

HOPKINS MEMORIAL FOREST

Activities Report

2011-2012



Drew Jones, HMF Manager

Williams College--Center for Environmental Studies

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Summary: The Year 2011-12

During the period September 2011 through August 2012, Williams College's environmental field station, Hopkins Memorial Forest (HMF), hosted a wide variety of research and educational activities. Henry Art and a crew of five students undertook vegetation surveys in the Red Oak Inventory Site. Joan Edwards' and her student assistants continued working on the study of population dynamics of garlic mustard and they continued to do baseline surveys for her study of aster and goldenrod diversity in the weather station field. In addition, David Dethier and Jay Racela continued their meteorological and geochemical monitoring activities. The northern saw-whet owl banding station was again open during fall 2011.

During fall 2012, Professor Cathy Gibson of Skidmore College undertook a study on nutrient metabolism in Birch Brook. This was one of several sites used in her more comprehensive study of streams in the northeast.

Hopkins Forest continued to be a focal point for local and regional educational programming. In June we hosted a forest pest workshop that focused on the detection and control of two rapidly encroaching insect invaders: the Asian long-horned beetle and the emerald ash borer. As in the past, Williams College Biology and Environmental Science classes made regular use of the Forest for field trips and study sites. Classes from other regional colleges, including Massachusetts College of Liberal Arts (MCLA), made use of the Forest for educational activities as well, and we conducted a variety of programs for local schools and the general public. Student caretakers were again instrumental in helping to host a variety of public events, highlighted by the Fall Festival and Maplefest.

During 2011-12 we continued to implement forest management activities – supported the Natural Resource Conservation Service – on our Vermont parcel. Foremost among them was the creation of a five-acre early successional patch cut on the Taconic Range in fall 2011.

On May 29, 2012, the Forest was hit by a major summer storm featuring “straight line” winds (Derecho), which leveled areas along the Upper Loop (Moon Lot) and Lower Loop (red oak stand). The damage was serious: several major swaths of downed trees resulted and it took several days before the trails were completely cleared of debris. The extent of the damage was mapped and documented by student researchers later that summer.

RESEARCH and MONITORING: Summer 2012 and Ongoing

Several scientific studies were underway during the past year (Table I).

Table I. HMF Williams College Student Researchers—Summer 2012.

<u>Student</u>	<u>Supervisor</u>	<u>Project</u>
Eric Hagen '14	Art	Permanent Plot Survey
Laurel Hamers '14	Art	Permanent Plot Survey
Ryan Buchanon '15	Art	Permanent Plot Survey
Claudia Corona '13	Art	Permanent Plot Survey
Sarah Rowe '13	Art	Permanent Plot Survey
Gordon Smith '13	Edwards	Garlic Mustard
Evelyn Tran '14	Edwards	Garlic Mustard
Amber Ellis '15	Racela	Hydro/Meteorology; Lab assistant
Julie Jung '15	Racela	Hydro/Meteorology; Lab assistant

Conservation of Asters, Goldenrods, and their Pollinators

Professor Joan Edwards continued baseline vegetation surveys for her study of old field management using the main weather station field. The design features a grid of twelve 24x24 meter plots on which the effects of four different mowing regimes will be tested: annual spring and fall mowing and a biennial early and late mowing. The entire field was slated to be mowed in fall 2012 so that treatments could begin the following year.

Nutrient Uptake in Birch Brook, Skidmore College

In autumn 2011, Dr. Cathy Gibson of Skidmore College conducted a stream metabolism study in Birch Brook, focusing on nitrogen/phosphorus ratios and how they might correlate to inputs of organic matter throughout the period of fall leaf deposition. Gibson made weekly visits to her sampling site, a 200 meter stretch of Birch Brook, just above the confluence of the Main Stem and North Branch, concluding her work in December 2012.

