Winter 1998

FORGET-ME-NOT

Myosotis Messenger

Edmund Niles Huyck Preserve
& Biological Research Station
P.O. Box 189, Rensselaerville, NY 12147

Open letter from the President

Dear Friends:

Last summer the Preserve had a special visitor - Ryoko Shibuya, a Japanese woman who had, as a Bryn Mawr college student, worked for two summers as Jessie Huyck's personal secretary in the 1950s - in the days before the Preserve had office staff. Jessie Huyck who, as you know was Edmund Niles Huyck's widow, led the Preserve's efforts as board chairman from 1931 until 1959 and, through her will, created the E.N. Huyck Foundation that, along with membership contributions, helps to support the Preserve today.

Ryoko was thrilled to be back in Rensselaerville, and was impressed with the new research building and all that is happening at the Preserve. Jessie, no doubt, would be impressed too: with the level of research activity including the world class decomposer food web/global warming research project; with the education programs that inspire science teachers as well as elementary and secondary school students; and with programs like the Huyck Hikes, led by Preserve researchers, that help people understand science and the environment a little better. She would also be pleased that our executive director, Richard Wyman, is playing a key role with the Organization of Biological Field Stations in developing a network of international field stations.

Rensselaerville and the Preserve were even more beautiful than Ryoko had remembered. Jessie and Edmund would be thrilled that so many people appreciate the Preserve's beauty and that visitors come to admire the falls, walk the trails, and enjoy the quiet solitude of the place.

The Board of Directors and the Staff are working to ensure that the Preserve continues its important work while remaining a beautiful place for people to enjoy. We look forward to seeing you at the Preserve in 1998 - whether it be at our programs, at the Annual Meeting on June 27th, or out on the trails. And who knows, maybe Ryoko will be back and you can meet her too.

Sincerely,

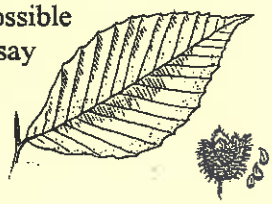
Laura D. Carter

Experimental Ecology: Analyzing complex systems with complex experiments

by Richard L. Wyman

The detrital food web is the grouping of organisms and their interactions that digests organic matter on the forest floor and recycles nutrients and minerals for use by forest vegetation. This food web is important because it plays a role in the carbon cycle regulating the rate at which carbon dioxide is released from dead material. In 1995 we received a grant from the USDA to experimentally test whether or not predation by salamanders and changes in abiotic factors (soil acidity and moisture) affected the rate of decomposition and carbon dynamics in three forests on the Huyck Preserve. These forests are typical of forests in mountainous regions in much of New York. Therefore studies in these forests may be generalized to a larger region.

The experimental design required that data be gathered on the rate of leaf decomposition, leaf litter fragmentation, leaf and soil chemistry (carbon and nitrogen content), and composition of the invertebrate community. These analyses were done in 48 enclosures and 24 plots at the beginning and end of each year. Half of the enclosures and plots had no salamanders and the other half contained salamanders. Half of the enclosures and plots excluded rainfall and half did not. Also half were located at the top of the soil catena (top of the hill) and half were at the bottom. We identified some 30 categories of invertebrates (e.g. spiders, beetle larvae, adult beetles, fly larvae, etc.) and tested statistically whether there were significant effects of predation, catena position, and soil moisture on them. We used two techniques to analyze invertebrates in each enclosure and plot. Analyses could then be conducted on 30 invertebrates x enclosures and plots x two types of invertebrate data or 120 possible analyses. Each statistical test can result in seven possible answers. Thus for one sampling period, say the end of 1996, about 840 results might be obtained. This is a problem when one conducts complex experiments



on complex systems - so many results can inhibit your ability to interpret their meaning. We have recently completed a set of analyses for the end of 1996 and through a good deal of thought and of generalizing the 840 results, have come up with some interesting conclusions.

Artificial drying of enclosures and plots in forests reduced the abundance of a large number of forest floor invertebrates and slowed decomposition. The location of the forest floor food web along a soil catena also affected the species composition in the food web. A suite of species dominates at the high elevation end of the catena and a different suite of species dominates at the lower end. Predation by salamanders in these experiments reduced the abundance of three functional groups of invertebrate predators and four functional groups of detritivores while two groups of predators and three groups of detritivores increased in abundance (Figure 1).

