

## Hopkins Forest--Activities Report 2001-02

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### INTRODUCTION—FY 2002

The year 2001-02 was one of continued growth of the programming in the Hopkins Forest. A new study on ant-leaf hopper mutualism was launched by Manuel Morales and another field prepared as a future site. Ongoing research projects continued--including garlic mustard growth dynamics, hayscented fern allelopathy and meteorological and geochemical monitoring. University of Vermont Scientist Tom Baribault began investigations of the sugar content variation within the sugar maple plantation. In addition, the Hopkins Forest hosted a fall banding station for migrating northern saw-whet owls for the first time.

The Forest also grew in physical dimensions as a parcel was added to the Vermont holdings. Work continued on the trail infrastructure in the Forest, including a restoration of the Upper Loop Trail; a new utility vehicle was procured to facilitate such work.

Educational programs continued at the Forest: two Biology classes held regular lab sessions; numerous programs were conducted for schools and the general public; and work was begun on interpretive signs for the Lower Loop. The Rosenberg Center was outfitted with four computer work stations with connectivity to the local campus network as well as the world wide web. As usual, a talented crew of student caretakers took care of maintaining the facilities and grounds.

During the coming year--in addition to continuing ongoing programs--we aim to undertake a strategic planning phase that may involve a visiting team of reviewers. Integral to this process will be planning management activities for the Vermont property, including a newly consolidated parcel, which may be entered into the state timber management program.

### ACTIVITIES—RESEARCH and MONITORING

#### Summer 2002 and ongoing

Several research projects, including a newly launched study, were underway during the past year (Table I). In addition, we planted the new site for the expansion of Biology Professor Dr. Manuel Morales' research on leaf hopper/ant symbiosis.

#### Garlic Mustard--Population Dynamics in Forested Ecosystems

Joan Edwards' study of the population dynamics of the invasive plant, garlic mustard (*Alliaria petiolata*), continued into 2001-02. Two students—Flynn Boonstra '04 and Tory Hendry '04--continued collecting

data on established plots in three different areas in Hopkins Forest: the Beinecke Stand, the former mansion site and the red oak stand. This is the fifth year of Dr. Edwards investigations of the mechanisms of garlic mustard's success in forests of different ages, its rate of invasion, and its effects on native flora.

### Hay-scented Fern Allelopathy

This was the third year of field experiments for Hank Art's and David Richardson's study of the possible allelopathic mechanisms of hay-scented fern *Dennstaedtia punctilobula*. Jude Dumfey '04 and Nisha David '05 worked on this study. The extracts were applied to a plot in the field north of the Rosenberg Center.

### Sediment Transport and Deposition in the Birch Brook Watershed

Matt Jungers '03 continued the work of David Dethier and Will Ouimet '01 on sediment transport within the Birch Brook Watershed. From this work Ouimet and Dethier published a paper, *Modeling Sediment Flux From Birch Brook, an Undisturbed Catchment in North-Western Massachusetts*, in *Northeastern Geology and Environmental Sciences* (v. 24, no. 3, 2002).

### Ant/Leaf Hopper Mutualism

This was the initial year of a study on ant-leaf hopper (*Publilia*) mutualism by Manual Morales of the Biology Department. This experiment utilized the south (existing) field on Northwest Hill Road. Fifty-six potted goldenrod (*Solidago altissima*) plants were put into fourteen study plots. Each set-up had two fertilized and two unfertilized plants, one each with ants and one excluding them. Thereby, the impact of primary productivity and ant presence on leaf hopper success was assessed; the results will be detailed in an honors thesis by Angus Beal '03. Jen Barone '03 also used the field to procure data for her thesis study on interspecific communication mechanisms. In addition, Dr. Morales set up several over-wintering studies in the same field.

The newly created field has not yet seen the introduction of any experiments; however, it was planted with goldenrod rhizomes and subsequent establishment of *S. altissima* in the field has been swift. To facilitate this, Hopkins Forest personnel took measures to control competition from woody perennials, namely the residual hybrid poplar, in the field.