Long-term Vegetation Studies

During summer 2012, Professor Henry Art and his student assistants conducted surveys of the Farm-Forestry Unit and the IBP plot within the Red Oak Inventory Site. These surveys are conducted at five year intervals. Both of these sites were severely affected by the straight-line wind storm of May 2012 and the crew spent time delimiting the effect and scope of the associated blow-down. About 15 cross sections were taken from five large wind-thrown oaks and preserved. They will be analyzed to ascertain growth rates and dynamics. In addition, the crew did some follow-up work from the previous two summers of surveys of the original Forest Service permanent plot network.

Ant/Leaf Hopper Mutualism

There was no field work conducted on this study during the summer 2012 as Professor Manuel Morales focused on writing. His work on mutualistic interactions between ants (*Myrmica spp.*) and leaf hoppers (*Publilia spp.*) on goldenrod plants will continue in future field seasons.

Garlic Mustard--Population Dynamics in Forested Ecosystems

Professor Joan Edwards' study of population dynamics of garlic mustard (*Alliaria petiolata*) continued in 2012. Gordon Smith '13 and Evelyn Tran '14 provided the field assistance with this study, collecting growth and recruitment data on established plots in three separate areas in Hopkins Forest: the Beinecke stand, the former mansion site, and the red oak stand.

Garlic Mustard, Tufts University (Discontinued)

Tegan Morton, a Masters student at Tufts University, completed her study on the effect of a geographic mosaic (with regards to soil quality) on defense allocation in garlic mustard (*Alliaria petiolata*) during summer 2011 and no work was done on the study this fiscal year.

Northern Saw-whet Owl (NSWO) Migration Banding

With the assistance of Dr. Ken Schmidt of Texas Tech University, the northern saw-whet owl (*Aegolius acadicus*) banding station was active once again in autumn 2011. We used our customary single-tier array of four 12-meter nets (with an audio-lure) along a trail south of the Rosenberg Center to catch migrating owls. The station was open on dry, calm nights from dark until around midnight between October 2nd and December 1st. During this period (38 nights of operation) we captured 220 individual saw-whet owls (Figures I and II), our station's second highest total in its 11 year history. The 19 recaptures of birds banded at other stations (foreign recaptures) were a station record. The HMF station served as the basis for field trips by Williams Biology classes as well as Environmental Science and Biology classes from MCLA, Berkshire Community College and Union College. In total, the station attracted 238 registered visitors during the season.



Figure I. Northern saw-whet owl captured at HMF.

