

Plan of Work Update: Fiscal Years 2005-2006



UNIVERSITY OF
RHODE ISLAND

College of the Environment and Life Sciences

Rhode Island
Agricultural Experiment Station
and
Cooperative Extension

Dr. Jeffrey R. Seemann, Director

A report to the USDA-CSREES on an update of the Plan of Work for FY2005-2006

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Rhode Island Agricultural Experiment Station
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Authority: This Plan responds to the Agricultural Research, Extension, and Education Reform Act of 1998 (AREERA), Public Law 105-185. It conforms to guidelines from the Federal Register (Vol. 64, No. 74, April 19, 1999, pp. 19242-19248 and Vol. 69, No. 27, February 10, 2004 pp. 6244-6248.)

A. General Requirements:

1. Planning Option: This Plan is for the **Rhode Island Agricultural Experiment Station** (RI AES; AES; “the Station”) and for **Rhode Island Cooperative Extension** (RI CE; CE; “Extension”), administrative units of the University of Rhode Island (URI). Dr. Jeffrey Seemann, the Director of both RI AES and RI CE, reports to the Provost and Vice President for Academic Affairs. Scientists from any URI department may affiliate with AES or CE through approved projects, which are organized under Programs, described herein.

2. Period Covered: Oct. 1, 2004 to Sept. 30, 2006.

3. Projected Resources: RI AES and RI CE enter the 2-year plan with 16.5 scientist years, 19.8 technical years, and 32.1 professional years, and an FY2005 baseline of \$2.209M in formula funds and with equal matching funds. These resources are distributed in the Programs described herein.

4. Submission Date: October 9, 2004.

5. Certification:

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Components of the Plan of Work Update

The original *Plan of Work* described the following programs within the five goals designated by CSREES shown below:

- Goal 1: An agricultural system that is highly competitive in the global economy
 - Program 1. Landscape horticulture and technology for sustainable agriculture
 - Program 2. Aquaculture biotechnology and fishing
- Goal 2: A safe and secure food and fiber system
 - Program 3. Health and well being of fish and animals
 - Program 4. Food safety
- Goal 3: A healthy, well-nourished population
 - Program 5. Nutrition
- Goal 4: Greater harmony between agriculture and the environment
 - Program 6. Natural resources and the environment
- Goal 5: Enhanced economic opportunity and the quality of life for Americans
 - Program 7. Sustainable and nurturing communities

Additionally, the *Plan of Work* included a description of efforts toward the following:

- Stakeholder Input Processes
- Program Review Process
- Multistate Research and Extension Activities
- Integrated Research and Extension Activities

This *Plan of Work Update* includes a description of programs within each goal. We have updated the information in the programs under each of the goals. This section, “Components of the Plan of Work Update”, notes areas in which we have made: no substantive changes (e.g., editorial corrections and updating figures) or minor changes (e.g., changes to existing programs). We have made no substantive changes (e.g., eliminating or adding new program areas) in the original *Plan of Work*.

- Goal 1: An agricultural system that is highly competitive in the global economy
 - Program 1. Landscape horticulture and technology for sustainable agriculture
Changes in the original Plan of Work for Goal 1, Program 1: no substantive changes
 - Program 2. Aquaculture biotechnology and fishing
Changes in the original Plan of Work for Goal 1, Program 2: no substantive changes

- Goal 2: A safe and secure food and fiber system
 Program 3. Health and well being of fish and animals
Changes in the original Plan of Work for Goal 2, Program 3: no substantive changes
 Program 4. Food safety
Changes in the original Plan of Work for Goal 2, Program 4: minor changes
- Goal 3: A healthy, well-nourished population
 Program 5. Nutrition
Changes in the original Plan of Work for Goal 3, Program 5: minor changes
- Goal 4: Greater harmony between agriculture and the environment
 Program 6. Natural resources and the environment
Changes in the original Plan of Work for Goal 4, Program 6: minor changes
- Goal 5: Enhanced economic opportunity and the quality of life for Americans
 Program 7. Sustainable and nurturing communities
Changes in the original Plan of Work for Goal 5: minor changes
- Stakeholder Input Processes
Changes in the original Plan of Work for Stakeholder Input Processes: minor changes
- Program Review Process
Changes in the original Plan of Work for Program Review Process: minor changes
- Multistate Research and Extension Activities
Changes in the original Plan of Work for Multistate Research and Extension Activities: minor changes
- Integrated Research and Extension Activities
Changes in the original Plan of Work for Integrated Research and Extension and Activities: minor changes

GOAL 1: AN AGRICULTURAL SYSTEM THAT IS HIGHLY COMPETITIVE IN THE GLOBAL ECONOMY.

For agriculture to remain competitive in a global economy much is required beyond the ability of the system to produce adequate supplies at affordable prices. Agricultural products must be safe for human and animal consumption. Agricultural production systems must conserve soil, ground water, and liquid fossil fuels and other nonrenewable resources. Farming practices should minimize harm to the environment. As global agricultural systems strain to meet ever-greater human needs, they are taxing planetary carrying capacities. Agriculture must change to less energy-and-material-dependent plants and animals, and to energy-conservative management practices. This resource conservation must be done without significantly raising production costs, which would price US products out of the international market. In addition, the products must possess the attributes that make the goods attractive to consumers in the global marketplace.

Program 1: Landscape Horticulture and Technology for Sustainable Agriculture.

1. Issues to be addressed:

RI AES research on integrated agroecosystem management promotes economically profitable and technologically progressive local agriculture that aims to be a) environmentally benign and b) sensitive to the balance of scarce resources allocated among competing uses important to society. Our integrated pest management (IPM) programs, for example, seek ways to minimize the need for pesticides through promotion of resistant plant varieties, biological controls, and cultural alternatives to pesticides. Similarly, through efforts to develop a University-wide Biotechnology Initiative, we are enhancing our capacity to conduct state-of-the-art research in genomics, transgenics, imaging, and bioinformatics. Our research efforts emphasize the green industries of Rhode Island (turf grasses and ornamental horticulture) because of their relative importance to the local economy. (RI's wholesale nurseries and turfgrass producers account for 2/3 of our 11,000 acres of agricultural production.) These farms face a large array of pest problems and significant challenges from constant land development pressures. Technological and market innovations are essential for this industry to survive in the new economy. We also extend our research to locally produced and marketed food crops.

RI CE targets both the green industry professionals, who develop and manage landscapes, and the gardening public. We include here our work on Sustainable Home Landscapes—the GreenShare, Master Gardener, and Learning Landscape Environmental Education programs. These programs, plus our IPM and pesticide applicator training programs, are also closely related to Goal 4. We include them here because we are attempting to influence *what* is produced locally and *how* it is produced. While emphasizing ornamental horticulture, we also maintain a capability to respond to emerging problems in insect and disease management on the State's wide variety of crops. We seek to better understand the market potential of products that result from identifiably more benign forms of agriculture.

2. Performance goals:

- Develop and deliver training for green industry professionals and gardeners, emphasizing use of plants that require less water and labor, and fewer nutrients and pesticides.
- Expand markets for resource-conserving products.
- Reduce pest-induced damage to horticultural and forest plants, while maintaining environmental quality.
- Balance the costs of developing new or improved products with the future benefits expected from these products.

Output Indicators:

- Refereed publications, M.S. theses, Ph.D. dissertations, and technical documents on sustainable agricultural practices, with an emphasis on landscape horticulture.
- Improved grasses and ornamental plants for local and expanded markets.
- Better understanding of the biology of plants and their pests, including the identification of gene functions for select traits on select crop species.
- Release of biological control agents benefiting traditional agriculture, landscape horticulture and the environment of southern New England.
- Dissemination of research products through publications, presentations, and patent descriptions.
- Promotion of current research results through CE offerings (e.g., our publication “Sustainable Trees and Shrubs,” programs in the Learning Landscape demonstration garden, Turf Field Day, television programs and newspaper articles, and training through the GreenShare, Master Gardener, and Pesticide Applicator programs.)
- Scientific information promulgated through presentations, bulletins, and press releases.

Outcome Indicators:

- Increased local production of sustainable trees, shrubs, and turf grasses.
- Improvement of horticultural plant genomes through introductions of select genes and propagation of whole transgenic plants.
- Increased use of sustainable plants and IPM practices by CE-trained green industry professionals and the gardening public.
- Reduction in damage caused by pests through our biological control efforts, or through environmentally sensitive pesticide applications influenced by our IPM and pesticide applicator-training programs.
- Reduction in needs for water, nutrients, or labor for select ornamental plants and grasses.
- Increased profit from production, resulting from more efficient marketing and lower production costs.

3. Key program components:

- Improvement of turf grasses and ornamental plants through traditional and new technologies.
- Integrated pest management for arthropods, emphasizing using insects and insect pathogens as control agents; classical biological control of invasive pests using introduced natural enemies.

