



the frogs and enabled a significant number to escape. For the final 10 trap events of the season only the dowels were used, resulting in a 23% decrease in the number of amphibians, and an 80% reduction of small mammal mortality. Removing the sponges made little difference in the small mammal mortality, but a significant difference in the amount of escaped amphibians.

#### Calculations based on changes as a result of the Dowels

There was a decrease in the number of amphibians caught, as a result of placing the dowels in half of the traps; therefore, the absolute values of 2002 data could not be compared to previous years' data. As dowels were in half the traps, the non-dowel trap results were doubled for all the calculations and results discussed below.

#### Changes in species composition

In 2002, a higher percentage of anurans (frogs and toads) was caught at the fences than last year; they continued to dominate at the fences, and comprised 86% of the total catch (Table 2). This varied from 2001, when they were 65% of the total catch. Green Frogs continued to show an increase in number caught per trapping and in percentage of the anuran population. This year there was a dramatic increase as the number caught per trapping went from 1.9 in 2001 to 22.1 in 2002. This was the second year that Green Frogs (77% of the anuran catch) surpassed Wood Frogs (16% of anuran catch). The lower overall percentage of Wood Frogs (from 59% of anurans to 16%) is due to the increase in the number of Green Frogs caught. Wood Frogs increased from 5.4 to 6.7 individuals caught per trapping. American Toads decreased from 17% to 4% of the anuran catch, this is also due to the greater number of Green Frogs, as their individual numbers per trapping increased from 1.6 to 1.9. Spring Peepers made up 2% of the anuran catch, up from last year's 0%, but still down from their high of 30% of the frog population in 1994. Only 2 Pickerel Frogs were caught this year. Pickerel Frog numbers have been fluctuating slightly over the last few years, but their numbers have always been very low.

Overall, a greater number of salamanders were caught per trapping in 2002, from 5.0 to 6.1. The percentage of Eastern Red-backed Salamanders showed a decrease from 36% to 26% of the salamander population, continuing its downward trend from 2000 when it was 48%. Although the Eastern Red-backed percentage has decreased, the numbers per trapping have stayed about the same (1.8 to 1.9). Spotted Salamanders went from 30% to 35% of the salamander catch showing a slight increase in numbers per trapping from 1.5 to 1.9. Eastern Newts remained constant at 26% of the salamander population, consistent with last year's results; although their trapping numbers also increased from 1.3 to 1.6. Dusky Salamanders showed a slight increase in percentage of the salamander population from 5% to 10%, while Northern Two-lined Salamanders stayed the same from 2001 to 2002 as 3% of the salamander population; although, their numbers per trapping increased from 0.1 to 0.3. The fences are not in appropriate habitat to accurately monitor the populations of these latter two species, so it is probable that these slight changes do not reflect changes in their population size.

#### Young of the year and abnormalities

The number of young of the year for 2002 was higher than in all the previous years. This was due to the large number of anuran young (95% of all young) specifically young Green Frogs (Table 3). Three hundred and forty young Green Frogs were caught accounting for 97% of all Green Frogs caught in 2002.

The percentage of young of the year in the salamander population was similarly high (28% of total salamander catch). The number of abnormalities continues to be low, with only one abnormal amphibian caught out of 526 (<0.1%). The numbers of abnormalities at this site, as well as our other two monitoring sites, have always been well below a level of concern. From 1998 through 2000 the total number of amphibians showing abnormalities from all captures were 5,3,2, and 0 individuals respectively. In 2002, the one abnormality was in a young Northern Two-lined Salamander. The salamander was completely missing its right eye, including the socket. This was most likely due to a developmental abnormality. A traumatic event would show scarring or perhaps an empty socket. The last reported abnormalities in 2000 were in a Dusky Salamander and a Spring Peeper.