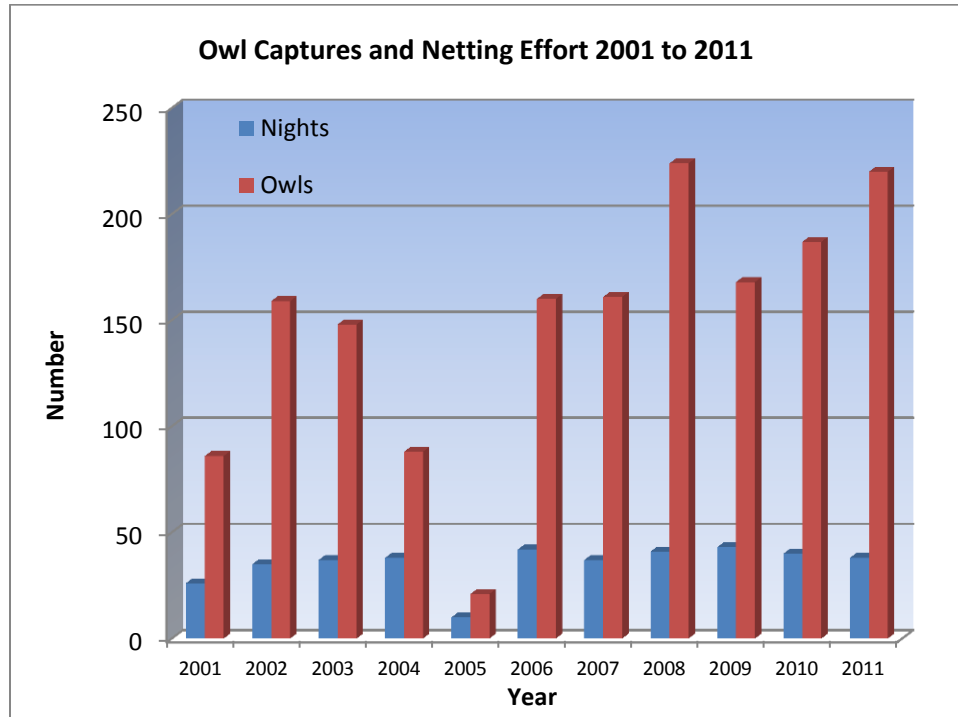


Figure II. Northern saw-whet owl captures at HMF, 2001-2011

Breeding Bird Point Surveys

In June 2012, I sampled singing males at 44 points that were established in 2001 to monitor breeding bird populations in the Forest. This year's total individuals (458) and species (47) were unremarkable for this site. Once again the red-eyed vireo and ovenbird topped the list of most abundant species, followed by the American redstart, veery and scarlet tanager (Table II). These points will continue to be surveyed on an annual basis.

Table II. Most abundant bird species from point counts, June 2012.

	Species	Number	Percent of total
1	Red-eyed Vireo	84	18.3
2	Ovenbird	82	17.9
3	Veery	31	6.8
4	American Redstart	30	6.6
5	Common Yellowthroat	16	3.5
6	Chestnut-sided Warbler	11	2.4
6	American Robin	11	2.4
6	Black-throated Blue Warbler	11	2.4
6	Yellow-bellied Sapsucker	11	2.4
10	Scarlet Tanager	10	2.2
10	Hermit Thrush	10	2.2
10	American Crow	10	2.2

Rare Species

In July 2012, six plots along the Hoosic River trail were surveyed to monitor the population of crooked-stem asters (*Symphiotrichum prenanthoides*). The number of asters counted in 2012 was lower than in past years. We noted a coincidence of heavy shade above many of the plots and thinned some competing non-native plants in an effort to reduce competition with the asters.

Watershed/Meteorological Monitoring (Environmental Analysis Lab)

The Center for Environmental Studies' Environmental Analysis Lab--under the guidance of David Dethier (Geosciences) and Technical Assistant Jay Racela--continued to gather, analyze and archive meteorological, hydrological and biogeochemical data from the Forest (Figures III and IV). Four standard weather stations, two stream gauging stations, and one vernal pool water depth and temperature station, using digital data loggers, ran continuously throughout the year. Data from the main weather station are streamed to the campus information network and displayed (<http://web.williams.edu/weather/>) along with data from the Taconic Ridge 50-m MET tower and the Morley Science Labs photovoltaic array. Bi-weekly and monthly collection and laboratory analysis of rain or stream water also continued (1983-present) as part of ongoing forest geochemical research that focuses on acid deposition and how it and other pollutants are "processed" by the forest ecosystem.

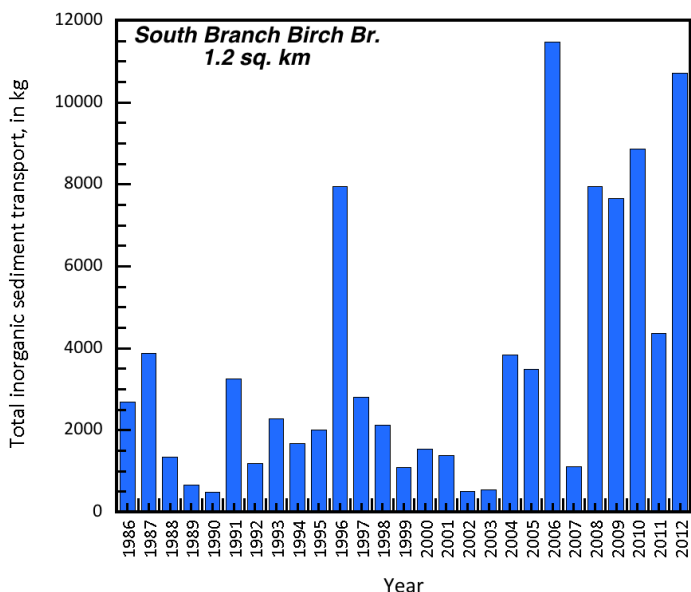


Figure III. Total inorganic sediment transported at the South Branch Birch Brook gauging station

