Mt. Mansfield Amphibian Monitoring

Update

2025

(Covering 1993-2025)

March 1, 2026

For the Forest Ecosystem Monitoring Cooperative

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Preferred citation: Andrews, J. and Talmage E., 2026. Mt. Mansfield Amphibian Monitoring 2025: Annual Report for the Forest Ecosystem Monitoring Cooperative. DOI: https://doi.org/10.18125/860von

Amphibian Monitoring on Mt. Mansfield, Vermont
1993-2025

Background

After an initial amphibian survey and establishment of monitoring protocols, populations of amphibian species have been monitored almost annually on Mount Mansfield since 1993. 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. This is the longest-running set of amphibian monitoring data in the state.

Four drift fences were built at three elevations on the west slope of Mt. Mansfield (Figure 1): 1200 feet (2 fences), 2200 feet (1), and 3200 feet (1). With the exception of the fence at 3200 ft., each fence was made of two 50-foot sections of 20-inchwide metal flashing buried 4 inches below the surface of the ground. The two sections were placed at right angles to each other, resulting in 100 feet of flashing set upright as a 16-inch-high fence. Buckets were buried every 12.5 feet on both sides of the fence so that the top edges of the buckets were flush with the ground. The fence at 3200 feet was made of only one 50-foot section of flashing with buckets at 12.5-foot intervals. Amphibians that encounter a fence while moving through the forest must turn to one side, and many eventually fall into a bucket. The lids are taken off the buckets in the late afternoon on rainy days, and the captured amphibians are identified and counted the following morning. The locations of these four sites are indicated in Figure 1. The fence at 3200 feet was removed in 1996. The remaining 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. In drought years, only one or two successful trap nights might need to be used instead.

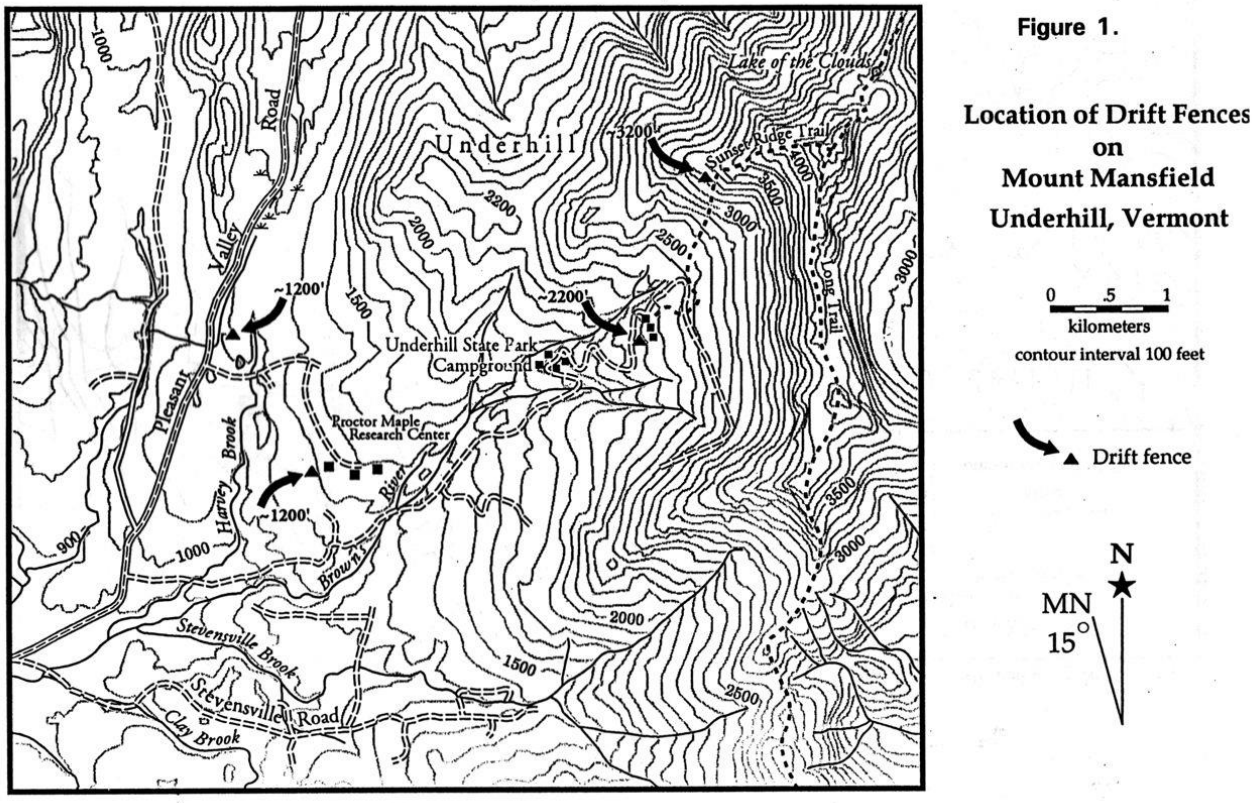

Figure 1. Drift fence locations on Mt. Mansfield.

We have drift-fence data from Mt. Mansfield from 1993 to the present, with the exceptions of 2004, 2009, 2015, and April and May of 2016. Due to an anticipated break in the funding, the drift fences were removed from Mt. Mansfield during the summer of 2015. Luckily, funding was restored, the fences were reinstalled in May of 2016, and data collection began again in June of 2016.

Periodic monitoring at Lye Brook allowed us to compare data at the two locations to see if there were corresponding patterns that may signal statewide changes. We collected data from fences near the Lye Brook Wilderness in southern Vermont annually from 1994 through 2002, when funding from the Green Mountain National Forest ended. During 2008, monitoring began again at Lye Brook Wilderness and continued at Mt. Mansfield as well. In 2009, only the Lye Brook Wilderness fences were monitored, and in 2010, only the Mt. Mansfield fences were monitored. In the fall of 2011, Hurricane Irene washed out the road leading to the Lye Brook drift fences from the west, preventing data collection in the fall of 2011 and in 2012. A new road allowing access from Manchester was completed. However, we no longer have funding or staff to monitor Lye Brook.

To save money and time, we agreed in 2009 to begin an every-other-year schedule of generating indices, analyzing, and reporting on the data gathered. However, recent contracts have again required annual reports. The 2016 report included all data from 1993 through June 2017 from Mt. Mansfield. Due to the reinstallation of the fences in the summer of 2016, no data were collected in April and May 2016. To be able to continue comparing year-to-year results, we needed to have a full year of results, including a spring migration in April and May. We chose to include the data collected during April and May 2017, as it was the closest chronologically to the 2016 field season and encompasses one full year. The 2017 report contained all data collected only in the 2017 season, as have all subsequent annual reports.

For the previous five field seasons (2020-2024), strings were added to half of the buckets to reduce small mammal mortality. We noticed the addition of strings impacted the amphibian capture rate, as some animals could use the string to climb out and escape. As we only had strings in half of the buckets, we were able to calculate a correction factor for all species. In addition, for some species, we noticed the small size class escaped at a different rate than the larger adults, thus requiring two correction coefficients. More specifics of these calculations can be found in our 2024 report.

During field season 2025, we used strings in all the pitfall traps and used the following correction factors so we could continue to compare year to year results: Spotted Salamander ≥ 70mm (1.38), Spotted Salamander < 70 mm (2.30). Northern Dusky Salamander (1.15), Northern Two-lined Salamander ≥ 60 mm (0.58), Northern Two-lined Salamander < 0.67, Spring Salamander (1.0), Eastern Newt ≥ 45 mm (1.0), Eastern Newt < 45 mm (1.22), Eastern Red-backed Salamander (1.25), American Toad (1.0), North American Green Frog (0.85), Pickerel Frog (1.14), Wood Frog ≥ 27 mm (1.16), Wood Frog > 27mm (1.35), Spring Peeper (1.63).

Cleaned and updated sets of all the drift-fence data from Mt. Mansfield, including data not used in our indices, have been sent to the FEMC.

Diversity of Adults and Young

In 2025, the usual five caudate (salamander) species were caught as adults. They are Spotted Salamander (*Ambystoma maculatum*), Northern Dusky Salamander (*Desmognathus fuscus*), Northern Two-lined Salamander (*Eurycea bislineata*), Eastern Newt (*Notophthalmus viridescens*), and Eastern Red-backed Salamander (*Plethodon cinereus*). Spring Salamanders (*Gyrinophilus porphyriticus*) were not detected in 2025. This is a species we have only caught in 13 of our 30 trapping seasons. It is a stream species that only occasionally travels far enough from its home stream to get caught in one of our fences. Young of the year of Spotted Salamander, Northern Two-lined, and Eastern Newt were captured: (Table 1).

In 2025, adults of five of our normally trapped anurans (frogs) were caught. They are American Toad (*Anaxyrus americanus*), Spring Peeper (*Pseudacris crucifer*), North American Green Frog (*Lithobates clamitans*), Pickerel Frog (*Lithobates palustris*), and Wood Frog (*Lithobates sylvaticus*). No Gray Treefrogs (*Hyla versicolor*) were captured. Gray Treefrogs can climb over our fences and out of our buckets. Our fences are not placed in or near the preferred habitat for Pickerel Frogs, and typically, very few are captured. Young of the year were captured for American Toad, North American Green Frogs, Pickerel Frogs, Spring Peeper, and Wood Frogs (Table 1).

Combined Numbers

The total number of amphibians (salamanders & frogs) detected per trapping was 36.1, higher than the average of 21.5 over the life of the study. Overall, the number of salamanders detected in the last 15 years of data collection is considerably higher than the numbers detected in the first 15 years of data collection (14.4 per trapping versus 6.5), with each individual species showing an increase. The number of salamanders increased when comparing those two timeframes; the number of frogs has also shown an increase, albeit much smaller (10.7 per trapping versus 11.4). During those same two timeframes, Wood Frogs increased by 34%, Pickerel Frogs increased by 6%, while all other species decreased, resulting in what looks like fairly stable frog numbers as a group.

