“If there were a way to plug into his personal energy, I’m sure he could have powered all the lights in our school!” said Keene Central School teacher Katherine Brown, after Hai worked with Keene students during their annual Environmental Awareness Week events.

“Each classroom that he entered felt his presence before he even started talking,” Brown said. The students knew they were in for a treat. And they were not disappointed.”

Hai rarely disappoints his audience.

An ESF graduate, Hai is the educational program coordinator of the AEC and the Roosevelt Wild Life Station, which works to increase conservation awareness across New York state. Hai develops educational outreach for the AEC and for the Roosevelt station’s educational program, which is headed by ESF’s D. Andrew Saunders. Hai also manages much of the project development and management for the AEC.

His outreach programs showcase his creativity and his ability to adapt a lesson to the students at hand.

Educational outreach programs at AEC fall into three main categories: discrete (on-site experiences often combined with a classroom experience), systemic (partnerships with secondary schools or other institutions to create programs integrated into the curriculum), and stand-alone projects (one-time events).

One of the most popular programs, “Traveling through Time and the Once and Future Forest,” explores forest ecology. Students explore research sites and learn about the relationships between wildlife ecology, forest ecology, forestry and economics.

“These themes are interwoven as we see and discuss more than a half-century of research. Most importantly, it is an educational experience unlike anything available elsewhere in the northern forest,” Hai said.
His educational programs embrace high school and college science students, but Hai also strives to create cross-disciplinary relationships, infusing science into other disciplines. Hai has created programs that link natural history and the process of science to core disciplinary standards for math, Spanish, French, and English/language arts.

Bruce Hodgson, a math teacher at Minerva Central School, about 20 minutes south of Newcomb, began collaborating with Hai several years ago. One of the first efforts they worked on was a Consortium for Educational Excellence through Partnerships program called “Raising a Howl,” in which MCS and Indian Lake Central School worked with ESF to create a town hall meeting to debate the feasibility of reintroducing the wolf into the Adirondacks.

“Paul has been tireless at creating and building the educational outreach of the AEC, not just for the students who reside within the Blue Line,” said Hodgson, using a traditional reference to the line that delineates the Adirondack Park on maps.

“The Natural History of Literature,” a two-day discrete program created for the MCS ninth-grade English class, engaged students in an exploration of the sense of place. The program began with readings from *Out of Africa*, *Desert Solitaire* and *The Last of the Mohicans* and the students, without knowing the titles or works, were asked to identify the places based on the author’s rich descriptions of the natural landscape. Next, students were shown a “place” with which they were not familiar (an active volcano crater) and asked to describe it, imagining sensory observations and paying attention to literary devices to create an evocative description. This exercise concluded with a discussion of the importance of precise observation and basic natural history knowledge in forming a believable and accurate articulation of place.

This classroom program was followed by a daylong visit to HWF, where students were taught observation skills and introduced to Adirondack biodiversity. The students also participated in a writer’s retreat, where they chose a site in the Arbutus area, developed a narrative of place for their site, and shared their writings with the group.

Another interdisciplinary effort is the “Flyways Program” (developed as a discrete program and later expanded to be systemic) for the Newcomb Central School’s seventh-grade Spanish class. This program, created in partnership with Newcomb Central School Spanish teacher Martha Swan, introduces students to the natural history of Adirondack breeding birds. Students explore the culture of the Spanish-speaking countries where many Adirondack birds spend their winter. The students learn to describe and identify common birds of the Adirondacks in concert with Spanish vocabulary and sentence structure. Students choose a species and research the bird’s life history and the culture of the country where it winters.

Flyways students conclude the program by participating in the Great Backyard Bird Count, a citizen science project. The class visits the Adirondack Park Agency’s Newcomb Visitor Interpretive Center and the AEC and — speaking almost entirely in Spanish — identifies and counts birds.

Maria Hosmer-Briggs, who teaches Writing and the Environment at ESF, visited HWF with her students in October 2005. Hai taught them about beech bark disease, selective cutting and deer exclusion.

They also used map and compass skills to plan and execute a route through the forest and then wrote about the experience.