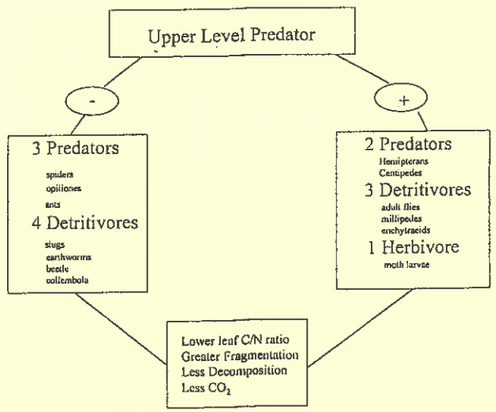


Illustration of the effects of predation by the red-backed salamander on the detrital food web. The upper box signifies predation. The left box lists groupings of organisms that decreased in abundance and the right those that increased in abundance. The bottom box list functions that changed with predation pressure by salamanders.

These shifts in trophic structure composition appeared to be compensatory, that is predation reduced a suite of predators and detritivores but two other suites of invertebrates increased in abundance. These shifts make it appear that the system compensated in terms of species composition. The experiment also revealed that the function of the trophic system nonetheless changed. Predation pressure indirectly reduced the rate of leaf litter decomposition and the chemistry of remaining leaf litter (lowermost box in figure). Carbon to nitrogen ratios (a measure of quality) were reduced in remaining leaf litter in the presence of salamander predation compared to ratios in the absence of salamander predation. Thus the changes in species composition compensated for predation effects, but the compensatory changes were not complimentary in terms of ecosystem function. While the loss of the upper level predator did not appear to result in a change in species diversity it nonetheless changed the way the system functioned.

This experimental system is valuable because the organisms can be relatively easily manipulated, the experiment can be duplicated, and can be applied to a number of ecological problems. The experiments are revealing new insights into how predation affects trophic structure diversity and ecosystem function. Also the experiment should continue because long term studies are often required, particularly in terrestrial systems, to reveal how indirect effects alter ecosystem function. For instance will changes in leaf litter chemistry propagate into changes in soil chemistry, and will forests with healthy populations of predators of detritivores sequester more carbon over time? Long term study is needed to confirm or refute the hypothesis that upper level predators of detrital food webs are modulating the cycling of nutrients in forested ecosystems.

COMENART Natural History Illustrators Program to return

The Preserve will be offering the COMENART Natural History Illustrators Artist-in-Residency program again in 1998. This will be the third year for the program. Since its inception in 1996, we have hosted 9 artists who have spent two weeks each working at the Preserve. Each artist has given a workshop or demonstration for the community and produced at least one finished piece of artwork for the Preserve's use.

We wish to thank the Rensselaerville Library for their collaboration with the community programs and for allowing us to display the COMENART collection this summer in the community room. The work is currently on display in the new addition of the Eldridge Research Center on Pond Hill Road.

Artists interested in participating in the program can call the Preserve office for more information. The deadline for submitting applications for the 1998 season is March 1st. Residents interested in providing housing for a visiting artist (particularly in May or June) can contact the Preserve Office at 797-3440.

Below: pen and ink illustration of lichens by Scott Rawlins.

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Groundhog Day Celebration Fund Raiser

Saturday, February 7
1:00 - 4:00 pm

Set aside Saturday, February 7th for the Huyck Preserve's annual Groundhog Day Celebration at the Eldridge Research Center on Pond Hill Road in Rensselaerville. Join us for skating on Lincoln Pond, cross-country skiing on the trails, and other winter amusements. Then, warm up with a cup of hot chocolate, a bowl of homemade soup or, or any of the other refreshments for sale upstairs in the lab. Eileen Ruggieri will entertain us with her wonderful stories and we will have stations and hand's-on activities relating to animal adaptations for winter set up as well. COMENART pieces will also be on display. Activities will begin at 1:00 pm All are welcome.

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Roots in Truth

by Barbara Bolster Barrett

It is often said we don't see the forest for the trees, but just as often, we don't see the individual trees for the forest We're so used to taking in all, that sometimes we forget to simply "consider". Those things we find most satisfying in life are pared down to narrow focus: our relationships with others; with God; with nature.

Occasionally, we'll be walking a patch of woods on a farm-stead, when a tree of such girth and stature will stand out as magnificent. A tree already massive when our ancestors cleared a farm or pasture or mill lot. Such trees fascinate us. We want to know how many people stretched fingertip-to-fingertip it takes to circumscribe such a tree. We reach out to touch its thick hide. We yearn to know how many rings this tree has amassed in secret - how many years of drought and how many rainy seasons it has endured.