Long-term Trends

Linear regressions most closely fit the data plots, so they are used to show potential trends in the abundance indices for all species caught from 1993-2025 (Figures 2-7). In 2017, in addition to using linear regressions to show potential trends in the abundance indices, we used the Monitor.exe freeware program to determine the reliability of the apparent trends. We had planned to reexamine the reliability of the trend lines in 2024, but unfortunately, Patuxent has disabled its website relating to the program Monitor and power analysis. We will look into other statistical tools in future reports to further analyze the trends we discuss.

Young of the Year

Beginning with the 1995 report, we began documenting the number of young of the year, calculating the percentage of young of the year (YOY), and recording the date of the first metamorph caught by a drift fence. The cutoff lengths listed in Table 1 were calculated in 1995, based on data we had collected and information gathered from the literature. As mentioned below and in the table footnotes, in addition to using the total length as one cutoff for determining young of the year, we also use dates, as some larvae or tadpoles may overwinter in their aquatic phase and metamorphose in the early spring. In 2025, young of the year made up 40% of the total amphibians captured (Table 1). Over the course of the portion of the study where we have juvenile information (1995 – 2025), the average percentage of young of the year of total catch has been 23.7%. Since 1995, the young of the year have varied from 11% (2014 and 2024) to 74% (2002). The 2025 result of 40% is below average. Table 3 and Table 4 summarize the young of the year information for salamanders and frogs, respectively.

All frogs monitored, except for North American Green Frogs, generally grow from egg to metamorph in one season. At this latitude and elevation, North American Green Frogs usually spend at least one winter as tadpoles and metamorphose a year or more after the eggs are laid. Other frogs metamorphose during the same year as egg laying, but at a very small size. American Toads can be as small as 8-13 mm after metamorphosis. Gray Treefrogs can be as small as 15 mm, Wood Frogs can transform as small as 10-20 mm, and Spring Peepers as small as 13 mm. It is possible that a froglet may have transformed in a previous year but still be under the cut-off size to be considered young of the year when found the following spring. Therefore, when determining young of the year, we do not include small frogs or toads found in spring if it was unlikely enough time had passed to allow for development through metamorphosis.

Different species of salamanders show even more variability, and for many, the term young of the year is misleading since they spend multiple years in their aquatic larval stage. It would be more accurate to say the first year of their terrestrial phase. The Eastern Newt and the Eastern Red-backed Salamander generally develop into a terrestrial form in the first year of their lives, although, like the frogs, they may still be very small and below our cutoff sizes the spring after they were deposited as eggs. Spotted Salamanders have a minimum larval phase of about 60 days, but can remain in the water as larvae over their first winter. Small Spotted Salamanders found in the spring and very early summer are not counted as young of the year in this report. Northern Dusky Salamanders can spend 7 to 11 months as larvae and transform the spring after emerging from eggs. Northern Two-lined Salamanders may remain in their aquatic stage for 2 – 3 years, and Spring Salamanders can remain in their larval form for up to 3-4 years. What we refer to as young of the year for these species are individuals that had hatched in previous years but were spending their first year in the terrestrial form.

Over the years of gathering and analyzing these data, as well as studying the literature, our ability to determine a particular species phenology at this latitude and elevation has improved. In 2022 and 2023, we created specific cut-off dates for determining if an individual should be considered young of the year. Species found prior to these dates were not considered young of the year: Spotted Salamander (July 1) Northern Dusky Salamander (June 1), Northern Two-lined Salamander

(June 1), Eastern Newt (August 15), and Eastern Red-backed Salamander (July 15), American Toad (May 1), Spring Peeper (July 1), North American Green Frog (June 1), Pickerel Frog (July 1), and Wood Frog (July 1), and Gray Treefrogs (July 1).

Although we used the best information we had in previous reports to determine the young of the year, it is possible that not all were classified using the cut-off at the dates listed above, which may account for some minor differences seen between years. It may be necessary in a future year to go back and re-evaluate all individuals determined young of the year between 1993 and 2021 using the above criteria.

Individual Species' Trends

Northern Two-lined Salamander

We catch relatively few Northern Two-lined Salamanders. This is expected since the fences were not placed within their preferred habitat. This species prefers saturated soils and travels only a limited distance away from those areas in very wet conditions. The first decade of monitoring showed a slightly increasing trend in numbers caught. Since 2003, the indices have shown some large annual fluctuations, and the linear regression trend line continues to show an increase, even though low numbers were captured in 2018-2021 and in 2023. When comparing the first fifteen years of the study to the second fifteen years, the numbers have increased by 44%. However, the timing and amount of rainfall, groundwater levels, and drainage changes all would have a large impact on the extent to which this species travels and intercepts our fences. In our 2021 report, we mentioned an apparent decline in the last ten years; 2022's and 2024's relatively high numbers have reversed that trend, and overall, they appear to be increasing despite the fluctuation. (Figure 2 and Table 2).

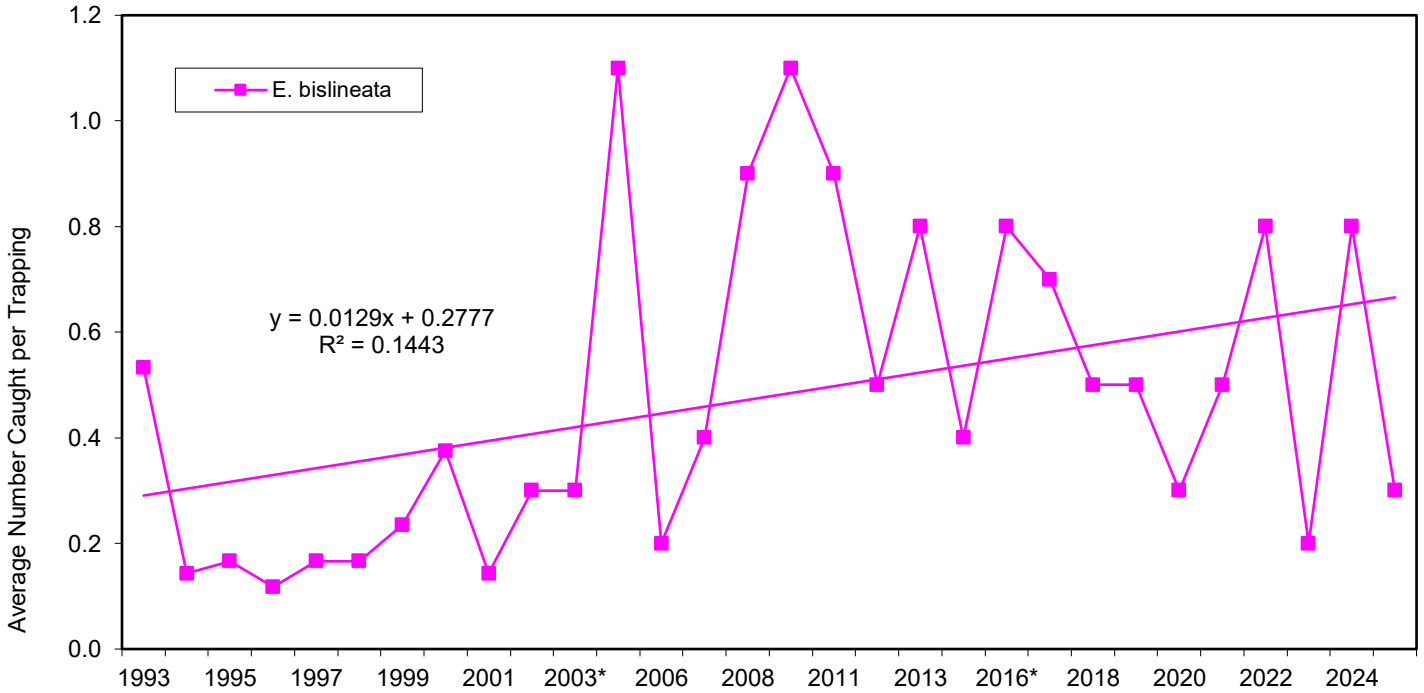

Figure 2. Northern Two-lined Salamander (*Eurycea bislineata*) population indices from Mt. Mansfield, Underhill, Vermont, 1993-2025.

Spotted Salamander

The Spotted Salamander has a regression trend line showing a very slight increase with some annual variation (Figure 3). The trapping of 2.9 individuals in 2017 was a record high for this species. When comparing the first fifteen years of the study to the second fifteen years the numbers have increased by 36%. This is a long-lived species with a life span of over 20 years. As a result, adult numbers are not expected to vary as much annually as a shorter-lived species such as a Spring Peeper or Wood Frog. The number of young of the year detected in 2025 was 50% (Table 4).

Eastern Red-backed Salamander

This species shows a clear long-term increase. Like the other amphibian species found at this site, the Eastern Red-backed Salamander population occasionally shows large annual fluctuations. In 2017, a record number (14.5 per trapping) were detected. As mentioned earlier, the number of overall salamanders detected in the last 15 years as compared to the first 15 years of the study was considerably higher and it showed a 66% increase. The Eastern Red-backed Salamanders appear to be the major driver of the overall shift. (Figure 3 and Table 2).

This species is reported to do well in mature hardwood forests with abundant coarse woody debris and deep deciduous leaf litter. Unlike the Wood Frog and Spring Peeper, it overwinters deep in the soil below the frost line, so it is less subject to overwintering mortality. Also, unlike Wood Frogs and Spring Peepers, it does not require wetlands in any stage of its development, so hydroperiod or other conditions in breeding ponds would not have any direct impact on their numbers, although soil moisture could. The overall increase in this species could be a result of the leaf litter becoming deeper, the leaf litter holding moisture better, an increasing amount of course woody debris, or some combination of these factors. These could also be a result of a maturing hardwood forest. The annual variation could be related to changes in moisture in the top layers of leaf litter, and in drier years (such as 2020 and 2025), these salamanders may be further underground. Invasive earthworms that influence the depth of the leaf litter and soil moisture may have an impact on this species in the future. The fluctuation has continued each year. No young of the year were detected this year, but that is not unusual for this species.

