



NATURAL HERITAGE NEWS

The Newsletter of the Natural Heritage & Endangered Species Program

Inventorizing and Protecting the Biological Resources of the Commonwealth Since 1978

University of Massachusetts
Library Copy

More than 432 acres have been acquired in 1992 by the Division of Fisheries and Wildlife to protect rare species and exemplary natural communities, the goal of the Natural Heritage & Endangered Species Program (NHESP). Through the inventory work of NHESP, funded by voluntary contributions on state tax forms, Fish & Wildlife was able to identify which land was important to purchase for conservation purposes. (The land purchases themselves were financed through bond funds,

not donations.) Five of the acquired parcels are adjacent to or surrounded by other conservation land, further buffering them from nearby land uses and possible residential and commercial development. Three of the transactions were negotiated by The Nature Conservancy (TNC) on behalf of the Commonwealth. The Division now owns 1210 acres of habitat purchased for the protection of rare species and exemplary natural communities.

Sally Carroll

Town	Acreage	Significance of Site Purchased
Stockbridge	70.0	Best calcareous basin fen in the state. 1,3,4,5
Hinsdale	10.8	Sloping calcareous seepage swamp. 1,3
West Stockbridge	118.0	Excellent example of rich mesic hardwoods. 1
Leverett	10.8	Private inholding in rich mesic hardwoods conservation area. 2
Westfield	195.18 (2 tracts)	Excellent amphibian breeding site with some of the highest diversity in abundance in the state.
Sunderland	6.0	Riverine cobble islands.
Plymouth	21.0	Pristine example of globally rare coastal plain pond community. 5
Edgartown	0.25	Small, private inholding in excellent sandplain grassland conservation area. 2,5

- 1 Adjacent to conservation land
- 2 Surrounded by conservation land
- 3 See story on page 3
- 4 See story on page 4
- 5 Negotiated by TNC

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Radiotelemetry: Tuning In To Turtles

BLANDING'S TURTLE

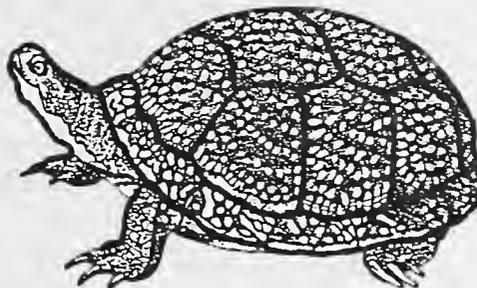


Illustration from *Amphibians and Reptiles of New England* by DeGraaf, 1983.

The decline of reptiles and amphibians has become a global problem due in part to their vulnerability to habitat fragmentation; yet, there has been little research into this area. This year, three studies funded through NHESP's 1992 Small Research Contracts program used the technology of radiotelemetry to learn about the dispersal and movement patterns of the Spotted Salamander, Blanding's Turtle, and Wood Turtle. Radiotelemetry is the use of audible signals transmitted through electromagnetic waves from a device, in this case, attached to the animals being tracked. The tracker carries a receiver that produces a beeping sound when it receives an animal's signal; the closer the animal, the louder the sound.

(Continued on next page)

Radiotelemetry

(continued from page 1)

To increase turtle populations, it is important for wildlife managers to know which habitat types turtles rely on for feeding and nesting. In an attempt to discover where Blanding's Turtles (*Emydoidea blandingii*) nest at Fort Devens, independent biologist Brian Butler radio-tracked Blanding's Turtles at the 9,000-acre army base in Lancaster for a study funded by the U.S. Department of Defense. These turtles like to nest in areas with open, sparsely vegetated, sandy soil, which is abundant at the base. It is often difficult to locate the exact site(s) they use for egg-laying because these turtles have a large home range that stretches along a river course.

In early June, Brian bolted or glued 2-by-1/2 inch radio transmitters and 8-inch wire antennas to the shells of ten females and two males. The adventure-some turtles provided Brian with constant challenges. Four of the monitored turtles decided to nest behind Fort Devens' firing ranges, which kept Brian away during target practice! Working long (sometimes 15-hour) days on his feet to radio-track the turtles, Brian discovered that they travel far and for long periods. Also, while each turtle's transmitter signal can ideally carry up to a mile, its range shrinks to about a quarter-mile when a turtle is surrounded by hills, thick vegetation, or deep water, making tracking a little more tricky.