Like older people, these trees take on character. They have their own unique root formations and configurations to their bark - like the wrinkles engraved on an ancient face. Their shapes are subtly altered by wind, disease, and the weathering of a thousand storms. Trees, unlike people, become more compelling for us as they age. An aged tree takes on a mystical quality - the embodiment of accrued wisdom.

We see trees in all stages of development. Shoots poke through leaf litter amid the Trillium and Jack-in-the-Pulpit. Saplings stand thin and straight in the thicket. We see guidebook perfect mature trees, and old sages.

Trees change dramatically with each season.

Early spring in the northeast is muddy and raw. The buds and catkins on awakening trees provide us our first sign of hope. Emerging leaves are tender and new. We marvel at a freshly minted maple leaf, so miniature and perfect, like a baby's tiny hand.

In summertime, trees are lush. At the height of the season, their green aroma permeates the air. By mid-August, however, their colors have subtly dulled, as they prepare for the changes ahead. It is a bittersweet time. Days are getting shorter; nights are getting cooler. Time is borrowed.

Autumn brings a magnificent show: the bright yellow leaves of beeches; maple leaves from orange to brilliant crimson; oak leaves the color of tanned leather. We realize the trees are winding down. The true colors of the leaves emerge under duress, just as our true characters arise during times of crisis. The time of year is named for a simple act of letting go - Fall.

By winter, trees are dormant. Before the snows, they are skeletal; after a snowfall - ghostly. When iced, they seem fragile, crystalline, like examples of the glassmaker's art. In reality, they are enduring nature's toughest time. They are waiting.

Finding a tree of personal significance is well worth our time. In their muteness, trees speak eloquently of the enduring qualities at our core...Qualities that don't change: rootedness; stability; growth; pause; regeneration. These, the same strengths that help us bear life's challenges. I have learned to tap into reserves that I didn't know existed. The trees bear witness.

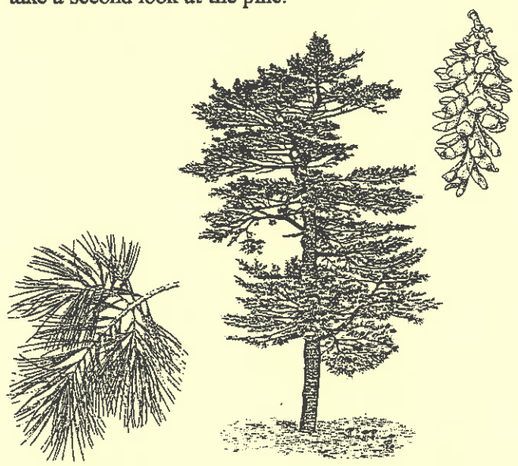
We learn from birches to bend, to be resilient, to stand as a community, to be playful, and to sing. We learn malleability from birches. Children write on its soft bark. Deer take nourishment by peeling apart the thin paper layers during hard winters. It is the white birch from which fine canoes are molded. The birch is a tree of joy, speaking to the childlike capacity for play within each of us. Wrote Robert Frost, "So was I once myself a swinger of birches. And so I dream of going back to be".

We learn the homely lessons of guardianship and tradition from the black locust. Locusts were extensively planted on farmsteads in the eighteenth and nineteenth centuries as wind breaks and lightning rods. They are long lived, and quickly grow thick and tall. Their thatched compound leaves and fissured bark make them heritage trees. Tough, splintery locust wood is ideal for fence posts - another traditional use. They are steadfast protectors.

We learn of strength, sweetness, utility, and beauty from the sugar maple - the tree prized by Yankees. The most beautiful maples are a study in symmetry - perfectly egg-shaped. The maple has balance. It yields a hardy wood, yet it is warm and fine grained. It is a stately tree, yet each Autumn, it explodes with a brilliance no other tree can match.

The maple takes on many roles: shade tree; ornamental; syrup producer; lumber stock. It makes fine furniture, floors, and cabinets, yet its seasoned limbs make excellent fuel. The wide leaves of a maple are reminiscent of many hands. It reminds us that service and utility are necessary to everyone's life. The maple is my tree.

We learn to not take the humblest tree for granted. Our regrowth white pines are unimpressive at first glance. They bear shaggy needles and amorphous shapes. Their wood is considered second rate stuff, and only an individual hard up for fuel will burn a fast, hot, and resinous pine log. But John Burrough's essay in *Signs and Seasons* made me take a second look at the pine.