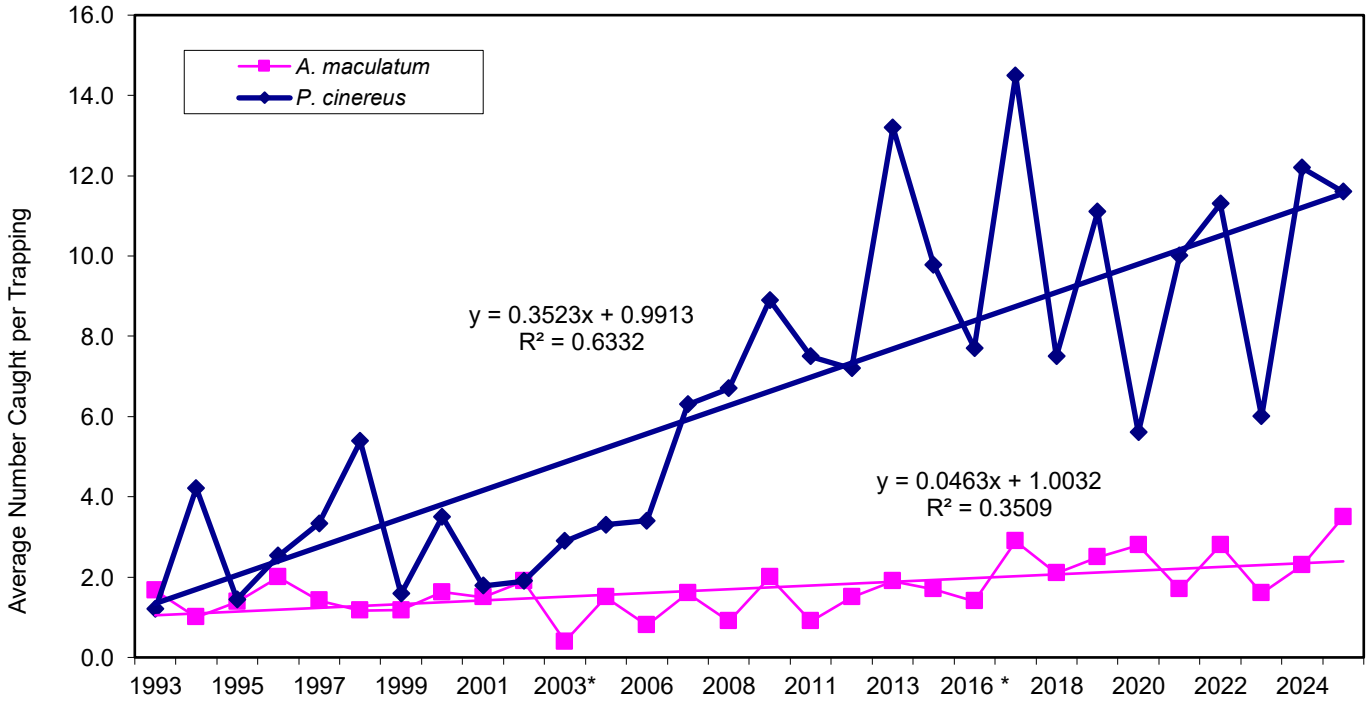

Figure 3. Spotted Salamander (*Ambystoma maculatum*) and Eastern Red-backed (*Plethodon cinereus*) Salamander population indices from Mt. Mansfield, Underhill, Vermont, 1993-2025.

Eastern Newt

The trapping rate for the Eastern Newt in 2025 was 1.4 animals per trapping, a slight decrease since 2024. These results are well below the previous year of 2022 when the highest (3.1) capture rate of any year of the study was detected. The long-term trend is virtually flat with a great deal of annual variation (Figure 4). When comparing the first fifteen years of the study to the second fifteen years, the numbers have increased by 3%. Of the animals captured, 32% were considered young of the year (Table 1 and Table 3).

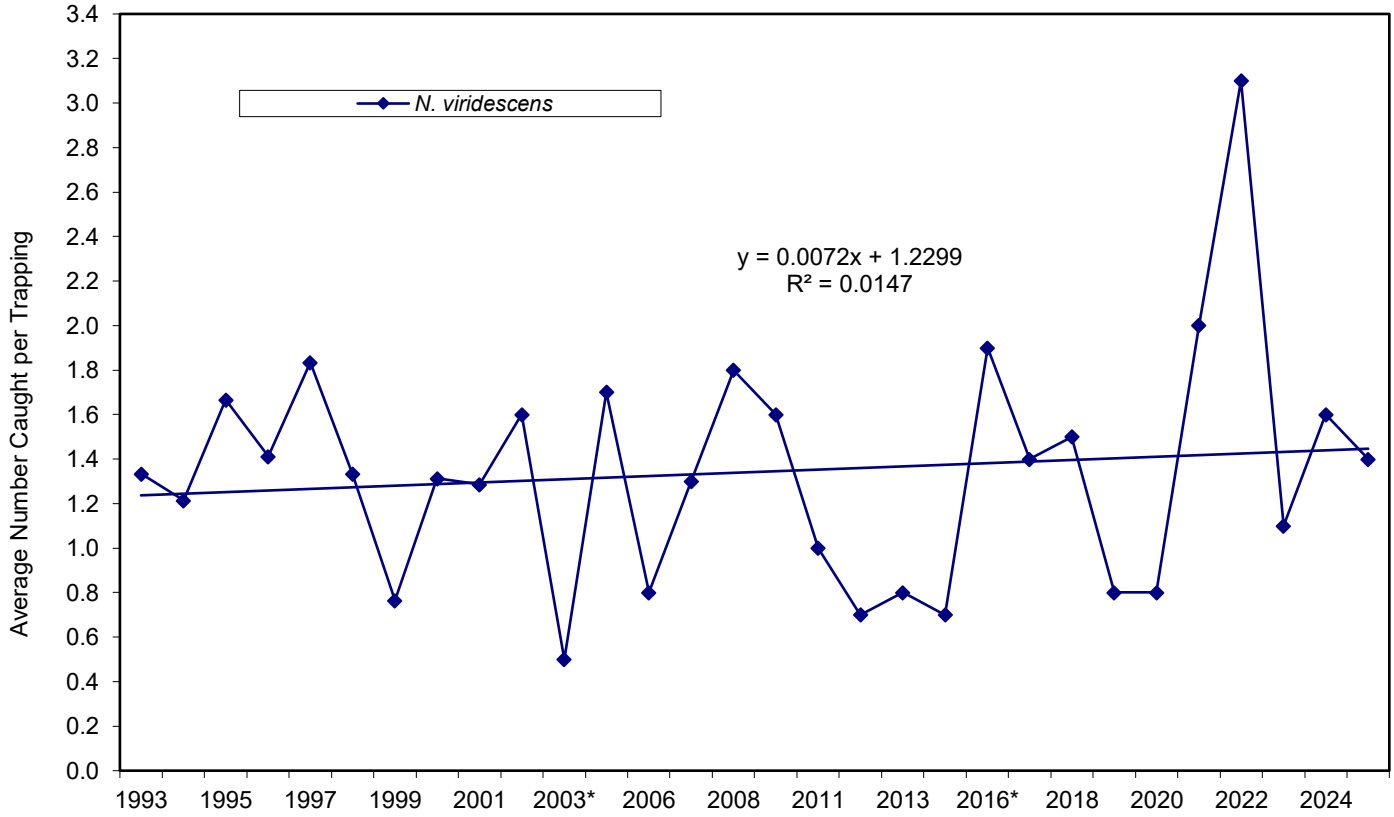

Figure 4. Eastern Newt (*Notophthalmus viridescens*) population indices from Mt. Mansfield, Underhill, Vermont, 1993-2025.

American Toad

American Toad capture rates have fluctuated with large annual variations (Figure 5). An all-time high of 5.5 American Toads per trapping was detected in 2013. The regression line shows that the population appears to be decreasing slightly. When comparing the first fifteen years of the study to the following fifteen years, the capture rates have decreased by 9%. Of the animals captured, 39% were considered young of the year (Table 1 and Table 4).

Pickerel Frog

We typically catch very few Pickerel Frogs (fewer than 1.0 per trapping); however, this year's capture rate was a record 1.6. Still, due to the small capture numbers, it is not possible to draw any meaningful conclusions (Figure 5 and Table 2). This is not surprising as our fences were not located in the preferred foraging habitat (open annual vegetation near water) for this species.

