Plan of Work

Rhode Island
Agricultural Experiment Station
and
Cooperative Extension

Federal Fiscal Years
2000 to 2004

Proposed Revision 1.0 (December, 1999)

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Rhode Island Agricultural Experiment Station
and Cooperative Extension

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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, p. 19242 – 19248).

A. General Requirements:

1. Planning Option: This Plan is for the **Rhode Island Agricultural Experiment Station** (RI AES; "the Station") and for **Rhode Island Cooperative Extension** (RI CE; "Extension"), administrative units of the University of Rhode Island (URI).

Patrick Logan, the Director of both RI AES and RI CE, reports to the Vice-Provost for Marine and Environmental Affairs. Scientists from any URI department may affiliate with AES or CE through approved projects, which are organized under Programs, described below.

2. Period Covered: Oct. 1, 1999 to Sept. 30, 2004.

3. Projected Resources: RI AES enters the 5-year plan with 10.1 scientist years, 5 technical years, and 1 professional years, and an FY1999 baseline of $1.2M in formula funds, and with equal matching funds. RI CE enters with 40.2 full-time calendar year equivalents (FTE's) of URI faculty, educators, and staff, with an FY1999 baseline of $1.3 in formula funds and the required matching funds. These resources are distributed over Planned Programs, below.

4. Submission Date: Proposed revision to be submitted July 15, 2000.

5. Certification:

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B. Components

Planned Programs: This Plan includes seven programs under the five CSREES goals:

Goal 1	Goal 2	Goal 3	Goal 4	Goal 5
Prog. 1,2	Prog. 3,4	Prog. 5	Prog. 6	Prog. 7

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 non-renewable 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 U.S. 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 Environmental Biotechnology Initiative, we are enhancing our capacity to conduct state-of-the-art research facilities for genomics, transgenics, imaging, and bioinformatics, with an initial emphasis on plants.

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 sod producers account for ⅔ of our 11,000 acres of agricultural production and _ of the dollar value.) 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 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 publication "Sustainable trees and shrubs," 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, Environmental and Natural Resource Economics, and Fisheries, Animal, and Veterinary Sciences).

External: The Station and Extension maintain collaborative research and demonstration projects relating to horticulture and silviculture.

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), and
- 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., AgriBioTech for collaborations on plant transgenics in forages and grasses).

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: 5 years.

7. Allocated resources ($1,000's):*

Fiscal Year:		**2000**	**2001**	**2002**	**2003**	**2004**
AES FTE		5.6	TBA	TBA	TBA	TBA
AES formula $'s	$	432	TBA	TBA	TBA	TBA
AES Match $'s	$	344	TBA	TBA	TBA	TBA
CE FTE		7.70	TBA	TBA	TBA	TBA
CE formula $'s	$	302	TBA	TBA	TBA	TBA
CE Match $'s	$	337	TBA	TBA	TBA	TBA
Total FTE(FTE's):		**13.30**				
Total federal $'s:	**$**	**734**				
Total match $'s	**$**	**681**				

*Estimates for FY2001-2004 on file with CSREES.

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 (see descriptions under Goal 4, below).

Program 2. Aquaculture Biotechnology and Fishing.

1. Issue 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.

  Program 1: Water gardens and ornamentals.

  Program 3: Improve biotechnology for increased health and well-being of fish and shellfish.

  Programs 4&5: Analyze the market and use education to improve marketing of fresh, quality products. Use science to improve the environmental conditions of fish and shellfish and to avoid food pathogens.

  Program 6: Reduce environmental impact of aquaculture and fishing. Analyze costs and benefits of policies controlling aquaculture production, environmental impacts, and industry growth.

  Program 7: Use aquaculture as an educational tool for 4-H, schools, RI Adult Education.
- Development of RI support industries for worldwide aquaculture development.
- Improved business planning for existing and new aquaculturalists in RI.

Output Indicators:

- 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.
  - Aquaculture business planning.
  - Aquaculture effluent management.
  - Aquaculture in the K-12 classroom.
  - Diseases in aquaculture livestock.
  - 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 focussing 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).

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:

7. 5 years.

7. Allocated resources:*

Fiscal Year:		**2000**	**2001**	**2002**	**2003**	**2004**
AES FTE		0.5	TBA	TBA	TBA	TBA
AES formula $'s	$	36	TBA	TBA	TBA	TBA
AES Match $'s	$	71	TBA	TBA	TBA	TBA
CE FTE		0.8	TBA	TBA	TBA	TBA
CE formula $'s		20	TBA	TBA	TBA	TBA
CE Match $'s		23	TBA	TBA	TBA	TBA
Total FTE(FTE's):		**1.30**				
Total federal $'s:	**$**	**56**				
Total match $'s	**$**	**93**				

*Estimates for FY2001-2004 on file with CSREES.

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.