- Enhanced cultural practices to minimize water, fertilizer, or energy inputs and to reduce pollution from farming.
- Analysis of the economic feasibility of large-scale application of new production systems and market opportunities.
- CE IPM programs in various commodities and pesticide applicator training for all RI applicators.
- CE programs for green industry professionals. Includes revision of publications, new workshops, newsletters, annual Turf Field Days, traveling exhibits, short courses, demonstration plots and gardens, and site visits.
- CE programs for gardeners, including training Master Gardeners, preparing mass media offerings such as newspaper feature articles and twice-weekly “Plant Pro” television shows, organizing an annual GreenShare Field Day, preparing and distributing fact sheets and maintaining a Master Gardener-supported telephone hotline.

4. Internal and external linkages:

Internal: AES research in landscape horticulture and sustainable agricultural technology is linked to CE through joint faculty appointments, or through collaborative projects between the Station, Extension, and academic departments (Plant Sciences; Natural Resources Science; Cell and Molecular Biology; Environmental and Natural Resource Economics; and Fisheries, Animal, and Veterinary Sciences). We also depend on input from our six Program Leaders. (See *Stakeholder Input Processes* for a description of the Program Leaders.)

External: The Station and Extension maintain collaborative research and demonstration projects relating to horticulture, sustainable agriculture technology and silviculture with the following external linkages:

Government Agencies:

- RI Dept. of Environmental Management (pesticide applicator training)
- U.S. Forest Service (biocontrol of hemlock woolly adelgid)
- National Parks Service (Lyme disease epidemiology, national park habitat and community conservation studies)
- We participate in regional efforts to establish APHIS-approved natural enemies for control of exotic insect pests (e.g., lily leaf beetle, hemlock woolly adelgid) and invasive weeds (e.g., purple loosestrife, *Phragmites australis*)
- Local governments (purple loosestrife management at the City of Providence’s Roger Williams Park Zoo wetlands area)

Universities:

- University of Massachusetts (apple integrated pest management, biological control of lily leaf beetle, others)
- Connecticut AES (monitoring and management of Lyme and other diseases vectored by ticks, biting insects, or rodents)
- Rutgers University (floral supplements for enhancing biocontrol)
- Michigan State University (Blueberry IPM, Blueberries as a landscape plant)

Private Sector:

- We are developing joint research and teaching / training facilities in conjunction with private industries, and with the support of Rhode Island state economic development funds (e.g., Hybrigene, Ophios for collaborations on plant transgenics in forages, grasses, ornamentals and crops; Amgen).

5. Target audiences: We have active partnerships with agricultural producers of turfgrass and ornamental plants, formally through regular contacts with the RI Nursery and Landscape Association (RINLA). We have research and demonstration projects on several nurseries and we work closely with RINLA to determine research needs and to design educational programs. We have similar working relations with the RI Golf Course Superintendents Association. We also target consumers through educational outreach programs designed to promote acceptance of local products.

6. Program duration: 2 years, ongoing.

7. Allocated resources¹:

Fiscal Year:	2005	2006
AES Federal FTE	3.89	3.89
AES State FTE	5.42	5.42
AES Formula \$'s	604,215	604,215
AES Match \$'s	271,344	271,344
CE Federal FTE	5.19	5.19
CE State FTE	2.82	2.82
CE Formula \$'s	403,730	403,730
CE match \$'s	289,836	289,836
Total FTE's	17.32	17.32
Total Formula \$'s	1,007,944	1,007,944
Total Match \$'s	561,180	561,180

8. Education and outreach programs already underway:

- IPM programs for commercial growers and homeowners.
- Master Gardeners Program, Plant Hotline, Web-based Fact Sheets, RI Greenshare.

¹ Financial notes for this table: Graduate assistantship FTE's are **not** included in this analysis; Federal FTE and \$ are prorated in respective funding source programs with the AD-419 Adjustment Factor (A/A-B) or (Funding Source Total / (Funding Source Total minus FS Admin Total)); State FTE and \$ are **not** prorated into Programs; and FY2005/2006 Federal calculations are based on an assumption of level funding from the USDA and within RI AES.

Program 2. Aquaculture Biotechnology and Fishing.

1. Issues to be addressed: We seek ways to decrease the U.S. trade deficit in seafood products by increasing the production of high-quality seafood locally, without further impacting wild stocks. Because commercial fish species in coastal New England waters are overfished, we need to produce seafood in aquaculture facilities and to better manage the existing fisheries. We focus on appropriate development of a nascent aquaculture industry.

2. Performance goals:

- Increased production, sales, and markets for high-quality fish and shellfish produced in RI, without adversely impacting the environment, through increased aquaculture production.
- Optimized management of wild fish and shellfish stocks in RI waters.
- Increased integration with other RI AES and CE Plan of Work Programs (e.g., greater integration with Goal 2 [Safe and secure food and fiber system], Program 3 [Health and well being of fish and animals]; Goal 4 [Greater harmony between agriculture and the environment], Program 6 [Natural resources and the environment] or Goal 5 [Enhanced economic opportunity and quality of life for Americans], Program 7 [Sustainable and nurturing communities]
- Development of RI support industries for worldwide aquaculture development.
- Improved business planning for existing and new aquaculturalists in RI.

Output Indicators:

- Refereed publications, M.S. theses, Ph.D. dissertations, and technical documents on fisheries and aquaculture.
- Instructional materials on gear design and methods for bycatch reduction.
- RI state management plan for American lobster fishery.
- RI state management plan for aquaculture.
- Use of shellfish management to improve estuarine water quality.
- Demonstration of advanced water reuse technology for aquacultural systems.
- Demonstration of advance methods for shellfish seed production.
- Instructional materials on aquaculture effluents.
- Instructional materials on HACCP and seafood.
- Web-based fact sheets on water gardening.
- Annual RI Aquaculture Conference and associated workshops (examples below).
 - Aquaculture business planning.
 - Aquaculture effluent management.
 - Aquaculture in the K-12 classroom.
 - Diseases in aquaculture stocks.
 - Shellfish and water quality.
- Scientific information provided to the public through scientific journal articles, presentations, bulletins, press releases, etc.

Outcome Indicators:

- Reduction in negative environmental impacts from fishing and aquaculture.
- Increased market share of aquaculturally produced seafood.

- Increased market share for fish/shellfish labeled as captured through environmentally benign methods.

3. Key program components:

- Enhanced management practices to reduce pollution from aquaculture.
- Production of educational materials to promote bycatch reduction.
- Market analysis using retail and wholesale sales studies focusing on market value of environmentally benign capture and production technologies, and product attributes and quality.
- Analysis of benefits and costs of environmental policies addressing resource use and aquaculture pollution management.
- Annual RI Aquaculture Conference for delivery of topical workshops.
- Cooperation with State agencies to provide scientific and educational support to develop lobster fishery and aquaculture management plans.
- Cooperation with RI teachers to support aquaculture-in-the-classroom activities.

4. Internal and external linkages:

Internal: Station research in aquaculture and fisheries is linked to CE through joint faculty appointments, or through collaborative projects between the Station, Extension, and academic departments (Environmental and Natural Resource Economics; and Fisheries, Animal, and Veterinary Sciences). We also depend on input from our six Program Leaders.

External:

- NOAA, Sea Grant, and the National Marine Fisheries Service
- All northeastern land grant universities through the Northeast Regional Aquaculture Center
- RI Department of Environmental Management (Division of Fish and Wildlife and Division of Water Resources)
- RI Coastal Resources Management Council
- Narragansett Bay Commission
- RI Legislative Commission on Aquaculture

5. Target audiences: We work with active and novice aquaculturalists, many of whom are affiliated with the Ocean State Aquaculture Association. We also work with members of the RI fishing community, including members of the RI Lobstermen's Association and the RI Shellfishermen's Association. We work with RI elementary and secondary schools on aquaculture in the classroom. We assist CE Master Gardeners with ornamental fish and water gardening. We also assist staff of our external partners to meet their information needs, through topical workshops and research collaborations.

6. Program duration: 2 years, ongoing.

7. Allocated resources²:

Fiscal Year:	2005	2006
AES Federal FTE	1.39	1.39
AES State FTE	1.41	1.41
AES Formula \$'s	158,816	158,816
AES Match \$'s	132,697	132,697
CE Federal FTE	0.67	0.67
CE State FTE	0.71	0.71
CE Formula \$'s	49,634	49,634
CE match \$'s	51,675	51,675
Total FTE's	4.18	4.18
Total Formula \$'s	208,450	208,450
Total Match \$'s	184,372	184,372

8. Education and outreach programs already underway:

- NRAC Regional Aquaculture Extension Project.
- Offshore Cetacean and Mid-Atlantic Take-Reduction Teams (CE, National Marine Fisheries Service, environmental non-government organizations, industry groups).
- Collaborations with RI Aquaculture Commission and New England Fishery Management Council on codes of conduct for fisheries management.
- Collaborations with RI DEM Division of Fish and Wildlife on lobster stock assessments and shellfish management.
- Annual Rhode Island Aquaculture Conference.
- Annual water-gardening booth at RI Greenshare program.
- *Ad hoc* presentations to industry and other groups.

² Financial notes for this table: Graduate assistantship FTE's are **not** included in this analysis; Federal FTE and \$ are prorated in respective funding source programs with the AD-419 Adjustment Factor (A/A-B) or (Funding Source Total / (Funding Source Total minus FS Admin Total)); State FTE and \$ are **not** prorated into Programs; and FY2005/2006 Federal calculations are based on an assumption of level funding from the USDA and within RI AES.