One of those students, Sunny Steenburgh, wrote as part of her experience summary: “I believe I have found my place in nature through the many adventures of this course. Through my experiences, not only have I bonded with my classmates, I have acquired a great deal of information that I will bring with me wherever my future takes me. When visiting Huntington Wildlife Forest, I learned about the positive and negative impacts that some of the plant species have on our environment. I also grew aware of how vital safety of humans, animals and plants is when in nature. Leaders such as Paul Hai have a positive influence on other people because they have gained a lot of knowledge and experience throughout their lives and are eager to share this knowledge with others.”
Hai feels his most significant stand-alone program was the Rachel Carson in the Adirondacks Centennial Celebration, developed with his Flyways partner, Martha Swan. The program celebrated Carson’s 100th birthday, May 27. This two-month project involved more than 200 students from nine classes in six Adirondack school districts, as well as more than 25 students from urban Albany, N.Y.

The celebration featured artists in residence at schools to explore biologist Carson’s legacy through song, drawing, and writing, and culminated in a panel discussion exploring the importance of exposing children to nature in formal and informal educational experiences. It ended with a free concert. Please visit the website www.esf.edu/rachelcarson to explore the breadth of the project.

Saunders said, “In developing new connections and directions within the Adirondack region, Paul Hai has rapidly accelerated conservation education, bringing novel ideas and energy to North Country schools. Paul’s inexhaustible perseverance, wisdom, energy, and good humor are indelibly imprinted on his contributions as is his command of environmental interpretation.”

It is clear that Hai’s impact on students is significant. He said, “Producing discrete programs for science classes of all ages is a tremendous amount of fun, and very rewarding; any opportunity to create a more effective, enjoyable and memorable science class experience is a win in my book.”

Paul Hai lives with his wife, SUNY-ESF wildlife ecologist Stacy McNulty, and their daughter, Lauren, at ESF’s Adirondack Ecological Center in Newcomb, N.Y.

Transitions

New Housing Coordinator Joins AEC

Kathy Poulton came to the AEC in March, taking over housing coordination and many administration tasks from Marianne Patinelli-Dubay. Poulton grew up in Newcomb and spent 10 years as squad captain/EMT for the Newcomb Rescue Squad. She will have been married to husband Craig for 26 years this September and they have three children, son Brian and twins Brandon and Shelby. Poulton enjoys spending time with her family, including attending NASCAR auto races, and says Dale Earnhardt Jr. is her favorite driver. She and her husband have motorcycles and love to take weekend rides together. Poulton says, “In my new job I really like meeting new and interesting people from everywhere. And I enjoy all of the people that I work with at the AEC. Everyone has been really great to work with!”

You can direct inquiries to her at extension 101. Please help us welcome her to the AEC.

Ecologist Joins AEC Staff

Dr. Colin Beier will join the ESF faculty as an ecologist at the Adirondack Ecological Center.

Beier completed his undergraduate degree at Virginia Commonwealth University and a master’s degree at Virginia Tech where he studied ecophysiology of oak regeneration in southern Appalachian forests. He recently completed his Ph.D. at the University of Alaska-Fairbanks, where he was an National Science Foundation Fellow. His doctoral work focused on ecological and economic issues on the Tongass National Forest in southeastern Alaska.

Dr. Beier’s responsibilities at the AEC will emphasize research on ecological economics and sustainability in the Adirondacks and northern forest, and will include teaching and outreach. He has expressed strong interest in collaborating with our many partners in the region.

We look forward to him joining our staff.
Finally, a Taste of the “Off Season”

Annie Woods paddles out to survey beaver lodges

By Annie Woods

Huntington Wildlife Forest is an amazing place to spend a summer. I knew that within my first week here as an incoming graduate student in the summer of 2004. Since then, I have spent every summer here working on research projects. When the opportunity arose to spend the fall 2006 and spring 2007 semesters here as an assistant to the staff at the AEC through a graduate apprenticeship, I jumped at the chance. I looked forward to witnessing the passing of the seasons in the Adirondacks and finding out just what happens once all the summer students depart.

I found out lots of interesting things happen in the fall, winter, and spring, from fieldwork to office work. I helped the staff with beaver surveys, small mammal trapping, seed surveys, and deer telemetry. I also created posters and Web pages for projects occurring at the AEC and assisted with educational outreach. Meanwhile, I was able to work on my thesis and participate in courses offered here at the AEC or on campus through distance-learning technology.

