

# 2010 University of Wyoming Combined Research and Extension Annual Report of Accomplishments and Results

Status: Accepted

Date Accepted: 06/22/2011

## I. Report Overview

### 1. Executive Summary

Agriculture is at a crossroads and faces many challenges and opportunities in the 21st century. Agriculture, as well as land-grant institutions, is challenged to compete in a global economy while still responding to the needs of a diverse U.S. population. New demands are placed on the industry to ensure that agriculture remains profitable and sustainable, while addressing environmental concerns. Issues involving production agriculture, natural resource management, and quality of life generate diverse research and extension directives. Stakeholders play a vital role in identification and prioritization of needs at the University of Wyoming.

The College of Agriculture and Natural Resources has a mission to serve the educational and information needs of students, Wyoming citizens and communities, and the global community by providing and distributing unbiased, scientifically sound information. Research and extension programs at the University of Wyoming focus on five initiatives: 4-H and Youth Development, Community Development Education, Nutrition and Food Safety, Profitable and Sustainable Agriculture Systems, and Sustainable Management of Rangeland Resources. The five additional planned programs added spring 2010: Global Food Security and Hunger; Climate Change; Sustainable Energy; Childhood Obesity; and Food Safety, have been integrated with existing initiatives or have been added as standalone plans. The University of Wyoming research and extension efforts have been addressing issues outlined in the new plans for several years. Because the five new planned programs were added after the 2010 plan of work was implemented it is difficult in some areas to report accomplishments and specific FTE's tied to these plans. As UW AES and CES transition efforts into the new planned programs, there will be some overlap in reporting outcomes and accomplishments. Cooperative Extension added the new program areas to its reporting system to capture time and effort beginning with FY2011.

Fiscal year 2010, the University of Wyoming research and extension programs reported success in all initiative areas. The College of Agriculture and Natural Resources is third at the University of Wyoming in total grant dollars brought in for research and extension. In-depth educational programs such as the Master Cattleman, the High Plains Ranch Practicum, Range 101 School, Dining with Diabetes, Wyoming Youth Leadership Education (WYLE) and Extension Volunteer Organization for Leadership, Vitality, and Enterprise (EVOLVE) institutes report strong impacts for citizens of the state. Each of the above CES programs is multi-session educational classes with 8 to 70 hours of class contact time with participants. These are just a few examples of high impact educational efforts by the University of Wyoming. Research and Extension Centers at UW and across the state are producing research which is relevant and vital to agriculture, families, and communities. Being an energy rich state, UW researchers are looking at possible alternative fuels. Reclamation of mined lands is an important issue being addressed through the Department of Renewable Resources and CES. The two new planned programs on Climate Change and Sustainable Energy are not only timely, but very important to the state of Wyoming due to the energy resources which we have in abundance. In 2009, CES partnered with the UW School of Energy Resources to fund an Energy Extension Coordinator; the incumbent for this position has completed his first year. This position has allowed for expanded partnerships within the University and with agencies and organizations both state and federal.

The College of Agriculture and Natural Resources brought in over \$11 million in external grants in these initiative areas of emphasis in 2010. These funds, along with state and federal formula funds, greatly add to the success of our programs.

During 2010 both research and extension at UW began implementation of the UW academic plan for

2009 through 2013. With stakeholder input and a structured process, objectives and action plans were developed to guide College efforts over the next five years. Emerging issues such as energy and management of small acreage land which was once farmland, forest, or rangeland are topics for UW to address.

This accomplishment report will provide data and impacts on 2010 research and extension efforts. Please note, in an effort to reduce total outputs and outcomes as recommended by NIFA reviewers last year, while transitioning the University of Wyoming POW to be aligned with the 2012 - 2016 POW update, we have consolidated from 10 to 8 planned programs. The accomplishment report template does not allow for deletion of outputs and outcomes submitted in April 2009. Therefore, we are not reporting on those outputs and outcomes which do not align with the 2012 update.

**Total Actual Amount of professional FTEs/SYs for this State**

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	114.0	0.0	47.6	0.0
Actual	104.0	0.0	55.2	0.0

**II. Merit Review Process**

**1. The Merit Review Process that was Employed for this year**

- Internal University Panel
- External University Panel
- External Non-University Panel
- Combined External and Internal University Panel
- Combined External and Internal University External Non-University Panel
- Expert Peer Review
- Other

**2. Brief Explanation**

The merit review process for extension programs covers all programs conducted by UW CES. A team leadership model is utilized to review program plans and chart direction for CES educational programs. Program initiative teams develop and review programs on an annual basis. Teams make decisions to maintain, modify, or create new programs to meet the needs identified through external and internal stakeholder input. Five area external advisory boards comprised of stakeholders review CES programs annually. Spring, 2007 UW CES held a CSREES program review of the total extension program. The review report was used as CES moves forward in academic planning for 2009 to 2013. In 2009 the UW CES academic plan was approved and implementation is in progress.

All projects supported with formula funds (Hatch, Multi-State, McIntire-Stennis, Animal Health) must be approved projects. The project proposal is transmitted to the department head and the head appoints a minimum of two internal scientific reviewers who are knowledgeable in the field to review the proposal. After a proposal is revised based on the above review, it is transmitted to the Experiment Station Director. The director's office assigns three external scientific reviewers who are knowledgeable in the field to review the proposal. The Wyoming Agricultural Experiment Station also administers an internal competitive grants program using a portion of federal dollars. Proposals are reviewed by a ten member university-wide

committee. Each proposal is also sent to a minimum of two external reviewers.

During FY-2009 CES implemented a competitive grants program to provide funds for innovative programs. All proposals are reviewed by a three member committee comprised of both internal and external professionals. With a new planned program focusing on energy, fall of 2009, UW CES also implemented a competitive grant program with an energy focus. A joint internal and external panel reviewed proposals.

### **III. Stakeholder Input**

#### **1. Actions taken to seek stakeholder input that encouraged their participation**

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of the general public
- Survey specifically with non-traditional groups
- Survey specifically with non-traditional individuals
- Survey of selected individuals from the general public
- Other

#### **Brief explanation.**

During the past year stakeholder input came to the College of Agriculture and Natural Resources Cooperative Extension Service and Agricultural Experiment Station through a variety of methods. The joint research and extension needs assessment conducted in 2004 was used as a baseline for determining efforts for this POW. As part of the CES academic plan, a working group has been formed to explore methodology to gather statewide stakeholder input. Stakeholder input gathered through all methods is shared with counties in annual area advisory committee meetings with representatives from each of the five initiative areas who meet in sub-groups to identify specific needs and issues. This input is summarized and shared statewide with both CES and AES. All counties have had targeted advisory meetings to gather stakeholder input on reaching limited resource audiences in the Cent\$ible Nutrition program. County 4-H educators conducted 4-H Expansion and Review committees to specifically address outreach efforts toward underserved youth audiences. County personnel also utilize collaborative partners to learn the needs within communities of the state. In 2007 UW CES had a CSREES program review of the total extension system. Both research and cooperative extension went through an academic planning process which was integrated into the College of Agriculture and Natural Resources plan. The College of Agriculture and Natural Resources academic plan was approved as part of the 2009 to 2013 University of Wyoming Academic Plan. Each of the four Research & Extension Centers held an advisory committee meeting to gather input on existing research and outreach programs and to identify new priorities in relation to research. The College of Agriculture and Natural Resources maintains a separate statewide advisory committee which meets annually. Three departments, Animal Science, Family and Consumer Sciences, and Veterinary Sciences, have separate advisory committees that provide input on programs in those departments.

**2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them**

**1. Method to identify individuals and groups**

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys
- Other

**Brief explanation.**

Originally, CES advisory committees were formed in the nine extension areas. In FY 2008 the areas in the western side of Wyoming were reconfigured to allow for greater efficiency in program delivery and to meet needs of all counties. In 2009 the eastern side of Wyoming also reconfigured areas. There are currently five extension areas. Advisory committee members are nominated by extension staff by subject matter interest. Selection to serve on advisory committees is based on gender, geographic representation, race, national origin, and underserved audiences. In 2009, the Northwest Area piloted a community meeting format to assess needs in the area. A series of small focus groups were used in the West area to gather more in-depth input on issues. In 2010, on-line surveys, focus groups, area meetings, and Extension Café meetings were held to gather input.

In addition, the Wyoming County Commissioners Association has formed an advisory committee of county commissioners who meet with the CES Director during quarterly meetings of their association. Research and Extension Center Advisory committees are represented by CES educators, industry leaders, and landowners (government and private) in all counties that they service. Advisory committee members are nominated by CES, AES, and administrative personnel and meet one to two times per year. In addition to these systematic methods of gathering stakeholder input, both AES and CES utilize both individuals and groups throughout the state to identify relevant issues of critical importance. Just a few examples include: commodity groups - such as Wyoming Wool Growers, Stock Growers, Wyoming Wheat Growers, the Wyoming Crop Improvement Association, local and state nutrition councils, youth organizations such as Big Brothers, Big Sisters, and School Districts. These groups and individuals provide input through both formal and informal discussions with both research and extension personnel.

Faculty, CES specialists and educators also gather relevant input from professional colleagues in Wyoming and across the nation.

**2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them**

**1. Methods for collecting Stakeholder Input**

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)

- Survey of the general public
- Meeting specifically with non-traditional groups
- Survey specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Survey specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public
- Other

**Brief explanation.**

Stakeholder input is collected through a variety of methods to reach the broadest scope of individuals and groups in Wyoming. CES utilizes annual area advisory meetings which involve both traditional and non-traditional stakeholders. Pilot efforts using on-line surveys, focus groups, 'Extension cafe' have been explored by CES. The AES also utilizes annual advisory meetings to gain input on research activities. Surveys both mail and on-line are used to assess needs. CES educators and researchers target key stakeholders such as agriculture commodity groups, youth organizations, and schools through meetings where discussion is held on needs and issues. University of Wyoming educators and faculty assess needs throughout the year based on individual contact with citizens at meetings and in local communities. Faculty and CES specialists and educators gather relevant input from professional colleagues through personal contact and interaction at professional meetings.

**3. A statement of how the input will be considered**

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities
- Other

**Brief explanation.**

Stakeholder input is used by AES and CES initiative teams to identify emerging issues. Input gathered is used in program planning, evaluation of current programs, and redirection of programs when applicable. Stakeholder input from area advisory groups, county commissioners, and area teams assist in staffing priorities. Search committees comprised of local stakeholders provide input on screening, interviewing and hiring decisions for CES.

Input from all sources is used in development, implementation, and evaluation of extension and research programs. Stakeholder input is collected through a variety of methods to reach the broadest scope of individuals and groups in Wyoming. CES utilizes annual area advisory meetings which involve both traditional and non-traditional stakeholders. The AES also utilizes annual advisory meetings to gain input on research activities. Surveys, both mail and on-line are used to assess needs. CES educators and researchers target key stakeholders such as agriculture commodity groups, youth organizations, and schools through meetings where discussion is held on

needs and issues. University of Wyoming educators and faculty assess needs throughout the year based on individual contact with citizens at meetings and in local communities.

**Brief Explanation of what you learned from your Stakeholders**

4-H and Youth Development - 1) increase volunteer training, 2) increase afterschool and summer programs for non-traditional 4-H 3) develop school mentorship programs and programs that address high risk behaviors 4) initiate workforce skill training for youth including college visits; 5) increase marketing efforts to reach underserved youth and retain older youth in the program.

Community Development Education - 1) continue financial management training efforts to include youth; 2) expand efforts in leadership development including leadership institutes in rural areas, 3) expand non-profit board training; 4) municipal employee training; 5) research on economic analysis of federal land management planning is essential to the state.

Childhood Obesity, Nutrition and Health- 1) obesity continues to be identified as a priority issue for adults and youth. 3) basic nutrition and cooking skills. 4) sustainable food and agriculture systems including growing, preserving, and preparation of foods; 5) childhood obesity.

Food Safety - 1) expand efforts in food safety at both food service and consumer level. 2) Research on the safety of food is essential to consumer confidence. 3) Safe food preservation techniques.

Global Food Security and Hunger, Crop, Livestock, and Horticulture Systems - 2) specialty crops and alternative forages; 3) increased need for educational programming for small acreage owners, 4) mediation training is needed for agriculture producers due to increased land use for energy expansion and federal land agencies; 5) new methods to deliver information are needed such as newspaper inserts, current information on Web site, and utilize the Northern Ag Network radio stations to reach producers.

Sustainable Management of Rangeland Resources - 1) hands-on range monitoring workshops, 2) water management including quality, quantity and efficient use 3) drought and ranch sustainability ;4) small acreage workshops to educate new land owners; 5) water management, livestock/wildlife interface; 6) and coalbed Methane water quality.

Sustainable Energy: 1) renewable energy - 2) energy development and reclamation; 3) energy including wind, oil, gas and the impact on agriculture.

Climate Change: 1) identify sustainable cropping systems and variety selection in the face of climate change 2) develop improved soil properties in light of rising CO2 levels.

**IV. Expenditure Summary**

<b>1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)</b>			
<b>Extension</b>		<b>Research</b>	
<b>Smith-Lever 3b &amp; 3c</b>	<b>1890 Extension</b>	<b>Hatch</b>	<b>Evans-Allen</b>
1537244	0	1761070	0

<b>2. Totaled Actual dollars from Planned Programs Inputs</b>				
<b>Extension</b>			<b>Research</b>	
	<b>Smith-Lever 3b &amp; 3c</b>	<b>1890 Extension</b>	<b>Hatch</b>	<b>Evans-Allen</b>
<b>Actual Formula</b>	1537244	0	1761070	0
<b>Actual Matching</b>	8772789	0	1761070	0
<b>Actual All Other</b>	0	0	0	0
<b>Total Actual Expended</b>	10310033	0	3522140	0

<b>3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous</b>				
<b>Carryover</b>	0	0	0	0

## V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Global Food Security and Hunger, Crop, Livestock, and Horticulture Systems
2	Community Development Education
3	Childhood Obesity, Nutrition and Health
4	4-H and Youth Development
5	Sustainable Management of Rangeland Resources (SMRR)
6	Food Safety
7	Climate Change
8	Sustainable Energy

**Add previously unplanned program**

**V(A). Planned Program (Summary)**

**Program # 1**

**1. Name of the Planned Program**

Global Food Security and Hunger, Crop, Livestock, and Horticulture Systems

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	5%		5%	
111	Conservation and Efficient Use of Water	5%		5%	
202	Plant Genetic Resources	5%		5%	
204	Plant Product Quality and Utility (Preharvest)	5%		5%	
205	Plant Management Systems	10%		10%	
211	Insects, Mites, and Other Arthropods Affecting Plants	5%		5%	
212	Pathogens and Nematodes Affecting Plants	5%		5%	
213	Weeds Affecting Plants	5%		5%	
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	5%		5%	
216	Integrated Pest Management Systems	5%		5%	
301	Reproductive Performance of Animals	5%		5%	
302	Nutrient Utilization in Animals	5%		5%	
305	Animal Physiological Processes	5%		5%	
307	Animal Management Systems	10%		10%	
311	Animal Diseases	5%		5%	
502	New and Improved Food Products	5%		5%	
601	Economics of Agricultural Production and Farm Management	5%		5%	
704	Nutrition and Hunger in the Population	5%		5%	
	<b>Total</b>	100%		100%	

**Add knowledge area**

**V(C). Planned Program (Inputs)**

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890

Plan	26.0	0.0	30.0	0.0
Actual	24.0	0.0	30.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
354748	0	369372	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2024489	0	369372	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

Any or all channels of the media were used to familiarize the public with UW College of Agriculture and Natural Resources areas of research and extension programming and personnel. Newsletter articles distributed both electronically and through the mail by county offices, area teams, and the University of Wyoming reach producers locally, regionally, and statewide. Public educational programs by extension specialists and educators presenting research-based information were held in response to local, state, and national crop and livestock production, horticultural and nutrition issues. Demonstrations of technology and skills training were included in education curriculum to enhance educational effectiveness. Field tours were organized to provide producers with the opportunity to observe improved sustainable agricultural practices.

Areas of focus in livestock systems emphasis is placed on the four main areas: herd management, herd development, cropping systems and livestock development, risk and operation management techniques and alternatives to enhance the stability of Wyoming livestock producers. Fostering development of local food systems, which includes promoting use of local foods, can improve energy efficiency of the food system while yielding many other benefits. CES is implementing programs to enhance efficiency within local food systems by improving relationships among local food producers and consumers in Wyoming.

Development and pilot-testing of Wyoming Local Food Expos in at least two communities;

Development and distribution of the Wyoming Local Foods Guide (print and electronic versions) which will include a directory of specialty crops and other local food products, nutrition and food safety resources, recipes for using local foods, factsheets related to local foods in Wyoming, and tips on sustainable living. The Foods Guide will be uniquely Wyoming but will draw from several existing examples. Development and implementation of a training module to provide UW CES educators statewide with the knowledge and skills to successfully promote local foods.

EFNEP adult curriculum taught in a series of lessons; adult one-time lessons; youth curricula taught in a series of lessons and day camps; displays and demonstrations; state and community partnerships with agencies serving the low-income; training for educators; evaluation of program; ongoing-updating of curricula and materials.