One turtle went over a mile away to nest, and remained there 4-5 days before returning. Three turtles were known to cross the river; one turtle left the base for a vernal (seasonal) pool off the property and stayed there 3 to 4 weeks. Turtles may make such visits to feast on the wood frog tadpoles and other amphibians that inhabit the warmer waters of vernal pools.

Brian will eventually plot all the turtles' movements on a large-scale com-

posite map. As the transmitters are expected to stay on the turtles for a couple of years, Brian hopes to continue the study next year to determine where the turtles choose to hibernate.

SPOTTED SALAMANDER.

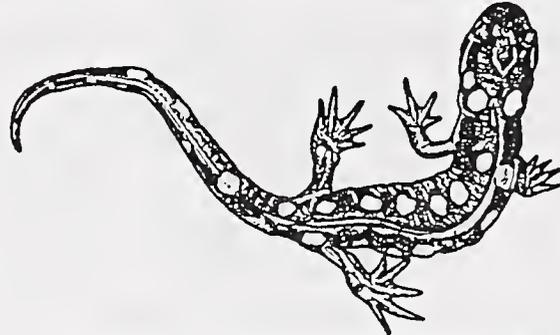


Illustration from *The Salamanders of New York* by Bishop, 1941.

Bryan Windmiller, a doctoral student at Tufts University, used transmitters the size of kidney beans to track 17 Spotted Salamanders (*Ambystoma maculatum*). This ongoing project at Minute Man National Historical Park in Lexington and Concord, funded through NHESP primarily by the National Park Service, used radiotelemetry to study the dispersal patterns of salamanders and their susceptibility to changes in their habitat. The transmitters were sewn onto small bandages and then sutured onto each salamander's skin while it was under anesthesia. These salamanders, which range from 5 to 8 inches (females are larger), could only be tracked for about 3 weeks because the transmitters came off when they shed their skins. Preliminary results of the study show that the tracked salamanders almost exclusively inhabited the burrows of small mammals, mainly short-tail shrews, which are usually under or near logs. Most Spotted Salamanders seem to head straight from the study pond towards the area with the highest density of shrew burrows. Through radiotelemetry, Bryan also found that the salamanders spent most of their time less than 6 inches under the surface of the soil, and rarely surfaced during the day. Bryan's

management recommendation for Spotted Salamander would be to leave the forest floor messy! Short-tail shrews like leaf litter and lots of logs, and what's good for shrews may be good for Spotted Salamanders.

WOOD TURTLE

Under a small research contract funded by monies made available to NHESP by The Nature Conservancy, Dr. Philip Robakiewicz of the Mass. Audubon Society is studying the habitat preferences of Wood Turtles (*Clemmys insculpta*) in the Scantic River floodplain area of Wilbraham, Hampden, and Monson. Phil's study got off to a late start after he and his volunteers took 6 weeks and 250 search hours to find 5 Wood Turtles. A total of 3 female and 2 male turtles, each at least 15 years old, were fitted with transmitters and tracked twice weekly, at which time a vegetation analysis was done of their surrounding habitat.

Phil found that, like Blanding's Turtles, the Wood Turtles moved long distances and, as summer progressed, they moved farther away from water into dry oak woods. No nesting turtles were found, probably because the study started late and the egg-laying season (May-June) had ended. However, radiotelemetry allows Phil the option to "tune in" to the turtles again next spring.

This year, Phil's study focused on the habitat choices of Wood Turtles. He speculates that one reason the turtles travel to certain areas is the seasonal abundance of food plants at those locations; he is thankful that instead of taking hours to find these turtles using conventional methods, he can locate a "wired" turtle in 45 minutes using radiotelemetry.

- Sally Carroll



Transmitter and antenna for adult female salamander (actual size)

Natural Community Profile: Calcareous Fen

Description

Some of New England's best calcareous fens are in Massachusetts. They provide habitat for many state-listed rare species of plants and animals, making them an important contributor to the state's biological diversity. They are open, peaty wetlands with cold, alkaline groundwater that flows through an underground mineral layer containing calcium carbonate. These calcareous fens support a variety of plants dominated by calciphile (lime-loving plants) species of sedges, grasses, broad-leaved herbs, and shrubs. Calcareous fens are inhabited by predominantly northern or midwestern plants that persist or outcompete southern species in the fen. (For more information on this community, a fact sheet is available from NHESP.) They also provide habitat for the Bog Turtle (*Clemmys muhlenbergii*), which is listed as Endangered in this state and has a restricted global range.