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, as well as 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 raised under humane conditions. When industry-accepted management practices (e.g., castration to calm 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 and fish research programs. Station scientists have learned a great deal about the physiological (e.g., changes in blood chemistry) and behavioral reactions to stressors, in both domestic sheep and goats, 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 (land-based) and mariculturalists (salt waters). 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:

- 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 domestic animals to standard animal management practices.
- Physiologic and endocrinologic analysis of stress response mechanisms in salmon to heat and osmotic shock; 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; Biochemistry, Microbiology, and Molecular Genetics; Natural Resources Science) and the Graduate School of Oceanography.

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 (Patuxet 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, veterinarians.

6. Program duration: 5 years

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7. Allocated resources:*

Fiscal Year:		**2000**	**2001**	**2002**	**2003**	**2004**
AES FTE		3.6	TBA	TBA	TBA	TBA
AES formula $'s	$	197	TBA	TBA	TBA	TBA
AES Match $'s	$	136	TBA	TBA	TBA	TBA
CE FTE		1.1	TBA	TBA	TBA	TBA

CE formula $'s	$	41	TBA	TBA	TBA	TBA
CE Match $'s	$	33	TBA	TBA	TBA	TBA
Total FTE(FTE's):		**4.70**				
Total federal $'s:	**$**	**237**				
Total match $'s	**$**	**168**				

*Estimates for FY2001-2004 on file with CSREES.

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.

Program 4: Food Safety

1. Issue to be addressed: The Centers for Disease Control estimate that 73,000,000 Americans suffer a foodborne illness each year, resulting in 325,000 hospitalizations and 5,000 deaths. There is a need for food safety education throughout a diverse Rhode Island community of food handlers. This community includes growers, processors, food industry workers and managers, educators, and consumers of all ages.

Foodborne illnesses can result from bacterial, viral, and contamination such as heavy metals or chemicals. We need research on the causes of foodborne illnesses, private and regulatory prevention techniques, and the cost effectiveness of regulatory programs (e.g. HACCP) aimed at reducing foodborne illnesses. We also need to calculate benefits of policies to prevent illnesses, and also benefits to the industry of providing safe food to the market (e.g., no loss of market due to bad publicity).

2. Performance goals:

- Reduction in food-borne illness, as a direct result of increased knowledge and application of basic food safety principles by producers and consumers.
- Adoption of cost-effective regulations and programs to prevent foodborne illnesses.
- Reduction of hazards during production and / or processing.

Output Indicators:

- Educational programs on food safety principles and technologies to reduce food-borne diseases.
- Scientific information provided to the public through scientific journal articles, theses and dissertations, presentations, bulletins, press releases, etc.

Outcome Indicators:

- Increased consumer awareness of foodborne illnesses, their causes and methods of prevention.
- New policies and incentives for increased food safety.
- Meat, poultry, and seafood processors will increase their knowledge of food safety principles.
- Fruit and vegetable growers will increase understanding of principles of good agricultural practices.

3. Key program components:
- Mandated HACCP training for seafood, meat, and poultry processors.
- Use of "train the trainer" educational concepts.
- Emphasis on current technology and research.

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; Fisheries, Animal, and Veterinary Sciences; Food Science and Nutrition; Community Planning) and the URI College of Continuing Education.
- RI Sea Grant Program.
- URI Dining Services, Residential Life, and Student Health Services.
- RI Center for Commercial Agriculture.
- Cooperative Extension Education Center.

External:
RI Government Departments:
- RI Departments of Corrections, Education, Health, and Environmental Management (Division of Agriculture)

Universities:
- Johnson & Wales University
- Rhode Island College
- Roger Williams University

Private Sector (RI):
- Seafood Council
- Food Dealers Association
- Hospitality and Tourism Association
- Rhode Island Hospital
- Head Start
- Farm Bureau
- Kids First—Team Nutrition
- Community Foodbank and member agencies

U.S. Government:
- National Oceanic and Atmospheric Administration
- Food and Drug Administration
- Environmental Protection Agency

5. Target audiences:
- Food service and processor workers and managers.
- Producers.
- Consumers of all ages.
- School-aged children and their caregivers.
- Other public stakeholders and agency regulators.

6. Program duration: Five years.

7. Allocated resources:*

Fiscal Year:	**2000**	**2001**	**2002**	**2003**	**2004**

AES FTE		0.3	TBA	TBA	TBA	TBA
AES formula $'s	$	15	TBA	TBA	TBA	TBA
AES Match $'s	$	72	TBA	TBA	TBA	TBA
CE FTE		4.1	TBA	TBA	TBA	TBA
CE formula $'s	$	76	TBA	TBA	TBA	TBA
CE Match $'s	$	162	TBA	TBA	TBA	TBA
Total FTE(FTE's):		**4.35**				
Total federal $'s:	**$**	**91**				
Total match $'s	**$**	**234**				

*Estimates for FY2001-2004 on file with CSREES.

