

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Economic Development and Quality of Life in Rural Communities

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
131	Alternative Uses of Land			10%	
134	Outdoor Recreation			15%	
511	New and Improved Non-Food Products and Processes			15%	
604	Marketing and Distribution Practices			15%	
605	Natural Resource and Environmental Economics			10%	
608	Community Resource Planning and Development			20%	
724	Healthy Lifestyle			5%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures			5%	
903	Communication, Education, and Information Delivery			5%	
	Total			100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	6.5	0.0
Actual Paid Professional	0.0	0.0	6.9	0.0
Actual Volunteer	0.0	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
0	0	419306	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	687734	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	169909	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

West Virginia is considered to be a lagging region in terms of economic development and growth, a characteristic shared by many states in the Appalachian Region. While the region has abundant natural resources, particularly coal, natural gas, forests, water and recreational opportunities, unemployment is typically higher than in the rest of the Nation. Accordingly, the West Virginia Agricultural and Forestry Experiment Station has designated economic development and the quality of life in rural communities as one of our primary program areas. Work in this program area is divided into two categories: economic development and quality of life.

A significant part of rural employment growth nationwide has occurred in non-traditional economic activities including those capitalizing on natural resources and climate. A number of possible economic opportunities are currently being investigated in West Virginia, including pasture finished beef, cool water aquaculture, wood utilization, organic production of vegetables and animal products, and ecotourism. Cutbacks in Agricultural Research Service (ARS) budgets and the closing of the ARS facility in Beaver, WV, have led to a reduction in the research resources devoted to the pasture finished beef projects. The elimination of congressionally directed spending has also led to reduced activity in the aquaculture and wood utilization areas. These cutbacks increase the relative importance of federal capacity funding and AFRI competitive funding to the success of our research programs.

In spite of funding cutbacks, advances were made in the aquaculture/aquaponics project. One study sought to determine how strains of rainbow trout differ in their performance under elevated temperature. This is an important consideration as most streams in the Mid-Atlantic reach summer temperatures that result in high levels of trout mortality. It was found that there were significant differences between the Critical Thermal Maxima among 3 trout strains and that the Case Western strain had a higher thermal tolerance than the Kamloop and Wytheville strains. In general, the Case Western strain consumed less, converted less efficiently, and grew less than the other two strains while held above optimal temperature. Another study examined the genetic basis for observed differences in thermal performance between strains based on how expression of Heat Shock Protein (HSP) 70 and HSP90 differ. The results confirm that the Case Western strain has higher thermal tolerance, highlighting the importance of this strain as a candidate to be cultured in aquaculture facilities to mitigate impacts of future climate change. Another study examined aquaculture feeding rates, fish growth and economic efficiency. It was found that feeding to satiation will maximize growth rate and shorten a production cycle, but restricted feeding will result in higher feed efficiency and lower cost/lb of gain.

On the aquaponics front, production data for 12 vegetable crops and 2 ornamental crops showed

greatly decreased production during fall/winter months. Production in spring and summer showed greater increase in production which is most likely dependent on temperature and light during production. Data did indicate that the lettuce cultivar Red Sails performed better in our system than Green Ice and Buttercrunch. Preliminary analysis of the nutrient removal data indicates that when crops are growing quickly an exponential function best describes uptake rates while under slower growing conditions a linear function is appropriate.

Native plants with potential use in the landscape and pharmaceutical industries have been identified from an extensive list of native plants in West Virginia. Information has been disseminated to medical doctors and pharmaceutical firms interested in plant extracts for treatment of specific illnesses. Initial findings have sparked interest by those wanting to develop products for sale in the pharmaceutical industry. Techniques are being explored to enhance concentration of the active ingredient in plants. Several protocols for in vitro propagation and storage were developed. These protocols will help conserve and protect several native plant species.

Another study examined lower back (lumbosacral, LSP) disease in working dogs, such as those used in the military or law enforcement. Eighteen Labrador Retrievers were included in the study, 12 males and 6 females. Groups consisted of 1 companion dog without LSP, 14 companion dogs with LSP, 2 working dogs without LSP, and 1 working dog with LSP. Mean area ratios were lower for all paraspinal muscles in working and companion dogs with LSP, except for the longissimus lumborum. Mean CT densities were lower for all paraspinal muscles in working dogs with LSP, except for the quadratus lumborum. Mean CT densities were lower for longissimus and quadratus lumborum muscles and higher for psoas/iliopsoas and multifidus muscles in companion dogs with LSP. Most of the findings in our study were similar to those reported in human studies. Higher area ratios for longissimus muscles and higher mean densities for psoas/iliopsoas, quadratus lumborum, and multifidus muscles in dogs with LSP were unexpected and may warrant further investigation.

2. Brief description of the target audience

The primary audience for our community and economic development activities is community managers, planners, policy makers, consultants and local development committees or groups. For aquacultural and agricultural product development and marketing, the audience includes producers, processors and distributors. Our work on the quality of life is used by local and State planners and policy makers, State citizens and community groups and educators.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

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

Patent Applications Submitted

Year: 2012
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	0	6	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Presentations on research at professional meetings

Year	Actual
2012	6

Output #2

Output Measure

- Team consultations with, and reports to assist, community action groups focused on improving local economic development and quality of life.