The calcareous fen is not classified as a bog, because of its continual water movement that transports dissolved calcium and magnesium and flushes out tannins and acids, and prevents the deeper peat accumulations characteristic of the acidic conditions of bogs.

Geology, Climate, and Origins

Calcareous fens in Massachusetts are small communities, mostly a few acres or less, that are found scattered through the limestone region in Berkshire County. They occupy low-lying basins or bottom slopes that intercept the flow of water draining from marble, dolomite, or magnesium limestone rock. Porous gravels

facilitate groundwater flow and often occur at calcareous fens, at their discharge sites. These gravels date back to the Pleistocene period, when glaciation left behind sorted gravel and sand in ridges, deltas and terraces deposited by meltwater streams in valleys of ancient rivers.

Generally, calcareous fens are considered an early stage of a sequence that begins with open water and progresses by gradual changes in habitat to a forest climax, a process known as succession. This process creates noticeable zones or patterns along the water level gradients where distinctive plant communities coexist. Superimposed on this is a topography of hummocks and hollows reflecting further unevenness in the distribution of peat and water and often leading to mosaic patterns of vegetation. The extremely wet portions (when present) are dominated by a variety of sedges and grasses. Basin or Level Calcareous Fens are large in size and originated as lakes now being filled in with slow-draining thick peat mats; Seepage Calcareous Fens typically have open channels of faster-moving water and thin or non-existent peat mat; and Sloping or Hillside Calcareous Fens are an intermediate form influenced by a stream that occasionally floods, bringing increased sediments and nutrients, and consequently a reduced peat mat. A complete classification of calcareous fens is being conducted by Glenn Motzkin under a research contract funded by NHESP and The Nature Conservancy; this includes studies of fens in adjacent areas of Connecticut and New York.

Protection Status

Most calcareous fens in Massachusetts have been influenced by human activity through the disturbance of the peat layer and/or water supply. A number of factors can either disrupt or maintain the checks and balances that stabilize calcareous fens over a long period of time, such as changes in the nutrients, water chemistry and water levels. Flooding and ditching, when they result in severe or prolonged water level changes, either reverse or speed up the natural processes in community succession; grazing may slow succession and appears to increase plant diversity of some fen communities, but its potential to increase nutrients and compact soils can often have negative effects, such as the decrease, absence or replacement of calciphiles by aggressive wetland species such as Giant Reed (*Phragmites australis*). Increased nutrient levels (primarily nitrogen) can also locally alter the balance of the flora by favoring escaped garden plants like Purple Loosestrife (*Lythrum salicaria*). Moderately disturbed or degraded calcareous fens still have the potential for some recovery. Others actually appear to require or benefit from intervention by controlled or specific disturbances. A few small and marginal calcareous fens in Massachusetts owe their diversity to light grazing or mowing.

Probably the greatest threat to calcareous fens is the change in quantity or quality of the groundwater originating from other areas within the watershed. In light of the few high-quality fens remaining, and their location in an area of accelerated growth and development (Berkshire County), they are among the five most threatened types of natural communities in the state.



Illustration by Virginia Salzman

- Adapted from a fact sheet by Virginia Salzman

Britton's Violet Or Not?



Viola brittoniana
v. brittoniana



Viola brittoniana
v. pectinata

The two plants pictured above have been classified by botanists as varieties of the same species although they look markedly different. Variety (*v.*) *brittoniana* has deeply lobed leaves, whereas the leaves of *v. pectinata* are unlobed and have comb-like teeth along the basal margins. The two plants may have originally been classified as similar because their flowers and overall ranges are similar.

Dr. Richard Kesseli, a geneticist at UMass Boston, is convinced that, although quite similar, the two violet varieties are distinct from one another. He and his student, Valerie Stone, are using

nuclear DNA analysis by gel electrophoresis to determine the genetic differences between the two taxa. The process involves separating DNA and protein from the plants and spotting them onto gel, so that they can be studied and compared. Through this method, Kesseli and Stone have identified several genetic markers that may have resulted from many generations of genetic selection before *v. pectinata* lost some leaf and other characteristics of *v. brittoniana*.