8. Education and outreach programs already underway:

- School Food Safety Policy.
- HACCP Training for Seafood, Meat, and Poultry Processors.
- Food Safety Education Curriculum for Health Educators.
- Food Safety Manager Certification/Recertification and Instructor Training.
- Food Safety Education for school-age children, their caregivers, and college-age consumers.
- Food Safety Coalition.
- Good Agricultural Practices.

Goal 3: A healthy, well-nourished population.

Program 5: Nutrition

1. Issue 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 > 40,000 Rhode Islanders. The annual, estimated medical care cost of osteoporotic fractures alone is $58 million in Rhode Island.

The prevalence of overweight in children and adults is increasing in RI. In 1996, 28.5% of RI adults were 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 1997, 35,400 Rhode Islanders regularly went hungry, one of every 30 households. Over 90,000 Rhode Islanders received food stamps in 1997. 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 children, young adults, and elderly adults.

Output Indicators:

- Food Security Coalition Collaborative Projects
- Educational approaches that can be used to reduce nutritional risk.

Outcome Indicators:

- Reduction in health risk factors among targeted Rhode Islanders.
- Statewide Mass Transit/Public Library Nutrition Education Campaign.

3. Key Program Components:

- Creation of a Food Security Coalition of health professionals, anti-hunger advocates, and agricultural leaders to reduce incidence of hunger and increase awareness of food systems and related issues.
- Nutrition information which alters dietary habits in order to increase consumption of foods which may prevent disease.

4. Internal and External Linkages:

Internal. Station research in nutrition is linked to CE through joint faculty appointments, or through collaborative projects between the Station, Extension (Expanded Food and Nutrition Education Program—EFNEP), and the Department of Food Science and Nutrition.

External:

Government Agencies:

- City of Providence Public Library
- RI Departments of Transportation, Human Services, Education, Health, and Environmental Management.

Private Sector:

- RI Council of Churches
- Southside Community Land Trust
- Kids First
- RI Farm Bureau
- Providence Journal
- WSNE Radio

5. Target Audience:

Readership of the Providence Journal/Food Section; listeners of WSNE radio (ages 22-40); Rhode Island residents with internet access, school age children, teachers and librarians, participants in Providence Public Library low literacy workshops, riders of Rhode Island public transportation, all Rhode Islanders who are food insecure.

6. Program Duration: 5 years.

7. Allocated Resources:

Fiscal Year:		**2000**	**2001**	**2002**	**2003**	**2004**
AES FTE		1	TBA	TBA	TBA	TBA
AES formula $'s	$	25	TBA	TBA	TBA	TBA
AES Match $'s	$	87	TBA	TBA	TBA	TBA
CE FTE		10.4	TBA	TBA	TBA	TBA
CE formula $'s	$	345	TBA	TBA	TBA	TBA
CE Match $'s	$	361	TBA	TBA	TBA	TBA
Total FTE(FTE's):		**11.40**				
Total federal $'s:	**$**	**370**				
Total match $'s	**$**	**448**				

*Estimates for FY2001-2004 on file with CSREES.

8. Education and outreach programs already underway:

- Good Food Give Life mass transit nutrition education campaign.
- Senior Nutrition Awareness Program.
- Food Security Coalition: collaborations focused on increased awareness, education, and advocacy.
- Reduction in nutrition related health risks through broadcast, written, and interactive nutrition programming.

Goal 4: Greater harmony between agriculture and the environment.

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, above), so too are we concerned with stewardship of coastal and forested ecosystems. We seek biological and ecological understanding of diverse natural communities, which we then help society use as a basis for wise management of human activities that affect these ecosystems. We also seek a better understanding of society's desires and values associated with ecosystem attributes (e.g. biodiversity) and ecosystem services, in order to give a human basis for judging wise use along with the biological and ecological bases for these critical judgements.

Program 6: Natural Resources

1. Issue to be addressed: We study the diverse natural communities of Rhode Island, providing a natural and social 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 community dynamics of filter-feeding bivalves (clams, scallops, oysters) in estuaries. In addition, we examine the relative priorities and values people place on conservation of various aspects of ecosystems, undeveloped lands, farms, forests, and open spaces.

RI AES scientists also study processes and linkages of soil and vegetative ecosystems that affect natural habitats and water quality. We also study nutrient cycling in forest and agricultural systems, including studies of the roles of soil microbes and nematodes, and studies of carbon, phosphorus, and nitrogen dynamics in coastal watersheds.

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. We explore public priorities and values for development and land conservation, and we assess the effectiveness of policies to accomplish a more desirable balance between development and conservation.