Being in the Adirondacks during the fall, winter, and spring allowed me to participate in many activities here on HWF and in the nearby communities. I volunteered for marten surveys conducted by the N.Y. Department of Environmental Conservation. I worked on a research project about strategies for bio-regional policy in the northern Adirondacks and finding out just what happens in the forest with researchers from the University of Vermont. I had fun participating in events like the alumni reunion, the town of Newcomb’s Teddy Roosevelt weekend, Women in Science Day, and a global positioning system workshop.

My appreciation for the resources offered to students here grew tremendously after spending a whole year working and living on the property. I often reflect on the fact that I may never again get to live in a place so unique, wild, and beautiful!
The trophy room at Huntington Lodge provided a cozy setting earlier this year as conversation turned to philosophy instead of science. We gathered there during two weekend retreats as part of the first philosophy salon offered at the Huntington Wildlife Forest. This salon, “Introduction to the Philosophy of Science,” was led by AEC educator Marianne Patinelli-Dubay and was offered as a credit-bearing seminar for graduate students and upper-level undergraduates.

Like most ESF students, we approached the course with strong backgrounds in science and little experience in philosophy. With her expertise in philosophy, Patinelli-Dubay introduced us to the discipline of philosophy and allowed us to apply it to ecology and ecological issues, which were most relevant to our personal studies. She chose readings that she thought would be meaningful to us and provided an environment for all of us to share our perspectives, which provided stimulating discussion and a chance for us to learn from each other. She introduced us to ecophenomenology, a topic that deals with human relationships with the earth.

This course was designed as a Socratic seminar, with discussion of our readings; additionally, the course included presentations on the history of philosophy and the major movements within the discipline. We also expanded our understanding of philosophy and the philosophy of science through games, dialogues, and written exercises. The outcome was a better understanding of not only philosophy, but also our own scientific disciplines, which will serve to make us better scientists. We learned to have a holistic perspective on science’s (and scientists’) role in the world.

Patinelli-Dubay said, “This salon was really successful in providing students a forum to explore the value and the impact of specific philosophical considerations on how they approach scientific investigations.” In the fall, she will teach “Philosophy of Science” along with a new course, “The Environmental Impact of a Dualistic World-View.” This new offering will “reflect on what it means to consider nature as separate from our self-conception and the implications of permitting the body boundary between ourselves and our environments to include a division between individual consciousness and environments,” said Patinelli-Dubay.

The location of the class in the trophy room helped inspire thoughtful conversation. Being in the midst of the Adirondacks in winter with wonderful people in front of a stone fireplace, nestled in one of the Great Camps, how could we not have stimulating discussions?

By Annie Woods, Tom Hennigan, and Elizabeth Dowling

Sharon Curtis is a sophomore, fisheries and wildlife science major at Paul Smith’s College in the northern Adirondacks.
Many of us in the Adirondacks are excited about the return of moose to New York’s North Country, which includes Huntington Wildlife Forest (HWF). After more than a century’s absence, moose began returning to New York State in the early 1980s.

Currently, only a handful of moose-vehicle collisions (MVC) occur each year in New York. However, biologists at ESF and the N.Y. Department of Environmental Conservation predict increases in the state’s moose population over the next few years, which could lead to more frequent MVC. Although collisions with deer are much more common, MVC pose greater safety risks to motorists due to the larger body size and higher center of gravity of moose. The most obvious concern is the tragic death of people involved in the accidents, and the number of moose that are killed or injured. The associated effects on heath care, property damage, increased insurance premiums, loss of a wildlife resource, and public dissatisfaction cost millions of dollars each year. These negative impacts obviate a need for better understanding of where and why MVC happen in order to better predict and prevent future occurrences.

For my master’s research, I examined patterns and characteristics of MVC in Maine, using geographic information systems (GIS). I reasoned that looking to another northeastern state where MVC are already common might help New York address the problem before it gets worse. Maine has the largest population of moose in the lower 48 states (approximately 30,000 moose). Each year between 600 and 700 MVC occur in Maine, with an estimated economic impact of $17.5 million. I obtained a database of more than 8,000 police-reported MVC from the Maine Department of Transportation. I used this extensive MVC data set with land cover and topography data to identify MVC hotspots and landscape characteristics related to the risk of MVC in western Maine, which is similar to the Adirondacks.

