



National Wildlife Federation®  
**CAMPUS**  
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**Green Mountain College**  
**Poultney, Vermont**  
**Plant Conservation on Campus:**  
**Natural Areas Management and Native Species Landscaping**

**SCHOOL**

Green Mountain College is a 4-year private liberal arts college with approximately 750 undergraduates, and master's programs in Environmental Studies and Business Administration, located in Poultney, in the northern Taconics region of Vermont. As part of its mission, the college challenges each student to bring knowledge and creativity to issues of sustainable environmental, economic, and social systems.

**ABSTRACT**

As centers of education and research, colleges and universities are in a good position to demonstrate responses to today's plant conservation challenges. Among its sustainability initiatives, Green Mountain College is developing land management policies and campus gardens and landscapes that support regional and global plant conservation goals, as well as academic programs in biology, environmental studies, and natural resource management. As guides to meeting conservation goals, we used the North American Botanic Garden Strategy for Plant Conservation (BGCI 2006) and similar initiatives, and researched land management and landscaping policies and practices at other colleges. The college adopted its Invasive Species Policy and Natural Areas Policy in 2006 to promote sustainable land management of college natural areas. In landscaped areas of campus, native species gardens have been established, beginning in 2000, by students and faculty, including class projects in Botany and Local Flora courses. Native species landscaping educates students and the public about a rich regional flora that many people aren't aware of, and maintains a unique sense of place associated with an ancient legacy of plant life. After extensive input and review by students, faculty, and staff in spring 2010, the college administration approved a proposal to replace invasive ornamentals on the landscaped campus, and in September 2010 approved the new campus-wide Native Species Landscaping Policy. To date, the annual costs of natural areas management and native species landscaping have included two work study positions during the school year, and three part-time summer student worker positions (\$6800), plant material and equipment and signs (about \$2000), an estimated 12 hours per week in service time contributed by a faculty member, and over 100 volunteer service hours. Funding for student positions comes from the college and a Wildlife Habitat Incentives Program (WHIP) grant (through 2010), and for plants and other materials from the college and our Student Campus Greening Fund for student proposals selected by a vote of the students.

**GOALS AND OUTCOMES**

**Goals**

There are two major goals of land management at Green Mountain College:

1. Integrate land use and management with global and regional plant conservation goals, and
2. Provide a resource for research and to educate students, staff, faculty, and the greater community about the flora of the region, and about conservation problems and their solutions.

### *Targets*

Since initiation of active land management in 2005, we have set four specific targets (without timelines) to help reach land use goals at the college:

1. Establish a system for assessing the status of invasive species on campus and for managing them effectively.
2. Establish a policy for use and management of natural areas on campus to maintain their recognized values for research, teaching, and recreation.
3. Increase the diversity of native species on campus by establishing one or more native species gardens.
4. Develop a campus-wide native species landscaping policy that reduces the ecological footprint caused by habitat loss and the presence of non-native species, but that also accommodates the appropriate use of non-native species.

### *Targets for the next three years*

We aim to improve implementation of the invasive species, natural areas, and native species landscaping policies:

1. Assess progress on invasive species management, and establish the support and organization necessary to maintain adequate invasive species and natural areas management into the future.
2. Remove invasive ornamentals in designed campus landscapes and replace them with native species as appropriate.
3. Plan and fund implementation of the Native Species Landscaping Policy in consultation with a landscape architect.

### **Accomplishments and Outcomes**

We are progressing toward the overall goals, having successfully met the four targets:

1. The Green Mountain College Invasive Species Control Policy (2006, attached) – The policy recognizes the ecological significance of non-native species and establishes methods by which invasive species are monitored and managed. The management protocol includes written management plans, and approval and oversight by the college's Land Use Committee. As of Fall 2010, crews are implementing management plans for Garlic Mustard (covering also Dame's Rocket and Celandine), Glossy Buckthorn (also covering Common Buckthorn, Morrow's Honeysuckle, and Multiflora Rose), Japanese Knotweed (and Phragmites), Norway Maple, White Poplar, and Periwinkle. Management plans are written but have not been implemented for Purple Loosestrife and for Goutweed. The student Natural Areas Crew established in 2006 is the primary means for carrying out invasive species management plans.
2. The Green Mountain College Natural Areas Policy (2006, attached) – Here the college identifies the values of natural areas for research, education, ecosystem services and habitat, and as a human environment. Leave-no-trace practices are standard practice for natural area users. Activities that may change the land require evaluation by the Land Use Committee and approval by the administration. An introduction to college natural areas and policy is included in new student orientation. Signs at the boundaries of natural areas welcome visitors, identify important values of the land, and outline their sustainable use.
3. As of fall 2010, seven native species gardens have been established on campus. Each garden contains species associated by habitat, growth form, ecological factor, or ethnobotany. Garden themes and the number of species added by each garden to the designed landscape include Northern Hardwood Forest Floor (33), Vermont Shrubs (11), Early Old-field Succession (15 species), Native Forest Perennials (10), Forest Openings in Vermont (15), Medicinal Plants (8), and Bird-dispersed Fruiting Shrubs (10). These are small gardens, up to about 20 m in length, but serve as models for the entire campus.