Viola brittoniana v. pectinata may be a hybrid of Britton's Violet and another stemless blue violet, which Kesseli and Stone hope to identify through further

Britton's Violet (*Viola brittoniana*) is a perennial herb that occurs in open floodplain woods and river meadows that are subject to occasional flooding. It is listed as Threatened in Massachusetts, as there are only 6 known populations of this plant which occur along the Concord River.

research. Such hybrids are rare in nature and are generally not recognized as being taxonomically different from the parental species.

As *v. pectinata* is only known from one population in Norfolk County, if it is considered a separate species from *Viola brittoniana* it is even more rare than previously thought, and might be proposed as a federally listed species. Stay tuned for updates on Britton's Violet in future issues.

- Sally Carroll

Protecting Kampososa Fen

We are pleased to report an environmental success story. We review hundreds of development projects a year, and it is nice to be able to show how the process can work. This particular environmental review involved Kampososa Fen in Stockbridge. Kampososa Fen supports one of the greatest concentrations of rare species in Massachusetts, and is one of the best examples of a calcareous basin fen natural community in New England; there are conservation restrictions over much of the area. The "life-blood" of the fen is the alkaline water which flows in with crucial minerals and nutrients, and should be free from sources of degradation.

Tennessee Gas Pipeline Company owns a right-of-way with a pipeline running through part of Kampososa Fen. The physical disturbance resulting from the construction of the original pipeline facilitated the growth of Giant Reed Grass (*Phragmites australis*), a six-foot tall,

invasive plant that crowds out other vegetation, which grew on Tennessee Gas Company's right-of-way along with two rare plant species, Pendulous Bulrush and Fringed Gentian. In 1989, Tennessee Gas Pipeline Co. proposed to construct a second pipeline, more than 10 miles long, going through Richmond and Stockbridge; it would pass under the Massachusetts Turnpike and through the Kampososa Fen. In May 1991, in response to the request, NHESP recommended that the new pipe be placed along the northern margin of the fen, situated further upland. In this location, the pipe would bypass the fen as much as possible, and cross fewer streams and wetlands than in the originally proposed location, where NHESP was also concerned that noise from construction would disturb rare birds nesting in the fen such as the American Bittern, and the 15 state-listed rare plant species there. NHESP also stated that, if a second pipeline was to be added, it should be with the

stipulation that existing damage to vegetation by *Phragmites* should be remediated as much as possible, and minimal new damage done.

To its credit, Tennessee Gas agreed to take the least damaging, most northerly route for its second pipeline, and has entered into an agreement with The Nature Conservancy to have the area cleared of *Phragmites* with regular mowing and herbicidal treatment, and to prevent its spread into the fen. Construction of the second pipeline will probably begin next fall to avoid construction during spring and summer, which is the animals' breeding season.

NHESP Environmental Reviewer Jay Copeland handled this project review. Jay worked with Stone & Webster, an engineering firm in Boston, to refine their mitigation measures. Their cooperation helped the review process go very smoothly, and show promising results.

- Sally Carroll

Advisory Committee holds 100th Meeting

The Division of Fisheries & Wildlife's Nongame Advisory Committee recently held its 100th meeting since its official establishment in 1983. This committee was created by the law that added the contribution line for nongame wildlife conservation to state income tax forms. The committee has been quietly and effectively going about its business ever since performing annual tasks such as reviewing Small Research Contract proposals or changes to the state's rare species list as well as taking on complex issues such as assessing the threats posed to native species and communities by exotic plant and animal species. NHESP greatly appreciates the tireless efforts of committee members who are generous with their time, ideas, and constructive advice.

The Committee meets on the second Thursday afternoon of each month (except August) at the Division's Field Headquarters in Westboro at 1:30 PM. Dr. Gwil Jones of Northeastern University's Biology Department is the chairman. For a complete list of committee members and associate members, please see the last page of this newsletter. The public is welcome at these meetings.

The Committee's schedule of annual agenda items is as follows:

- January** - Review previous year's Small Research Contract results;
- February** - Review current year's Small Research Contract proposals;
- March** - Review NHESP budget;
- April** - Review proposed changes to the state endangered species list;
- May** - Review NHES Fund promotional campaign;
- June** - Discussion of final recommendations for endangered species list changes;
- September** - Review of previous fiscal year's activities of NHESP;
- December** - Election of Advisory Committee Officers.