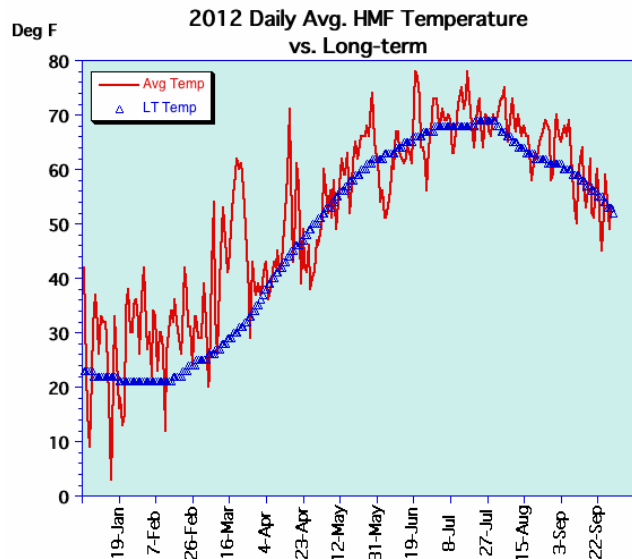


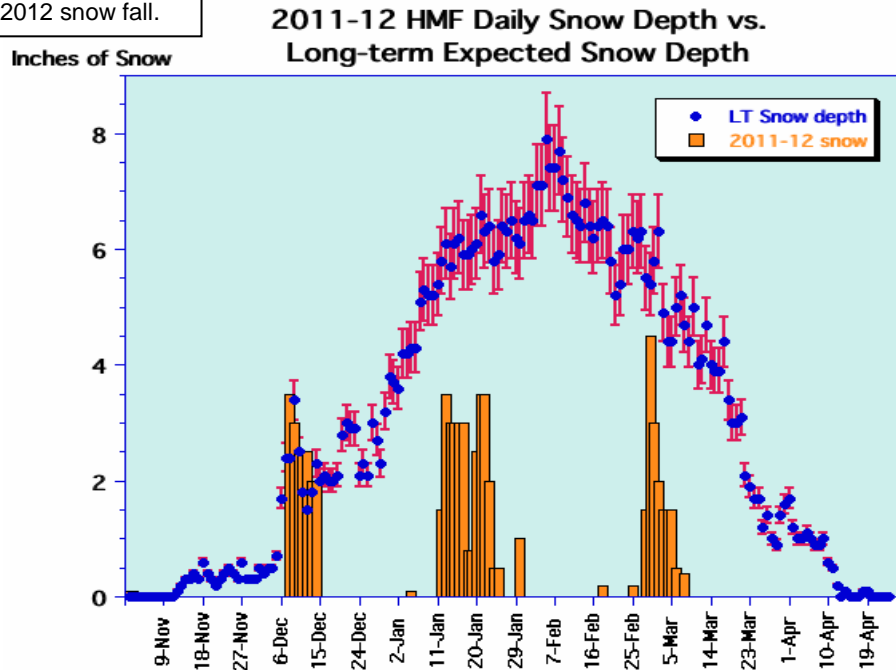
Figure IV. To date 2012 HMF daily average temperatures have averaged 4 degrees F above the long-term expected temperature.

Amber Ellis '15 and Julie Jung '15 worked as research assistants with Jay Racela during the past summer. During their tenure in the lab, in addition to their regular field and lab research duties, Amber and Julie compiled the lab's historical chemical data on Eph's Pond to investigate and report on the College's effect on local waters, and created a poster illustrating their results.