### Northern Saw-whet Owl Migration Banding

Ken Schmidt and Drew Jones established a banding station for the Northern saw-whet owl, *Aegolius acadicus*, in the Hopkins Forest for the first time during the fall of 2001. Mist-nets (a single-tier array of three 12 meter nets) were set up on a trail south of the Rosenberg Center; an audio lure was used to attract the migrating owls into the nets. The station was open on dry, calm nights from dark until around midnight between October 18<sup>th</sup> and November 16<sup>th</sup> (for a total of 26 net-nights). Eighty-six owls (all saw-whets) were captured and banded at the sight; no recaptures were recorded. Students from BIOL/ENVI 203--*Ecology* took part in this endeavor as a part of a lab requirement for the class. With the establishment of this station, HMF joins several dozen other stations throughout the county (primarily in the east and midwest) in 'Project Owl-net'. We aim to continue this banding lab in the fall of '02.

### Sugar Maple Genetics

This past year, Tom Baribault of the University of Vermont's Proctor Center commenced to sample sugar

content of the remaining trees in the sugar maple plantation located that was established by the Forest Service in 1960. Dr. Baribault made two collections at the site--one in March and one later in the spring. Baribault has a map of the source parent material of the trees in the plantation and aims to identify parent trees, some of which are thought to have been in the Hopkins Forest. There are two other known plantations with siblings of the one in HMF--one in Vermont and one in Ohio. Dr. Baribault plans to continue sampling the sugar content of the trees in all three plantations in the coming year.

### Permanent Plot Network

The task of entering and compiling data from the last round of plot sampling in the middle 1990s continued during the past academic year. Several students were employed during the year and into the summer (Nura Kinge '05 and Lani Stinson of Bates College) to finish entering the remaining data, primarily herbs, shrubs and herb frequency, into Excel spreadsheets. This will be the first time since the completion of the third survey of the plots in 1997 that all the data are in electronic form. The next step will be to move the data into an Oracle database to permit it to be queried using a web-based interface. Jason Taylor, the newly hired Database Integration Specialist in the Office of Instructional Technology, has been given the clearance to devote some of his time to this project.

During the past year, sampling was conducted in the Beinecke and Red Oak stands. These sites are revisited every five years to monitor compositional changes and growth in these to historically significant stands. Several students--Brook Ray Smith '02, Nura Kinge '05 and Lani Stinson--conducted the sampling of these plots under the direction of Hank Art.

Table I HMF STUDENT RESEARCHERS—Summer 2002

<u>Student</u>	<u>Supervisor</u>	<u>Project</u>	<u>Funding</u>
Flynn Boonstra '04	Joan Edwards	Garlic Mustard	Biology
Tory Hendry '04	Edwards	Garlic Mustard	Biology
Matt Jungers '03	David Dethier	Sediment transport in Birch Brook Watershed	Geosciences
Jude Dumfey '04	Art, David Richardson	Allelopathy	Chemistry
Nisha David '05	Art, David Richardson	Allelopathy	Chemistry
Angus Beal '03	Morales	Mutualism	Biology
Jen Barone '03	Morales	Mutualism	Biology
Nura Kinge '05	Art	Permanent Plot Data Entry/Sampling	CES
Lani Stinson	Art	Permanent Plot Data Entry/Sampling	CES

Brook Ray Smith '02	Art	Lab Assistant/ Vegetation Sampling	CES
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### **Watershed/Meteorological Monitoring (Environmental Analysis Lab)**

Once again, the Center for Environmental Studies' Environmental Analysis Lab--under the guidance of David Dethier and Sandy Brown--continued the process of analyzing meteorological, hydrologic and biogeochemical parameters within the Forest. Four weather stations and two stream gauging stations were monitored continuously throughout the year with the aid of digital data loggers. The main weather station is now electronically connected to the campus network and data downloads from that station are now automated in real time. Newly acquired software allows the data to be viewed in real time from several computers on campus and at the Rosenberg Center.

On July 30th, 2002, the weirs were dredged and the sediment load weighed by HMF and lab personnel. Formerly, there was a gauging weir along the North Fork of Birch Brook, but this station is no longer in service. Rachel Horwitz '04--along with part-time stints from Sam Van Volkenburg '05, Nina Trautman '03 and Eleanor Shoreman--was employed with CES funding to assist Sandy Brown in running the lab during the past summer.

### **Rare Species**

#### Wild Gensing (*Panax quincifolia*)

Drew Jones inventoried a population of wild gensing (*Panax quincifolia*), a Massachusetts 'species of special concern', for the New England Wildflower Society's plant volunteer program. This population, which had been previously documented at the site, appeared to be healthy.