Year	Actual
2012	4

Output #3

Output Measure

- Completed graduate degree programs

Year	Actual
2012	14

Output #4

Output Measure

- Popular press reports.

Year	Actual
2012	3

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of community specific plans developed and adopted in whole or in part to help enhance economic development and quality of life.
2	Number of business plans in the State developed and implemented with assistance from the WVU Agricultural and Forestry Experiment Station.
3	Improve recreational fishing opportunities to help stimulate the recreational fishing industry in the State.

Outcome #1

1. Outcome Measures

Number of community specific plans developed and adopted in whole or in part to help enhance economic development and quality of life.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many communities in West Virginia are lagging economically and need assistance in developing plans to enhance their economic development, quality of life, and attractiveness to tourists. Our Community Design Team (CDT) has operated for 13 years to provide multidisciplinary University teams to help regional communities with economic development, tourism, flood control, transportation planning and design issues. The CDT is a joint venture of the Davis College and WVU Extension

What has been done

In 2012 the WVU Community Design Team visited two new communities, Moundsville and the New Vrindaban, Palace of Gold Community, revisited one (Clay) and completed a project involving Parkersburg.

Results

In Parkersburg the team worked with the Northern WV Brownfields Assistance Center Development Collaborative and obtained a competitive grant to assist the community with Brownfield remediation and development. In a collaboration between Extension and Davis College Programs, the team produced a marketing report for business owners and drafted a historic preservation plan concerning the endangered old county courthouse. A 6-person Landscape Design Team that included faculty and students analyzed potential park plans and overall spatial needs in Moundsville. Historic, business, tourism and neighborhood opportunities were also considered.

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land

605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

Outcome #2

1. Outcome Measures

Number of business plans in the State developed and implemented with assistance from the WVU Agricultural and Forestry Experiment Station.

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Improve recreational fishing opportunities to help stimulate the recreational fishing industry in the State.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Recreational fishing is an important and growing State industry. The industry is limited by two factors: water pollution from abandoned mining operations and limits to cold water fishing opportunities (mainly trout) due to warm water in the summer months.

What has been done

We have worked with the Department of Natural Resources in the State to restore tree cover in the upper reaches of two watersheds to reduce water temperatures and have also designed culvert systems that do not block trout movement to allow trout to move to cooler spring-fed sections of streams in the summer. We have also been developing new strains of trout that are more heat tolerant than current strains. The results confirm that the Case Western strain has higher thermal tolerance, highlighting the importance of this strain as a candidate to be cultured in aquaculture facilities to mitigate impacts of future climate change. Another study examined

aquaculture feeding rates, fish growth and economic efficiency. It was found that feeding to satiation will maximize growth rate and shorten a production cycle, but restricted feeding will result in higher feed efficiency and lower cost/lb of gain.

Results

The Case Western strains demonstrated heat tolerance make it a favorable candidate for stream stocking programs in the State. The strain may also be useful in the Northern sections of the Northeast as climate change warms previously cold aquatic habitats. We are starting a three year study in conjunction with the State Department of Natural Resources to examine the effectiveness of the stream restoration efforts in restoring native trout species in damaged stream reaches.

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land
134	Outdoor Recreation
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

Brief Explanation

Cutbacks in Agricultural Research Service (ARS) budgets and the closing of the ARS facility in Beaver, WV, have lead to a reduction in the research resources devoted to the pasture finished beef projects. The elimination of congressionally directed spending has also lead to reduced activity in the aquaculture and wood utilization areas. These cutbacks increase the relative importance of federal capacity funding and AFRI competitive funding to the success of our research programs.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

This year evaluation consisted of annual evaluation of short term impacts as documented in Outputs and State Defined Outputs and Outcomes. As described in the plan of work, we will be developing a longer term program specific evaluation process in conjunction with our College Visiting Committee. This process and the timetable for evaluation will be determined at our Spring 2013 Visiting Committee Meeting.

Key Items of Evaluation

The Community Design Team (CDT) continues to be an effective means of providing university expertise to local communities who wish to improve the regional economy and the quality of life in rural communities. Earlier evaluations of the program led to the realization that a single visit and report was often not sufficient to insure that community goals were met. Consequently, we now schedule follow-up visits with previously visited

communities to assess how well they have implemented the plans that were jointly developed and to assist with a mid course correction to get them back on track. This change has increased the effectiveness of the CDT and has often identified new opportunities for collaboration. In addition, while students have always been involved in the visits, we have developed a new Masters in Landscape Architecture program that allows students to conduct research at the community level. This change is too recent to evaluate, but we feel strongly that it will be successful.

We are just starting a three year evaluation of our stream restoration efforts. The evaluation will not only look at the ecological impacts of the restoration projects, but will also examine the economic consequences of the efforts in terms of recreational benefits and costs of implementation.