V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Natural Resources, Environment, and Climate Change

☑ 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	10%	0%	30%	0%
111	Conservation and Efficient Use of Water	5%	0%	5%	0%
112	Watershed Protection and Management	15%	15%	20%	0%
123	Management and Sustainability of Forest Resources	20%	30%	15%	0%
124	Urban Forestry	5%	15%	5%	0%
125	Agroforestry	0%	15%	0%	0%
131	Alternative Uses of Land	15%	15%	0%	0%
133	Pollution Prevention and Mitigation	5%	0%	0%	100%
135	Aquatic and Terrestrial Wildlife	8%	0%	10%	0%
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals	0%	0%	5%	0%
403	Waste Disposal, Recycling, and Reuse	10%	0%	0%	0%
605	Natural Resource and Environmental Economics	7%	10%	10%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	22.3	1.5	25.9	0.0
Actual Paid	37.5	1.0	51.5	1.0
Actual Volunteer	3782.0	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**
825722	301487	782603	150853
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1193859	406130	908055	228891
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
2290318	672750	9906772	234616

V(D). Planned Program (Activity)

1. Brief description of the Activity

Primary outputs from this program include the following: developing and delivering educational programs such as short courses, workshops, field days and tours, seminars, conducting applied research and link with extension, develop and maintain demonstration areas, developing collaborative partnerships with government officials, state agencies, non-governmental organizations, developing and disseminating educational materials such as extension bulletins, journal articles, conference proceedings, webinars, trade journal articles, DVD's, and developing and maintaining web based educational materials such as short courses, web sites, discussion boards.

2. Brief description of the target audience

Farmers, forest owners, loggers, Christmas tree growers, youth, homeowners, mill owners and workers, private consultants and companies, local **and national** governmental officials, **scientists and extension educators,** private landowners, waste water treatment operators, state and federal agencies, nongovernmental organizations, professional associations and societies, and community groups.

3. How was eXtension used?

Information is shared and supported by involvement in several COP's. For example: Forest Farming eXtension Community of Practice - This project uses eXtension to create a national virtual community to synthesize and deliver synchronous and asynchronous forest farming educational programs, encourage and inform forest farming initiatives, compile comprehensive forest farming data, incorporate cutting-edge technology, and equitably address social and biophysical variability. eXtension's optimization metrics capture the community's characteristics, resources, behaviors, and activities. Wood Products Community of Practice- Web site: http://www.extension.org/wood_products Description: The goal of the Wood Products CoP is to disseminate knowledge on the design, production, management, marketing, and environmental impact of wood products to small and large wood products manufacturers. Geospacial: Map@syst - Map@Systis a community of practice devoted to the outreach and education for geospatial technologies and their application to today's world. The Map@syst community provides information on using geospatial technologies and how geospatial technologies are making a difference in peoples' lives. may@syst is responsible for the Geospatial Technology resource area within eXtension. Other COP involvement includes: Climate, Forests and Woodlands, Drinking Water and Human Health, Land Use Planning, Sustainable Marine Fisheries, Urban Forestry and Energy Conservation, Wood Energy, and Wildlife Damage Management.

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	266026	329507	115101	5371

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	26	115	141

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational programs offered.

Year	Actual
2014	1309

Output #2

Output Measure

- Number of educational materials and curriculas developed

Year	Actual
2014	26

Output #3

Output Measure

- Number of applied research projects.
  Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Acres of land exposed to educational programming efforts.
  Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Identifiable impacts reported by agents/specialists

Year	Actual
2014	90

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increased number of people adopting at least one new or improved land management practices.
2	Improved natural resource industries that contribute to community viability.
3	Number of participants learning about the quality of their private water supply and about private water system maintenance by participating in a county-based Virginia Household Drinking Water Program water testing clinic.
4	Increase in the number of individuals who gain knowledge as certified nutrient management planners in turf and landscape systems.
5	Increase in the number of acres covered by nutrient management plans in turf and landscape systems due to participation in Extension educational programs.
6	Increase in the tons of compost produced from organic wastes typically land-applied (manure, biosolids) or land-filled (yardwaste, biosolids, industrial sludge) as a result of increased knowledge and skills.
7	Increase in the number of people directly impacted by new or improved land management practices
8	Increased public awareness of climate change, biodiversity, and ecosystem services.
9	Increased number of stakeholders involved in community natural resource management and decision-making.
10	Increase program participants understanding of raw material conversion and modern business management practices.
11	The general public, landowners, and loggers use the forest in alternative and traditional ways to increase value and profit.
12	Increase in the number of acres directly impacted by new or improved land management practices.
13	Increase basic and applied knowledge relating to ecological processes and global climate change
14	Landowner Retreats for New Woodland Managers
15	Landowners improve water quality through sustainable forest management