This year sediment in the weirs along the South Branch and Main Stem of Birch Brook was dredged and weighed by HMF and lab personnel and volunteers in mid-July. The sediment weight removed from the South Branch weir was much higher than average, reflecting long periods of high flow from Tropical Storm Irene and other big events.

Unfortunately, total snowfall for the previous snow season was less than expected and strayed far from the expected amounts (Figure V).

Figure V. 2012 snow fall.



EDUCATION and OUTREACH

Undergraduate Classes

During the fall semester, BIOL/ENVI 203—*Ecology* (Smith) held several lab sessions at the Forest. In spring 2012, ENVI 102--*Introduction to Environmental Science* (Cook, Bingemann) used the Forest for some of its laboratory exercises aimed at estimating carbon storage in biomass and soils. A team of students from that class sampled sugar maples for their independent study of the chemistry of maple sap. BIOL 102--*The Organism* also visited the Forest for laboratory exercises in the spring. In addition, BIOL 220—*Field Botany and Plant Natural History* (Edwards) made numerous visits to the Forest for field investigations. The Forest figured prominently in a class on Nature Writing offered by CES visiting professor Elizabeth Colbert; after a class field trip the students used the some aspect of the forest as the subject of their major project. In addition, HMF also hosted field trips and lab sessions by Biology and Environmental Science classes from Massachusetts College of Liberal Arts, Berkshire Community College and Union College (Appendix I).

Public Outreach

Community Events

Once again HMF hosted several events for the public and College communities. The following events were held the past year:

- **Fall Festival**— The Fall Festival was held on Sunday, September 25th and, on a warm afternoon, drew more than 250 visitors. In addition to the traditional forest and harvest activities—beam hewing, shake-splitting, cross-cut sawing, apple butter and cider production, and live fiddle music—the event featured guided tours of the canopy walkway.
- **Animal Tracking**— Dan Yacobellis, a naturalist from Grafton, NY, was hired to lead our annual wildlife tracking workshop on February 11th. The event attracted 20 people, including many Williams students.

- **Maple Festival**— “Maplefest” was celebrated on Saturday, March 10th, drawing a crowd of approximately 200 on a seasonable late winter afternoon. People came to see sugaring exhibits and demonstrations and to taste HMF produced syrup served over pancakes.
- **Amphibian & Reptile Program** – On April 21st, Tom Tynning of Berkshire Community College led a reptile and amphibian foray in Hopkins Forest. Approximately 40 people, including a large contingent of home school families, attended.
- **Wildflower Walk**– Joan Edwards led this annual event on Saturday, May 5th; this popular event attracted approximately 25 people this year.
- **Alumni Day**— HMF again offered a variety of activities, including a bird walk, hikes, and children’s activities, during this year’s Alumni Weekend (June 9th). Fair weather this year resulted in a good turnout for the activities.
- **Urban Scholars**-- In July, 2012 the Urban Scholars were back for two programs at Hopkins Forest. This year the high school students from New York took part in a canopy walkway tour and a program on aquatic life.

Forest Pest Workshop

On Saturday, June 30th we, along with Massachusetts Department of Agricultural Resources (MDAP), hosted a workshop on invasive forest pests. The goal of this three hour event was to teach land-owners and natural resources professionals to identify and report possible outbreaks of the Asian longhorn beetle and the emerald ash borer before they cause devastation in the Berkshires. The workshop, conducted by MDAP Biologist Samantha Brady, drew 32 participants from throughout the community.

Schools

Public education continued to be a prominent part of our programming at Hopkins Forest. First and fifth grade classes from Williamstown Elementary School made visits to the Forest for hands-on educational programs. Home-school groups took advantage of Hopkins Forest as well, visiting for programs on owls in the fall and reptiles in the spring. In addition, I made two ex-situ visits to Mount Greylock High School and another to the Berkshire Museum to help with the regional science fair.

