



# Marsh Monitoring Project Newsletter

Deerfield River Watershed Association

## The Results Are In!

This year was an outstanding one for the marsh monitoring project. Because of the dedication of 18 volunteers, we were able to survey more wetlands and collect more information at each wetland than in 1999. A special thank you to you all! I would also like to acknowledge the 19 landowners who gave the Deerfield River Watershed Association (DRWA) permission to conduct surveys on their property for the second year in a row.

More amphibian species were observed this year, and we had some outstanding bird sightings. Although the first amphibian survey period or "window" was missed at some wetlands, wood frogs, American toads, and pickerel frogs were reported from many wetlands (See **Survey Results for 2000**, page 3).

Marshbirds were found at 8 of the 23 wetlands where surveys occurred. However, more interesting was the fact that volunteers reported more species of marshbirds and higher numbers of birds than last year. For example, when compared

to last years' data, soras were heard at two sites compared to one in 1999, American bitterns were found at four sites versus one, and Virginia rails at 8 sites versus 5. No sightings of king rail, common moorhen, pied-billed grebe, or sedge wren were reported. In April (before surveys had begun) a pied-billed grebe surprised several of us at a Shelburne wetland, entertaining us with its strange laughing call for about an hour. However, it did not appear to remain at the site.

The most productive wetlands for marshbirds were two in Shelburne and one in Conway. For the second year in a row, the most diverse site for marshbirds, in terms of number of species and individuals, was Little Mohawk Road in Shelburne. In addition to sightings of the least bittern, American bittern, Virginia and sora rails, marsh wrens were also observed here, one of the few sites in Western Massachusetts to host this species.

Six species of frogs were reported from

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Marsh Wren  
Photo: Robert Packard

## Water, Water Everywhere

With the abundance of precipitation this year, some of you are undoubtedly wondering how all this rain affects our wetlands. Many plants need a periodic "drying out" during their life cycle. Cattails, for example, will not germinate in water over a few inches deep, and actually proliferate when the marsh-bottom is exposed to the air for a few weeks. The marsh bottom (or marsh soils) may be exposed during periods of drought (the

summer of 1999 is a good example of this), or when a beaver dam has been breached. Whenever soils are exposed, seeds stored in the deep mud can germinate and thrive.

A survey site with an abandoned beaver pond and an active one is the Leyden Road wetland complex in Greenfield (see **Survey Results for 2000**, page 3). These wetlands, where habitat training

## Results! continued from p. 1

five sites: Ashfield Lake, Lower Road in Deerfield, Brattleboro Road in Leyden, and Leyden Road and the Tree Farm on Rte. 5&10 in Greenfield. The highest number of species (7) was found at West Leyden Road in Leyden. This beautiful marsh is located adjacent to W. Leyden Road, east of the cemetery. The gray treefrogs were deafening here in June.

The Deerfield River Watershed Association sponsored the project this year. Under the auspices of the DRWA, we received funding from several sources, including the Sweet Water Trust and Living Springs Foundation (two private foundations), and The Riverways Small Grants Program and the Massachusetts Environmental Trust (two state organizations). These organizations provided enough support to see the project through until December 2001, its final year. A big THANK YOU to these groups for their support and interest.

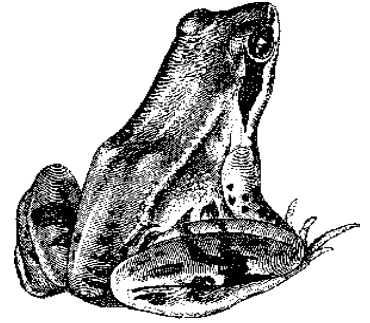
I would like to acknowledge two people who helped make this project a success during the last two years: Jennifer Strules and Bob Packard. Because of an increase in funding, we were able to hire Jennifer as the Assistant Biologist this year. Her hard work and unflagging enthusiasm, in spite of flooded wetlands, bears, and cold and rainy weather were much appreciated. Bob surveyed 12 wetlands for birds and frogs last year and checked out others to determine their potential for the project. This year we gave him a break: he only had to survey 7 wetlands!! Bob is an incredible, self-taught naturalist who

is happy to share his knowledge with others. Thanks again to you both.