Using a statistical model in GIS, I was able to predict 75 percent of MVC in western Maine. MVC did not occur at random, either temporally or spatially. More than half of MVC happened between 8 p.m. and midnight. MVC most often (79 percent) occurred between June and October, with the most in June (22 percent). MVC tended to cluster spatially along roads, showing distinct “hotspots” a few kilometers in length. MVC were most common on roads with high speed limits and intermediate traffic volumes. Risk of MVC was highest where these roads bisected large (2.5 to 5 km), unfragmented areas of cutover and coniferous forest cover close to non-forested wetlands and far from human development.

Not surprisingly, the daily timing of most MVCs (dusk and dark) corresponds with peaks in daily activity of moose. Darkness also impedes the ability of drivers to see moose on the road. The seasonal distribution of MVC corresponds with peak travel seasons for motorists (summer and fall), periods of increased moose activity (calving and breeding), increased food availability (vegetation green-up), and the need for cover (from intense heat or deep snow). Higher driving speeds mean slower reaction times of drivers and moose, thereby increasing risk of MVC. In areas where traffic volume is low to moderate, an increase in traffic also increases the likelihood of MVCs. At very high traffic volumes, however, moose are discouraged from entering the roadway.

Traffic was not the whole story, as evidenced by seasonal patterns and habitat relationships of MVC. In early summer, cow moose abandon their calves from the previous year to give birth again.
In 1981, two scientists working in aquatic systems, James Karr and Daniel Dudley, found that using simple measurements like pollutant concentrations to monitor and assess aquatic ecosystems did not inform where a stream fell on the spectrum of pristine to totally degraded. Their idea for a more holistic assessment was to use the fish that lived in these environments to capture the condition of the streams, because fish responded to all the influences, positive and negative, that went into the stream. By combining several measurements of biotic communities, they created a score called an index of biotic integrity (IBI).

Since that time, the concept has been successfully adapted to terrestrial systems using birds as an indicator. In New York State, we have a wealth of information on birds from the Breeding Bird Atlas (BBA) project directed by the Department of Environmental Conservation. Using data on bird communities gleaned from the 1980-85 BBA, Dr. Michale Glennon, a former PhD student at SUNY-ESF, developed an IBI for the Adirondacks. With the recent completion of the 2000-05 BBA, I was interested in assessing biotic integrity in the Adirondacks with the new atlas data. I was also interested in the relationship between biotic integrity and human development, land cover, and topography, including the land classes (zoning) in the park.

I hope my research can be used to prioritize the placement of mitigation treatments. However, given the landscape-scale (2.5-5 km) influence of habitat-related variables on MVC risk, management of traffic volume and speed may be most effective. Public information campaigns can improve driver awareness of MVC, but cannot ensure that drivers will obey posted speed limits or limit trips during times of high MVC risk. Unless people are willing to modify their driving behavior in moose country, MVC will continue to occur, and we can expect more MVC in the Adirondacks as the moose population continues to grow.

Zak Danks is a Master’s candidate in EFB under Dr. William Porter.

These yearling moose, on their own for the first time, are more likely to wander across roads and be involved in an MVC. Green-up of upland and aquatic vegetation also occurs during early summer, which accounts for the higher risk of MVC near cutovers and wetlands, both of which are important foraging areas. Cutovers contain shrubby areas of early successional and regenerating browse, which moose prefer. Wetland vegetation usually contains more sodium than upland browse, and moose crave sodium in spring due to a sodium-potassium imbalance in their diet. Moose are also more mobile during the breeding season (“rut”) in September and October; I observed a corresponding rise in MVC frequency during this period.

Based on my research, reducing driving speeds and traffic volumes would likely reduce MVC. Unfortunately, transportation agencies do not view speed reduction as a practical solution given the motoring public’s demand for high-speed travel routes. To date, most MVC mitigation strategies have focused on clearing roadside vegetation; erecting fences, some with one-way gates; ultrasonic sound devices, mirrors, and reflectors; and feeding stations to intercept animals before they reach roads. Although proactive, these measures are expensive and often inadequate.