RECREATION

This year numerous hikers, joggers, horse-back riders, skiers, and nature observers took to the trails of the Forest in their recreational pursuits. Fortunately, the year was quiet insofar as trespassing and public use problems were concerned. We have been active with the Taconic Crest Trail (TCT) Consortium, which is dedicated to the stewardship of the TCT.

Williams Outing Club

Once its roof was repaired in September 2011, the Outing Club cabin accommodated hostellers on a regular basis during the academic year. It was also integral to our hosting of the *Maplefest* event in March 2012. By contrast, the remote Outing Club lean-to was used sparingly by the Williams Community. The Club began to refurbish the low-ropes course to the point where it was able to be used once in the spring. However, more work will be needed before regular programming can continue in earnest. The Outing Club student naturalists planned several Forest-related activities during spring 2012.

Hunting

In late autumn 2011, HMF again hosted its annual special permit deer hunt for the Massachusetts shotgun season. As usual, no hunting was permitted in Vermont, New York or east of Northwest Hill Road, nor was archery hunting allowed. Eighty-seven hunters were issued permits and two deer were harvested during the twelve day season according to our unofficial sign-in (Table III). In 2011 permits

were again distributed at no charge and the season went on without a hitch. Since previously registered hunters were not required to submit an updated application this year, it is likely that the actual number of hunters on the property was lower than what is indicated on the table. Williams College security officers were hired to provide surveillance during the busiest days of the hunt.

Table III. Hunting effort and deer harvested at HMF since 1999.

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Mean
Permits Issued	110	86	90	86	86	100	93	89	83	66	61	82	87	86.1
Total Deer Harvested	13	9	9	20	10	8	10	14	3	4	4	4	2	8.5
Success Rate (percent)	11.8	10.5	10.0	23.3	11.6	8.0	10.8	15.7	3.6	6.1	6.6	4.9	2.3	9.8

MAPLE SUGARING

The 2012 sugaring season was an early and short one due to the mild late winter; indeed the February 13th tapping date was the earliest in my 13 year tenure here. Nonetheless, production was solid as student workers gathered 1615 gallons of raw sap, which was boiled into 30 gallons of syrup (Table IV). The finished syrup was lighter this year with most of the batches resulting in an “A-grade” (the sap averaged 2.5 percent sugar). During the sugaring season, we hosted our annual ‘*Maplefest*’ celebration, which attracted a solid crowd of community members and Williams students. This was the first year that the season was effectively finished by the onset of the spring mid-semester recess.



Figure VI. Sap bucket in HMF sugarbush.

Table IV. Hopkins Forest Maple Syrup Production 2000-2012.

Year	Beginning Tap Date	Taps	Sap gallons	Sap per tap	Boil hours	Syrup drawn off gallons	Bottled syrup gallons	Sap boiled per hr.	Wood burned (cords)
2000	22-Feb	130	1495	11.5	135	26	23	11.1	1.3
2001	23-Feb	125	2170	17.4	100	44.5	40	21.7	2.2
2002	18-Feb	125	2580	20.6	109	48	40	23.7	2.4
2003	4-Mar	135	1625	12.0	68	34	30	23.9	1.7
2004	27-Feb	130	2130	16.4	93	44	39	22.9	2.2
2005	28-Feb	125	1680	13.4	71.5	37	35	23.5	1.9
2006	15-Feb	139	2005	14.4	72	42	39	27.8	2.1
2007	28-Feb	127	1225	9.6	46	28	26	26.6	1.4
2008	25-Feb	125	2760	22.1	116.5	63	58	23.7	3.2
2009	25-Feb	125	1935	15.5	84	41	40	23.0	1.9
2010	25-Feb	125	840	6.7	32	16	15.5	26.3	0.8
2011	23-Feb	128	1685	13.2	69.8	35	33.0	24.2	1.8
2012	13-Feb	130	1615	12.4	64	30	30	25.2	2.0
Mean	23-Feb	128	1827	14.5	81.6	37.6	34.5	23.4	1.9
Median	25-Feb	128	1685	13.4	72.0	37.0	35.0	23.7	1.9

