V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Supporting Rural Economies

☑ 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
102	Soil, Plant, Water, Nutrient Relationships			20%	
133	Pollution Prevention and Mitigation			5%	
205	Plant Management Systems			25%	
403	Waste Disposal, Recycling, and Reuse			10%	
601	Economics of Agricultural Production and Farm Management			10%	
608	Community Resource Planning and Development			5%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities			25%	
	Total			100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	1.9	0.0
Actual Paid	0.0	0.0	1.4	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	76046	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	111669	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	435	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

• Used focus groups of New Hampshire farmers and conducted a general population survey of residences on produce purchasing habits especially as they relate to locally grown produce.
• Investigate the changing organizational structure, tax policy and fiscal standing of local governments and the impact of tax and/or expenditure limitations on local government fiscal stress and economic growth in rural areas.
• Document the realignment of U.S. nonmetro population growth and decline during the periods before, during, and after the Great Recession of 2006-2009, with associated shifts in rural unemployment and investigate linkages between job loss and population dynamics, and changes in rural housing markets
• Developed root sampling procedures to measure root tolerance of shrubs and trees to extreme cold exposure. These will provide means to test environmental and cultural factors of container nursery stock, to improve overwintering and transplant success of trees and shrubs used in Northern New England Landscaping. This is a multimillion dollar industry in the region.
• Determine the viability of using controlled-release fertilizers for nutrient delivery for greenhouse crops.

2. Brief description of the target audience

• Scientists, undergraduate and graduate students, citizens, land use professionals, homeowners, legislators, contractors, firms and rural residents, demographers, social and natural scientists as well as policy-makers and the media.
• State policy makers, planners and concerned citizens who will facilitate actions to enhance the social and economic development of the state, aid in developing comprehensive plans to guide future landscape development, and protect the state's abundant natural resources.
• Nursery producers and landscape contractors in NH and throughout the northeast.
• Owners and operators of greenhouses who produce floriculture crops, extension professionals, agricultural service providers, and high school agriculture and biology teachers.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1175	0	0	0

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

Patent Applications Submitted

Year: 2014

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	2	3	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of presentations at regional, national, or international scientific meetings

Year	Actual
2014	13

Output #2

Output Measure

- Number of workshops, training sessions and presentations to non-scientific stakeholders

Year	Actual
2014	6

Output #3

Output Measure

- Number of reviewed, bulletin, popular, news and other publications

Year	Actual
2014	2

Output #4

Output Measure

- Number of surveys or other means of gathering information and data from participants

Year	Actual
2014	3

Output #5

Output Measure

- Number of graduate students directly involved in research project.

Year	Actual
2014	5

Output #6

Output Measure

- Number of websites in which project results have been incorporated

Year	Actual
2014	5

Output #7

Output Measure

- Number of undergraduate students directly involved in the projects

Year	Actual
2014	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of presentations to civic and government entities to increase knowledge of demographics and migration in the region and nation.
2	Availability of modified production systems for woody nursery crops in northern nurseries.
3	Availability of new management guidelines for use of controlled-release fertilizers in greenhouse floriculture.
4	Improved methods to facilitate two-way communications between public and decision makers, and survey instruments associated with natural resource and agriculture management
5	To assess emerging opportunities for expanding local agriculture in Northern New England

Outcome #1

1. Outcome Measures

Number of presentations to civic and government entities to increase knowledge of demographics and migration in the region and nation.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	6

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
A critical goal of demographic trends in rural economies is not only to collect data but to disseminate information about trends in the recessionary and post-recession period to critical policy audiences and stakeholders through policy oriented presentation.

What has been done
Data has been collected about population growth and decline, changes in employment and rural housing, and migration and diversity in rural New Hampshire and Northern New England.

Results
Presentations included two briefings to senior staff of the U.S. Forest Service, "Demographic Trends and Implications for U.S. National Forests" and "Demographic Transformation in the Forested Regions of Nonmetropolitan America: Implications for Carbon Sequestration, Forest Harvesting and Ecosystem Services in June 2014; serving on the Science Steering Committee, Towards Scenarios of U.S. Demographic Change Workshop, Interagency Working Group on Scenarios and Interpretive Sciences, U.S, Global Change Research Program, in June, 2014; an invited presentation at the New Hampshire Charitable Foundation Leadership Summit "New Hampshire Demographic Trends in the New Century." in April, 2014; briefing Commissioner Patricia Barry of NH Dept. of Education on "New Hampshire Demographic Trends: Implications for School Age Children." January 2014; an invited presentation to the Tri-State Bankers Trust Forum on "Demographic Trends and Developments in Northern New England." in September, 2013; and an invited presentation to the Riverwoods Community on "Changing Demographic Trends in the New Century: America's Growing Diversity." in October, 2013.