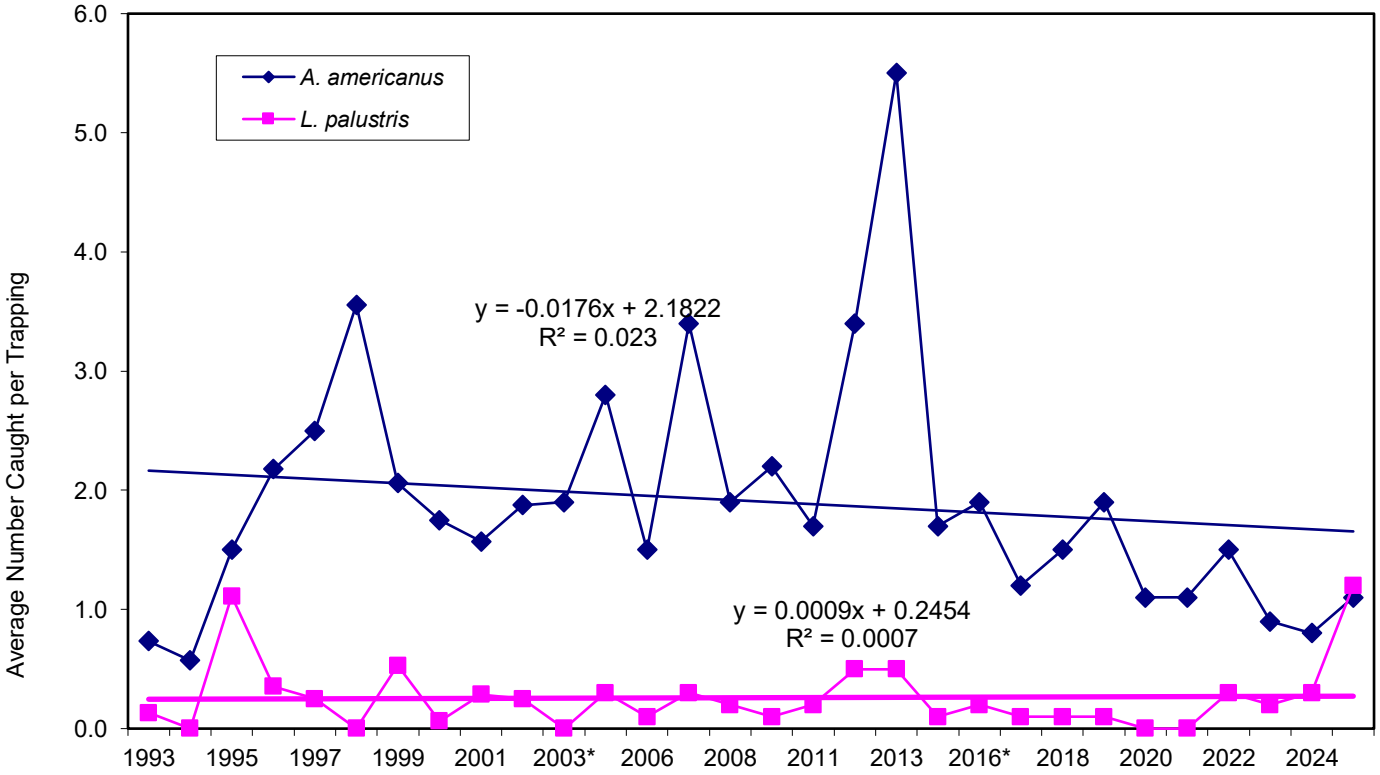

Figure 5. American Toad (*Anaxyrus americanus*) and Pickerel Frog (*Lithobates palustris*) population indices from Mt. Mansfield, Underhill, Vermont, 1993-2025. The numbers for the Pickerel Frog are too low to draw any meaningful conclusions.

Wood Frog

Wood Frogs continue to have large year-to-year fluctuations with a few good years, including 2025, when a record 14.3 were captured (Figure 6 and Table 2). The regression line appears to show a long-term increase. In 2021 and 2022, capture rates for Wood Frogs were below the average of 5.3 per trapping at 2.8 and 4.9. It is possible many were missed in 2021, as the first trapping date was April 29, 2021. Wood Frogs migrate to breeding ponds early in the spring and return shortly afterwards. If peak migration was missed, it would impact the abundance index for that year. When comparing the first fifteen years of the study to the following fifteen years, the numbers have increased by 34%. In 2025, a record number of young of the year were captured (67%).

Since this species grows from egg to metamorph in a matter of months, seasonal droughts (such as seen in 2020) of only a couple of weeks' duration could have a large impact on a population. In addition, since this species overwinters in the leaf litter, depth of freeze, snow depth, and invasive earthworms could also have immediate and pronounced impacts on populations. Conversely, a single successful breeding year could generate the increase in numbers we saw this last year. At a privately funded research site in Lincoln, VT (Colby Hill Ecological Preserve), where we are monitoring egg-mass numbers, we have not seen any significant long-term trends for this species.

Spring Peeper

In 2017, using Power analysis, we showed that the Spring Peeper was showing an annual decline of 1.6%. It was the only decline shown among the species we monitor on Mt. Mansfield that we confidently (100%) had the power to claim. However, at that time, it appeared that their population was beginning to recover after completely disappearing from our fences back in 2008. By 2017, their numbers had bounced back to those seen at the very beginning of our monitoring back in 1993. Since 2017, their numbers have remained low. (Table 1 and 2 and Figure 6). When comparing the first fifteen years of the study to the last fifteen years, the numbers have decreased by 41%. In 2025, they had a capture rate of 0.6, just below the average rate of 0.7.

Local changes in breeding habitat are one possible explanation for this population variation, but we have no data to support a significant change in habitat. Spring Peepers breed primarily in open, shallow, and well-vegetated wetlands. If local breeding habitat were flooded by beaver and/or exposed to trout, populations would be expected to decline. The importance of nearby breeding habitat is supported by the fact that we have never caught a Spring Peeper at the drift-fence at Underhill State Park. As far as we can tell, there is no breeding habitat in that area. In our minds, changes in appropriate breeding habitat, perhaps because of forest succession or changes in local beaver activity, could potentially be driving population changes.

Spring Peeper is another species that overwinters in the leaf litter. Changes in the depth of frost during winter, snowpack, or changes in the depth of the leaf litter could also bring about declines. Invasive worms and disease are other potentially significant variables.

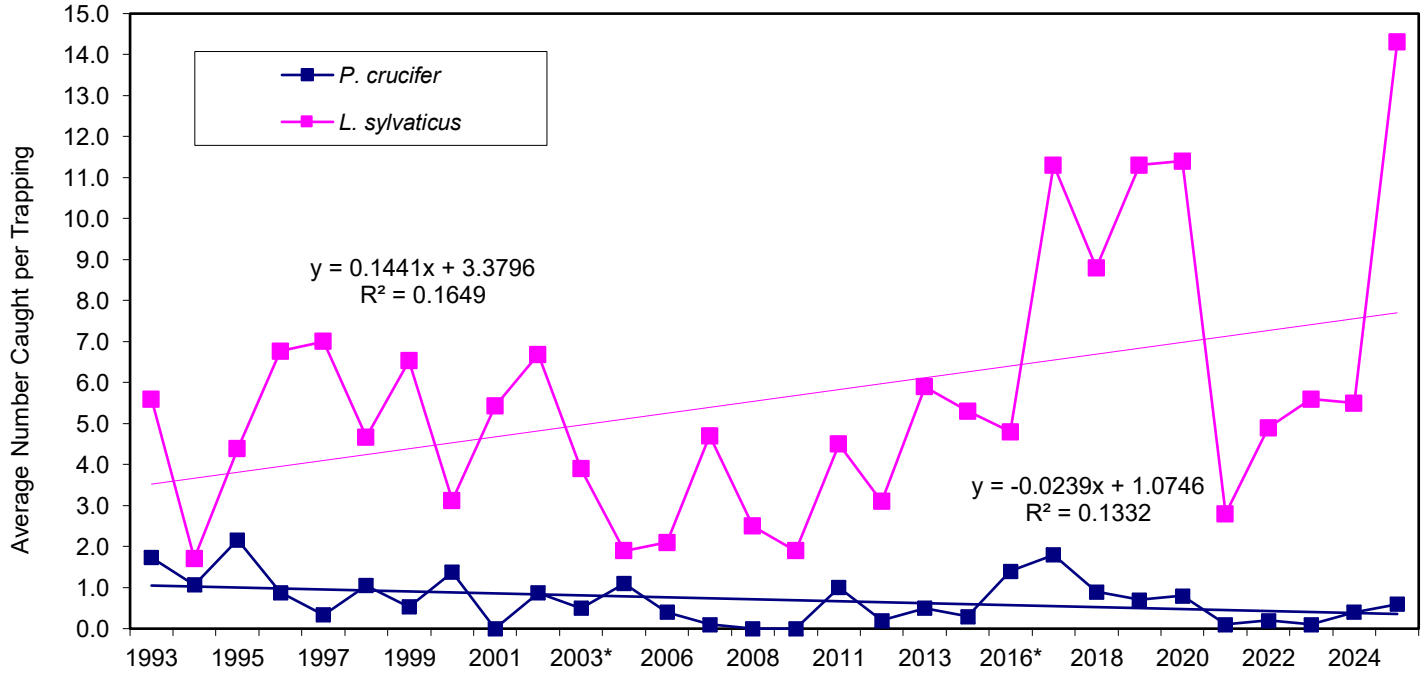

Figure 6. Wood Frog (*Lithobates sylvaticus*) and Spring Peeper (*Pseudacris crucifer*) indices from Mt. Mansfield, Underhill, Vermont, 1993-2025.

North American Green Frog (the accepted common name has recently changed from Green Frog)

The number of North American Green Frogs increased slightly through 2002, when there was a dramatic increase from 1.9 per trapping to 22.1 per trapping, for a total of 350 North American Green Frogs captured (Figure 7). After that one dramatic year, there was a large drop back down to the historic trend line in 2003 and only relatively small annual variations since then. The long-term trend line shows no discernible increase or decrease. 2024 and 2025 were below-average years, with 1.6 detected each year. When comparing the first fifteen years of the study to the last fifteen years, the numbers have decreased by 59%, although this was influenced by the 2002 results. Since this species overwinters as a tadpole, a winter that allowed high survival in a nearby breeding pond could generate a spike like that seen in 2002, particularly if it was preceded and/or succeeded by wet conditions. North American Green Frogs are also largely aquatic and require standing pools of water to rehydrate and wet conditions in which to move.