GOAL 2: A SAFE AND SECURE FOOD AND FIBER SYSTEM.

A safe food and fiber system spans the health and well-being of animals and fish and a safe food supply. Animal husbandry practices that promote the health and well-being of animals and fish will often simultaneously create safer and higher quality food products, which may yet be highly competitive in the global economy. For example, a growing market for free-range poultry appeals to the environmentally-concerned consumer, and satisfies a market for higher quality, and perhaps more nutritious, meat. A secure food system is one that prevents contamination of food by any source, as well as a facilitating a predictable and steady supply of high quality and safe foods.

Program 3: Health and Well-being of Fish and Animals.

1. Issues to be addressed: People whose diet includes protein from fish and domestic animals want those animals to be healthy and reared under humane conditions. When industry-accepted management practices (e.g., castration to modify behavior, penning to make best use of time and space, high density aquaculture) create animal stress, we seek new strategies to minimize pain and discomfort, reduce the risk of stress-related diseases, and enhance animal well-being. Our studies of animal husbandry practices seek new strategies to reduce physiological or behavioral stress. Similar biological reactions to stress in farm animals and in cultured fish provide a unifying theme to our animal research programs. Station scientists have learned a great deal about the physiological (e.g., changes in blood chemistry) and behavioral reactions to stressors, in domestic livestock and in cultured salmon. We have a special interest in expanding our ability to diagnose and to respond to stress-related diseases associated with cultured fish and shellfish, which we see as a need common to north-Atlantic aquaculturalists and mariculturalists. We place increasing emphasis on use of biotechnology for disease recognition, for vaccine development, and for genetic enhancements of cultured species. Finally, we have strength in research and outreach on vector-borne diseases, including national leadership in monitoring tick-borne pathogens (e.g., *Ixodes scapularis* carrying Lyme disease) and on biological control of ticks on deer and cattle.

2. Performance goals:

- Reduction in adverse physiologic and behavioral responses to standard animal management practices.
- Reduction in stress related disorders of cultured fish and shellfish.
- Prevention and treatment of infectious diseases in cultured fish and shellfish.
- Reduction of tick and mosquito borne epizootics.
- Management of infectious diseases in wild populations of fish and shellfish.

Output Indicators:

- Refereed publications, M.S. theses, Ph.D. dissertations, and technical documents.
- Identification of physiological and behavioral indicators of stress, and stress-induced proteins and their associated genes.
- Understanding of relationship between cultural stress factors and disease.
- Identification of genes related to stress reaction and mitigation of stress effects through transgenic stock enhancement of species raised for aquaculture.
- Development of improved diagnostic tools for diseases of fish and shellfish.

- Identification of genes involved in the defense response to pathogens in fish and shellfish.
- Development of tools for the prevention of infectious diseases of fish and livestock.
- Development of improved diagnostic tools for vector-borne disease risk.
- Development of entomopathogenic biological controls for ticks on deer and cattle, and patented application methods.
- Scientific information provided to the public through scientific journal articles, presentations, bulletins, press releases, etc.

Outcome Indicators:

- Industry adaptation of less stressful management practices for animal husbandry.
- Reduction in mortality due to osmotic shock in salmonid release programs.
- Reduced incidence of disease in cultured stocks of shellfish and fish.
- Faster diagnosis of infected wild and penned stocks (e.g., Bay oysters) and faster screening of stocks to estimate likelihood of infection (e.g., *Vibrio parahaemolytica*).
- Measured reduction in tick and tick-borne disease incidence attributable to area-wide use of entomopathogens applied to deer or cattle.
- Measured improvement in public health action response in relation to vector-borne disease.
- Undergraduate and graduate students employed in appropriate career-related positions.

3. Key program components:

- Physiological and behavioral analysis of stress reactions in animals.
- Analysis of the molecular basis of stress response mechanisms; analysis of functional proteins involved in induced reactions and responsible genes
- Biotechnological methods for disease agent identification.
- Biotechnological methods for disease prevention.
- Laboratory for invertebrate pathology.
- Laboratory for vector-borne disease diagnosis.
- Laboratory for biological containment.

4. Internal and external linkages:

Internal: Station research in aquaculture and fisheries is linked to CE through joint faculty appointments, or through collaborative projects between the Station, Extension, and academic departments (Fisheries, Animal, and Veterinary Sciences; Plant Sciences; Cell and Molecular Biology; and Natural Resources Science) and the Graduate School of Oceanography. We also depend on input from our six Program Leaders.

External:

- National Sea Grant Program
- National Institutes of Health
- National Marine Fisheries Service (CMER, Saltonstall-Kennedy)
- Northeast Regional Aquaculture Center
- National Centers for Disease Control and Prevention
- U.S. Geological Survey
- Pawtuxet Wildlife Research Center

- Rhode Island Department of Environmental Management
- Pharmaceutical and biotechnology companies (e.g., InterVet, Inc; Alpharma Inc.)

5. Target audiences: Small scale, independent aquaculturalists and fishers; government resource managers; independent animal producers; physicians and veterinarians

6. Program duration: 2 years, ongoing.

7. Allocated resources³:

Fiscal Year:	2005	2006
AES Federal FTE	-	-
AES State FTE	0.25	0.25
AES Formula \$'s	27,962	27,962
AES Match \$'s	15,844	15,844
CE Federal FTE	-	-
CE State FTE	-	-
CE Formula \$'s	-	-
CE match \$'s	-	-
Total FTE's	0.25	0.25
Total Formula \$'s	27,962	27,962
Total Match \$'s	15,844	15,844

8. Education and outreach programs already underway:

- Collaboration with the RI DEM Division of Fish and Wildlife to assess diseases in oysters and other shellfish in Rhode Island coastal waters.
- Presentations to fishermen and aquaculturalists on results from disease surveys.
- Collaboration with RI DEM to monitor shellfish diseases in Rhode Island.
- Disease diagnoses for area aquaculturalists.
- *Ad hoc* presentations and annual state Aquaculture Association conference; miscellaneous presentations to aquaculturalists; miscellaneous presentations to small animal producers.

³ Financial notes for this table: Graduate assistantship FTE's are **not** included in this analysis; Federal FTE and \$ are prorated in respective funding source programs with the AD-419 Adjustment Factor (A/A-B) or (Funding Source Total / (Funding Source Total minus FS Admin Total)); State FTE and \$ are **not** prorated into Programs; and FY2005/2006 Federal calculations are based on an assumption of level funding from the USDA and within RI AES.

Program 4: Food Safety.

1. Issues to be addressed: There is a need for food safety information throughout the diverse Rhode Island community of educators, consumers, food service workers, food industry personnel and processors, and commercial fruit and vegetable growers. Federal and state regulations mandate specific training that allows the RI food industry to be in compliance. Program expertise will continue to provide regional support for a variety of educational activities.

2. Performance goals:

- Reduction in foodborne diseases.
- Control of food hazards.

Output Indicators:

- Refereed publications, M.S. theses, Ph.D. dissertations, and technical documents.
- Educational programs that provide consumers, educators, and food industry personnel with the knowledge and tools to reduce the risk of foodborne illness.

Outcome Indicators:

- Increased food safety knowledge among participants of food safety education programs directed towards educators, special needs teachers, caregivers, school administrators, nurse teachers, school-aged children, consumers and volunteer food service workers.
- Food processors and food service personnel will increase their food safety knowledge.
- Commercial fruit and vegetable growers and home gardeners will increase understanding of principles of good agricultural practices.

3. Key program components:

- Securing external funding to support current and future programs.
- HACCP and sanitation training for seafood, meat, and poultry and juice/cider processors.
- Food safety manager certification targeting school food service workers and volunteer food service workers.
- In-service for education professionals-teachers, school administrators
- Use of web-based information
- Good Agricultural Practice (GAP) programming for commercial growers.
- Food safety principles of planting, harvesting and post-harvest handling of produce for home gardeners
- Use of “train the trainer” concepts.
- Assessing consumer and trade association perceptions of barriers to seafood consumption
- Assessing effectiveness and perceptions of new processing technology on the safety of ready-to-eat foods

4. Internal and external linkages:

Internal: Station research in aquaculture and fisheries is linked to CE through joint faculty appointments, or through collaborative projects between the Station, Extension, and academic departments (Nutrition and Food Sciences; Fisheries, Animal, and

Veterinary Sciences; and Cell and Molecular Biology), University service departments (Dining Services, Residential Life and Student Health Services) and the University's Partnership in Food, Hunger and Nutrition. Station research in food safety is linked to CE through joint faculty appointments and through collaborative projects. We also depend on input from our six Program Leaders.