#### Crooked-stem Aster (*Aster preenthoides*)

This rare aster was not monitored this year. However, actions were taken to protect a population that grows along the Hoosic River Trail by restricting horse access to this area.

#### Crayfish (*Cambarus bartonii*)

No work was conducted on the Appalachian Brook Crayfish (*Cambarus bartonii*) this past year. During the previous summer, a volunteer had documented several populations of this Massachusetts 'species of special concern' in the Birch Brook and Ford Glen watersheds. Several individual crayfish were found during the weir-dredging day on July 30<sup>th</sup>. In addition, three spring salamanders

(*Gyrinophilus porphyriticus*), another 'species of special concern', were found that day.

#### Breeding Bird Point Surveys

During June, Drew surveyed 40 points that had been established the previous year throughout the Forest to monitor breeding birds. These points were located with a GPS receiver and will continue to be surveyed on a yearly basis.

### **Data Management**

## Geographic Information Systems

Bill Fox, a CES Research Associate, continues to develop a database of HMF cover maps using Arcview GIS. Dr. Fox is working with Henry Art to spatially analyze the changing forest landscape in the HMF. As mentioned, Jason Taylor has started working on the integration of the long-term vegetation and weather/stream gauging data.

## **TEACHING**

During the fall semester, BIOL/ENVI 203--*Ecology*, held several lab sections at the Forest; these sections were taught by Kenneth Schmidt, Visiting Biology Professor. Dr. Schmidt integrated the saw-whet owl banding project into his course, having students visit the site on several occasions during the fall migration period.

During the spring, BIOL 302/ENVI 312--*Communities and Ecosystems* (Schmidt), and BIOL/ENVI 220—*Field Botany* (Edwards), made use of the Forest for several lab/field sessions. Some students from these classes and ENVI 102--*Introduction to Environmental Science*, used the Forest for their independent research; these projects ranged from tapping of birch trees (to produce birch beer) to the study of amphibian larvae in root-rut vernal pools. This year ENVI 102 did not use the Forest regularly for its labs as in years past, opting instead for a location closer to campus; there is talk about returning to HMF for the 2003 class labs.

## **FACILITIES/CARETAKING**

### Rosenburg Center

During the fall of 2001, the Rosenburg Center was equipped with four computer work stations: two Macintosh and two IBMs. Although these computers came from OIT surplus stock, they are adequate for running basic software and have enabled linkage to the campus network and Internet via a DSL line and a network of data ports that were installed in the building in 2001. The next step is to procure a few high-end computers so that GIS and GPS applications can be run at the Rosenburg Center Lab; a request for such machines has been submitted to OIT.

The aging refrigerator in the dry lab was finally replaced by a more up-to-date and capacious unit. Additionally, Drew has continued to expand a collection of field guides and reference books that are housed in the lab. These guides are available for students to use in and around the Hopkins Forest and can be checked-out through Drew.

During the winter/spring of 2002, the old, crumbling stone walls that had framed the basement doors to the Rosenburg Center were finally replaced by solid masonry structures. Likewise, the doors themselves were replaced, finally enabling us to seal off the basement. During this job, an electrical wire was run from the building to the back shed and lights and outlets were installed. This will eliminate the need to run dangerous extension cords to the shed as was the practice in the past (the back section of the shed was used as a banding lab for saw-whet owls in the fall of '01).

### Interpretive Program

During the summer 2002, Alicia Arevalos '05 was awarded a CES grant to design and produce a network of permanent interpretive signs for the Lower Loop Trail. At the time of writing, thirteen signs were being

designed for placement along the trail. The work of producing the signs will be contracted out and we aim to have many in place by the end of 2002. Once completed, these signs should go a long way toward educating the public as to the mission and academic activities of the Hopkins Forest.

### Farm Museum

The Moon Barn, replete with new light fixtures, hosted several exhibits, which generally coincided with public events during this period. The museum collection has become more serviceable since it was organized during the summer of 2001.

### Canopy Walkway

The canopy walkway was inspected once again in 2002 and some routine maintenance was performed by inspector Bart Bouricius. The walkway continues to be used about three times per year for public and educational events. It has been several years, however, since any academic activities utilized this facility.