Outcome #1

1. Outcome Measures

Increased number of people adopting at least one new or improved land management practices.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Approximately 373,000 people in Virginia have ownership of 80% of the forestland (VDOF State of the Forest Report, 2014. New land ownership abounds each year and inquiring landowners need assistance. Currently less than 15 percent of the 15.8 million acres of forest land in Virginia is being actively managed in some way. Attending to the needs of the remaining 85 percent of forest landowners with this information is the main mission of the Virginia forest Landowner Education Program, and one of the main missions of the field-based Forestry and Natural Resources Extension agents.

What has been done
In 2014, the event was held centrally in the 19,000-acre Appomattox/Buckingham State Forest with 27 participants. For the first time, due to popular demand a second event was added that occurred in the fall of 2013 in Wakefield, Virginia. In the fall of 2014 a third event was added in the Southwest District at Matthews State Forest with 23 participants. A combination of classroom and field exercises comprise this event with topics such as estate planning, timber harvesting, alternative forest income opportunities, forest certification and wildlife management.

Results
A total of 194 participants owning 21,145 acres of land in Virginia and nine other states have attended this event in Central District since 2008. Due to interest in providing the event elsewhere in the state, a second program was planned and conducted by the Southeast District Extension Natural Resources Agent with 17 participants and in the summer of 2014 a third event was added at Matthews State Forest in Galax, Virginia with 23 participants. For the first time this made a spring, summer, and fall event available. One-hundred percent of participants indicated on exit

surveys that topics and field events over the weekend would help them accomplish their land management objectives more effectively. Participants ranked the event a 4.9 on a scale of 5.0 for overall effectiveness, the highest since 1998. The most common actions to take in the next 6 months by participants were: 1) Establish contact with Area DOF Forester, 2) enhance wildlife habitat in fields for quail and insects using wildflowers, and 3) monitor insect pests in woods. Private funding supporting the Central District program to date exceeds $21,500.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
123	Management and Sustainability of Forest Resources
124	Urban Forestry
133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife
403	Waste Disposal, Recycling, and Reuse

Outcome #2

1. Outcome Measures

Improved natural resource industries that contribute to community viability.

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Number of participants learning about the quality of their private water supply and about private water system maintenance by participating in a county-based Virginia Household Drinking Water Program water testing clinic.

2. Associated Institution Types

- 1862 Extension

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 U.S. Environmental Protection Agency estimates that water infrastructure investments of $335 billion will be needed between 2007 and 2027 to protect from contaminants that might create serious health risks and to assure continued compliance with the Safe Drinking Water Act. Nearly one quarter (22%) of Virginia's population (1.7 million people) rely on private water supply systems, such as wells, springs and cisterns, for their household water. In the US, municipal water supplies are regulated under the Safe Drinking Water Act by the Environmental Protection Agency, which mandates regular testing and water treatment. Homeowners who use private water supplies are completely responsible for routine testing, system maintenance and addressing any water quality problems, should they exist. Lack of knowledge about private water supply management and water quality issues may lead to system neglect and a lack of regular water testing, which can have serious implications for water quality, longevity of the water supply system, and, ultimately, the health and safety of the families who rely on these systems.

What has been done

The Virginia Household Water Quality Program (VAHWQP) provides confidential water testing and educates private water supply users through county-based drinking water clinics. With Virginia Cooperative Extension agents, trained through the Virginia Master Well Owner Network (VAMWON), VCE faculty coordinate clinics in up to 60 counties per year. At a clinic kickoff meeting, participants receive water sampling kits and instructions. A day later, participants bring their water samples to a central location in the county. The samples are transported to Virginia Tech for analysis. Samples are analyzed for 12 chemical constituents and for the presence of total coliform and E. coli bacteria. Three weeks later, test results, an explanation of individual results, and possible solutions to water problems, including water treatment options, are discussed with clinic participants at an interpretation meeting. This interpretation meeting is a critical value-added component unique to VAHWQP drinking water clinics.

