsletters to professionals and peer-reviewed Extension publications. Faculty also served as preceptors for dietetic interns in partnerships with the UNLV Department of Kinesiology & Nutrition Sciences and hosted undergraduate student interns from institutions of higher education.</p> <p>In total, these activities reached 1,248 people, with 5,072 indirect contacts and 1,709 direct contacts to adults. As these activities illustrate, UNR Extension engaged with and supported individuals, communities, businesses, government, and educational institutions to improve the food system.</p>	
27.	Healthy Aging	<p>In Nevada, older adults are the fastest growing population. Aging trends indicate this population consists of three generations: Pre-retirement (ages 50-64), retirement qualified (ages 65-84) and oldest (85 and older). Over 16% of Nevada's population are older adults, primarily ages 55 to 84 (95%). Nevada's older adult population is anticipated to increase by 36% over the next 10 years. Urban areas, such as Clark (Las Vegas) and Washoe (Reno) counties have the largest older Nevadan population (consistent with these counties also having the highest population base throughout the state). Nye County, a small county just outside Clark, has the largest population of older Nevadans when compared to the other remaining frontier and rural counties.</p>	Health, Nutrition & Food Safety

		<p>The number of older adults in Nevada that were told they had COPD, diabetes, pre-diabetes, hypertension, and cardiovascular and heart disease was more than twice compared to the overall U.S. adult population. Nationally, Nevada has the third highest growth rate of Alzheimer’s disease (64%), currently found in 1:9 people of those over the age of 65. Older adults in Nevada also have higher inactivity rates. One in seven older Nevadans ages 60 years and older (15%) are food insecure, and 8% of older Nevadan’s (ages 65 and older) live 100% below the poverty line. Risk factors for older adult poor health are attributable to food insecurity, poverty, lack of reliable social support and transportation, low fixed incomes, and disability or functional limitations, all of which are prevalent in Nevada. A nutritious diet, physical activity, social engagement, and mentally stimulating pursuits have all been associated with helping people stay healthy as they age.</p> <p>Healthy Aging is a statewide strategy that addresses health in older adults through nutrition, physical activity, maintained independence of Activities of Daily Living (ADLs), and fall prevention. Using a variety of approaches including direct education, policy, multi-level systems, environmental changes (PSE) and community partnerships, public health changes are implemented in both residential and community senior centers to promote access and opportunities for healthy living. To address healthy aging, Nevada implemented two statewide programs both targeting older adults in Nevada (ages 50 and older).</p> <p>Stay Strong, Stay Healthy (SSSH) is an evidence-based exercise program for older and sedentary aged adults. The program provides sixteen lessons over an eight-week period. The program provides older adults with access to a safe, structured, and effective exercise program capable of building muscle and increasing bone density, thus decreasing frailty, osteoporosis, and the risk of falls. SSSH helps participants meet the CDC 2018 physical activity guidelines for Americans, which call for strengthening activities that work all major muscle groups at least two days a week combined with aerobic activities. Classes are led by a certified instructor.</p> <p>Seniors Eating Well (SEW), a health and nutrition education program, designed to meet the needs of older adults and address food insecurity amongst these individuals. SEW increases healthy food consumption through education, healthy food demonstrations, and healthy recipes. There are nine, 45-minute lessons that address management of chronic conditions, promotion of MyPlate and planning of nutritious meals, evaluation of dietary supplements, shopping on a budget, and increasing physical activity.</p>	
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		<p>Extension provided direct education to 302 seniors through these programs across 7 sites in 3 counties and 4 virtual class series (via Zoom). Healthy Aging collaborated with Extension strategies (Healthy Food Systems, Garden Nutrition, Healthy Living Sustainable Recovery, Food Preservation) for a virtual Guest Lecture series on health and nutrition. Statewide SSSH training and certification was conducted for 28 new instructors in Clark and Lyon County.</p> <p>For Stay Strong, Stay Healthy, 65% of participants improved in Chair Stands (lower body strength and endurance), 60% improved in Sit-and-Reach (lower body flexibility), 88% improved in 8 Foot Up-and-Go (balance and agility), 60% improved in Back Scratch (upper body flexibility) and 50% improved in Progressive Balance. For Seniors Eating Well, respondents demonstrated significant improvement in all areas including 80% improved dietary quality choices ($p < .001$); 72% improved dietary behavior patterns ($p < .000$); 59% reported less cooking barriers ($p < .001$); 90% improved healthy food preparation ($p < .001$); 70% reported higher cooking confidence ($p < .000$); and 67% improved food resource management ($p < .002$).</p> <p>Finally, as part of a joint effort between the UNR School of Medicine's Sanford Center for Aging and Extension a partnership was developed around food insecurity and providing services to seniors during COVID-19 with the Governor's Rapid Response Teams: Nevada Care Connection (Nevada CAN) and the Food & Medication Action Team (FMAT). Through this joint partnership, Extension nutrition education outreach opportunities were linked with the Nevada COVID-19 Aging Network (NV CAN) action teams for food and medication distribution and social engagement. Extension faculty participated on both teams and multiple committees.</p> <p>The pandemic outbreak hit Nevada's seniors very hard, furthering isolation and loneliness for home-bound seniors. Since seniors are extremely vulnerable to the pandemic outbreak, many nutrition education providers shifted to congregate meal drive-thru's, meals-on-wheels, food commodities, and food bank deliveries. To complement these food delivery services Extension developed newsletters accompanied food deliveries reaching over 2,000 seniors each month. Newsletters included recipes, physical activities, and other health tips. Alternate outreach supports were also provided such as garden home grow kits, online virtual lessons, and curriculum delivery. It is anticipated that older adults will continue to sheltering-place for a very long time therefore, suitable program delivery continues to be a high priority.</p> <p>Healthy aging in an effective statewide strategy that increases strength, coordination, balance, healthy food consumption, and food resource management among seniors, which are critical to</p>	
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		aging population mortality and independent living (associated ADLs). 14,095 adults were reached through indirect extension methods and 415 via direct extension methods. Through our work, Extension increases the social and physical health and well-being of older adults in Nevada (rural and urban) reducing the financial burden of the overall health care system (including Medicare and Medicaid).	
28.	Veggies for Seniors	<p>In Nevada, older adults are the fastest growing population. The 2015 U.S. Census Bureau reports 16% of Nevada’s population are older adults, primarily ages 55 to 84 (95%). The number of older adults in Nevada that were told they had COPD, diabetes, pre-diabetes, hypertension and cardiovascular and heart disease was more than twice compared to the overall U.S. adult population. Risk factors for older adult poor health are attributable to food insecurity, poverty, lack of reliable social support and transportation, low fixed incomes, and disability or functional limitations, all of which are prevalent in Nevada. Similarly, food insecurity is a strong predictor of poor health and disease, such as heart disease, stroke, lung disease, and diabetes. In 2015, 8% of older Nevadans (ages 65 and older) lived below 100% poverty, which is slightly lower than the U.S. rate of 9%. An additional 10% of older Nevadans lived between 100 to 149% poverty. A nutritious diet, physical activity, social engagement, and mentally stimulating pursuits have all been associated with helping people stay healthy as they age. Furthermore, discussions with the Walker River Tribe, Pyramid Lake Tribe and Duck Valley Tribe confirmed that overall health and nutrition for seniors was one of the reservation priorities.</p> <p>The Veggies for Seniors program was created in 2010 after there was a need identified in Mineral County that senior citizen access to fresh fruits and vegetables was limited. As part of the program, all produce from the school garden combined with purchased produce from local growers is distributed. This program works with Mineral County Senior Center and the Mt. Grant General Hospital in-home health program providers to deliver fruits and vegetables and educational information to local residents. This program also served the Walker River reservation and the Pyramid Lake reservation. The target audience is seniors 65 years and older.</p> <p>The Veggies for Seniors Program provided fresh fruits and vegetables, recipes and education to 141 seniors. There was a 40% response rate (N= 56) on returned program evaluations. Seniors reported that participation in the program had increased their intake of fruits and vegetables intake to 1-2 times per week (11%) and by 3-5 times a week (21%). Seventy-four percent</p>	Health, Nutrition & Food Safety