2. Performance goals:

- Expand knowledge base on watershed biogeochemistry (the interactions of biotic and abiotic factors that influence nutrient dynamics) and conservation biology of coastal and forested ecosystems.
- 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 that identify critical habitats and characterize the linkage between landscape attributes and processes, human activities, values, and habitat function in Southern New England.
- Refereed publications, M.S. theses, Ph.D. dissertations and technical documents that characterize water quality and the linkage between landscape attributes and processes, human activities, values, and water quality in Southern New England.
- Statewide and community-based educational materials and workshops that increase constituent knowledge on management and policy options and practices to protect, restore, or improve the quality of local watersheds, water quality, and critical habitats (e.g., wetlands, streams, lakes, 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.
- Enhanced knowledge of local officials, agency regulators, and public stakeholder groups concerning the priorities and values of citizens regarding ecosystem services in southern New England.
- 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.
- Improved relationships among local watershed stakeholders and public and private experts for improved effectiveness in managing local resources.
- Characterization of local water resources and identification of critical natural habitats.
- Target at least 20% of our output activities to under-served communities.

Outcome Indicators:
- 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
- Increase in community and individual watershed management control and protection measures.
- New policies or incentives for watershed and ecosystem management, development, or conservation.
- 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.
- Participation by State agencies and other resource professionals in CE community-based education programs.
- 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 and incentives or policies to improve the balance between development and conservation.
- URI On-Site Wastewater Training Center
- URI Watershed Watch scientist-led volunteer water quality monitoring
- RI Home*A*Syst Residential Pollution Prevention Program
- Municipal Watershed Management Training
- Critical Habitats Program

4. Internal and external linkages:

Internal. Station research in natural resources is linked to CE through joint faculty appointments, or through collaborative projects between the Station, Extension, and academic departments (Natural Resources Management, Environmental and Natural Resource Economics, and Plant Sciences).

Other:

- CE Water Quality Program
- CE Rural Resources Education Act Program
- CE Greenshare Program

External:

Government Agencies:

- U.S. Environmental Protection Agency (National and Region I)
- U.S. Department of the Interior
- U.S. Geological Survey
- USDA Fund for Rural America (through 2001)
- RI Departments of Transportation, Administration (Office of Municipal Affairs), Health, and Environmental Management.
- RI. Coastal Resources Management Council.
- Rhode Island Conservation Districts
- Miscellaneous RI town planning offices

Universities:

- 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:

- RI Natural History Survey
- Audubon Society of Rhode Island

- Save the Bay (RI)
- Environment Council of Rhode Island

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

6. Program duration: 5 years

7. Allocated resources:*

Fiscal Year:		**2000**	**2001**	**2002**	**2003**	**2004**
AES FTE		3.8	TBA	TBA	TBA	TBA
AES formula $'s	$	402	TBA	TBA	TBA	TBA
AES Match $'s	$	391	TBA	TBA	TBA	TBA
CE FTE		5.3	TBA	TBA	TBA	TBA
CE formula $'s		187	TBA	TBA	TBA	TBA
CE Match $'s		92	TBA	TBA	TBA	TBA
Total FTE(FTE's):		**9.10**				
Total federal $'s:	**$**	**589**				
Total match $'s	**$**	**483**				

*Estimates for FY2001-2004 on file with CSREES.

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 Critical Habitats Program
(See descriptions under Key Program Components, above)

Goal 5: Enhanced economic opportunity and quality of life for Americans.

The concept of sustainability applies both to agro ecosystems and to communities. Both require knowledge for wise stewardship. RI AES and CE are engaged in studies of community social organization and economic well being. Sustainable communities live within their natural environments. They require physical planning to integrate industrial and recreational activities with residences and natural surroundings. They also require social planning, with special attention for young people who may be at risk due to stresses from within the community (poverty, crime, dysfunctional families, teen pregnancies, etc.).

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, marked in part as follows:

- 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.

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.

Output Indicators:

- Number of youth participants and adult volunteers involved in Children, Youth and Families / 4-H programs.
- Research on factors affecting the quality of child care and training of child care 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.

Outcome Indicators:

- 4-H participants will learn leadership skills (e.g., public speaking, project leadership).
- More effective parental methods for discipline
- 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).

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 stressful communities.
- Women experiencing transient financial difficulties due to death of spouse or divorce.
- Housing authorities.
- RI townships with inadequate professional planning staff.
- Other local officials, policy regulators, and public stakeholders.

6. **Program duration**: Five years, ongoing.

7. **Allocated resources:**

Fiscal Year:		**2000**	**2001**	**2002**	**2003**	**2004**
AES FTE		1.5	TBA	TBA	TBA	TBA
AES formula $'s	$	61	TBA	TBA	TBA	TBA
AES Match $'s	$	78	TBA	TBA	TBA	TBA
CE FTE		10.8	TBA	TBA	TBA	TBA
CE formula $'s	$	313	TBA	TBA	TBA	TBA
CE Match $'s	$	99	TBA	TBA	TBA	TBA
Total FTE(FTE's):		**12.30**				
Total federal $'s:	**$**	**374**				
Total match $'s	**$**	**177**				

*Estimates for FY2001-2004 on file with CSREES.

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.

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) (hereafter, "Stakeholder Requirements")..