I hope my research can be used to prioritize the placement of mitigation treatments. However, given the landscape-scale (2.5-5 km) influence of habitat-related variables on MVC risk, management of traffic volume and speed may be most effective. Public information campaigns can improve driver awareness of MVC, but cannot ensure that drivers will obey posted speed limits or limit trips during times of high MVC risk. Unless people are willing to modify their driving behavior in moose country, MVC will continue to occur, and we can expect more MVC in the Adirondacks as the moose population continues to grow.

Zak Danks is a Master’s candidate in EFB under Dr. William Porter.

By Annie Woods

Assessing Biotic Integrity in the Adirondack Park

In 1981, two scientists working in aquatic systems, James Karr and Daniel Dudley, found that using simple measurements like pollutant concentrations to monitor and assess aquatic ecosystems did not inform where a stream fell on the spectrum of pristine to totally degraded. Their idea for a more holistic assessment was to use the fish that lived in these environments to capture the condition of the streams, because fish responded to all the influences, positive and negative, that went into the stream. By combining several measurements of biotic communities, they created a score called an index of biotic integrity (IBI).

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Using GIS, I found IBI was positively related to continuous forest cover and negatively related to open cover types and development. State land designated Wilderness had the highest biotic integrity, followed by Wild Forest and private Resource Management land classes, with Rural Use (largely agriculture) and higher density settlements having lowest IBI. These results make sense considering IBI values those species that would likely be found in the absence of humans. This project shows how concepts of landscape ecology can be applied to guide land use management decisions in the Adirondacks.

Annie Woods is a Master’s candidate in EFB under Dr. William Porter.
I am creating a conservation-planning tool for wetland mitigation in the Ausable and Boquet River watersheds of the Adirondack Park. New development frequently impacts important ecological functions of wetlands. Wetlands filter and process impurities, lower flood peaks, result in fewer drought periods, and provide crucial habitat for both flora and fauna, in addition to providing the recreational benefits of bird watching, boating, and fishing.

Many methods are used to locate wetlands, but each has its limitations. Aerial photo interpretation relies on the quality and scale of the photo, as well as the eye and experience of the interpreter. Hydric soil map units, on a Natural Resource Conservation Service (NRCS) county soil map, tend to overestimate the extent of wetlands and include an array of problems related to mapping scale and map unit inclusions. Even maps that combine these methods, such as the National Wetland Inventory (NWI) maps, tend to miss drier-end wetlands, forested wetlands, linear wetlands, and farmed wetlands.

A principal limitation with all of these wetland-mapping methods is that they are snapshots, depicting the wetlands at the time the map was made. To improve on this temporal constraint, I am attempting to map both current and historical wetlands. I am creating wetland maps using an ecological land unit (ELU) approach developed by The Nature Conservancy. This approach incorporates enduring landscape features (e.g., slope, moisture, land position, and soil) in a geographic information system (GIS). I do not use any vegetation or land cover data in the process. By limiting my analysis in this way, I get at the source of wetland expression. The resulting wetland map depicts not only wetlands that currently exist, but also historical wetlands that have the enduring landscape features of a wetland, even if they do not currently have wetland vegetation. These historical wetlands may have been mowed, farmed, or impacted by human or beaver damming.

To conserve wetlands, developers are often required to restore or create a wetland in exchange for the one they impact. Using the wetland map produced by my ELU model that shows where wetlands could be, I hope to provide information to use in the process and increase the chance for success. A created or restored wetland is more likely to succeed if it is sited where the underlying features are supportive of a wetland.

Ariel Diggory is a master's student at ESF, studying with Dr. William Porter and Dr. Donald Leopold. She has received funding support from the U.S. Environmental Protection Agency Wetland Protection Program Development Grant (secured and distributed through the Adirondack Park Agency), the Edna Bailey Sussman Foundation, and an EFB teaching assistantship.

Top: working with Cordelia Sand and Larry Phillips to determine if this cow pasture might have been a wetland once upon a time (Phillips is using a soil auger and we're looking for hydric soil).

