Amphibian Monitoring on Mt. Mansfield, Vermont 1993-1999

James S. Andrews and Kristianne G. Tolgyesi
Biology Department
Middlebury College, Middlebury Vermont 05753

Background

Populations of amphibian species are monitored annually on Mount Mansfield using drift-fences. The goals of the monitoring are to (1) establish a baseline data set of abundance indices for the amphibian species caught in the fences, (2) monitor year-to-year changes in their abundance indices, (3) monitor changes in the number and type of obvious external abnormalities, (4) gather inventory data for the Vermont Herp Atlas, and (5) gather basic natural history information on the species present. Amphibians are targeted for this kind of study because their multiple habitat usage and permeable skin make them especially sensitive to changes in environmental conditions. Seven years of data have now been gathered at this site. This is the longest-running set of amphibian monitoring data in the state. Three fences are opened and checked up to five times per month during rain events throughout the field season (April through October excluding August). The abundance indices are generated using the three most successful trap-nights per month. For more detailed information on methods, locations of fences, and survey results, see the 1995 VMC annual report.

Changes in species composition

Despite a decline in numbers for American toad, Gray treefrog, and Spring peeper since last year (Table 1), increases in numbers of Green, Pickerel, and Wood frogs created the highest ever percentage of anurans at the fences (76%, Table 2). The Pickerel frog, absent from the fences last year, returned in 1999 for its second highest showing (9) since 1995 when this species was caught 20 times. The absence of Gray treefrogs this year is not a concern. This species' excellent climbing ability enables it to escape capture at the fences. Green frogs represented an all-time high of 21% of the frog population at these fences in 1999. American toads showed a decrease to 17%, which is down from their high of 35% of the frog population in 1998. This reflects both a short-term decrease in the number of toads as well as the relative increase in both Wood frogs and Green frogs.

In 1999 numbers of all salamander species either remained the same or declined. The most dramatic decline occurred with the Redback salamander which decreased to 41 %, down from its 1998 high point of 63% of the salamander population. This decline in Redbacks drove up the percentages for both the Eastern newt (20%) and the Spotted salamander (30%) despite no increase in numbers for either of these species (newts declined from 1.3 per trapping in 1998 to 0.8 in 1999, Spotteds held at 1.2 per trapping).

Young of the year and malformities

Although the number of young of the year for 1999 is slightly higher than for 1998, the number of malformities reported is lower (Table 2). No malformed amphibians had been caught in any of the fences at this site until 1998 when five were caught. During egg-mass counts in 1994, two metamorph Wood frogs were found with abnormalities. One was missing its right eye and a portion of its left rear leg and the other had a malformed and twisted toe on its rear foot. In 1999 three (~1.0%) out of a total of 296 individuals

