Fall, 2001

Marsh Monitoring Project Newsletter

Deerfield River Watershed Association

The Results Are In!

The final year of the 3-year marsh monitoring project has come to a close. When sitting down to tabulate the results, I realized I already missed slogging and paddling around the marshes and swamps: peering through cattails hoping to glimpse a sora rail; disturbing a huge moose at pond's edge while canoeing in the dark; watching an American woodcock's nuptial flight while wood frogs "quack" around me. What more could a person wish for? Jennifer and I thank you for contributing your time and enthusiasm toward making this project a success. We have also benefited from the generosity of local landowners who provided access to their property. And "three cheers" of appreciation to four people who have participated in the project since its inception: Rick Chandler, Don Chapman, Jim Galipault, and Bob Packard.

On July 1st, we had a cook-out at my home in Greenfield. In spite of thunderstorms, we had a good turnout. Copies of the booklet *A Field Guide to the Animals of Vernal Pools* were given out. We mailed copies to those who couldn't attend. I have received good reviews of the booklet from many of you. I will be completing a final report documenting the three-year project. If anyone would like a copy, call or email and I'll add your name to the mailing list.

2001 RESULTS

This year 26 volunteers monitored 27 wetlands in eleven towns throughout the Massachusetts portion of the Deerfield River watershed (see *Results*, p. 3). In spite of confusion caused by a late, cold, and erratic spring, most participants caught the first emergence of wood frogs and spring peepers. We were able to document wood frogs at 15 wetlands compared to six in 2000. The number of wetlands with at least five frog species was increased from eight in 2000 to 11 in 2001. Wetlands with six or seven species were: Ashfield Lake, Schneck Brook, Leyden Road, Tree Farm, and West Leyden Road. However, it is likely that more frogs would be found if wetlands were surveyed more frequently. Sometimes frogs will inconveniently call before or after a survey!

Sing A (Not So) Simple Song

Anybody who has experienced a full chorus of gray treefrogs at the height of breeding season can attest to the incredible sonic commotion these tiny creatures cause. Have you ever wondered exactly how or why male amphibians call in this manner? The primary function of male vocalization is to attract a mate. But how, then, do females choose their mate from all the prospective singles in that rioting cacophony?

Each call is produced by the passage of air forced from the lungs across vocal cords in the larynx, and into throat sacs that amplify or modify the resulting sound. Male spring peepers have trunk muscles that have become specialized to aid with sound production. These muscles account for fifteen percent of their total body mass, as opposed to just three percent in females, who, like most other female frogs and toads, are not burdened

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Powerline Wetland in Ashfield: Changes in water levels have occurred at this site because of beaver activity.

Photo: Pat Serrentino

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Green frogs were heard at 26 wetlands, spring peepers at all except one (Oxbow), and gray treefrogs at 18. Bullfrogs were heard at 14 sites. Differences between the results in 2000 and 2001 were slight. Here are two examples of this: a small decline in the number of wetlands where American toads were heard (8 in 2000 versus 5 in 2001); and a slight increase in the number of sites with at least four species (19 in 2001 versus 14 in 2000). We're missing information from the Rte. 5&10 North site in Deerfield because the datasheets were never turned in.

Bullfrogs were heard at most wetlands. These large frogs are restricted to wetlands with permanent water, such as ponds, lakes, slow-moving rivers and streams, and marshes. They'll use drier sites, such as vernal pools, when traveling overland and as feeding areas. Underwater plants and thick stands of emergent vegetation provide sites for basking, ambushing prey, and escaping from predators. It was surprising that bullfrogs weren't observed at Phillips Road, Hawley Bog, Hell's Kitchen Road, and Burnett Pond in either 2000 or 2001. These sites would appear to have everything a bullfrog requires. My guess is that with additional surveys we would find them at these wetlands as well.

The rarest calling amphibians were pickerel frogs (6 sites), American toads (5 sites), and Northern leopard frogs (3 sites). Although American toads and pickerel frogs weren't often heard, this was probably because of their shorter breeding season, and/or softer calls compared, for example, to spring peepers. As many of us have found, the loud and boisterous calling choruses of spring peepers and gray treefrogs make it difficult to hear anything else! In addition, both leopard and pickerel frogs call underwater.