RI AES and CE incorporate stakeholder input in the design and implementation of the programs outlined above and the individual research projects and outreach activities that they comprise. We believe that feedback is a critical hallmark of any quality organization and that stakeholder input is a key component of feedback. During the 5 years of this Plan, we will more-tightly focus existing stakeholder input processes in extension while broadening slightly those used to inform research.

Caveates: Rhode Island has many unique attributes that should be kept in mind in 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 townships and villages have a variety of town-focused councils and managers.
- The state has a diversity of agriculture similar to other states, but most often represented by a handful of individuals (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) mission.
- 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 (and University) match for both AES and CE has been historically among the lowest in the Nation.

The ability of RI AES and CE to meet myriad needs for agricultural, environmental, and social research and outreach is challenged both by its unusual demographics and economics, and by unusually constrained resources.

Resources available to RI AES and CE are in general significantly lower per capita than in all other states, although we are taking steps to improve this by working

directly with the RI Board of Governors for Higher Education. The University President, Robert Carothers, has asked for a Board-level discussion of the land grant missions of the University (as well as its sea grant and urban grant missions) and the relation of funding to the ability of the University to conduct programs under those missions.

Major Stakeholder Groups. Given our resource constraints, the Station and Extension must choose carefully among many competing priorities as we develop major programs and the projects under them. We clearly can not address very many of the large number of needs for research or outreach. Given this, we must also carefully structure our stakeholder processes to simultaneously receive fair and open input, but without creating a false sense that we will be able to respond to all of the needs and demands that we hear. We believe this to be more of an issue in Rhode Island than in any other state.

Accordingly, we receive and must respond to input from a diverse array of stakeholder groups, from which advice we then determine our priorities. In general, this array represents the following groups:

- University Board of Governors, University Administration, and faculty steering committees representing the primary producers of research and outreach (i.e., University faculty and staff).
- An external Marine and Environmental Advisory Council, who provide an overview of the needs of governments, industries, and communities to the products of research and outreach.
- 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 have also recognized 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. We have applied a novel assessment strategy to gain an understanding of the perspectives of this diverse group, which we outline below.

The role of each of these stakeholder groups is outlined more fully in what follows.

University Stakeholder Input:

The University of Rhode Island is the source of faculty and staff who conduct AES research and CE outreach. There is a traditional strong link between AES research and graduate education, typical of all research universities. The University is conscientiously attempting to strengthen undergraduate access to research, and the Station is actively engaged in this effort through a formal University Partnership for the Coastal Environment. The potential educational value (both graduate and undergraduate) of outreach programs has yet to be realized by the University, and integration of students will become a more important subject of consideration for RI CE in the near future.

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 and college deans).

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

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

The primary emphasis of AES and CE is highly congruent with the Marine and Environment (included agriculture, aquaculture, community design). We also have strong alliances with the Health Initiative (Vector-borne diseases, food science and nutrition, environmental pathogens) and Children, Families, and Communities (see goal 5, above). We plan for greater integration with the Enterprise and Advanced Technology focus as we develop interacting Centers of Excellence funded by the State for **biotechnology** and for **sensors and surface** (thin-film) **technology** (e.g., the joint development of bio-sensitive microchips to detect environmental pollutants, toxins from pathogens, etc.).

Each of these focus groups has **internal steering committees** that advise on major initiatives of the group, on faculty hires, and on academic curricula and related research agendas. The Marine and Environment committee, for example, has endorsed two major initiatives, the **Coastal Institute** (subject of a major on-going USDA-supported building initiative) and a new **Environmental Biotechnology Initiative**. Both are highly 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. A new building, the Coastal Institute Main Campus Building, now under construction with an opening date in ~ 16 months, features an economic policy simulation laboratory which will provide critical research and outreach capabilities for our resource economics faculty.

Another example, the Board-of-Governors-approved **Environmental Biotechnology** Initiative is now driving a campaign for a year 2000 state bond issue for a major biotech building, the most significant state investment in University research capacity in over 30 years. The Initiative has spurred interest in partnerships with new biotechnology companies, including AgriBioTech, one of the fastest growing R&D companies dealing with forages and grasses. The state has engaged in this partnership by awarding a $2.1M 9-year economic development grant for a Center of Excellence in Plant Biotechnology. This type of investment is critical to the future ability of the Station to conduct essential genomics and transgenics work on plants and animals (goal 1, above), and to provide a new level of training facilities with significant applications for sophisticated CE programs.

Thus, the University administration, the Board of Governors, and faculty representatives from the major research foci of the University provide stakeholder input to a significant degree. The Station and CE place high priority on responding to these groups, who in the end determine our levels of state and University support, our faculty hires, our staff, and our facilities.

