V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Ecosystem Management, Protection And Restoration

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	10%			
123	Management and Sustainability of Forest Resources	20%			
131	Alternative Uses of Land	15%			
133	Pollution Prevention and Mitigation	10%			
135	Aquatic and Terrestrial Wildlife	10%			
136	Conservation of Biological Diversity	15%			
205	Plant Management Systems	10%			
206	Basic Plant Biology	5%			
212	Pathogens and Nematodes Affecting Plants	5%			
	Total	100%			

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	7.1	0.0	0.0	0.0
Actual	13.4	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**
352681	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
604208	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
1681780	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Analytic tools and techniques

Applied Research Programs

Diagnostic Service

Facilitated Group Meetings and Conferences

Peer Reviewed Publications

Printed Materials

Single day workshop, class or event

Survey or needs assessment

Websites or other computer-based delivery

Workshop Series or educational course

2. Brief description of the target audience

•Natural Resource Agencies •Regional Planning Authorities •Development and Planning Agencies •Municipalities •Conservation Organizations •Landowners and Land Managers •Business/Industry (Natural resource based businesses, development industry, environmental consultants)

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	15415	28177	0	2800
Actual	18471	363534	0	0

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
Plan	2	0	
Actual	1	2	3

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Analytic tools and techniques

Year	Target	Actual
2010	5	6

Output #2

Output Measure

- Applied Research Programs

Year	Target	Actual
2010	7	2

Output #3

Output Measure

- Diagnostic Service

Year	Target	Actual
2010	21125	20900

Output #4

Output Measure

- Facilitated Group Meetings and Conferences

Year	Target	Actual
2010	9	10

Output #5

Output Measure

- Peer Reviewed Publications

Year	Target	Actual
2010	2	3

Output #6

Output Measure

- Printed Materials

Year	Target	Actual
2010	11	21

Output #7

Output Measure

- Single day workshop, class or event

Year	Target	Actual
2010	33	76

Output #8

Output Measure

- Survey or needs assessment

Year	Target	Actual

2010	1	2

Output #9

Output Measure

- Websites or other computer-based delivery

Year	Target	Actual
2010	12	75

Output #10

Output Measure

- Workshop Series or educational course

Year	Target	Actual
2010	2	5

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Participants acquire knowledge, skill and motivation to adopt practices that reduce the risk of exotic pests, diseases and invasive species
2	Participants develop the knowledge and skill to adopt land management practices that protect and enhance natural resources and ecosystems
3	Participants adopt land management practices that protect and enhance natural resources and ecosystems
4	Participants acquire knowledge and skill to effectively address natural resource issues during project review and permitting
5	Participants acquire knowledge and skill to minimize the impact of development projects on natural resources and ecosystems
6	Participants adopt practices that minimize the impact of development projects on natural resources and ecosystems.
7	Number of participants who develop the knowledge and skills for land conservation programs that protect ecosystems and natural resources
8	Participants adopt environmentally sound crop management
9	Participants adopt environmentally sound landscape, floriculture and turf management techniques
10	Participants acquire knowledge and skills for environmentally sound crop management
11	Participants acquire knowledge and skills for environmentally sound landscape, floriculture and turf management techniques

Outcome #1

1. Outcome Measures

Participants acquire knowledge, skill and motivation to adopt practices that reduce the risk of exotic pests, diseases and invasive species

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Participants develop the knowledge and skill to adopt land management practices that protect and enhance natural resources and ecosystems

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	100	8257

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Private citizens, policymakers and agencies are concerned with maintaining healthy forest in Massachusetts, a vital indigenous resources that support recreation, commerce and wildlife habitat.

What has been done
We develop and disseminate networking tools that target a large segment of forest landowners who have not been reached by traditional programs, to encourage informed decisions, forest conservation and landowner. We provide a continuously updated, local, internet resource that enables landowners to share information through threaded discussions, understand their land in relation to the surrounding area and systems through a mapserver application, find information about their land, and ask questions about estate planning and land transfer.

Results
Effective networks of forest landowners and peer educators have been created. Through these networks, thousands of forest landowners have gained a better understanding of conservation principles and land management options. Hundreds of forest owners were also referred to a private land trust.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land
133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity

Outcome #3

1. Outcome Measures

Participants adopt land management practices that protect and enhance natural resources and ecosystems

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Participants acquire knowledge and skill to effectively address natural resource issues during project review and permitting

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	100	219

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The general public, federal and state regulators and our collaborating agencies are highly invested in Conservation Assessment and Prioritization System. The computer software program provides an objective, dynamic, and flexible tool to support decision-making for land conservation, land management, project review and permitting to protect habitat and biodiversity.

What has been done

Work on the Conservation Assessment and Prioritization System (CAPS) continued in FY10, including field data collection in salt marshes, identification of samples from forested wetlands and salt marshes, data analysis and development of indices of biological integrity (IBIs), development and revision of ecological settings variables and integrity metrics, and development of techniques for using CAPS scenario analysis for assessment and project planning.