#### Trends

Linear regressions most closely fit most of the data plots, so they were used to show potential trends in the abundance indices for all species caught from 1993-2002 (Figures 1-6). The data gathered suggest that three of the seven species abundant enough to monitor show an average increase over this ten year period: Green Frog, American Toad, and Wood Frog. The number of Green Frogs has increased since 1993 with a slight dip in 2001 (Figure 4). In 2002 there was a dramatic increase from 1.9 per trapping to 22.1, for a total of 350 Green Frogs captured. This species is showing the most dramatic and consistent trend of any species monitored in this study. All except one of the Green Frog records are from the fences at 1200 feet elevation (Research Center and Pleasant Valley Road). In 2000 the majority of Green Frog records came from the fence near the Research Center (60%), and the rest from the fence near Pleasant Valley Road. In 2001, although there were slightly fewer Green Frogs, 77% of them were found near the fence near the Research Station. In 2002 there were more Green Frogs found at that drift fence, increasing from 20 in 2001 to 55 in 2002. But, there was an even greater increase in Green Frogs near Pleasant Valley Road where they increased from 6 in 2001 to 294 in 2002. It is very possible that this increase is due to renewed beaver activity near these fences. The beavers rebuilt an old beaver dam, thereby reflooding the area. The Green Frog is a permanent-water breeder and needs to overwinter for one or two winters under the ice as a tadpole before metamorphosis. Increased water levels in the beaver ponds would allow them to overwinter successfully. At the three fences in the Lye Brook Wilderness Region in southern Vermont, Green Frogs appear to be holding relatively steady, with no obvious increase over the ten years of monitoring there.

The number of American Toads increased steadily until 1998 when they peaked at 3.6 caught per trapping (Figure 5). In 1999, 2000 and in 2001 they decreased with the lowest numbers found in 2001, 1.6 per trapping. In 2002 they again increased to 1.9 caught per trapping. Overall, even with the slight recent decline, using linear regression it appears their population is increasing slightly. In 2000 we reported that the Wood Frog was showing a slight decline; since that year, the number of Wood Frogs has increased and in 2002 the number per trapping was 6.7, almost at its peak of 7.0 in 1997 (Figure 6).

Although the numbers vary from year-to-year, the overall trend for Spring Peepers has been downward (Figure 6). This appears to be a local phenomenon. The numbers of Spring Peepers may be decreasing for much the same reason the Green Frogs are increasing. Beaver activity has changed the local breeding habitat and may have made it less suitable for the Spring Peepers. Warren Ellison, drift fence supervisor, reports that choruses of Spring Peepers are still very common in the area. This could indicate that either the downward trend of the Spring Peepers we show here is localized to the immediate area of the study site, or that a larger more widespread decline is not yet large enough to affect the perceived abundance of the species in the area. The steady decline of Spring Peepers has not been seen at the other two study sites.

Eastern Newts, Eastern Red-backed Salamanders, and Spotted Salamanders appear to be relatively stable, with some variation from year-to-year, but with no visible upward or downward trend (Figures 1 and 3). We catch so few Pickerel Frogs and Northern Two-lined Salamanders that it is difficult to observe any long-term trends for these species. Fewer than 1.0 Pickerel Frogs and Northern Two-lined Salamanders were caught per trapping (Figure 2 and 5). It appears that both populations are relatively stable, but the numbers of captures are so low, it is not possible to draw any meaningful conclusions.

## Summary

Although always rare, the number of abnormalities continues to decrease from its high in 1998. This year at the fences, all of the seven amphibian species that can be reliably monitored were caught in higher numbers per trapping than last year. I