		<p>participate in the program because they strongly believe it improves their health, and 66% strongly believe it improves their quality of life. Eighty percent strongly agree that the program increases their access to fresh fruits and vegetables. Seventy-five percent of seniors participated in the program to increase their knowledge on how to prepare fruits and vegetables. Results indicate that the program contributes to health aging among Nevada's seniors.</p>	
<p>29.</p>	<p>Healthy Living Sustainable Recovery</p>	<p>In most substance abuse treatment programs, women make up more than half of the clients treated for methamphetamine. One study indicates that five times the percentage of females than males attributed initial meth use to a desire to lose weight and more females than males reported using meth as a way to get more energy. While Nevada ranks 4th for methamphetamine/amphetamine treatment admissions and drug overdose mortality rate in the United States, meth remains the most prevalent substance of abuse among incarcerated women and is higher among females arrested than males. There is an ongoing need for treatment professionals to augment health and body image curriculum with traditional treatment for women in substance abuse and mental health recovery settings. Extension faculty research shows higher rates of obesity, eating pathologies, body dissatisfaction, preoccupation with body shape and binge eating among incarcerated females as compared to non-incarcerated females. They also utilized unhealthy dieting practices and illicit drug use for losing weight at a higher rate than their community comparisons. A team approach among allied health professionals directed at health intervention and body image/eating disorder screens and interventions appears warranted in this population.</p> <p>Healthy Living Sustainable Recovery (HLSR) is an evidence-based, gender-responsive health, nutrition and body image program designed to augment existing broad-based drug prevention and community education programs for women and girls under correctional supervision for amphetamine, opioid, and other illegal drug use. Healthy lifestyles are taught to improve recovery, help rebuild healthy families, as well as provide a healthy approach to weight loss and desire for increased energy -- one of the primary reasons women use drugs. The companion, Health Steps to Freedom, curriculum focuses on exercise and nutrition; weight bearing exercise and calcium intake to rebuild muscles and bone loss; MyPlate, family meal planning and healthy eating patterns for mothers and young families; and educational programs which address body dissatisfaction, eating pathologies and other poor lifestyle practices. Food demonstrations and garden education efforts empower women to grow their own affordable, nutrient dense food,</p>	<p>Health, Nutrition & Food Safety</p>

		<p>increase fruit and vegetable consumption, develop healthy habits, and learn marketable job skills. Professional development UNR credit course are offered to clinical providers and counselors to obtain licensing credit for completion of the Enhanced Professional Learning Series. This course addresses gender-responsive education around health issues linked to substance use disorders and promoting the implementation of HLSR in treatment centers and correction settings.</p> <p>In Nevada, HLSR was taught to 318 participants through 21 program sessions at residential treatment facilities, a women’s correctional center, and a conservation camp for female offenders. 137 people completed the 12-week/90 min program and 181 partially completed the program. In addition, Extension conducted 42 fitness assessments and implemented several policy, systems, and environmental change (PSE) approaches. PSE strategies included environmental scans to determine nutrition and physical activities barriers, physical activities – such as a volleyball tournament wellness event, implementation of nutrition gardens, and healthy parenting alternatives for those with young children. Extension faculty also conducted nutrition, physical activity and body dissatisfaction workshops reaching 26 women connected with a local non-profit.</p> <p>After participating in the program, participants demonstrated significant improvements in healthy behaviors ($p < .007$), improved physical activity ($p < .001$), but not decreased sitting ($p = .666$). Women also show improvement in reliance on internal hunger and satiety cues that determine when and how much to eat ($p < .015$). While improvements were not statistically significant women showed positive changes in binge eating attitudes ($p < .367$) and self-reported “ideal weight” that was higher at post-test than pre-test ($p < .060$). The latter indicates that clients learned the ability to perceive a more realistic weight goal. Measurement of perceived body image also improved but was not statistically different from pre-test levels ($p < .403$).</p> <p>To support delivery and expansion of the program, HLSR provides professional development and UNR credit course for clinical providers and counselors to obtain licensing credit for completion of the Enhanced Professional Learning Series (4 sessions). Professional development (UNR credit classes) and HSF instructor training is offered through the Center for Application of Substance Abuse Treatment (CASAT) and the national Addiction Technology Transfer Center (ATTC Network) for clinical directors, prison staff and treatment providers across 15 states to understand gender-responsive, health-related treatment issues and promote the facilitation of</p>	
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		<p>HSF in their facilities. In total, 96 people were reached through these efforts for a total of 324 contacts.</p> <p>As a result of the partnerships built, Extension faculty founded a Women’s Sustainable Recovery (WSR) Coalition, which advocates a sustainable recovery for women through a network of providers and resources to help women sustain recovery and restore their lives. The coalition will educate participating agencies, promote gender-responsive work plans, provide opportunities to network and apply for external funding collaboratively.</p> <p>Taken together, over 448 adults received educational programming through direct extension methods; and 2,710 adults through indirect extension methods.</p> <p>Prior to implementation of HLSR, there were few programs developed and implemented, but none monitored, evaluated or published using evidenced-based practice. HLSR has led to an increased focus on teaching gender-responsive education around health issues linked to substance use disorders and promoting the implementation of HLSR in treatment centers and correction settings. The value of this program is decrease recidivism for women in prison, jail and inpatient/outpatient treatment programs suffering from substance use disorder (SUD) reducing the financial burden of Nevada’s overall health care system, foster care system and mortality of women and young mothers from SUD.</p>	
30.	EFNEP	<p>Food insecurity exists when the availability of nutritious and safe foods OR the ability to acquire those foods is limited or uncertain. Food insecurity exists in every county and congressional district in the country. The national average is approximately 12.3% of people are food insecure. That rate is higher for children than adults as households with children are more likely to be food insecure than those without children. The state of Nevada and Clark County have slightly higher rates of food insecurity than the national average. In 2016, 12.7% of Nevada residents and 12.8% of residents of Clark County were food insecure. In Clark County that amounted to about 264,000 people.</p> <p>There are several serious consequences to food insecurity. Food insecurity may reflect a household’s need to make trade-offs between important basic needs, such as housing or medical bills, and purchasing nutritionally adequate foods. In order to make their dollars stretch, many opted to purchase unhealthy cheap food or to water down food or drinks or sell personal property to eat. Food insecurity has significant effects on children’s development. The</p>	Health, Nutrition & Food Safety