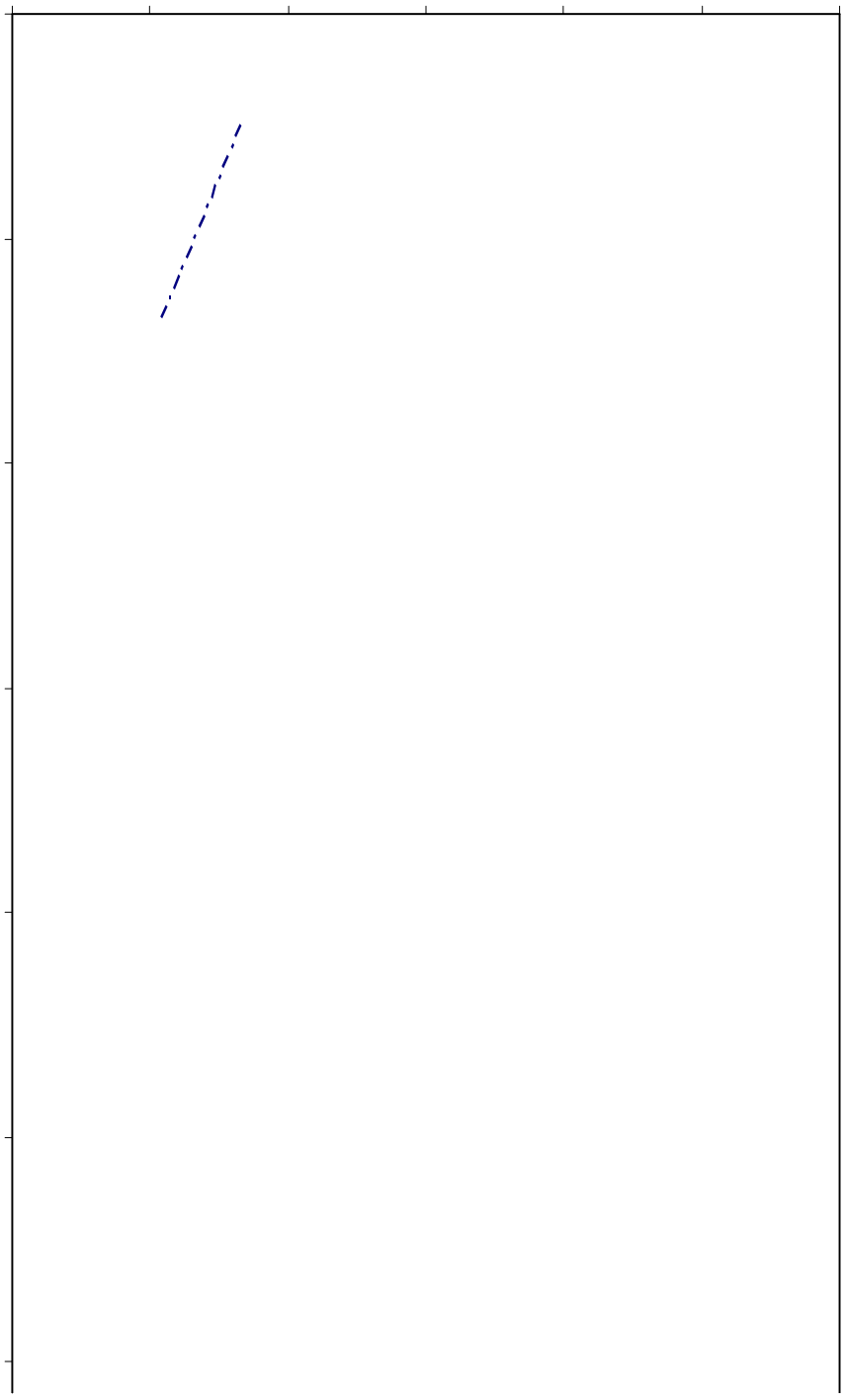
caught in the fences were malformed. Two species were represented: Spotted salamander (1) and Spring peeper (2). Spring peepers were not among the four species with malformities found in 1998. Also unlike 1998, none of the malformities in 1999 occurred in young of the year. One of the peepers was missing a leg and the other had an abnormal digit. The Spotted salamander had shortened digits on one foot. The

Table 1. A comparison of drift-fence data from the 1993 through 1999 field seasons at Mt. Mansfield, Underhill, Vermont. Data used are from two fences at 1,200 ft. and one fence at 2,200 ft. in elevation.

Species name	# per trapping[1]							% of total catch						
	93	94	95	96	97	98	99	93	94	95	96	97	98	99
Caudates (Salamanders)														
Spotted salamander	1.7	1.0	1.4	2.0	1.4	1.2	1.2	12%	10%	9%	12%	8%	6%	7%
Dusky salamander	0.3	0.3	0.3	0.0	0.0	0.6	0.1	2%	3%	2%	0%	0%	3%	1%
N. two-lined salamander														

Table 2. Monitoring results from the two drift-fences at 1,200 ft. and one at 2,200 ft. on Mt. Mansfield, Underhill, Vermont during 1999. Traps were opened whenever conditions were appropriate for amphibian movement from April through October excluding August. Data used are from the three most successful trappings (2 in April) per month (± 7 days): April 17 and May 6; May 9, 20, and 25; June 7, 15, and 29; July 2, 6, 25; September 9, 11, and 30; and October 9, 14, and November 3. Data from 17 of 26 trap-efforts are used. Trapping on April 17 was possible at the lower two drift-fences only. Malformity, maximum size, and first metamorph data are taken from all 26 trappings.