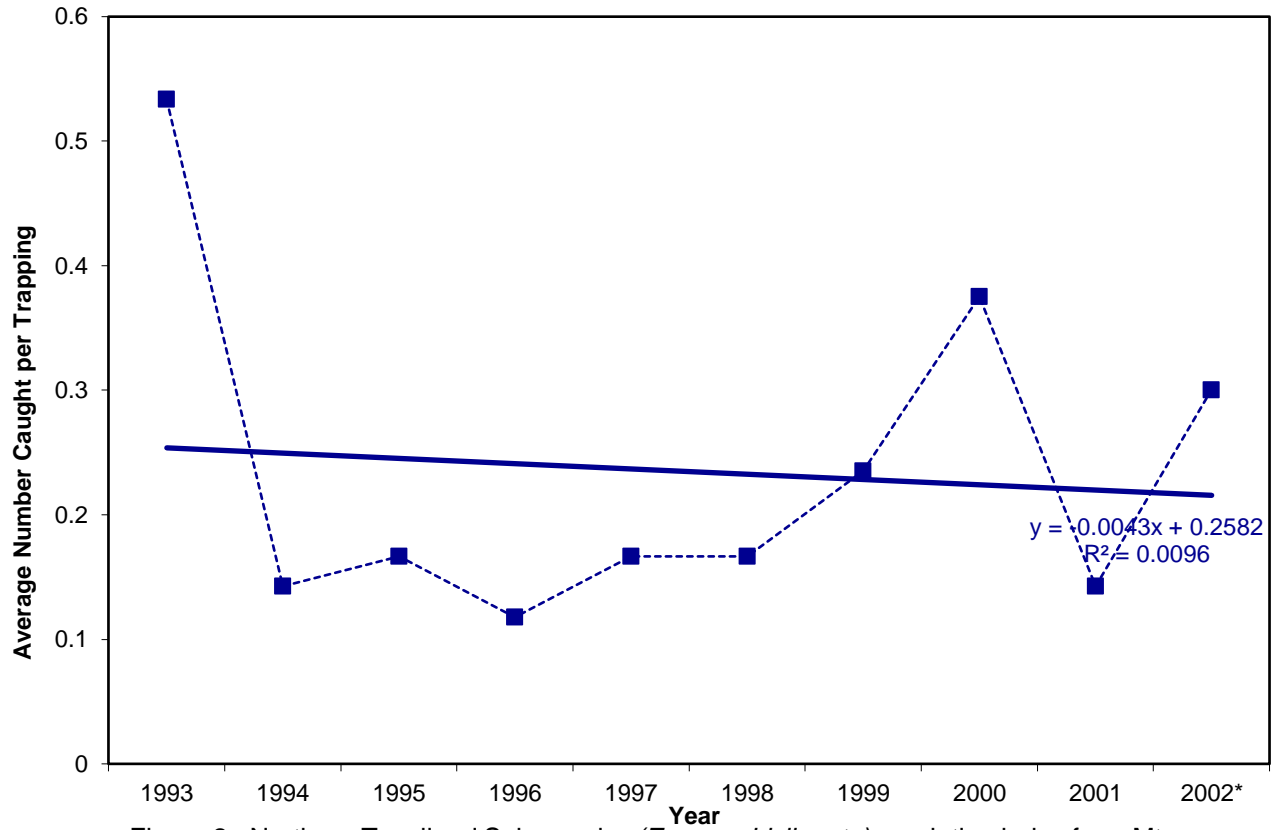


Figure 2. Northern Two-lined Salamander (*Eurycea bislineata*) population index from Mt. Mansfield, Underhill, Vermont, 1993-2002. For this species the numbers are too low to draw meaningful conclusions.