### Utility Vehicle

This past year, HMF acquired a new John Deere diesel (6X4) utility vehicle to assist with jobs requiring the hauling of heavy materials and supplies. This vehicle--equipped with a trailer, tipping bed and winch--has a payload of over 1200 pounds. Indeed, it has already been instrumental, not only in the maintenance of grounds and trails, but also in watering Dr. Morales' goldenrod plots. This vehicle, which was paid for in FY '03, should have many useful applications in maintaining the grounds and research sites in the future.

### Trails/Ski Track

The Upper Loop restoration project was slated for summer 2002, but logistical details delayed the start of this undertaking for several weeks. This project, which will be funded in part through a grant from DEM's Trails Program, will re-surface several severely degraded sections over a one mile length of the Upper Loop Trail. A local contractor--who put in the cross-country course at Mt. Greylock High School--will be engaged in this work for several weeks using an excavator.

The summer of 2002 brought a major campaign to stabilize the upper half of the Birch Brook Trail, which had become severely eroded in sections. An Americorps Crew spent ten days on this task that included setting many water bars, countless check steps and a culvert in the trail. The lower section of the Birch Brook Trail will likely be targeted for future restoration.

### Roads

The entry road to the Rosenberg Center was resurfaced in the spring of 2002 with funding assistance from the Buildings and Grounds Department.

### Land Acquisition/Boundaries

FY '02 saw a significant addition of land to the Hopkins Forest: the acquisition of the entire interest in the Thornton/Black parcel. The College now owns the entire interest in the 115 acre parcel, which is contiguous with an additional 250 acres that it had already owned in Pownal. This newly consolidated section of the Forest has few use restrictions and may soon be entered into a Vermont forest management

program.

The Northwest Hill parcel (80 acres), acquired in 2001, was posted and marked by student workers during the past fiscal year.

### **Caretaking**

As in the past, HMF relied for a major part of its management, upkeep and outreach activities on the efforts of student caretakers. The fall and spring semesters had a regular crew of eight to ten students, each generally working 3 to 5 hours per week under the leadership of head caretaker, Michelle Ruby '02.

The fall crew kept busy working in the Buxton Garden; preparing for and hosting the Fall Festival; marking and posting boundaries; preparing for hunting season; and doing general property maintenance. In the spring, the major effort was the maple sugaring campaign; some time was spent preparing equipment and splitting wood before the season and in cleaning up afterwards. Caretakers also spent some time preparing and planting a goldenrod field as a future research site for Manuel Morales. They were also involved with preparing for and hosting two spring events, *Maplefest* and Spring Field Day. Some students also assisted with school programs.

A summer caretaking crew, consisting of Ken Brown '05 and several short-term employees—Briana Halpin '04, Melissa Purdy '02, Josh Earn '04, and Sam Van Volkenburg '05, labored throughout the summer. In addition to their regular tasks—mowing, gardening, trail and water-bar maintenance, working on research plots, maintaining the museum collection and the Rosenburg Center area—this year's crew spent about 10 percent of its time tending the 'Forest Garden' at Kellogg House. They were also dispatched to help the Americorps crew on the restoration of the Birch Brook Trail in mid-July.

Total caretaking hours during the academic year 2001-02:

Fall: 304.5 hrs.

Spring: 485.25 hrs

Total: 789.75 hrs

### **Public Outreach**

#### Community Events

As in years past, HMF hosted several events for the public and college communities (APPENDIX II lists these and other Forest activities). They were generally well attended and well received by visitors. The following events were held the past year:

- **Fall Festival**—The Fall Festival was held on Sunday, October 6<sup>th</sup> with approximately 200 people taking advantage of a fine fall afternoon to attend. Traditional forest and harvest activities—beam hewing, shake-splitting, cider and apple butter production--and live music were featured.
- **Fall Family Days**--This was the first year that events were planned for the fall family weekend with two guided hikes held on Saturday October 27<sup>th</sup>. Approximately 40 people took part in the two hikes.

· **Maple Festival**— "Maplefest" was held on a blustery Sunday afternoon (March 10th). A solid turnout of 125-150 people came to see sugaring exhibits, demonstrations, and to taste HMF produced syrup served over pancakes and 'on snow'.

