



# News from Hudsonia

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## UNTAPPED POWER: RARE SPECIES IN UTILITY CORRIDORS

by Spider Barbour\*, with illustrations by Anita Barbour\*

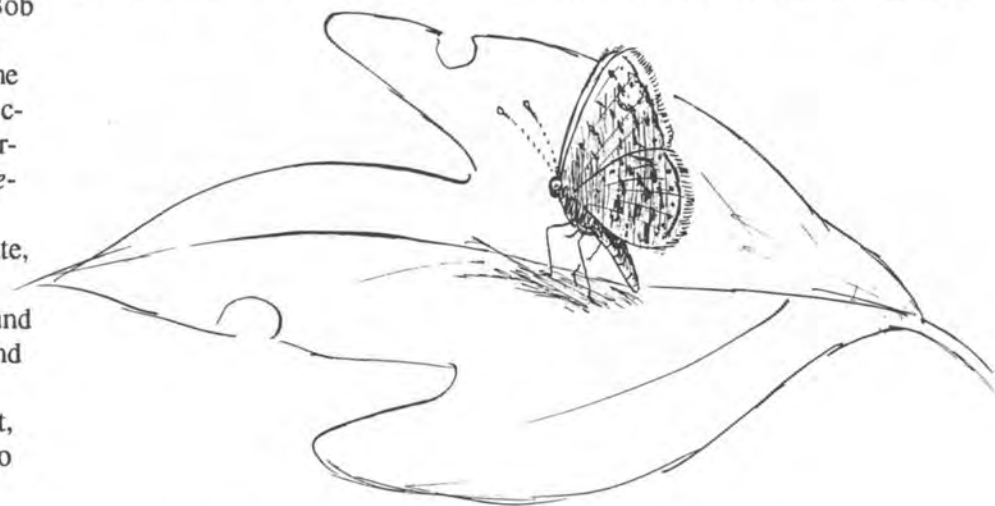
*Hudsonia is pleased to present the Barbours' article on utility rights-of-way. Although conservation biologists generally find that corridors cleared through forest are deleterious to biological diversity, there are certain rare animals and plants that benefit from corridors. Therefore, rights-of-way must be planned, designed, and managed on a case-by-case basis with full knowledge of the local biota.*

The day after Independence Day this year I drove 2 1/2 hours from my home in Saugerties, New York, to Springdale, a small town in northern New Jersey, to meet my friend and fellow naturalist Bob Dirig, who was driving from his home in Hancock, New York. The two of us were making our respective treks to look for a rare butterfly, the northern metalmark (*Calephelis borealis*), at its nearest known location to New York State, a power line cut on a limestone ridge. Shortly after I arrived around noon, another car pulled up behind mine, but it wasn't Bob's. The bearded, booted man who got out, like me, had his socks tucked into

his pants, a way of thwarting ticks. We immediately recognized each other as biologists, made introductions and discovered we had both come to look for butterflies, the metalmark in particular. This was Jim Springer, a local lepidopterist leading a Fourth of July Butterfly Count, an event initiated by the Xerces Society in the 80s, and continuing under the auspices of the North American Butterfly Association.

I joined the butterfly count group for a while, then went back to see if Bob had arrived. He hadn't, so I got out my lunch, and during this interlude Bob pulled up. He had had trouble finding the

road. We soon caught up with the counters along a dirt road that passed by a shrub swamp where we saw two butterfly species, Appalachian browns and a Baltimore. The day seemed perfect for butterflies, sunny and a bit hot, but not too humid or windy. From a side trail Jim Springer appeared, telling us he'd seen three or four metalmarks along the power line, and pointed the way to it. Excitedly we climbed the trail through the limestone woodland to the bright promise of the utility corridor. The habitat there looked inauspicious, a thick tangle of Eurasian honeysuckle (*Lonicera* sp.), bramble and common weeds, with few flowers



Northern metalmark (wingspan 2.6 – 3.0 cm)

\*Didymographics, 5 Fish Creek Rd.,  
Saugerties, NY 12477

for nectaring. We headed for those, a sparse patch of ox-eye daisies and a few Canada thistles, but saw no butterflies. Discouraged, we scrambled through dense shrubs for a look north from the top of a jagged, rocky crest. The rest of the line didn't look much better, so we tried the other direction. To the south and downslope we found more brush, a few herb patches and a sedgy shrub swamp that looked good for sedge-feeding skippers. We saw none, and concluded the date was a bit early for black dash and mulberry wing, and two-spotted skipper was probably absent.