- Henry Woolsey

Returning grasslands to Martha's Vineyard State Forest

The winds of Hurricane Bob in August 1991 and the subsequent storm on Halloween have long since disappeared but the storms' repercussions are still being felt on Martha's Vineyard. These storms caused significant damage to many of the forest plantations of the Manuel F. Correllus State Forest that occupies 4300 acres in the center of the island. NHESP is a member of a committee that has been formed by the Department of Environmental Management's Division of Forests & Parks (DEM) to assess fire hazards within the forest and to reevaluate the property's ecological resources.

Property History

The property was acquired originally by the Commonwealth in the early years of this century to help protect the Heath Hen, a relative of prairie chickens, which had become entirely restricted to Martha's Vineyard by the end of the nineteenth century. After the Heath Hen became extinct in the early 1930s the state began planting a variety of pine species in what had previously been the Heath Hen's open grassland and heathland habitat. Many of the pine plantations have not fared well due to disease and other factors. The recent wind storms compounded the situation.

A Fire Hazard

Most of the vegetation of the state forest is quite flammable and the area has a long history of wild fires. Because of the additional potential fire hazard posed by the trees that had been blown down, DEM has been assessing the different vegetation types as potential "fuels" and has been rapidly moving ahead to widen existing fire breaks to be better able to control possible wild fires or to conduct prescribed burns which would reduce woody fuels and thus the fire danger.

Rare Species

Fifteen species that are presently listed as Endangered, Threatened or of Special Concern in Massachusetts have been recorded from this state forest as follows:

	current	historical
butterflies	-	1
moths	3	-
birds	-	1
plants	8	2

Most of the rare species recorded from the forest occur in grassland/heathland habitats which have declined markedly during this century, both in the forest and on the island. A few of the listed species are inhabitants of pitch pine/scrub oak barrens.

Grasslands

As a means to help control wildfires, to create an important wildlife habitat, and to recreate vegetative communities that formerly occurred within the state forest, DEM is developing a plan that would convert up to a thousand acres of pine plantations or oak woods back into grasslands and perhaps another thousand acres into a savanna habitat. The potential for managing habitat within the state forest for state listed rare species and other uncommon species represents a very exciting opportunity for wildlife conservation in Massachusetts.

Task at hand

DEM is working with a variety of individuals and organizations to further develop and implement this ambitious but most worthwhile plan. Groups helping DEM in this endeavor include: the NHESP, The Nature Conservancy, Massachusetts Audubon Society, The Trustees of Reservations, the U.S. Fish & Wildlife Service, the U.S. Forest Service, the Cape Cod National Seashore, the Department of Forestry & Wildlife Management at the University of Massachusetts at Amherst, and the Nantucket Conservation Foundation. For more information individuals can contact Bill Rivers at DEM, (413) 545-5993.

- Henry Woolsey

FUND UPDATE

As close readers of this newsletter are no doubt aware, **eighty-four percent of the Program's operating budget comes from tax form contributions.** However, contributions to the Natural Heritage & Endangered Species Fund on state income tax forms have declined for two consecutive years and 1991 figures appear to continue this trend. The present tabulation of contributions on 1991 tax forms, although still incomplete, shows a total \$301,451. Contributions declined 14% in 1990 and final 1991 figures are expected to show an additional decline of 8 percent. These declines are thought to be due to general economic factors as well as competing "checkoffs" on the tax forms.

In an effort to augment our declining revenues, NHESP has been successful in obtaining money from various organizations and federal agencies for the following variety of projects:

Department of Defense

*Blanding's Turtle Study,
Fort Devens

*Wildlife inventories, Fort Devens

*Flora of Camp Edwards

National Park Service

*Biological inventories,
Minute Man National Historical Park

Fish & Wildlife Service

*Research and management on
federally listed species

*Wetland bird research

*Data for study of potential
Conte National Wildlife Refuge

Environmental Protection Agency

*Wetland bird research

Forest Service/Dept. of Env. Mgmt.

*Review Forest Stewardship plans
and preparation of species atlas

The Nature Conservancy

*Biological inventories,
Connecticut River.

These grants total about \$200,000, spread over several years.