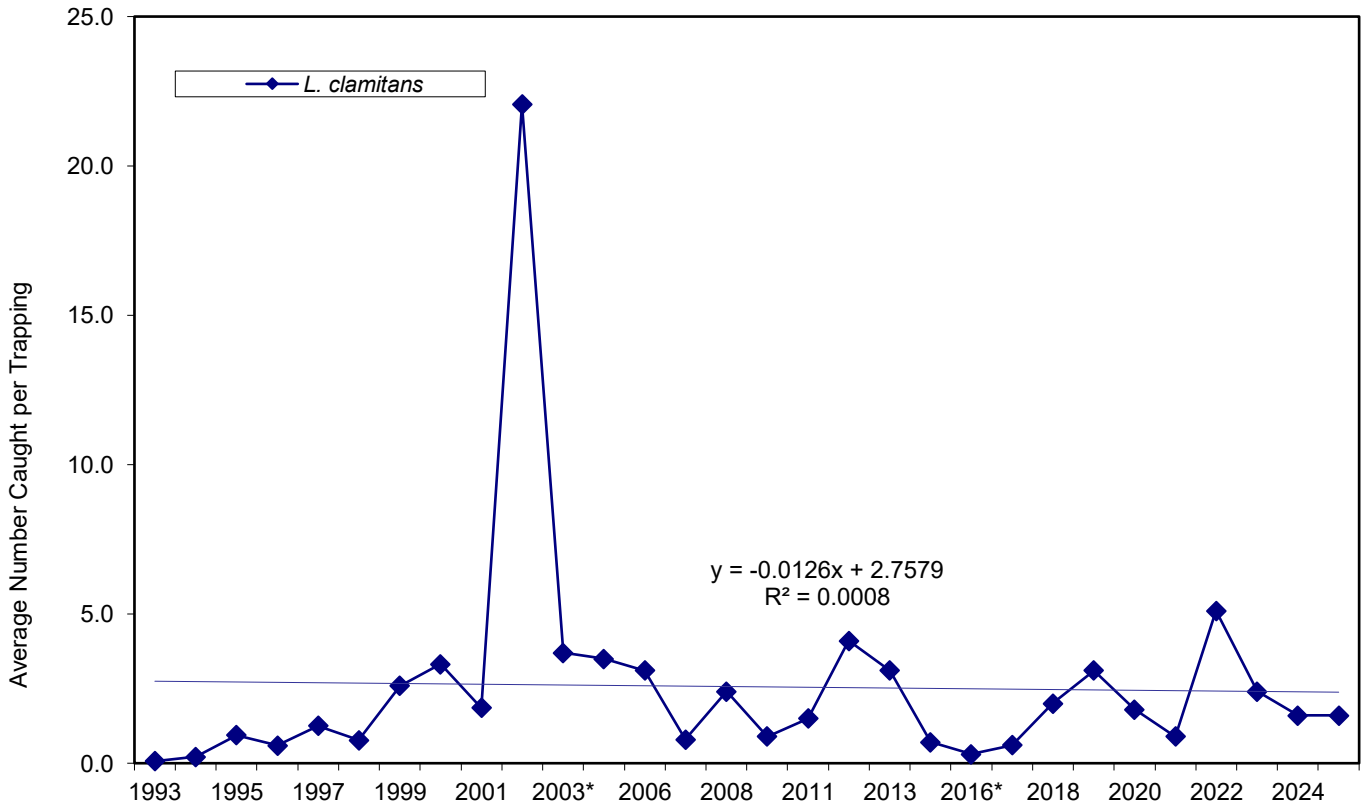

Figure 7. North American Green Frog (*Lithobates clamitans*) population indices from Mt. Mansfield, Underhill, Vermont, 1993-2025.

Abnormalities

No abnormalities were detected in 2025 out of 464 animals captured. Total numbers for abnormality are raw numbers (correction factors not used).

Very few abnormalities have been seen at this site. In 2011, one abnormality was detected in the 314 animals captured. It was a Wood Frog that had a left leg that bent back over the top of the frog. This could well have been the result of an injury. In 2012, two of the 384 animals were found with abnormalities. One Spring Salamander was missing toes and its lower leg, and a North American Green Frog was found with an atrophied right rear leg. In 2018, a Spotted Salamander was found with an adventitious tail. In 2023, a Wood Frog with the last two sections of its right rear leg missing was found. The stump was healed with two projections that might have been toes. We suspect this might have been the result of predation during

the frog's late tadpole stage. A second Wood Frog that had the toes on its left rear foot fused was found in 2023. It is unclear whether this was a developmental problem or the result of predation and regrowth.

The number of abnormalities at this site has always been well below the level of concern. From 1998 through 2025, the total number of amphibians showing abnormalities from all captures has been 18 individuals.

Data

Data from these efforts are exported in Excel format and sent via email to FEMC annually.

Amphibian mortality

In 2025, of the 464 amphibians, 24 were found dead: five Wood Frogs, sixteen Eastern Red-backed Salamanders, one American Toad, and one Northern Two-lined Salamander.

Small mammal mortality

Small mammals fall into the pitfall traps along with amphibians. Sadly, mammals smaller than a chipmunk are unable to escape the traps, and most die. During field seasons 2002, 2003, and 2005, we experimented with installing dowels and sponges in ½ of the pitfalls to allow small mammals to climb out. Unfortunately, many Spring Peepers and all Eastern Red-backed Salamanders also escaped, making it impossible to continue to monitor Eastern Red-backed Salamanders using traps with dowels. As a result, we removed the dowels from all the traps. To compare these years' data to years when we did not use dowels, we excluded data from all traps with dowels, doubled captures from traps without dowels, and added the snake trap data.

There was a dramatic jump in jumping mouse populations during 2019. Consequently, there was a large increase in their mortality at the fences. This stimulated efforts to once again alter the pitfall traps in a way that would lower small-mammal mortality while at the same time not allowing amphibians to escape. Starting in the 2020 season, we hung nylon parachute cord (string) in the center of one of each pair of pitfall traps, keeping the end of the string off the bottom of the pitfall traps. Making these changes to only ½ of the traps allowed us to measure the success of the method and generate correction factors to compare data to other years. When comparing non-strings to strings, small mammal mortality dropped 39%, 60%, 67%, 75%, and 56% from 2020 to 2024, respectively. During the 2020 field season, 155 small mammals died in traps without strings and 95 in traps with strings. During the 2021 field season, 176 small mammals died in traps without strings and 70 in traps with strings. During the 2022 field season, 270 small mammals died in traps without strings and 88 in traps with strings. During the 2023 field season, 285 small mammals died in traps without strings and 71 in traps with strings. During the 2024 field season, 179 small mammals died in traps without strings and 79 in traps with strings.

Overall, small mammal mortality at the fences in 2025 totaled 134: 10 *Peromyscus* species, 71 Other shrews, 17 Short-tailed Shrews, 17 voles, zero moles, one meadow jumping mouse, 18 woodland jumping mice. All of these were transferred to Dr. Sarah Helms Cahan of UVM. This year's combined total mortality of 134 compares to 249 in 2024, 312 in 2023, and 366 in 2022. There was an average of 376 per year in the eight years prior to this experiment with strings. These numbers demonstrate the reduction in small mammal mortality that the addition of strings has had on these species. Although we see annual variation in species numbers, we have not seen any long-term declines in the numbers of any of the mammal species caught in our fences.

Annelids

All earthworms (phylum Annelida) in Vermont are non-native, as any earthworms that had existed in Vermont went extinct 12,000 years ago during the most recent ice age. Earthworms have been reintroduced through the movement of dirt and plant material or imported for fishing bait and garden use. In recent years, it has come to the attention of many that three species of jumping worms have been introduced. These species have a different lifecycle, can reproduce very quickly, may be able to out-compete other species of earthworms, and may rapidly consume leaf litter and other organic material, possibly altering the structure of the forest floor and thereby impacting numerous amphibian species. As of this writing, they have been documented in 12 of 14 Vermont counties, but it is possible they are more widespread, as identification to species can be difficult, and the worms are easy to spread.

The field crew started making notes regarding the presence/absence of annelids in 2013. Although we have not kept records of the species, a few anecdotal findings have surfaced.

- Annelids have been seen most years at 1200 ft. Pleasant Valley Road since 2013, but not in 2023 and 2024.
- Annelids have only been recorded at 2200 ft. State Park in 2019 and 2023.
- Annelids have been recorded every year at PMRC between 2020 and 2024, but not prior to 2020, and were not seen in 2025.

This information may be relevant if we start looking at trends by site or if abnormal variations show up over the next few years. Over the last year, additional information has been published about how to identify these worms with photographs, and it may be worth trying those techniques if the worms become more prevalent.

Summary

The drift-fence array at Mt. Mansfield has generated the longest-running set of amphibian-monitoring data in the state. It is the only amphibian drift-fence location in Vermont that has been monitored almost continuously from 1993 through 2025.

Due to the addition of strings in all buckets, the 2025 raw number results were converted by a correction factor specific to species, and in some cases, age cohorts, to compare year to year results.

The overall number of suitable nights to open the drift fences was slightly lower than in previous years, due to the low rainfall in the summer and fall of 2025. The capture indices for all salamanders and all frogs were above average.

- Populations of **Spring Peeper** have declined over the long-term duration of this study. They entirely disappeared and then rebounded in 2016 and 2017. Their numbers were very low again from 2021 through 2023, but they have shown slight increases over the last two years.

- Populations of the **Eastern Red-backed Salamander** have increased over the length of the study, with considerable annual variation.

- Populations of **Spotted Salamander** remain fairly stable or slightly increasing.

- Populations of **Eastern Newt** have remained fairly stable but show large annual variations. A record number were detected in 2022.

- Populations of the **Northern Two-lined Salamander** have increased over the entire study but show large annual variation. For an unknown reason (possibly predation), more Northern two-lined Salamanders were captured in traps with strings as opposed to traps without strings. They are the only species where the correction factor lowers the raw number of captures.

- Populations of **North American Green Frog** remain fairly stable, except for 2002 when there was a large increase in young of the year. They do show annual fluctuation, and although relatively more were seen in 2022, the numbers have been below average for the last three years.

- Populations of **Wood Frog** are showing an increase over the long term, and it was a record year in 2025 for both individuals and young of the year.

- Populations of **American Toad** have decreased slightly over the duration of the study; however, we continue to catch relatively few.

- We have gathered enough data to better determine when **young of the year** show up as opposed to small non-young of the year. We may want to return to some of our earlier data and reexamine them for better year-to-year comparisons.

Life history differences and similarities between species help us rule out some potential causes of these changes and suggest others, but at this point, little is known about what is driving these changes.

Although always rare at this site, the **number of abnormalities remains very low (0 out of 464 in 2025)**.