You may be wondering how the information that you collected will be used. First, we send the results to each landowner who participated in the project. Sightings of rare species of birds and amphibians are reported to the appropriate state agencies. A final report will be written in the fall of 2001. Copies of this report will be sent to numerous organizations and agencies, such as the Massachusetts Natural Heritage and Endangered Species Program, Conte National Fish and Wildlife Refuge, funding agencies and foundations, and others with an interest in wildlife-related issues.

We hope that you all enjoyed participating in the project and look forward to seeing you in 2001. Have a great fall and happy holiday season.

*Pat Serrentino*



## Water, Water Everywhere continued from p. 1

sessions took place, are actually two marshes with differing amounts of standing water. The abandoned beaver pond is no longer flooded for the entire year. The soils remain damp in the summer and an amazing variety of plants can be found, including swamp milkweed, jewelweed, cattails, willows, smartweed, and boneset. During amphibian surveys we only heard spring peepers and American toads at this wetland. The active beaver pond is dominated by open water, with a border of sedges, grasses, ferns, and shrubs. Spring peeper, gray treefrog, pickerel frog, green frog, and bullfrog were heard between April and July. The presence of standing water provides the appropriate living conditions for more species of amphibians.

If beavers return to the abandoned wetland, the thick stands of vegetation will die out and be replaced by open water and plants better adapted to water-logged soils, such as bulrush, water-lilies, and bur-reed. The greatest diversity of plant and animal life occurs when almost equal amounts of open water and emergent plants coexist in a patchwork formation across the



entire marsh. Some good examples of marshes with both small ponds and zones of emergent plants are: Little Mohawk Road in Shelburne, Phillips Road in Ashfield, Beaver Pond in Hawley, Schneck Brook in Conway, and West Leyden Road in Leyden.

*Jennifer Strules and Pat Serrentino*



Bell Road Marsh, Leyden.  
*Photo: Pat Serrentino*

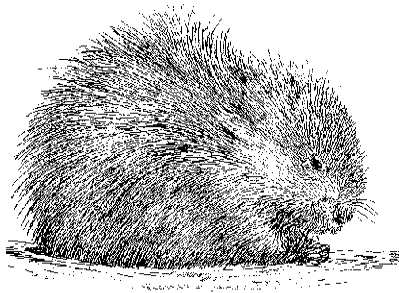
## SURVEY RESULTS FOR 2000

Wetland Name and Location	Calling Amphibians	Marshbirds
<i>Ashfield:</i>		
Ashfield Lake	Wood frog, spring peeper, pickerel frog, American toad, gray treefrog, bullfrog	No survey conducted
Phillips Road	Spring peeper, gray treefrog, green frog,	None observed
Powerline (Bear Swamp Rd.)	Spring peeper, Northern leopard frog, gray treefrog, green frog,	None observed
Shrub Swamp (Bear Swamp Rd.)	Wood frog, spring peeper, gray treefrog, green frog	No survey conducted
<i>Buckland:</i>		
Cemetery Road	Spring peeper, pickerel frog, gray treefrog, green frog	No survey conducted
Conway: Schneck Brook	Spring peeper, pickerel frog, gray treefrog, green frog, bullfrog	Sora and Virginia rails, American bittern
<i>Deerfield:</i>		
Chase (Mill Village Rd.)	Spring peeper, gray treefrog, green frog	Virginia rail, American bittern
Oxbow	Gray treefrog, green frog, bullfrog	None observed
Bement School	Spring peeper, American toad, gray treefrog, green frog	None observed
Lower Road	Spring peeper, American toad, pickerel frog, gray treefrog, green frog, bullfrog	Virginia rail
Rte. 5&10, North	Green frog	Virginia rail
<i>Greenfield:</i>		
Leyden Road	Spring peeper, pickerel frog, American toad, gray treefrog, green frog, bullfrog	None observed
Tree Farm (Rte. 5&10)	Wood frog, spring peeper, American toad, gray treefrog, green frog, bullfrog	None observed
<i>Hawley:</i>		
Hallockville Road	Spring peeper, green frog	None observed
Hawley Bog	Spring peeper, gray treefrog, green frog	None observed
Hell's Kitchen Road	Spring peeper, gray treefrog, green frog	None observed
Beaver Pond (Middle Rd.)	Spring peeper, pickerel frog, green frog	Virginia rail
Hunt Road	Spring peeper, gray treefrog, green frog	Virginia rail
<i>Leyden:</i>		
Bell Road	Spring peeper, gray treefrog, green frog, bullfrog	None observed
Brattleboro Road	Wood frog, spring peeper, American toad, gray treefrog, green frog, bullfrog	None observed
West Leyden Road	Wood frog, spring peeper, American toad, pickerel frog, gray treefrog, green frog, bullfrog	None observed
Plainfield: Route 116	Spring peeper, green frog, bullfrog	None observed
Savoy: Burnett Pond	Wood frog, spring peeper	None observed
<i>Shelburne:</i>		
Chip-and-Putt	Spring peeper, green frog, bullfrog,	Virginia rail, American bittern
Ballfield (Little Mohawk Rd.)	Spring peeper, American toad, gray treefrog, green frog	None observed
Little Mohawk Road	Spring peeper, pickerel frog, gray treefrog, green frog, bullfrog	Sora and Virginia rails, American and least bitterns