Results
The Conservation Assessment and Prioritization System (CAPS) was used to identify core forest and wetland areas, and clusters of vernal pools for inclusion in the Biomap 2 project. Biomap 2 is used by agencies and organization throughout Massachusetts to prioritize land protection efforts. CAPS serves as the centerpiece of the state?s comprehensive wetlands monitoring and assessment program and a potential model for use at the regional scale. Important Habitat Maps based on CAPS assessments are integrated into MassDEPs approach for protecting wildlife habitat during wetlands permitting by requiring greater scrutiny of specific projects that take place in or near these habitats.

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity

Outcome #5

1. Outcome Measures

Participants acquire knowledge and skill to minimize the impact of development projects on natural resources and ecosystems

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	100	2006

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The general public, our partner organizations, which include the Nature Conservancy and the Massachusetts Division of Ecological Restoration, as well as municipalities at different levels (town, state and region) throughout the country are highly invested in this work which focuses on

the impact of road-stream crossings (culverts, bridges, fords) on fish and other aquatic organism passage.

What has been done
We worked with our collaborators to revise our road-stream crossing assessment methods based on results of a detailed evaluation of the previous version of the protocol. A universal coding system for road-stream crossings that can be used throughout the U.S. was been developed and is ready for implementation. The online Crossings Database has been updated and a new scoring algorithm for aquatic passability was developed and implemented.

Results
The MA River and Stream Crossing Standards that have been generated continue to inform policy at both the state and federal level. Multiple references to the Massachusetts River and Stream Crossing Standards and Road-Stream Crossing Assessment protocols were included in the Massachusetts Department of Transportation?s handbook ?Design of Bridges and Culverts for Wildlife Passages at Freshwater Streams? issued in December 2010. The standards are referenced in the U.S. Army Corps of Engineers Programmatic General Permit (PGP) for Massachusetts that was reissued in January of 2010. New crossings of rivers and streams must meet these standards in order to qualify for non-reporting status under the General Permit.

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity

Outcome #6

1. Outcome Measures

Participants adopt practices that minimize the impact of development projects on natural resources and ecosystems.

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Number of participants who develop the knowledge and skills for land conservation programs that protect ecosystems and natural resources

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1012

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
There is a shared interest and collective responsibility for maintaining ecosystems, promoting biodiversity and preserving native species.

What has been done
A third season of field data collection was completed in 2010 and preliminary results are already being used to provide technical advice to people engaged in turtle conservation in Massachusetts and other states. Twenty volunteers were involved in the Massachusetts Calling Amphibian Survey monitoring 18 routes as part of the North American Amphibian Monitoring Program. A web site for the Massachusetts Herp Atlas Project was developed and launched in FY10.

Results
Data from turtle tunnel research is being used to provide technical advice to people engaged in turtle conservation in Massachusetts and other states. Calling amphibian monitoring data were collected for 18 routes in Massachusetts as part of the North American Amphibian Monitoring Program. Members of the public have begun submitting records of amphibian and reptile occurrences to the MA Herp Atlas web site, continually updating distribution maps for those species and providing important information for wildlife conservation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land
133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity

Outcome #8

1. Outcome Measures

Participants adopt environmentally sound crop management

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	2335

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
133	Pollution Prevention and Mitigation
205	Plant Management Systems
206	Basic Plant Biology
212	Pathogens and Nematodes Affecting Plants

Outcome #9

1. Outcome Measures

Participants adopt environmentally sound landscape, floriculture and turf management techniques

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual

2010	{No Data Entered}	675

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
We serve the entire green industry including floriculture (greenhouse) operations, turfgrass managers (golf courses, athletic fields, municipal parks and grounds, and school fields), landscape contractors, arborists, and the vegetable industry. The long term viability of this sector of the Massachusetts economy, as well as their client and consumer base. relies on accurate diagnosis of plant problems and an accurate picture of soil nutrient levels, physical characteristics, and heavy metal contamination.

What has been done
The Soil and Tissue Testing Laboratory processes over 20,000 soil and tissue samples for nutrient analysis and a report is sent which outlines major nutrients status, organic matter content of the soil, CEC, soil pH, and the presence of toxic, heavy metals such as lead and mercury. Each report also contains detailed fertilizer recommendations based upon the intended use of the soil.

Results
Each year, thousands of clients receive our services, and as a result they base their pest management decisions on accurate diagnosis of plant problems. We also provide critical education and that helps floriculture operations, turfgrass managers, landscape contractors, arborists, and farmers to implement environmentally sound management practices.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
133	Pollution Prevention and Mitigation
205	Plant Management Systems
206	Basic Plant Biology
212	Pathogens and Nematodes Affecting Plants

Outcome #10

1. Outcome Measures

Participants acquire knowledge and skills for environmentally sound crop management

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	500

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
133	Pollution Prevention and Mitigation
205	Plant Management Systems
206	Basic Plant Biology
212	Pathogens and Nematodes Affecting Plants

Outcome #11

1. Outcome Measures

Participants acquire knowledge and skills for environmentally sound landscape, floriculture and turf management techniques

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	230

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
133	Pollution Prevention and Mitigation
205	Plant Management Systems
206	Basic Plant Biology
212	Pathogens and Nematodes Affecting Plants

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

Brief Explanation

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- Case Study
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Key Items of Evaluation