

***Justification for Cooperative Agreement with
The University of Connecticut***

To what extent was competition considered or sought for this purpose?

Competition was considered but it was determined to be impractical. The University has a long history of expertise in education, identification of invasive plants and in working with federal agencies including the Fish and Wildlife Service on invasive species issues in the Northeast.

Why was this cooperator selected?

The University of Connecticut is well-suited based on background, expertise and physical location to develop products for the National Park Service Inventory and Monitoring Program and Integrated Pest Management Program as required by the agreement. They are leaders in invasive species identification in the Northeast.

Explain the nature of the anticipated substantial involvement.

The Northeast Region staff and parks will initially select study and project needs, study areas, and will set priorities. Northeast Region staff will work with the University and principal investigator(s) in developing proposals and protocols. The parks will research and provide historical reports, investigations, plans and existing GIS/GPS data and may provide office space, field assistance and other support for researchers.

Why is the substantial involvement considered to be necessary?

The primary objective of this proposed Cooperative Agreement is to expand the inventory, monitoring, understanding and interpretation of natural resources in the Northeast Region. Such a cooperative agreement will bring state-of-the-art science to the parks in the Northeast, so that all management alternatives are considered in the context of the full range of interactions within the natural ecosystem. Substantial involvement by duty

stationed personnel will insure that all projects and investigations address NPS resource management goals and objectives.

Explain why the project or activity entails a relationship of assistance rather than one of ordinary procurement.

The University of Connecticut is organized and maintained to conduct educational, research and public service programs. The National Park Service and the University of Connecticut have as a common goal the better understanding and management of natural resources and will cooperate fully in all aspects of the development of the contents of study projects in order to accomplish this goal. Any final study proposal, protocols, databases and articles will be based on peer review comments from park staff and other cooperators. Park and Regional staff will assist the University in analyzing the information, identifying management issues, outlining management options, preparing the final report, and promulgating the effort in the professional literature and conferences, including Park Science. In addition, recommendations for additional inventory, monitoring, and/or research activities will be developed with assistance from park staff.

What is the public purpose of support or stimulation?

The purpose of the NPS program is to initiate a regional presence at the University to cooperate with partners in the long-term and cost effective inventory and monitoring of park resources and education and training of park staff. The investigations conducted and information gathered will be an important contribution in the overall understanding and enhancement of management and protection of park resources.

What law or laws authorize granting of assistance for performance of this project or activity?

Public Law 104-208, provides that the National Park Service may in fiscal year 1997 and thereafter enter into cooperative agreements that involve the transfer of National Park Service appropriated funds to State, local and tribal governments, other public entities, educational institutions, and

private nonprofit organizations for the public purpose of carrying out National Park Service programs pursuant to 3 U.S.C. 6305 to carry out public purposes of National Park Service programs.

Public Law 104-333, also known as "The Omnibus Parks and Public Lands Management Act of 1996" provides that the National Park Service may "enter into cooperative agreements with public or private educational institutions, States, and their political subdivisions, for the purpose of developing adequate, coordinated, cooperative research and training programs concerning the resources of the National Park System, and, pursuant to any such agreements, to accept from and make available to the cooperator such technical and support staff, financial assistance for mutually agreed upon research projects, supplies and equipment, facilities, and administrative services relating to cooperative research units as the Secretary deems appropriate; except that this paragraph shall not waive any requirements for research projects that are subject to the Federal procurement regulations." P.L. 97-258 authorizes the Service to enter into cooperative agreements with universities and other organizations.

How was the determination made that the costs are accurate and proper? Provide breakdown of costs and rationale for determining they are acceptable.

Costs for individual phases under the proposed Cooperative Agreement have been reviewed by Washington Office staff involved in Servicewide Programs to manage invasive species in National Parks. Also, the Regional Chief Scientists in the Boston Support Office and Philadelphia Support Office will review and evaluate all costs for services to be performed to determine that they are fair, reasonable, and justified, and equivalent to those charged for similar studies previously done by other universities in cooperation with the Service. The costs of conducting invasive species education and inventory programs are greatly reduced for several reasons:

1. NPS staff will participate in the research, inventory and monitoring efforts,
2. Overhead rate is substantially reduced by the University,
3. Office and laboratory space is contributed by the University,
4. Some secretarial support is contributed by the University,
5. Projects utilize University equipment, and
6. Student assistance is available.

UConn Scientists Combat Invasive Plants with National Park Service

In the 18th century, New England farmers made a disturbing discovery. Their ancestors, from colonial times, had nurtured a plant called the common barberry. Hearty and able to survive tough northeast winters, the shrub was useful in several respects: its red berries made delicious jelly, attractive foliage, and winter forage for native birds, which were undeterred by the fact that the plant bristles with needlelike thorns.

But there was a problem. Common barberry was a host for a pathogenic wheat rust that was devastating crops throughout the region.

The farmers' subsequent efforts to outlaw and eradicate the plant marked one of the first cases in the country of people dealing with plants creating unexpected problems. Lacking the kind of information needed to make scientifically astute decisions about importation of plants, the New Englanders were encouraged to replace the common barberry with an equally attractive alternative.

Japanese barberry seemed the ideal solution. It offered the benefits of its common cousin without harboring the wheat rust. But a decided disadvantage would soon become apparent. Japanese barberry spreads like wildfire.