Results

Thirty-nine drinking water clinics were held serving participants from 60 counties in 2014. About 1,222 private water supply systems were tested, which provide water for almost 3,000 Virginians. Statewide, in 2014, about 33% of all samples did not meet the EPA standard for public systems for total coliform bacteria, and 6% didn?t meet the standards for E. coli. Nearly 20% of samples exceeded the recommended level for lead in first draw samples. An evaluation is conducted immediately after the clinic to find out what actions, if any, participants plan to take in the following year. In 2013, we finalized the results of a follow-up phone survey with 500 people who participated in clinics between 2009 and 2011 (RR=30%). These results were encouraging, showing that people were actually more likely to take action than they indicated in the post-clinic surveys. According to the phone survey data, 70% of respondents took some action and 64% took more than one action. Specifically, 38% sought additional testing, 52% pumped out septic tank, 34% performed maintenance on well, 36% shock-chlorinated their well, and 34% purchased water treatment equipment or improved function of existing equipment.

4. Associated Knowledge Areas

KA Code	Knowledge Area

111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #4

1. Outcome Measures

Increase in the number of individuals who gain knowledge as certified nutrient management planners in turf and landscape systems.

2. Associated Institution Types

- 1862 Extension
- 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)
Virginia's state legislature began enforcing an unfunded mandate in 2013 that requires commercial applicators of fertilizer to turf and ornamental properties to be certified in the proper selection, handling, and application of fertilizer materials. In lieu of attending on-site training and testing programs, it was desirable to develop a web-based training and testing system that was readily available to Virginia's turfgrass industry professionals at reduced or no cost.
Virginia currently has nutrient management Standards and Criteria and corresponding Turf and Landscape Nutrient Management Planner training and certification programs administered by the Virginia Department of Conservation and Recreation (DCR). This program, initiated in 2009, was developed through a collaborative effort between DCR, VCE, and VT. The parties also collaborated in the development of a state/regional training manual to support the certification process in 2010. Standards and Criteria were updated in 2014, so these changes were incorporated into new presentations.

What has been done
Personnel from VCE, CALS-IT, VT Pesticide Programs, Virginia Department of Agriculture and Consumer Services (VADCS), and DCR collaborated on the development of a no-cost, self-paced, web-based training and testing program to provide not only certification, but also testing that meets VDACS (certifying agency) requirements. The program is called FACT and is hosted on the VCE website at www.ext.vt.edu/fact. The program consists of 10 training modules and is

also supported by numerous training videos and electronic files. Personnel from VCE, VT, and DCR collaborated on 2-day training sessions for 61 participants in spring and fall training sessions of 2014. The audience included turfgrass and allied green industry professionals, extension agents, and Master Gardener Volunteers desiring to become certified plan writers in 2014.

Results

Reviews of the on-line program continue to be extremely positive and the program has become a mandatory requirement for the new Virginia Turfgrass Certification Program. In 2014, 1,035 participants enrolled in the FACT on-line program and 389 successfully completed the training and have become certified fertilizer applicators.
Of the 61 participants in the urban nutrient management training program, 35 new urban nutrient management planners were certified. An additional 23,893.6 acres of turf under an Urban Nutrient Management Plan was added from these and previously certified trainers that came through this program (113 prior to 2014).

A total of ninety-three Henrico residents had their lawns measured, one hundred and fourteen (114) soil samples were submitted, and ninety-three (93) urban nutrient management plans were written and given to the respective homeowners. A total of 655,930 square feet (15.05 acres) of residential turf were brought under a nutrient management plan that is in full compliance with DCR urban nutrient management planning criteria.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

Outcome #5

1. Outcome Measures

Increase in the number of acres covered by nutrient management plans in turf and landscape systems due to participation in Extension educational programs.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Home lawns in Virginia comprise nearly 62% of the 1.7 million acres of managed turfgrass in the state and account for $1.7 billion in annual expenditures. Many homeowners apply chemical fertilizers and pesticides to keep their lawns healthy and green. Without proper training, it is easy to over apply or inappropriately apply chemical inputs leading to run-off into local streams and waterways. Excessive use and misapplication of chemical fertilizer can lead to excess nitrogen and phosphorous which can potentially reach storm drains or sewers and ultimately compromise ground or surface waters. This trend paired with high levels of residential development dramatically increases the potential overall impact on water quality. Ultimately the water quality of the Chesapeake Bay is compromised.

What has been done
VCE Master Gardener volunteers provide educational and technical services to homeowners with regard to home lawn management. The "Green" Grass Program brings awareness to local water quality as it is impacted by residential lawn care practices. In 2014, 71 homeowners received customized nutrient management plans.