Common name	Scientific name	# of all ages	# of young of the year [1]	% young of the year	date of first metamorph [2]	largest adult (total length in mm)	# per trapping [3]	% of group	% of total catch	# malformed/ total [4]
Salamanders										
Redback salamander	*Plethodon cinereus*	27	0	0%	NA	96	1.6	41%	10%	0 / 29
Spotted salamander	*Ambystoma maculatum*	20	0	0%	NA	195	1.2	30%	7%	1 / 21
Eastern newt	*Notophthalmus viridescens*	13	0	0%	NA	78	0.8	20%	5%	0 / 13
Northern two-lined	*Eurycea bislineata*	4	0	0%	NA	81	0.2	6%	1%	0 / 4
Dusky salamander	*Desmognathus fuscus*	2	0	0%	NA	98	0.1	3%	1%	0 / 2
Group totals	*P t*	66	0	0%	NA08	NA	3.9	100%	24[illegible]%	1[illegible]



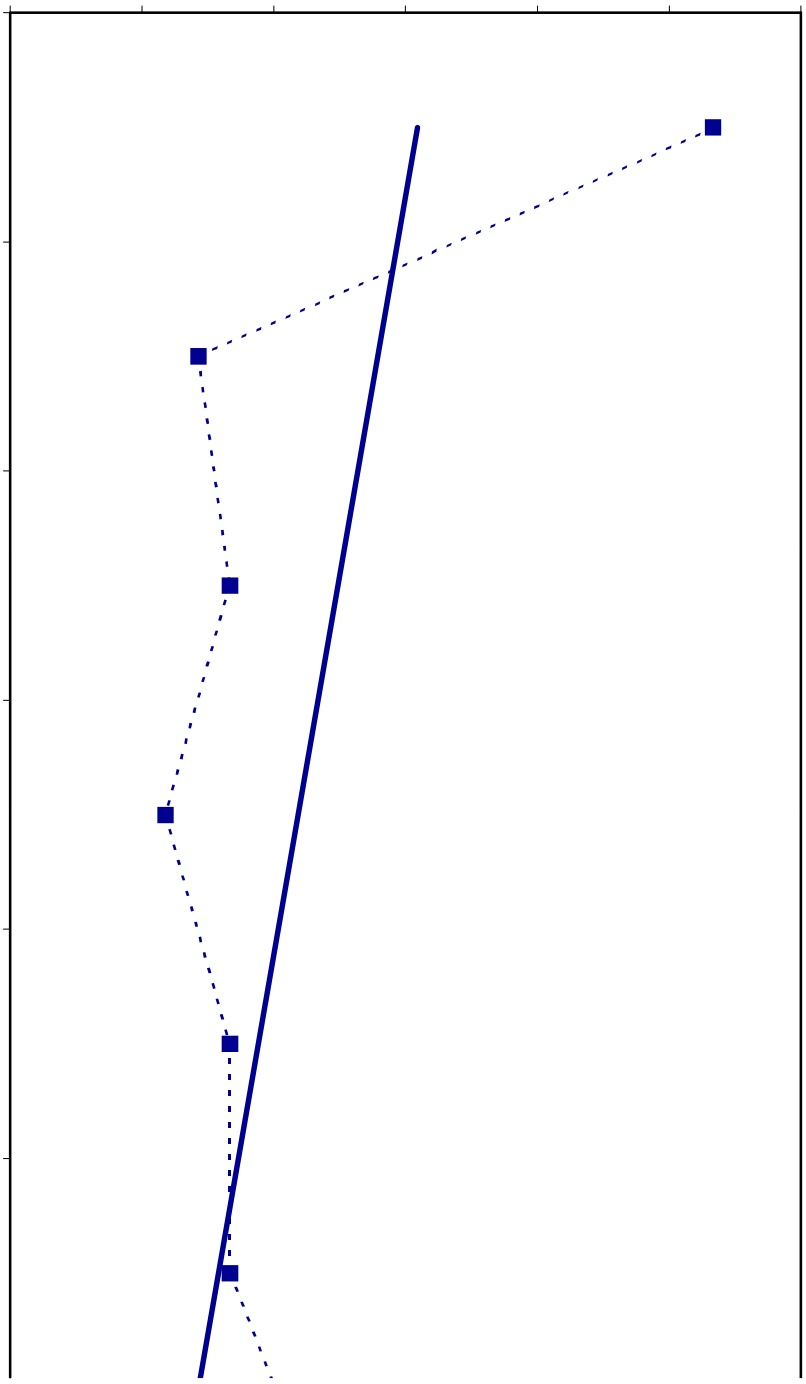


Figure 2. Northern Two-lined Salamander *(Eurycea bislineata)* population indices from Mt. Mansfield, Underhill, Ver