We decided to look for the faint tracks of the butterfly counters who said they'd seen metalmarks. This led us back to the path we'd entered on, and the one small area -- only a few square meters -- of low herbaceous plants along the path at the east border of the cleared right-of-way. Just as our hearts were sinking, I saw a small, reddish, moth-like insect, and quickly tracked it to where it landed behind a scrub oak. There was our metalmark! Bob soon found two more, and was quickly snapping his Canon at them. These

butterflies, no bigger than a postage stamp and marked with faint scallops like some geometrid moths, were easily approached and observed once we had found them and formed a search image.

### Living on the Edge

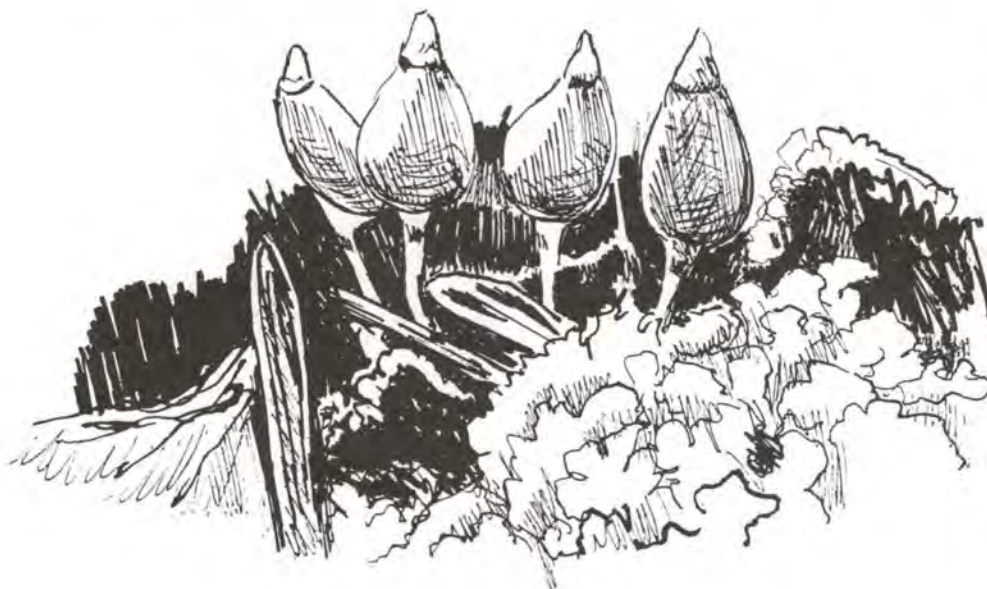
As the novelty and delight of their closeness began to wane, we remembered science and began to subject the metalmarks' habitat to an intense inspection and conversational analysis. Immediately we concluded the butterfly was an "edge species," one which lives at the boundary or transition between two different habitats, in this case, the shady limestone woodland and the more open, sunlit power line corridor. We quickly found the plant eaten by the metalmark as a caterpillar, a yellow-blossomed member of the daisy family commonly called lyre-leaved ragwort (*Senecio obovatus*). Ragwort was abundant on mossy rock outcrops in the woods, and patchily distributed under shrubs in the power line corridor. Plant resources for the larval stage of the metalmark were plentiful, but adult resources were

scarce; there were few flowers to provide nectar, and little of the low-growing mix of grasses and broad-leaved herbs the butterflies seemed to prefer. The divergent needs of the metalmark's early and late life stages necessitate living on the edge where these resources sometimes meet and blend.