**2. Brief description of the target audience**



2010 20000 0

**Output #2**

**Output Measure**

- Research efforts will develop new and improved forages for high elevation livestock systems. Target measures are new or improved forages.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	2	0

**Output #3**

**Output Measure**

- Ultimately, this program will improve livestock value through cropping practices, herd selection, and management for Wyoming livestock producers. Targets include number of programs conducted, livestock producers reporting change in practices as a result of educational efforts.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	1	0

**Output #4**

**Output Measure**

- Number of subscriptions to Barnyards and Backyards publication. Target is paid subscription numbers for magazine.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	3000	0

**Output #5**

**Output Measure**

- Develop improved methods of estimating forage base under varying environmental conditions. Targets included new methods developed for assessing forage base and growth.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	1	0

**Output #6**

**Output Measure**

- Number of Master Gardener Volunteers statewide. Target measure is new volunteers recruited and trained.

Not reporting on this Output for this Annual Report

Year	Target	Actual

2010 150 0

**Output #7**

**Output Measure**

- Research will develop more sustainable dryland cropping systems using extended rotations, ley pastures and narrow row fallow systems. Short term goals include increased grants and demonstration projects. Target is the number of demonstration projects implemented.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	3	0

**Output #8**

**Output Measure**

- Research: Wildlife/livestock disease interaction and transfer: long term goal to maintain Wyoming's Brucellosis free status and determine CWD transfer from cervids to domestic livestock. Targets are defined as projects developed.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	3	0

**Output #9**

**Output Measure**

- Research: Improve pest management practices. Long term goal is to reduce pesticide applications and increase use of IPM practices. Targets are programs implemented.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	2	0

**Output #10**

**Output Measure**

- Research: Development of biological control practices that effectively reduce populations of invasive weeds. Targets are listed as new programs developed on various weed species.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	1	0

**Output #11**

**Output Measure**

- Research: Development of simple blood test for diagnosis of brisquet disease. Short term goals include increased grant funding and demonstration results. Target is grant funding obtained.

Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	1	0

**Output #12**

**Output Measure**

- Research: Determine the impact environment has on the ability of female ewes to produce healthy offspring. The long term goal is to develop models to predict production performance under different environments. Targets listed are new projects intended.

Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	1	0

**Output #13**

**Output Measure**

- Develop profitable and sustainable forage based livestock systems for the High Plains. Targets are defined as new systems developed.

Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	1	0

**Output #14**

**Output Measure**

- Number of educational programs focusing on global food security and hunger, crop, livestock, or horticulture systems. Target is the number of programs.

Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	{No Data Entered}	253

**Output #15**

**Output Measure**

- Number of participants attending programs focusing on global food security and hunger, crop, livestock, and horticulture systems. Target is the number of individuals.

Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	{No Data Entered}	6157

**Output #16**

**Output Measure**

- Number of partnerships formed with other agencies or organizations and volunteers integrated into programs. Target is the number of partnerships and/or volunteers.

Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
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2010	{No Data Entered}	225
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**Output #17**

**Output Measure**

- Increased adoption of sustainable agriculture methods and practices which result in increased production of the food supply. Target is 10 to 20% of total Wyoming agriculture operations participants.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	2000

**Output #18**

**Output Measure**

- Research: Number of research publications, bulletins, reports, and presentations on crop, livestock, and horticulture systems. Target is number of outputs reported.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	100

**V(G). State Defined Outcomes****V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Awareness created through extension and research efforts. Target is number of participants in extension and research programs reporting that they have gained awareness on topic.
2	Pasture land owners and/or managers will be able to recognize indicators of pasture condition and will possess decision-making skills necessary to make needed management decisions. Target is number of participants reporting outcome.
3	Producers with the resources to irrigate their crops and/or pasture will know and understand costs and returns associated with their irrigation practices and systems. Target is number of producers reporting outcome.
4	Wyoming producers will implement electronic animal identification to gain advantages in herd management. Target is number of producers implementing outcome.
5	Producers will gain an understanding of heifer development as well as opportunities for matching genetic improvement with successful marketing strategies. Target is number of producers reporting outcome.
6	Wyoming producers will benefit through an increased value of livestock and crops related to improved cropping practices, herd selection, and management. Target is number of producers reporting positive outcome as a result of educational efforts.
7	Wyoming crop producers will be able to substitute traditional or current crop production with alternative horticultural crops to market if increased profitability may result. Target is number of crop producers utilizing alternative crop production practices.
8	Water conservation will improve the profitability and sustainability of Wyoming's green industry and municipal water supplies. Target is number of participants reporting outcome.
9	Youth and their families will choose gardening as a healthy choice for active living. Target is number of participants reporting outcome.
10	Research: Awareness created; change in knowledge through publications and integration into extension programs. Target is number of research projects. Research outcomes often take multiple years to establish results. The target numbers indicate on-going research projects.
11	Research - Awareness created in animal systems; Change in knowledge through publications and integration into extension programs. Target is number of projects. Outcomes from research efforts often take multiple years. The number of projects reflects efforts.
12	Research - Awareness created on IPM; change in knowledge through publications and integration into extension programs. Target is number of projects which have outcomes that have been integrated into extension programs.
13	Research - Awareness created in plant systems; change in knowledge through publications and integration into extension programs. Target is number of projects which have outcomes integrated into extension programs.
14	Research in animal reproduction - awareness created; change in knowledge through publications and integration into extension activities. Target is number of projects which are on-going which have generated publications or integration into extension programs.
15	Increased knowledge of agriculture producers on sustainable cropping and livestock systems. Target is the number of producers reporting outcome.
16	Improved sustainable agriculture production practices resulting in an increased food supply. Outcome is the number of producers reporting outcome

17	Research: Transfer knowledge and increase awareness of research on crop, livestock, and horticulture systems. Target is number of projects reporting outcome.
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**Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure**

**Outcome #1**

**1. Outcome Measures**

Not Reporting on this Outcome Measure

Awareness created through extension and research efforts. Target is number of participants in extension and research programs reporting that they have gained awareness on topic.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	500	6157

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

The value of agriculture to Wyoming's economy approaches \$1 billion each year, and agriculture's contribution to open spaces, wildlife, and recreation is even greater. Livestock and crop producers throughout the state of Wyoming face an ever changing industry with issues such as; increasing cost of production, increasing pressure focused on land conversion, changing requirements for marketing knowledge. All of the issues are coupled with the need for producers to be able to raise agricultural products in a sustainable operation with limited resources.

**What has been done**

Extension Educators in Profitable and Sustainable Agriculture Systems conducted 253 educational programs including field days, workshops, classes, multi-session courses, and volunteer training. In addition media is utilized to reach citizens through television, newspaper inserts, magazines, news columns and special articles, and radio. Educators also write educational newsletters distributed by mail and on line.

**Results**

Formal and informal evaluations were used to determine outcome. 100 percent of agriculture

producers participating in educational activities reported increased awareness on Global Food Security, Hunger, Crop, Livestock, and Horticulture Systems.

#### 4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 502 - New and Improved Food Products
- 601 - Economics of Agricultural Production and Farm Management
- 704 - Nutrition and Hunger in the Population

#### Outcome #2

##### 1. Outcome Measures

- Not Reporting on this Outcome Measure

Pasture land owners and/or managers will be able to recognize indicators of pasture condition and will possess decision-making skills necessary to make needed management decisions. Target is number of participants reporting outcome.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

##### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
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2010

100

0

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

#### What has been done

#### Results

### 4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 502 - New and Improved Food Products
- 601 - Economics of Agricultural Production and Farm Management
- 704 - Nutrition and Hunger in the Population

### Outcome #3

#### 1. Outcome Measures

- Not Reporting on this Outcome Measure

Producers with the resources to irrigate their crops and/or pasture will know and understand costs and returns associated with their irrigation practices and systems. Target is number of producers reporting outcome.

#### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	50	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 502 - New and Improved Food Products
- 601 - Economics of Agricultural Production and Farm Management
- 704 - Nutrition and Hunger in the Population

**Outcome #4**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Wyoming producers will implement electronic animal identification to gain advantages in herd management. Target is number of producers implementing outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	20	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals

- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 502 - New and Improved Food Products
- 601 - Economics of Agricultural Production and Farm Management
- 704 - Nutrition and Hunger in the Population

**Outcome #5**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Producers will gain an understanding of heifer development as well as opportunities for matching genetic improvement with successful marketing strategies. Target is number of producers reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	20	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)

- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 502 - New and Improved Food Products
- 601 - Economics of Agricultural Production and Farm Management
- 704 - Nutrition and Hunger in the Population

**Outcome #6**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Wyoming producers will benefit through an increased value of livestock and crops related to improved cropping practices, herd selection, and management. Target is number of producers reporting positive outcome as a result of educational efforts.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	25	1979

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

The value of agriculture to Wyoming's economy approaches \$1 billion each year. The largest component of Wyoming agriculture is the beef cattle industry, accounting for approximately 70 percent of all cash receipts. Sheep, lamb, and wool receipts in 1998 were \$29 million. Forage

sustains the Wyoming livestock industry. Hay is the leading crop in Wyoming with 1998 production valued at \$185 million, mostly marketed through livestock. Crop producers across Wyoming are challenged with increasing production costs, global market competition, environmental pressure, and decreased labor availability. Alternative markets, improved management practices, and cost efficiency is critical to ensure profitability and sustainability for Wyoming producers.

### **What has been done**

CES educators in the Profitable and Sustainable Agriculture team conducted 197 workshops, classes, tours, and conferences reaching 1857 Wyoming producers. Topics ranged from Master Cattleman 8 week class to weed management, ranch management, marketing options, genetic tools, nutrition and feeding of livestock, cost control and risk, natural resource tours and the Wyoming Agribility conference. Educators also publish educational articles in newspaper inserts, news columns, and newsletters.

### **Results**

All participants in educational activities reported gaining knowledge and awareness. Because of the depth and breadth of programs presented a variety of evaluations were used. A sample of responses:

Producers were asked to evaluate each of the sessions using an electronic response system. Follow-up discussions were held with a sample of participants one month after the program. Effectiveness of each session ranges from 57-100 percent, with an average of 80.5 for the class. Forty-five producers from throughout Wyoming participated in the Master Cattleman program. All took part in the weekly discussions.

End of 2010 program evaluations reported:

94 percent gained knowledge of production strategies

92 percent gained knowledge of enterprise analysis and risk management

100 percent plan to implement one or more ideas

'This has been an excellent program. Lots of new information. Great exchanges with other participants and the presenters.'

Follow up surveys conducted one month after the program to all participants provided the following impact:

100 percent have implemented a practice or changed a practice because of attending this program.

100 percent felt the program has made or will make a positive impact on the profitability of their ranching or farming operation.

## **4. Associated Knowledge Areas**

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants

- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 502 - New and Improved Food Products
- 601 - Economics of Agricultural Production and Farm Management
- 704 - Nutrition and Hunger in the Population

**Outcome #7**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Wyoming crop producers will be able to substitute traditional or current crop production with alternative horticultural crops to market if increased profitability may result. Target is number of crop producers utilizing alternative crop production practices.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	25	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water

- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 502 - New and Improved Food Products
- 601 - Economics of Agricultural Production and Farm Management
- 704 - Nutrition and Hunger in the Population

**Outcome #8**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Water conservation will improve the profitability and sustainability of Wyoming's green industry and municipal water supplies. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	100	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 502 - New and Improved Food Products
- 601 - Economics of Agricultural Production and Farm Management
- 704 - Nutrition and Hunger in the Population

**Outcome #9**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Youth and their families will choose gardening as a healthy choice for active living. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
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2010

100

0

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

#### What has been done

#### Results

### 4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 502 - New and Improved Food Products
- 601 - Economics of Agricultural Production and Farm Management
- 704 - Nutrition and Hunger in the Population

### Outcome #10

#### 1. Outcome Measures

- Not Reporting on this Outcome Measure

Research: Awareness created; change in knowledge through publications and integration into extension programs. Target is number of research projects. Research outcomes often take multiple years to establish results. The target numbers indicate on-going research projects.

#### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	3	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 502 - New and Improved Food Products
- 601 - Economics of Agricultural Production and Farm Management
- 704 - Nutrition and Hunger in the Population

## **Outcome #11**

### **1. Outcome Measures**

- Not Reporting on this Outcome Measure

Research - Awareness created in animal systems; Change in knowledge through publications and integration into extension programs. Target is number of projects. Outcomes from research efforts often take multiple years. The number of projects reflects efforts.

### **2. Associated Institution Types**

- 1862 Extension  
 1862 Research

### **3a. Outcome Type:**

- Change in Knowledge Outcome Measure  
 Change in Action Outcome Measure  
 Change in Condition Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	3	0

### **3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

### **4. Associated Knowledge Areas**

- 102 - Soil, Plant, Water, Nutrient Relationships  
 111 - Conservation and Efficient Use of Water  
 202 - Plant Genetic Resources  
 204 - Plant Product Quality and Utility (Preharvest)  
 205 - Plant Management Systems  
 211 - Insects, Mites, and Other Arthropods Affecting Plants  
 212 - Pathogens and Nematodes Affecting Plants  
 213 - Weeds Affecting Plants  
 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants  
 216 - Integrated Pest Management Systems  
 301 - Reproductive Performance of Animals

- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 502 - New and Improved Food Products
- 601 - Economics of Agricultural Production and Farm Management
- 704 - Nutrition and Hunger in the Population

**Outcome #12**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Research - Awareness created on IPM; change in knowledge through publications and integration into extension programs. Target is number of projects which have outcomes that have been integrated into extension programs.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	3	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)

- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 502 - New and Improved Food Products
- 601 - Economics of Agricultural Production and Farm Management
- 704 - Nutrition and Hunger in the Population

**Outcome #13**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Research - Awareness created in plant systems; change in knowledge through publications and integration into extension programs. Target is number of projects which have outcomes integrated into extension programs.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	3	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

## Results

### 4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 502 - New and Improved Food Products
- 601 - Economics of Agricultural Production and Farm Management
- 704 - Nutrition and Hunger in the Population

### Outcome #14

#### 1. Outcome Measures

- Not Reporting on this Outcome Measure

Research in animal reproduction - awareness created; change in knowledge through publications and integration into extension activities. Target is number of projects which are on-going which have generated publications or integration into extension programs.

#### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

#### 3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

#### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
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2010

3

0

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

#### What has been done

#### Results

### 4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 502 - New and Improved Food Products
- 601 - Economics of Agricultural Production and Farm Management
- 704 - Nutrition and Hunger in the Population

### Outcome #15

#### 1. Outcome Measures

- Not Reporting on this Outcome Measure

Increased knowledge of agriculture producers on sustainable cropping and livestock systems.  
Target is the number of producers reporting outcome.

#### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	5541

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

The value of agriculture to Wyoming's economy approaches \$1 billion each year, and agriculture's contribution to open spaces, wildlife, and recreation is even greater. Livestock and crop producers throughout the state of Wyoming face an ever changing industry with issues such as; increasing cost of production, increasing pressure for using sustainable practices, changing requirements for marketing knowledge. All of the issues are coupled with the need for producers to be able to raise livestock and crops in a sustainable operation with limited resources.

**What has been done**

Extension Educators in Profitable and Sustainable Agriculture Systems conducted 254 educational programs including field days, workshops, classes, multi-session courses, and volunteer training. In addition media is utilized to reach citizens through television, newspaper inserts, magazines, news columns and special articles, and radio. Educators also write educational newsletters distributed by mail and on line.

**Results**

Formal and informal evaluations were used to determine outcome. Over 90 percent of agriculture producers participating in educational activities reported increased knowledge.

**4. Associated Knowledge Areas**

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants

- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 502 - New and Improved Food Products
- 601 - Economics of Agricultural Production and Farm Management
- 704 - Nutrition and Hunger in the Population

**Outcome #16**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Improved sustainable agriculture production practices resulting in an increased food supply.  
Outcome is the number of producers reporting outcome

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	4500

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

The value of agriculture to Wyoming's economy approaches \$1 billion each year, and agriculture's contribution to open spaces, wildlife, and recreation is even greater. The largest component of Wyoming agriculture is the beef cattle industry, accounting for approximately 70 percent of all cash receipts and 86.5 percent of all livestock production. Sheep, lamb, and wool receipts in 1998 were \$29 million. Forage sustains the Wyoming livestock industry. Hay is the leading crop in Wyoming with 1998 production valued at \$185 million, mostly marketed through livestock. Crop producers across Wyoming are challenged with increasing production costs, global market competition, environmental pressure, and decreased labor availability. Alternative markets, improved management practices, and cost efficiency is critical to ensure profitability and sustainability for Wyoming producers. Irrigation is a key factor identified by CES area advisory committees and AES advisory groups.

### **What has been done**

CES educators conducted 10 classes, workshops, tours on pasture management and grazing for Wyoming producers. In addition, educators published articles in local newspapers, newsletters, special newspaper inserts and discussed the topic on radio programs. Topics included pasture management, introduction to irrigation, and the Wyoming Water Conference, and Wyoming Water Association tour. The Master Cattleman Class, which met weekly for eight weeks, provided 24 hours of classroom instruction. Over a three year period classes have been held in all five areas of the state.