External:

Government Agencies - State:

- RI Dept. of Health
- RI Dept. of Corrections
- RI Dept. of Education
- RI Dept. of Environmental Management

Government Agencies – Federal:

- USDA- FSIS, FSA
- FDA – CFSAN
- CDC
- NOAA/NMFS
- RI College Sea Grant Program

Universities:

- Johnson & Wales University
- Rhode Island College
- Universities of Delaware, Maryland, Cornell, Louisiana, North Carolina State, Georgia and Oregon
- New England Land Grant Universities – Connecticut, New Hampshire, Vermont, Massachusetts and Maine

Private Sector:

- Team Nutrition/Kid's First
- National Fisheries Institute
- New England Dairy Council
- RI Food Dealers Association
- RI Hospitality and Tourism Association
- Rhode Island school districts
- Head Start programs-statewide
- RI Farm Bureau
- RI Center for Agricultural Promotion and Education (RICAPE)
- RI Community Foodbank and member agencies

5. Target audiences: Food industry and food service workers and managers, food processors, consumers, agricultural producers, home gardeners, school administrators, school-aged children and their caregivers, teachers, community volunteers and Master Gardener volunteers.

6. Program duration: 2 years, ongoing.

7. Allocated resources⁴:

Fiscal Year:	2005	2006
AES Federal FTE	-	-
AES State FTE	-	-
AES Formula \$'s	-	-
AES Match \$'s	-	-
CE Federal FTE	0.90	0.90
CE State FTE	1.00	1.00
CE Formula \$'s	102,712	102,712
CE match \$'s	104,642	104,642
Total FTE's	1.90	1.90
Total Formula \$'s	102,712	102,712
Total Match \$'s	104,642	104,642

8. Education and outreach programs already underway:

- Food Safety Policy for Schools. Provides food safety education in schools; focuses on food being prepared in and brought into schools as part of the curriculum.
- HACCP and Sanitation Training for Seafood, Meat and Poultry, Juice/Cider Processors.
- Training sessions for food process workers on compliance with FDA and USDA regulations.
- Food Safety Education Curriculums for Educators. Continue to offer in-service education and update existing curriculums.
- Food Safety Manager Certification/Recertification Courses and Instructor Training.
- Certification/Recertification courses will continue to be offered through URI's College of Continuing Education. Course content reflects the requirements of RI Department of Health. Also will continue to provide resource support for course instructors, foodservice managers and FCS and Culinary Arts teachers.
- Food Safety Education for Consumers. Programs focusing on school-age children and their caregivers and on college-age consumers.
- RI Food Safety Coalition and related activities. The coalition will meet quarterly to share issues and implement programs. Major emphasis will be on an annual conference which targets the state's food safety professionals.
- Good Agricultural Practices (GAP). Work with the RI CAPE, RI Department of Environmental Management, USDA and RI Farm Bureau to continue to implement an educational program (HACCP) for RI fruit and vegetable growers which provides growers who complete the training and on-farm audit with a certification as RI GAP certified growers which is renewable every three years.

⁴ Financial notes for this table: Graduate assistantship FTE's are **not** included in this analysis; Federal FTE and \$ are prorated in respective funding source programs with the AD-419 Adjustment Factor (A/A-B) or (Funding Source Total / (Funding Source Total minus FS Admin Total)); State FTE and \$ are **not** prorated into Programs; and FY2005/2006 Federal calculations are based on an assumption of level funding from the USDA and within RI AES.

GOAL 3: A HEALTHY, WELL-NOURISHED POPULATION.

Program 5: Nutrition.

1. Issues to be addressed: Nutritional dietary factors are associated with 4 of the 10 leading causes of death in RI – cardiovascular disease, cancer, stroke, and diabetes. Dietary factors are also associated with osteoporosis, which affects more than 40,000 Rhode Islanders. The prevalence of overweight in children and adults is rapidly increasing. In 2001, 52% of RI adults were overweight, with a BMI of greater than 25. In children, the rate of obesity is similar to the national average of 15%; another 15% of children are at risk for overweight. The establishment of healthy diets and exercise habits needs to start in early childhood and be maintained throughout adulthood.

Many RI households struggle to maintain adequate diets. In 2004, over 73,000 residents were on food stamps; 11% of Rhode Island's population is living at or below the federal poverty level; of all the New England states, Rhode Island has the highest percentage of children living in poverty. Chronically poor diets in childhood increase the risk of nutrient deficiencies, which may lead to impaired cognitive development, growth failure and anemia. In older adults hunger exacerbates pre-existing ill health, limits efficacy of many prescription drugs, and relates to an increase in depression, confusion and isolation. There is a need among these households for information on maximizing nutritional value of food dollars.

2. Performance Goals:

- Reduced health risk through improved diet and exercise habits for targeted populations (children, young adults and elderly).
- Ensure the security of food through promotion campaigns, coalitions and partnerships.

Output Indicators:

- Refereed publications, M.S. theses, Ph.D. dissertations, and technical documents.
- More effective delivery systems, (traditional and interactive media) for transferring nutrition information.
- Research results on mass transit targeting of food stamp recipients.
- Formation of and integration into URI Partnership in Food, Hunger and Nutrition

Outcome Indicators:

- Reduction in health risk factors among Rhode Islanders
- Increased access to food for Rhode Islanders
- Statewide Mass Transit Nutrition Education Campaign

3. Key Program Components:

- Restructuring of EFNEP to include part-time personnel to work with previously untargeted audiences with newly developed curriculum materials.
- Food Stamp Nutrition Education campaign using RI public transportation, the RI Department of Corrections and state-supported day-care providers.
- Continued focus on calcium and a plant-based diet
- Integration with URI Partnership in Food, Hunger and Nutrition

- Research into the metabolic, hormonal and appetitive responses to different carbohydrates in lean and obese adults.
- Research into improving plant food (fruit, vegetable and whole grains) availability and intake in older adults.

4. Internal and External Linkages:

Internal: Station research in nutrition is linked to CE through collaborative projects between academic departments (Nutrition and Food Sciences; and Human Development and Family Studies), academic colleges (College of the Environment and Life Sciences, College of Nursing), University service departments (Dining Services, Residential Life and Student Health Services), the Expanded Food and Nutrition Education Program, the University's Feinsein Center for a Hunger Free America and the University's Partnership in Food, Hunger and Nutrition. We also depend on input from our six Program Leaders.

External:

Government Agencies:

- City of Providence
- RIPTA
- RI Department of Human Services
- RI Department of Education
- RI Department of Health

Private Sector:

- RI Council of Churches
- Southside Community Land Trust
- Kids First
- *Providence Journal*
- Local Community Food Pantries
- RI Food Bank
- Crossroads Rhode Island

5. Target Audience: Low-income residents – school age children to the elderly; riders of Rhode Island public transportation; teachers in Title 1 schools; and all Rhode Islanders who are food insecure.

6. Program Duration: 2 years, ongoing.

7. Allocated resources⁵:

Fiscal Year:	2005	2006
AES Federal FTE	-	-
AES State FTE	0.47	0.47
AES Formula \$'s	55,537	55,537
AES Match \$'s	35,402	35,402
CE Federal FTE	6.49	6.49
CE State FTE	0.25	0.25
CE Formula \$'s	260,352	260,352
CE match \$'s	25,464	25,464
Total FTE's	7.21	7.21
Total Formula \$'s	315,889	315,889
Total Match \$'s	60,866	60,866

8. Education and outreach programs already underway:

- Two multi-state projects NE-172, “Nutritional Risk and Antioxidant Status in the Elderly”, and NC-219 “Using Stage Based Interventions to Increase Fruit and Vegetable Intake in Young Adults”, provide the basis for much of the outreach program.
- Rhode Island’s USDA Food Stamp Nutrition Education Program (FSNEP). The focus of this program is to provide food stamp eligible or participating elderly and families with relevant information related to improving diet quality, ensuring food security and safety and managing food resources (e.g., Senior Nutrition Awareness Project and Good Food Gives Life Project).
- The RI FSNEP website is fully functional. The site houses the Family Nutrition Program.
- 5-week nutrition education curriculum for “Women in Transition” was developed and piloted to 35 women transitioning out of the RI Correctional Institute and into mainstream society.
- New instrumentation to assess nutrition risk among homeless individuals was developed and tested for sensitivity, as were techniques and partnerships for identifying these individuals/families

⁵ Financial notes for this table: Graduate assistantship FTE's are **not** included in this analysis; Federal FTE and \$ are prorated in respective funding source programs with the AD-419 Adjustment Factor (A/A-B) or (Funding Source Total / (Funding Source Total minus FS Admin Total)); State FTE and \$ are **not** prorated into Programs; and FY2005/2006 Federal calculations are based on an assumption of level funding from the USDA and within RI AES.

GOAL 4: GREATER HARMONY BETWEEN AGRICULTURE AND THE ENVIRONMENT.

Program 6: Natural Resources.

1. Issues to be addressed: Coastal southern New England has a high density of people on a landscape that is richly forested and blessed by an abundance of high-quality ground water. Just as RI AES and CE are concerned with wise use of agricultural lands to assure future productivity (Goal 1), so too are we concerned with stewardship over coastal forested ecosystems and the watersheds that support our estuarine and freshwater resources. We seek biological and ecological understandings of diverse natural communities, which we use as a basis for wise management of human activities that affect these ecosystems.

We study the diverse natural communities of Rhode Island, providing a scientific basis for management of forests, woodlands, and open spaces. Individual research projects focus on migratory birds and birds in sensitive habitats, on reptile and amphibian ecology in vernal pools, on local rare or endangered insect species, and on the genetics of mammal populations that are affected by human encroachment on habitats. We are also interested in the role of filter-feeding bivalves (clams, scallops, oysters) as agents of water-quality enhancement in estuaries.