4. Associated Knowledge Areas

KA Code	Knowledge Area
803	Sociological and Technological Change Affecting Individuals, Families, and Communities

Outcome #2

1. Outcome Measures

Availability of modified production systems for woody nursery crops in northern nurseries.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The overall goals of one NHAES research project are to determine the importance of environmental and cultural factors on root cold tolerance (RCT)of container nursery stock, to improve overwintering and transplant success of trees and shrubs used in Northern New England landscaping. This is a multimillion dollar industry in NH.

What has been done
1)Research was initiated to further knowledge about root tolerance to extreme cold exposure. Much of this first season's work was in refining and repeating root sampling procedures and lab protocols to assure their reliability.
2)The effects of three production methods: below ground fabric container (FC), pot in pot(PiP) and field grown, for river birch trees Half of the trees for each treatment were root pruned before transplant.

Results
1)Four species of nursery-grown shrubs were sampled and run through the programmed freeze treatments during the course of the winter. A significant quadratic relationship between electrolyte leakage and minimum temperature exposure for most species. Multiple tests per species over three years of experimentation to determine a cold tolerance threshold (based on 50% damage) for each plant, that can be used by growers for making crop protection decisions.
2) Evaluation continued on three different nursery production methods and consequence of root pruning at transplant. All trees were able to establish new roots, with a mean north- south spread

of 11.7' for PiP, 12.1' for FC and 13.3' for field-grown trees, which corresponded with total stem caliper increases of 2.0, 2.7 and 3.7" respectively. These differences were correlated with initial tree size (field-grown trees were largest and PiP smallest at transplanting). The strong radial distribution of structural roots observed in field-grown trees is purported to be the best structure for long term tree health. Root pruning to remove defects in PiP trees at transplanting was successful and no additional defects were observed at the termination of this experiment. The FC trees generally had good root structure but some new roots grew inward or tangentially to the original rootball.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #3

1. Outcome Measures

Availability of new management guidelines for use of controlled-release fertilizers in greenhouse floriculture.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Common practice with most greenhouse crops is to fertilize with a water-soluble fertilizer on a constant or near constant basis. Although relatively easy to manage their use can be very wasteful unless runoff is captured and reused. Controlled-release fertilizers (CRF) have been shown to reduce the amount of nutrients being lost to leaching and therefore the reducing fertilizer cost.Recent technology advancements have allowed fertilizer manufactures more precisely deliver nutrients due to altering coatings, and the decrease the individual granule sizes of CRFs. These advancements have made CRFs a more viable option for greenhouse crops.

What has been done
Over the course of this project the growth of bedding plants such as geraniums, poinsettias, cyclamen, gerbera, and begonias have been tested using controlled release fertilizers (CRFs).

Nutrient analysis was conducted of effluent from pots to determine if less fertilizer is wasted by leaching when controlled release fertilizers are used. Finally pH and electrical conductivity of the substrate was monitored to evaluate the effects of controlled released fertilizers on these parameters.

Results
All species have shown to respond favorably to being grown using controlled release fertilizers.In all cases the amount of fertilizer lost due to leaching was significantly lower than that of plants grown with the typical constant liquid feed regime used in most commercial greenhouse. Additionally the cost of fertilizing plants with controlled release fertilizers was one-third that of constant liquid feed; $1.00 per 100 pots using controlled release fertilizers verses $3.25 per 100 pots using constant liquid feed The electrical conductivity was observed to be 10 fold lower when controlled release fertilizers are used. This indicates that plants are using released nutrients nearly at the same rate of release from the fertilizer and implies lower amounts of nutrients being loss to leaching.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
133	Pollution Prevention and Mitigation
205	Plant Management Systems

Outcome #4

1. Outcome Measures

Improved methods to facilitate two-way communications between public and decision makers, and survey instruments associated with natural resource and agriculture management

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
To be effective, local state and federal agencies and non-profit organizations need to be able to

identify, characterize, and communicate with all stakeholder groups of a specific program or policy.