Twenty-five wetlands were surveyed for marshbirds in 2001.For the third year in a row, there were no observations of pied-billed grebes, king rails, sedge wrens, and common moorhens. Given the rarity of these species throughout Massachusetts, the lack of sightings was not unexpected. However, we were rewarded with numerous sightings of four other species of interest: Virginia and sora rails, and American and least bitterns. At least one of these four was observed at eight wetlands in 2000 and 2001; however, there were differences in the particular species seen and where they were seen. American bitterns were found at six sites this year compared to four in 2000. These birds will use wetlands near their breeding sites for hunting areas. Therefore, an observation of an American bittern may not indicate an actual nesting site. With other marshbirds, such as the Virginia and sora rails, repeated sightings, during the breeding season and year to year, provide strong evidence of nesting.

From a frog surveyor: "Oh, I'll be fine, I go out in the woods <u>all</u> the time." Got a little lost...figured it out….

Virginia rails continue to be the most common marshbird observed during the three-year project. They were heard or seen at six sites this year. The least bittern, the rarest bird of our study, was found again at the North Shelburne site, where they appear to have nested since 1999. This wetland remains the most productive site for marshbirds. Other marshes that supported two species of marshbirds in either 2000 or 2001 were Schneck Brook, Rtes. 5&10 North, Beaver Pond, Hunt Road, and Chip-and-Putt.

The sora was found at two sites: Rtes. 5&10 North and North Shelburne. Although it is rare to see these shy birds, they have quite a loud call. We had fewer soras at the North Shelburne wetland this year. The reasons for this are unclear, however, high water levels or possibly the late, cold spring may have played a role. For many birds, cold weather can delay nesting and/or cause nest failure. Higher than normal water levels may flood nests. Some birds will breed again, but others leave their territory and fail to produce any offspring that year.

This spring our frog surveyors reported some interesting bird sightings at night. Approximately 10 (continued on p. 6) barred owls were heard at Cemetery Road during early early

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with the task of attracting a mate. And vocalizing is unquestionably a burden. One researcher characterized the calls of gray treefrogs as being the "…most energetically expensive activity regularly undertaken…and, indeed, is the most demanding yet measured in a (cold-blooded) vertebrate."

Advertisement calls comprise the bulk of an amphibian's repertoire. These calls function to attract females to breeding sites. The vocalizations are believed to convey information about the species, age, size, and vigor of breeding males. Typically, males congregate at a breeding site and begin calling. This, in turn, attracts other vocalizing males to the area. A cluster of several calling males of the same species is known as a chorus, such as that heard with spring peepers.

Mating American toads with double string of eggs. The larger female is on the bottom.
Photo: Jennifer Strules

SURVEY RESULTS FOR 2001

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

Variation on Birds of a Feather: The Virginia and Sora Rails

Members of the rail family are some of our least familiar birds. With nine North American species, one ornithologist characterized them as "perhaps the most elusive birds on the continent." Both the Virginia and sora rails display typical rail family characteristics, such as laterally-compressed bodies that enable silent passage through dense stands of marsh vegetation, and long toes to facilitate wading. However, these two birds utilize their shared habitat in diversified fashion, thus permitting both to live in relative harmony.

Virginia Rail
Artist: Steven D'Amato

Both rails are about nine inches long and share a somewhat chicken-like profile. The Virginia rail bears a long, curved bill that is reddish in color, as are its eyes. Grey cheeks, black barring on the flanks, and an overall rusty coloration to the wings, breast and neck are typical of adults. Soras are distinguished from the Virginia rail by a black facial mask extending to the throat, brown barring on the flanks, stumpy tail, yellow legs, and a short yellow bill.

Though both birds are marsh-dwellers, their habitat preferences vary. Virginia rails most often occur in wetlands larger than 2-3 acres, with 40-70% emergent vegetation (e.g., cattails and sedges) interspersed with open water, mudflats, or matted plant materials. Fluctuations in water levels are another important aspect of Virginia rail habitat. This action creates the moist or wet soils required for foraging. As such, the Virginia rail can take advantage of wetlands following floods, storms, and other natural disasters, thus allowing it to occupy a uniquely unstable niche within the avian wetland community. Soras, by comparison, may be adversely affected by the rapid changes occurring in many wetlands today. Some biologists suggest that the combined effect of displaced native plant communities and fluctuating water levels could be detrimental to the sora. Large marshes of shallow to intermediate depth with an abundance of sedges, cattails, bur-reeds, and bulrushes are needed for this bird to thrive.

Similarities and differences also exist within the realm of reproduction. Borders between vegetation types, such as that found between sedges and cattails, are frequently sought as nest-sites for the Virginia rail, and soras will use these areas for foraging and nesting, too. The sora breeds in wetter sites than the Virginia rail, placing nests only a few inches above water that averages six to ten inches deep. Deep, basket-like cradles of dead cattails, lined with bulrushes or coarse grasses, are erected as towering structures by rails to resist flooding. Nests are well-anchored to the surrounding vegetation and a living canopy of emergents often conceals the nest from above.