LAND MANAGEMENT

Forest Management--Vermont Parcel

During the fall of 2011, we cleared a five-acre early successional patch atop the Taconic Ridge in the southwestern corner of the Forest's Vermont parcel. This cut was designed to reinvigorate a stand beset by a preponderance of beech bark disease (*Nectria* fungus) and to increase diversity of shrub/scrub dependent species. It was completed in late October, just before an early snowstorm arrived. Several healthy trees per acre were left for their wildlife value and mast potential. Funding for the job was provided through our 2010 contract with the Natural Resources Conservation Service's Wildlife Habitat Incentive Program. During summer 2012 we were in the stages of planning another timber stand improvement intervention on the property, a 10-acre mast tree release. This activity was slated to be implemented the following fall. Table V. outlines progress on our NRCS Conservation Plan.

Table V. Progress on work to be implemented on the Pownal Tract as part of the NRCS Conservation Plan.

Practice	Purpose	Scope	Progress	Year
Forest Roads and Trails	Maintenance and restoration of access road	6000 feet	6000 feet	2010
Pest Management	Removal of invasive plants along road	2 acres	2 acres	2010
Early Successional Habitat	Creating clearings for biodiversity on Taconic Ridge	5 acres	completed	2011
Early Successional Habitat	Creating clearings for biodiversity on Taconic Ridge	5 acres	planned	2013
Wildlife Habitat Management	Mast tree release for oak	10 acres	scheduled	2012
Forest Stand Improvement	Thinning, releasing competing trees	30 acres	future	2013

Wire Bridge Farm

In 2011-12 there was some movement toward completing the purchase of the Wire Bridge Farm. Indeed, we were in frequent discussions with its owner about acquiring the additional 60 acres. The Forest Users Committee and the Center for Environmental Studies has endorsed the move in principle and, as of summer 2012, Vice President Fred Puddister was in the process of crafting a proposal for Senior Staff. Meanwhile, Joel Burrington of Pownal, VT continued to cultivate corn and hay on the parcel and to perform rudimentary maintenance on its access road.

Roads/Trails

Once again the summer caretaking crew conducted substantial drainage remediation work on the trails. Their focus was the Lower and Upper Loop trails where they replaced about a dozen waterbars and performed maintenance on many other drainage structures and culverts. In spring 2012, the entry road to the Rosenberg Center was resurfaced and graded by a contractor hired by the Williams College Facilities Department.

FACILITIES

Rosenburg Center/Moon Barn

The Rosenberg Center was again used for classes, lab set-ups, public events, workshops, and as an exhibit space for visitors. The information technology network, including the 'WiFi' installation, generally functioned well with the support of the Williams Information Technology Department. Once again, the Moon Barn was used for public exhibit space during special events such as the Fall Festival. Due to a shortage of storage space, we continue to use this historic building, in part, for storage.

During spring 2012, some major work was done on the roof and exterior of the Rosenberg Center. The shingles, eaves, gutters, façade and one entry were the main focus of this work, which was funded by the Facilities Department and carried out by a local contractor. Now that the repairs have been made, the plan is to bolster the building's insulation. During the spring of 2012 the Facilities Department started planning for the future installation of a wood gasification boiler and solar (hot water) panel. Such renewable energy based heating systems would help the College reach its carbon dioxide emission reduction goals. As of now this upgrade is still in the planning and conceptual stage.

Canopy Walkway

This past year the canopy walkway was open for public visitation several times including during the Fall Festival. The walkway was damaged by a tree during the spring of 2012 and, although it was not serious, minor repairs were made in the summer.

Caretaking

As in the past, HMF relied on student caretakers for a major part of its maintenance, upkeep and outreach activities (Table VI). The fall and spring semesters had a regular crew of eight to ten students, each working about three to six hours per week under the leadership of head caretakers Ben Keulthau '13 and Sara Dorsey '12. The fall crew kept busy preparing for and hosting the Fall Festival, keeping up with trail maintenance, gardening and boundary posting. In the spring, much time was devoted to the maple sugaring season and hosting *Maplefest*. Spring and fall hourly totals are detailed in Table VII.