Results
71 homeowners had their lawns measured, 71 soil tests were submitted, and 71 urban nutrient management plans were written and given to their respective homeowner. In 2012, a total of 40.7 acres of residential turf were brought under a nutrient management plans, which promotes best practices. Since 2009, 362 residences have received customized nutrient management plans for their turf.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
133	Pollution Prevention and Mitigation

Outcome #6

1. Outcome Measures

Increase in the tons of compost produced from organic wastes typically land-applied (manure, biosolids) or land-filled (yardwaste, biosolids, industrial sludge) as a result of increased knowledge and skills.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Soil is a foundational resource to farming, conservation and health in the 21st century. Controlling soil loss and nutrient runoff, non-point source pollution, is an important focus of water quality protection and clean-up efforts throughout Virginia. Additionally, there is growing interest and research on the role and function of soil health and its relevance to environmental sustainability, farm-to-table connections, long-term farm profitability and resilience, human gastrointestinal correlations, and the mitigation and adaptation to climate change by farmers and communities.

What has been done
With growing interest in soil health and its relevance to farm-to-table connections, prevention of diet-related diseases, sustainability and mitigation of climate change, VCE and USDA-Natural Resources Conservation Service (NRCS), in cooperation with 40 community partners, hosted the three-day 2014 Virginia Farm to Table Conference and In-Depth Soil Biology Training at Blue Ridge Community College and Virginia State University. The Virginia Farm-to-Table Conference and In-Depth Soil Biology Training was tailored to farmers production context (i.e., agronomic crops, forages, vegetables, fruits, and/or urban environment) and adaptive soil management to build appreciation of soil ecology and a more holistic understanding of the soil resource. The conference included 6-hours of training during the plenary sessions on nutrition health, soil biology, scale, and community ethics. More in-depth training on the principles and applications of soil biology were then offered as a specific track on days 2 and 3 of the conference at two sites in Virginia. Continuing education credits were offered for dietitians and nutritionists, certified crop advisers, nutrient management planners, and natural resources conservation personnel.

Results
The conference, producer-buyer meet-n-greet, and soil biology training was attended by 863 participants, exhibitors and panelists over the three days. The two 6-hour in-depth soil biology trainings at the two sites reached in total 87 soil conservationists of Virginia's NRCS field staff; 27 employees from soil and water conservation districts; 36 Extension agents and specialists; 61 representatives from non-profit organizations; and 215 farmers. To make the conference a bit greener and to better model what we are teaching, we partnered with A Bowl of Good Café and Black Bear Composting on Days 1 and 2 to divert seven 65-gallon containers of compostable materials (food, plates, glasses, forks, napkins etc.) to be composted and turned into soil rather than material for the landfill.

4. Associated Knowledge Areas

KA Code	Knowledge Area

133	Pollution Prevention and Mitigation
403	Waste Disposal, Recycling, and Reuse

Outcome #7

1. **Outcome Measures**

   Increase in the number of people directly impacted by new or improved land management practices

   Not Reporting on this Outcome Measure

Outcome #8

1. **Outcome Measures**

   Increased public awareness of climate change, biodiversity, and ecosystem services.

   Not Reporting on this Outcome Measure

Outcome #9

1. **Outcome Measures**

   Increased number of stakeholders involved in community natural resource management and decision-making.

   Not Reporting on this Outcome Measure

Outcome #10

1. **Outcome Measures**

   Increase program participants understanding of raw material conversion and modern business management practices.

   Not Reporting on this Outcome Measure

Outcome #11

1. **Outcome Measures**

   The general public, landowners, and loggers use the forest in alternative and traditional ways to increase value and profit.

2. **Associated Institution Types**

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Forests and the forest industry provide an economic impact of over $17 Billion to Virginia's economy. Harvesting and transportation is a critical component for providing raw materials for forest industry and providing revenue to forest landowners. Logging can be dangerous and is often listed as one of the most dangerous occupations in the US. Forest harvesting operations have the potential for environmental impacts, primarily related to erosion and sedimentation issues during harvests. Performing harvesting operations safely and sustainably is critical for workers and for the sustainability of forests. Proper training can reduce the safety risk to workers on harvesting operations and can also minimize environmental impacts associated with harvesting.