· **Spring Field Day**--which coincided with Family Weekend, was held on April 20<sup>th</sup>. This event included hikes, bird-walks, and canopy walkway visits on a seasonable spring day. In spite of fine weather, attendance for the afternoon's activities was quite low this year (under 100).

· **Alumni Day**—HMF again offered a variety of activities including hikes, trips up the canopy walkway, ropes course and childrens' activities for this year's Alumni Weekend (June 8<sup>th</sup>). A solid crowd of over 100 attended this year's activities, taking advantage of a pleasant June day.

### Local Schools

As usual, HMF hosted a variety of school groups from around the area. Student naturalists and, in some cases, Drew served as guides or interpreters for these school groups. Stream-oriented activities continued to be especially popular with several groups.

On November 17th, the Rosenburg Center played host to a *Project Learning Tree* workshop. This training session--aimed at those interested in environmental education--drew about 12 Williams students in addition to several staff/community members and two teachers from the local elementary school. It was moderated by a certified facilitator from the Department of Environmental Management. We may continue to host such workshops in the future depending upon student interest.

### Publicity

The local press published articles announcing the hunting season and the community festivals in addition to a piece on equestrian use in the Forest.

### **Williams Outing Club**

The Outing Club cabin saw a constant stream of use during the year 2001-02, hosting revelers on approximately 30 nights. The cabin was also used during *Maplefest* in March. The Outing Club lean-to was used sparingly by the Williams Community; use by unauthorized persons was not noted this year, although the remoteness of the facility prevents us from monitoring it closely. The new low-ropes course has proven to be very popular; the Outing Club has used the facility often for the community and college.

The WOC student naturalists were active in HMF during the past year. Led by Paige McClanahan '04, the naturalists conducted a variety of hikes and bird-walks and co-sponsored some community events such as *Maplefest*

## **SPECIAL PROGRAMS**

### **Hunting**

As in past years, HMF hosted a special permit hunt during the Massachusetts deer shotgun season. As usual, no hunting was permitted in Vermont, New York or east of Northwest Hill Road, nor was archery hunting allowed. Ninety hunters from throughout Massachusetts and several other states registered nine deer (unofficial sign-in), mostly antler-less, during the twelve day season; both figures were similar to



those of the previous year. Williams College security along with Williamstown police officers were hired to provide security during the hunt. This season, Massachusetts Wildlife Environmental Police were commissioned to bolster up security on both Saturdays. These officials handed out several citations for hunting on posted sections of the Forest (east of Northwest Hill Road). We hope that, with a higher security profile, hunting violations will be minimized in the future.

As in past years, the HMF hunting program had to be subsidized from the Forest's operating budget (Table V). As of now this loss appears to be necessary to maintain both the level of hunters and security needed to achieve our goals of managing the Forest's deer population.

### **Maple Syrup Season**

The spring of 2002 was another good one for maple syrup production in the HMF sugarbush. The tapping period lasted from February 18<sup>th</sup> until the last buckets were removed around the first of April. During these seven weeks, caretakers collected over 2500 gallons of sap from 125 trees, mostly along Northwest Hill Road (Table III). This sap was boiled down into approximately 40 gallons of syrup that was ultimately bottled. During this season, we also hosted the "Maplefest" celebration and entertained several classes and numerous public visitors. During the past year, we focused on sugarbush management: removing competitive non-maples and thinning over-crowded maples; this work will continue into the current year.

Table II SUMMARY OF SUGARING ACTIVITIES—2002

Trees tapped	125*
Tapping Period (days)	41
Tap Nights	4985
Gallons of Sap	2580
Days (sessions) Boiled	9
Hours	109
Gallons (approx.)	
Raw Syrup Drawn Off	48
Bottled	40.0
Caretaker hours	219.5**
Manager's hours	120**

\*Most figures are approximate

\*\*Not including before and after tapping period

### **ADMINISTRATIVE**

## **HMF Users Committee**

The Hopkins Forest Users Committee is charged with deciding most of the management and planning issues pertaining to the Forest and its infrastructure. Most of its members--selected from among College faculty, staff and students--have vested research or teaching interests in the Forest (Table IV). Under the direction of Dr. Joan Edwards, the committee met each month to advise and assist the Forest Manager. In addition to serving in his "ex-officio" post on the HMF Users Committee, HMF Manager Drew Jones also serves on the advisory committee for the Center for Environmental Studies.