Acknowledgments

Long-term monitoring at Mt. Mansfield during 2025 was supported by a cost-sharing grant to Vermont Family Forests from the Vermont Department of Forests, Parks, and Recreation through the Forest Ecosystem Monitoring Cooperative (FEMC). Vermont Family Forests is the fiscal 501c3 sponsor of the Vermont Reptile and Amphibian Atlas. Cynthia Brown entered all the data. Erin Talmage reviewed the data, generated the tables and figures, and drafted the report. Field personnel at Mt. Mansfield were Warren Ellison, Jeff Salisbury, Katie Arms, Sandra Hamlet, and Robert Robbins. Warren Ellison supervised the field crew.

Tables

Table 1. Monitoring results from the two drift-fences at 1,200 ft. and one at 2,200 ft. on Mt. Mansfield, Underhill, Vermont during 2025. Traps were opened whenever conditions were appropriate for amphibian movement from April through November excluding August. Three successful trappings per month (± 10 days) were the goal, however due to periods of low rainfall, two trappings per month were sometimes used. **Data from 16 of 16 trap-efforts were used: April 19 and April 26; May 4, 10, and 18; May 31, June 7, and June 28; July 8, and July 18 ; September 5, 24, and Sept 26; October 8, 22, and October 31.** Raw numbers were converted and rounded to a whole number to account for the addition of strings in each trap. Abnormality, maximum size, and first metamorph data were taken from all **16** trappings, and were not converted.

Common name	Scientific name	# of all ages [5]	# 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	# abnormal/ total [4]
Caudates (Salamanders)										
Spotted Salamander	*Ambystoma maculatum*	56	28	50%	September 5	194	3.5	21%	10%	0/32
N. Dusky Salamander	*Desmognathus fuscus*	8	0	0%	N/A	102	0.5	3%	1%	0/7
N. Two-lined Salamander	*Eurycea bislineata*	4	1	25%	July 18	98	0.3	1%	1%	0/7
Spring Salamander	*Gyrinophilus porphyriticus*	0	0	N/A	N/A	N/A	0.0	0%	0%	0/0
Eastern Newt	*Notophthalmus viridescens*	22	7	32%	September 5	76	1.4	8%	4%	0/20
E. Red-backed Salamander	*Plethodon cinereus*	186	0	0%	N/A	90	11.6	69%	33%	0/149
Group totals	Group totals	276	36	13%	N/A	N/A	17.3	103%	48%	0/215
Anurans (Frogs)										
American Toad	*Anaxyrus americanus*	18	7	39%	May 4	91	1.1	6%	3%	0/18
N.A. Green Frog	*Lithobates clamitans*	26	19.55	75%	July 8	50	1.6	9%	5%	0/30
Pickerel Frog	*Lithobates palustris*	19	14.82	78%	September 5	37	1.2	6%	3%	0/17
Wood Frog	*Lithobates sylvaticus*	228	153	67%	July 18	68	14.3	77%	40%	0/178
Spring Peeper	*Pseudacris crucifer*	10	1.63	16%	September 5	32	0.6	3%	2%	0/6
Group totals	Group totals	301	196	65%	N/A	N/A	18.8	101%	52%	0/249
Amphibian totals	Amphibian totals	577	232	40%	N/A	N/A	36.1	100%	100%	0/464

[1] For each species, individuals under a given total length were considered potential young of the year. The chosen length was based on the timing of their appearance, gaps in their size continuum, and records in the literature. The cutoff sizes used were *A. maculatum* (70 mm), *D. fuscus* (30 mm), *E. bislineata* (60 mm), *N. viridescens* (45 mm), *P. cinereus* (32 mm), *A. americanus* (23 mm), *H. versicolor* (26 mm), *P. crucifer* (20 mm), L. *clamitans* (44 mm), *L. palustris* (34 mm), and *L. sylvaticus* (27 mm). Young of the year for *G. porphyriticus* have external gills and are aquatic for up to 4 years. In addition, it was necessary to examine the minimum possible development time for each species. Individuals shorter than the cutoff lengths clearly overwinter (possibly as larvae for *N. viridescens* and *A. maculatum*) and show up in very early spring. These are not counted as young of the year.

[2] No trapping took place in August.

[3] These figures are rounded to the nearest 0.1. All other figures are rounded to the nearest whole number. As a result of this, group totals may not be equivalent to the sum of the individual species' values.

[4] These may contain old deformities (traumatic) as well as malformities (developmental). Salamanders missing all or portions of their tails are not included. The total number checked may contain specimens that were caught more than once.

[5] In 2025, the following correction factors were used due to the addition of strings to all buckets: Spotted Salamander ≥ 70mm (1.38), Spotted Salamander < 70 mm (2.30). Northern Dusky Salamander (1.15), Northern Two-lined Salamander ≥ 60 mm (0.58), Northern Two-lined Salamander < 60 mm (0.67), Spring Salamander (1.0), Eastern Newt ≥ 45 mm (1.0), Eastern Newt ,< 45 mm (1.22), Eastern Red-backed Salamander (1.25), American Toad (1.0), North American Green Frog (0.85), Pickerel Frog (1.14), Wood Frog ≥ 27 mm (1.16), Wood Frog < 27mm (1.35), Spring Peeper (1.63) .

Table 2. A comparison of drift-fence data (numbers per trapping) from 1993 through 2025 (no data were collected in 2004, 2009, nor 2015) 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.

Common name																													
	93	94	95	96	97	98	99	00	01	02[2]	03[2]	05[2]	06	07	08	10	11	12	13	14	16[4]	17	18	19	20	21	22	23	24	25
Caudates (Salamanders)																													
Spotted Salamander	1.7	1.0	1.4	2.0	1.4	1.2	1.2	1.6	1.5	1.9	0.4	1.5	0.8	1.6	0.9	2.0	0.9	1.5	1.9	1.7	1.4	2.9	2.1	2.5	2.8	1.7	2.8	1.6	2.3	3.5
N. Dusky Salamander	0.3	0.3	0.3	0.0	0.0	0.6	0.1	0.4	0.3	0.4	0.1	0.0	0.0	0.1	0.3	0.6	0.2	0.5	0.8	0.9	0.6	0.7	0.6	0.9	0.5	0.5	0.6	0.5	0.5	0.5
N. Two-lined Salamander	0.5	0.1	0.2	0.1	0.2	0.2	0.2	0.4	0.1	0.3	0.3	1.1	0.2	0.4	0.9	1.1	0.9	0.5	0.8	0.4	0.8	0.7	0.5	0.5	0.3	0.5	0.8	0.2	0.8	0.3
Spring Salamander	< 0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.6	0.0	0.3	0.0	0.0	0.0	0.2	0.0	0.0
Eastern Newt	1.3	1.2	1.7	1.4	1.8	1.3	0.8	1.3	1.3	1.6	0.5	1.7	0.8	1.3	1.8	1.6	1.0	0.7	0.8	0.7	1.9	1.4	1.5	0.8	0.8	2.0	3.1	1.1	1.6	1.4
E. Red-backed Salamander	1.2	4.2	1.3	2.5	3.3	5.4	1.6	3.5	1.8	1.9	2.9	3.3	3.4	6.3	6.7	8.9	7.5	7.2	13.2	9.8	7.7	14.5	7.5	11.1	5.6	10.0	11.3	6.0	12.2	11.6
Group totals	5.0	6.8	4.9	6.1	6.7	8.7	3.9	7.2	5.0	6.1	4.2	7.8	5.2	9.7	10.8	14.3	10.6	10.5	17.7	13.6	12.6	20.8	12.2	16.1	10.1	14.7	18.6	9.6	17.4	17.3
Anurans (Frogs)																													
American Toad	0.7	0.6	1.5	2.2	2.5	3.6	2.1	1.8	1.6	1.9	1.9	2.8	1.5	3.4	1.9	2.2	1.7	3.4	5.5	1.7	1.9	1.2	1.5	1.9	1.1	1.1	1.5	0.9	0.8	1.1
Gray Treefrog	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
N.A. Green Frog	< 0.1	0.2	0.9	0.6	1.3	0.8	2.6	3.3	1.9	22.1	3.7	3.5	3.1	0.8	2.4	0.9	1.5	4.1	3.1	0.7	0.3	0.6	2.0	3.1	1.8	0.9	5.1	2.4	1.6	1.6
Pickerel Frog	0.1	0.0	1.1	0.3	0.3	0.0	0.5	0.1	0.3	0.3	0.0	0.3	0.1	0.3	0.2	0.1	0.2	0.5	0.5	0.1	0.2	0.1	0.1	0.1	0.2	0.0	0.3	0.2	0.3	1.2
Wood Frog	5.6	1.7	4.4	6.8	7.0	4.7	6.5	3.1	5.4	6.7	3.9	1.9	2.1	4.7	2.5	1.9	4.5	3.1	5.9	5.3	4.8	11.3	8.8	11.3	11.4	2.8	4.9	5.6	5.5	14.3
Spring Peeper	1.7	1.1	2.2	0.9	0.3	1.1	0.5	1.4	0.0	0.9	0.5	1.1	0.4	0.1	0.0	0.0	1.0	0.2	0.5	0.0	1.4	1.8	0.9	0.7	0.8	0.1	0.2	0.1	0.4	0.6
Group totals	8.1	3.6	10.1	10.8	11.4	10.3	12.2	9.8	9.2	31.9	10.0	9.5	7.2	9.3	7.0	5.1	8.9	11.3	15.5	7.9	8.7	15.0	13.3	17.1	15.2	4.9	11.9	9.2	8.6	18.8
Amphibian totals	13.1	10.4	15.0	16.9	18.1	19.0	16.1	17.0	14.2	38.0	14.2	17.4	12.4	19.0	17.8	19.4	19.5	21.8	33.2	21.5	21.3	35.8	25.5	33.2	25.3	19.6	30.5	18.9	26.1	36.1

[1] Numbers per trapping are rounded to the nearest 0.1. All other figures are rounded to the nearest whole number. As a result of this, group totals may not be equivalent to the sum of the individual species' values. There were a total of 15 trappings in 1993, 14 in 1994, 18 in 1995, 17 in 1996, 12 in 1997, 18 in 1998, 17 in 1999, 16 in 2000, 14 in 2001, 16 in 2002, 15 in 2003, 16 in 2005, 16 in 2006, 15 in 2007, 14 in 2008, 15 in 2010, 15 in 2011, 17 in 2012, 17 in 2013, 18 in 2014, 18 in 2016[4], 18 in 2017, 18 in 2018, 15 in 2019, 13 in 2020, 15 in 2021, 17 in 2022, 17 in 2023, 17 in 2024, and 16 in 2025. Trappings counted were on those nights when at least 2 of the three traps were opened under appropriate weather conditions for amphibian movement.