### **Results**

100 percent of pasture land owners and/or managers reported being able to recognize indicators of pasture condition. They also indicated through formal and informal evaluations that they increased confidence in decision making skills necessary to make needed management decisions. Producers reported increased knowledge and awareness of pasture conditions. All 230 participants in educational activities reported gaining knowledge and awareness of resources and methods of irrigation and cost related to each method. End of 2010 program evaluations reported:

96 percent gained knowledge of production strategies

92 percent gained knowledge of enterprise analysis and risk management

100 percent plan to implement one or more ideas

## **4. Associated Knowledge Areas**

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 502 - New and Improved Food Products
- 601 - Economics of Agricultural Production and Farm Management
- 704 - Nutrition and Hunger in the Population

**Outcome #17**

**1. Outcome Measures**

Not Reporting on this Outcome Measure

Research: Transfer knowledge and increase awareness of research on crop, livestock, and horticulture systems. Target is number of projects reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	25

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Grass pastures are essential components of western US agriculture, especially on cattle ranches of the intermountain region. Rising prices of fertilizer, energy, and fuel has made improvement of these natural grasslands more difficult, and thus threatens the profitability and sustainability of current production systems. Introduction of a novel, drought tolerant, and winter hardy tall fescue system in these grass pastures may have potential to increase productivity, profitability, quality, and sustainability.

**What has been done**

The study was planted at the Powell R&E Center and Stroh Farm. Seed study: seven varieties/genotypes of tall fescue were planted in rows with four replications. Two treatments of three nitrogen levels and three clipping times were imposed. Forage trial: similar treatments followed on seven varieties/genotypes except that there was no clipping treatment and nitrogen was applied annually in two-splits. Different growth parameters including forage yield, forage quality, and seed yield are being collected and processed.

**Results**

This project has a great implication of hands-on-learning experience by the producers as one demonstration and study is being conducted on a producer's field. Knowing the suitable line(s) of tall fescue and optimum rates of N application will have great impact on the reduction of production cost and increase of yield and profitability of producers in the Big Horn Basin of Wyoming.

**4. Associated Knowledge Areas**

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 502 - New and Improved Food Products
- 601 - Economics of Agricultural Production and Farm Management
- 704 - Nutrition and Hunger in the Population

#### **V(H). Planned Program (External Factors)**

##### **External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other ()

##### **Brief Explanation**

Many conditions and situations that exist in Wyoming are similar to those in other parts of the country, for example, the following:

- Food choices made available and advertised to consumers by producers
- Access to timely and accurate information
- Coordination and cooperation of federal agencies and state partners
- Existence of local collaboration
- Level of funding at federal, state and local level
- Willingness of private sector-funders, such as corporations, foundations, and community organizations, to collaborate with Wyoming Cooperative Extension Service.

Weather extremes and drought may affect producers in agriculture or horticulture

issues. Funding is vital to this program; changes in appropriations could impact funding. Additionally, global market changes impact both research and extension programs in profitable and sustainable agriculture.

If EFNEP funding is decreased, appropriations will impact program delivery. Population changes.

## **V(I). Planned Program (Evaluation Studies and Data Collection)**

### **(OPTIONAL SECTION)**

#### **1. Evaluation Studies Planned**

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other

#### **Evaluation Results**

National EFNEP reporting program was used. Entry and exit data is collected on program participants. Case studies and success stories are gathered by nutrition educators. Collection of pre-, post-, and follow-up evaluation data as part of other programs.

Systematic evaluation utilizing a variety of methods was used to document outcomes and impact to clientele. This program includes four focuses: global food security and hunger, livestock systems; crop systems; and urban horticulture. Each focus has developed a logic model which includes specific evaluation plans and methods. Educational activities use written evaluations following the program, as follow-up; pre-and post -test to measure knowledge and aspirations. Follow-up evaluations either by mail, phone, or personal visit document medium and long term outcomes.

#### **Key Items of Evaluation**

Multiple methods were used. Sampling was utilized to gather evaluative data from media education efforts. Surveys, by mail, telephone, or on-site will be used with program participants. Observation and unstructured interviews were used to determine medium to

long term outcomes. Tests including pre- and post- were utilized to measure knowledge gained.

**V(A). Planned Program (Summary)**

**Program # 2**

**1. Name of the Planned Program**

Community Development Education

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

<b>KA Code</b>	<b>Knowledge Area</b>	<b>%1862 Extension</b>	<b>%1890 Extension</b>	<b>%1862 Research</b>	<b>%1890 Research</b>
601	Economics of Agricultural Production and Farm Management	5%		5%	
602	Business Management, Finance, and Taxation	5%		5%	
604	Marketing and Distribution Practices	5%		5%	
608	Community Resource Planning and Development	50%		50%	
801	Individual and Family Resource Management	25%		25%	
802	Human Development and Family Well-Being	5%		5%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	5%		5%	
	<b>Total</b>	100%		100%	

**Add knowledge area**

**V(C). Planned Program (Inputs)**

**1. Actual amount of professional FTE/SYs expended this Program**

<b>Year: 2010</b>	<b>Extension</b>		<b>Research</b>	
	<b>1862</b>	<b>1890</b>	<b>1862</b>	<b>1890</b>
Plan	11.0	0.0	2.1	0.0
Actual	12.0	0.0	2.2	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
177374	0	265504	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1012244	0	265504	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

Educational and research activities and efforts of the CDE program include:

Development of models to explain the impact changes have on the ability of communities to capture and retain dollars such as the impact of eliminating snowmobiling in Yellowstone National Park or the impact of reducing grazing permits in Bridger Teton National Forest.

Family resource management programs will reach out to a broad spectrum of constituents throughout Wyoming using a variety of anticipated programs. Outputs include methods such as train-the-trainer workshops, home-study courses, and such approaches as the Internet ([www.uwyo.edu/CES/FRM/](http://www.uwyo.edu/CES/FRM/)), and satellite. Also included are publications, meetings, news releases, and feature articles.

Community-based leadership training institutes - (EVOLVE) Extension Volunteer Organization for Leadership Vitality and Education. Skill training workshops - i.e. board training. General public information and educational efforts - i.e. public media materials; information/educational meetings and workshops; books, booklets, bulletins, training materials; providing data. Facilitation of community processes. Analyses of community data and economic impact. Assessments to identify individual strengths and areas to be strengthened to guide personal development and grow talent. Media resources to promote community capital development Extension education and increase awareness of Extension resources.

Outputs for entrepreneurship programs include publications, meetings, classes, workshops, conferences, one-on-one consultations, and web sites.

Research efforts will include economic analysis of Federal land management planning. These efforts provide important information that is used to assist in the planning process to make decisions that are critical to the future of Wyoming.

**2. Brief description of the target audience**

The University of Wyoming College of Agriculture is committed to reaching underrepresented groups and individuals and to implementing the objectives of equal opportunity regulations relative to the consideration and treatment of clientele for participation in programs regardless of their race, national origin, gender, age, religion, or disability. The ultimate consumer of the educational products for financial management programs will be all individuals (including youth and senior citizens), families (including low-

income families), and in general people at risk of experiencing financial stress. The group of educators, specialists, and faculty responsible for leading and delivering the outputs in the program is the smallest of the University of Wyoming's Cooperative Extension Service groups. A priority for program development is to use methods of information and instruction that make it possible for most constituents to be assisted while minimizing face-to-face work. Thus the team will emphasize train-the-trainer courses, newsletters, and electronic delivery of information and programming.

Targeted audiences for leadership development include: Elected officials. Members and leaders of formal and informal community organizations. Faith-based leaders and members. Business owners/managers/employees. Trade/produce groups. Educational entities. Federal/state/local agency leaders/members.

Entrepreneurship programs targets audiences who will manage or may develop ventures relating to food and agricultural systems, a non-farm extension of a farm business, forestry, home trades, crafts, services, etc. Other audiences through which Wyoming CES program may be delivered include: teachers, public and private agencies, business owners/managers/employers, trade/produce groups, educational entities, identified publics, youth groups/students, and small acreage owners.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Plan</b>	500	2000	200	1000
<b>Actual</b>	3058	2000	206	1000

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

**Patent Applications Submitted**

Year: 2010  
 Plan: 0  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2010	Extension	Research	Total
<b>Plan</b>	1	2	
<b>Actual</b>	1	7	8

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Family Resource Management programs will ultimately benefit all families in Wyoming. Short term effects may be increased grant funding and increased involvement in regional and multi-state projects. Target is number of programs.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	1	90

**Output #2**

**Output Measure**

- Number of individuals participating in programs. Target is number of individuals.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	500	3264

**Output #3**

**Output Measure**

- Number of programs in group process, leadership, facilitation, and other CD topics delivered. Target is number of programs.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	30	128

**Output #4**

**Output Measure**

- Entrepreneurship output targets include: number of individuals assisted.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	5	134

**Output #5**

**Output Measure**

- Participation in entrepreneurship programs designed for specific audiences including beginning farmers, multi-generation farm families, part-time farmers, and existing farmers. Target is number of participants.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	50	26

**Output #6**

**Output Measure**

- Research efforts will include community economic analysis which includes improving efficiency of existing firms, improve efficiency to capture and retain dollars and attract new businesses. Targets show number of projects.

Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	2	3

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Permanent changes in practices as determined by follow-up surveys with those attending meetings, events, and workshops. Target is number of participants reporting positive practice changes.
2	Financial stability and security in Wyoming households. Target is number of households reporting improved financial stability.
3	One or more management principles from educational programs on personal finance management are adopted by workshop participants. Target is number of participants reporting outcome.
4	Improved credit debt-management skills reported by participants in workshops. Target is number of participants reporting outcome.
5	Knowledge and confidence gained as measured by end of workshop evaluations. Target is number of participants reporting outcome.
6	Participants of leadership classes will develop skills and confidence necessary for community participation, find resources to enhance community capital, recognize the needs for community vision, capacity building, and direction, and strengthen inner-community relationships. Target is number of participants reporting positive outcomes through program evaluations.
7	Leadership participants will be able to utilize collaborative/coalition building practices to implement visionary community programs in order to provide the community with leaders, officials, and volunteers who are able to affect desired change or stability. Target is number of participants reporting outcome.
8	Long term changes in action documented through follow-up surveys of program participants regarding planning, improved management of risk, insurance, and labor. Improved confidence and ability to market, produce and finance, and promote products from new enterprises. Target is number of participants reporting outcome.
9	Short term outcome of research efforts include increased grant funding and increased involvement on regional and mulit-state projects. Target is number of projects reporting outcome.
10	Development of impact models which will improve community economic analysis as well as mitigate unwanted consequences. Target is number of impact models developed.
11	Research: Transfer of knowledge regarding decisions on public land management and community development.
12	Research: Development of impact models that will contribute to community development and mitigate unwanted consequences.

**Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure**

**Outcome #1**

**1. Outcome Measures**

Not Reporting on this Outcome Measure

Permanent changes in practices as determined by follow-up surveys with those attending meetings, events, and workshops. Target is number of participants reporting positive practice changes.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	100	905

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Many county-appointed board members and elected officials want to complete their assigned duties yet lack the skills and training needed to perform to the best of their ability. County commissioners have identified the need to provide training to current and new members appointed to county boards so they might more properly fulfill their duties and responsibilities. The Cooperative Extension Service's Community Development Education (CDE) initiative team developed materials to support training programs for county boards and Municipal treasurers.

**What has been done**

The CDE team developed curriculum and educational materials to support the program. Area educators used these materials to develop a four-hour educational program for county-appointed boards in the state. Twenty-four training sessions were held reaching 551 individuals. The CDE area educator presented the subjects of board vs. executive director duties, officer roles, effective meetings, and parliamentary procedure during the four-hour session. Board members received written and verbal instruction on the proper functions of boards, board members, and executive directors. In 2010, the curriculum was available on line which enhanced learning opportunities.

**Results**

Participants stated confidence in serving in a position of leadership for an organization increased from 3.45 to 4.09 on a Likert scale of 1 - 5 1=not confident; 5=confident and capable to a great extent. Respondents' stated knowledge of the subject matter at the beginning of the series was 2.62 on a scale of 1=not much; 5=a lot. At the end of the series knowledge gained in the subject matter the average score was 4.14.

100 percent of participants reported that they will participate more, will accept leadership positions, will facilitate effective meetings, and that they have improved confidence in reviewing and requesting key financial documents.

**4. Associated Knowledge Areas**

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 608 - Community Resource Planning and Development
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and

**Outcome #2**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Financial stability and security in Wyoming households. Target is number of households reporting improved financial stability.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	100	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 608 - Community Resource Planning and Development
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and

### **Outcome #3**

#### **1. Outcome Measures**

- Not Reporting on this Outcome Measure

One or more management principles from educational programs on personal finance management are adopted by workshop participants. Target is number of participants reporting outcome.

#### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

#### **3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

#### **3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	50	325

#### **3c. Qualitative Outcome or Impact Statement**

##### **Issue (Who cares and Why)**

In the last ten years Wyoming has experienced significant economic growth. Sound financial management will increase the stability and security of households as well as the happiness of household members. The first critical need is the management of credit and debt. Seven out of 10 low and middle income households report using their credit cards as a safety net. In Wyoming about 2,500 people file for bankruptcy protection each year. The second critical issue is the spending habits of adolescents. Many adolescents earn income, of which they spend 98 percent, and do not have to pay for many living expenses such as housing.

##### **What has been done**

Family resource management programs will reach out to a broad spectrum of constituents throughout Wyoming using a variety of programs. Four courses were held which were six to eight week series in addition to nine single session programs totaling fifty-five classes reaching 636 individuals.

**Results**

End of session evaluations indicated 100 percent of the participants increased knowledge and awareness of financial principles. Over 50 percent reported adopting and implementing at least one financial practice principal as a result of the classes. These included better credit management; financial recovery after bankruptcy; and initiating a savings plan.

**4. Associated Knowledge Areas**

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 608 - Community Resource Planning and Development
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and

**Outcome #4**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Improved credit debt-management skills reported by participants in workshops. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	50	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 608 - Community Resource Planning and Development
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and

#### Outcome #5

##### 1. Outcome Measures

- Not Reporting on this Outcome Measure

Knowledge and confidence gained as measured by end of workshop evaluations. Target is number of participants reporting outcome.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

##### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	100	0

##### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices

- 608 - Community Resource Planning and Development
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and

**Outcome #6**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Participants of leadership classes will develop skills and confidence necessary for community participation, find resources to enhance community capital, recognize the needs for community vision, capacity building, and direction, and strengthen inner-community relationships. Target is number of participants reporting positive outcomes through program evaluations.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	100	241

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Leadership development was identified as a need by the Wyoming Rural Development Council's Community Assessments. This was later reaffirmed by Area Advisory Committees and the Extension Research Needs

Assessment in 2004. The Wyoming Business Council has shared their vision of community economic development using a building block model. At the base are three blocks - leadership development, workforce development, and community capacity building. The second level has two blocks, existing business development and entrepreneur development, and one block on the top for recruiting.

**What has been done**

In FY 2010 four EVOLVE leadership institutes were conducted. Each institute meets monthly for 8 sessions ranging from 6 - 8 hours in length. Topics covered include teambuilding, communication, conflict management, a fishbowl simulation of leadership assessment, community involvement, and overall leadership. Educators also conducted assessments for Wyoming LEAD, and marketing sessions for the institutes.

**Results**

In 2010, over 100 EVOLVE graduates from four community leadership institutes in Wyoming completed a survey reflecting their perceptions of the institutes. More than 95 percent reported they were more aware of their strengths and weaknesses. In fact, respondents reported they agreed leadership behavior improved in all areas listed. 'Has your overall involvement in the community strengthened (in quality or quantity) through participation in the Institute?' Eighty respondents agreed or strongly agreed. There was also a doubling in the number who reported participating in five to six leadership roles after the institute.

**4. Associated Knowledge Areas**

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 608 - Community Resource Planning and Development
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and

**Outcome #7**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Leadership participants will be able to utilize collaborative/coalition building practices to implement visionary community programs in order to provide the community with leaders, officials, and volunteers who are able to affect desired change or stability. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	25	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 608 - Community Resource Planning and Development
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and

**Outcome #8**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Long term changes in action documented through follow-up surveys of program participants regarding planning, improved management of risk, insurance, and labor. Improved confidence and ability to market, produce and finance, and promote products from new enterprises. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	2	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 608 - Community Resource Planning and Development
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and

#### Outcome #9

##### 1. Outcome Measures

- Not Reporting on this Outcome Measure

Short term outcome of research efforts include increased grant funding and increased involvement on regional and mulit-state projects. Target is number of projects reporting outcome.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

##### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2	0

##### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices

- 608 - Community Resource Planning and Development
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and

## **Outcome #10**

### **1. Outcome Measures**

- Not Reporting on this Outcome Measure

Development of impact models which will improve community economic analysis as well as mitigate unwanted consequences. Target is number of impact models developed.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	2	3

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Documentation of the need for the evaluation of the influence of land-use patterns on the provision of local government services dates back to the 1950s. The literature indicates low-density developments distant from centers of service provision are more expensive to serve than more proximate and high-density developments. Inefficiencies occur due to average cost user charges which undercharge outlying low-density areas while overcharging interior or high-density areas.

#### **What has been done**

The research extends previous production modeling of public services to include a spatial index representing pattern of development as an explanatory variable in the production function. Results suggest the pattern of residential land use is a statistically significant driver of local government spending on policing services. This research contributes to both a more richly specified production function and may contribute to the development of the next step in fiscal impacts modeling, spatially precise evaluation.