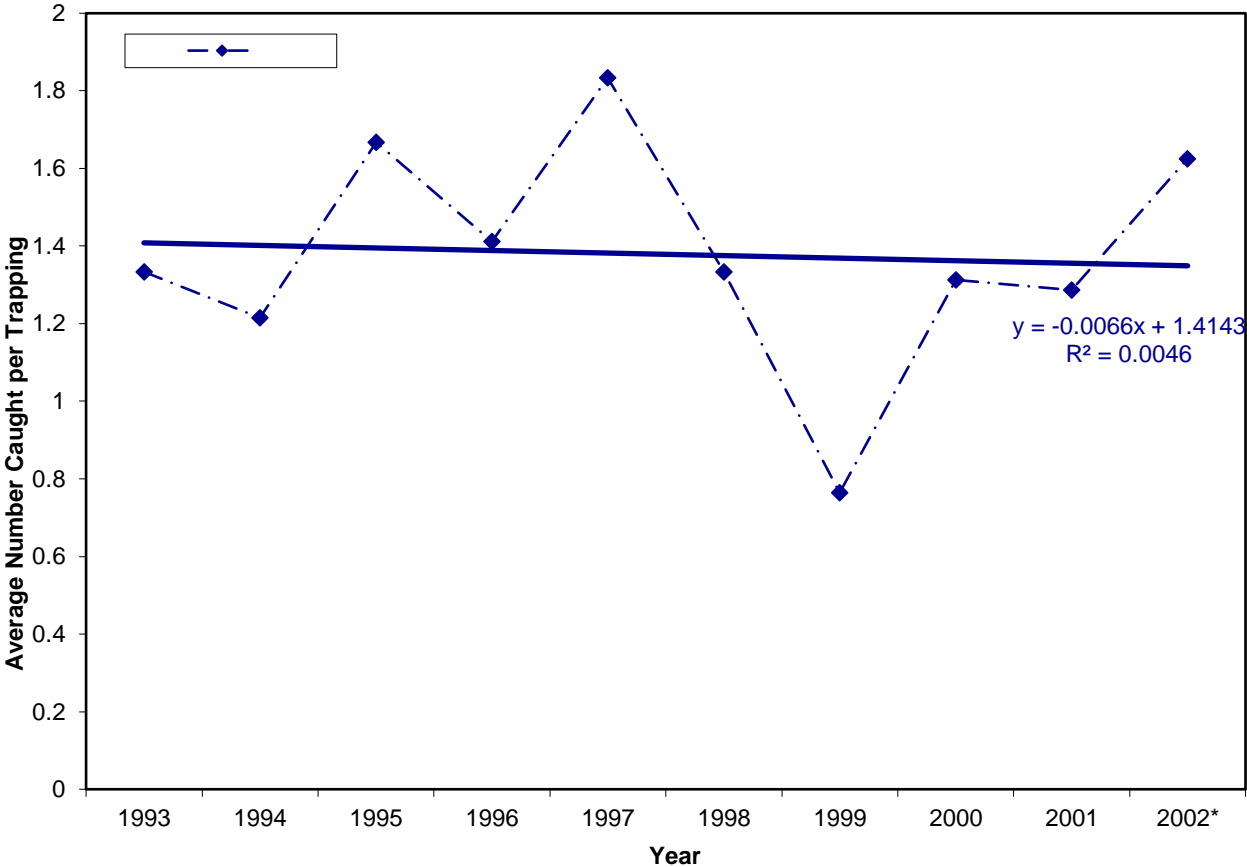
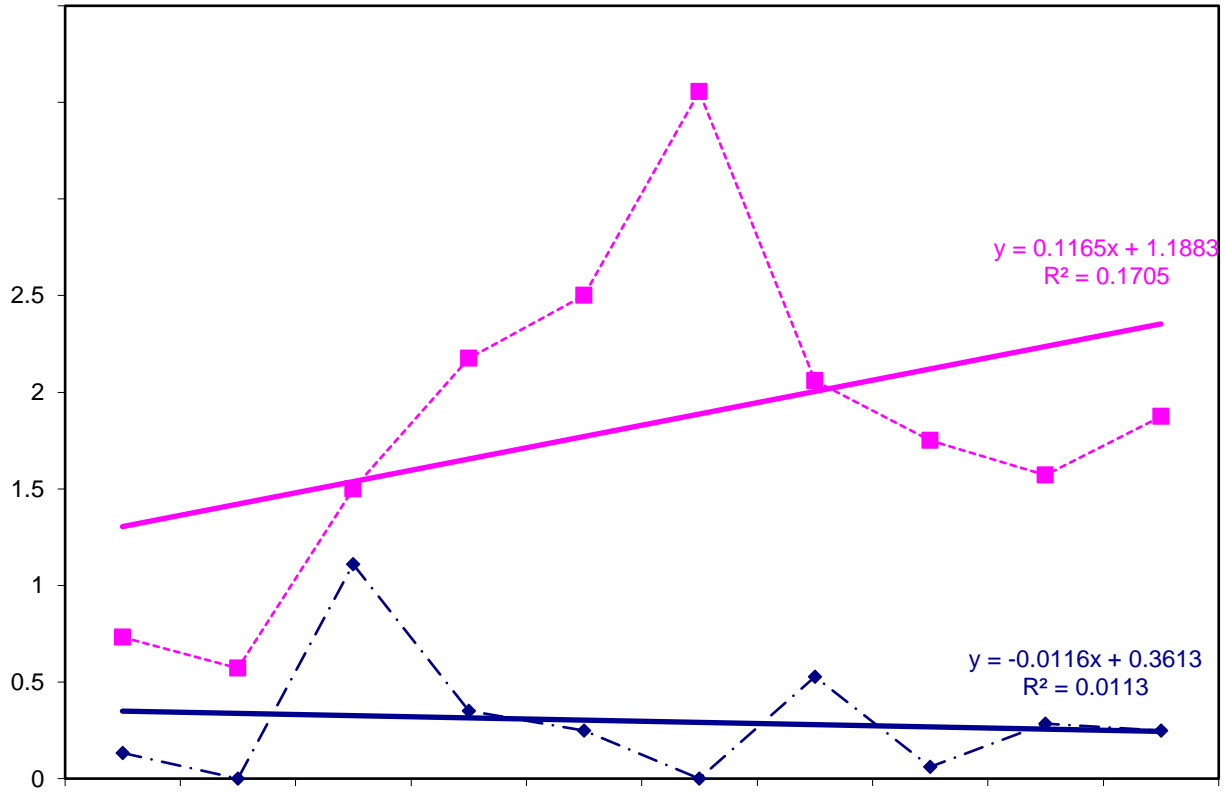