[2] For three years we used dowels in half of the traps to reduce small mammal mortality. In order to compare those year's with other year's data, we converted all numbers to approximate non-dowel values. Using the preselected data sets, this was done by excluding all dowel captures, doubling captures in unimproved traps and adding snake trap data.

[3] These figures are rounded to the nearest 0.1. All other figures are rounded to the nearest whole number. As a result of this, group totals may not be equivalent to the sum of the individual species' values.

[4] April and May data were gathered in the spring of 2017.

[5] In 2025, the following correction factors were used due to the addition of strings to all buckets: Spotted Salamander ≥ 70mm (1.38), Spotted Salamander < 70 mm (2.30). Northern Dusky Salamander (1.15), Northern Two-lined Salamander ≥ 60 mm (0.58), Northern Two-lined Salamander < 60 mm (0.67), Spring Salamander (1.0), Eastern Newt ≥ 45 mm (1.0), Eastern Newt , < 45 mm (1.22), Eastern Red-backed Salamander (1.25), American Toad (1.0), North American Green Frog (0.85), Pickerel Frog (1.14), Wood Frog ≥ 27 mm (1.16), Wood Frog < 27mm (1.35), Spring Peeper (1.63) .

Table 3. A comparison of young-of-the-year salamanders from drift-fence data from 1995 through 2025 (no data were collected in 2004, 2009, and 2015) 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.

Common Name	# young of the year/ total amphibians captured (% young of the year) 1,2,3,4,5																												
	95	96	97	98	99	00	01	02[3]	03[3]	05[3]	06	07	08	10	11	12	13	14	16[4]	17	18	19	20	21	22	23	24	25
Caudates (Salamanders)																												
Spotted Salamander	3/25 (12%)	16/34 (47%)	0/17 (0%)	4/21 (19%)	0/20 (0%)	12/26 (46%)	6/21 (29%)	5/25 (20%)	5/10 (50%)	3/20 (15%)	6/12 (50%)	4/24 (17%)	4/12 (33%)	16/28 (57%)	5/13 (38%)	10/25 (40%)	8/32 (25%)	10/30 (33%)	11/16 (69%)	5/52 (10%)	7/35 (20%)	13/38 (34%)	16/36 (44%)	6/25 (24%)	19/48 (40%)	5/28 (18%)	6/39 (15%)	28/56 (50%)
N. Dusky Salamander	0/6 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)	0/2 (0%)	0/7 (0%)	0/4 (0%)	0/7 (0%)	0/1 (0%)	0/1 (0%)	0/0 (0%)	0/1 (0%)	0/4 (0%)	0/9 (0%)	0/3 (0%)	0/9 (0%)	0/13 (0%)	0/17 (0%)	0/5 (0%)	0/12 (0%)	0/11 (0%)	0/14 (0%)	0/7 (0%)	0/7 (0%)	0/10 (0%)	0/9 (0%)	0/9 (0%)	0/8 (0%)
N. Two-lined Salamander	0/3 (0%)	0/2 (0%)	0/2 (0%)	0/3 (0%)	0/4 (0%)	0/6 (0%)	0/2 (0%)	1/2 (50%)	1/2 (50%)	1/8 (13%)	0/3 (0%)	0/7 (0%)	2/13 (15%)	3/15 (20%)	2/14 (14%)	1/9 (11%)	3/13 (23%)	1/8 (13%)	3/12 (25%)	0/13 (0%)	3/8 (38%)	2/8 (25%)	1/4 (25%)	3/8 (38%)	2/13 (15%)	0/33 (0%)	3/13 (23%)	1/4 (25%)
Spring Salamander	0/0 (0%)	0/1 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/3 (0%)	0/0 (0%)	0/0 (0%)	0/3 (0%)	0/2 (0%)	0/2 (0%)	0/1 (0%)	0/4 (0%)	0/1 (0%)	0/2 (0%)	0/10 (0%)	0/0 (0%)	0/5 (0%)	0/5 (0%)	0/0 (0%)	0/0 (0%)	0/3 (0%)	0/0 (0%)	0/0 (0%)
Eastern Newt	13/30 (43%)	3/24 (13%)	1/22 (5%)	0/24 (0%)	0/13 (0%)	5/21 (24%)	6/18 (33%)	14/19 (74%)	0/5 (0%)	4/16 (25%)	4/13 (31%)	10/19 (53%)	4/25 (16%)	17/23 (74%)	9/15 (60%)	5/12 (42%)	5/14 (36%)	4/12 (33%)	11/26 (42%)	5/26 (19%)	6/26 (23%)	8/12 (67%)	5/11 (45%)	8/30 (27%)	31/53 (58%)	6/19 (32%)	5/27 (19%)	7/22 (32%)
E. Red-backed Salamander	0/24 (0%)	0/42 (0%)	2/40 (5%)	1/97 (1%)	0/27 (0%)	2/56 (4%)	0/25 (0%)	0/19 (0%)	0/24 (0%)	1/27 (4%)	1/55 (2%)	6/94 (6%)	1/94 (1%)	6/125 (5%)	0/113 (0%)	3/22 (2%)	9/224 (4%)	2/176 (1%)	2/97 (2%)	3/261 (1%)	1/127 (1%)	1/167 (1%)	0/73 (0%)	0/150 (0%)	3/192 (2%)	0/102 (0%)	3/208 1%	0/186 0%
Salamander group totals	16/88 (18%)	19/103 (18%)	3/81 (4%)	5/155 (3%)	0/66 (0%)	19/116 (16%)	12/70 (17%)	19/72 (26%)	6/42 (14%)	9/75 (12%)	11/83 (13%)	20/144 (14%)	11/151 (7%)	42/202 (21%)	16/160 (10%)	19/178 (11%)	25/300 (8%)	17/244 (7%)	27/158 (17%)	13/374 (3%)	17/206 (8%)	24/244 (10%)	22/131 (17%)	17/220 (8%)	55/316 (17%)	11/164 (7%)	17/296 (6%)	36/276 (13%)
Amphibian totals	108/270 (40%)	86/286 (30%)	55/217 (25%)	53/337 (16%)	67/274 (24%)	93/272 (34%)	57/198 (29%)	389/526 (74%)	68/155 (44%)	58/177 (33%)	80/197 (41%)	48/290 (17%)	41/249 (16%)	63/274 (23%)	50/295 (17%)	86/368 (23%)	103/562 (18%)	41/390 (11%)	40/226 (18%)	110/642 (17%)	98/432 (23%)	76/501 (15%)	39/329 (12%)	37/294 (13%)	163/519 (31%)	50/321 (16%)	50/443 (11%)	232/577 (40%)

[1] There were a total of 18 trappings in 1995, 17 in 1996, 12 in 1997, 18 in 1998, 17 in 1999, 16 in 2000, 14 in 2001, 16 in 2002, 15 in 2003, 16 in 2005, 16 in 2006, 15 in 2007, 14 in 2008, 15 in 2010, 15 in 2011, 17 in 2012, 17 in 2013, and 18 in 2014, 18 in 2016[4], 18 in 2017, 18 in 2018, 15 in 2019, 13 in 2020, 15 in 2021, 17 in 2022, 17 in 2023, 17 in 2024, and 16 in 2025. Trappings counted were on those nights when at least 2 of the three traps were opened under appropriate weather conditions for amphibian movement. Data from 1993 and 1994 are not included in this chart as not all individuals were measured.

[2] For each species, individuals under a given total length were considered potential young of the year. The chosen length was based on the timing of their appearance, gaps in their size continuum, and records in the literature. The cutoff sizes used were *A. maculatum* (70 mm), *D. fuscus* (30 mm), *E. bislineata* (60 mm), *N. viridescens* (45 mm), *P. cinereus* (32 mm), *A. americanus* (23 mm), *H. versicolor* (26 mm), *P. crucifer* (20 mm), *L. clamitans* (44 mm), *L. palustris* (34 mm), and *L. sylvaticus* (27 mm). Young of the year for *G. porphyriticus* have external gills and are aquatic for up to 4 years. In addition, it was necessary to examine the minimum possible development time for each species. Individuals shorter than the cutoff lengths clearly overwinter (possibly as larvae for *N. viridescens* and *A. maculatum*) and show up in very early spring. These are not counted as young of the year.

[3] For three years we used dowels in half of the traps to reduce small mammal mortality. In order to compare those year's with other year's data, we converted all numbers to approximate non-dowel values. Using the preselected data sets, this was done by excluding all dowel captures, doubling captures in unimproved traps and adding snake trap data.

[4] April and May data were gathered in the spring of 2017.

[5] In 2025, the following correction factors were used due to the addition of strings to all buckets: Spotted Salamander ≥ 70mm (1.38), Spotted Salamander < 70 mm (2.30). Northern Dusky Salamander (1.15), Northern Two-lined Salamander ≥ 60 mm (0.58), Northern Two-lined Salamander < 60 mm (0.67), Spring Salamander (1.0), Eastern Newt ≥ 45 mm (1.0), Eastern Newt < 45 mm (1.22), Eastern Red-backed Salamander (1.25), American Toad (1.0), North American Green Frog (0.85), Pickerel Frog (1.14), Wood Frog ≥ 27 mm (1.16), Wood Frog < 27mm (1.35), Spring Peeper (1.63) .

Table 4. A comparison of young-of-the-year frogs from drift-fence data from 1995 through 2023 (no data were collected in 2004, 2009, and 2015) 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.