Female soras lay an average of ten to twelve eggs; whereas eight to ten eggs is a typical clutch size for the Virginia rail. Both sexes of each species incubate their eggs. Virginia rails continue to add materials to the nest throughout incubation, whereas the sora does not. Nest parasitism, in which one bird lays its eggs in another nest to be raised by an unsuspecting pair of the same species, is occasionally seen with soras, but is apparently not a strategy employed by the Virginia rail. The incubation period of the Virginia rail is somewhat shorter (8-10 days) than that of the sora (16-20 days). Upon hatching, the young of both species are able to swim. The chicks of each species are fluffy and coal-black, with a claw at the bend of the wing that will be retained throughout their lifespan. Believed to be a climbing adaptation, this odd appendage aids the tiny chicks as they struggle to follow a foraging parent through thick marsh vegetation. While one adult continues to incubate any remaining eggs, *dummy nests* (usually a simple platform of vegetation, raised above the water) are utilized by the remaining parent as brooding sites for the active, hatched chicks.

Virginia and sora rails exhibit quite different food preferences. Aquatic plant seeds constitute 75% of the sora's food intake. Favorites include wild rice, bulrushes, sedges, smartweeds, duckweeds, and foxtail grasses. Sixty percent of the Virginia rail's diet is insects, and, unlike most birds, they have a highly developed sense of smell, thought to aid them in their probing search for prey in the muddy depths of feeding areas. A captive Virginia rail provided one observer in 1915 with a first-hand account of what this bird wanted: meat! It refused rice, corn, and bread, and instead ravenously consumed sunfish, sticklebacks, and bullheads. Frogs were bludgeoned in the water of its tank and rapidly devoured. A crayfish was "pecked and shaken" until the legs dropped off. Thus rendered harmless, it too, was eaten and the legs swallowed as an apparent afterthought. A caterpillar was fair game, once the bristles were soft enough to remove after a brief soaking in water.

Sora Rail
Artist: Daniel S. Kilby

Much has been written about the retiring tendencies of these two rails. Both species' presence often goes unnoticed because of their secretive behaviors. Their voices, heard most frequently in the early morning hours and at night, are often the most reliable indication of activity. One call of the Virginia rail has been likened to the clicking of a telegraph wire. Another vocalization is a strange-sounding series of buzzy grunts. Soras give voice to an upslurred, questioning, "Per-weet?" often followed by a loud, descending whinny. Other behaviors are indicative of their preference for concealment. Both the Virginia rail and sora prefer to run run swiftly through marsh vegetation

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Smaller subgroups of frogs within the chorus, comprised of two or more individuals, will often form duets, trios, etc., of alternating calls given at slightly different pitches. Often a particular male, known as the "chorus leader", will initiate a calling sequence within the subgroup. These leaders may be larger males with louder or deeper voices. The presence of these calling hierarchies are thought to assist females with mate selection by encouraging a more direct response to the mate of her choice, because his voice is not lost amongst competitors.

Exactly how females choose their mates varies among species,and even among populations of the same species. Size, believed to be one of the major factors in mate selection, may have different implications than previously believed. Larger, and therefore supposedly older, more experienced males, are able to call at faster rates and have deeper voices. Females of several species appear to choose males exhibiting these characteristics more often than not. However, large size is not necessarily related to age in amphibians. Rapid juvenile growth, too, can account for some large individuals. Other factors that may be involved with mate choice are the quality of the male's territory, and the number of nights a male occupies a particular calling site. We still have much to discover about the role of voice in amphibian mate selection.