What has been done
The Virginia SHARP Logger Program (www.SHARPlogger.vt.edu) provides training to landowners, loggers, and others in the forest industry. The program provides training in sustainable forestry, environmental protection, and workplace safety. The SHARP Logger program is a cooperative effort between forest industry, VCE, state agencies, and others in involved in forest operations. The program is operated as an Extension program in the Department of Forest Resources and Environmental Conservation (FREC) in the College of Natural Resources and Environment. Trainings are coordinated through the FREC department and are often hosted locally by district agents. Trainings are offered throughout the Commonwealth and focus on issues related to safety, environmental impacts, and other issues related to harvesting operations.

Results
The vast majority of all logging businesses in Virginia are reached by the SHARP logger program. In 2014, over 30 training events and workshops were offered through the SHARP logger Program and over 1300 individuals attended at least one training to receive SHARP logger credit. Surveys of program participants have shown that trainings are effective and business owners frequently made changes to their operations as a result of attending SHARP logger trainings. The most commonly reported changes reported in their operations included improvements in safety and improvements in implementation of Best Management Practices to protect water quality.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land
403	Waste Disposal, Recycling, and Reuse

Outcome #12

1. **Outcome Measures**

Increase in the number of acres directly impacted by new or improved land management practices.

Not Reporting on this Outcome Measure

Outcome #13

1. **Outcome Measures**

Increase basic and applied knowledge relating to ecological processes and global climate change

Not Reporting on this Outcome Measure

Outcome #14

1. **Outcome Measures**

Landowner Retreats for New Woodland Managers

2. **Associated Institution Types**

- 1862 Extension
- 1890 Extension

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)

Forestry is the third largest industry in Virginia. It contributes over $17 billion a year to the economy. Forests also provide clean water and air, plant and wildlife habitat, scenery and recreational opportunities, and soil protection and enhancement. The annual value of these environmental benefits is estimated to be $21.8 billion. Most of our forests (68%) are owned by private families. An aging ownership and rapid turn-over of land results in constantly changing ownership. While most owners claim a conservation ethic, few have knowledge & experience to recognize & practice sustainability. Research into landowner decision making highlights the importance of planning, professional assistance, and peer influence to increase stewardship while meeting society's demands.

What has been done
To reach these new landowners, VCE developed the Forest Landowner Weekend Retreat Program. This day-and-a-half program combines classroom, field, and hands-on learning experiences to introduce landowners to basic forest management concepts, skills, and natural resource professionals. From its inception in 2008, through 2012, this program was offered annually in Central Virginia locations. Due to its success, the program was expanded in 2013 to include a southeast location and expanded again in 2014 to include a southwest location. To date, 9 Retreats have been held.

Results
Over 200 landowners have attended a Retreat. The average ownership size of attendees is 90 acres. As a result of attending a Retreat, exit surveys indicate that 10% intended on contacting a natural resource professional, 9% intended on obtaining a management plan, 5% planned on controlling invasive species on their land, and 5% intended on harvesting timber. However, the interesting story lies in anecdotal evidence. After the Retreats, we hear back from our speakers that they have been contacted by participants, wanting to donate easements, join Tree Farm, obtain a management plan, sell timber, etc. We are in the process of refining our exit survey tool and developing a follow-up survey for early participants in the program, so we can better tell this story. The follow up survey will be sent out this spring, so the 2015 Impact Statements will contain these results.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land
133	Pollution Prevention and Mitigation

<u>Outcome #15</u>

1. Outcome Measures

Landowners improve water quality through sustainable forest management

2. Associated Institution Types

- 1862 Extension

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)
Water and forests are vital and interlaced natural resources. The commonwealth has an estimated 100,823 miles of streams and rivers, 117,158 acres of public lakes, 236,900 acres of tidal and coastal wetlands, 808,000 acres of freshwater wetlands, 120 miles of Atlantic Coastline, and approximately 2,308 square miles of Chesapeake Bay estuarine waters. The highly indented shoreline is estimated at 3,315 miles. Forests are the dominant land cover in Virginia, with over 15.9 million acres. Forests protect water quality by acting as natural filters, absorbing nutrients & other pollutants that would otherwise be washed into nearby waters. In fact, high quality waters are most commonly associated with forested areas.

Non-industrial private individuals and families own 68% of Virginia?s forested acres. As such, Virginia forest landowners have the opportunity, by using sustainable forest management practices, to play a significant role in improving water quality. Research into landowner decision-making highlights the importance of planning, professional assistance, and peer influence to increase stewardship while meeting society?s demands (such as clean water). VFLE Programs present woodland owners with educational programs that outline forest management planning and highlight sustainable management practices. In addition, VFLE Programs provide a forum that fosters interaction with natural resource professionals and provides peer-to-peer learning opportunities.