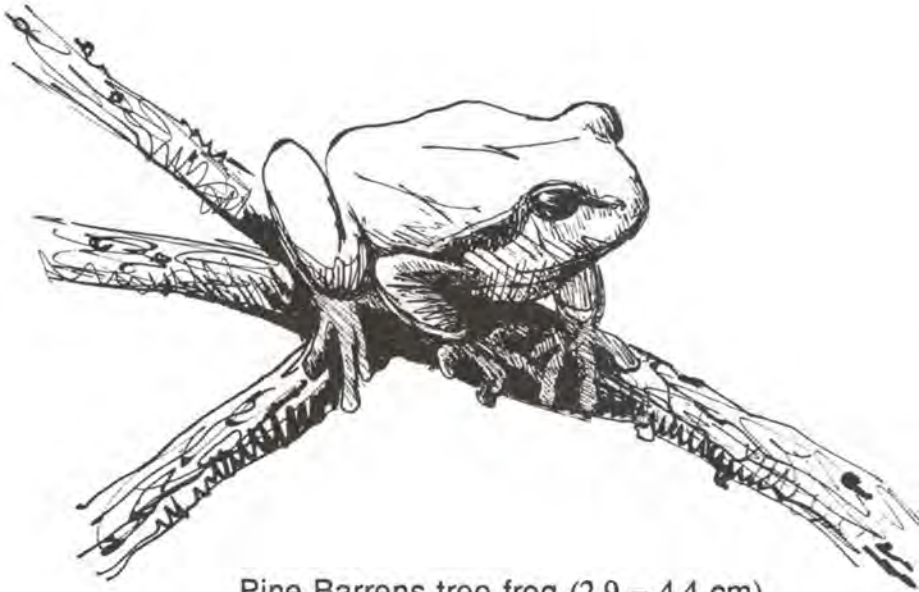
### Other Rare Species

Basking in the good fortune of having found the thing we came so far to find, we said goodbye and made our weary ways home. Along the way I thought how strange yet satisfying it was to have made that journey to discover such a rare beast in such a common and unaesthetic arena. I thought about the power line nearest to my house, and reminded myself that there, too, were rare organisms: two vascular plants, a moss and two butterflies listed as rare in the state by the New York Natural Heritage Program. When we bought our house in 1981 I was happy to find a few individuals of the state-rare falcate orangetip butterfly flying in our back yard. I soon found them in greater numbers along the power line 150 meters south of the house. An edge species like the metalmark, falcate orangetip normally lives along open rocky ledges in wooded terrain, where it finds abundant rock cresses (*Arabis* spp.), its larval host plant and a preferred adult nectar source. Power line cuts often extend the territory of this insect and its plant resources, and provide open links between undisturbed patches of its rocky woodland habitat.

Frequenting this power line to see orangetips and follow the butterfly's life cycle, I discovered a late-blooming rock cress I'd never seen. I sent a specimen to Bob Dirig, who is also a curator at Cornell University's Bailey Hor-



*Buxbaumia aphylla* (capsules 0.3 – 0.5 cm)



Pine Barrens tree frog (2.9 – 4.4 cm)

torium. He identified the plant as green rock cress (*Arabis missouriensis*), another state-rare species. A year or so later I found violet bush-clover (*Lespedeza violacea*) along the power line, and just this year, the rare moss *Buxbaumia aphylla*, and another rare butterfly, Edwards' hairstreak (*Satyrium edwardsii*). Farther from home on small survey jobs I've found other rarities on utility paths: in Saratoga County, Karner blue (*Lycaena melissa samuelis*) and dusted skipper (*Atrytonopsis hianna*) butterflies; in Orange County, yellow harlequin (*Corydalis flavula*), violet bush-clover, purple milkweed (*Asclepias purpurascens*), dusted skipper and Edwards' hairstreak.