#### **Results**

Products derived from these methods will be a useful addition in evaluations of community development and service provision as well as discussions concerning the costs of growth. An

AES competitive grant has been received to study the impacts of ex-urban sprawl on county costs and revenues. GIS technology and economic models have provided insights as to why disperse residential development brings greater cost per unit tax revenue when law enforcement resources are used to achieve public safety. These results are being shared with county planning groups.

**4. Associated Knowledge Areas**

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 608 - Community Resource Planning and Development
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and

**Outcome #11**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Research: Transfer of knowledge regarding decisions on public land management and community development.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	1

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

With about 49 percent of the state federally owned, management decisions by federal land management agencies can have significant impacts on the economies and lifestyles of Wyoming communities. In recent years, the management of federal lands has become much more contentious with a number of interest groups with divergent concerns becoming more involved in the planning process. One area of debate that is of particular importance to Wyoming is the economic implications for local communities of energy development issues.

**What has been done**

The working team for community economic development is conducting numerous projects with respect to federal land management and energy development efforts in Wyoming and the Western United States. These efforts provide important information used to assist in the planning process to make decisions that are critical to the future of Wyoming.

**Results**

Providing solid economic information helps reduce the emotionalism associated with discussions regarding the management of federal land and energy development. It also improves the decision making process by providing decision makers with more reliable and credible information on which to base their decisions. Finally, these types of analyses allow communities of Wyoming to participate in the planning process by quantifying the issue that are of particular concern to them. The net result is improved decision making with regards to the management of federal lands and energy development.

**4. Associated Knowledge Areas**

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 608 - Community Resource Planning and Development
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and

**Outcome #12**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Research: Development of impact models that will contribute to community development and mitigate unwanted consequences.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	1

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Exurban sprawl and landscape fragmentation continue to be critical issues with respect to resource management and local governance. Analysis of emerging conservation easement markets will generate important outcomes for water policy makers, landowners, land use planners, land trusts, federal and state agency personnel, researchers, elected officials, and concerned citizens.

#### What has been done

Stated choice analysis using a random utility model and mixed logit estimation techniques indicated difference between Colorado and Wyoming landowner preferences for conservation easement programs. It also indicates that land trusts have different missions that influence the types of Conservation Easements they would pursue. GIS technology and economic models have provided insights as to why disperse residential development brings greater cost per unit tax revenue when law enforcement resources are used to achieve public safety.

#### Results

The research is designed to improve the decision making environment for program providers and participants. These results are being shared with the academic community, extension educators, land trusts and producer groups. The work also has implications for state, county and municipal land use planning efforts as well as property owners.

### 4. Associated Knowledge Areas

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 608 - Community Resource Planning and Development
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and

### V(H). Planned Program (External Factors)

#### External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (changes in technology)

### **Brief Explanation**

UW CES had a long tenured educator retire; Training to build capacity in new educators is on going in this initiative which has the smallest team to provide programming statewide.

### **V(I). Planned Program (Evaluation Studies and Data Collection)**

#### **(OPTIONAL SECTION)**

#### **1. Evaluation Studies Planned**

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other

#### **Evaluation Results**

{No Data Entered}

#### **Key Items of Evaluation**

{No Data Entered}

**V(A). Planned Program (Summary)**

**Program # 3**

**1. Name of the Planned Program**

Childhood Obesity, Nutrition and Health

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
305	Animal Physiological Processes	0%		40%	
703	Nutrition Education and Behavior	10%		20%	
704	Nutrition and Hunger in the Population	80%		20%	
724	Healthy Lifestyle	10%		20%	
	<b>Total</b>	100%		100%	

Add knowledge area

**V(C). Planned Program (Inputs)**

**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	15.0	0.0	3.5	0.0
Actual	12.0	0.0	4.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
177374	0	260593	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1012244	0	260593	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

Nutrition efforts focus on educational programs which increase knowledge and skills in nutrition needs of children and incorporate physical activity into lifestyle; media outreach; health fairs; training; assessment/data collection. Programs which teach body size acceptance were also targeted to youth.

EFNEP adult curriculum taught in a series of lessons; adult one-time lessons; youth curricula taught in a series of lessons and day camps; displays and demonstrations; state and community partnerships with agencies serving the low-income; training for educators; evaluation of program; Ongoing- Updating of curricula and materials.

Since skeletal muscle is the main site for utilization of glucose and fatty acids in the body and insulin resistance in skeletal muscle is the key step in the incidence of type 2 diabetes, we hypothesize that impaired fetal skeletal muscle growth due to nutrient deficiency plays an important role. The goal is to understand how the development of fetal skeletal muscle affects the properties of skeletal muscle of adulthood, and to develop effective strategies to mitigate or avoid incidence of diabetes and obesity caused by impaired skeletal muscle development due to fetal nutrient deficiency.

UW AES researchers intend to investigate the role of maternal nutrition in programming of pre- and postnatal body composition.

**2. Brief description of the target audience**

The University of Wyoming is committed to reaching underrepresented groups and individuals and to implementing the objectives of equal opportunity regulations relative to the consideration and treatment of clientele for participation in all programs regardless of their race, national origin, gender, age, religion, or disability. Specific target audience groups for the CNP (EFNEP) program: Low-income adults, Youth in Title I schools.

All other nutrition efforts targeted audience includes: general public, both adults and youth and policy makers.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Plan</b>	1000	4000	1500	3000
<b>Actual</b>	3838	4000	2515	3000

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

**Patent Applications Submitted**

Year: 2010  
 Plan: 1  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

<b>2010</b>	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Plan</b>	0	4	
<b>Actual</b>	0	13	13

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of Dining with Diabetes, food safety and programs which promote healthier food choices and lifestyles offered in Wyoming communities. Target is number of programs.

Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	30	0

**Output #2**

**Output Measure**

- Number of participants in educational programs offered in NFS initiative. Target is number of participants.

Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	1000	5710

**Output #3**

**Output Measure**

- Number of partnerships formed with environmental health specialists (food safety); public health of other agencies, and Diabetes coordinators. Target is number of partnerships.

Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	10	0

**Output #4**

**Output Measure**

- Increased adoption of healthy food practices and participation in regular physical activities. Target is number of participants reporting outcome.

Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	250	1427

**Output #5**

**Output Measure**

- Effectiveness of research programs will be based on integration into extension programs, patents, grant dollars, and publications. The ultimate research goal is to provide tools for detection of food contaminated products. (target is number of research projects in NRI)

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	5	0

**Output #6**

**Output Measure**

- Improve ability to detect and analyze for the presence of food-borne pathogens. Target is number of research projects.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	1	0

**Output #7**

**Output Measure**

- Number of educational programs delivered to youth. Target is number of programs.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	83

**Output #8**

**Output Measure**

- Number of youth participating in educational program targeting childhood obesity. Target is number of youth participating.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	2515

**Output #9**

**Output Measure**

- Number of partnerships formed in local counties of professionals to collaborate on childhood obesity, nutrition, and health issues. Target is number of partnerships formalized.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	36

**Output #10**

**Output Measure**

- Research: Conduct research and present results on obesity, nutrition and health. Target is number of publications, reports, bulletins, and presentations.
- Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	{No Data Entered}	10

**V(G). State Defined Outcomes****V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Improved attitude related to diabetes self care, food, and physical activity. Targets are number of participants reporting outcome.
2	Increased knowledge of healthy food choices for optimal diabetes management, and health. Targets are number of participants reporting outcome.
3	Improved skill in selection of healthy foods. Targets are number of participants reporting outcome.
4	Improved eating behavior practices, food choices , and lifestyle habits. Targets are number of participants reporting outcome.
5	Using a variety of food resources to reduce food costs. Providing culturally acceptable meals that are balances for cost as well as for nutritional value. Target is number of participants reporting outcome.
6	Improved personal hygiene such as hand washing. Avoidance of cross-contamination resulting in keeping foods safe. Target is number of participants reporting outcome.
7	Increased availability of personal/family food resources. Target is number of participants reporting outcome.
8	Individuals gain awareness, knowledge and skills related to: improved attitude about healthy eating; increased knowledge of healthy food choices; improved skill in selection of healthy foods; improved body image. Target is number of participants reporting outcome.
9	Individuals incorporate skills and change behaviors related to: increased participation in physical activity; increased knowledge of healthy food choices; improved skill in selection of healthy foods; improved body image. Target is number of participants reporting outcome.
10	Individuals and families experience: improved nutritional health; reduced medical costs; health improved through improved community opportunities; healthier weight; decreased risk factors for nutrition-health related problems. Target is number of participants reporting outcome.
11	Increased awareness and knowledge of food safety practices. Target is number of participants reporting outcome.
12	Behavior or practice changes that improve food safety. Target is number of participants reporting outcome.
13	The short term goal of research efforts is to increase grant funding and to patent detective process. Target is number of projects which show positive outcomes in regard to additional funding and patents.
14	Research will result in easier, more rapid methods of detection of food-borne pathogens such as E.coli and Listeria. Ultimately, deliniate genes that promote survival in the environment and result in disease contamination of food. Target is number of projects with results that demonstrate outcome.
15	Improved knowledge of food guide pyramid, serving sizes, and physical activity. Targets are the number of participants reporting outcome.
16	Improved eating behavior practices, food choices, and lifestyle habits. Targets are the number of participants reporting outcome.

17	Individuals gain awareness, knowledge and skills related to: improved attitude about healthy eating; increased knowledge of healthy food choices; improved skills in selection of healthy foods; improved body image. Target is number of participants reporting outcome.
18	Youth incorporate skills and change behaviors related to: increased physical activity; increased knowledge of healthy food choices; improved selection of healthy foods; understanding of serving sizes; improved body image.
19	Youth and families experience: improved nutritional health; reduced medical costs; health improved through community opportunities; healthier weight; decreased risk factors for nutrition-health related problems. Target is number of participants reporting outcome.
20	Research: Create awareness of relationships between obesity, nutrition and health. Target is number of projects reporting this outcome.

**Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure**

**Outcome #1**

**1. Outcome Measures**

Not Reporting on this Outcome Measure

Improved attitude related to diabetes self care, food, and physical activity. Targets are number of participants reporting outcome.

**2. Associated Institution Types**

1862 Extension

1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	100	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 305 - Animal Physiological Processes
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

**Outcome #2**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Increased knowledge of healthy food choices for optimal diabetes management, and health.  
Targets are number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	1000	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 305 - Animal Physiological Processes
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

**Outcome #3**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Improved skill in selection of healthy foods. Targets are number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	500	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 305 - Animal Physiological Processes
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

**Outcome #4**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Improved eating behavior practices, food choices , and lifestyle habits. Targets are number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	200	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 305 - Animal Physiological Processes
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

**Outcome #5**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Using a variety of food resources to reduce food costs. Providing culturally acceptable meals that are balances for cost as well as for nutritional value. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	100	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 305 - Animal Physiological Processes
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

**Outcome #6**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Improved personal hygiene such as hand washing. Avoidance of cross-contamination resulting in keeping foods safe. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	200	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 305 - Animal Physiological Processes
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

**Outcome #7**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Increased availability of personal/family food resources. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	50	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 305 - Animal Physiological Processes
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

### **Outcome #8**

#### **1. Outcome Measures**

- Not Reporting on this Outcome Measure

Individuals gain awareness, knowledge and skills related to: improved attitude about healthy eating; increased knowledge of healthy food choices; improved skill in selection of healthy foods; improved body image. Target is number of participants reporting outcome.

#### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

#### **3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

#### **3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	100	0

#### **3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### **4. Associated Knowledge Areas**

- 305 - Animal Physiological Processes
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

### **Outcome #9**

#### **1. Outcome Measures**

- Not Reporting on this Outcome Measure

Individuals incorporate skills and change behaviors related to: increased participation in physical activity; increased knowledge of healthy food choices; improved skill in selection of healthy foods; improved body image. Target is number of participants reporting outcome.

#### **2. Associated Institution Types**

- 1862 Extension  
 1862 Research

#### **3a. Outcome Type:**

- Change in Knowledge Outcome Measure  
 Change in Action Outcome Measure  
 Change in Condition Outcome Measure

#### **3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	100	0

#### **3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### **4. Associated Knowledge Areas**

- 305 - Animal Physiological Processes  
 703 - Nutrition Education and Behavior  
 704 - Nutrition and Hunger in the Population  
 724 - Healthy Lifestyle

### **Outcome #10**

#### **1. Outcome Measures**

- Not Reporting on this Outcome Measure

Individuals and families experience: improved nutritional health; reduced medical costs; health improved through improved community opportunities; healthier weight; decreased risk factors for nutrition-health related problems. Target is number of participants reporting outcome.

## 2. Associated Institution Types

- 1862 Extension
- 1862 Research

### 3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	50	0

### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

**What has been done**

**Results**

## 4. Associated Knowledge Areas

- 305 - Animal Physiological Processes
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

## Outcome #11

### 1. Outcome Measures

- Not Reporting on this Outcome Measure

Increased awareness and knowledge of food safety practices. Target is number of participants reporting outcome.

### 2. Associated Institution Types

- 1862 Extension

1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	500	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

**Outcome #12**

**1. Outcome Measures**

Not Reporting on this Outcome Measure

Behavior or practice changes that improve food safety. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	250	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 305 - Animal Physiological Processes
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

**Outcome #13**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

The short term goal of research efforts is to increase grant funding and to patent detective process. Target is number of projects which show positive outcomes in regard to additional funding and patents.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	1	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 305 - Animal Physiological Processes
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

**Outcome #14**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Research will result in easier, more rapid methods of detection of food-borne pathogens such as E.coli and Listeria. Ultimately, delineate genes that promote survival in the environment and result in disease contamination of food. Target is number of projects with results that demonstrate outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	1	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 305 - Animal Physiological Processes
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

## **Outcome #15**

### **1. Outcome Measures**

Not Reporting on this Outcome Measure

Improved knowledge of food guide pyramid, serving sizes, and physical activity. Targets are the number of participants reporting outcome.

### **2. Associated Institution Types**

1862 Extension

1862 Research

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	{No Data Entered}	3500

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Wyoming youth and adults are at risk as reflected by various health-related data: For example, over 20 percent of Wyoming adults report no leisure time physical activity, 47 percent of Wyoming high school students report not being enrolled in a physical education class, and 78 percent of both Wyoming adults and high school students do not eat recommended amounts of fruits and vegetables. Additionally, research in Wyoming, Montana, and Idaho documented body dissatisfaction as a significant predictor of self-consciousness keeping respondents from participating in physical activity.

#### **What has been done**

A variety of classes (many multi-session) on Steps to a New You, Healthy Eating, Weight Management and basic nutrition were conducted by nutrition educators. Articles were published in newsletters, newspaper columns and educational displays were developed.

#### **Results**

36 percent reported being physically active for at least 30 minutes per day, on four or more days per week, more often.

40 percent reported getting a 'super-sized' portion less often. (A 'super-sized' portion of food or beverage is one that is much bigger but costs only a little more money).

92 percent showed improvement in one or more nutrition practices.

25 percent reported weight loss as a result of changes in eating, meal planning, and increasing physical activity.

#### 4. Associated Knowledge Areas

- 305 - Animal Physiological Processes
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

#### Outcome #16

##### 1. Outcome Measures

- Not Reporting on this Outcome Measure

Improved eating behavior practices, food choices, and lifestyle habits. Targets are the number of participants reporting outcome.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

##### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	3838

##### 3c. Qualitative Outcome or Impact Statement

###### Issue (Who cares and Why)

The United States Department of Agriculture Dietary Guidelines for Americans identified the number one message of the new guidelines as getting the most nutrition out of calories consumed. Number two was finding a balance between food and physical activity. The key recommendations include an emphasis on increased consumption of fruits and vegetables, whole grains, and low-fat dairy and increased physical activity. Childhood obesity concerns identify similar issues in eating and lifestyle behavior.

###### What has been done

Nutrition and food safety educators conducted 229 educational programs on basic nutrition, health, and food selection. Activity based programs such as Steps to a New You, Strong Bones, and Dining with Diabetes were also held. Health fair displays, newspaper articles, and newsletters were also used to reach youth and adults.

###### Results

One hundred percent of participants reported increasing knowledge as a result of educational efforts. Over half of evaluation respondents indicated they had changed at least one dietary

behavior.

Shorter term impacts included participants reporting they feel strongly that:

- \*what people do can make a big difference in the control of their diabetes and overall health
- \*healthy food can taste good
- \*physical activity comes more easily to them

Longer term (at two- to four-month follow-up)

- \*Better understanding of the Plate Method for portioning their food
- \*Increasing the proportion of participants...who eat high-fiber cereal

#### 4. Associated Knowledge Areas

- 305 - Animal Physiological Processes
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

### Outcome #17

#### 1. Outcome Measures

- Not Reporting on this Outcome Measure

Individuals gain awareness, knowledge and skills related to: improved attitude about healthy eating; increased knowledge of healthy food choices; improved skills in selection of healthy foods; improved body image. Target is number of participants reporting outcome.

#### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

#### 3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

#### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	3838

#### 3c. Qualitative Outcome or Impact Statement

##### Issue (Who cares and Why)

Wyoming residents are at risk as reflected by various health-related data: For example, over 20 percent of Wyoming adults report no leisure time physical activity, 47 percent of Wyoming high school students report not being enrolled in a physical education class, and 78 percent of both Wyoming adults and high school students do not eat recommended amounts of fruits and

vegetables.

