

New Brunswick Strategic Planning Proposal

Proposal Title: The Rutgers Ecological Preserve as an Inter-disciplinary Learning Environment

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Proposal Partners:

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Primary Strategic Priority/Foundational Element/Integrating Theme Addressed (Select one)

XX Creating a Sustainable World through Innovation, Engineering, and Technology

Proposal Abstract:

The state of New Jersey has long been a leader in the preservation of open space as an antidote to our dense urban areas and sprawling suburban growth. What is becoming increasingly recognized is that purchasing open space is not enough, proper stewardship is vital if we are to fully appreciate our investment as a society. The Rutgers New Brunswick-Piscataway campus is blessed to have 400 acres of open space right at its very core, the Rutgers Ecological Preserve and Natural Teaching Area (www.ecopreserve.rutgers.edu). The goal of the proposed program, *The Rutgers Ecological Preserve as an Inter-disciplinary Learning Environment*, is to preserve the natural resources of the EcoPreserve while also increasing the compatible educational, recreational and research uses. The University has the opportunity to build a world-class educational program around the EcoPreserve and thus lead the United States in the academic pursuit of natural areas/open space stewardship, ecological restoration and leadership training. At the same time, the role of the Preserve as a central hub for the New Brunswick campus as the locus for outdoor recreational pursuits, open space relaxation and aesthetic enjoyment to enhance student and community life could be more fully realized. By using this natural classroom and living laboratory to its fullest potential, the proposed project addresses one of the key integrating themes of the University Strategic Plan, *Creating a Sustainable World through Innovation, Engineering, and Technology*, but also has the potential for significant impact and benefit for the broader New Brunswick and Rutgers community.

Full Proposal Description

As the most densely populated state in the nation, the state of New Jersey serves as a bellwether on many issues related to urbanization. New Jersey has long been a leader in the preservation of open space as an antidote to our dense urban areas and sprawling suburban growth. What is becoming increasingly recognized is that purchasing open space is not enough, proper stewardship is vital if we are to fully appreciate our investment as a society. The Rutgers New Brunswick-Piscataway campus is blessed to have 400 acres of open space right at its very core, the Rutgers Ecological Preserve and Natural Teaching Area. The goal of the proposed program, *The Rutgers Ecological Preserve as an Inter-disciplinary Learning Environment*, is to preserve the natural resources of the EcoPreserve while also increasing the compatible educational, recreational and research uses. The University has the opportunity to build a world-class educational program around the EcoPreserve and thus lead the United States in the academic pursuit of natural areas/open space stewardship, ecological restoration and leadership training. At the same time, the role of the Preserve as a central hub for the New Brunswick campus as the locus for outdoor recreational pursuits, open space relaxation and aesthetic enjoyment to enhance student and community life could be more fully realized.

The proposed Initiative aligns with the University Strategic Plan: By using this natural classroom and living laboratory to its fullest potential, the proposed project addresses one of the key Integrating Themes of the University Strategic Plan, ***Creating a Sustainable World through Innovation, Engineering, and Technology*** by leveraging our existing talent across a number of disciplines to address the issue of sustaining biologically diverse, ecologically functioning and humanly meaningful natural environments in an increasingly urbanizing world. This initiative also has the potential for significant impact and benefit for the Strategic Priorities:

- Envision Tomorrow's University*** – by enhancing hands-on experiential learning that is coupled seamlessly to advanced information technology;
- Build Faculty Excellence*** – by creating a living laboratory that will advance tomorrow's research and education into sustainability;
- Transform the Student Experience*** – by providing a unique and intimate on-campus learning environment that also promotes student engagement and social interaction in a positive environment; and,
- Enhance Our Public Prominence*** – by enhancing the physical appearance of the New Brunswick campus while also promoting community health and well-being.

Involvement: The proposed Initiative has been developed with input from and will involve participation of the School of Environmental & Biological Sciences (Departments of Ecology, Evolution & Natural Resources; Landscape Architecture, Human Ecology), School of Arts and Sciences (Departments of Biological Sciences; Geography, Douglass STEM Project), Bloustein School of Planning and Policy, Army/Air Force ROTC and the Rutgers Recreation Program. We propose to seek additional interaction with other schools and departments such as Mason Gross and Engineering.

The following sections enumerate the goals, objectives and desired outcomes for the key Education, Research, and Recreation components.

Education: Our goal is to promote greater use of the EcoPreserve as a case study of Rutgers' place and role in the Raritan River Watershed to support the SAS/SEBS Core Curricula as well as outreach to local communities.