Some state- and regionally-rare plants fare better after clearing for overhead or underground utility lines. Botanist Richard Mitchell (New York State Museum) told me of two such cases. In Clinton County, yellow ladyslippers (*Cypripedium pubescens* var. *calceolus*) increased two- or three-fold in numbers and coverage after a path was cleared through a wetland. A sparsely distributed forest population of state-rare red-root (*Cea-*

*nothus herbacea*) increased so dramatically after a power path was cleared that the plant formed a stable ground cover that eliminated the need for further vegetation control along a section of the path.

During a Hudsonia survey of rare reptiles and amphibians on an electric company property in the New Jersey Pine Barrens, we discovered the endangered pine barrens tree frog (*Hyla andersonii*) breeding in greater numbers in open, even disturbed, wetlands than in equally accessible wooded wetlands. These beautiful lime-green frogs, with orange and purple beneath the limbs, seemed to like wetlands crossed by utility rights-of-way and abandoned sand mines.

### Unnatural Selection

If power line cuts and similar cleared paths are bastions of biodiversity, why? We tend to think of disturbance, especially clear-cutting, as detrimental to natural systems and their resident plants and animals. Yet several factors combine to make power line cuts favorable places for certain rare species.

1) Organisms with an edge ecology are often rare simply because edges by their very geometry may occupy far less land area than uniform expanses of the same community or habitat type.

2) In forested country, maintenance of power line paths and other open corridors prevents succession, the natural invasion of the herbaceous community by shrubs and trees.

3) Open corridors act as transmission lines for plant and animal dispersal; seeds are more easily carried by wind, water, animals and even recreational vehicles, while small, sun-basking animals such as insects, reptiles, and amphibians can move long distances along the open paths.

4) Regular maintenance of utility corridors allows the invasion of new plant species, which may consequently become more widely established. This last factor deserves a more detailed discussion.

Control of woody plants on utility paths is usually accomplished by one of two methods: mechanical cutting or application of herbicides. Chain-saws are used to cut trees and large shrubs. Brush-hogging is not a common practice, probably because many power lines cross rough, rocky terrain that would prevent the use of a brush hog. Unless the stumps are chemically killed, many trees and shrubs grow back after cutting, and the surviving shoots may grow large enough to warrant another cutting after a decade or so. Under this regime shrubs generally fare better than trees, being capable of quicker regrowth and a shorter time before reaching reproductive maturity. Some corridors thus become shrub-choked, with a resulting loss of herbaceous species. This was the case with the Springdale metalmark site. This sort of "unnatural selection" may favor low shrubs, such as the red-root cited by Mitchell,

reducing the need for maintenance.

Paradoxically, control of woody plants by herbicides may actually favor herbaceous plants, especially grasses and similar plants, over shrubs. Usually the chemicals are sprayed directly on the leaves of trees and shrubs, the ground plants receiving a lesser dose of residual droplets. Most sedges and grasses are resistant to certain herbicidal chemicals and may be further benefitted by the suppression or elimination of competing broad-leaved plants. Herbicides, especially those that are quickly biodegraded, probably have little effect on seeds. Thus annuals may fare better than perennials under a program of chemical control. Though rare perennials probably outnumber rare annuals, the latter are sometimes spectacularly successful along power line paths. In June 1997 along a transmission line in Harriman State Park I found thousands of yellow harlequin holding their own among red clover, birdfoot trefoil and other common forage herbs.