		<p>most common issue for food insecure children is the increased risk of iron deficiency anemia leading to poor developmental outcomes. Food insecurity in children also increases anxiety, depression, binge eating, and food hoarding. Finally, food insecure children have higher levels of aggression and behavioral problems than food secure children.</p> <p>EFNEP is a nutrition education program that serves low-income audiences with the priority being families with young children (parents and other caregivers with primary responsibility for feeding young children). The EFNEP program uses paraprofessionals to deliver education on diet quality and physical activity, food resource management, food safety, and food security. Participants learn how to read food labels, save money on groceries, plan meals, safely handle food, make healthy food choices, and be more active.</p> <p>In Nevada, EFNEP uses the evidence based curriculum Eating Smart, Be Active. There are 8 lessons taught 2 times a week for 4 weeks. The eight core lessons of the curriculum include the latest, research-based information from the Dietary Guidelines for Americans, MyPlate, and the Physical Activity Guidelines for Americans. The lessons address topics about: Physical activity; nutrition and healthy lifestyle choices; food preparation (cooking) and food resource management (saving money at the grocery store); eating a variety of healthy foods from all of the food groups; food safety; reducing fat, sugar and salt; and feeding children. The lessons contain a variety of hands-on activities to reinforce learning and allow participants to apply the newly learned information. Every lesson includes a food preparation activity with participants actively involved in preparing a low-cost, healthy, and tasty recipe. Additionally, all lessons except the first lesson include a 10 to 15 minute segment where the educator leads the participants in physical activity.</p> <p>EFNEP conducted 36 sessions of the Eat Smart, Be Active curriculum reaching 325 adults. Each session is 90 minutes twice a week for 4 weeks. Results from pre and post surveys indicate that 92% improved at least one behavior related to diet quality, 85% improved physical activity behaviors, and 84% improved food safety behaviors.</p> <p>The long-term goals of EFNEP are to improve diet quality, physical activity, and food security within insecure food populations to reduce the risk of negative physical and mental health problems among Nevada’s youth and adults.</p>	
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31.	Application of bacteriophages on contaminated beef trimmings to reduce E. coli in ground beef	<p>Research has suggested that the incidence of Salmonella in ground beef may be associated with contaminated lymph nodes that are not removed from trimmings destined for grinding. In this study, we tested the application of bacteriophages and peroxyacetic acid solutions on trimmings and on coarse and fine ground beef to simulate different scenarios of contamination.</p> <p>This research provided support documentation to the FDA to extend GRAS status for bacteriophages as processing aids against all adulterant diarrhea causing E. coli.</p>	Health, Nutrition and Food Safety
32.	Nevada Economic Assessment Project (NEAP)	<p>Public Lands encompass nearly 87 percent of Nevada’s land mass. These lands are managed by the Federal Government (Bureau of Land Management, Forest Service and Department of Defense) and land decisions can have a significant impact on economic development opportunities for communities of all sizes. Currently Nevada, and its 17 counties, do not have adequate or timely analytical tools or programs established to comprehensively respond to economic development and public land policy decisions. This makes Nevada vulnerable to land management decisions that can have significant long-term economic development impacts on communities and the overall state.</p> <p>Extension in partnership with the University Center for Economic Development established the Nevada Economic Assessment Project (NEAP). The goal of this program is to develop a comprehensive data repository of each county’s quantitative and qualitative baseline data to be used to assess local planning and economic development initiatives. The program also provides individual counties with economic impact assessment models to analyze industries and activities associated with policy decisions. As such, the target audience for this program is local, state, and federal decision makers, industry and business leaders, and the general public. This program is a collaboration between the College, Extension, Experiment Station, Bureau of Land Management (BLM), US Forest Service (FS), USDA Rural Development, and Nevada Association of Counties (NACO). Extension is the lead agency for developing, delivering, and measuring impact for the statewide NEAP program.</p> <p>Activities included:</p> <ul style="list-style-type: none"> • Lead the program advisory NEAP team including representatives from the College, Extension, Experiment Station, BLM, FS, USDA Rural Development, and NACO. 	Community and Economic Development