# Humble Citizen of the Marsh: The Muskrat

Most people are disappointed the first time they see a muskrat. Hoping that the football-sized form seen swimming through the cattails is something unusual, the muskrat's true identity is then too often dismissed while we pursue the more glamorous inhabitants of wetlands: river otter, red-shouldered hawk, or wood turtle. Yet this creature, weighing an average of 1.5-3.0 pounds has physiological adaptations, behaviors, and ecology that are equal to its celebrity neighbors.

Essentially an oversized field mouse, the muskrat has retained the rotund and paunchy appearance of its smaller relatives. Beady black eyes peer out (nearsightedly, it's believed) from a broad, blunt head. Tiny furred ears, set high, are usually not visible.



Muskrats can close their lips behind the upper and lower incisors, allowing them to chew close-mouthed under water. Nearly waterproof underfur, olive-gray or tawny, is overlain by long guard hairs, the head and rump being the darkest. The pelt is still as much in demand today as it was in the 1800's. Front and hind feet both bear 5 toes, equipped with sharp claws. The forefeet are hand-like, and are utilized similarly: to clutch food items, build lodges, and dig burrows and channels. The broad hind feet are only partially webbed. The naked tail serves as a scull for swimming, likely providing as much force as the alternating strokes of the hind feet, and operates as a rudder as well.

Muskrats are found in areas characterized by slow-moving water and dense emergent and herbaceous vegetation, such as swamps, marshes, shores of lakes or streams, and bogs - anywhere that does not have large or sudden fluctuations in water depth. Water must be deep enough so that it doesn't freeze solid in winter, but shallow enough to encourage the growth of wetland plants, on which the muskrat feeds. The roots and basal stems of cattails are its favored food. Bulrush, sedges, sweet flag, water-lily, pondweed, duckweed, pickerelweed, arrowhead, and even corn, clover, and grasses in agricultural areas round out the muskrat's summer diet. Also taken are small turtles, frogs, mussels, and salamanders.

In our area, lodges are frequently built from August through October, where the water is shallow, perhaps 2 feet deep, or sometimes directly on the bottom of the wetland. The foundation may be an existing brush pile, a submerged stump or log, or mud bars. Cattails, common reed, sedges, weeds, small sticks and mud are piled up, resembling a lop-sided or flattened cone. When the pile of debris reaches 2-4 feet above the water level, the muskrat excavates a chamber, often clear through to the top of the lodge, from beneath. The lodge's underwater entrances (called

plunge holes) usually consist of two tunnels, dug at an angle and leading to the interior chamber. Additional plants and mud will be added from the outside to reinforce the structure, creating walls 3-24 inches thick, and an overall lodge diameter of 3-8 feet. Some lodges have more than one chamber, to house family members or to function as a communal denning site for large numbers of muskrats in the winter. The thick walls of the lodge, when frozen solid, will become a formidable defense against the severe winter weather.

Bank burrows are chosen by muskrats living along waterways, preferably in stable embankments with some clay, but not with an abundance of rocks and sand. Cooler than lodges in the summer, these homes are preferred by muskrats during the warmer months of the year. Some bank burrows have been in consecutive use for 20-30 years, evolving into a vast series of chambers and tunnels.