- Henry Woolsey

Plover Numbers Reach All-Time High

This year brought exciting news for the threatened Piping Plover! The number of nesting Plovers in Massachusetts increased to 213 pairs, the highest number ever documented in the state, reports Dr. Scott Melvin of NHESP. This number of breeding pairs increased from 160 and 140 pairs in 1991 and 1990, respectively. Average statewide productivity increased to 2.0 chicks fledged per pair, compared to 1.7 and 1.4 in the previous 2 years.

The Piping Plover is a small, grey and light-brown shorebird that nests on sandy coastal beaches. Its numbers have been declining over the last 50 years partly because of human intrusion into its coastal habitat and from predation by growing numbers of raccoons and other animals that thrive in residential areas.

The recent population increases of plovers are attributed to intensive management designed to protect habitat and enhance productivity. Management included use of wire fencing to protect nests from predators such as foxes, skunks, crows, and gulls. Twine fencing and warning signs were used to protect nests from pedestrian disturbance and provide refuge areas for chicks. Temporary closures to off-road vehicles at several beaches protected flightless chicks from being run over.

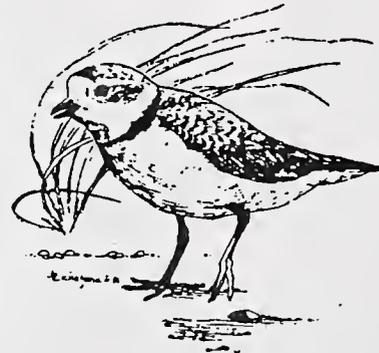
Protection from vehicles was too little and too late for a chick that was run over and killed by a vehicle on East Beach on Chappaquiddick Island on June 24. Biologists that were stationed on the beach during daylight hours to guide vehicles past the lone chick lost track of it for only 15 minutes, during which time it was run over and killed. Such incidents demonstrate how vulnerable plover chicks may be to mortality caused by motorized vehicles on beaches.

On Cape Cod, Piping Plovers showed positive responses where portions of beaches were closed temporarily to recreational off-road vehicles to protect newly hatched chicks. Numbers of plovers increased from 15 to 28 pairs on the North District of the Cape Cod National Seashore, from 8 to 14 pairs at Nauset Spit in Orleans, and from 5 to 10 pairs at Sandy Neck in Barnstable. Plovers at all three areas fledged an average of greater than 2 chicks per pair, which indicates excellent productivity.

Only 6 pairs nested along the South Shore in Scituate, Duxbury, and Plymouth, but in these towns productivity again averaged above 2 chicks fledged per pair, which bodes well for the future. "The population on the South Shore has declined to such a low level that it will likely take several years to rebound" said Dr. Melvin. On Plymouth Beach, the pair of plovers that nested this year moved

their newly hatched chicks onto sections of beach that had been closed to off-road vehicles only days before, and remained in those areas for several weeks until the chicks fledged.

Censuses and protection efforts for Piping Plovers are carried out by wildlife biologists and beach managers working for state and federal agencies, private conservation organizations, and towns, and by university researchers. Much of this work is coordinated by the Massachusetts Division of Fisheries and Wildlife, and is funded in part through voluntary contributions to Massachusetts' Natural Heritage and Endangered Species Fund. Despite increases in its population, the state's Piping Plover continues to face threats in other parts of its range both in and outside Massachusetts. Its growing success highlights the bird's dependence on our continued management and protection for its survival.



- Adapted from a press release
by Scott Melvin.

NEWS NOTES

NEWS NOTES

PUBLICATIONS



ERGLE COUNT

A total of 7 pairs of Bald Eagles nested this year in the state; 5 pairs laid eggs, and 7 chicks fledged this summer, including one that was raised in captivity and then "fostered" into a wild nest.



BURYING BEETLES CHILL OUT

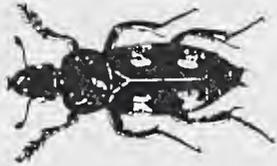
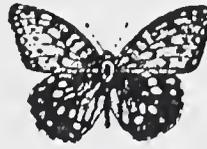


Illustration from The Common Insects of North America by Swan & Papp, 1972.

Perhaps due to an unseasonably cool survey period this year, only two American Burying Beetles (Nicrophorus americanus) were captured on Penikese Island in Buzzards Bay. In 1991, 16 were captured during the July 1-4 survey period when the temperature stayed above 59 degrees Fahrenheit. A total of 89 of these lab-reared beetles have been released on the island through the 1992 field season as part of an attempt to reintroduce this once-thriving species to this state. Burying beetles are so named because they bury the corpses of small animals before using them as food for their offspring.