		<ul style="list-style-type: none"> • Setup a systematic approach to developing a comprehensive socioeconomic database for Nevada’s 17 counties. • Populated database for all counties and baseline analysis published for 13 counties in technical reports and 58 infographic fact sheets. • Developed economic impact models (IMPLAN) for all 17 counties. • Developed 30 press releases and a series of 12 county and state presentations to commissioners, community groups, agencies, and stakeholders. Invited presentations at regional BLM and Forest Service manager meetings on how NEAP is impacting Nevada counties and assisting with public land policy decisions. • Developed a NEAP website, with county webpages. Each webpage provides a county cultural overview, timeline of county interactions with presentations, all technical reports and infographic fact sheets, and special technical industry/policy impact assessment reports. The website is: https://extension.unr.edu/neap/default.aspx • Developed a statewide NEAP sustainability plan. • Secured \$410,000 from BLM and FS in support of the program. <p>The effectiveness of NEAP is evaluated using the following metrics: Are counties working better with land agencies and organizations with land use planning? How counties use program outputs for land use and economic development planning? And, do quantity and quality of jobs change?</p> <p>Two examples of NEAP implementation are provided below:</p> <p>HUMBOLDT COUNTY – NEAP was used to conduct a comprehensive Socioeconomic Economic Impact Assessment for a proposed new lithium mine, lithium processing plant, and sulfuric acid manufacturing plant in Humboldt County, Nevada.</p> <p>In 2020, through an extensive permitting process, Nevada Lithium was approved for all their federal mining and processing permits, meaning this operation will become reality and a major industry for Nevada. The NEAP program helped provide key analysis for the socioeconomic impact of the total operation on Humboldt County and the State of Nevada. The NEAP program</p>	
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		<p>has also helped Humboldt County identify and begin planning for substantial changes and challenges that come with new industries. For example, during NEAP educational sessions with county departments, it was identified that this industry will bring upwards of 500 new jobs and approximately 1,200 new residents that will put pressures on housing, schools, and government services. The results of these sessions, and engaging the primary business Nevada Lithium, Humboldt County is working with housing developers to add inventory, Nevada Lithium has agreed to contribute up to \$20 million for a new or upgrade to school facilities, and the basic infrastructure capacity and demands are being closely monitored to make sure the county can meet the needs of the business and citizens. The NEAP baseline data and analytical tools have helped guide the county through this process.</p> <p><i>"My expectations of the NEAP program were mixed...I was blown away and I was thrilled with the process and depth of the analytical tools that I use everyday. This is one of the best programs that I have experienced and has helped the county and region better understand our current baseline and how it will be impacted with addition of Nevada Lithium to our county." - Economic Development Officer for the Northeastern Nevada Regional Development Authority</i></p> <p>LINCOLN COUNTY – NEAP was used to provide technical assistance for local government and small emerging businesses to understand the economic and business feasibility for expanding outdoor recreation opportunities. The program identified the potential impacts and opportunities of expanding outdoor Mountain Biking tourism for the City of Caliente and provide timely education to enable businesses to succeed at servicing these new opportunities for greater economic development and sustainability.</p> <p>In 2020, since the release of the technical report, Lincoln County and Bureau of Land Management have been working together to minimize environmental impacts and maximize economic and social impacts. Through this partnership and using available land assets, both entities have worked together to construct 40 miles of mountain biking trails that were completed in 2020. In 2019 the NEAP program conducted a business entrepreneurship workshop that resulted in the opening of a new bike repair and sales shop and expanded the local diner to meet increased visitor demand. In 2020, these operation are continuing and have added to the business economic base of the city.</p>	
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		<p><i>"We are really impressed that the data and analytical tools are county-specific. The availability of the baseline data is needed to determine impacts, and how to quantify them."</i> - Executive Director for the Lincoln County Regional Development Authority</p> <p>The NEAP reached 1,000 adults through direct extension methods such as demonstrations, educational classes, and workshops. 50 additional people were reached through newsletters, popular publications and the website. As a result, counties are able to use data and economic models for assessment, decision making and planning; thereby, supporting the economic growth and development of Nevada's industries.</p>	
33.	Business Development	<p>Economic and business development is a strategic priority in Nevada. Clark County represents over 73 percent of the state's total population and approximately 70 percent of total business licensees. According to the United States Small Business Administration (SBA), small businesses (500 employees or less) represent 99.7% of all employer enterprises. Since 1995, small businesses have generated 64 percent of the new jobs and paid 44 percent of the total United States private payroll.</p> <p>The current landscape of business education and counseling programs in Clark County are fragmented, with only a handful of organizations providing any consistent education and counseling to the business community. Collaborations and partnerships are needed to better serve the technical and educational needs of Clark County businesses.</p> <p>In response to the COVID-19 pandemic, most businesses were forced to shut down. In such an unprecedented crisis, business owners found it difficult to track mandates that affected their income and livelihood. Information on crucial topics like forgivable loans (PPP) and reopening procedures was continually updated at higher levels and then distributed online through separate channels. Although this assistance was available for small business owners and vital to the businesses staying afloat, the information was hard to track. Often, when the information was found, there were still frequently asked, specific questions that professionals could only answer. In addition to adapting to new policies, a new need appeared on managing the business's everyday aspects during abnormal times. Communication with banks and the government became vital to receiving support, which meant recordkeeping received a renewed importance. Similarly, the overall response to COVID-19 affected small business aspects, ranging from marketing to business credit to taxes.</p>	Community and Economic Development

		<p>Before COVID-19, the Business Development program partnered with the University of Nevada, Las Vegas (UNLV) to deliver small business educational workshops to new and existing small businesses. Workshops were presented weekly face-to-face and via webinar in both English and Spanish. The focus of the workshops included marketing, taxes, customer service, sales, etc. All individual small business counseling is provided by UNLV Small Business Development Counselors from the referral of Business Development team of instructors.</p> <p>During the pandemic, Extension’s Business Development Program shifted in terms of delivery model and content. The new virtual program is entitled “Coping with COVID-19: Small Business Educational Town Halls and Classes” and included weekly virtual town halls and classes in English and Spanish that provided small business owners an open forum to ask panelists questions. Every week, participants from all over Nevada attended a themed webinar conducted by Extension's business development instructors and co-hosted by guest practitioners invited from partner organizations. Some topics included: Business counseling, filing taxes, applying for county small business grant program, forgivable loans and paycheck protection programs, and delivering value to customers. Townhalls were streamed through Facebook live and available for small business owners to view anytime. A website was created that included general information, town hall and class offerings, resource information or government and state programs, and resource partners. See https://extension.unr.edu/program.aspx?ID=181</p> <p>A total of 30 English and 30 Spanish virtual town halls were offered and 21 in-person and virtual classes in English and Spanish. Pre-pandemic, approximately 50 small businesses participated in classes. Post-pandemic the class size increased to 152 small businesses (+204%). In total over 550 small businesses participated in the program (virtual or in-person); and data shows that town halls and classes are accessed on an average of 6,219 times during a given month. There were 43,538 views of town halls and classes through Facebook live and an average of 228 likes monthly on Facebook.</p> <p>Business and Resource Partners Testimonials:</p> <ul style="list-style-type: none"> • “Extension has stepped to the plate to assist small businesses through these difficult times. Your program is making a difference for so many of our small businesses in Nevada.” – Resource Partner 	
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		<ul style="list-style-type: none"> • “Extension has been a vital component in making information available to the public, in general, the teachings regarding the City of North Las Vegas Small Business Stabilization Program.” - Resource Partner • “I appreciate the efforts Extension and the panelists put into making the town halls and classes an excellent learning experience. This has really helped my business stay above water during these difficult times. Thank you for the opportunity to attend, learn, and network. Looking forward to the next town hall!” – Business Owner • “Again-thank you all! I feel very supported! Please keep these very valuable town halls and classes going!” – Business Owner • “Today was a great town hall guys. So informative and relevant.” – Business Owner • “Thank you for offering your collective talent and teaching to the public in this excellent presentation.” – Business Owner <p>This program helped small businesses develop strong relationships with resource partners and remain resilient during the pandemic.</p>	
34.	Rural Health Works	<p>With current interest in healthcare and potential changes in healthcare policy, the relationship of the healthcare sector to other economic sectors in the state and local economy are of interest. Good healthcare sectors are essential for industrial development and recruitment of the retirement population. In addition, information as to feasibility and impacts of expanded or new healthcare facilities is of interest to local decision makers.</p> <p>Nevada Rural Health Works is designed to help provide Nevada decision makers and populace with economic information concerning the importance of their local health care sector, as well as future trends in healthcare. Upon request faculty complete feasibility studies as to expansion of healthcare facilities and equipment, and provide information as to potential impacts to local healthcare sector from changes in federal government health care policies.</p> <p>For this year, Extension faculty assisted in completion of a project requested by Nevada Assembly to investigate feasibility of assisted living facilities in rural Nevada. As a result of this work, county authorities have become aware of the importance of health care sector for their local economy and in fulfilling economic development plans. The Nevada Assembly study on the feasibility of assisted living facilities showed the difficulties of sparse populations in rural Nevada</p>	Community and Economic Development