Many natural and social science courses at Rutgers examine the natural, social and economic dimensions of the environment. Their import is captured in the use of the phrase "environmental literacy". Environmental literacy means an understanding of the ecological, social, and economic dimensions of human-environment interactions, including how to live day to day in a sustainable fashion. Global environmental crises and the growing interdependency of environmental, social, and economic issues motivate environmental literacy as a basic competency for 21st century education.

The EcoPreserve provides the opportunity for students to be actively engaged in real-life hands-on studies and projects related to natural areas stewardship. Students can undertake field surveys/monitoring, develop management plans, consult with experts concerning these plans and then implement them. In addition, to the natural sciences, student learning on the preserve can build on a strong theoretical base in the social sciences on "**place**" in which local resources and structures are studied to understand the significance of social forms. Applied to ecological issues, the argument is made that conservation and environmental projects often falter or fail because they have ignored local ecological circumstances, historical contingency, and distinctive cultural and personal needs. A place-based approach to environmental issues can help to avoid such problems. It provides a bottom-up approach to environmental understanding and practice by paying close attention to particular environments, communities, and people.

We propose to engage a variety of curricula, both here on campus as well as off-, to make greater use of the EcoPreserve as part of their educational program. The EcoPreserve provides an experiential learning site observe and collect data as well as get their "hands dirty" by undertaking experimental manipulations and be involved in hands-on restoration and enhancement, design or arts projects. Within the EcoPreserve, students can put into practice classroom or online learning in a real world environment. We propose that these field experiences will be coupled with advanced information technology to integrate field data collection with real-time sensor networks and geospatial information systems to make the EcoPreserve a natural classroom as well as a living laboratory. One great advantage of the EcoPreserve is that it is right on campus and accessible to students via the campus bus system; thus using the EcoPreserve for instructional purposes is both time and cost effective.

A pool of competitive funding should be created to support the development of curricula, individual courses and service learning opportunities associated with the Preserve, as well as longer term course support costs (i.e., equipment and materials). These internal seed grants could be used to help spur individual faculty or interdisciplinary teams of faculty for course development grants and graduate student grants to design modules or courses that involve the EcoPreserve as a central component. Likewise, the ongoing

use of the EcoPreserve as the locus for a variety of service learning opportunities should be further expanded.

Research: Our goal is to promote greater use of the EcoPreserve for inter-disciplinary research on sustainable management of open space lands.

The Preserve and nearby Rutgers forest properties (e.g., Helyar Woods, Hutcheson Memorial Forest) along with the nearby Duke Farms properties provide an ideal network to investigate sustainable management of natural resource conservation lands. This network of Rutgers and allied properties could serve as the test site for comparative studies of “proactive” management to sustain the natural resources that the lands were originally set aside to conserve. Many of the other land grant research universities that Rutgers aspires to reach have similar experimental forest/preserve lands, though very few are as blessed to have these properties right in the heart of campus.

New Jersey has been in the forefront of acquiring lands as public open space with billions of dollars invested in the initial purchase. Once purchased, many of these lands are “passively” managed with little to no subsequent monitoring or engagement. Unfortunately, these lands are under significant pressure by inappropriate human use, overpopulation of deer and invasion by exotic plants or pests, off-site impacts from non-point source pollution and storm-water runoff. To counter these impacts, we propose to: a) establish a series of deer exclosures/fencing to assess their efficacy in reducing the most deleterious impacts of overbrowsing; b) investigate alternative techniques to control invasive plants and/or promote native vegetation; c) restore within-stream and adjacent riparian/wetland habitats; d) maintain and enhance meadows to promote pollinator habitat; and e) enhance regeneration and health of upland forests. The results of the research and management experience gained on the EcoPreserve can also serve as a model of land use protection and management for local governments in the Raritan River watershed.

We propose to promote greater faculty and student research in the EcoPreserve by funding research fellowships. In addition, greater oversight by a reserve manager would provide for coordination of various research activities as well active patrolling and educational interaction to reduce the incidence of vandalism to research-associated infrastructure. To aid in long-term management and research, we propose to maintain a geospatial information system of natural resource monitoring and research data complemented by real-time network of environmental monitoring sensors. These data bases will be documented and made readily accessible to the research community, for the educational program, as well as the public at large via the Web.

Recreation: Promote greater use of the EcoPreserve for compatible outdoor recreation through a revamped trails system and increased programming. A companion goal is to promote student leadership and service opportunities by providing students a major role in the design and operation of the proposed activities.