Jennifer Strules

Variation on Birds of a Feather continued from p. 4

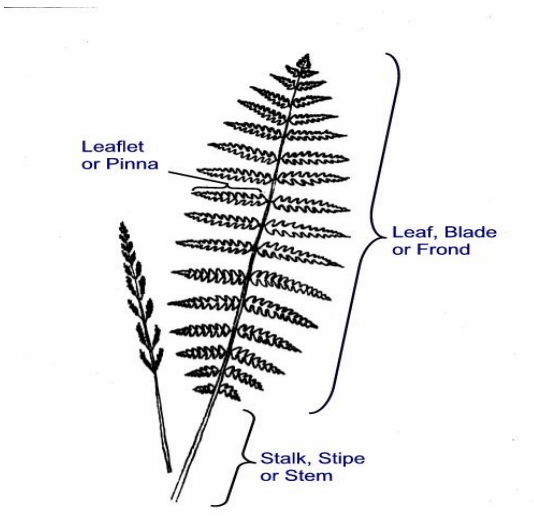
run swiftly through the marsh vegetation rather than take to wing when threatened. Although reluctant fliers on their breeding grounds, they are both long-distance migrants. Some researchers believe soras, having poor tolerance for cold weather, migrate at the first hint of frost. In flocks up to 100 birds, from September to early October, soras travel south, primarily at night. The Gulf Coast or West Indies are their winter destination. For the Virginia rail fall migration is a solitary feat, also occurring at night in September through mid-October. Coastal marshes from North Carolina south, and the Gulf and Pacific coasts extending south to Mexico into Guatemala, are the major wintering areas.

The sora and Virginia rail are indeed alike. They feed and nest in close proximity in an environment that to our eyes demonstrates only subtle gradients of difference. Similar in design and behavior, it would seem that these birds would inevitably come into conflict. Differences in their life histories, though small, allow them to coexist in our marshes. Birds of a feather may flock together, but in the case of the Virginia and sora rails, they find a lot to be different about as well.

Jennifer Strules

Those Touchy, Feel-y Ferns

Ferns are some of the more friendly and conspicuous plants one encounters in a wetland. Their graceful appearance invites tactile interaction, and they don't seem to mind an acquaintance of this sort. Three common species (cinnamon, sensitive, and royal, ferns) are also wonderfully easy to identify, especially if you are eager for hands-on exploration. First, a short course on fern anatomy. The green, leafy part of the fern is referred to as the **blade**, which is comprised of **leaflets** or **pinna**. Within the blade, the stalk that bears the leaflets is technically defined as the **rachis** (ray-kiss), while below the blade it is called the **stipe**.



Cinnamon Fern (Fertile Leaf on Left)

Cinnamon Fern (*Osmunda cinnamomea*): Tufts of cinnamon-colored "wool" affixed to the base of each leaflet at the point of attachment to the rachis, give the very common cinnamon fern its' name. Wool may also persist on the stipe throughout the season. Arising in 2-5 foot high circular clusters, this fern also bears a separate **fertile leaf**, which is the first part of the fern to appear in the spring. The bright green fertile leaflet changes to the color of cinnamon as the growing season progresses. At this stage the fertile leaflets resemble feathery pairs of clubs attached in a "V" formation up the length of the frond. The cin-

Sensitive Fern (Fertile Leaf on Left)

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namon fern enjoys a broad distribution throughout the Northeast, with a tendency to be confined to moist, shady areas.

Sensitive Fern *(Onoclea sensibilis*): This fern bears blades that are roughly triangular in shape and appear somewhat reclined in posture. Heights up to two feet can be attained. Leaflets are leathery to touch, wavy-edged, light yellow-green in color and have a "netted" appearance owing to the network of veins throughout. Also distinct on this species is the separate fertile leaf, which grows from the same rootstock as the fronds, but resembles a short cluster of upward-branching reddish-brown beads. This structure (primarily the "beads", which are actually modified leaflets) is responsible for the protection, development, and dispersal of the fern reproductive cells, called **spores**. You will find sensitive fern in wetlands, but also in drier areas as well.

Royal Fern (*Osmunda regalis*): This species is the Grace Kelly of the fern clan. Its' widely-spaced, oblong leaflets give the impression of ultimate cool green elegance. Reaching heights of six feet or more, it's often found growing in standing water from a tussock-like rootstock. Instead of the separately-borne fertile leaf seen in the cinnamon and sensitive ferns, the royal fern's fertile leaflets emerge as a light brown, feathery tip from the frond's top.

Jennifer Strules

Drawings by Alex Haro

Royal Fern

Results! continued from p. 2

May. At subsequent visits, about five were heard. Barred owls were also reported at Burnett Pond, Powerline, Beaver Pond, Rte. 116, and West Leyden Road. At Schneck Brook, a whip-poor-will was calling the night of May 15th. He (probably the same bird) was heard again on the 6th and 28th of June. As usual Jennifer and I enjoyed reading your comments and hearing about your adventures throughout the monitoring season. Enjoy the fall and upcoming holiday season.

Pat Serrentino

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For information on the Marsh Monitoring Project, please contact: Pat Serrentino, Wildlife Biologist and Project Coordinator, 72 Hastings Street, Greenfield, MA 01301; (413) 772-0520; email: 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.