**What has been done**

UW CES educators conducted over 300 classes which emphasized a holistic approach including proper nutrition, increasing physical activity and healthy food choices. Strong Bones - Strong People, basic nutrition, and Steps to a New You were all programs focused on objectives. Youth curriculum developed by the UW Cent\$ible Nutrition program was also implemented in schools across the state.

**Results**

3838 individuals participated in 229 classes of which 10 were multi-session with four to eight sessions in length. Over 50 percent, or 1900 participants reported improved eating behavior practices, food choices, and lifestyle habits through end of session evaluations.

**4. Associated Knowledge Areas**

- 305 - Animal Physiological Processes
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

**Outcome #18**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Youth incorporate skills and change behaviors related to: increased physical activity; increased knowledge of healthy food choices; improved selection of healthy foods; understanding of serving sizes; improved body image.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	2574

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Childhood obesity has more than tripled in the past 30 years. The prevalence of obesity among children aged 6 to 11 years increased from 6.5% in 1980 to 19.6% in 2008. The prevalence of obesity among adolescents aged 12 to 19 years increased from 5.0% to 18.1%. Approximately 13,000 of 57,000 Wyoming children ages 10 to 17 years (22.9%) are considered overweight or obese according to BMI for age standards. Wyoming ranks third among the 50 states and D.C. in overall prevalence.

\* Only one in six (16.3%) Wyoming children in higher income families are overweight or obese. The state ranks third in prevalence among higher income children.

\* One in five (20.2%) Wyoming children with private health insurance are overweight or obese.

\* Wyoming children are more likely than their counterparts nationwide to be physically active for at least 4 days per week, and less likely to spend 2 hours or more in front of a television or computer screen.

#### **What has been done**

UW CES utilized EFNEP youth curricula taught in a series of lessons and day camps; displays and demonstrations; Other nutrition efforts focused on educational programs which increase knowledge and skills in nutrition needs of children and incorporate physical activity into lifestyle; educators use media outreach (newspapers, newsletters, radio); health fairs; Programs which teach body size acceptance also are targeted to youth.

#### **Results**

Results of the 65 educational programs (several were series of 5 - 8 weeks) reaching 2114 youth included:

30% reported eating a variety of foods;

36% increased knowledge of nutrition;

Over 50% increased their knowledge of MyPyramid food groups;

23% could identify missing food groups in meals;

37% could identify physical activity recommendations for their age;

28.5% increased their knowledge of body size diversity.

#### **4. Associated Knowledge Areas**

- 305 - Animal Physiological Processes
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

#### **Outcome #19**

##### **1. Outcome Measures**

- Not Reporting on this Outcome Measure

Youth and families experience: improved nutritional health; reduced medical costs; health improved through community opportunities; healthier weight; decreased risk factors for nutrition-health related problems. Target is number of participants reporting outcome.

##### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	1944

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Approximately 13,000 of 57,000 Wyoming children ages 10 to 17 years (22.9%) are considered overweight or obese according to BMI for age standards. Wyoming ranks third among the 50 states and D.C. in overall prevalence.

\* Only one in six (16.3%) Wyoming children in higher income families are overweight or obese. The state ranks third in prevalence among higher income children.

\* One in five (20.2%) Wyoming children with private health insurance are overweight or obese.

\* Wyoming children are more likely than their counterparts nationwide to be physically active for at least 4 days per week, and less likely to spend 2 hours or more in front of a television or computer screen.

**What has been done**

UW CES utilized EFNEP youth curricula taught in a series of lessons and day camps; displays and demonstrations; Other nutrition efforts focused on educational programs which increase knowledge and skills in nutrition needs of children and adults and also incorporate physical activity into lifestyle; educators use media outreach (newspapers, newsletters, radio); health fairs; Programs which teach body size acceptance also are targeted to youth.

A variety of classes (many multi-session) on Steps to a New You, Healthy Eating, Weight Management and basic nutrition were conducted by nutrition educators.

**Results**

Results of the 65 educational programs (several were series of 5 - 8 weeks) reaching 2114 youth included:

92 percent showed improvement in one or more nutrition practices.

27% reported eating a variety of foods;

Over 50% increased their knowledge of MyPryamid food groups;

24% could identify missing food groups in meals;

45% could identify physical activity recommendations for their age;

33% increased their knowledge of body size diversity.

**4. Associated Knowledge Areas**

- 305 - Animal Physiological Processes
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

## **Outcome #20**

### **1. Outcome Measures**

- Not Reporting on this Outcome Measure

Research: Create awareness of relationships between obesity, nutrition and health. Target is number of projects reporting this outcome.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	{No Data Entered}	4

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

It has been well established in the scientific literature that obesity in reproductive age women, resulting from the consumption of too many calories before and during pregnancy markedly increases the incidence of obesity, systolic or diastolic hypertension, high triglyceride levels, low HDL levels, glucose intolerance and type II diabetes in their offspring. This cadre of health concerns is referred to as the Metabolic Syndrome, and has increased markedly in the United States population in recent years and is occurring in younger individuals.

#### **What has been done**

Using the sheep as our animal model, we have developed an overnutrition protocol designed to make ewes extremely fat by conception and maintain them in an obese state throughout gestation. In short, offspring born to obese ewes develop aspects of the Metabolic Syndrome that are observed in human offspring born to obese women.

#### **Results**

Understanding of the specific physiologic factors leading to the observed postnatal health problems in offspring born to obese mothers will allow the development of methods to prevent the alterations in fetal growth and development associated with maternal obesity and result in the birth of normal health offspring. Implications of this research relate equally to both humans and

livestock and will help to alleviate the epidemic of obesity and type II diabetes seen in the population of the U.S. and other developed countries.

#### **4. Associated Knowledge Areas**

- 305 - Animal Physiological Processes
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

#### **V(H). Planned Program (External Factors)**

##### **External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other ()

##### **Brief Explanation**

Many conditions and situations that exist in Wyoming are similar to those in other parts of the country, for example, the following:

Food choices made available and advertised to consumers by producers; Access to timely and accurate information; Coordination and cooperation of federal agencies and state partners, schools and other youth agencies; Existence of local collaboration; Level of funding at federal, state and local level; and Willingness of community organizations, to collaborate with Wyoming Cooperative Extension Service.

If EFNEP funding is decreased, appropriations will impact program delivery. Population changes impact limited resource audiences eligible for program.

Availability of funding for research in childhood obesity.

#### **V(I). Planned Program (Evaluation Studies and Data Collection)**

##### **(OPTIONAL SECTION)**

##### **1. Evaluation Studies Planned**

- After Only (post program)

- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other

## **Evaluation Results**

### **Key Items of Evaluation**

**V(A). Planned Program (Summary)**

**Program # 4**

**1. Name of the Planned Program**

4-H and Youth Development

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
801	Individual and Family Resource Management	10%		0%	
802	Human Development and Family Well-Being	25%		0%	
806	Youth Development	65%		0%	
	<b>Total</b>	100%		0%	

Add knowledge area

**V(C). Planned Program (Inputs)**

**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	29.0	0.0	0.0	0.0
Actual	32.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
472998	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2699319	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

Activities include volunteer training on the following topics: Ages and Stages of Youth; Risk Management; Youth Development Concepts; Non-Profit Management/Coordination; Financial Management/IRS Issues; Project Training; Learning Styles; Club Maintenance; Recruitment and Retention.

Traditional 4-H will focus on project or leadership activities; teach and/or facilitate educational programs; recruitment of new members, training, camps, clinics, contests, media, and assessment.

Non-traditional 4-H activities will include: Cloverbuds (pre 4-H); After school programs; School enrichment; Youth Leadership; Marketing; and Camps.

**2. Brief description of the target audience**

The University of Wyoming College of Agriculture is committed to reaching underrepresented groups and individuals and to implementing the objectives of equal opportunity regulations relative to the consideration and treatment of clientele for participation in Extension programs regardless of their race, national origin, gender, age, religion, or disability. 4-H Volunteers will be recruited from the following groups: Adults in the Community, Other Agencies, Civic Groups, Youth Groups, and the General Public.

Traditional 4-H youth audiences will target:

- Youth
- Volunteers
- Families
- Community.

The target audience for non-traditional 4-H will include: Underserved and high risk youth who do not participate in the traditional 4-H Youth program in Wyoming. Youth from military families both at F.E. Warren Air Force Base and National Guard Installations.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Plan</b>	3000	5000	7000	10000
<b>Actual</b>	2617	5000	25927	10000

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

**Patent Applications Submitted**

Year: 2010  
 Plan: 0  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2010	Extension	Research	Total
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<b>Plan</b>	0	0	
<b>Actual</b>	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of youth enrolled in the traditional 4-H program. Target is number of youth enrolled in traditional 4-H club programs.
- Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	7500	9342

**Output #2**

**Output Measure**

- Number of educational events, camps, training workshops, clinics implemented. Target is number of programs and events.
- Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	100	668

**Output #3**

**Output Measure**

- Number of volunteers enrolled as leaders in the 4-H program. Target is number of volunteers enrolled in the 4-H program.
- Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	3000	2735

**Output #4**

**Output Measure**

- Number of volunteers participating in formal training programs. Target is number of volunteers participating in training programs.
- Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	800	2598

**Output #5**

**Output Measure**

- Number of non-traditional programs established. Target is number of non-traditional programs.

Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	15	20

**Output #6**

**Output Measure**

- Number of youth enrolled in non-traditional youth development programs. Target is number of youth enrolled in non-traditional programs.

Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	7000	11248

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Increased knowledge, skills, self-esteem, awareness, motivation, belonging, and diversity. Target is number of youth participating who report positive outcome.
2	Wyoming youth will acquire knowledge which builds life skills including critical thinking, public speaking, teamwork, self-discipline, responsibility, decision making, self-esteem, communication, and leadership. Target is number of youth reporting outcome.
3	Youth will be empowered to make logical decisions, develop a positive behavior (according to traditional values), effectively communicate, and establish a working relationship with others. Target is number of participants reporting outcome.
4	Wyoming youth build assets and essential life skills to lead productive, responsible, and healthy lifestyles. Target is number of participants reporting outcome.
5	Decreased incidence of youth engaging in high risk behavior. Youth become responsible, productive adults. Target is number of participants reporting outcome.
6	Non-traditional youth participating in programs serve in leadership roles, serve on governing bodies, act as mentors, and teach other youth. Target is number of participants reporting outcome.
7	Volunteers demonstrate increased knowledge in project areas. Target is number of participants reporting outcome.
8	Volunteers become key players in 4-H and youth development programs. Target is number of participants reporting outcome.
9	Volunteers demonstrate knowledge of youth development principles. Target is number of participants reporting outcome.
10	Volunteers will learn and apply the experiential learning model. Target is number of participants reporting outcome.
11	Trained adult volunteers will demonstrate skills and abilities in which they are able to foster youth to become responsible adults. Target is number of participants reporting outcome.

**Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure**

**Outcome #1**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Increased knowledge, skills, self-esteem, awareness, motivation, belonging, and diversity. Target is number of youth participating who report positive outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	1000	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

**Outcome #2**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Wyoming youth will acquire knowledge which builds life skills including critical thinking, public speaking, teamwork, self-discipline, responsibility, decision making, self-esteem, communication, and leadership. Target is number of youth reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	2500	3921

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

In Wyoming there are an estimated 75,000 youth between the ages of 8 and 18 according to the U.S. Census Bureau. According to the Search Institute 'youth who have ten or fewer of the 40 external and internal assets are at high risk of developing at-risk behaviors'. All of the 40 external and internal assets are likely to be developed by youth involved in the 4-H program. Youth in the traditional 4-H program have the opportunity to expand their knowledge base, increase their life skills and develop leadership abilities in order to become responsible, contributing citizens.

**What has been done**

4-H youth educators conducted 68 educational activities including 4-H camps, Junior Leader programs, leadership retreats and special interest sessions, judging programs, training on public speaking and presentations and implemented Character Counts training statewide.

**Results**

Over 300 youth participating in 4-H judging programs reported increased confidence and skills in decision making and communication. Junior leaders (youth age 13 - 18) reported through formal and informal evaluations increased awareness and skills in teamwork, decision making, self-discipline, leadership, communication, and responsibility. Youth participating in educational programs, camps, and other activities demonstrate increased knowledge and skills.

**4. Associated Knowledge Areas**

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

**Outcome #3**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Youth will be empowered to make logical decisions, develop a positive behavior (according to traditional values), effectively communicate, and establish a working relationship with others. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	1000	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

**Outcome #4**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Wyoming youth build assets and essential life skills to lead productive, responsible, and healthy lifestyles. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	500	2450

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

In Wyoming there are an estimated 75,000 youth between the ages of 8 and 18 according to the U.S. Census Bureau. According to the Search Institute 'youth who have ten or fewer of the 40 external and internal assets are at high risk of developing at-risk behaviors'. All of the 40 external and internal assets are likely to be developed by youth involved in the 4-H program. Youth in the traditional 4-H program have the opportunity to expand their knowledge base, increase their life skills and develop leadership abilities in order to become responsible, contributing citizens.

**What has been done**

4-H educators work with youth ages 13 - 18 in Junior Leader programs which target development of assets. A variety of methods are used including training, camps, workshops, leadership retreats, and on-going monthly junior leader meetings. WYLE curriculum, Wyoming Youth Leadership Education program, funded through the Daniels Fund, was held in all areas in the state with 2 to 3 day retreats for junior leader age youth. Focusing on developing assets in youth is an objective of all educational activities.

**Results**

Junior leader age youth (13 - 18) report through formal and informal evaluation increased skills, knowledge, and assets such as self esteem, communication, responsibility, and decision making. Wyoming Youth Leadership Education retreats had the following impact: daily evaluations as well as a final overall evaluation were used to evaluate the overall impact of the program. The evaluations showed that 68 percent of youth said that their knowledge was improved or greatly improved by the True Colors assessment, 72 percent for learning styles, 89 percent for body language, and 94 percent for extreme leadership, 42 percent for youth in governance, 58 percent for business etiquette, 90 percent for senior sensitivity, 65 percent for Character Counts, and 90 percent for communication.

**4. Associated Knowledge Areas**

- 801 - Individual and Family Resource Management

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

**Outcome #5**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Decreased incidence of youth engaging in high risk behavior. Youth become responsible, productive adults. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	500	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

**Outcome #6**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Non-traditional youth participating in programs serve in leadership roles, serve on governing bodies, act as mentors, and teach other youth. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	100	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

**Outcome #7**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Volunteers demonstrate increased knowledge in project areas. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	500	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

**Outcome #8**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Volunteers become key players in 4-H and youth development programs. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	200	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

**Outcome #9**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Volunteers demonstrate knowledge of youth development principles. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	500	2300

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Adult volunteers are the mainstay of the 4-H Program. The success of the program depends on the knowledge and skills volunteer leaders have and can then pass on to the youth and parents in their clubs. Leaders can directly accomplish goals of the program for positive youth development of all participants. In the 2009-2010 program year in Wyoming there were 2617 leaders at all stages of experience and expertise. Area advisory meetings, 4-H councils, program assessments compiled over three years revealed the need for leadership training beyond the basics of 4-H.

**What has been done**

4-H educators and the State 4-H volunteer development specialist teamed to design and implement the Master 4-H Volunteer Training which is held at the state 4-H leaders conference. Resources included curriculum and activities developed to provide hands-on, experiential learning opportunities for volunteers. The program consisted of 11 hours of intensive training. In addition, county youth educators conducted over 125 training sessions for volunteers, reaching over 2300.

**Results**

100 percent (26) of the volunteer leaders rated the overall Master Volunteer training as good or very good. Many leaders indicated an intent to use the information to help train other leaders in

their home county. Following is a sample of how leaders plan to use what they learned:

\*Going back to my county and working as a resource for community club leaders, and the county 4-H council.

\*I have decided to take on Jr. Leaders; I'm very excited to use all this information.

\*Training volunteers and encouraging leaders. Build strong clubs.

\*End of session evaluations on other programs indicated 100 percent gained knowledge and skills to build confidence in working with youth.

**4. Associated Knowledge Areas**

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

**Outcome #10**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Volunteers will learn and apply the experiential learning model. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	300	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

## **Outcome #11**

### **1. Outcome Measures**

- Not Reporting on this Outcome Measure

Trained adult volunteers will demonstrate skills and abilities in which they are able to foster youth to become responsible adults. Target is number of participants reporting outcome.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	200	890

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Adult volunteers are the mainstay of the 4-H Program. The success of the program depends on the knowledge and skills volunteer leaders have and can then pass on to the youth and parents in their clubs. Leaders can directly accomplish goals of the program for positive youth development of all participants. In the 2009-2010 program year in Wyoming there were 2795 leaders at all stages of experience and expertise. Area advisory meetings, 4-H councils, program assessments compiled over three years revealed the need for leadership training beyond the basics of 4-H.

#### **What has been done**

4-H youth educators conducted 62 training activities including state 4-H leaders conference, project and general leader training. Objectives and goals of 4-H youth development principles are incorporated into all training sessions.

#### **Results**

Volunteers stated increased understanding of youth development principles which foster youth to become productive adults. Testimonials from 4-H leaders and youth indicate the positive influence adult volunteers have on the life of 4-H members.

### **4. Associated Knowledge Areas**

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

**V(H). Planned Program (External Factors)**

**External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (background of participants)

**Brief Explanation**

High staff turnover in the 4-H program also impacts continuity of youth development programs.