RI AES scientists also study the mosaic of soil and groundwater that affect the overlying natural communities and affect the fate of watershed nutrients and surface water contaminants. These studies include basic research on the mechanisms of nutrient cycling in forest and agricultural systems, including studies of the roles of soil microbes and nematodes, and long-term studies of the dynamics of carbon and nitrogen partitioning.

Rural Rhode Island is subject to intense pressure from suburban development. RI AES and CE together focus on the identification, protection and restoration of locally valuable habitats and drinking water supplies. We inform the public and decision-makers on methods to minimize environmental damage from human activities.

2. Performance goals:

- Expand knowledge base on hydrology and wildlife biology (birds, mammals, amphibians, and insects) of coastal forested ecosystems and estuaries. Develop methods for public policy formulation for stewardship of local natural resources, based on valuation methods and economic analysis.
- Deliver education programs on local environments to improve community-based management of water resources and critical habitats. Reduce nitrogen or phosphorus loading, and other pollution risks. Target adaptation of on site specific best management practices needed to address locally-identified resource protection issues.
- Maintain and strengthen partnerships with federal, state, local, public and private organizations for more effective and sustained solutions to long-term watershed and critical habitat issues through community-based education.

Output Indicators

- Refereed publications, M.S. theses, Ph.D. dissertations, and technical documents.
- Statewide and community-based educational materials and workshops that increase constituent knowledge on management options to protect, restore, or improve the quality of local watersheds and critical habitats (e.g., wetlands, vernal pools, forest patch community and population dynamics).
- The use of computerized and web-based spatial data by town officials that enhance environmental decision-making for priority resource areas.
- Trained citizen volunteers and local officials, who collect, understand and can access scientifically valid data on local waters and critical habitats and a full range of residential pollution prevention techniques.
- Enhanced knowledge of local officials, state agency regulators, septic system designers and installers, homeowners, and other groups to identify and apply appropriate on-site wastewater technologies to reduce pollution.
- Improved capacity of local officials, homeowners, and other watershed stakeholders to identify riparian stream buffer location and functions, evaluate impacts to these areas, and select appropriate buffer management and restoration practices.
- Build new and lasting relationships among local watershed stakeholders and public and private experts for improved effectiveness in managing local resources.
- Target at least 20% of our output activities to under-served communities.

Outcome Indicators:

- Characterization of local water resources and identification of critical natural habitats.
- Use of URI Watershed Watch, RI Natural History Survey, and RI AES studies by decision-makers to target resource protection efforts.
- Land and water management issues identified by local groups and consensus reached on common goals, priorities, or actions to be taken.
- Expanded use of geographic information systems in environmental decision making
- Local watershed management actions (e.g. changes in existing planning documents, standards, ordinances, best-management and site review practices).
- Actions taken by town officials and other stakeholders to educate residents on local resource values, and impacts of land use activities.
- Special efforts will be made to assess outcomes in under-served communities.
- Best management practices adopted by individuals participating in Home*A*Syst.
- Wastewater best management practices adopted as a result of On-site Wastewater Training center education. These include new technologies used in Rhode Island, number of adopted community-based wastewater management plans and standards, local financial assistance programs established for septic system repair or upgrading, number of septic systems inspected, maintained and repaired and increases in site-specific assessment of septic system constraints.
- Riparian buffer management practices adopted by towns, stream corridor residents, and other watershed stakeholders, and number or acreage of new development proposals using creative design techniques to protect stream riparian areas.
- Participation by State agencies and other resource professionals in CE community-based education programs.

- Partnerships and committees formed among town officials and other local stakeholders to share information, review policies, resolve conflicts, or to otherwise address land use/resource management issues.
- Participation in interagency meetings to coordinate activities, work plans developed with agency partner input, and partnerships formed or strengthened among federal, state, and local partners.
- Collaborative pollution prevention or watershed management activities sparked by coordination among federal, state, or local partners, including resources leveraged, co-sponsored activities, and joint activities initiated.

3. Key program components:

- Research on biogeochemistry, vernal pool and forest ecology, coastal land use valuation methodology, plant and animal community and population dynamics.
- **URI On-Site Wastewater Training Center.** This Center was established on campus in 1994 as a Northeast demonstration and training center for alternative septic system technologies, one of eight U.S. regional centers. The Center provides training on septic system design, operation, and maintenance to protect and restore local water quality. It works with state and federal agencies, municipalities, and over 40 private contractors. It features 19 innovative full scale systems constructed above ground for hands-on learning, each system based upon technologies known to minimize nutrient and/or microbial loading to ground and surface waters.
- **URI Watershed Watch.** This is RI's largest scientist-led volunteer water quality monitoring program. It uses 250 trained volunteers, investing 12,500 hours each year on over 100 streams, ponds, and estuaries, providing 90% of the State's lake water quality data. The goal is to promote citizen participation in water quality protection, to educate the public about water quality issues, and to monitor surface water quality continually both to determine current conditions and to detect trends. Watershed Watch has over 30 local sponsors, including one third of RI towns that provide annual volunteer training and technical support, laboratory analysis, an EPA certified QA/QC program, data analysis, and reporting.
- **URI Home*A*Syst Residential Pollution Prevention Program.** URI Home*A*Syst is a voluntary residential pollution prevention program. Programmatic efforts work in partnership with Federal, regional, state, and local agencies and organizations to develop and deliver educational training and materials to residents. This program provides customized workshops, publications, an extensive web-site, and other educational resources and tools to individuals, community leaders, groups and organizations, and local, state and federal agencies to promote informed decision-making and to take actions to reduce risks to environmental and human health. This program focuses on: public and private drinking water protection; landscaping for water quality protection in partnership with the Landscape Horticulture Program, including residential integrated pest management (IPM) programs that work to minimize the need for pesticides through promotion of resistant plant varieties, biological controls, and cultural alternatives to pesticides; riparian buffer protection; and proper disposal of household hazardous wastes. This program has been successful in developing new initiatives and materials that address emerging water quality concerns in the State and region, including small acreage

woodland management and small acreage non-commercial farms that typically do not qualify for “traditional” agricultural assistance programs.

• **Municipal Watershed Management Training.** This program helps officials identify and control local water quality within a watershed context. It provides computer generated maps and other information on pollution risks from land use activities, emphasizing non-point best management practice pollution-control options and protection strategies tailored to community needs. Our joint programs—conducted with the RI Department of Administration Division of Planning, Office of Municipal Affairs—provide the *only source* of regular watershed training for volunteer board members and are the primary source of education on nonpoint pollution controls.

• **GeoSpatial Technologies to Improve Stewardship.** This Program uses geospatial technologies as tools to promote stewardship at the state and local level. These technologies enable decision makers and citizens to access and analyze the most up-to-date geographical information thereby promoting informed decision making and wise resource management. A hallmark of this program is Rhode Island Geographic Information System (RIGIS) database, one of the most complete and detailed compilation of digital geospatial data in the nation. We develop and distribute decision support tools and data, empower audiences to use these data and tools, and demonstrate the use of both the technology and the data to resource managers in a pilot project setting. Through the internet, (www.edc.uri.edu) we provide 24/7 access to our geospatial data (RIGIS database, to our global positioning system (GPS) base station files (through the NGS Cooperative CORS Program), and to static (RI Digital Atlas) and interactive maps (RI Digital Imagery Server, RI Habitat Restoration Project, RI Coastal Eelgrass Project). Decision support tools, such as URI's MANAGE model and the Critical Habitats Analysis, that use geospatial technologies, have been developed and used in resource protection efforts at the local level. To enhance the use of these technologies for natural resource management, the second component of the program is to provide hands-on technology training programs that allow resource managers to use and access GIS software, data, and other geospatial tools. The third component is to demonstrate the use of these technologies in resource protection efforts. Examples include the Rhode Island Department of Health's Source Water Protection Program; use of the MANAGE model with local communities to adopt local wastewater management plans and programs; and, identifying critical areas within the state for resource protection and acquisition.

4. Internal and external linkages:

Internal: CE educational programs are integrated with the AES research through faculty collaborations and through joint projects of graduate and undergraduate students. This includes collaborations among departments (Natural Resources Science; Environmental and Natural Resource Economics; and Plant Sciences), programs (CE Water Quality Program, Rural Resources Education Act Program, CE Greenshare Program, and the CE Master Gardener Program) and the University's Partnership for the Coastal Environment. We also depend on input from our six Program Leaders.