External University Oversight:

In addition to internal University stakeholder input (above), RI AES and CE receive advice from an external **Marine and Environment Advisory Council**, the principal external council for the Vice Provost for Marine and Environment (to whom the

Directors of AES and CE report). This group is selected based on recommendations to the Vice-Provost, with the approval of the President. It represents major government, industry, and citizen groups through a panel of distinguished academic and private sector leaders. The Council meets twice annually, focusing on overall developments within the University (presented by the President and the Provost), and on particular educational, research, or outreach initiatives brought forward by the Vice Provost. The Council serves as an extraordinary conduit between the Marine and Environment Focus and the University administration, state government, and important components of the private sector. For example, the support of the Council was critical in gaining early acceptance of both the Coastal Institute and the Environmental Biotechnology Initiatives, each of which is highly significant to current programmatic directions in RI AES and CE (see University Stakeholder Input above).

Other External Stakeholders:

State and federal government agencies. Lack of county government mechanisms to deliver agricultural support services (as would be typical in, say, most Midwestern counties) is not a critical issue in Rhode Island. Rather, the state and various federal offices link directly to farmers

State. The principal state agency stakeholder is the Department of Environmental Management, which has a separate Division of Agriculture. The Director of DEM and the Chief of the Agriculture Division (as well as heads for fisheries, coastal management, etc.) all have direct links to several Station and Extension faculty and staff. Thus, stakeholder input from DEM is informal and highly efficient. The most important effort that can be made to strengthen ties between RI AES and CE and the DEM will be to re-establish regular contact with the Directors of each, something that existed previously but that has been disrupted by sequential turnovers in all of the Directors positions. Reestablishing these direct ties will be a goal of a Strategic Plan for the Office(s) of the Director (AES and CE), to be developed this fall (1999) and reported on in the first annual report next year. Assisting the Director in this task will be a newly appointed Associate Director for Marine and Environmental Outreach, recently established.

Other state agencies interact with AES and CE on several projects. CE youth initiatives, for example, typically involve state Departments of Education, Health, Corrections, or Human Services, often supplemented by direct agency grants. Assisting the Director in the task of identifying any necessary improvements beyond the current direct agency / faculty links will be a soon-to-be appointed Associate Director for Child, Family, and Community Outreach.

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 (National Marine Fisheries, Cooperative Marine Education and Research) and Interior (Parks Service). We have recurrent collaborations with EPA through the Region I office and the Narragansett laboratory. We regularly collaborate with the Natural Resource Conservation Service on agronomic or water quality programs. We believe that these liaisons provide adequate stakeholder input from these agencies and that these are the most critical stakeholders.

Producer (commodity) groups:

Rhode Island farmers and fishers are historically highly 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. 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 regular exchanges with the Rhode Island Nursery and Landscape Association, which has a large annual meeting and biannual meetings of a research and outreach executive committee. Given the size of the industry, there are myriad direct contacts between University faculty (both research and outreach) and industry representatives. RINLA members have made a major contribution of time and materials to a formal garden demonstrating sustainable plantings (see WWW.RIAES.ORG 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.

Aquaculture—a younger, less-well organized industry—needs help organizing a stakeholder group. The Ocean State Aquaculture Association and other organizations for open water fishers, clam rakers, etc., have established an annual two-day conference (the next will be the 4th) that provides one forum for stakeholder input or listening sessions. We also receive input through the biennial industry summit run by the Northeast Regional Aquaculture Center, a lively exchange of industry perspectives on priorities, attended by RI industry and academic representatives (the RI AES 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 RI Center for Commercial Agriculture, which was originally established through CE leadership but now runs a largely independent program with some fiscal support through USDA-SARE, via the Station. Ties between RICCA and the University could be stronger and the CE Director is seeking ways to accomplish this in the coming year. Without county government structures, and with township governments being too small to support a traditional county agent infrastructure (3 CE "district" offices closed in the 1980's), RICCA provides a potential network to link RI's many smaller operators to relevant faculty and staff.

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.

There are myriad local groups that provide stakeholder input for AES and CE programs. Many are independent. Others are affiliated with town governments or state agencies. Most input from these groups is direct and regular. Because we are awash in such input, we have not elected to pursue a formal statewide "town meeting" approach wherein all who care to be heard can be heard in an open listening session or series of sessions, although this would be a traditional local approach. We believe that this level of access is already in place through existing individual contacts and that there are adequate mechanisms to translate heard needs into new programs. (*See, however*, **AES/CE State Advisory Council**, *below*)

Community groups and sources of information now used in setting AES 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 Commercial Agriculture
- 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
- NRI Cooperative Extension Board of Directors
- 4-H Program Planning Committees
- Community Advisory Boards
- Alan Shawn Feinstein, URI 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

- State Rural Development Committee

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 or CE projects include

- RI Dept. 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

New Approaches to Stakeholder Input:

AES/CE State Advisory Council. We reiterate that we feel that we have a plethora of stakeholder input and adequate means to use it to establish programmatic priorities. Nevertheless, we are creating a new AES/CE State Advisory Council, based on a 1997 CE Strategic Plan. The establishment of the Council is underway and will be in place FY2000. Membership of the Council will be balanced in proportion to AES and CE program emphases and will include representation from major stakeholder groups. We will place particular emphasis to include members who are capable of representing otherwise underrepresented populations. The Council will meet annually, or more often as needed, at the discretion of the Director. Its first agenda will be to review the adequacy of stakeholder listening mechanisms outlined here and to advise the Director(s) as to whether changes are warranted.