The white pines he wrote of are magnificent - spires that ascend to the heavens. Industry hewed these giants to fashion ships and railroad ties. Buildings are framed in pine still. The simplest farmhouse may hold floors and wainscot crafted of virgin pine. Some boards are as wide as a coffee table, and all are buffed by years of wear. Common, yet uncommon is the pine. A fledgling country was built upon the back of this sturdy tree.

We don't often dig deep within ourselves. It can be a dark, unpleasant place. Trees take nourishment from beneath, however, sending their roots deep and spreading them wide. So, we too, can pull up a measure of grace, seemingly from our toes through our whole being. As a tree courses sap from its roots to each branch.

Last year, my favorite maple, again, gently instructed me - this time in the art of letting go. It sets across the street from the northeast corner of our house. I am looking at it now as I sit at my kitchen table. It was once a full egg - lush in summer, a burnished red-orange in fall. But it grows too near our phone line - that umbilical cord. One sad day, the workmen from NYNEX came and lopped off nearly an entire lobe. It looked like half a brain.

But maples are resilient. It has been over a year now, and the tree has healed. The lines of demarcation are softer now, as new growth has emerged from the wounds. Because it gave its limbs, I know if someone runs late; I can call the doctor if a kid gets sick. For this, I am grateful. I have learned that I can still love something even when it is not perfect anymore. This one tree is in narrow focus. It is good, strong, and sweet…And it is as individual as any friend.

Field Station Visits Available to Schools

Huyck Preserve Educational Mission Statement: Our mission is to provide the public with the knowledge to appreciate and understand how the natural world functions, using scientific field research as the focus, in engaging and innovative ways.

The Preserve has developed a program in keeping with our mission that is being offered to local school districts for students in grades K-8. Students are introduced by Preserve staff to field biology as an exciting career option and to the importance of biological field stations to scientific research. Classes visiting the Preserve tour our facilities and the varied habitats of the Preserve. These visits focus on research methods emphasizing an inquiry based science approach. Students learn about the kinds of projects that have been undertaken here throughout our long history as a field station and current research now underway. They have the opportunity to explore different natural habitats, learning about plants, animals and the physical factors that define them; and carry out investigations of different biological questions. For more specific information concerning the Preserve's educational programming please contact Marilyn Wyman, Education Coordinator, at 797-3440.

Carpet Squares Donated: The Preserve would like to thank the Carpet Warehouse Corporation for their generous donation of 50 carpet squares which will be used by visiting students. These squares fill a basic need for students in our facilities. We appreciate the kind of community support this donation represents.

Views of Intern Amanda Oprysko

As a pre-med. student from a New York City college, I began my Huyck Preserve internship with a general knowledge of biology and the environment. However, I was totally out of my element when thrown into the middle of an intense environmental study in the forests of upstate New York. I was unaware of the importance of this study when I began (it is being conducted in the hopes that the findings could prove useful in our struggle to control the effects of global warming).

We know very little about the many and various species on Earth. While information may have already been collected about specific plants and animals, we do not fully understand their effect upon their habitat and surrounding ecosystem. What happens if they disappear? So, the current topic of study being "practiced" by researchers such as my mentor for this internship, Dr. Richard Wyman, is that of life forms living and reacting in their ecosystem and their effect upon that system. Those species that appear to have an important or great effect upon their surroundings - the ecosystem engineers - are researched first. The main research project at the Huyck Preserve involves studying how "predation and abiotic factors influence the detritus food web of hardwood-hemlock forests" (R. Wyman). Dr. Wyman decided to look at the most abundant terrestrial vertebrate in the northeastern United States - *Plethodon cinereus*, or red-backed salamander. This small creature who lives primarily in forests rich in beech, under rocks, and decomposing logs and wet leaves has turned out to be a very important source of slowing down the process of the carbon cycle. Finding something that slows down the carbon cycle, even slightly, would enable us to decrease the amount of carbon dioxide that is currently trapped in our atmosphere, along with other gases, as a result of human "progress".

In the early nineties global warming seemed to gain "popularity". But, gradually and unfortunately, the concern about global warming has faded. What most of us don't realize is that this dangerous problem has not disappeared, nor have the polluting gases. Global warming is a real threat. Temperature changes and shifts in entire climates and ecosystems are possible. Scientists are now searching for other answers, using and trying to understand nature's methods to slow down the quickening pace of a process that could end, or at least severely damage our existence.