External:

Government Agencies:

- U.S. Environmental Protection Agency Region I

- U.S. Department of the Interior
- U.S. Geological Survey
- RI Department of Environmental Management (Division of Agriculture)
- RI Department of Administration, Office of Municipal Affairs
- RI Department of Health
- RI Department of Transportation
- RI Coastal Resources Management Council
- Miscellaneous RI town planning offices

Universities:

- The New England Region Water Quality Program consists of the 6 New England Land Grant institutions working with the CSREES National Integrated Water Quality Program. This Program works to improve water quality management through educational knowledge and extension programming that emerges from a research base. The Program builds on the strengths of the Extension Water Quality Programs at the Land Grant Universities throughout the region and partners with Federal, state, and local agencies and organizations.
- Consortium of Institutes for Decentralized Wastewater Treatment. The Consortium has 22 member institutions from the U.S. and Canada, each with faculty or staff engaged in onsite wastewater treatment research, teaching and/or outreach. It also has a large advisory board of private sector and regulatory onsite wastewater practitioners. Its mission is to develop and improve onsite wastewater undergraduate and graduate curriculum, coordinate research activities and priorities, and develop outreach materials for practitioner training. Consortium members interact on wastewater demonstration projects, technology performance reviews, regulatory code revisions, publication co-authorship, and research project assistance.

Private Sector:

- Watershed Associations and River Councils
- RI Natural History Survey
- Audubon Society of Rhode Island
- Save the Bay (RI)
- Environment Council of Rhode Island
- RI Independent Contractors and Associates
- RI Realtor's Association

5. Target audiences: Local (town government planning offices, etc.) decision-makers and the public. We also work with state, federal and local governmental organizations, citizen groups and the private sector.

6. Program duration: 2 years, ongoing.

7. Allocated resources⁶:

Fiscal Year:	2005	2006
AES Federal FTE	1.16	1.16
AES State FTE	2.09	2.09
AES Formula \$'s	257,144	257,144
AES Match \$'s	194,512	194,512
CE Federal FTE	2.11	2.11
CE State FTE	0.92	0.92
CE Formula \$'s	241,737	241,737
CE match \$'s	90,513	90,513
Total FTE's	6.28	6.28
Total Formula \$'s	498,880	498,880
Total Match \$'s	285,025	285,025

8. Education and outreach programs already underway:

- The URI Onsite Wastewater Training Center
- URI Watershed Watch
- URI Home-A-Syst
- URI Municipal Watershed Management Program
- URI Geospatial Technologies Program

⁶ Financial notes for this table: Graduate assistantship FTE's are **not** included in this analysis; Federal FTE and \$ are prorated in respective funding source programs with the AD-419 Adjustment Factor (A/A-B) or (Funding Source Total / (Funding Source Total minus FS Admin Total)); State FTE and \$ are **not** prorated into Programs; and FY2005/2006 Federal calculations are based on an assumption of level funding from the USDA and within RI AES.

GOAL 5: ENHANCED ECONOMIC OPPORTUNITY AND QUALITY OF LIFE FOR AMERICANS

Program 7: Sustainable and Nurturing Communities.

1. Issues to be addressed: RI AES and CE programs blend ecological and social sciences in their focus on human communities. Current AES studies emphasize policies for economic development in suburbs and of factors that affect family-run businesses. CE programs in youth at risk and community leadership are aimed at dealing with a complex array of sources of community distress, such as:

- The number of children in poverty is increasing in all RI cities and towns.
- Family structures are stressed by poverty, creating weakened environments for child rearing.
- There is limited access to social programs for youth and families, and links between service providers and families are weak.
- Parents need skills to teach their children limits and how to avoid violence.
- Too many youth and adults lack financial literacy; family debt levels are rising, with increasing defaults on credit cards and mortgages; many families have inadequate savings and no retirement funds.
- Policies and practices to enhance rural development, including housing have been fragmented or ineffectively implemented.
- Suburbanization transforms community character and the environmental qualities that residents seek.
- Smaller communities are in need of information, training, education, technical assistance and technology transfer for both public officials and private/non-profit organizations.
- Resources to support community-based programs are shrinking.

2. Performance goals:

- Increase the number of individuals, families, and community organizations trained with skills necessary to cope with fiscally and socially stressful environments.
- Assist rural and suburban communities to formulate policies and programs to promote local economic development, to manage housing and growth, to protect community character, to revitalize stressed neighborhoods, and to conserve critical natural areas.
- Evaluate the effectiveness of our programs in children, youth and families using a CSREES review (expected date of review December 2004.)

Output Indicators:

- Refereed publications, M.S. theses, Ph.D. dissertations, and technical documents.
- Number of youth participants and adult volunteers involved in Children, Youth and Families/4-H programs.
- Research on factors affecting the quality of childcare and training of childcare providers to increase competency and ability to cope with problems confronting caregivers today.
- Statewide and community-based educational material, training courses and workshops that increase knowledge and skills of children, youth and families to solve problems facing them daily.
- Programs to link parents with community resources benefiting children.

- Training programs in financial management for youth, and women in marital transitions.
- Understanding of economic development and conservation policies in successful suburban communities.
- Guidelines for community economic development policy makers.
- Use the result of the CSREES review to evaluate and refocus our programs in children, youth and families.

Outcome Indicators:

- 4-H participants will learn leadership skills (e.g., public speaking, project leadership).
- More effective methods for parental discipline of children.
- Better use of family time as a result of parental skills training.
- Establishment of rural, suburban, and urban community advisory boards to identify program needs unique to their respective communities.
- Provide education and risk reduction activities that promote health and safety.
- Improved individual financial planning behaviors.
- Quantitative improvements in quality of life in housing communities.
- Implementation of successful economic development and conservation programs and policies by local communities.

3. Key program components:

- 4-H Youth and Volunteer Leadership Development
- Professional staff development training programs for agency staff and child care providers.
- Parenting and Family Life Education
- Children, Youth, and Families at Risk
- Family Financial Management
- Family-run Businesses
- Community Economic Development Policy
- Community Housing Policy

4. Internal and external linkages:

Internal: Station research in sustainable communities is linked to CE through joint faculty appointments, or through collaborative projects between the Station, Extension, and academic departments (Community Planning; Natural Resources Science; Environmental and Natural Resource Economics; Human Development and Family Studies). We also depend on input from our six Program Leaders.

External:

Universities:

- Cornell University
- University of Connecticut
- University of New Hampshire
- 13 Land Grant Universities in the National Network for Child Care, and the Child Care and Youth Development Initiative

Other:

- Rhode Island Departments of Education, Health, and Human Services

5. Target audiences: Youth participants in 4-H (~1,800 now) and adult volunteers; day care, after-school care, and center-based child care providers; youth and parents in families in distressed communities; women experiencing transient financial difficulties due to death of spouse or divorce; housing authorities; RI cities, towns, and villages with inadequate professional planning staff; and other local officials, policy regulators, and public stakeholders.

6. Program duration: 2 years, ongoing.

7. Allocated resources⁷:

Fiscal Year:	2005	2006
AES Federal FTE	-	-
AES State FTE	1.98	1.98
AES Formula \$'s	114,053	114,053
AES Match \$'s	219,879	219,879
CE Federal FTE	4.12	4.12
CE State FTE	2.25	2.25
CE Formula \$'s	319,366	319,366
CE match \$'s	229,742	229,742
Total FTE's	8.35	8.35
Total Formula \$'s	433,419	433,419
Total Match \$'s	449,621	449,621

8. Education and outreach programs already underway:

- 4-H Youth and Volunteer Leadership Development
- Development of training programs for Child Care Providers
- Parenting and Family Life Education.
- Children, Youth, and Families at Risk
- Family Financial Management
- Community Economic Development
- Community Housing Policy

⁷ Financial notes for this table: Graduate assistantship FTE's are **not** included in this analysis; Federal FTE and \$ are prorated in respective funding source programs with the AD-419 Adjustment Factor (A/A-B) or (Funding Source Total / (Funding Source Total minus FS Admin Total)); State FTE and \$ are **not** prorated into Programs; and FY2005/2006 Federal calculations are based on an assumption of level funding from the USDA and within RI AES.

B.2. Stakeholder Input Process:

This section responds to section 102 (c) of AREERA, outlined in section B.2. of the Guidelines. It follows “Stakeholder Input Requirements for Recipients of Agricultural Research, Education, and Extension Formula Funds” (Federal Register, Vol. 64, No. 71, April 14, 1999, p. 18534 – 18536).

RI AES and CE incorporate stakeholder input in the design and implementation of all the programs outlined in this *Program of Work Update* and the individual research projects and outreach activities that constitute the *Program of Work*. We believe that feedback is a critical hallmark of any quality organization and that stakeholder input is a key component of feedback. During the 2 years of this *Plan*, we will continue to focus existing stakeholder input processes in both extension and research.

Caveats: Rhode Island has many unique attributes that should be considered when assessing stakeholder input.

- Its ~1 million people live in an area that is smaller than, for example, 13 of New York’s largest counties.
- High population density coincides with high density of forested or wooded lands
- RI’s 5 counties do not have working county governments; instead, 39 towns, cities and villages have a variety of local-focused governmental councils and managers.
- The state has a diversity of agriculture similar to other states, but is represented by a handful of individuals (e.g., a dozen potato farmers, nine sweet corn growers, etc.).
- Per capita income is significantly lower than neighboring states and the general economy of the state is poor (despite having a relatively high percentage of very rich people).
- The state has not had a legacy of strong support for its public university, nor for its land grant (or sea grant, or urban grant) missions.
- The state is demographically elderly, and made up of heterogeneous ethnic groups (Italian, Portuguese, Irish, with new populations of Hispanic Americans and Southeast Asians).
- State match for both AES and CE has been historically among the lowest in the Nation.