**V(I). Planned Program (Evaluation Studies and Data Collection)**

**(OPTIONAL SECTION)**

**1. Evaluation Studies Planned**

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other

**Evaluation Results**

**Key Items of Evaluation**

**V(A). Planned Program (Summary)**

**Program # 5**

**1. Name of the Planned Program**

Sustainable Management of Rangeland Resources (SMRR)

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

<b>KA Code</b>	<b>Knowledge Area</b>	<b>%1862 Extension</b>	<b>%1890 Extension</b>	<b>%1862 Research</b>	<b>%1890 Research</b>
101	Appraisal of Soil Resources	5%		5%	
102	Soil, Plant, Water, Nutrient Relationships	5%		5%	
103	Management of Saline and Sodic Soils and Salinity	5%		5%	
104	Protect Soil from Harmful Effects of Natural Elements	5%		5%	
111	Conservation and Efficient Use of Water	5%		5%	
112	Watershed Protection and Management	5%		5%	
121	Management of Range Resources	5%		5%	
123	Management and Sustainability of Forest Resources	5%		5%	
131	Alternative Uses of Land	5%		5%	
132	Weather and Climate	5%		5%	
135	Aquatic and Terrestrial Wildlife	5%		5%	
136	Conservation of Biological Diversity	5%		5%	
205	Plant Management Systems	5%		5%	
206	Basic Plant Biology	5%		5%	
211	Insects, Mites, and Other Arthropods Affecting Plants	5%		5%	
213	Weeds Affecting Plants	5%		5%	
306	Environmental Stress in Animals	5%		5%	
311	Animal Diseases	5%		5%	
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals	5%		5%	
605	Natural Resource and Environmental Economics	5%		5%	
	<b>Total</b>	100%		100%	

**Add knowledge area**

**V(C). Planned Program (Inputs)**

**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	12.0	0.0	12.0	0.0
Actual	14.0	0.0	10.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
206936	0	133151	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1180952	0	133151	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

Natural resource programs will reach out to a broad spectrum of constituents throughout Wyoming using a variety of sources. Workshops on sustainable rangeland and animal management principles were offered within each extension area within the state. Provide professional development opportunities for rangeland professionals. Developed written educational materials on rangeland and animal management practices and principles (fact sheets, bulletins, media, presentations, Web). Conduct technical consultation on rangeland and animal management, and monitoring of rangelands. Developed media on rangeland management principles (radio, TV, press). Conduct research and demonstrations on sustainable natural resource management principles. Work with individual rangeland managers on developing, implementing, and evaluating sustainable management practices.

Develop and/or present programs on natural resources at youth activities. Produce, or update currently produced educational materials targeted to youth on natural resource education. Produce information/education modules emphasizing natural resource topics for 4-H leader use in 4-H project with large enrollment.

**2. Brief description of the target audience**

The University of Wyoming is committed to reaching underrepresented groups and individuals and to implementing the objectives of equal opportunity regulations relative to the consideration and treatment of clientele for participation in programs regardless of their race, national origin, gender, age, religion, or disability. The College of Agriculture is committed to transmitting unbiased scientific-based information to solve local and regional natural resource conflicts involving state, Federal, and private resources. All efforts will be made to provide information through direct contact and through publications, newsletters, Web sites and other methods. The general public and exurban landowners, agricultural producers and federal and state land management agency personnel as well as general youth and traditional 4-H, are among the target audiences for natural resource youth programs.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Plan</b>	200	2000	50	500
<b>Actual</b>	2308	30000	391	500

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

**Patent Applications Submitted**

Year: 2010  
 Plan: 1  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2010	Extension	Research	Total
<b>Plan</b>	1	8	
<b>Actual</b>	1	29	30

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of programs implemented. Target is number of programs.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	10	16

**Output #2**

**Output Measure**

- Documented media efforts implemented. Target is number of media efforts such as magazines, TV, radio, newspaper inserts.

Not reporting on this Output for this Annual Report

Year	Target	Actual
------	--------	--------

2010 5 0

**Output #3**

**Output Measure**

- Number of individuals participating in educational programs or activities. Target is number of participants.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	200	2308

**Output #4**

**Output Measure**

- Number of agency personnel, range professionals, and general public participating in training. Target is number of participants.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	150	2308

**Output #5**

**Output Measure**

- Number of youth related natural resource programs implemented. Target is number of programs.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	1	10

**Output #6**

**Output Measure**

- Number of youth participating in natural resource educational programs or activities. Target is number of participants.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	100	397

**Output #7**

**Output Measure**

- Research: The ability of producers to adopt economically and environmentally sustainable production practices in the face of persistent drought will improve the economic viability while reducing potential resource damage. The long term goal will be to model scenarios of long term drought on economic viability of rural communities. Target is number of producers implementing practices.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	1	0

**Output #8**

**Output Measure**

- Research - Impacts of natural resource development on long term rural water quality. Long term goals will be to integrate knowledge gained into environmental regulations and improved water quality. Target is number of projects.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	2	0

**Output #9**

**Output Measure**

- Research - One of the major environmental controversies is rising CO2 levels. There is a large potential to increase C storage in disturbed and reclaimed land. Long term goals will be to develop improved soil properties on these sites. Target is number of projects.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	1	0

**Output #10**

**Output Measure**

- Research - Matching animal productivity to actual resources available rather than modifying resources to match animal nutrient needs. The long term goal is to develop more sustainable grazing systems. Target is number of projects.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	1	0

**Output #11**

**Output Measure**

- Research: Number of research publications, bulletins, reports, and presentations on sustainable rangeland production practices. Target is number of outputs reported.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	25

**Output #12**

**Output Measure**

- Research: Number of research publications, bulletins, reports, and presentations on watershed management. Target is number of outputs reported.

Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	{No Data Entered}	25

**V(G). State Defined Outcomes****V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Increase public knowledge and appreciation of natural resources and public awareness of sustainable resources. Target is number of participants reporting outcome.
2	General public understands the impact of resource use and management on the quality and quantity of the resources. (i.e. water, rangeland, wildlife, viewsheds). Target is number of participants reporting outcome.
3	Raise the understanding of the general public on the interaction of natural resource use in Wyoming's economy. Citizens will make better informed decisions on natural resource issues and topics. Target is number of participants reporting outcome.
4	Greater public consensus of management of private and public lands resulting in less litigation and burden on the system, through unbiased information that will reduce conflict and contribute to the economic and biological sustainability of Wyoming communities. Target is number of participants reporting outcome.
5	Youth participating in natural resource programs will have increased interest in careers in natural resources. Target is youth participants choosing natural resource careers.
6	Increased enrollment in 4-H natural resource programs (projects, camps, activities). Target is number of increased youth participation in natural resource programs.
7	Increase knowledge, awareness and skills among youth on natural resources, their management and associated issues. Target is number of participants reporting outcome.
8	Raise awareness, knowledge, and skills for development, implementation and evaluation of land management plans that include management of grazing and browsing animals, and adjusting management as to necessary to meet objectives. Target is number of participants reporting outcome.
9	Land managers, public and private, will develop, implement, and evaluate plans for improved management of rangeland resources and associated herbivores. Target is number of participants reporting outcome.
10	Increased profit for range-based agriculture enterprises. Target is number of participants reporting outcome.
11	Improved rangeland health, productivity, and profitability including value of rangeland for multiple use. Target is number of participants reporting outcome.
12	Research - Increased knowledge and appreciation of sustainable production practices. Change in knowledge through publications and integration into extension programs. Target is number of projects which have resulted in publication of results and/or integration into extension programs.
13	Research - Increase knowledge and appreciation of resource development on water quality. Outcomes will be change in knowledge through publications, bulletins, reports and long term to integrate research into extension programs. Target is number of projects which have outcomes that have been documented in publications, bulletins and/or integrated into extension programs.
14	Research - Increase public awareness on long term CO2 levels and integrate findings into extension programs. Target is number of projects in which outcomes have been integrated into extension programs.

15	Research - Increase producers ability to match resources to animal productivity. Target is number of projects which report research outcome. These projects have been integrated into extension programming.
16	Research: Transfer knowledge and increase appreciation of sustainable rangeland production. Target is number of projects reporting outcome.
17	Research: Transfer knowledge and increase appreciation of watershed management. Target is number of projects reporting outcome.

**Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure**

**Outcome #1**

**1. Outcome Measures**

Not Reporting on this Outcome Measure

Increase public knowledge and appreciation of natural resources and public awareness of sustainable resources. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	500	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 103 - Management of Saline and Sodic Soils and Salinity

- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources
- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 306 - Environmental Stress in Animals
- 311 - Animal Diseases
- 314 - Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards
- 605 - Natural Resource and Environmental Economics

**Outcome #2**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

General public understands the impact of resource use and management on the quality and quantity of the resources. (i.e. water, rangeland, wildlife, viewsheds). Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	250	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

## What has been done

### Results

#### 4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 103 - Management of Saline and Sodic Soils and Salinity
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources
- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 306 - Environmental Stress in Animals
- 311 - Animal Diseases
- 314 - Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards
- 605 - Natural Resource and Environmental Economics

#### Outcome #3

##### 1. Outcome Measures

- Not Reporting on this Outcome Measure

Raise the understanding of the general public on the interaction of natural resource use in Wyoming's economy. Citizens will make better informed decisions on natural resource issues and topics. Target is number of participants reporting outcome.

##### 2. Associated Institution Types

- 1862 Extension

- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	100	30000

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Many Wyomingites are not directly tied to natural resources and agriculture. This results in lack of knowledge and experience regarding natural resource systems, their management and the industries they support. Unfortunately, a segment of the general public appears to believe that any use of even renewable resources is damaging. There is often conflict and occasional litigation among interest groups that differ on how resources should be used and managed. Natural resources are important to all segments of the Wyoming population.

**What has been done**

The Sustainable Management of Rangeland Resources initiative team has produced over 175 seventy second TV spots which air twice weekly on commercial TV station in Casper. The segment titled 'Exploring the Natural Wonders of Wyoming' (ENOW) covers natural resource topics to provide education to the general public. The ENOW spots have also been placed on You-Tube to reach a national audience.

**Results**

In the fifth year of airing these spots, the team receives regular feedback from Wyoming citizens and now national viewers on the positive aspects of the spots. It is difficult to measure impact, though the audience response has generated enough impact that the the energy industry now provides partial funding for the segments aired twice weekly.

**4. Associated Knowledge Areas**

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 103 - Management of Saline and Sodic Soils and Salinity
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources
- 123 - Management and Sustainability of Forest Resources

- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 306 - Environmental Stress in Animals
- 311 - Animal Diseases
- 314 - Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards
- 605 - Natural Resource and Environmental Economics

**Outcome #4**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Greater public consensus of management of private and public lands resulting in less litigation and burden on the system, through unbiased information that will reduce conflict and contribute to the economic and biological sustainability of Wyoming communities. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	5	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 103 - Management of Saline and Sodic Soils and Salinity
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources
- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 306 - Environmental Stress in Animals
- 311 - Animal Diseases
- 314 - Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards
- 605 - Natural Resource and Environmental Economics

#### Outcome #5

##### 1. Outcome Measures

- Not Reporting on this Outcome Measure

Youth participating in natural resource programs will have increased interest in careers in natural resources. Target is youth participants choosing natural resource careers.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

##### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
------	---------------------	--------

2010

5

0

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

#### What has been done

#### Results

### 4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 103 - Management of Saline and Sodic Soils and Salinity
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources
- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 306 - Environmental Stress in Animals
- 311 - Animal Diseases
- 314 - Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards
- 605 - Natural Resource and Environmental Economics

### Outcome #6

#### 1. Outcome Measures

- Not Reporting on this Outcome Measure

Increased enrollment in 4-H natural resource programs (projects, camps, activities). Target is number of increased youth participation in natural resource programs.

#### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	50	397

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Extension is uniquely positioned in that we have existing volunteer youth development programming infrastructure already built in the 4-H program featuring offices in all of Wyoming's 23 counties, several thousand volunteer staff and thousands of youth already acquainted with the 4-H program. These youth present an immediate natural resource education audience and an opportunity to reach the broader youth audience with the educational resources we have. Building stronger natural resource programs, enhancing natural resource teaching opportunities within existing high-interest projects (like market livestock and shooting sports projects) and increasing youth development opportunities are key. This will continue to foster interest in natural resource careers. Science, engineering, and technology emphasis of 4-H align with SMRR educational efforts.

**What has been done**

Educators conducted 12 educational programs including an ag expo, GPS training, plant anatomy, native plants and noxious weeds, and nature awareness. Alternative energy, windmill science and wind workshops were also conducted.

**Results**

Enrollment in 4-H livestock projects continues to increase. Shooting sports which is also closely tied to natural resources is also experiencing increased enrollment. All youth participating in targeted natural resource education programs report increased knowledge and skills.

**4. Associated Knowledge Areas**

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 103 - Management of Saline and Sodic Soils and Salinity
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water

- 112 - Watershed Protection and Management
- 121 - Management of Range Resources
- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 306 - Environmental Stress in Animals
- 311 - Animal Diseases
- 314 - Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards
- 605 - Natural Resource and Environmental Economics

**Outcome #7**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Increase knowledge, awareness and skills among youth on natural resources, their management and associated issues. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	100	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

## Results

### 4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 103 - Management of Saline and Sodic Soils and Salinity
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources
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- 136 - Conservation of Biological Diversity
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 306 - Environmental Stress in Animals
- 311 - Animal Diseases
- 314 - Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards
- 605 - Natural Resource and Environmental Economics

### Outcome #8

#### 1. Outcome Measures

- Not Reporting on this Outcome Measure

Raise awareness, knowledge, and skills for development, implementation and evaluation of land management plans that include management of grazing and browsing animals, and adjusting management as to necessary to meet objectives. Target is number of participants reporting outcome.

#### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

#### 3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	50	828

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Rangelands comprise over 80 percent of Wyoming's land base. Range livestock production, recreation, and wildlife habitat are some of the dominant uses of rangelands. Rangelands also provide water for homes and municipalities, irrigation, industries, fisheries, wildlife and livestock. In semi-arid Wyoming, rangeland uses need to be compatible with maintaining the quality and quantity of water resources. Livestock grazing and wildlife habitat management must also be compatible as both are important for the sustainability of the State's rangeland resources and its economy.

**What has been done**

Extension educators in the SMRR initiative conducted 32 educational programs, tours, or workshops on range monitoring. Most classes were targeted toward permittees reaching 828 individuals. Reclamation 101 School has been implemented to assist producers and industry in mitigating energy impacts.

**Results**

100 percent of participants in educational programs reported increased awareness, knowledge, and skills of range monitoring. 65 individuals reported implementing or adjusting management plans as a result of the workshops.

**4. Associated Knowledge Areas**

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 103 - Management of Saline and Sodic Soils and Salinity
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources
- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity

- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 306 - Environmental Stress in Animals
- 311 - Animal Diseases
- 314 - Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards
- 605 - Natural Resource and Environmental Economics

**Outcome #9**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Land managers, public and private, will develop, implement, and evaluate plans for improved management of rangeland resources and associated herbivores. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	20	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 103 - Management of Saline and Sodic Soils and Salinity

- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources
- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 306 - Environmental Stress in Animals
- 311 - Animal Diseases
- 314 - Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards
- 605 - Natural Resource and Environmental Economics

**Outcome #10**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Increased profit for range-based agriculture enterprises. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	5	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

## What has been done

### Results

#### 4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 103 - Management of Saline and Sodic Soils and Salinity
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources
- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 306 - Environmental Stress in Animals
- 311 - Animal Diseases
- 314 - Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards
- 605 - Natural Resource and Environmental Economics

#### Outcome #11

##### 1. Outcome Measures

- Not Reporting on this Outcome Measure

Improved rangeland health, productivity, and profitability including value of rangeland for multiple use. Target is number of participants reporting outcome.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	5	0

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

#### What has been done

#### Results

### 4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 103 - Management of Saline and Sodic Soils and Salinity
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources
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- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 306 - Environmental Stress in Animals
- 311 - Animal Diseases
- 314 - Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards
- 605 - Natural Resource and Environmental Economics

**Outcome #12**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Research - Increased knowledge and appreciation of sustainable production practices. Change in knowledge through publications and integration into extension programs. Target is number of projects which have resulted in publication of results and/or integration into extension programs.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	3	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 103 - Management of Saline and Sodic Soils and Salinity
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources
- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 135 - Aquatic and Terrestrial Wildlife

- 136 - Conservation of Biological Diversity
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 306 - Environmental Stress in Animals
- 311 - Animal Diseases
- 314 - Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards
- 605 - Natural Resource and Environmental Economics

**Outcome #13**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Research - Increase knowledge and appreciation of resource development on water quality. Outcomes will be change in knowledge through publications, bulletins, reports and long term to integrate research into extension programs. Target is number of projects which have outcomes that have been documented in publications, bulletins and/or integrated into extension programs.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	2	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 101 - Appraisal of Soil Resources

- 102 - Soil, Plant, Water, Nutrient Relationships
- 103 - Management of Saline and Sodic Soils and Salinity
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources
- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 306 - Environmental Stress in Animals
- 311 - Animal Diseases
- 314 - Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards
- 605 - Natural Resource and Environmental Economics

**Outcome #14**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Research - Increase public awareness on long term CO2 levels and integrate findings into extension programs. Target is number of projects in which outcomes have been integrated into extension programs.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	1	0

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

#### What has been done

#### Results

#### 4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 103 - Management of Saline and Sodic Soils and Salinity
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources
- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 306 - Environmental Stress in Animals
- 311 - Animal Diseases
- 314 - Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards
- 605 - Natural Resource and Environmental Economics

#### Outcome #15

##### 1. Outcome Measures

- Not Reporting on this Outcome Measure

Research - Increase producers ability to match resources to animal productivity. Target is number of projects which report research outcome. These projects have been integrated into extension programming.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	1	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 103 - Management of Saline and Sodic Soils and Salinity
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources
- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 306 - Environmental Stress in Animals
- 311 - Animal Diseases
- 314 - Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards

- 605 - Natural Resource and Environmental Economics

### **Outcome #16**

#### **1. Outcome Measures**

- Not Reporting on this Outcome Measure

Research: Transfer knowledge and increase appreciation of sustainable rangeland production.  
Target is number of projects reporting outcome.