We propose to work with various student and citizen groups (such as the Friends of Rutgers Ecological Preserve) to promote the EcoPreserve for its outdoor recreation and nature study values. We are collaborating with the Office of University Planning and Development to more fully integrate and promote the EcoPreserve as an amenity for the Livingston as well as broader New Brunswick campus. A new trailhead serving as a gateway into the EcoPreserve with an information kiosk (designed by a Landscape Architecture student) is being installed so as to integrate into the redesigned Livingston Campus. Issues such as parking and security need to be resolved to provide greater access by both Rutgers students, faculty, staff and the surrounding community.

The trails network (<http://ecopreserve.rutgers.edu/brochure.pdf>) should be redesigned to 1) provide for a set of multi-use trails to support a variety of means of access (i.e., by foot or self-propelled bike, possibly some sections by wheel-chair); 2) provide educational and recreational access to a larger portion of the EcoPreserve; 3) reroute and improve trailbed to reduce erosion and promote ease of travel; 4) construct benches/tables to provide rest spots; 5) improve educational signage; and, 6) remove incompatible features (e.g., chain link fence, junked cars). The long term objective is to foster the involvement of the Rutgers University Outdoors Club, the Naturalist Club and other student groups as volunteer trail stewards.

The Rutgers Outdoors Recreation Program has been a major partner in developing outdoor programming that utilizes the EcoPreserve. For example, the Outdoors Recreation Program holds the RU Down & Dirty Mud Run which traverses portions of the EcoPreserve with over 700 participants. The Outdoors Program also runs an Adventure Camp that holds activities on the EcoPreserve (http://camps.rutgers.edu/Adventure_Camp_Session_1.html). We are presently working with the Rec Program and other student groups to host other events such as an outdoor adventure triathlon, a trail run and a mountain bike race. The Delaware Valley Orienteering Association has held several orienteering events at the EcoPreserve that have attracted well over one hundred participants, including Rutgers students and local scouting organizations. Much more could be done. These types of outdoor activities benefit both the Rutgers University community as well as the broader citizenry

An outdoor “outpost” building should be constructed near the existing EcoPreserve parking lot to provide a staging point for EcoPreserve-related activities such as class field trips, environmental inventory and monitoring, stewardship activities and recreational pursuits such as trail running, mountain biking, cross country skiing and snowshoeing as well as storage facilities for related equipment.

Anticipated resources needed to support this initiative:

Curriculum Integration and Development: proposals for both undergraduate and graduate programs to use the Preserve in existing courses, the development of new courses, enhancements of existing specializations in academic programs, the development of new specializations including certificates and potentially new degree programs. Annual Support: \$75,000.

Research: proposals for research projects drawing on the Preserve and related areas, to engage graduate and undergraduate students in research projects, to support proposals for externally funded research contracts and grants, and to support interdisciplinary projects. Annual support: \$75,000.

Ecological Preserve Fellows: proposals for support of Ph.D. and masters' theses, and for undergraduate theses, research projects, and honors programs. Annual support: \$20,000.

Stewardship and Restoration: Initial support for deer fencing (\$150,000-\$250,000) and major restoration (\$75,000) initiatives. Annual Support: \$35,000.

Preserve Director/Manager: Cost potentially to be shared with SEBS. Annual support to be determined; possibly summer salary. Annual Support: \$20,000

Recreation and Outreach and Service: Proposals for enhanced student recreation, public education, integration with Livingston Campus, and other appropriate public service functions. Annual support: \$35,000.

Trails maintenance: Initial support for Redesign and construction: \$75,000
Annual Support: \$15,000

Construct an enclosed Educational/Outreach Building:
Capital Cost: TBD – e.g., the resources needed to come from the endowment itself – i.e., some initial amount to be used for capital construction for a modest sized structure.

Total Annual support: \$350,000

Total Initial Support: \$250,000

Proposed Measures to Mark Progress or Determine Success

A number of metrics will be assessed to mark progress on this initiative:

- 1) Number of courses, student class hours spent in the EcoPreserve;
- 2) Number of student management/research projects;
- 3) Number of student service learning hours;
- 4) Number of outdoor recreational events held and number of participants involved;
- 5) Numbers of informal visitors and surveys of visitor satisfaction;
- 6) Area of habitat restoration/enhancement actions and trends in biological diversity as measured through routine monitoring.

We will consider this initiative to be successful if a random sample of 4th year students determines that a majority have heard of the Rutgers EcoPreserve and that a third have actually visited the Preserve sometime during their time at Rutgers.