		in having financially feasible assisted living facilities. The long-term goal of this program is to support decision-making that promotes access to healthcare and that strengthens local economies.	
35.	Leadership and Organizational Development	<p>Government and non-profit organizations need to expand their capacity to create safe and productive communities. The government and non-profit sectors face challenges in addressing new critical issues, developing effective policies, adapting communications strategies, improving volunteer recruitment, using technology effectively, collaborating with community partners, and managing resources efficiently. Capacity building strengthens an organization’s ability to fulfill its mission, develop goals, achieve measurable and sustainable results, and have a positive impact on places where people live, work, play, and learn.</p> <p>Extension is frequently called upon to help build the capacity of government and non-profit agencies. For example, Extension faculty facilitated the collaborative planning process among seven counties and federal entities to create the final Comprehensive Economic Development Strategy (EDS) document. The Western Nevada Development District (WNDD) is comprised of seven counties in Western Nevada and is responsible for updating their regional Comprehensive Economic Development Strategy (CEDS) to receive federal funding for economic development projects in the region. WNDD is the only development district in Nevada (i.e., a federal Economic Development Authority) and hence able to access federal dollars for projects across the region. The CEDS was completed with participation and engagement from all the seven counties and associate members. A completed CEDS that meets all the federal guidelines and mandates allows seven counties across Western Nevada to apply for and receive federal funding to implement identified needed projects in their counties.</p> <p>Extension faculty also developed and lead facilitator training workshops for various entities such as the Douglas County Chamber of Commerce and Nevada Collaborative Conservative Network – a state-wide effort to build a network to promote, support, and coordinate locally led conservation efforts.</p> <p>Additionally, Extension leads a program called the Non-profit Evaluation Training and Technical Assistance (NETTA). The goal is to <i>increase the capacity of non-profits to engage in program evaluation</i>. The NETTA program is conducted through partnerships between non-profits in northern Nevada and Extension. The NETTA program has three components: 1) Evaluation training for non-profits; 2) Individualized evaluation technical assistance to select non-profits;</p>	Community and Economic Development

		<p>and 3) Providing low-cost evaluation (provided by UNR doctoral students) to select non-profits. During the year, Extension selected ten non-profits for the first workshop. The workshop was a success, receiving strong evaluations. In the evaluation process all participants asked for individual follow-up assistance. Over 90% of the workshop participants reported support for the NETTA program. 100% indicated that the workshop was very useful. Qualitative comments indicating that the hands-on work with the individual consultants was the most helpful aspect of the program. Because of the hands-on nature of the workshops, the second two workshops were postponed until COVID-19 is under control. Extension has also been providing ongoing evaluation technical assistance to Awaken, a community non-profit dedicated to working with sex trafficking in Nevada. Four outreach activities, including ongoing SWOT (strengths, weaknesses, opportunities, and threats) analysis have been conducted. Through the evaluation technical assistance Extension is teaching Awaken staff how to better utilize data.</p> <p>Additionally, Extension faculty led a strategic planning process for the Nevada Native Seed partnership which is comprised of 13 agencies and entities in Nevada.</p> <p>Over 139 adults from different organizations and agencies benefited from Extension’s organizational development and capacity building efforts. These activities play a critical role in strengthening communities.</p>	
36.	Let’s Discover STEM	<p>Early exposure to STEM (Science, Technology, Engineering and Math)—whether in school or at home—supports children’s overall academic growth, develops early critical thinking and reasoning skills, and enhances later interest in STEM study and careers. In Nevada, far too many children are not ready for kindergarten and the vast majority of children reach Grade 4 lacking key science and math skills and knowledge (National Assessment for Educational Progress, 2019). Latino children are particularly at risk for not developing strong STEM skills and attitudes. Nevada Latino 4th graders fall behind their white counterparts in both math and science. As adults, Latinos are underrepresented in STEM professions. Researchers and educators have documented the value of creating stronger home-school connections for children’s educational growth and success. Involving parents encourages them to take an active role in creating a positive and safe environment at home for exploration and discovery, as well as supporting children’s learning at school.</p>	Children, Youth, & Families

		<p>The primary purpose of Let's Discover STEM is to increase young, Latino children's interest, knowledge, and engagement in STEM activities, and to encourage and teach Spanish-speaking parents to be positive forces for their children's early STEM learning as they enter and progress through school. The program was implemented in targeted neighborhoods in two urban cities in Nevada (Reno and Las Vegas) that contain several high risk elementary schools. The target audience for this program is Latino children 3-6 years of age and their parents. The program includes a series of 7 workshops. 21 program series were offered at various locations, including libraries, Title 1 schools, and community centers, as well as virtually. 215 adults and 220 children participated in the program. As a result of COVID-19, the team created 50 virtual STEM parenting workshops (one-time) that were attended by 309 families and 178 watched the recorded workshops later. Additionally, 41 STEM Youtube videos were produced and watched by 584 individuals; 48 Facebook posts and 193 Instagram posts reached 2732 individuals. Parents who participated in the program reported increased confidence teaching STEM skills to their children, belief their children could learn from them, and feeling prepared to help their children learn on pre- and post-test measures ($p < .001$ on all outcomes). Parents also reported significant gains in their children's emerging STEM skills (e.g., count 1-10, recognize shapes, recognize numbers, compare objects to determine more or less, and measure length, weight, etc.) ($p < .001$ on each of the 16 skills). And, over 97% of parents reported that they felt the program increased both their own and their child's knowledge and interest in STEM. Long term, children will be prepared to succeed in STEM education and their parents will play an active role in fostering their children's STEM education as they enter and progress through school. Additionally, this program has the potential to reduce achievement gaps among Latino and other youth of color and prepare the next generation for STEM careers.</p>	
37.	Nevada 4-H Youth Development Program	<p>Nevada ranks 46th among the 50 states for children's well-being. Additionally, Nevada continually ranks in the bottom 5 within the United States for educational standards. In 2018, Nevada ranked last in the Chance for Success, which attempts to measure a state's capacity for helping young people succeed and 50th out of 51 states/District of Columbia in graduation rates (Education Week Research, 2018). This report also showed that only 41% of Nevada young adults (ages 18-24) are enrolled in post-secondary education or have a degree.</p>	Children, Youth, & Families