#### **2. Associated Institution Types**

- 1862 Extension  
 1862 Research

#### **3a. Outcome Type:**

- Change in Knowledge Outcome Measure  
 Change in Action Outcome Measure  
 Change in Condition Outcome Measure

#### **3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	{No Data Entered}	3

#### **3c. Qualitative Outcome or Impact Statement**

##### **Issue (Who cares and Why)**

Monitoring and assessing rangeland sustainability and the communities that depend upon them are necessary for policy makers, land managers, and the people that use rangelands. Knowing how social, economic, and ecological systems are changing through time and across space helps those decision-makers to understand how changes in management and policy affect the ecosystem.

##### **What has been done**

The Sustainable Rangelands Roundtable is a national effort to bring interested parties together to develop mutually agreed upon criteria and indicators of social, economic, and ecological sustainability. To date, the roundtable has agreed upon 64 indicators, developed a conceptual framework to assess those indicators, developed a guide for ecosystem goods and services from rangelands, and is currently developing a ranch assessment guide.

##### **Results**

The Sustainable Rangelands Roundtable efforts are helping stakeholders from federal, state, local, and tribal governments, industry, environmental groups, academics, and other interested citizens evaluate the same data to assess the U.S. sustainability of rangelands.

#### **4. Associated Knowledge Areas**

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 103 - Management of Saline and Sodic Soils and Salinity
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources
- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 306 - Environmental Stress in Animals
- 311 - Animal Diseases
- 314 - Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards
- 605 - Natural Resource and Environmental Economics

**Outcome #17**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Research: Transfer knowledge and increase appreciation of watershed management. Target is number of projects reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	2

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

A significant challenge the West faces is to satisfy local, state, and national energy needs, while ensuring adequate quantity and quality water supplies and minimizing negative environmental impacts associated with management of co-produced water, often of substantially impaired quality.

#### What has been done

Integrated research was conducted by regional team members and collaborators across the Northern region to address questions regarding the potential short and long-term impacts of the discharge water to soil, vegetation, and water resources and management alternatives. Individual and state strengths and expertise were integrated to develop effective education and extension program tools to address the identified needs across the region and in individual states.

#### Results

The development of the comprehensive integrated research, education and extension project has resulted in providing numerous landowners within the Northern Plains and Mountain Regions the tools to institute science-based natural resource monitoring programs to better manage produced and impaired waters from energy development. The impacts of this integrated project continue to reach local, regional, and national levels - with the state of Montana, Northern Cheyenne Tribe, and US EPA adopting promulgated surface water quality standards specific to salinity and sodicity. At the local level, the "landowner guide" has provided a scientific approach for landowners to use to measure and monitor changes in their plant, soil, and water resources due to the impacts of CMB development.

### 4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 103 - Management of Saline and Sodic Soils and Salinity
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources
- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 306 - Environmental Stress in Animals

- 311 - Animal Diseases
- 314 - Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards
- 605 - Natural Resource and Environmental Economics

#### **V(H). Planned Program (External Factors)**

##### **External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Technology changes)

##### **Brief Explanation**

CES has experienced several educators resigning during this period. Searches are in progress to bring this team of educators back to full capacity. Weather extremes and funding are factors which impact both research and extension efforts.

#### **V(I). Planned Program (Evaluation Studies and Data Collection)**

##### **(OPTIONAL SECTION)**

##### **1. Evaluation Studies Planned**

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other

**Evaluation Results**

{No Data Entered}

**Key Items of Evaluation**

{No Data Entered}

**V(A). Planned Program (Summary)**

**Program # 6**

**1. Name of the Planned Program**

Food Safety

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	10%		10%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	90%		90%	
	<b>Total</b>	100%		100%	

Add knowledge area

**V(C). Planned Program (Inputs)**

**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Actual	6.0	0.0	2.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
88688	0	223646	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
506123	0	223646	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

Cooperative Extension collaborates with the Wyoming Department of Agriculture, Consumer Health Division and Wyoming Environmental Health Association, and local health agencies in partnership as the Wyoming Food Safety Coalition. Educational efforts include a series of workshops or classes targeting food industry personal. In addition, utilizing ServSafe, the certification course of the National Restaurant Association in depth classes which include end of session certification testing are conducted. Classes, workshops, displays, and demonstrations were used to reach a general consumer audience. Youth are reached through school programs on handwashing and avoidance of cross contamination.

Educational programs on food preservation including pressure and water-bath canning, freezing, and drying foods were delivered using multiple methods to ensure safety of the end product.

Research focused on more rapid methods of detection of food-borne pathogens such as E.coli and Listeria. Ultimately delineate genes that promote survival in the environment and result in disease contamination of food.

**2. Brief description of the target audience**

The University of Wyoming is committed to reaching underrepresented groups and individuals and to implementing the objectives of equal opportunity regulations relative to the consideration and treatment of clientele for participation in all programs regardless of their race, national origin, gender, age, religion, or disability. Specific target audience groups for the CNP (EFNEP) program: Low-income adults, Youth in Title I schools. All other food safety efforts targeted audiences include: general public, both adults and youth and policy makers. Restaurant workers are a major target audience for CES food safety efforts.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Plan</b>	{NO DATA}	{NO DATA}	{NO DATA}	{NO DATA}
<b>Actual</b>	1805	10000	200	1000

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

**Patent Applications Submitted**

Year: 2010

Plan:

Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2010	Extension	Research	Total
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<b>Actual</b>	12	4	16
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**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Research: Improve ability to detect and analyze for the presence of food-borne pathogens. Target is number of publications, reports, bulletins, and presentations.

Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	{No Data Entered}	10

**Output #2**

**Output Measure**

- Number of food safety programs which promote safe handling practices in the public and food service industry.

Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	{No Data Entered}	101

**Output #3**

**Output Measure**

- Number of participants in educational programs offered by the Wyoming Food Safety Coalition.

Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	{No Data Entered}	1848

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Improve personal hygiene such as hand washing. Avoidance of cross-contamination resulting in keeping foods safe. Target is the number of participants reporting outcome.
2	Increased awareness and knowledge of food safety practices. Target is the number of participants reporting outcome.
3	The short term goal of research efforts is to increase grant funding and to patent detective processes. Target is the number of projects which show positive outcomes in regard to additional funding and patents.
4	Research: Transfer of knowledge on the ability to detect and analyze for the presence of food-borne pathogens. Target is the number of projects reporting this outcome.

**Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure**

**Outcome #1**

**1. Outcome Measures**

Not Reporting on this Outcome Measure

Improve personal hygiene such as hand washing. Avoidance of cross-contamination resulting in keeping foods safe. Target is the number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	854

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Microbial contamination of food is a serious public health problem: Each year in the U.S., food-borne diseases cause approximately 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths. With approximately 60 percent of food-borne illness outbreaks nationwide attributable to food-service establishments, food-service personnel are key to reducing the risk of food-borne illness. Additionally, home food preparers and consumers are important groups to reach with food safety education because their behaviors greatly affect the safety of food that they serve to others and/or eat themselves.

**What has been done**

Cooperative Extension collaborates with the Wyoming Department of Agriculture, Consumer Health Division and Wyoming Environmental Health Association, and local health agencies in partnership as the Wyoming Food Safety Coalition (WFSC). Educational efforts include a series of workshops or classes targeting food industry personal. In addition, utilizing ServSafe, the certification course of the National Restaurant Association in depth classes which include end of session certification testing are conducted. Classes, workshops, displays, and demonstrations are used to reach a general consumer audience. Youth are reached through school programs on handwashing and avoidance of cross contamination.

**Results**

Based on data from an evaluation project conducted by UW CES for the WFSC, this year 97 percent of participants made at least once change related to cleanliness, for example, washed their hands more often. 78 percent made at least one change related to food preparation, for example, prevented cross-contamination by keeping raw meats, cooked foods, and fresh produce

separated.

#### 4. Associated Knowledge Areas

- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and

### Outcome #2

#### 1. Outcome Measures

- Not Reporting on this Outcome Measure

Increased awareness and knowledge of food safety practices. Target is the number of participants reporting outcome.

#### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

#### 3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

#### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	2762

#### 3c. Qualitative Outcome or Impact Statement

##### **Issue (Who cares and Why)**

Food-borne diseases cause approximately 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths. With approximately 60% of food-borne illness outbreaks nationwide attributable to food-service establishments, food-service personnel are key to reducing the risk of food-borne illness. Additionally, home food preparers and consumers are important groups to reach with food safety education because their behaviors greatly affect the safety of food that they serve to others and/or eat themselves.

##### **What has been done**

101 classes ranging from ServSafe certification courses, Going for the Gold food safety classes for food service handlers, consumer food safety classes and school workshops on proper handwashing methods were conducted. Additionally classes on safe food preservation were taught statewide.

##### **Results**

100 percent of participants reported through both formal and informal evaluations increased awareness and knowledge of food safety practices.

97% made at least one change in regard to cleanliness.

80% made at least one change in regard to cooling food.

78% made at least one change related to food preparation.

75% made at least one change such as monitored critical control points more closely.

70% made at least one change related to cooking food.

Improved food handling behaviours such as those listed above increase the likelihood that food served in Wyoming is safe, and therefore, that lives have been saved, illnesses avoided, health care costs controlled, fewer work days missed, and local businesses and institutions made stronger.

#### 4. Associated Knowledge Areas

- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and

### Outcome #3

#### 1. Outcome Measures

- Not Reporting on this Outcome Measure

The short term goal of research efforts is to increase grant funding and to patent detective processes. Target is the number of projects which show positive outcomes in regard to additional funding and patents.

#### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

#### 3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

#### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

#### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and

#### Outcome #4

##### 1. Outcome Measures

- Not Reporting on this Outcome Measure

Research: Transfer of knowledge on the ability to detect and analyze for the presence of food-borne pathogens. Target is the number of projects reporting this outcome.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

##### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	3

##### 3c. Qualitative Outcome or Impact Statement

###### Issue (Who cares and Why)

Although other food-borne agents cause more illnesses, *L. monocytogenes* is the deadliest of the common food-borne bacteria. Infants, the elderly, immunocompromised individuals such as AIDS and cancer patients, and pregnant women have the greatest risk of being infected. Because of uncertainties about the dosage of cells required to cause disease in at-risk patients, the USDA has established a zero-tolerance policy for *L. monocytogenes* contamination in ready-to-eat foods.

###### What has been done

The mechanism of action of bacteriocins against *L. monocytogenes* is being investigated by studying strains that have acquired resistance to these agents.

###### Results

The research ultimately will lead to use of bacteriocins in additional food preservation applications.

#### 4. Associated Knowledge Areas

- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from

- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and

## **V(H). Planned Program (External Factors)**

### **External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other

### **Brief Explanation**

Turnover of personnel offers challenges in Wyoming; recruitment of three new nutrition educators required training specifically in ServSafe® to allow eligibility to teach that course. Food Preservation as part of food safety also requires specialized training to provide competency in that subject area.

## **V(I). Planned Program (Evaluation Studies and Data Collection)**

### **(OPTIONAL SECTION)**

#### **1. Evaluation Studies Planned**

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other

**Evaluation Results**

**Key Items of Evaluation**

**V(A). Planned Program (Summary)**

**Program # 7**

**1. Name of the Planned Program**

Climate Change

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
104	Protect Soil from Harmful Effects of Natural Elements	10%		10%	
112	Watershed Protection and Management	10%		10%	
132	Weather and Climate	20%		20%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	10%		10%	
205	Plant Management Systems	10%		10%	
306	Environmental Stress in Animals	10%		10%	
307	Animal Management Systems	10%		10%	
605	Natural Resource and Environmental Economics	10%		10%	
608	Community Resource Planning and Development	10%		10%	
	<b>Total</b>	100%		100%	

**Add knowledge area**

**V(C). Planned Program (Inputs)**

**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Actual	2.0	0.0	4.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
29563	0	136552	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
168709	0	136552	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

One of the most challenging issues facing our world today is change in the earth's climate. This has particular importance for agriculture because environment, climate and weather are such critical factors in the production system. The ultimate goal of this program is to develop research and extension educational programs which increase the capacity for agriculture producers to adjust to small changes in climate.

UW Research and Extension activities focus on best species and variety selection as well as effectiveness of production practices as aspects of climate changes. Invasive species, and drought are addressed through educational programs which enhance strategies to control global warming and will likely create opportunities for Wyoming agriculture to both profit and contribute to mitigation of forces driving change in climate.

Basic work in carbon storage in ecosystems, the implications of agricultural and land management practices on storage, and education related to these questions are being addressed. Plant species and variety adaption to the changing ecosystem are critical to maintaining the agricultural productivity for the state. Educational programs help producers and land managers understand the implications of drought for grasslands and cropping ecosystem management. The implications of climate change for invasive species and ecosystem management implications are important opportunities for UW AES and CES.

**2. Brief description of the target audience**

The University of Wyoming is committed to reaching underrepresented groups and individuals and to implementing the objectives of equal opportunity regulations relative to the consideration and treatment of clientele for participation in all programs regardless of their race, national origin, gender, age, religion, or disability. Specific target audience groups for the climate change program include agriculture producers, commodity groups, and agriculture agencies. Horticulture and small acreage audiences will also benefit from water conservation and risk management components of the program.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Plan</b>	{NO DATA}	{NO DATA}	{NO DATA}	{NO DATA}
<b>Actual</b>	649	30000	216	0

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

**Patent Applications Submitted**

Year: 2010  
 Plan:  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2010	Extension	Research	Total
Actual	0	8	8

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of agriculture producers participating in educational programs. Target is the number of program participants.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	649

**Output #2**

**Output Measure**

- Number of educational programs conducted targeting climate change. Target is the number of programs.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	32

**Output #3**

**Output Measure**

- Research: Evaluation of production practices in the face of climate changes. Target is number of research projects.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	0

**Output #4**

**Output Measure**

- Research: Determine the relationship between climate change and competition among native and invasive plant species. Target is number of research projects.

Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	{No Data Entered}	3

**Output #5**

**Output Measure**

- Research: Evaluate strategies to mitigate release of greenhouse gases into the atmosphere. Target is number of research projects.

Not reporting on this Output for this Annual Report

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	{No Data Entered}	0

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Awareness created through extension and research efforts. Target is the number of participants in extension and research programs reporting that they have gained awareness on topic.
2	Agriculture, horticulture, and small acreage participants will increase awareness of climate change and the impact on agriculture and horticulture production. Target is number of participants reporting outcome.
3	Producers will implement practices in animal and plant production which will mitigate climate change. Target is the number of producers reporting outcome.
4	Research: Create awareness of production practices, invasive plant species, and potential to mitigate greenhouse gas emissions in the face of climate change. Target is number of projects reporting this outcome.

**Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure**

**Outcome #1**

**1. Outcome Measures**

Not Reporting on this Outcome Measure

Awareness created through extension and research efforts. Target is the number of participants in extension and research programs reporting that they have gained awareness on topic.

**2. Associated Institution Types**

1862 Extension

1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	865

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Wyoming is a rangelands state where small changes in temperature and growing season and amount and timing of precipitation can have a dramatic effect on the success of plant communities in the ecosystem. Best species and variety selection as well as effectiveness of production practices will change as aspects of climate changes. Invasive species are a particular problem in the dry cold desert ecosystem as small changes in climate can shift the competitive relationship among plant species. This can have a significant effect on plant community diversity and rangelands productivity. Periodic and sustained drought is another critical factor in the success of agriculture in Wyoming. Some evidence suggests that drought and other climate variability may be more of a factor as the climate warms. In addition, strategies to control global warming will likely create opportunities for Wyoming agriculture to both profit and contribute to mitigation of forces driving change in climate.

**What has been done**

UW research and extension activities focus on best species and variety selection as well as effectiveness of production practices as aspects of climate changes. Invasive species, and drought were addressed through educational programs which enhance strategies to control global warming and will likely create opportunities for Wyoming agriculture to both profit and contribute to mitigation of forces driving change in climate. Basic work in carbon storage in ecosystems, the implications of agricultural and land management practices on storage, and education related to these questions are addressed. Educational programs presented help producers and land managers understand the implications of drought for grasslands and cropping ecosystem management.

**Results**

Participants in the 32 educational programs conducted by CES reaching 865 youth and adults reported gaining awareness and knowledge on the subject.