### Table IV HMF USERS COMMITTEE--2001/02

Joan Edwards, Chair, Biology

Kai Lee, Acting CES Director

Hank Art, Biology

David Smith, Biology

Jay Thoman, Chemistry

David Dethier, Geosciences

Manuel Morales, Biology

Sandy Brown, CES—Environmental Analysis Lab

Scott Lewis, Director—Williams Outing Club

Drew Jones, HMF Manager

Bill Sacks '03

## **Affiliations**

Taconic Crest Trail Consortium: Drew has been working with the Taconic Crest Trail Consortium and attending regular meetings of that organization, which seeks to promote sustainable recreational use of that 35 mile trail and coordinate management and maintenance activities. The Rosenburg Center has provided a venue for the semi-regular meetings of this Consortium whose members represent a number of non-profit groups and agencies from New York and Massachusetts. This year we will contribute to the printing costs of the Taconic Trail Map and will have those maps available at the new kiosk at the Petersburg Pass trailhead.

Hoosic River Watershed Association (HoorWA): Drew participated in the HoorWA's Artists and Scientists program by giving several presentations and lessons at a school in Clarksburg, MA during the spring.

North Berkshire Audubon Chapter--HMF continued to host bird counts and walks sponsored by the North Berkshire Audubon Chapter, including the annual Christmas Bird and Spring Migration counts.

## Conferences/Meetings

Drew attended the following conferences during the past year:

- *Northeast Environmental Studies Consortium*, Annual Meeting, Saratoga Springs, NY, November 10-11, 2001.
- *Organization of Biological Field Stations*--Annual Meeting: Oklahoma, September 20-23, 2001. Drew plans to attend the '02 meeting from September 19<sup>th</sup> to 22<sup>nd</sup> at the Kellogg Biological Station in Michigan.
- *Massachusetts Woodlands Cooperative*--Organizational Meeting, Plainfield, MA, October 4th, 2001.

## FUTURE

### --What's in store for 2002-03?

Research Directions: We look forward to an expansion of the mutualism studies to the newly prepared field on Northwest Hill Road during the coming year. It is expected that introduction of experimental insect colonies and subsequent investigations will be possible by Summer 2003.

Other research and monitoring initiatives--including the allelopathy, garlic mustard, and maple genetics studies, Northern saw-whet owl banding and weather and stream monitoring--will continue into the coming year. To strengthen our hydrological monitoring program we are tentatively planning to install a groundwater monitoring well at the main weather station.

We aim, through cooperation with the Office of Instructional Technology, to continue the process of building the Hopkins Forest databases and making them accessible to the College community through a the campus network. We will continue to work with Jason Taylor of OIT to make this happen.

### Teaching

Manager Drew Jones will be teaching a winter study course, *The New England Forest*, which will use the Forest and the Rosenberg Center for its class meetings. We also look forward to continued use of the Forest by several Biology classes, ENVI 102, and perhaps other classes during this academic year.

Outreach: We intend to continue reaching out to the community by having the Forest as an arena for student naturalists to gain experience in teaching and outreach through contact with local public schools and community groups.

### Facilities

We aim to continue to upgrade the computer work stations at the Rosenberg Center; it is our intention to procure several lap-tops with GIS/GPS capabilities to complement the existing set-up. As we continue to grow, there will be an increasing need for additional space, not only for lab and teaching activities, but also for storage; indeed, space for storage and maintenance of equipment has become sorely limited. We aim to expand such storage facilities in the coming year.

### Planning

During the upcoming year, we aim to invite a team of professionals from various field stations and universities to review the Hopkins Forest program and to offer recommendations for strengthening it. Some of the planning aspects that we would expect a review team to address are: improving facilities; strengthening and expanding the research program; managing the Vermont tracts; possibly converting the declining plantations; honing data management/dissemination strategies; increasing teaching; and possibly starting a Research Experiences for Undergraduates (REU) program at the Forest.

This year, with possible input from the review panel, we will start to develop a management plan for the 365 acres of recently consolidated land in Vermont. One idea is to enroll the property in the Vermont Forest Stewardship Program, thereby saving substantially on annual property tax levies. We will aim to integrate whatever management strategy we adopt into the educational mission of the Forest.

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