Winter is a particularly challenging time for the muskrat. While it can remain underwater for up to 17 minutes by relaxing its muscles, thereby decreasing the need for oxygen, it cannot survive for extended periods under the ice. In addition, many of the plants that formed the bulk of the muskrat's summer diet are not available during the winter. How does the muskrat meet its caloric needs while remaining in the relative safety of the frozen-over pond? As soon as ice forms on the water, the muskrat chews a hole, 4-5 inches in diameter, through the ice, often where an air bubble has formed or at a location of escaping marsh gas. Submergent plants, roots, and mud are pushed up out of the water and onto the surface of the ice, where they are allowed to freeze. In the manner of lodge construction, a cavity is excavated at ice level, from below the water's surface. Called a push-up, this small shelter affords the muskrat ice-free cover in which to safely come up for air or to consume winter foods. Several of these stations will be constructed throughout the muskrat's winter territory. Through frigid waters and in nearly complete darkness, the muskrat forages under the ice, often at considerable distance from its lodge or den. Portions of plants, such as coontail, water-lily, tubers, water-milfoil, waterweed, and bladderwort are unearthed, carried to the nearest push-up, and are consumed, safe from predators.

*Other animals seen during surveys:  
black bear and cub at Hawley Bog,  
bull moose at Hell's Kitchen Road,  
otters at Little Mohawk Road,  
solitary sandpiper and barred owl at  
Burnett Pond, spotted salamanders  
at Chip-and-Putt, and "hopping  
long-tailed mice" at Phillips Road  
(probably meadow jumping mice)!!*

Muskrats are not long-lived creatures, reaching (if they are fortunate) 3-4 years of age. Birds of prey, foxes, coyotes, raccoons, skunks, river otters, weasels, snapping turtles, and even pickerel, northern pike, and largemouth bass consider the muskrat fair game. A surprisingly vicious fighter, the muskrat can inflict much damage with its powerful incisors,

standing its ground courageously if escape to deep water is not possible.

When you return to your monitoring site next year, take a look around for lodges, feeding stations, and the cut leaves of cattails drifting slowly through the water. And pay your new-found respects to the muskrat.

Jennifer Strules

Quote from a volunteer:  
"Another beautiful summer evening in the swamp!"



### Bird Observations

Because of space constraints, it's difficult to list all the birds seen at each wetland in the Table on page 3. We see a tremendous number of birds during the surveys, including many that are not dependent on marshes but that live in the adjacent forests and grasslands. Included below is a summary of all the bird species observed during surveys at each wetland. I hope this gives you an idea of the kinds of birds you might encounter if you were exploring the marshes and other habitats found in the Deerfield River watershed. If anyone would like a list of birds seen at a particular wetland, give me a call or email.

Birds seen and/or heard: Green-backed heron, Canada goose, mallard, wood duck, black duck, hooded merganser, killdeer, spotted sandpiper, mourning dove, chimney swift, ruby-throated hummingbird, belted kingfisher, yellow-bellied sapsucker, downy woodpecker, pileated woodpecker, Northern flicker, willow flycatcher, alder flycatcher, Eastern wood pewee, least flycatcher, Eastern phoebe, great-crested flycatcher, Eastern kingbird, tree swallow, barn swallow, blue jay, American crow, tufted titmouse, black-capped chickadee, white-breasted nuthatch, marsh wren, winter wren, golden-crowned kinglet, hermit thrush, wood thrush, veery, Ameri-

can robin, gray catbird, Northern mockingbird, cedar wax-wing, warbling vireo, solitary vireo, red-eyed vireo, black-throated green warbler, blue-winged warbler, Canada warbler, black-throated blue warbler, blackburnian warbler, American redstart, chestnut-sided warbler, black and white warbler, yellow-rumped warbler, magnolia warbler, prairie



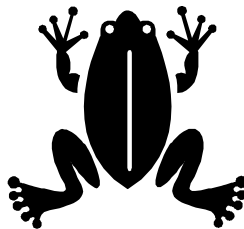
Red-winged Blackbird Nest  
Photo: Robert Packard

warbler, yellow warbler, common yellowthroat, ovenbird, Northern waterthrush, rose-breasted grosbeak, Northern cardinal, indigo bunting, chipping sparrow, song sparrow, swamp sparrow, white-throated sparrow, dark-eyed junco, red-winged blackbird, brown-headed cowbird, common grackle, Northern oriole, scarlet tanager, house sparrow, American goldfinch, purple finch, and evening grosbeak.