What has been done
An intercept survey/interview was conducted for the New Hampshire Seacoast Advisory Committee. This survey, previously conduced in 1996 with pencil and paper, was carried out in 2014 using iPads. The effectiveness of digital data collection was evaluated.

Results
1.The intercept survey/interview found that visitors were generally satisfied with both the quantity of parking available and the price charged for parking. The intercept survey did show that parking was more of a problem in Portsmouth and Jenness Beach sub-areas. Likewise visitors to those same two areas were more likely to negatively evaluate the available and cleanliness of public restroom facilities (another topic identified as extremely important by the Advisory Committee). This research documented that iPads were a cost effective data collection tool. A total of 3031 iPad intercept interviews were completed via an off-line application developed by Qualtrics. The interviews were collected at nine sampling sites, on 3 sampling days and at 3 sampling times. The average interview time was 10 minutes which was essentially the same as the pen and paper surveys. However the iPad offline application eliminated the data entry step of the process since the data was uploaded directly from the iPads to the data base once the iPads were connected to the internet.
Another time and cost saving step of this research design is the technological integration of the iPad Intercept Interview with the Web-based Follow up Survey. However the percentage of those who agreed to follow-up surveys decreased significantly, from 51 percent to 5 percent from the more expensive mail followup survey conducted in 1996 to the email survey in 2014.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

Outcome #5

1. Outcome Measures

To assess emerging opportunities for expanding local agriculture in Northern New England

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The focus this project is to assess the potential for local agriculture in northern New England. This requires a better understanding of production potential, consumer demand and willingness to pay a premium for local produce.

What has been done
An integrated supply-demand approach was used to both assess the potential for producing more locally demanded products and the premium the region's residents are willing to pay. The approach involved farmers via focus groups and extension outreach, and general population surveys.

Results
Survey respondents spend an average of 21 % of their grocery budget on fresh produce, primarily at the grocery store both for the year and during the growing season. Almost all have purchased local fresh produce in the past year. During the growing season some respondents changed their primary source of fresh produce from the grocery store to farmers markets or directly from producer. There may be more concern for supporting local business and not as much concern about purchasing organic, consistent with other studies. The top reasons respondents purchase local fresh produce are concern for healthy eating, quality of the produce, and to support local farms. Receiving information about where to purchase local fresh produce through word of mouth, lack of information as a reason for not purchasing local fresh produce, and the perceived lack of availability of local fresh produce may explain why more people are not using farmers markets and direct from producer sources.or the three crops studied, premiums per pound estimated indicate different demand curves for local/organic than for conventional produce. Consumers in the study are willing to pay approximately 35 percent more for local green beans and snap peas and 55 percent more for local cucumbers. Organic premiums were lower, approximately 30 percent and 25 percent, respectively, for green beans and cucumbers, indicating that consumers value "local" more than "organic," and gives important price information to producers which they can weigh against their production costs in deciding what and how much to produce.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

The Great Recession (2006-2009) brought the collapse of the stock market, high foreclosure rates, falling housing prices, rising unemployment and unexpected downturns in migration and fertility rates. All of these factors have had distinctive impacts on rural communities, as compared to urban population centers.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

The primary evaluation of research and integrated projects in planned program area come from a robust record of publication in peer-reviewed publications, popularity of workshops, response to surveys , and the utilization of results by popular media and government agencies. By all of these criteria, the research covered by this planned program area appears to be successful.

Key Items of Evaluation

- Demographic studies by Ken Johnson of the Carsey Institute are supported by a multi-state project. In the past year he has discussed recent demographic trends and the impact of the recession of these demographic trends in rural America, in the state of New Hampshire and in the U.S. There have been more than 1,000 media mentions of these demographic studies in the last year, including major national outlets such as the New York Times, Wall Street Journal, Washington Post and USA today.
- Applying controlled release fertilizer to production of greenhouse bedding plants reduces fertilizer cost by 70 percent, while decreasing the release of nutrients in runoff by approximately ten fold compared to liquid fertilizer. These new recommendations for improved bedding plant fertilizers have been widely disseminated to growers and greenhouse managers.