This internship has provided me with knowledge which has led to a respect for and an awareness of the environment. It also allowed me to experience the difficulties of conducting a large scale, complicated experiment - the salamander project. This project involved predation, salamanders, decomposition, carbon dioxide, leaf fragmentation, soil chemistry, the catena, and climactic conditions. We determined predation by searching through leaf litter in designated forest areas for invertebrates. We either picked through the leaf litter by hand, or put it in an extractor machine. This machine's bright hot lights force invertebrates from the top into more favorable conditions - a cool, dark, damp area where they are caught. Leaf samples are taken from plots and enclosures that have been built to house salamanders in a created and controlled space, where environmental conditions are manipulated. Decomposition was examined by placing leaf-filled mesh bags and baskets in the midst of natural leaf litter, and then collecting them periodically and taking note of their weight and condition. Carbon dioxide data are collected monthly using carbon dioxide collars placed inside and outside of the enclosures. A machine is connected to these collars, which have trapped a sample of the surrounding air. Using UV light rays, this machine tells us how much carbon dioxide is contained in that sample air space. Leaf fragmentation is tested by using a device that separates the sample leaf litter by size, from whole leaves to fragmented ones. When invertebrates fragment leaves, carbon dioxide contained in the leaves escapes into the air. When the leaf samples are not very fragmented, we conclude that the salamanders are eating enough invertebrates so that the leaf litter is decomposing more slowly thus slowing the release of carbon.

The rest of the components are variables of this particular experiment; salamanders, the catena (which involves pH), and climactic conditions (or wet verses dry areas). Each enclosure or plot is a combination of these factors. For instance, one enclosure might contain salamanders, exposed to natural climate, and be in a high pH area (in a low lying region). Another might have no salamanders, and be protected from any climactic conditions using an excluder (a plastic sheet that shelters the enclosure or plot from rainfall). All of these different factors are covered, and duplicated once in each of three forests using sixteen enclosures and eight plots.

In addition to the salamander project, there were a number of research projects being conducted at the Preserve. I assisted in a project with Jennifer Frank, a graduate student from SUNY - Albany, who was testing the effects of predation on earthworms by yellow spotted salamanders and abiotic factors on the detritus food web. I not only gathered information about earthworms, but I also learned how to set up an experiment and experienced the frustrations scientists face - experiment logistics, overwhelming costs, and time requirements. I also saw the other side - the feeling of accomplishment, the pride and excitement in performing experiments that had never been performed before and whose results could provide extremely important, never published before information that could help slow global warming. I was also able to observe the role of the project manager, Kelly MacWatters, who performs the complicated task of collecting and summarizing data.

I have been fortunate enough to be part of a group of people who are living and working to save the beauty and the delicate nature of the environment that surrounds us. I spent an incredible summer working in a peaceful forest looking for salamanders, and gazing out over a picturesque and pristine pond, watching Herons fly in and out during my lunch break. The prospect that any of this could be lost is a possibility that I cannot fathom. The researchers of the science community have become both fighters and pioneers. They fight to save our small, yet perfect planet.

Amanda was an intern for the salamander/decomposer food web study last summer.

Ruth Williamson Eldridge and Sybil Waldron: The Preserve was saddened to hear of the passing of our long-time friends and supporters, Mrs. Ruth Eldridge and Mrs. Sybil Waldron. Mrs. Eldridge and her husband were actively involved in the Preserve from its inception. Her late husband, Mr. Lewis Eldridge served as one of the original Board members and Huyck Foundation trustees and it is in his honor that the Eldridge Research Center was named. Her son, Dr. Roswell Eldridge, is a current trustee of the Preserve. Mrs. Waldron was active in the Preserve through her husband, William A. Waldron. Mr. Waldron, a nephew of Jessie Huyck and one of the original trustees of the Foundation, has helped the Preserve both personally and through his trusteeship.

1998 Membership Form

Name_____ Membership $_____

Endowment Fund $_____

Address_____ Lab Fund $_____

_____ Total Donation(s) $_____

Membership Level (Circle One)

Student $10 Individual $30 Family $40

Senior Individual $20 Senior Family $30

Contributing $100 Sustaining $250 Patron $500 Benefactor $1000

Katharine Huyck Elmore Fund (Endowment Fund) $_____ Eldridge Research Center (Lab Fund) $_____

Please make your contribution payable to the E.N. Huyck Preserve and mail to PO Box 189, Rensselaerville, NY 12147. Thank You.

The Edmund Niles Huyck Preserve
PO Box 189
Rensselaerville, NY 12147