		<p>With a goal of ensuring every Nevada youth has the necessary knowledge, tools, and skills to lead a healthy and productive life, University of Nevada, Reno Extension’s 4-H Youth Development Program prepares the state’s youth for the future. By providing youth with a continuum of learning opportunities, resources and support through age 19, these programs have a vital impact on Nevada communities. The programs develop a capacity for academic success in youth, create workforce-ready young adults, reduce high-risk behaviors, engage and develop youth as current and future leaders, and so much more.</p> <p>4-H learning experiences are based on the principles and practices of positive youth development (PYD). The structured learning, encouragement, and adult mentoring that young people receive through their participation in 4-H plays a vital role in helping them achieve future life success. Nevada 4-H projects and programs allow youth to explore new worlds and gain new knowledge while growing their confidence, civic engagement, leadership skills, and sense of responsibility. Additionally, 4-H partners with over 100 different agencies and organizations in the delivery of 4-H programming and research-based content to young people. The most common partnering agency across the state is school districts.</p> <p>Even with the restrictions set forth by COVID-19, Nevada 4-H Youth Development continued to provide opportunities for youth to connect to their peers through virtual and in-person opportunities. Over the past year, Nevada 4-H Youth Development reached 49,804 youth, aged 5 to 18 years old through club-based, school-based, afterschool-based, camp-based, special interest-based, and video/web-based programming. There were 2,427 trained adult volunteers who worked with youth throughout the year. In 2020, 8% of the total youth enrollment was in club-based programming, 16% was through special interest/short term programs, 1% of was from camping programs (including overnight and day camps), the reach for school-based programming was 32% of the total participation, 10% was reached through after-school programming, less than 1% of the participation was through individual members, and finally, 32% of the 4-H participation was through video/web-based programming efforts. This was the largest increase in participation within the state 4-H program, which is contributed to the programming shift to virtual learning opportunities due to COVID-19 restrictions. Nevada 4-H Youth Development reached approximately 10% of the potential youth population (based on</p>	
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		<p>2010 US Census Data and NV State Department of Education School Enrollment). All 17 counties In Nevada reported 4-H youth and adult program participation.</p> <p>A few examples of successful programs that were offered include:</p> <ul style="list-style-type: none"> • Partnership with Moapa Valley Community Educational Advisory Board and county Parks & Recreation to support youth involved in online learning through training parents how the use the school district’s online platform, and establish homework help sessions three times a week. • Two counties implemented a family college readiness program for high school aged youth. All of the youth and families participating in these programs felt like they better understood what the higher education options available to them were. • Virtual, Day Camps, and “at-home” projects kits related to STEM education were offered in 5 counties. From these programs, 50% to 58% reported they would like a job in a STEM related field. An average of 50% of the youth said they learned something new about science and engineering in 4-H. They also reported wanting to learn more about topics on science and engineering. <p>In a statewide assessment of youth participating in Nevada 4-H Youth Development, all youth (grades 4 to 12) were asked about their 4-H experience and the youth who are grades 8 through 12 were asked a series of questions regarding universal life skills. The results showed that an overwhelming number of youth in the program felt that 4-H was a place where adults care about them (97%) and they feel safe (97%). The youth also felt that 4-H was a place that allowed them to figure things out for themselves (89%) and a place where it is okay to make mistakes (94%). Related to supporting youth with seeing possibilities, 90% of the respondents said that 4-H is a place that encourages them to plan for their future.</p> <p>The older youth (grades 8 through 12) reported finding it easy to speak in front of a group (78%), are comfortable being a leader (83%), and have learned to set goals for themselves (87%), plus can help others achieve their goals (88%).</p>	
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		<p>The statewide assessment included a question to all youth asking them what they liked best about 4-H. Some of the quotes from the youth include: “What I like about 4-H is how I can work with other kids and help others out”, “I like how involved we are with the community”, “Shooting sports that are not in a public schools limiting youth to have more success in life. I am offered a scholarship to shoot at Tickle College of Engineering part of University of Tennessee”, and “4-H is a place where you can be yourself and others are there to help you throughout it all. 4-H is a place where everyone accepts you and if you are new or shy, someone will be there to guide you and help you grow. 4-H is a place where you can learn about things that interest you at your own pace without the pressure and stress that comes along with school. 4-H is a place of acceptance, growth, and compassion.”</p> <p>Sixty-four percent of respondents (grades 8-12) said they wanted to go to college after high school; 12% indicated they wanted to go to trade school; 14% wanted to find a full-time job; 3% selected ‘join the military’; and 8% selected ‘other’. Of the youth selecting ‘go to college’ 30% are undecided as to the school they wish to attend; 33% want to attend a school outside of Nevada; 20% want to attend UNR; 9% want to attend Great Basin College; 3% want to attend UNLV; 2% want to attend Western Nevada College and 2% want to attend College of Southern Nevada. No respondents selected Truckee Meadows Community College or Nevada State College.</p> <p>As expected, 4-H youth thrive and show improved life skills development and academic achievement and motivation that support a successful transition to adulthood. 4-H brings great value to the Battle Born state, as more successful young people in communities result in greater tax revenues and consumer spending, and increases the likelihood that young people will stay in, or return to, their communities.</p>	
38.	Workforce Development	<p>Nevada employers indicate that the skills most deficient in the workforce are soft skills. These skills include employees showing up to work on time, working efficiently, and getting along with coworkers. Currently, the top requested skills for Nevada’s in-demand occupations are critical thinking, judgment and decision making, communicating to include speaking, active listening and persuasion, time management, complex problem solving, social perceptiveness, and service orientation.</p>	Children, Youth, & Families

		<p>The Workforce Development program is designed to provide youth ages 10-19 and adults with critical soft skills that are in demand by employers, transferable across industries, and can be used to help individuals succeed in work and daily life. Through interactive learning experiences Extension provides soft-skill development in the areas of communication, decision making, leadership, and critical thinking. Classes and workshops also focus on job readiness skills as well as career awareness and exploration to build confidence to pursue STEM education and careers. The sessions are administered to diverse populations, such as teens looking to obtain their first job, those at risk of dropping out of high school, and under resourced elementary and underrepresented middle school youth, especially girls. One of the primary objectives is to increase representation in fast growing, highly sought-after STEM careers. Extension staff also offer workshops and training for adults. These sessions are offered to organizations and businesses looking to enhance their employees' skills and improve job performance.</p> <p>The total number of participants in the program was 952 (502 youth and 450 adults). Participants showed improvement in the following areas as a result of participating in the program: Decision making, self-esteem, communication, taking direction, ability to work with others, understand how to turn a business idea into business plan and future career, awareness of job/careers in STEM, ability to fill out job application, construct a resume, interview, dress appropriately for work, and understanding how education relates to future careers. As evidenced by the results, this program helps individuals move beyond their current circumstances and contribute positively to a growing workforce and community.</p>	
39.	Youth Program Quality Assurance	<p>Traditionally youth quality assurance programs were done face-to-face, and the same content was taught to all youth regardless of age or learning ability. Nebraska Extension was the first to make an online quality assurance course, which served as the model for development of a national course.</p> <p>Livestock Specialists from across the Land Grant University system worked with the National Pork Board to develop a content map, curriculum, and evaluation tools for YQCA. All curriculum has been blind peer reviewed by University specialists and industry experts. By having an online course the youth can complete it at their convenience and they can have access to the content as much as they want/need until they understand the concepts. Additionally, the content is delivered in age appropriate modules and requires a passing score on a quiz to receive their completion certificate. YQCA will make quality assurance consistent across the country. It is also</p>	Children, Youth, & Families