The ability of RI AES and CE to meet the breadth of needs for agricultural, environmental, and social research and outreach is challenged both by its unusual demographics and economics, and by constrained resources. Resources available to RI AES and CE are, in general, significantly lower per capita than in all other states. However, we are working directly with the RI Board of Governors for Higher Education and the RI General Assembly to seek greater support for our land grant programs. Indeed, in the past three years, bills that support the land grant mission have been introduced in the RI General Assembly.

Major Stakeholder Groups: Given our resource constraints, the Station and Cooperative Extension chooses carefully among many competing priorities as we develop major programs and the projects. Clearly, the numerous needs for research and outreach in the state cannot all be addressed with our limited resource base. We carefully structure our stakeholder (both internal and external) processes to ensure fair and open

input. With that input we have (and will continue) to focus upon areas in which we are able to deliver quality programs.

Our array of stakeholders provides us with valuable input for the determination of priorities. In general, our stakeholders include:

- The Rhode Island Board of Governors for Higher Education, the administration of the University, the Faculty Senate and faculty steering committees representing the primary producers of research and outreach.
- AES/CE Program Leader Team. This is a management team consisting of six program-area advisors, the Director and the Associate Director. The Program Leaders have the following assigned responsibilities:

Program Leader in Sustainable Agriculture-Dr. Richard Casagrande:

Oversees the implementation of Goal 1-An agricultural system that is highly competitive in the global economy, Program 1-Landscape horticulture and technology for sustainable agriculture.

Program Leader in Animal Health and Aquaculture-Dr. David Bengtson:

Oversees the implementation of Goal 1-An agricultural system that is highly competitive in the global economy, Program 2 Aquaculture biotechnology and fishing and Goal 2-A safe and secure food and fiber system, Program 3-Health and well-being of fish and animals.

Program Leader in Food Safety and Nutrition-Ms. Linda Sebelia: Oversees the implementation of Goal 2-A safe and secure food and fiber system, Program 4-Food Safety and Goal 3-A healthy, well nourished population, Program 5-Nutrition.

Program Leader in Natural Resources-Dr. Arthur Gold: Oversees Goal 4-Greater harmony between agriculture and the environment, Program 6-Natural resource and the environment.

Program Leader in Sustainable Communities-Dr. Cathy Roheim: Oversees Goal 5-Enhanced economic opportunity and quality of life for Americans, Program 7-Sustainable and nurturing communities.

Program Leader in Children, Youth and Families-Ms Marcia Morreira: Oversees Goal 5-Enhanced economic opportunity and quality of life for Americans, Program 7-Sustainable and nurturing communities

These Program Leaders serve important roles as an advisory body to the Director and Associate Director regarding every facet of the Land Grant Programs at URI.

- State and federal government agencies.
- Agricultural and aquacultural producer groups.
- Community governments and publicly funded social organizations.
- Public non-profit environmental groups.
- Industrial constituents.
- We also recognize the need to seek feedback on the value of our programs from the **general citizenry**, whose tax dollars fund our public research and outreach agendas.

Internal Stakeholder Input:

University: University stakeholders include individual faculty, who have very traditional methods of letting AES and CE administration know of their priorities (i.e., direct contact and contact through department chairs, Program Leaders and College deans).

The University has also organized its research and academic programs under four focus groups, to receive special emphasis for resource allocation (e.g., funds, positions):

- Marine and the Environment
- Health
- Children, Families and Communities
- Enterprise and Technology.

The primary emphasis of AES and CE is highly congruent with the Marine and Environment (e.g., sustainable agriculture, aquaculture, community design). We also have strong alliances with the Health focus (e.g., vector-borne diseases, nutrition, food science and food safety, environmental pathogens) and Children, Families, and Communities (e.g., 4-H, youth at risk programs, Food Stamp program). We plan for greater integration with the Enterprise and Technology focus as we develop centers of excellence funded by the State for biotechnology. Each of these focus groups has internal steering committees that advise on major initiatives of the group (e.g., faculty hires, academic curricula and related research agendas.) The Marine and Environment committee, for example, endorsed two of our major initiatives, the Coastal Institute (an USDA-supported building that has now been in use for three years) and a new Biotechnology Initiative. Both are important to the Station and CE.

The Coastal Institute, for example, provides a major forum for the interaction of biological and social scientists interested in public policy for the management of coastal (terrestrial and near-ocean) resources. The Coastal Institute Building on the Kingston campus features an economic policy simulation laboratory which provides critical research and outreach capabilities for our land grant programs.

Another example, the RI Board of Governors for Higher Education-approved Biotechnology Initiative is now driving a force in our state. We are currently mounting a campaign for a 2004 state bond referendum. Passage of this referendum will support the construction of a major biotech building (the Center for Biotechnology and Life Sciences; 150,000 sq feet at a cost of \$50 million), the most significant investment in research ever made by the state. The initiative has spurred interest in partnerships with new biotechnology companies and the establishment of a Center of Excellence in Plant Biotechnology. The level of support for the Biotechnology Initiative is also evident in the \$500,000 investment by the RI General Assembly for the planning of the Center for Biotechnology and Life Sciences. These investments are critical to the future ability of the Station to conduct essential genomics and transgenics work on plants and animals (as described in Goal 1) and to provide modern, state-of-the-art training facilities with significant applications for sophisticated CE programs.

The University administration, the RI Board of Governors for Higher Education, and faculty of the University provide significant stakeholder input. The Station and CE place high priority on responding to these groups, who, in the end determine levels of support for: our budgets, our hires (faculty and staff), and our facilities.

External Input:

State and federal government agencies. Lack of county governments to deliver agricultural support services is not a critical issue in Rhode Island. Rather, the state and various federal offices link directly to end-users.

State. The principal state agency stakeholder is the Department of Environmental Management (DEM), which has a separate Division of Agriculture. The Director of the DEM and the Chief of the Agriculture Division (as well as heads for fisheries and coastal management) all have direct links to the Director and to Station and Extension faculty and staff. Thus, stakeholder input from DEM is formal and highly efficient. Other state agencies interact with AES and CE on many projects. CE initiatives dedicated to children youth and families, for example, typically involve RI Departments of Education, Health, Corrections, and Human Services, and are often supplemented by direct agency grants.

Federal. The Station and Extension interact with various federal partners through informal individual working relations and through formal arrangements established as grants or memoranda of understanding. We have established formal on-campus liaisons (involving long-term commitments of agency personnel) with NOAA (e.g., National Marine Fisheries, Cooperative Marine Education and Research, RI Sea Grant College Program) and with the Department of the Interior (e.g., National Park Service). We have ongoing collaborations with the EPA through the Region I office and the Health and Environmental Effects Research Laboratory in Narragansett, RI. We regularly collaborate with the Natural Resource Conservation Service on agronomic or water quality programs. We believe that these liaisons provide important input from our local federal partners and are critical in determining direction of Station and Cooperative Extension programs.

Producer and commodity groups: Rhode Island farmers and fishers are historically independent, self-sufficient operators, proud of this “Yankee” tradition. Given relatively low numbers of farmers within any given commodity, there are few formal commodity groups. The RI Farm Bureau provides a general organization with national links but it has developed a protectionist political agenda that discourages many farmers from active participation. We have established a sound working relationship with the green industry through the Rhode Island Nursery and Landscape Association (RINLA), which has a large annual meeting and biannual meetings of a research and outreach executive committee. Given the size of the industry, there are numerous direct contacts between the Director, Station faculty and professionals (research and outreach) and industry representatives. RINLA has made major contributions to the University including supporting new hires (e.g., start up funds for a new horticulturalist) and the development of a formal garden demonstrating sustainable plantings. (See

<http://riaes.cels.rui.edu/explore> for a virtual reality tour of this garden.) Through our Winter School and GreenShare programs, we provide annual educational and re-certification programs for growers, creating an excellent forum for exchange of information from this vital stakeholder group.

The Ocean State Aquaculture Association and other organizations for open water fishers, aquaculturalists, clam rakers, etc., have established an annual two-day conference that provides a significant forum for stakeholder input and listening sessions. We also receive input through the biennial industry summit run by the Northeast Regional Aquaculture Center. This summit is attended by the Northeast industry and by academic representatives from throughout the region. Importantly, the RI AES Associate Director is a member of the NRAC Advisory Board and its Executive Committee.

Smaller, independent and part-time farmers are represented by a non-profit group, the RI Council for Center for Agricultural Promotion and Education (RICAPE). This organization was established through cooperation and collaboration of the University, Cooperative Extension, the Station, the Division of Agriculture and a non-profit group and now runs with fiscal support from USDA-SARE, CE and the Station.

In 2003, the Director and Associate Director continued a rebuilding process with the three former RI Cooperative District Boards. (These are boards that are similar to the county boards from other states.) We have identified leaders from each of the three district boards and a formed a collaborative committee that we call the “Triboard.” As the TriBoard represents great breadth in RI constituencies and commodities, we currently employ the TriBoard as an ad hoc CE Advisory Board.

Other commodity groups include:

- RI Christmas Tree Growers Association
- RI Fruit Growers Association
- RI Golf Course Superintendents Association

Community governments and publicly funded social organizations.