Right: The author takes a much needed break during her work on watersheds.
Stacy McNulty and her student assistants, Jose Lopez and Sharon Curtis, embarked upon a plan last year to catch and identify odonates in the Newcomb area as volunteers for the New York state Dragonfly and Damselfly Atlas. While none of them knew much about these beautiful animals, they knew that the region, with its diverse wetlands and largely intact ecosystem, would harbor many species.

“The biodiversity of the Adirondacks is probably much higher than we realize, simply because people have never looked in many locations. Even here on Huntington Forest, we don’t know a lot about the invertebrate community, and one survey isn’t enough because insects hatch at different times of year,” McNulty said.

The researchers spent roughly 50 hours collecting 35 species that were sent to state experts for verification and archival. “Many species were observable in hand or by digital scan, allowing them to be released unharmed. Seeing the colors and patterns of the dragonflies up close was marvelous,” said McNulty. New state location records for 12 species of greatest conservation need were documented in 2006, including one for Essex County by Lopez and Curtis, who found Gomphus quadricolor (rapids clubtail), on HWF at Military Pond.

Erin White, project coordinator for the atlas, says there are about 190 species statewide. To date, 148 new county records have been entered into the database, representing 90 different species. McNulty and her students will be out again this summer to capture additional species for a more comprehensive survey of these lovely creatures.

### RESEARCH FOLLOW UP:

Search Nets  
New Records of Dragonflies and Damselflies

As forests change, so do salamanders

Defining the link between forest characteristics and salamander distribution is just one of many undergraduate research projects at the AEC.

By Jose Lopez

Salamanders’ thin, moist skin, used for cutaneous respiration, leaves them susceptible to microclimatic, chemical, and physical conditions. Globally, salamanders are declining due to a variety of factors. I investigated the relationship of forest type, land use history, soil and air characteristics to distribution of four salamander species on Huntington Wildlife Forest (HWF).

I surveyed salamander populations during summer 2006 at HWF. I sampled at 32 artificial cover object sites (each is a set of bricks mimicking natural rock cover, useful for repeat sampling at the same site). For each salamander, I identified the species and measured snout to vent length to determine age class. At each site, I measured soil temperature, air temperature and humidity. I took soil samples to assess soil pH and soil moisture in the lab. I also used data from the long-term salamander cover object study at HWF for comparison.

Salamander distribution was associated with forest type and management history. Abundance was highest in deciduous forest. Redbacked salamanders and red efts (juvenile red-spotted newts) were more abundant in managed sites, while duskys and two-lined salamanders were associated with streams and seeps in old-growth forest. Soil pH and soil temperature also had a significant relationship to salamander distribution. Most salamanders were found at soil pH between 3.5-5.0, 16-18°C soil temperature and 50-80% soil moisture.

Anthropogenic changes to forests can affect salamander distribution, which may cause declines in populations. Impacts of physical and chemical forest characteristics on the salamanders remain important to investigate.

Jose Lopez is an EFB student at ESF.
Earthworms, those efficient soil recyclers, are an important component of their terrestrial and aquatic ecosystems. Gardeners use them to improve the soil, and anglers use them as live bait.

But despite their benefits, there are areas in the northern United States where worms have been introduced and are now negatively affecting native forests. In the northern hardwood forest, the worm has a much less benign effect than in a squash patch.

The Adirondack Mountains are located well inside the region glaciated during the Pleistocene period; therefore, species of earthworms occurring in the Adirondacks are not considered native. About 45 exotic worm species have been found in the Eastern United States. I conducted an independent research project with Stacy McNulty to determine whether worms are present on Huntington Wildlife Forest and possible explanations for their distribution pattern.

To collect earthworms, I used two sampling methods during the summer of 2006. First, I extracted worms by pouring a mixture of water and ground dry mustard (an irritating, nontoxic substance) onto the ground. I collected worms that came to the surface during a 10-minute period. I also employed hand digging and sorting on separate plots. I examined past land use, leaf litter thickness, vegetative cover, and pH of the sites.

I located earthworms on half (10 of 21) of my study sites on HWF. These were places such as boat launches, old roads, trails, yards, and planting sites where humans had a major influence on the land. Interestingly, while I found worms in a grassy yard, I did not find them in the adjacent forest; worms were only in the “disturbed” areas. On HWF, earthworms inhabited areas with higher pH on average. The pH of soil is often a determining factor in the distribution of worm species.