		<p>very appealing to livestock show managers that require youth complete quality assurance prior to a show.</p> <p>The YQCA program is for youth ages 8 to 21 who raise/show a livestock animal that produces a consumable product (beef cattle, dairy cattle, pigs, sheep, goats (meat and dairy), market rabbits, poultry). A total of 300 Nevada youth completed the certification, and nationally 92,104 youth.</p> <p>Expected results from the program are:</p> <ol style="list-style-type: none"> 1. Ensure safety and well-being of animals produced by youth for showing and for 4-H and FFA projects. 2. Ensure a safe food supply to consumers. 3. Enhance the future of livestock industry by educating youth on these very important issues so they can become more informed producers, consumers, and/or employees in the agriculture and food industry. 4. Maximize the limited development time and budgets of state and national youth program leaders to provide an effective quality assurance program. 5. Offer livestock shows a valid, national quality assurance certification for youth livestock exhibitors. 	
39.	Workforce Preparedness for Early Childhood Professionals	<p>Interactions between young children and caregivers has been shown to be a key component of healthy cognitive and social development. Consistent, high-quality interactions with adults has been linked to executive function skills such as inhibition, working memory and cognitive flexibility. Therefore, training and coaching early childhood teachers to engage in responsive caregiving and to facilitate interactive learning experiences is essential to young children's growth and development.</p> <p>Workforce preparedness for early childhood professionals is designed to teach professionals workforce skills that are needed to improve the quality of child care in Nevada. This is accomplished through teaching informal education classes to early childhood directors, coaches, trainers and teachers, coaching teachers and directors, facilitating professional learning communities of practice, and developing research-based publications. Target audience for this</p>	Children, Youth, & Families

		<p>effort are early childhood professionals, directors of child care centers, and early childhood coaches and trainers.</p> <p>Classes included: 25-hour Adult Learning Academy for new trainers in collaboration with the Nevada Registry (1); CDA (Child Development Associate) (196 classes); In-person community early childhood training (31); Nevada READY! training for Pre-Kindergarten teachers (23); Internal QRIS (Quality Rating Improvement System) Coaching Academy (16); Leadership Community of Practice for Directors (7); Early Childhood Trainer Professional Learning Community (5); Adult Learning Academy for new trainers (2); and Coaching Community of Practice (1). These classes reached 1,016 adults with 6,227 contacts.</p> <p>Additionally, 19,747 certificates were issued to 7,589 early childhood professionals completing online training courses, including Recognizing and Reporting Child Abuse & Neglect; Sudden Infant Death Syndrome (SIDS); Signs & Symptoms of Illness with Blood-borne Pathogens; Wellness (Obesity, Nutrition & Physical Activity); Positive Guidance for Young Children; Early Child Development - Birth to Age 3; and Early Child Development Ages 3 to 5. These online training courses meet many of the required courses early childhood professionals must complete within 120 days of hire.</p> <p>Additionally, a book <i>“Lose the Lecture: Engaging Approaches to Early Childhood Professional Learning”</i> was published and 12 peer reviewed Extension fact sheets were created for the public on topics such as physical development and the brain and engagement strategies for physical development.</p> <p>Overall, results from pre- and post-test surveys and classroom observations indicate that as a result of participating in the workforce preparedness programs teachers showed positive changes in emotional behavioral support and support for learning, greater understanding of child development and how to care for infants and toddlers, and improved teaching practices in the areas of positive climate, teacher sensitivity, regard for child perspectives, behavior guidance, and facilitation of learning and development.</p> <p>In addition, 69 participants completed the CDA coursework and 68 applied to the Council for Professional Recognition for consideration in receiving the CDA credential. One individual chose not to apply. To date, 39 infant toddler teachers have received their CDA, and 29 are pending.</p>	
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		<p>Finally, participants attending the Leadership Community of Practice completed an online post-test survey. All 28 participants reported that they gained new knowledge and skills as a leader, felt more confident and motivated to do the work that they do as a leader, applied information and skills acquired in their work as a leader, and helped impact and contribute to programmatic and/or organization changes in their programs.</p> <p>As a result of this comprehensive program, it is expected that the quality of child care in Nevada is improved leading to healthy growth and development.</p>	
<p>41.</p>	<p>Just in Time Parenting</p>	<p>Today's parents are less likely to attend traditional parenting programs, prefer convenient or self-directed sources of information, are increasingly online, use mobile devices to access the internet, and increasingly use social media. Additionally, research indicates that younger and unmarried parents are more likely to use the internet for parenting information and younger, poorer, and less educated parents report getting more out of parenting websites than their counterparts.</p> <p>Electronic delivery of newsletters is a cost-effective way to reach parents. Just in Time Parenting (JITP) is a national project of leading land grant universities from across the country that brings high quality, research-based information to parents/caregivers of 0 to 5-year olds, parents-to-be, and professionals working with families. Just In Time Parenting is an electronic, age-paced newsletter covering topics such as pregnancy, parenting, child development, health and safety, nutrition and the prevention of childhood obesity, school readiness, and couples relationships timed with the child's age to provide critical information at just the right time for parents. The vision is to reach all parents – starting prenatally and continuing through early childhood – with the key information that can help their family thrive. Although information in JITP is derived from scientific studies, it is written in user-friendly language. Newsletters are currently available in English and Spanish (http://jitp.info).</p> <p>UNR Extension is part of this national effort. JITP reached 790 adults through direct extension methods in Nevada. An additional 13,160 adults are newsletter subscribers, 227 from Nevada. The 50,538 JITP website users had 221,917 page views. Users are from all over the world; the five countries with the most users are the United States (75%), United Kingdom (6%), Canada (2%), India (2%), and Australia (1%). The top five states with the most users are Wisconsin,</p>	<p>Children, Youth, & Families</p>

		<p>California, Illinois, Indiana and Texas. There are 430 JITP users in Nevada. 55% of JITP website users are JITP newsletter subscribers.</p> <p>Parents/caregivers with children 0-36 months all reported changed parenting practices (e.g., used the parenting tips in taking care of my baby, had more patience, used ideas to protect my child from accidents and injuries, used ideas to guide my child's healthy eating, etc.). The JITP newsletter was rated "very useful" more frequently than any other source on the list (67%). One user commented: <i>"I really appreciate the milestone markers that are included in each month's newsletter. It helps me know what to look for as I play with my child. The first year is HARD, but it has been really beneficial for me to read through the newsletter and see all the things my kid can do written out. It helps me celebrate these little steps that I wouldn't know to recognize otherwise. I also appreciate the example activities to do with your child. It helps to try something new!"</i></p> <p>Of the professional users, 31% of them shared JITP newsletters in a printed version with their families, 31% of them shared website links to newsletters with their families, and 31% of them encouraged families to subscribe to JITP. 53% of them reported that JITP newsletters are much more useful than other parenting/child development information they use. One professional commented: <i>"Love the PDF format that can be printed and given out. Great information. Looks professional. Includes pictures of children from many races. Address many aspects of development including socialization."</i></p> <p>It is expected that parents will learn and use the knowledge and skills highlighted in JITP to help their children grow into happy, healthy, well-functioning adults.</p>	
44.	Partners in Parenting	<p>Parents are the foundational developmental context for children. Children start building their knowledge about the world long before they reach school; thus the home environment has a strong effect on children's skills. A comprehensive parenting program that helps support positive development from the earliest years through adolescence is needed. A key area of need in Nevada is early literacy. Barely one-quarter of Nevada's school age children are reading at or above proficiency placing Nevada's children at extremely high risk for developing literacy-related problems, such as grade retention, school failure and dropout, delinquency, and unemployment or underemployment. Play can help foster all areas of children's development: Cognitive, physical, social and emotional well-being. Additionally, 50% of Nevada's child abuse and neglect victims are children under 5 years old. According to the Child Abuse Prevention and</p>	Children, Youth, & Families