Pat Serrentino

### Amphibians in Trouble

An unprecedented number of frogs and salamanders are declining, becoming extinct, or are displaying inexplicable deformities. Although habitat loss and degradation have been implicated in some areas, amphibians have also disappeared from large nature reserves seemingly protected from the effects of human-related disturbances.



uting to the problem. Part of the problem, scientists admit, is a lack of baseline knowledge about these animals. In the past, the plight of amphibians was often ignored.

No one factor has been identified as the cause of all amphibian declines. Increases in ultraviolet radiation, acid precipitation, disease, chemical pollutants, introduction of exotic animals, and natural fluctuations have all been cited as contrib-

For all the vertebrate groups, diseases are least known and understood for amphibians. Fungal infection is believed to be a likely cause of amphibian die-offs in Central America. Recently, iridoviruses were implicated in a series of die-offs occurring in Maine, North Carolina, and Massachusetts. In Massachusetts, an iridovirus was isolated from dead and dying wood frog tadpoles and

## Amphibians in Trouble continued from p. 5

spotted salamanders. Iridoviruses are a family of viruses that were previously found in fresh- and saltwater fish. Some are associated with serious disease, whereas others have been detected in apparently healthy animals.

Population surveys are being conducted with more regularity now, but the results may be disheartening or perplexing. Amphibian populations in Yosemite National Park have experienced sudden and severe declines, even though the Park is remote and seemingly protected from the negative effects of human activities. Many high-altitude, wilderness areas have experienced similar incidents. The effects of ultraviolet (UV) rays, a form of radiation that has increased with the thinning of the ozone layer, are most acute in high, exposed areas. In some amphibian species, exposure to UV rays kills eggs or interferes with normal embryonic development.

It seems likely that there are multiple factors contributing to the causes of amphibian deformities as well. Chemicals that are added to the environment, such as herbicides, pesticides, fertilizers, or the byproducts of manufacturing, are the primary suspects in some cases of this phenomenon. With so many industrial and agricultural chemicals in use, it seems likely that unforeseen combinations of these chemicals may be responsible for deformities in some regions. Other scientists maintain that genetic mutations or parasites are to

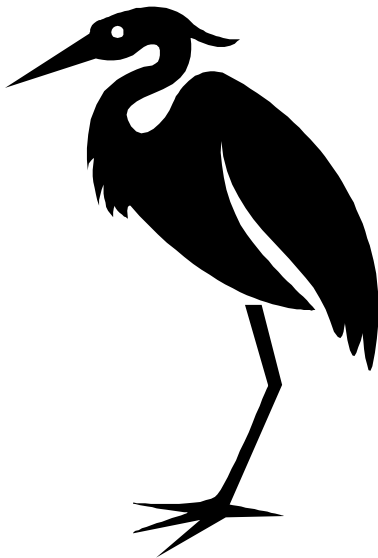
blame. A naturally-occurring flatworm parasite can cause multiple hind legs or missing eyes in frogs. The frequency of deformities is highest among frogs that have recently metamorphosed from the tadpole stage.

Acid rain still appears to be adversely affecting some amphibians today. Developing embryos are killed at pH levels below 4 or 5. Acid rain also increases the influence of chemical pollutants and UV rays. This triple threat may be an important factor in the declines reported in northern and acid-sensitive regions.

As a result of concern for amphibians, scientists formed the *Declining Amphibian Populations Task Force* or DAPTF. The DAPTF was established in 1991, and its mission is to “*determine the nature, extent and causes of declines of amphibians throughout the world, and to promote means by which declines can be halted or reversed.*” The information that you collect during surveys adds to our knowledge of amphibian populations in Western Massachusetts, and contributes to their long-term protection.

*Jennifer Strules and Pat Serrentino*

For information on the Marsh Monitoring Project or to volunteer for the project, please contact: Pat Serrentino, Wildlife Biologist and Project Coordinator, 72 Hastings Street, Greenfield, MA 01301; (413) 772-0520; email: [pserr@crocker.com](mailto:pserr@crocker.com)



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The Deerfield River Watershed Association is a local non-profit organization whose mission is to protect, preserve and enhance the natural resources of the watershed for the benefit of all its inhabitants, today and in the future.