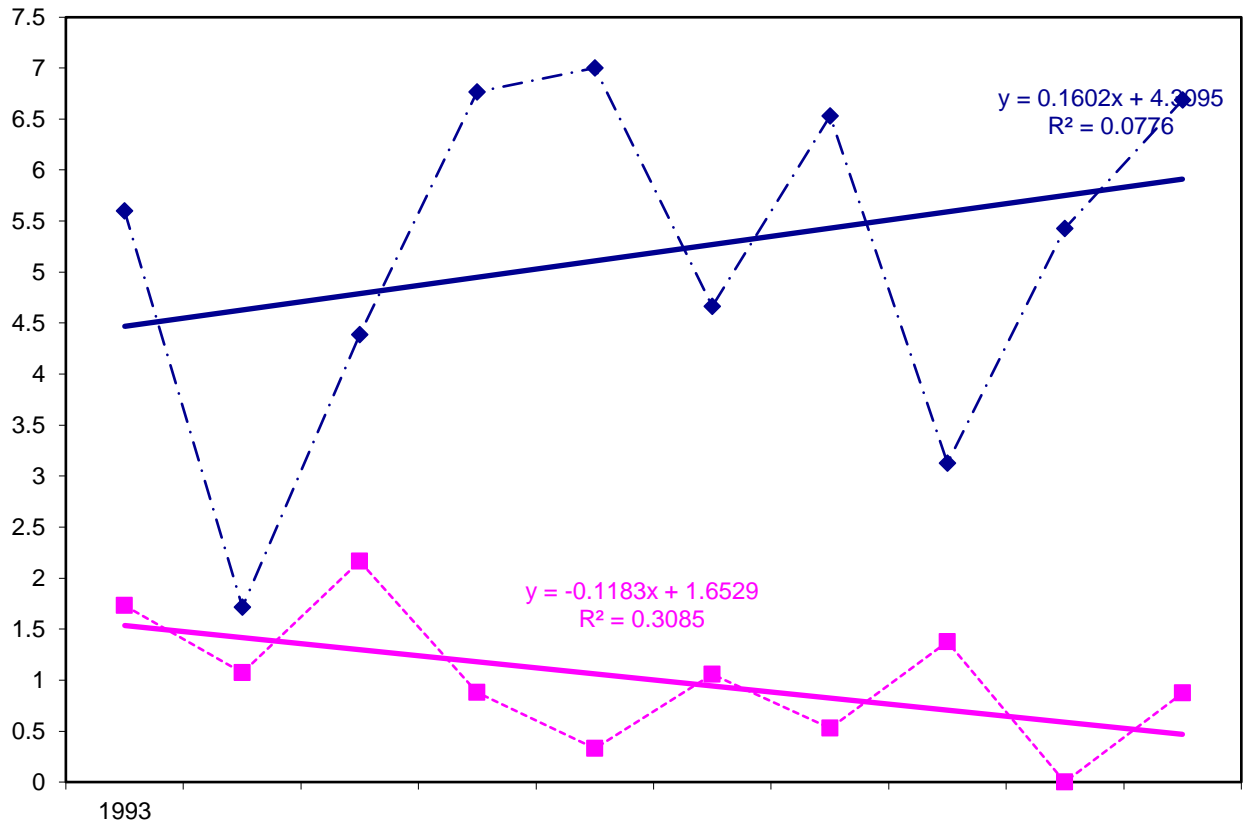
Figure 3. Eastern Newt (*Notophthalmus viridescens*) population indices from Mt. Mansfield, Underhill, Vermont, 1993-2002.