RERRING REGAL FRITILLARIES

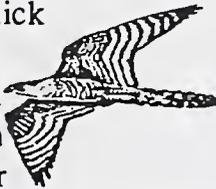


In a cooperative project between NHESP, UMass Amherst, UConn., and many other public and private parties, the Regal Fritillary butterfly will be studied to discover why its population has declined. Unfortunately, no Regal Fritillaries were found in Massachusetts or anywhere else in New England this year. Four female Fritillaries from Pennsylvania, the nearest known colony, were taken to Massachusetts to be captive-reared. From the 4,000 eggs laid so far could come several hundred viable pupae, some of which may in future be released into suitable habitat in Massachusetts.



PEREGRINES' PROGRESS

A Peregrine chick we released in Boston in 1990 is nesting at Throg's Neck Bridge in New York with her mate, also from Boston; we released him in our 1984 pilot program. A record high of 6 Peregrine chicks were counted this year: 4 fledged in Boston and 2 in Springfield, the sites of our two known Peregrine nests. There were 5 males and 1 female.



Henry Woolsey, Coordinator of NHESP, has co-authored a book entitled the New Massachusetts Endangered Species Act published by Massachusetts Continuing Legal Education, Inc. (MCLE), a non-profit educational institution. While not everyone may want to purchase this \$60 softcover, it might be a worthwhile investment for those who want a greater understanding of the legal impact of the Massachusetts Endangered Species Act (MESA). The book explains the Act and regulations; species taking issues; and analyzes case decisions on whether land use regulations constitute a regulatory "taking" without compensation. The book includes the complete MESA and regulations. Anyone interested in the book may call MCLE at 1-800-632-8077.

James Cardoza, Gwilym Jones, Thomas French, and David Halliwell have produced a booklet entitled A Compilation of the History and Status of Exotic Vertebrates in Massachusetts. This is Number 6 in the Division of Fisheries & Wildlife's series entitled Fauna of Massachusetts. Information on obtaining this booklet is available by calling the DFW's Westboro office at (508) 792-7270.

- Sally Carroll



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Staff Changes

Paul Somers joined us in May as the new State Botanist. Paul received his master's degree in botany from the University of Maine and his Ph.D. in plant systematics from the University of Tennessee. He has 15 years of experience directing the Rare Plant Protection Program in the Tennessee Department of Conservation's Natural Heritage Program, one of the oldest heritage programs in the country. Paul received the Tennessee Governor's Environmental Achievement Award in 1990. He has published more than 25 articles and reports; his work has appeared in *The Tennessee Conservationist*, *Cumberland Journal*, and the *Journal of Tennessee Academy of Sciences*. We look forward to his contributions in inventorying, researching, and protecting Massachusetts' flora.

Steve Roble left the Program this spring to take the position of Chief Zool-

ogist of the Virginia Natural Heritage Program in Richmond. Steve joined NHESP in January 1988 and made important contributions to the Program's environmental review operations and biological data base. He drafted the "Guidelines for the Certification of Vernal Pool Habitat" and subsequently certified more than 200 vernal pools. He greatly improved the Program's invertebrate (dragonflies in particular) and herpetological data base. An excellent field biologist, he tirelessly responded to approximately 400 Wetlands Protection Act regulatory filings a year that potentially impacted rare wildlife. We wish him lots of success, and field work, in Virginia.

While Environmental Reviewer Jay Copeland is on a leave of absence to care for his infant daughter, Molly, his assistant Patricia Huckery is the Acting Environmental Reviewer until the winter of

1993. Pat was Environmental Review Intern at NHESP while completing her Master's degree in Environmental Studies at UMass-Lowell.

Jay wasn't the only one to become a father--congratulations also go out to our Assistant Director Tom French on the birth of his daughter, Alexandra, on May 24th. And speaking of babies, our former newsletter intern Chris Dugan is now taking care of her son, Zachary, who was born on July 24th, before his deadline. Chris also raised the *Natural Heritage News* from its infancy these past two years; we thank her for cheerfully pioneering the format and layout of the newsletter, and we will miss her. A former data intern, I have assumed production of this newsletter.

- Sally Carroll

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