Tables VI. Student caretakers academic year 2011-12.

Ben Keulthau '13	Kiah Walker '15
Zoe Kline '12	Stephanie Durell '14
Noah Wentzel '13	Sonja Thalheimer '13
Helen Song '14	Laurel Hamers '14
Sara Dorsey '12	Michael Semensi '12
Ben Nathan '15	Marissa Shieh '15
Jessica Luning '14	George Gurney '13
Lucie Coleman '14	Nicholas Kraus '14

A seasonal caretaking crew comprised of Henry Schmidt '14 and Christopher Cameron '13 was employed throughout the summer months. The crew worked on many of the regular summer tasks—mowing, gardening, grounds-keeping, program facilitation, trail and water-bar maintenance and controlling invasive vegetation. Our crew did collaborate on occasion with the regional trail crew, consisting of Jay Gurney '13 and Erik Levinsohn '12, who were employed by the Williams Outing Club and the Williamstown Rural Lands Foundation respectively.

MEETINGS/COORDINATION

Conferences/Meetings/Affiliations

National Ecological Observatory Network (NEON): In 2011-12 we continued to hold a seat on the NEON governing board. Jay Racela made the trip to Colorado to attend the annual NEON meeting on September 16th 2011. In addition, on June 8th 2012, Jay Racela and I attended a “ribbon-cutting” ceremony and meeting at Harvard Forest.

Organization of Biological Field Stations (OBFS): We continue to hold an institutional membership in OBFS, though we did not attend the 2011 annual meeting.

Taconic Crest Trail Consortium: We continue to be involved with this consortium, which promotes sustainable recreation and coordinates stewardship activities on the 35 mile trail. The consortium held a meeting in spring 2012.

ADMINISTRATIVE

HMF Users Committee

The Hopkins Forest Users Committee--charged with oversight and planning responsibilities for the Forest--is comprised of faculty and staff who have vested research or teaching interests in the Forest (Table VII). Under the direction of new Chair Manuel Morales, the Committee met occasionally to discuss management and administrative matters during 2011-12.

Table VII. HMF Users Committee--2011-12.

Faculty	Department	Ex-officio	Affiliation
Manuel Morales, Chair	Biology	Jennifer French	CES Director
Hank Art	Biology	Scott Lewis	WOC Director
Joan Edwards	Biology	Jay Racela	CES, Envi. Analysis Lab
David Smith	Biology	Drew Jones	HMF Manager
David Dethier	Geosciences		

FUTURE – What’s in store for 2012-13?

In the summer of 2013 we will mow the first set of experimental plots for the aster and goldenrod diversity study. Most other research and educational activities will continue. Additionally, we will continue to implement the NRCS supported conservation measures on the Vermont parcel, including making another early successional patch cut on the Taconic Range. We will continue working with the Facilities Department in the planning and design of the new low-emissions heating retrofit for the Rosenberg Center and working with senior staff to resolve the status of the Wire Bridge Farm.

APPENDIX I – Outside Organizational Users of HMF 2011-12.

Organization	Location	Department/Program	Type of Use
Berkshire Community College	Pittsfield	Environmental Science	owl banding
Massachusetts College of Liberal Arts	North Adams	Biology, Environmental Science	field trip; owl banding, spring wildflowers
Texas Tech University	Lubbock, TX	Biology	Owl Banding
Union College	Schenectady, NY	Biology/General	Owl Banding
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Hoosic River Watershed Association	Williamstown	Monitoring/Outreach	Monitoring lab
Massachusetts Department of Agricultural Resources	Boston	Extension	Invasive Species Workshop
Williamstown Elementary	Williamstown	1 st and 5 th Grades	Outreach Programs
Mount Greylock High School	Williamstown	11 th grade	Workshop; guest lecture
Home School Association	Berkshire Co.	Students/Parents	Owl banding