Common Name	# young of the year/ total amphibians captured (% young of the year) 1,2,3,4,5																											
	95	96	97	98	99	00	01	02[3]	03[3]	05[3]	06	07	08	10	11	12	13	14	16[4]	17	18	19	20	21	22	23	24	25
Anurans (Frogs and Toads)																												
American Toad	25/27 (93%)	10/37 (27%)	6/30 (20%)	12/64 (19%)	2/35 (6%)	4/28 (14%)	6/22 (27%)	4/20 (20%)	3/19 (16%)	11/32 (34%)	12/24 (50%)	0/51 (0%)	0/26 (0%)	4/31 (13%)	1/26 (4%)	15/57 (26%)	1/93 (1%)	5/31 (16%)	0/27 (0%)	1/22 (5%)	0/26 (0%)	2/29 (7%)	0/14 (0%)	2/17 (12%)	4/25 (16%)	0/16 (0%)	3/14 (21%)	7/18 (39%)
Gray Treefrog	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/1 (0%)	0/0 (0%)	1/2 (50%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/7 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/1 (100%	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)
Spring Peeper	3/39 (8%)	2/15 (13%)	2/4 (50%)	0/19 (0%)	0/9 (0%)	12/22 (55%)	0/0 (0%)	4/11 (36%)	2/6 (33%)	0/9 (0%)	0/7 (0%)	0/2 (0%)	0/0 (0%)	0/0 (0%)	0/15 (0%)	1/3 (33%)	0/8 (0%)	0/6 (0%)	1/1 (100%	4/32 (13%)	0/15 (7%)	8/11 (73%)	0/10 (0%)	0/2 (0%)	3/4 (75%)	0/1 (0%)	2/6 (33%)	1.6/10 (26%)
Green Frog	14/17 (82%)	4/10 (40%)	10/15 (67%)	9/14 (64%)	27/44 (61%)	42/53 (79%)	21/26 (81%)	340/350 (97%)	31/44 (70%)	28/36 (78%)	43/49 (88%)	6/12 (50%)	25/34 (74%)	11/12 (92%)	12/23 (52%)	46/70 (66%)	39/52 (75%)	3/13 (23%)	2/6 (33%)	7/10 (70%)	22/34 (65%)	13/47 (28%)	3/24 (13%)	10/13 (77%)	65/86 (76%)	25/41 (61%)	12/28 (43%)	19.6/26 (75%)
Pickerel Frog	19/20 (95%)	1/6 (17%)	0/3 (0%)	0/0 (0%)	0/9 (0%)	1/1 (100%	4/4 (100%	2/2 (100%)	0/0 (0%)	2/2 (100%	1/1 (100%	2/4 (50%)	1/3 (33%)	0/2 (0%)	0/3 (0%)	6/11 (55%)	0/8 (0%)	0/1 (0%)	0/3 (0%)	0/1 (0%)	0/1 (0%)	1/1 (100%)	1/2 (50%)	0/0 (0%)	1/5 (20%)	1/3 (33%)	0/5 (0%)	15/19 (78%)
Wood Frog	31/79 (39%)	50/115 (43%)	34/84 (40%)	27/84 (32%)	38/111 (34%)	14/50 (28%)	14/76 (18%)	19/76 (27%)	26/44 (59%)	8/23 (35%)	13/23 (39%)	20/70 (29%)	4/35 (11%)	6/27 (22%)	21/68 (31%)	02/52 (4%)	38/101 (38%)	16/95 (17%)	10/31 (32%)	85/203 (42%)	58/150 (39%)	28/169 (17%)	13/148 (9%)	8/42 (19%)	35/83 (42%)	13/96 (14%)	16/94 (17%)	153/228 (67%)
Frog group totals	92/182 (51%)	67/183 (37%)	52/136 (38%)	48/182 (26%)	67/208 (32%)	74/156 (47%)	45/128 (35%)	369/454 (81%)	62/113 (55%)	49/102 (48%)	69/114 (61%)	28/146 (20%)	30/98 (31%)	21/72 (29%)	34/135 (25%)	67/190 (35%)	78/262 (30%)	24/146 (16%)	13/68 (19%)	97/268 (36%)	81/226 (36%)	52/257 (20%)	17/198 (9%)	20/74 (27%)	108/203 (53%)	39/157 (25%)	33/147 (22%)	196/301 (65%)
Amphibian totals	108/270 (40%)	86/286 (30%)	55/217 (25%)	53/337 (16%)	67/274 (24%)	93/272 (34%)	57/198 (29%)	389/526 (74%)	68/155 (44%)	58/177 (33%)	80/197 (41%)	48/290 (17%)	41/249 (16%)	63/274 (23%)	50/295 (17%)	86/368 (23%)	103/562 (18%)	41/390 (11%)	40/226 (18%)	110/642 (17%)	98/432 (23%)	76/501 (15%)	39/329 (12%)	37/294 (13%)	163/519 (31%)	50/321 (16%)	50/443 (11%)	232/577 (40%)

[1] There were a total of 18 trappings in 1995, 17 in 1996, 12 in 1997, 18 in 1998, 17 in 1999, 16 in 2000, 14 in 2001, 16 in 2002, 15 in 2003, 16 in 2005, 16 in 2006, 15 in 2007, 14 in 2008, 15 in 2010, 15 in 2011, 17 in 2012, 17 in 2013, 18 in 2014, 18 in 2016[4], 18 in 2017, 18 in 2018, 15 in 2019, 13 in 2020, 15 in 2021, 17 in 2022, 17 in 2023, 17 in 2024, and 16 in 2025. Trappings counted were on those nights when at least 2 of the three traps were opened under appropriate weather conditions for amphibian movement. Data from 1993 and 1994 are not included in this chart as not all individuals were measured.

[2] For each species, individuals under a given total length were considered potential young of the year. The chosen length was based on the timing of their appearance, gaps in their size continuum, and records in the literature. The cutoff sizes used were *A. maculatum* (70 mm), *D. fuscus* (30 mm), *E. bislineata* (60 mm), *N. viridescens* (45 mm), *P. cinereus* (32 mm), *A. americanus* (23 mm), *H. versicolor* (26 mm), *P. crucifer* (20 mm), *L. clamitans* (44 mm), *L. palustris* (34 mm), and *L. sylvaticus* (27 mm). Young of the year for *G. porphyriticus* have external gills and are aquatic for up to 4 years. In addition, it was necessary to examine the minimum possible development time for each species. Individuals shorter than the cutoff lengths clearly overwinter (possibly as larvae for *N. viridescens* and *A. maculatum*) and show up in very early spring. These are not counted as young of the year.

[3] For three years we used dowels in half of the traps to reduce small mammal mortality. In order to compare those year's with other year's data, we converted all numbers to approximate non-dowel values. Using the preselected data sets, this was done by excluding all dowel captures, doubling captures in unimproved traps and adding snake trap data.

[4] April and May data were gathered in the spring of 2017.

[5] In 2025, the following correction factors were used due to the addition of strings to all buckets: Spotted Salamander ≥ 70mm (1.38), Spotted Salamander < 70 mm (2.30). Northern Dusky Salamander (1.15), Northern Two-lined Salamander ≥ 60 mm (0.58), Northern Two-lined Salamander < 60 mm (0.67), Spring Salamander (1.0), Eastern Newt ≥ 45 mm (1.0), Eastern Newt < 45 mm (1.22), Eastern Red-backed Salamander (1.25), American Toad (1.0), North American Green Frog (0.85), Pickerel Frog (1.14), Wood Frog ≥ 27 mm (1.16), Wood Frog < 27mm (1.35), Spring Peeper (1.63) .

Table 5. Comparison of amphibians captured in traps with string versus traps without strings (2020 - 2024) from the two drift-fences at 1,200 ft. and one at 2,200 ft. on Mt. Mansfield, Underhill, Vermont. Starting in the 2020 season, nylon parachute cord (string) were hung in the center of one of each pair of pitfall traps, to reduce small mammal mortality.

Common name	Scientific name	# in traps with string	# in traps without strings	Total	Percentage found in traps with string/total	Conversion Factor
Caudates (Salamanders)						
Spotted Salamander	*Ambystoma maculatum*	62	104	166	37.3%	See below
N. Dusky Salamander	*Desmognathus fuscus*	20	23	43	46.5%	1.15
N. Two-lined Salamander	*Eurycea bislineata*	25	15	40	62.5%	See below
Spring Salamander	*Gyrinophilus porphyriticus*	0	0	0		
Eastern Newt	*Notophthalmus viridescens*	66	75	141	46.8%	See below
E. Red-backed Salamander	*Plethodon cinereus*	297	372	669	44.4%	1.25
Group totals	Group totals	470	589	1059	44.4%	
Anurans (Frogs)						
American Toad	*Anaxyrus americanus*	44	40	84	52.4%	1.00
N.A Green Frog	*Lithobates clamitans*	103	88	191	53.9%	0.85
Pickerel Frog	*Lithobates palustris*	7	8	15	46.7%	1.14
Wood Frog	*Lithobates sylvaticus*	209	251	460	45.4%	See below
Spring Peeper	*Pseudacris crucifer*	8	13	21	38.1%	1.63
Group totals	Group totals	371	400	771	48.1%	
Amphibian totals	Amphibian totals	841	989	1830	46.0%	
Spotted Salamander under 70 mm	*Ambystoma maculatum*	20	46	66	30.3%	2.30
Spotted Salamander 70 mm and larger	*Ambystoma maculatum*	42	58	100	42.0%	1.38
Eastern Newt under 45 mm	*Notophthalmus viridescens*	45	55	100	45.0%	1.22
Eastern Newt 45 mm or larger	*Notophthalmus viridescens*	21	20	41	51.2%	1.00
Northern Two-lined under 60 mm	*Eurycea bislineata*	6	4	10	60.0%	0.67
Northern Two-lined 60 mm or larger	*Eurycea bislineata*	19	11	30	63.3%	0.58
Wood Frog under 27 mm	*Lithobates sylvaticus*	48	65	113	42.5%	1.35
Wood Frog 27 mm or larger	*Lithobates sylvaticus*	160	186	346	46.2%	1.16

For this chart we use the size cut off for YOY, but not the date cut off.

48-52% = conversion factor of 1