Yellow harlequin, *Corydalis flavula* (10 – 30 cm tall)

### Sun and Shade

For animals, power line cuts may act as corridors for dispersal, links between larger patches of good habitat, and habitats for foraging, courtship and reproduction. The mix of sun and shade along utility corridors is favorable to many reptiles and arthropods who regulate their body temperature by moving in and out of sunlight. American toads prefer to breed in sun-warmed deep puddles with little vegetation. The infrequent traffic of utility maintenance vehicles along rights-of-way may deepen ruts in wet spots, maintaining the toads' breeding habitat, but killing few or no toads. In summer, young green frogs and bullfrogs take up residence in the deeper puddles. These amphibians are

attracted by the greater abundance of insects and other arthropods in the herb-shrub community of the open corridor than in the adjacent forest. At the same time, the adjacent forest offers other values: cool, moist shelters during drought, and better winter hibernacula for some. Populations of eastern hognose snake (a Special Concern species in New York), a reptile that feeds almost exclusively on toads and frogs, may do well along utility corridors with an abundance of these amphibians. At the top of the food chain, the red-shouldered hawk, a raptor with a fondness for snakes, depends on extensive mature forests for breeding habitat, but may forage along cleared corridors where, not only hognose snakes, but other rodent-eating

serpents such as milk snakes and black rat snakes find plenty of mice, attracted by the wealth of seeds and insects. Black racers and copperheads fare well too, taking both mice and frogs.

### Loss of Deep Forest Habitats

By no means is it bright and sunny for all along the lines. Though birding may be good along a right-of-way, because many itinerant and migrant birds are attracted by fruit and insect food, the intrusion of a corridor can spell disaster for deep-forest-nesting birds. The brown-headed cowbird, which lays its eggs in other birds' nests, never ventures far into forested habitat to find foster parents. Birds such as thrushes, vireos and

many warblers escape cowbird parasitism by nesting deep in the woods. Power line corridors can provide cowbirds deeper penetration into forested tracts, and more access to their avian victims. Similarly, aggressive alien plants such as garlic mustard and Japanese stilt grass can invade deep forest habitats from the edges of open corridors, crowding out native woodland herbs.

For these reasons, utility corridors should be rerouted around the margins of big forest patches to keep the unbroken portions as large as possible. The same applies to forest habitats containing rare native herbs or areas of unusual herbaceous diversity. The needs of rare species occurring in or near existing utility rights-of-way are seldom considered by those making management decisions. Most rights-of-way were developed before laws protecting rare species were enacted. Now, biological surveys must be conducted where new rights-of-way are proposed through undeveloped lands. Unfortunately, such surveys are often too geographically limited (not much beyond the width of the proposed path), insufficiently detailed, or the communities and resident organisms poorly understood by the surveying biologist.

### Case by Case Assessment

It is vitally important that biologists understand the ecology of the plants and animals discovered in the vicinity of the proposed path. Certain species are benefitted by clearing of woody vegetation, while others are harmed. For some species, equally important habitat adjacent to power line cuts may suffer damage even if utilities manage corridors to preserve rare species. Open corridors through large tracts of mature forest risk exposing nesting birds to cowbird

parasitism. In some cases, procedures different from the utility's standard policy may be necessary to preserve a species; for example, prescribed burning, or elimination of plants that do not necessarily pose a problem for the utility, but do for the rare species. An example is the New Jersey metalmark site. There the power line vegetation is becoming increasingly brushy, eliminating important resources for adult butterflies, such as flowers for nectar and low herbaceous vegetation that provides both shelter and sunlight, and a safer habitat for courtship activities.

Utility corridors seem to invite other human activities that pose special risks to sensitive habitats. The damage to natural systems from off-road vehicles has increased tremendously in the last two decades. I have seen steel gates erected by the power company broken or pulled off their posts by locals to gain access to utility corridors. In many parts of the Hudson Valley, operators of all-terrain vehicles have gained access to deeper wild habitat along utility corridors. An instructive example is Fishkill Ridge in the Town of Beacon, where a Hudsonia survey revealed a forest so riddled by ATV paths as to completely confound hikers trying to stay on the narrow, more subtly marked hiking trails maintained by the New York-New Jersey Trail Conference.