Many local groups, including independent organizations, community governments and community organizations provide stakeholder input for AES and CE programs. Most input from these groups is direct and regular; a distinct reflection of the size of the state and the access that stakeholders have to the deliverers of land grant programs. Because we have frequent input, we have not elected to pursue a formal statewide “town meeting” approach. We believe that the level of access that our stakeholders now have is effective in translating “heard needs” into new programs.

Community groups and sources of information now used in setting AES and/or CE priorities include the following:

- Rhode Island Food Coalition
- Consumer Survey - “Test Your Food Safety IQ”
- Practitioners Survey – State approved instructors of food safety
- Participant Survey – HACCP Training Courses
- Participant evaluation results – Annual conference, training courses

- URI Departments (Academic departments listed under Program descriptions, above)
- Dining Services Health Services Residential Life RI Sea Grant
- RI Center for Agricultural Promotion and Education
- RI Seafood Council
- RI Food Dealers Association
- RI Hospitality and Tourism Association
- RI Hospital
- RI Association of Family and Consumer Sciences
- Head Start
- New England Dairy and Food Council
- RI Community Foodbank
- Kids First-Team Nutrition
- Team Nutrition
- RI State Council of Churches
- Local Community Food Pantries
- Southside Community Land Trust
- Sustainable Landscape Advisory Board
- RI Chapter, American Society of Landscape Architects
- URI CE Master Gardener Association
- RI Partners for Resource Protection
- RI Grow Smart Education Subcommittee
- RI Chapter of the American Planning Committee
- State 4-H Program Advisory Committee
- Eastern R.I. CE Board of Directors
- Northern Southern and Eastern Cooperative Extension Boards of Directors
- 4-H Program Planning Committees
- Community Advisory Boards
- Alan Shawn Feinstein College of Continuing Education, Providence Center
- Foster Old Home Days Committee
- CHILDSPAN
- Consumer Credit Counseling Service
- National Endowment for Financial Education
- Retired Senior Volunteer Program
- Narragansett Indian Tribe
- East Bay Educational Collaborative
- Rhode Island 4-H Club Foundation
- Civic planning departments
- RI Rural Development Council

Public non-profit environmental groups: For a small state, there is no shortage of sources of good advice on the environment. Groups that serve as advisors for current AES and/or CE projects include:

- RI Department of Health, Source Water Assessment Committee
- RI Natural History Survey
- Natural Resource Conservation Service
- Rhode Island Builders Association

- Soil Scientists of Southern New England
- Rhode Island Independent Contractors Association
- RI Chapter of the American Water Works Association
- Water Resources Board
- RI Chapter of Nature Conservancy
- Audubon Society of RI
- Local land trusts (e.g., Town of South Kingstown Heritage Trust)
- Save the Bay
- Environment Council of Rhode Island.
- Other Water Quality Inputs
 - Project specific focus groups
 - Watershed councils
 - Project specific committees of town officials
 - Soil Conservation Districts Citizen groups
 - Project specific Steering Committees

Additional Stakeholder Input:

Environmental Groups. To seek input from the environmental groups, and to assist the Director in establishing and reviewing AES and CE priorities, we have engaged the Director of the Rhode Island Natural History Survey to establish formal listening sessions with RI environmental groups. (The Survey was created in 1995 by a coalition of natural historians from major Rhode Island universities and private sector groups, including the University of Rhode Island, Roger Williams University, Brown University, and Providence College. It holds an annual Conference each year, providing an exchange of scientific papers on topics of local interest. The Survey also supports publication of papers and monographs on flora and fauna of southern New England.) RINHS has become an effective unifying force for an unusually large community of natural historians, many of whom are also members of the organizations listed above.

RIAAES/CE Website. We live in a world transformed by the internet. We have placed great priority on the development of a two-way web presence. The Station and Cooperative Extension currently supports a Senior Information Technologist to persistently add new, relevant content to our interactive, integrated portal. Indeed, we are proud of the content that our website has (and will continue) to provide. Further, we value the input that we receive from the website.

B.3. Program Review Process

a. Merit Review. Stakeholder input has lead to the establishment of AES and CE priority programs, as outlined herein. The following processes are used to select from proposed projects to be supported by the Station or Extension.

The Director uses the AES/CE Program Leader Team (described previously) to establish annual funding priorities for projects. The Station and Extension issue annual request for proposals, stating funding limits and current program priorities. Station projects (and, where relevant, Extension projects) are subject to screening to establish relevancy to current program objectives.

The project is also assessed for merit. Project merit depends on goodness of fit to program priorities, and on peer review. General criteria for project merit include:

- Is the project an appropriate match to strengths of our faculty, staff, and facilities? (See also, peer review questions in the following section.)
- Is the project's level of sophistication worthy of a major university?
- Is the project best conducted by the University (i.e., AES or CE), or is another agent of government or the private sector more suitable?

Projects judged to merit support are also weighed against the record of the project author in previous efforts ("what were the outcomes?") and in efforts to secure additional external funds through established granting agencies (e.g., government or private foundations.) Were the AES/CE funds used effectively to leverage new funds to support the project? Priority is given to proposals that enhance research or outreach capacity or to proposals that provide continuity for Station or Extension projects largely supported by competitive funding.

Projects that are multi-state (where the reasons for multi-state collaboration are sound), integrated (research-based with clear relation to public good outcomes appropriate for outreach), and team oriented (multi-disciplinary, as appropriate) are also given priority. (The implementation of this new orientation to "the multi's" began with FY2000 funding.)

All projects that are approved under the above merit review are informed that they have passed the merit review. Those that are rejected on the basis of a lack of merit are given a written explanation from the Director, with (when appropriate) suggestions for modification for resubmission.

Last, the Director has the option of providing support for capacity-building projects (i.e., preliminary research studies of limited duration) intended to explore potential new program directions.

b. Peer Review of Research. RI AES has in place a process that conforms to the "Guidelines for Peer and Merit Reviews" drafted by the Farm Bill Implementation Task Force as Appendix 2 to a Report to ESCOP, July 1999. That is, we employ both internal and external reviewers (assigned by the Director) to evaluate the scientific and technical soundness of proposed research. Specifically, we ask a minimum of three reviewers to assess each proposed project and to respond to six questions:

- Does the proposal hold promise of making a significant contribution to science, technology, or human well-being sufficient to warrant the proposed investment of time and effort?
- Does the proposal demonstrate adequate familiarity with the work of previous and contemporary investigators working in closely related areas?
- Are the objectives clear?
- Is the approach to the investigation, outlined in methods, clear and appropriate to meet the objectives?

- Is the principal investigator(s) and specified members of the research team qualified to conduct the research?
- Are the facilities and equipment (existing or proposed, as described in the proposal) of the Rhode Island Agricultural Experiment Station adequate for the PI to perform the proposed research?

Reviewer's comments are made available to the proposal principal investigator except in unusual circumstances. Reviewers are also asked for any additional comments that they deem relevant.

c. Reporting Requirements. See above.

B.4. Multistate Research and Extension Activities

a. Hatch Multistate Research. RI AES actively monitors and participates in regional research efforts (both within and outside of the Northeast region). To further stimulate URI faculty and staff participation in multistate research, and to boost the percentage of Station resources dedicated to multistate activities, we are centering the FY 2005 RI AES RFP on multistate and integrated activities.

b. Smith-Lever Multistate Extension. RI CE is committed to meeting required levels of expenditures for multistate extension activities supported by 3(b)(1) and (c) funds. Although we have achieved the minimal 25% level of Smith-Lever expenditure for multi-state activities, we see opportunities to expand multistate activities in extension (e.g., through the Northeast Regional Aquaculture Center extension efforts). We also recognize that RI CE needs to complete a comprehensive analysis of existing and potential multistate collaborations, including logical integration with multistate research. For example, we believe there are other significant opportunities in multi-state extension areas such as the analysis of nutritional risk for the elderly (which is the subject of a multistate research project.) We look forward to exploiting these opportunities.

c. Reporting Requirements. See above.

B.5. Integrated Research and Extension Activities.

RI AES and CE are committed to meeting required levels of expenditures for integrated activities. In FY2004, over 25% of AES and CE projects were conducted by individuals with split academic appointments (i.e., both AES and CE), reflecting consistency between their Station and Extension activities. We believe that we can encourage significant additional integration and look forward to the release of the FY 2005 RFP for RI AES projects. As we indicated, the RFP will be centered on multistate and integrated projects.

In developing this *Plan of Work Update*, we have described seven integrated programs. We hold that research (including basic research) should produce an outcome within the program area that meets an identifiable public good and that can be addressed through Extension. We also hold that outreach should be based on University research, rooted in the Station.

In 1995, CE and AES were been administered separately under different Vice-Provosts. In 2001, the management of the AES and CE was consolidated by the Provost and Vice President for Academic Affairs under a single Director, Dr. Jeffrey R. Seemann. This consolidation is a true reflection of the commitment of the University to integrate research and extension activities. Further, the charge to the Director from the Provost was to implement a broad program that integrated AES research and CE outreach with the University's academic programs. The goal was to increase the access of students to our Land Grant Programs. We are well on our way to meeting this goal.