What has been done
The Fall Forestry & Wildlife Field Tours take forest landowners to private, public and industry owned lands to see, first-hand, what sustainable forest and wildlife management practices look like, and how they can be implemented on private lands. Water quality protection and enhancement is a running theme in these discussions. Participants are provided with information on how to obtain both technical and financial assistance. The day-long experience provides ample time for participants to interact with, and learn from, fellow woodland owners and natural resource professionals. Typically, 3-4 tours are held throughout Virginia each fall. This is the longest continuous running program of its type in Virginia and possibly even in the US. In 2014, VCE and the VFLE Program held three Fall Forestry & Wildlife Field Tours throughout Virginia. In September, the Northern and Eastern Districts co-hosted the first overnight Fall Forestry & Wildlife Bus and Boat Tour, an immersion experience for woodland owners to learn about and see first-hand the relationship between forestry and Bay water quality. In October, the Central District hosted a tour in Halifax County, and the Western District hosted a tour in Grayson-Carroll

Counties. In all, 120 woodland owners, who own over 8,057 forested acres, participated in one of the three tours.

Results
As a result of attending the program, 29% of participants either "agreed" or "strongly agreed" that they would obtain a written forest management plan. In addition, 85% either "agreed" or "strongly agreed" that they would adapt the management of their forest to enhance the benefits it provides to society, including protecting and enhancing water quality. 86% "agreed" or "strongly agreed" that they could list three examples of Best Management Practices (BMPs) to protect water quality and explain the importance of using BMPs during forest management activities. All participants who completed the exit evaluations "agreed" or "strongly agreed" that forests can be managed in ways that protect water quality and indicated that they would implement at least one BMP in conjunction with their management practices.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
133	Pollution Prevention and Mitigation

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.)

Brief Explanation

The gross income derived from farming could be affected by natural disasters, changes in the economy, government regulations and public policy changes. Disasters damage infrastructure and facilities while economic and governance changes influence profitability of production systems. The number of acres of land subject to nutrient management plans/best management practices/conservation plans affected by government regulations and changes in the economy. If greater emphasis is placed on water and environmental quality then even more widespread implementation of these practices will be encouraged. These factors may have immediate impact as they significantly influence items such as production economics, industry infrastructure, marketing systems, and consumer demand. Good economic conditions encourage consumption of value added products. In Virginia, increasing land values in traditional animal production areas around cities and growing

towns are a significant challenge. The recent anticipated future growth of this alternative fuel source will likely have major impacts on forest production practices in Virginia. Scope of such impacts is unknown, but anticipated direction has influenced this planned program.

A recent challenge has been the change in demographics in Virginia. There is an increased demand to offer education resources in Spanish. Employers have a desire to employ non-English speaking workers. The prohibitive, besides the lack of resources to change the training materials and examinations, is that most materials use in Virginia (and most states) are written in English only. Changes in global food production capacity, energy costs, and epidemic diseases could have unpredictable effects. All external factors affecting personal discretionary spending will affect the implementation of environmentally sound BMP's. Natural disasters may affect producers directly but also will affect ag producers, homeowner and commercial landscaping. The general economy, public policy and governmental regulations impact production and sales of horticultural products. Appropriations and competing programmatic challenges affect the dedication of personnel and programs to the described programs. Population changes affect supply and demand for horticultural products.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

A mail survey was sent to 5,200 households in the Maryland and Virginia suburbs of Washington, D.C. The survey elicited consumer attitudes toward drinking water quality and willingness to pay for three programs aimed at improving drinking water services: 1) water quality improvement, 2) pinhole leak damage insurance and 3) water utility infrastructure upgrade. Results suggest that consumers respond to information about the quality and reliability of their drinking water. Positive information is likely to increase their confidence in their water and reduce their willingness to pay for improvements while negative messages increase their willingness to pay for improvements in some cases. Of perhaps equal importance are the experiences consumers have had with their drinking water. For example, respondents who had personally experienced leaks were more likely to support pinhole leak insurance. Thus, a combination of informational campaigns targeting actual problems experienced by large numbers of drinking water system users is most likely to increase acceptance of water quality improvement programs. The results indicate stronger support for public infrastructure improvements compared to the other two programs, which may indicate heightened public awareness of infrastructure concerns. In addition, this study supports previous findings regarding the link between information, risk perceptions and individuals' valuation decisions.

Key Items of Evaluation

The results indicate stronger support for public infrastructure improvements compared to the other two programs, which may indicate heightened public awareness of infrastructure concerns.