Rare species and natural communities on and near power line cuts would benefit greatly from information-sharing and cooperation among amateur naturalists, research scientists, and utility management decision-makers. Nature-lovers should not shy away from utility corridors in the belief that they are too disturbed to be interesting. Indeed, we may find that many populations of rare species will yet be discovered in the unlikely context of power line paths. ●

## HELLO FROM THE HERBARIUM

Hudsonia manages the Bard College Field Station Herbarium, an expanding collection of over 5000 preserved specimens of vascular plants, mosses, liverworts, lichens, and macrofungi. The Herbarium, curated by botanist Gretchen Stevens, is a repository for Hudson Valley specimens, and a regional resource for Hudson Valley biodiversity research.

Herbaria are increasingly valuable in the study and conservation of biological diversity here and around the world. Plant specimens and associated data help to answer questions about taxonomy, species distribution, ecology, insect associates, rarity, reproductive strategies, and region- or habitat-specific phenology. The Field Station Herbarium supports many of Hudsonia's research projects on Hudson Valley habitats and the ecology of rare species, and regularly serves other ecologists, environmental and citizens' groups, scientific illustrators, other herbaria, state and municipal agencies, environmental consultants, naturalists, and students.

Over the last decade, the Herbarium has been partially supported by generous grants from the National Oceanic and Atmospheric Administration (NOAA), the Hudson River Foundation, the Bay Foundation, and the Norcross Wildlife Foundation.

Each year, several student assistants and interns learn herbarium techniques by participating in field surveys, and by pressing, mounting, and cataloguing specimens in the laboratory. Biologists and students may use the Herbarium under the Curator's supervision. Students and the public also have free access to a separate teaching collection of 700 specimens. Private organizations, individuals, and public agencies often submit botanical inquiries, or submit plant specimens for identification. Let us know if you have questions about Hudson Valley botany that might be answered by our biologists, the specimens themselves, or the herbarium database.

# HUDSONIA PROJECT HIGHLIGHTS

## Manual for the Identification of Biodiversity Resources in the Hudson River Greenway Corridor.

Hudsonia's tool for planners and conservationists is nearly complete, and we will be announcing a subscription package this fall. A special feature of the Manual is a key to habitats based on soils and topographic maps. (Supported by Sweet Water Trust, Hudson River Foundation, Norcross Wildlife Foundation, Wildlife Conservation Society, and individual donors.) Hudsonia is seeking donated services for (computer) design and printing.

## Hudson River Marshes

Hudsonia is developing an approach for assessing wetland function based on the hydrogeomorphic (HGM) method. Last year we studied soils and vegetation, and this year fish, benthic invertebrates, and biogeochemistry, in 15 marshes along 160 km (100 miles) of the estuary. Our approach will be used in restoration, management, and permit decisions. (Collaboration with Hudson River National Estuarine Research Reserve and Institute of Ecosystem Studies; supported by Hudson River Improvement Fund and New York State Department of Environmental Conservation.)

## Fens

Fens are limy, groundwater-fed, wet meadows that often provide habitat for rare plants and animals. This summer we studied 25 fens in Columbia, Dutchess, and Litchfield counties. The project will produce a technique for identifying and mapping fens, and a new view of land-use impacts on fen vegetation and soils. Our results will help agencies, NGOs, and landowners conserve fens and their biodiver-

sity. (Collaboration with Institute of Ecosystem Studies; supported by U.S. Environmental Protection Agency.)

## Constructed Wetlands

Hudsonia designed and oversaw the construction of new wetlands for a rare species, using a state-of-the-art salvage method. The entire wetland community and soils were translocated from a wetland that was subsequently filled. We are now monitoring the development of soils, vegetation, and wildlife to see how closely constructed wetlands resemble natural wetlands. (Supported by Arlington Central School District and Guinness Water of Life.)

## Purple Loosestrife Insects

Invasive plants such as purple loosestrife alter marsh biota, but little is known about the ecological effects of these alterations. Hudsonia has conducted three studies of loosestrife insects to begin to answer some fundamental questions:

1. Comparison of insects of loosestrife flower clusters in drier and wetter habitats;
2. Comparison of insects in cattail, loosestrife, and phragmites;
3. Feeding on loosestrife by *Cecropia* and *Polyphemus* moth caterpillars.