All four earthworm species identified on HWF and confirmed by ESF’s Dr. Roy Norton were members of the family Lumbricidae, and all are native to temperate regions in Europe. This evidence supports theories that earthworms are not moving northward following the retreat of the glaciers but are being brought from Europe through human introduction.

It is probable that not all sites on HWF with worms and not all earthworm species were identified. Seasonal differences exist between earthworm populations and earthworm activity. The success of the mustard extraction technique depends on activity; if earthworms are inactive, they will not be responsive. I needed adult worms to distinguish species, but many of the worms were too young. However, this study showed that generally the natural forest on HWF is free of worms, at least for now.

The earthworm clitellum, a swelling used in reproduction, could help explain how the worms move from one place to another. The clitellum slides off the adult to form the cocoon in which young earthworms develop. This cocoon is strong and small, and can be easily transported in soil, on cars or trucks, and through waterways. The cocoon can remain viable for many years until it reaches a suitable place for the earthworm to hatch. Human transport is a major factor in earthworm transportation. Earthworms bought for fishing bait are often dumped still alive if they are not used, and earthworm coccoons may be present in soil or vegetation roots of plantings, both probable sources of worms on HWF.

Earthworms are important because they can influence soil structure and composition. Earthworm activity improves aeration and drainage, but can also lead to soil erosion by bringing very finely divided soil to the surface. Nutrient cycling can be altered by earthworm activity though the mixing of the litter layer with the organic soil layer. This redistribution of organic matter has been shown to cause changes in the ability of microbes to function in the soil. Microbial function is also affected by earthworm consumption, as some microbes cannot pass without harm through an earthworm’s system. What is good for the garden, therefore, is not good for the native forest.

Although earthworm species are highly influential on many temperate zone forests where they are not native, there are no specific regulations on earthworm imports into the United States. The Animal and Plant Health Inspection Service (APHIS) only regulates earthworm imports because of the potential of exotic plant pathogens being transferred along with them, and their sale within the United States is not regulated at all. In order to successfully preserve our ecosystems, it is important not to focus all efforts on attention-grabbing exotic and invasive species. In the future, regulations on earthworm use for fishing should become a priority, as any exotic species which is being used and introduced in an area has the potential to upset the ecological balance.

Gina Marchini has a B.S. in conservation biology from ESF.
During the first weekend of March, Huntington Wildlife Forest provided a scenic background as the Northeast Section of The Wildlife Society hosted the annual student conclave. The event brings together students for a weekend of experiential learning combined with an opportunity to meet wildlife professionals and other students interested in wildlife biology. The conclave was co-sponsored by SUNY-ESF and SUNY-Cobleskill and held at the Huntington and Newcomb Central School.

More than 100 students and faculty from eight colleges around the Northeast attended the conclave, including Framingham State College in Massachusetts, Paul Smith's College in the Adirondacks, Penn State, University of Maine, University of Massachusetts at Amherst, and University of Rhode Island, in addition to ESF and Cobleskill. Students enjoyed a keynote seminar by Paul Hai of the AEC on the economic, theological, and artistic forces behind the development and history of the Adirondack region and the Huntington Wildlife Forest. Students learned about the formation of this unique area, a state park larger than Yellowstone, Yosemite and Death Valley National Parks put together, that combines a patchwork of public and private land to create a mosaic of wilderness alongside towns and villages.

On Saturday, students learned field techniques important in wildlife biology. Workshops covered a variety of topics, including technical writing, mammal trapping, bear capture techniques, winter tracking and sign, wildlife photography, mesocarnivore survey techniques, and the new habitat guidelines being developed for amphibians and reptiles. A group of students were taken to a deeryard in nearby Long Lake to practice radiotelemetry by locating collared deer. Huntington Forest provided an interesting backdrop to learn about forest management techniques and discuss the importance of forest ecology when managing for wildlife. Many students went out on snowshoes to look for wildlife along the trails at the Newcomb Visitor’s Interpretive Center.