		<p>Treatment Act, parenting education is a core prevention service. And, finally, although no parent wants to think about tough topics, like teen suicide, teen pregnancy, and teen violence, those issues are real among many of today's teenagers. It is important for parents to be informed about the issues many teenagers are facing. There are no perfect parents, but parenting can make a difference in teen's lives.</p> <p>Nevada offers four programs to address these needs:</p> <p>The Family Storyteller targets those families with infants, preschoolers, and beginning readers who may have limited language skills and few children's books at home. The primary purpose of the program is to increase the amount and quality of time parents and young children spend together in literacy enriching activities and to enhance school readiness and parent engagement. It includes six weekly sessions during which families learn about the importance of literacy for their children, discuss key parent/child reading techniques, watch a video that models the techniques, practice reading, learn about extender activities that enhance the value of the reading, and receive a free book and materials to complete the extender activities at home. The overall program includes English, Spanish, English Language Learner, Infant/Toddler (English and Spanish), and Native American versions.</p> <p>The Family Storyteller workshops were offered throughout Nevada's urban counties, Clark and Washoe County. 219 families (225 adults and 221 children) participated in the program (403 adults and 478 youth) at a variety of community sites including Title I schools and family engagement centers, community recreation centers, and libraries, as well as virtually. In addition, Extension organized and hosted the 5th annual Kickoff to Kindergarten School Readiness Fair in collaboration with 15 local agencies and organizations. Kickoff to Kindergarten School Readiness Fair introduced parents and preschoolers to school readiness skills through fun hands-on activities. 5 volunteers helped out with the event that reached 284 people.</p> <p>The Family Storyteller has been extensively evaluated and has shown that children's literacy skills improve, parents and children read together more often, parents use more joint book reading skills, parents and children do more literacy activities at home, and parents improve their confidence in facilitating their children's early literacy development. For example, a pre- and post-test paired sample t-test found a statistically significant increase in the frequency of reading to their child ($t = 3.72, p < .001$) and the number of picture books for child's use at home ($t = 2.93, p < .01$). Also, on a scale from 1 (poor) to 5 (outstanding), parents rated the workshops</p>	
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		<p>high on usefulness ($M = 4.76$) and quality ($M = 4.78$). After completing the program, 99% of parents reported they would recommend the program to their friends and family. Anticipated long-term goals of the program are to enhance school readiness, school and future work success, and reduce the costly burden to society as a result of illiteracy.</p> <p>Fun to Play for Preschoolers utilizes a parent/child interactive curriculum offered through a series of eight weekly sessions. Parents are encouraged to enhance their nurturing skills and abilities through age-appropriate play. The lessons introduce families to the joy of play and show parents ideas for fun and healthy activities for their preschoolers (math, music, science, social-emotional development, health/safety, creative arts and literacy). In addition, the lessons help parents understand Nevada Pre-Kindergarten Standards and teach them how to play with their children to improve their children's pre-kindergarten skills. Five program series were taught to 33 adults and 38 children at a variety of sites, including the Extension office, libraries, Title I family engagement centers, and community recreation centers. Parents who participated in the program reported knowledge and behavior change. Pre- and post-test results indicate that parents' understanding about pre-k standards increased and parents spent more time playing with their own child (2.16 hours--> 2.82 hours). Parents reported that their children's school readiness skills were not yet developed at the pre-test, but they were in progress at the post-test. Parents also reported that they spent more time playing with their kids focusing on school readiness skills after taking the program. Anticipated long-term goals of the program are to enhance school readiness, school and future work success, and reduce the costly burden to society as a result of illiteracy.</p> <p>Exploring Safety program is designed for parents of children 0-5 to increase their awareness and knowledge of several child safety and welfare issues. Topics covered include Shaken Baby Syndrome, child abuse and awareness, anger management, positive guidance, and body safety. The program includes six weekly sessions. Eight program series were taught to 49 parents and 59 children in a group setting at Title I family engagement centers, Title I schools and libraries. Results indicate that after attending the program parents' abilities to manage their own anger ($t = 2.38, p < .05$), use positive guidance skills ($t = 4.78, p < .001$), and properly respond to children's questions about body safety ($t = 4.64, p < .001$) improved significantly. Parents reported increased knowledge of what happens to a baby when it is shaken ($t = 5.03, p < .001$); how to manage their own anger when parenting ($t = 3.45, p < .01$); types of child abuse and how to prevent child abuse ($t = 3.39, p < .01$); age-appropriate human sexuality development ($t =$</p>	
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		<p>5.08, $p < .001$); and how to teach children to say no to unwanted touches ($t = 2.95$, $p < .01$). Expected long-term goals of the program are to build a healthy family, and further prevent child abuse and neglect.</p> <p>Positive Connections for Parents and Teens is a four-week program where parents/caregivers learn the skills of developing a respectful and cooperative relationship with their teen. Lessons focus on decoding the teen brain, ICYMI, talking teen lingo LOL, stress management, and positive discipline. Nine Positive Connections for Parents and Teenage program series were provided to 59 families (70 adults and 50 teens) in a group setting. The program was taught at CCSD Title I schools and a community setting. Results indicate that after completing the program parents reported knowledge, skills, and behavior change. For example, 67% of the parents/caregivers rated excellent on understanding their child's development, 53% of the parents/caregivers rated excellent on communicating with their child, 78% of the parents/caregivers rated excellent on understanding more about internet safety, social media and cyberbullying, 64% of the parents/caregivers rated excellent on managing their stress, 56% of the parents/caregivers rated excellent on managing their stress and 47% on helping their child manage stress, 52% of the parents/caregivers rated excellent on resolving conflict with their child, and 63% of the parents/caregivers rated excellent on using positive discipline. Additionally, 100% of parents reported the program's activities helped create more positive parent-child interactions in class and at home; and 98% reported improved relationships with their teen. Comments from parents included <i>"I loved the classes and they help me a lot and helped me understand more how teenagers think"</i>, and <i>"My suggestion is to have more programs like this to guide and teach parents"</i>. Through improved understanding, communication, and healthy parent/child relationships, it is expected that issues such as suicide, pregnancy, and violence will be reduced leading to healthy adolescent and adult development.</p> <p>In total, this program and associated one-time workshops and events provided direct parenting education to 2,738 adults and youth, and indirect education to 35,264 individuals through the website and other activities. Through increasing parent's knowledge and skills these efforts are helping to prepare the next generation to be healthy, happy thriving people who make a positive difference in their communities.</p>	
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