Environmental Groups. To facilitate listening with these groups, and to assist the Director in establishing and reviewing AES and CE priorities, we have elected to engage the services of 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 has held an annual Conference each year since 1995, providing an exchange of scientific papers on topics of

local interest. The Survey supports publication of papers and monographs on flora and fauna of southern New England. Through its Executive Director, who has an office in the CE Center on campus, it has become an effective unifying force for an unusually large community of natural historians, many of whom are also members of the above societies. We have engaged the Survey Executive Director to establish formal systematic listening sessions with these groups, to be reported to the AES and CE Director(s).

New Technologies. In a world transformed by the internet, we have decided to place much greater priority on development of a two-way web presence. An initial effort to establish a CE page was begun in 1997, but has not received needed updating for several months. In January, AES hired a full-time media guru who is now producing an exciting AES web presence (www. riaes. org). The purpose of the effort is to produce an interactive educational forum to promote public awareness of AES and CE programs in Rhode Island. We have established a basic framework and are building content. A first major project, for example, is a virtual reality tour of an on-campus demonstration garden (nearly complete, with expected release on riaes.org by August 1). This is a research driven (Northeast Sustainable Agricultural Research and Education grant), outreach oriented collaboration with the Nursery and Landscape Association that exhibits locally grown plants selected for low maintenance requirements (we have not needed a pesticide on this 2+ acre garden in 3 years, for example). We believe that this project illustrates the successful integration of research and outreach for the public good. A second major project will be completed this fall: it will feature research and outreach on tick-borne diseases and newly patented methods to control ticks on both deer and cattle.

A third, long-term web project will be to develop interactive on-line survey capacities for the department of Environmental and Natural Resource Economics, in conjunction with the development of an Economic Policy Simulation Laboratory being built into our new Coastal Institute Building (a prototype laboratory has been developed with AES support). We believe that an extension of such a capacity will allow us to create a virtual on-line town meeting as an open forum for feedback on AES and CE programs (see next).

(Note: We are aware that there are significant lag times in the acquisition of computers and internet access among traditionally underrepresented populations. The RI Hispanic and Asian communities in particular are held back by economics and by the dominance of English-only materials. This in itself needs to be the object of study and potential program focus.)

New Analytic Approaches. From exchanges with other states, stakeholder input processes, driven by GPRA and AREERA, appear to be following two paths. One is to formalize exchanges with existing groups of stakeholders (above). The other is to hold open sessions at state or county levels for simple public presentation of individual perspectives (the town-meeting approach).

We are exploring a novel third approach. In 1998, RI AES conducted a survey of randomly selected RI voters "for the ambitious goal of identifying the economic benefits that Rhode Island AES provides to the state's public." The survey was designed over six months, in conjunction with ten focus groups. It asked for input on 18 broad research topics across a spectrum of social and natural sciences. It used the continent choice method of contingent valuation (Adamosicz et al.. 1998. Am. J. of Ag. Econ. 80, 64-75). The survey provided background on the AES and asked respondents their view

on the importance (i.e., merit) of research to serve existing and new businesses, local communities, or to balance conservation with economic uses of environmental resources. It asked respondents to consider the allocation of scientist-months across research topics within five different topic-groups (roughly corresponding to the 5 CSREES goal framework). This part of the survey required respondents to read brief descriptions of numerous research activities with AES and to consider them in relation to their personal preferences for resource allocations. Finally, the survey presented four alternative AES programs with pre-defined allocation of effort across the five research topic-groups, and a required cost (i.e., state tax dollars). Respondents were offered a chance to eliminate the AES, to decrease, maintain at current levels, or increase the current effort (i.e., to elect to increase their own taxes). The survey produced 590 responses from 1211 randomly selected registered voters. Rural residents comprised 39% of the sample (they are 11% of the RI population), suburban residents another 34% (they are 26% of the population), and urban residents the remainder. Among the many conclusions drawn by the survey's authors (S. Swallow and M. Mazzotta, Dept. of Environmental and Natural Resource Economics) was a parametric estimate of taxpayer willingness to pay (through state taxes) for *existing* levels of RI AES research at a per capita rate that is far above what is now being supported by state government. The RI Director believes that many AES local supporters, and many Directors in other states, will find this approach to be very useful. A formal presentation of the survey is being made at a national meeting this August with submission for publication early this fall. We will share this survey nationally as soon as possible after submission.

B.3. Program Review Process

a. Merit Review. Stakeholder input leads to the establishment of AES and CE priority *programs*, as outlined above. The following processes are then used to select from proposed *projects* which will be supported by the Station or Extension.