"It was cultivated mostly in suburban areas and selected rural retreats," says John Silander, a professor of ecology and evolutionary biology. "From that foothold it began spreading in the 1920s. By the 1960s, it had dispersed widely throughout the northeast. By the 1970s, it was recognized as a problematic invasive species throughout the region."

Every bit as tenacious as the common species, it thrives in an extraordi-



Les Mehrhoff, curator of the herbarium, left, and John Silander, professor of ecology and evolutionary biology, look at a sample of Oriental Bittersweet, one of a growing number of invasive plant species. Detail shown below.

nary range of soil, moisture and light conditions. And thanks to birds, which spread the seeds in their droppings, it is constantly expanding its turf. Wherever it goes, it chokes out other plants.

A 'Growing' Problem

Japanese barberry is just one of an increasing number of non-native plants on which Silander and Leslie J. Mehrhoff, curator of the University's George Safford Torrey Herbarium, are focusing their attention as part of a recently signed cooperative agreement with the National Park Service. The relationship, which will have an impact on nearly 40 eastern parks in

New England and south to the Virginias, is expected to last for a number of years and unfold through a series of phases.

The first phase, for which the researchers will receive \$30,000, is scheduled to last one and a half years. During this phase, they will bring scientists from all over the region to UConn. Silander and Mehrhoff hope that students will benefit from exposure to these scientists and that it may lead to some formalized relationships.

A major goal of the project is to help the Park Service learn how to identify and deal with invasive plants. To begin with, the two researchers will assist the Park Service in developing a list of plants to watch for and protocols for identifying and dealing with those plants. Through workshops, Silander and Mehrhoff will acquaint park personnel with the plants, assist them in establishing inventories, and help them develop plans for monitoring and remediation. Similar workshops have been held at UConn for federal, state and town government officials, land trusts and conservation organizations during the past four years.

Although other universities work with some of the parks, UConn is unusual in working with so many, over such a large area.

"Each park has different problems," says Silander, "but when

they've been surveyed, most park managers cite the need to know more about these plants."

That's why education is central to the project, says Mehrhoff. "Most people have little interest in where these species come from or how they came to be part of the mosaic of species that make up a particular landscape," he notes. "But when you look closer, there are reasons for concern. Some non-native plants are altering our landscapes in unforeseen and possibly irreversible ways."

The word "some" belies the scope of the problem, however. *Non-Native Invasive and Potentially Invasive Vascular Plants in Connecticut*, a publication Mehrhoff produced last January in collaboration with the State Geological and Natural History Survey of Connecticut and the Connecticut Invasive Plant Working Group, lists nearly 100 plants, including trees, shrubs, vines, herbaceous plants, grasses and aquatics. Many are well known. They include watercress, gill-over-the-ground, several privets, Norway maple, yellow iris, and Asiatic bittersweet, whose bright orange and

yellow berries, festooning roadside thickets, are prized for autumnal wreaths and seasonal centerpieces.

"Not all plants brought into the country become problems," says Silander. "But those that do can cause severe environmental damage."

Many Kinds of Damage

And the scope of damage is wide-ranging. A study published last spring in the journal *Issues in Ecology* notes, for instance, that "plant invaders can completely alter the fire regime, nutrient cycling, hydrology, and energy budgets in a native ecosystem, greatly diminish the abundance or survival of native species, and even block navigation or enhance flooding." They can also push out or hybridize with native plants. In the process they often eliminate food sources necessary for other species in the food chain.

"There has been an unprecedented influx of exotic plants in the last decade," says Wayne Millington, regional integrated pest management coordinator for the northeast region of the national parks. "The spread of these plants has increased sharply. Many of these plants have enemies in other places that are not present here. So they spread unchecked. In the process, we're losing native species, including insects and species that pollinate the native plants that are being pushed aside by these aggressive competitors."

"Early detection is the future of pest management in the parks," Millington adds. "The park service doesn't have enough human resources to do all

that is needed, so on an individual level we need to become more effective. That's what this relationship with the University of Connecticut is about."

Students benefit from the relationship, as well. The knowledge Mehrhoff and Silander obtain through the project will, of course, help to inform their courses. But the two also expect project funding to allow them to employ students in many ways, including internships and assistantships. Students are also expected to be involved in creating a project website. Mehrhoff adds: "We hope this project will help encourage more students to embark on careers in the field."

JIM SMITH

Characteristics of Invasive Plants

Five key biologic traits characterize invasive species, says Mehrhoff, and account for the striking pace of their intrusion into the landscape.

- **Abundant fruits, seeds or vegetative reproductive structures**
Notable examples include Morrow's Honeysuckle, Autumn Olive, Multiflora Rose, Purple Loosestrife, and Oriental Bittersweet.

- **Effective dispersal mechanisms**

Many of the well-known invasive woody plants, including trees, shrubs, and vines, are dispersed by wind or birds.

- **Easily and rapidly established**

Most invasives have a high percentage of germination and seedlings with a wide range of biological tolerance.

- **Rapid growth**

Annuals produce a large number of seeds in one year and biennials in two. Some shrubs can produce flowers and fruits in just four to six years.

- **Aggressive competitors**

Imported plants often leave behind the predators, parasites and diseases that helped keep them in check in their natural ranges.

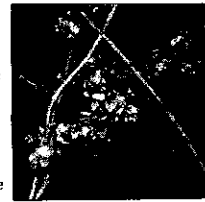


PHOTO BY LES MEHRHOFF

Combined Admission