Our data indicate that many insects are associated with loosestrife in summer but few in winter, loosestrife has fewer insects in wetter habitats, and insects have little impact on loosestrife. These studies have implications for management of marsh vegetation and insect-feeding animals such as fish and birds. Several students and scientists have worked on this research.

## New Research Associates:

### Rob Brauman

Herpetologist, formerly Research Assistant with our Blanding's turtle studies.

### Peter Groffman

Microbial ecologist with the Institute of Ecosystem Studies, involved in studies of fens and constructed wetlands.

### Hank Gruner

The Science Center of Connecticut, collaborating in research on herps in fens and estuarine wetlands.

### Ernie Schuyler

Botanist with the Academy of Natural Sciences of Philadelphia, specializing in sedges and estuarine plants.

### Chris Swarth

Jug Bay Wetlands Sanctuary, Maryland, involved in a variety of studies of freshwater tidal wetlands and is collaborating with Hudsonia on a painted turtle project.

### Dennis Whigham

Ecologist with the Smithsonian Environmental Research Center, expert on estuarine wetlands.

## Board of Directors:

**C. Lavett "Smitty" Smith**, long-time board member, has resigned. For many years a curator at the American Museum of Natural History, Smitty will be moving to Colorado Springs. We express our gratitude and affection to Smitty, and wish him well in his new life.

**Drayton Grant**, an attorney specializing in environmental and land-use law, has joined the Board. A former Deputy Commissioner of the New York State Department of Environmental Conservation, she brings to her new position a wealth of expertise and enthusiasm.

**Jack Wertheim** is our most recent new board member. He retired from investment banking with Goldman Sachs & Co. in 1991 and now lives full-time in Dutchess County, where he is active in community organizations.

**Our Other Board Members are:** Lawrence H. Weintraub (Acting Chair), Deborah Meyer DeWan, Karen L. Jacobs, Michael W. Klemens, Thomas R. Lake, and William T. Maple.

## NATIONAL AWARD

Hudsonia has received the Project Facilitation Award from the Society for Ecological Restoration for our innovative design of the wetland mitigation for the Arlington Central School District (see Project Highlights).

## THANKS to DONORS

### Goods and Services:

Anonymous, Juliana Barrett, Nels Barrett, Bernd Blosssey/Cornell University, Lin Fagan, Stuart Findlay, Katherine Gould-Martin, Peter Groffman, Garry Hollands, Peter Petokas, Beth Waterman.

## WISH LIST

486 or Pentium IBM compatible computer; design and printing services for the Biodiversity Manual.

## GRADUATE SCHOOL

Bard College Graduate School of Environmental Studies:

The catalog is available by calling (914) 758-7483.

*Erik Kiviat is encouraging inquiries and applications from individuals interested in participating in Hudsonia research on:*

- 1. Development of plant communities and animal use of constructed wetlands; and*
- 2. Reptile and amphibian ecology in the Hudson River and other estuaries.*

## THANKS ALSO TO:

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## JOIN THE TURTLE TEAM!



Our T-shirts are 100% cotton, pre-shrunk, and available in white or buff. They have a small Hudsonia logo on the front left and our "signature" Blanding's turtle on the back in green and yellow. Tax included; please add \$2 for shipping: Children's (short sleeve, S, M, & L) -\$13.00; Adult, (short sleeve, M, L, XL) -\$16.50; Adult (long sleeve, M, L, XL) - \$21.00.

## CREDITS

Design & layout of *News from Hudsonia* by Kathleen A. Schmidt. Production and editing by Gretchen Stevens and Erik Kiviat. We welcome suggestions for articles and offers of underwriting for future issues.

- \* The Bay Foundation
- \* Furthermore
- \* Guinness Water of Life
- \* Hudson River Improvement Fund
- \* Norcross Wildlife Foundation
- \* U.S. Environmental Protection Agency
- \* Volunteer Monitoring Demonstration Project of the Salisbury Association
- \* Wildlife Conservation Society

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