On Saturday evening, students participated in an informal poster session, highlighting research in the Northeast. Students from Paul Smith's College and ESF provided posters ranging from research on Adirondack bird populations to managing areas in central New York for endangered species.

Saturday night highlighted the quizbowl action, with students from seven schools participating. The team from the University of Rhode Island took top honors, sailing through three rounds of intense competition to become overall champions. The URI team also participated in a bonus round competition against a team of faculty from Paul Smith’s, Penn State, ESF and URI. The faculty prevailed after a tough round of questions ranging from wetland restoration to scientific nomenclature.

Sunday morning dawned with an opportunity to view the central Adirondacks from the fire tower at the top of Goodnow Mountain. The views were spectacular in spite of some ominous cloud cover earlier in the morning. Overall, we greatly enjoyed learning more about the wildlife field while taking advantage of the opportunity to meet people who might be future colleagues. The Adirondacks provided a beautiful backdrop to an enjoyable weekend.
From Teacher to Student and Back Again

Sarah Boggia

What is it about the outdoors that makes everything so fascinating? The mind relaxes, the anxiety melts away, and everything you see triggers a new question. As a kid, I was drawn to people who could answer those questions and teach me something new. My love of learning and teaching led me to become a high school biology and chemistry teacher, but along the way, it became apparent that something was missing.

When I came to Huntington Wildlife Forest in the summer of 2005 to attend the “Stalking Science Education in the Adirondacks” teacher workshop, I found the place that would change my life. There I fell into a swamp, was bitten by black flies, served as a toilet for a salamander, and loved every minute of it. I discovered the study of ecology and my new path as an environmental interpreter. D. Andrew Saunders, my major professor, would later advise me that the goal of an interpreter should be to send visitors away tired, laughing, smiling, full of new knowledge and hungry for more for more.

I became the first education intern to work at the AEC. Many days were spent researching, writing, formatting, and trying to perfect educational programs. Winter visits from school groups were always an adventure. They practiced radio telemetry and took water samples through holes augered in the lake ice.

Spring arrived with new responsibilities as I enticed teachers to bring their students to the AEC. Teachers and students were fascinated when I brought them natural objects to examine, and took them outdoors to explore. It was thrilling to be able to answer their questions; it felt like I had become one of the knowledgeable people I had admired as a kid.

The last few weeks of my internship were particularly busy. I visited schools, teaching about the wonders of nature, the need for conservation, and the value of science. I worked with almost 300 children and made 25 trips to educational facilities from Albany to Middlebury, Vt., delivering programs ranging from beaver ecology to the modern environmental movement.

There is nothing more gratifying than igniting in someone the desire to learn. On my last day some seventh-grade girls came up to me and said, “Thank you for coming and teaching us about this stuff. It was really cool.” Girls, I couldn’t agree more. I have tremendous respect for the people I worked with at the AEC and Newcomb Visitor Interpretive Center. I appreciate the patience and guidance extended to me by Paul and the staff. I promise to put the lessons I have learned at HWF to good use as a science teacher.

Sarah Boggia is an MPS candidate in EFB with D. Andrew Saunders.

Do Salt Licks Help Transmit CWD?

By Caitlin McAuliffe

Chronic wasting disease has not yet been seen in the Adirondacks, but the illness is serious enough to warrant research into how it is transmitted.

CWD is a fatal neurodegenerative disease affecting white-tailed deer. There are many questions about the disease: Which animals are most likely to transmit it? Do sites with features such as salt “licks” encourage congregation and disease spread?

I assessed the demographic characteristics of deer at Huntington Wildlife Forest at salt-baited sites to investigate these questions.

During the summer of 2006, I recorded deer visits to box traps with cameras, trip timers and presence of tracks. Adult females were the most frequent visitors, likely because pregnant and lactating females are driven to consume salt. Marked individuals visited only one trap each; adult females tend to remain within their home ranges, suggesting a low risk of disease spread compared to young dispersing males.

Visits occurred primarily at night, consistent with deer foraging activities. One or two deer visited at a time, typical of the species’ behavior in heavily forested northern regions and an indication that large numbers of deer do not gather at traps on HWF. However, traps were visited by multiple individuals over the study, indicating sites with salt or other attractive features have the potential for disease spread.

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