The Station and Extension Director(s) use the internal counsel of advisors (the Vice-Provost for Marine and Environmental Affairs, Academic Deans and their Associates, Academic Department Chairs, and two Associate Directors for Extension) 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 as well, are subject to an initial screening by the Director to establish relevancy to current program objectives. (Note: The Director reserves the option of providing limited support for capacity-building projects (i.e., preliminary research studies of limited duration) intended to explore potential new program directions.)

Project merit depends on goodness of fit to program priorities, and on peer review. In addition, the Director judges projects on three general criteria:

- Is the project an appropriate match to strengths of our faculty, staff, and facilities (see also, peer review questions, below)?
- 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 external funding through established granting agencies in government or private foundations.

That is, priority is given to proposals to enhance research or outreach capacity or to provide continuity for Station or Extension projects largely supported by competitive funding.

Finally, 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) will also be given priority. The implementation of this new orientation to "the multi's" will begin with FY2000 funding, in response to AREERA.

Projects that are approved under the above merit review will be informed simply that they have passed merit review. Those that are rejected on merit will be given a written explanation from the Director, with (when appropriate) suggestions for modification for resubmission.

b. Peer Review of Research. RI AES has in place a process that conforms to proposed "Guidelines for Peer and Merit Reviews" drafted by the Farm Bill Implementation Task Force as Appendix 2 to a Report to ESCOP, July 1999 (attached). That is, we employ internal or external reviewers, assigned by the Station 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:

1. 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?
2. Does the proposal demonstrate adequate familiarity with the work of previous and contemporary investigators working in closely related areas?
3. Are the objectives clear?
4. Is the approach to the investigation, outlined in methods, clear and appropriate to meet the objectives?
5. 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?

Reviewers comments are normally 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 is actively monitoring and participating in Northeast Regional efforts to develop a comprehensive multistate research framework. That is, at present we adopt by reference the "Coordinated Multi-state Research Framework" (draft at http://www.agnr.umd.edu/users/NERA/workshop/RPAFramework.html), which we assume reviewers of this Plan are recognizing and deeming appropriate as fulfilling AREERA requirements at this time.

In addition, the RI AES Director is representing New England AES Directors in a study of new means to coordinate regional collaborations within the six New England states. This study was requested by the six New England deans of agriculture and natural resources and is to be completed (with recommendations to the deans and AES

directors) this fall. The purpose of a sub-regional coordination is to identify any particular needs that may be more effectively addressed through New England Stations. For example, in a 1997 study of regional research priorities (rated on need and potential to address the need), interest in aquaculture varied significantly across the region and there was equal variance in perceptions of state's abilities to accomplish anything of significance; however, the New England states share a common perspective that this is a significant need and that we can accomplish something.

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. We believe that we can achieve the 25% level through greater integration of outreach with multistate research (above) and through on-going regional (NEED) and sub-regional (i.e., New England CE Directors) coordination. We also see an opportunity to expand multistate activities related to aquaculture through more effective use of the Northeast Regional Aquaculture Center's extension efforts.

RI CE needs to complete a more comprehensive analysis of existing and potential multistate collaborations, including logical integration with multistate research. For example, we believe there are significant opportunities in areas such as analysis of nutritional risk for the elderly (subject of a multistate research project), which can be coordinated with an on-going RI outreach effort being conducted in conjunction with Connecticut. RI CE is just ending a series of interim Directors, with some discontinuities in leadership. The new Director will attempt to complete a review of this topic by mid September, and to thereby complete this Plan.

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 FY1998, over 20% of AES and CE projects were conducted by individuals with split academic appointments (i.e., both AES and CE), reflecting harmony between their Station and Extension activities. We believe that we can encourage significant additional integration and that we will be able to meet or exceed the required 25% during FY2000.

In developing this Plan, we have deliberately projected a single set of seven integrated programs, each based on principles written into both CE and AES strategic plans. That is, we hold that research (including, to a certain extent, basic research) should produce an outcome within the program area that meets an identifiable public good that can be addressed through Extension. We also hold that outreach should be based on University research, rooted in the Station.

Since 1995, CE and AES have been administered separately under different Vice-Provosts. A further sign of commitment to integration is that as of 1999 (official announcement pending), CE and AES will be administered under a single Vice-Provost and, for the next two years at least, by a single Director. The charge to the Director (from the Provost) it is to effect broadly integrated program, with broad participation from across the University, integrating AES and CE activities, and enhancing their relation to academic programs through increased access to students (both graduate and undergraduate) to AES research and CE outreach.

In submitting this Plan, the new Director asks CSREES to extend until mid-September any additional level of detail or documentation regarding the 25% level. We are not at this time requesting help from CSREES for this purpose, which we believe we can document by ourselves. We do, however, expect further guidance from CSREES Funds Management as to the details of acceptable accounting procedures necessary to satisfy formal audits of the multistate and integrated project requirements.