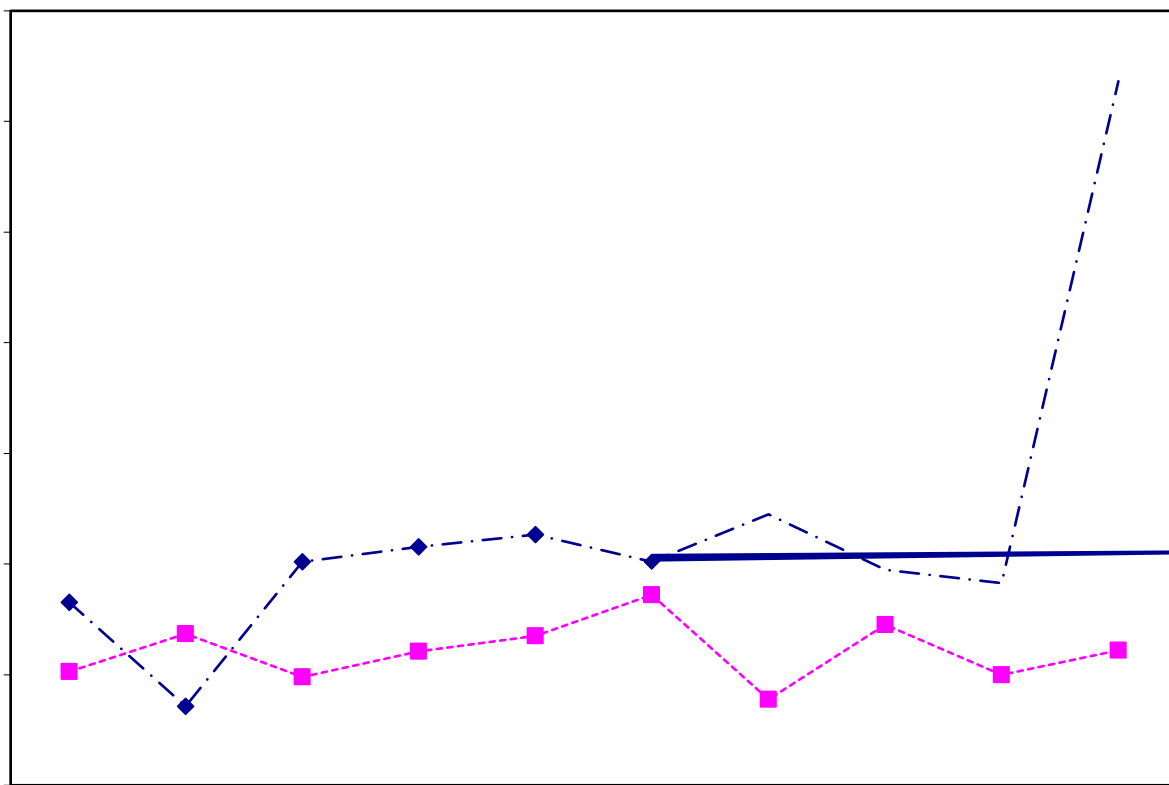


Figure 4. Green Frog (*Rana clamitans*) population indices from Mt. Mansfield, Underhill,









Tables

**Herptile Capture  
Species**

Common name	# per trapping					
	93	94	95	96	97	980.04

W\*3eW'

Table 3. Monitoring results from the two drift-fences at 1,200 ft. and one at 2,200 ft. on Mt. Mansfield, Underhill, Vermont during 2002. Traps were opened whenever conditions were appropriate for amphibian movement