**4. Associated Knowledge Areas**

- 104 - Protect Soil from Harmful Effects of Natural Elements
- 112 - Watershed Protection and Management
- 132 - Weather and Climate
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 205 - Plant Management Systems
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development

**Outcome #2**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Agriculture, horticulture, and small acreage participants will increase awareness of climate change and the impact on agriculture and horticulture production. Target is number of participants reporting outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	649

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Wyoming is a rangelands state where small changes in temperature and growing season and amount and timing of precipitation can have a dramatic effect on the success of plant communities in the ecosystem. In urban areas, small acreages, and towns, horticulture has become an important component of CES agriculture efforts. Best species and variety selection as

well as effectiveness of production practices will change as aspects of climate changes. Invasive species are a particular problem in the dry cold desert ecosystem as small changes in climate can shift the competitive relationship among plant species. This can have a significant effect on plant community diversity and rangelands productivity. Periodic and sustained drought is another critical factor in the success of agriculture including horticulture in Wyoming. Some evidence suggests that drought and other climate variability may be more of a factor as the climate warms. In addition, strategies to control global warming will likely create opportunities for Wyoming agriculture to both profit and contribute to mitigation of forces driving change in climate.

#### **What has been done**

UW CES has Master Gardener programs in half the counties in the state. Training includes best species selection, xeriscaping landscape, water conservation and other topics related to climate change. In addition educators have presented programs on water conservation, drought, plant and landscape specie selection for the Wyoming ecosystem.

#### **Results**

100 percent of participants indicated they had gained awareness and knowledge as a result of educational programs. Over 50 percent of participants in horticulture programs on xeriscape, landscape design, water conservation, and plant selection have made changes in horticulture practices as a result of educational efforts.

#### **4. Associated Knowledge Areas**

- 104 - Protect Soil from Harmful Effects of Natural Elements
- 112 - Watershed Protection and Management
- 132 - Weather and Climate
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 205 - Plant Management Systems
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development

#### **Outcome #3**

##### **1. Outcome Measures**

- Not Reporting on this Outcome Measure

Producers will implement practices in animal and plant production which will mitigate climate change. Target is the number of producers reporting outcome.

##### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Wyoming is a rangelands state where small changes in temperature and growing season and amount and timing of precipitation can have a dramatic effect on the success of plant communities in the ecosystem. In urban areas, small acreages, and towns, horticulture has become an important component of CES agriculture efforts. Best species and variety selection as well as effectiveness of production practices will change as aspects of climate changes. Invasive species are a particular problem in the dry cold desert ecosystem as small changes in climate can shift the competitive relationship among plant species. This can have a significant effect on plant community diversity and rangelands productivity. Periodic and sustained drought is another critical factor in the success of agriculture including horticulture in Wyoming. Some evidence suggests that drought and other climate variability may be more of a factor as the climate warms. In addition, strategies to control global warming will likely create opportunities for Wyoming agriculture to both profit and contribute to mitigation of forces driving change in climate.

**What has been done**

CES educators in crop and livestock systems, and horticulture address climate change in numerous production programs presented throughout the state. The energy extension coordinator provides programming specific to climate change mitigation. Newspaper inserts, magazines, and newsletters also assist in information dissemination.

**Results**

100 percent of participants indicated they had gained awareness and knowledge as a result of educational programs. Over 25 percent of participants in CES programs on xeriscape, landscape design, water conservation, and plant selection and livestock production have made changes in practices as a result of educational efforts. As an on-going program significant impacts are not available this year.

**4. Associated Knowledge Areas**

- 104 - Protect Soil from Harmful Effects of Natural Elements
- 112 - Watershed Protection and Management
- 132 - Weather and Climate

- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 205 - Plant Management Systems
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development

**Outcome #4**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Research: Create awareness of production practices, invasive plant species, and potential to mitigate greenhouse gas emissions in the face of climate change. Target is number of projects reporting this outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	3

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

This project is developing the basic understanding of how rangelands in Wyoming are likely to be affected by changes in climate and atmospheric chemistry, and how these factors interact to promote or reduce invasion by noxious weeds. We are assisting development of predictive models for grassland productivity changes affecting the cattle industry and management of wildlife and water resources. Local, state, federal and private land management organizations and agencies will benefit from the modeling products and the new knowledge.

**What has been done**

Five full field seasons have been completed on this six-year project. Measures of plant photosynthesis, water balance, and ecosystem carbon dioxide (CO2) and evapotranspiration fluxes are conducted and plant biomass samples have been analyzed for isotopic variation. Elevated CO2 and warming so far have had large impacts on the regulation of photosynthesis and growth in dominant prairie grasses and forbs. Further, interactive effects of warming and elevated CO2 have been detected in above ground biomass production and soil carbon cycling.

### Results

The goal of this project is to understand the consequences of atmospheric and climatic changes on the productivity of grasslands in Wyoming and the region, and to discern how these changes might alter the vulnerability to invasion by weedy, non-native plants.

#### 4. Associated Knowledge Areas

- 104 - Protect Soil from Harmful Effects of Natural Elements
- 112 - Watershed Protection and Management
- 132 - Weather and Climate
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 205 - Plant Management Systems
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development

#### V(H). Planned Program (External Factors)

##### External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other ()

##### Brief Explanation

Weather extremes and drought often affect program participation. Funding is vital to this new program, changes in appropriations could impact funding. Additionally, global market changes impact both research and extension programs in agriculture.

#### V(I). Planned Program (Evaluation Studies and Data Collection)

##### (OPTIONAL SECTION)

##### 1. Evaluation Studies Planned

- After Only (post program)

- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other

## **Evaluation Results**

### **Key Items of Evaluation**

**V(A). Planned Program (Summary)**

**Program # 8**

**1. Name of the Planned Program**

Sustainable Energy

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	20%		20%	
121	Management of Range Resources	20%		20%	
131	Alternative Uses of Land	0%		10%	
133	Pollution Prevention and Mitigation	0%		10%	
401	Structures, Facilities, and General Purpose Farm Supplies	10%		10%	
402	Engineering Systems and Equipment	20%		20%	
608	Community Resource Planning and Development	30%		10%	
	<b>Total</b>	100%		100%	

**Add knowledge area**

**V(C). Planned Program (Inputs)**

**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Actual	2.0	0.0	3.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
29563	0	372252	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
168709	0	372252	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

## V(D). Planned Program (Activity)

### 1. Brief description of the Activity

Both UW AES and CES are in a unique position to help citizens make sound science-based decisions on the use of natural resources to develop new sources of renewable energy.

Media was used to familiarize the public with UW College of Agriculture and Natural Resources areas of programming and personnel in regard to sustainable energy. Media releases in local newspapers, radio spots and television advertisements were utilized to inform the public of upcoming extension programs. Newsletter articles distributed both electronically and through the mail by county offices, area teams, and the University of Wyoming, reach general public and agriculture producers locally, regionally, and statewide. Public educational programs with invited speakers and extension specialists and educators presenting research-based information continue to be held in response to local, state, and national energy sustainability. Demonstrations of technology and skills training were included in education curriculum to enhance educational effectiveness. Field tours were organized to provide producers with the opportunity to observe industry procedure (i.e., tour of an ethanol plant).

The Sustainable Agriculture Research and Extension Center (SAREC) located at Lingle, Wyoming will provide a resource base for integrating agriculture production and renewable energy based programs.

Educational programs emphasize sustainable energy practices such as bio-fuels and wind energy, reclamation and restoration of disturbed lands, and energy conservation practices. Other methods will include individual interaction with landowners educating them on resources available to assist them with sustainable energy practices. UW CES will provide coordination with other colleges on the UW campus such as Engineering and the School of Energy Resources, state and federal agencies to provide education on this topic, and funding for this effort. UW CES also provide educational opportunities for professionals involved with reclamation and restoration of disturbed lands.

The University of Wyoming's College of Agriculture and Natural Resources conducts research and direct extension programming efforts to help ensure prudent use of the state's precious resources.

### 2. Brief description of the target audience

The University of Wyoming is committed to reaching underrepresented groups and individuals and to implementing the objectives of equal opportunity regulations relative to the consideration and treatment of clientele for participation in all programs regardless of their race, national origin, gender, age, religion, or disability. Participants include policy makers for county, state, and federal government agencies, crop

producers, livestock producers, energy companies, general public, and the scientific community. An existing secondary audience is the media, general public, and interest groups not directly involved in production agriculture (i.e., environmental groups). Energy conservation methods are targeted at both agriculture and general public audiences.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Plan</b>	{NO DATA}	{NO DATA}	{NO DATA}	{NO DATA}
<b>Actual</b>	2810	20000	300	1000

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

**Patent Applications Submitted**

Year: 2010  
 Plan:  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2010	Extension	Research	Total
<b>Actual</b>	0	9	9

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of individuals participating in sustainable energy programs. Target is the number of contacts.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	2809

**Output #2**

**Output Measure**

- Research: Determine ecosystem services affected by energy development and reclamation efforts. Target is number of publications, reports, bulletins, and presentations.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	15

**Output #3**

**Output Measure**

- Research: Evaluate the potential for production of bioenergy. Target is number of publications, reports, bulletins, and presentations.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	5

**Output #4**

**Output Measure**

- Number of educational programs or activities focusing on sustainable energy by CES. Target is the number of educational programs implemented.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	61

**Output #5**

**Output Measure**

- Number of collaborative partnerships formed to address sustainable energy in Wyoming. Target is the number of partnerships.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	7

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Awareness created focusing on sustainable energy topics. Target is the number of individuals reporting this outcome.
2	Partnerships will be developed with agencies and organizations to expand sustainable energy efforts. Target is the number of partnerships formed.
3	New technologies or devices used in ag production systems and/or farmsteads. Target is the number of new technologies developed.
4	Research: Create awareness of ecosystem services affected by energy development and reclamation efforts. Target is number of projects reporting this outcome.
5	Research: Create awareness on the potential to produce bioenergy. Target is number of projects reporting this outcome.

**Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure**

**Outcome #1**

**1. Outcome Measures**

Not Reporting on this Outcome Measure

Awareness created focusing on sustainable energy topics. Target is the number of individuals reporting this outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	2809

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

The State of Wyoming is well known for being a critical source of the nation's supply of natural resources. Because fossil fuels are essentially an irreplaceable base for Wyoming's vibrant energy industry, the College of Agriculture and Natural Resources conducts research and direct extension programming efforts to help ensure prudent use of the state's precious resources. In addition to fossil fuel resources, Wyoming also possesses abundant renewable energy resources including wind, solar, hydroelectric, geothermal, and biomass. Both small-scale, such solar photovoltaics or geothermal heat pumps, and utility-scale, primarily wind energy, are important issues. Development of renewable technologies such as specific systems that can be used in agriculture production and/or farmsteads and small-scale power generation where power can be sold such as wind energy are also important issues. Conservation and preservation of our natural resources, both land and water is an ongoing effort for both extension and research.

**What has been done**

The University of Wyoming College of Agriculture and Natural Resources research and extension efforts in sustainable energy focus on efficiency and conservation specifically in relation to farm and agriculture production. In addition, residential and public conservation education is targeted toward the general public and businesses. In fall 2009, UW CES partnered with the School of Energy Resources at UW to fund an Energy Extension Coordinator who provides leadership and coordination for extension energy programs in the College. Initial training for field extension educators was conducted; a Western SARE grant (\$110,000) was obtained by Montana State University in collaboration with the UW CES Energy Extension Coordinator to implement a Western Region training on energy issues (release of funds has delayed this until Fall 2011). In addition to educational programs to raise awareness

and knowledge, CES is in development of a Web site for information, publications, and a set of educational videos. To maximize outreach efforts, partnerships have been developed with the College of Engineering and Applied Science, School of Energy Resources, the Wyoming State Energy Office, Wind Energy Research Center, USDA Rural Development, Natural Resource Conservation Service, and the Wyoming Business Council.

### Results

In 2010, CES initiated an issue team focusing on sustainable energy issues. 100 percent of participants in the 61 programs held reported gaining awareness of the topic and gaining knowledge. Early partnership efforts have resulted in increasing effectiveness of programs through multiple collaborators.

#### 4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 121 - Management of Range Resources
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 608 - Community Resource Planning and Development

### Outcome #2

#### 1. Outcome Measures

- Not Reporting on this Outcome Measure

Partnerships will be developed with agencies and organizations to expand sustainable energy efforts. Target is the number of partnerships formed.

#### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

#### 3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

#### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	7

#### 3c. Qualitative Outcome or Impact Statement

### **Issue (Who cares and Why)**

The State of Wyoming is well known for being a critical source of the nation's supply of natural resources. Because fossil fuels are essentially an irreplaceable base for Wyoming's vibrant energy industry, the College of Agriculture and Natural Resources strives to conduct research and direct extension programming efforts to help ensure prudent use of the state's precious resources. In addition to fossil fuel resources, Wyoming also possesses abundant renewable energy resources including wind, solar, hydroelectric, geothermal, and biomass. Both small-scale, such solar photovoltaics or geothermal heat pumps, and utility-scale, primarily wind energy, are important issues. Development of renewable technologies such as specific systems that can be used in agriculture production and/or farmsteads and small scale power generation where power can be sold such as wind energy are also important issues. As an energy rich state, conservation and preservation of our natural resources, both land and water is an ongoing effort for both extension and research.

### **What has been done**

To maximize outreach efforts, partnerships have been developed with the College of Engineering and Applied Science, School of Energy Resources, the Wyoming State Energy Office, Wind Energy Resource Center, USDA Rural Development, Natural Resource Conservation Service, and the Wyoming Business Council.

### **Results**

Partnerships have increased resources, both financial and human capital to maximize outreach efforts. Partnerships have leveraged funding to support an innovative energy internal grant program for CES. Integrated program efforts are in progress.

## **4. Associated Knowledge Areas**

- 102 - Soil, Plant, Water, Nutrient Relationships
- 121 - Management of Range Resources
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 608 - Community Resource Planning and Development

## **Outcome #3**

### **1. Outcome Measures**

- Not Reporting on this Outcome Measure

New technologies or devices used in ag production systems and/or farmsteads. Target is the number of new technologies developed.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

- 102 - Soil, Plant, Water, Nutrient Relationships
- 121 - Management of Range Resources
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 608 - Community Resource Planning and Development

**Outcome #4**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Research: Create awareness of ecosystem services affected by energy development and reclamation efforts. Target is number of projects reporting this outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	3

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Over 140,000 acres of land in Wyoming have been impacted by drilling for surface mining for coal. State and federal laws require that lands disturbed by surface coal mining be reclaimed. Land managers, livestock producers, wildlife managers, and ecologists require information regarding the long term recovery and stability of these reclaimed ecosystems to manage them properly.

**What has been done**

The Soil Ecology Laboratory at the University of Wyoming has been conducting long term studies of ecosystem recovery on reclaimed surface coal mined lands. Results of these studies thus far indicate that reclaimed semiarid rangeland ecosystems are resilient and are recovering from disturbance associated with surface coal mining.

**Results**

These studies validate the effectiveness of regulatory performance standards in the Surface Mine Reclamation and Control Act of 1977. Data collected support the assumption that minelands can be reclaimed effectively and returned to long term sustainability and support previous land uses in the long term. This work also indicates that through reclamation functioning ecosystems can be reconstructed and their ecosystem services can be reestablished.

**4. Associated Knowledge Areas**

- 102 - Soil, Plant, Water, Nutrient Relationships
- 121 - Management of Range Resources
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 608 - Community Resource Planning and Development

**Outcome #5**

**1. Outcome Measures**

- Not Reporting on this Outcome Measure

Research: Create awareness on the potential to produce bioenergy. Target is number of projects reporting this outcome.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	2

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Farmers and ranchers in Wyoming operate under harsh climatological and economic constraints. New agricultural technologies that relieve these constraints and integrate with existing production activities are vital to healthy economic development in rural parts of the state. Aquaculture of oil-producing microalgae has been identified as an appropriate method of biodiesel production in arid regions of the Western U.S.

**What has been done**

The project includes formulating and testing genetic engineering strategies for improving the growth of algae in the presence of oxygen radicals and studying the use of industrial carbon dioxide emissions as a growth enhancer for algae. The algal biomass produced by this study will be used for experimental fertilization of forage grass plots and bare soils.

**Results**

Practical application of our findings by the private sector in Wyoming is estimated to occur within 10 years. In the meantime, the project employs and trains two or more graduate and undergraduate students per year, on average. These students are part of a growing technical workforce needed by the nascent algal biofuel industry and other sectors of the agricultural economy.

**4. Associated Knowledge Areas**

- 102 - Soil, Plant, Water, Nutrient Relationships

- 121 - Management of Range Resources
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 608 - Community Resource Planning and Development

#### **V(H). Planned Program (External Factors)**

##### **External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other

##### **Brief Explanation**

Funding for this new program is essential in development and implementation of both research and extension efforts. Weather extremes are a factor in agriculture production outcomes regarding crops for alternative fuels. As a new planned program, the first year heavily involved training and awareness for extension educators.

#### **V(I). Planned Program (Evaluation Studies and Data Collection)**

##### **(OPTIONAL SECTION)**

##### **1. Evaluation Studies Planned**

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.

- Comparison between locales where the program operates and sites without program intervention
- Other

## **Evaluation Results**

### **Key Items of Evaluation**