4. Green Mountain College Native Species Landscaping Policy (2010, attached) – The policy is supplemented by an extensive rationale for establishing the policy (Gowdy and Graves 2010, attached). The case is made that native species landscaping is an important sustainability initiative that helps a college meet conservation and education goals, and establishes a unique sense of place on campus. By demonstrating the use of native species in designed landscapes, the college hopes to encourage home landscape designs with smaller ecological footprints – with greater use of the preexisting natural communities, and less habitat loss for wildlife. Broadly, the policy makes use of native species the norm throughout the outdoor campus. However, a strength of the policy is its resolution of three possible sticking points for establishing native species landscaping on campus: (1) Native species are defined narrowly enough to limit species to our regionally distinctive flora, but are not limited to species native to Vermont which would arbitrarily rule out some species in the nearby Hudson Valley. Species lists are also flexible to climate-related changes in range. (2) Exceptions to the policy are made for the college farm and lawns, or when a compelling rationale is approved by the administration. (3) Over time, it is recommended that existing non-native species be replaced by native species, but an indefinite timeline and a provision for keeping plants with recognized value provide flexibility.

### **Challenges and Responses**

The greatest challenge to establishing a robust set of land initiatives on campus that respond to plant conservation goals is the near absence of some of the most urgent threats to biodiversity in sustainability discussions on campus. Here are some of the approaches we have taken to raise awareness of conservation issues in our community:

1. Make campus monitoring by students part of the curriculum and undergraduate research, to make the community aware of the plant communities and species present on campus.
2. Engage students with issues in plant conservation biology in the region. For example, have students research invasive species found on campus – their history, expected changes in abundance, ecological effects, and management methods used by conservation organizations such as The Nature Conservancy.
3. Request policy research and recommendations for land management by students in the Public Policy and the Environment class.
4. Engage the entire campus community in a discussion of proposed land management policies.
5. Provide hands-on experience to students creating native species gardens, and managing campus lands.
6. Communicate land initiatives with signs and announcements.

Over several years, these kinds of initiatives raised awareness of conservation issues and prepared the ground for a good discussion about a native species landscaping policy. Limited time and resources will stretch out the process of integrating conservation goals with campus sustainability programs.

### **Campus Climate Action: Your School's Carbon Footprint**

We haven't estimated how much our natural areas management and native species landscaping contribute to a reduction in greenhouse gas emissions. Small reductions are possible in two ways. First, more Carbon will be sequestered in forests that are replacing fields in the buffer zone near the Poultney River and in other natural areas we have released from agriculture. Second, where lawns are replaced by low-maintenance native species landscaping, fossil fuel consumption for mowing will be reduced.

### **Commentary and Reflection**

Current assessment systems for sustainability programs on college campuses give too little weight to land management practices. Globally, habitat loss and species invasions continue to reduce populations of

many species. We ignore these major drivers of loss of biodiversity at our peril. By integrating regional species conservation goals with campus sustainability programs, we will come closer to modeling systems that are sustainable for all species on Earth. It may be challenging to raise the salience of land management to campus sustainability programs. Nationwide, we need statements of commitment to species conservation that mirror the good progress we have made to reduce Carbon footprints with initiatives like the Presidents' Climate Commitment.

## **ENGAGEMENT AND SUPPORT**

### **Leaders and Supporters**

*Natural areas management* has been established with the support of the college administration and the help of many students:

- Garlic Mustard assessment and management recommendations, 2005 – Pearl Wetherall, Undergraduate Research Assistant with James Graves
- First Annual Garlic Mustard Pull, 2005 – Service Learning Project by the Forest Ecology and Management students (BIO 3025), James Graves, instructor
- Natural Areas Crews (members underlined also served in the school year work study position), supervised by James Graves:
  - 2006 – Justin Valliere, Ashley Case, Megan Nugent
  - 2007 – Shannon Bonney, Justin Valliere, Elizabeth Roma, Evan Miller, Laura DiNardo, Elaine Blodgett
  - 2008 – Laura DiNardo, Evan Miller, Elaine Blodgett
  - 2009 – Olesea Cojohari, Ruth Larkin, Emma Buckley, Brandon Gowdy
  - 2010 – Brandon Gowdy, Kelsy Allan, Erin Burch
- Invasive Species Policy, approved by the college Cabinet in November 2006 – Spring 2005 Public Policy and the Environment (ENV 2011) class with Professor Rebecca Purdom, and Land Use Committee
- Natural Areas Policy, approved by the college Cabinet in November 2006 – Natural Areas Policy Subcommittee of Land Use Committee; revision by the Spring 2009 Public Policy and the Environment (ENV 2011) class with Professor Sam Edwards – under review

*Native Species Gardens* have been created and maintained by many students in collaboration with Professor James Graves:

- Northern Hardwood Forest Floor, 2000 – Botany 3013 student project
- Vermont Shrubs, 2001 – Mark Raishart, Claire Zbierajewski, with Professor Shawn White; funding by the Stewart's Foundation
- Early Old-field Succession, 2003 – conversion to native species of a garden established in 1996 by Botany (BIO 1013) students
- Native Forest Perennials, 2009 – Emily Provonsha, Mara Smith, with Student Campus Greening Funds
- Forest Openings in Vermont, and Medicinal Plants, 2010 – Steven Carpenter, Emily Provonsha, with Student Campus Greening Funds
- Bird-dispersed Fruiting Shrubs, 2010 – Kadie DellaCamera, with Student Campus Greening Funds
- Wild seed collection and propagation for native species gardens, 2004-2010 – Botany (BIO 3013) and Solar Powered Life (BIO 1036) students

*Native Species Landscaping Policy*, approved by the college administration with the broad support of the campus community in September 2010. Drafted by Brandon Gowdy and Professor James Graves, the

policy was improved significantly by recommendations of policy Professor Sam Edwards, and revised by Land Use Committee following student, staff, and faculty input.

### **Funding and Resources**

To date, native species landscaping and natural areas management have been supported largely through strong ties to the curriculum and small budgets for part-time student positions. The costs of land management in natural areas on our 120 acre main campus include one work study position during the school year (\$1800), three part-time summer positions (\$5000), supervision of the student crew and Land Use Committee work by a faculty member (8 hours per week as part of service contribution), and a small budget for tools and signs (under \$500). Gardens have been installed as part of student service learning projects and by volunteers, and maintained primarily by one additional work study student during the school year (\$1800) and as part of one faculty member's service contribution to the college (4 hours per week). Landscaping plants and materials including signs cost under \$2000 per year. Funding currently comes from three sources – college funds, Student Campus Greening Funds (a portion of student activity fees) for proposals voted on by students (about \$2000 in 2010), and a Wildlife Habitat Incentives Program (WHIP) grant (about \$2300 in 2010). In addition, many volunteer and service learning hours are contributed by students and faculty. With current funding, we can only gradually implement the new native species landscaping policy, and natural areas management may not keep pace with management needs. We recognize that land management and implementation of the native species landscaping policy would be greatly enhanced by creating a permanent land/garden manager staff position, and will look for ways to increase funding to support such a position.

### **Education and Community Outreach**

Beginning in 2000, we have engaged the campus community in native species landscaping projects and policy making generally in the following ways:

- Plant conservation biology is part of the curriculum in the general education Local Flora course and in upper division Botany. Students in these classes have planned and installed native species gardens, and they have collected and propagated seed of native species and produced plants that are in the gardens today.
- Several planting projects advertise to attract volunteers to prepare, plant, and weed beds; and students in classes that are directly involved generate interest among other students. “Adopt-a-garden” appeals yield a few student volunteers to manage particular beds each summer.
- The college sets aside a large portion of student activity fees to create a Student Campus Greening Fund, awarded to projects proposed by students and selected by a vote of the students. Students who have developed an interest in native species landscaping on campus have proposed successful garden projects in each of the last two years.
- In 2010, signs were installed at six native species gardens on campus to raise awareness of the regional flora among more of our students and visitors to campus. We have noticed that more people stop to spend time in the gardens since the signs have gone up.
- A detailed Rationale for a Native Species Landscaping Policy educated the campus community about the connection between native species landscaping, plant conservation goals, campus sustainability initiatives, and the environment-focused mission of the college.
- The campus Land Use Committee publicized the proposed Native Species Landscaping Policy, sought input from all community members, and incorporated this input in changes to the policy.

Community support for the Native Species Landscaping Policy has been enthusiastic and constructive. The policy was improved significantly by the input from several key faculty and students who read the proposal carefully.

## **National Wildlife Federation's Campus Ecology Program**

The Campus Ecology Program's *Online Case Study Database* is one of the best places to find examples of sustainable land management programs and projects on college and university campuses. To prepare the Native Species Landscaping Policy at Green Mountain College, we investigated what other schools are doing by searching the database, published articles, and internet sources, and corresponded with colleagues in the plant conservation and college and university sections in the American Public Gardens Association.

### **Literature Cited**

Gowdy, Brandon, and James Graves. 2010. *The Green Mountain College native species landscaping policy: a rationale*. Report for Green Mountain College, Poultney, VT.

### **CONTACT INFORMATION**

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### **MORE ABOUT YOUR SCHOOL**

#### **Campus Sustainability History**

Green Mountain College made education about and engagement with issues of sustainability in natural and human environments a major focus of its mission in 1995, and launched its unique Environmental Liberal Arts general education program. Today, a full-time sustainability coordinator facilitates sustainability initiatives across college programs, documented on the college website at [www.greenmtn.edu/sustainability.aspx](http://www.greenmtn.edu/sustainability.aspx). In addition to improvements in land management, recent highlights in sustainability include the renovation of a college building in 2009 to create a LEED Gold certified dorm, completion of the college biomass burning facility in 2010, and adoption of our Climate Action Plan with the goal of becoming a climate neutral campus by 2011.