

## The Wait for Big Night

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Picture this: the sky is dark and wet above you. Raindrops pour down through the branches and patter into the crunching leaves under your bare feet. Around you, hard crusts of old, icy snow erode into rivulets of water to join the growing puddles of mud. Below you, the first fragile shoots of trout lilies and crocuses are just poking their heads up into the slowly thawing mud.



Spotted Salamander (*Ambystoma maculatum*)

Far ahead, something new is happening – something you have waited for all winter long. The pouring rain after so many dry nights; the thawing snow after so many frozen weeks; the warming air after so many cold sleeps. For you, the conditions all add up to one crucial thing: the Big Night.

When the winter ice thaws and the early spring rains return, the forest floor is suddenly home to a great surplus of water. That water pools, mixes with snow melt, and creates both the infamous mud season and a very special phenomenon deep in the woods. In hollows, ditches, and shallow ponds, the extra water builds. It softens the ground, deepens the swamps, and

creates a new water feature called a *vernal pool*: a small, ephemeral pond, created and sustained by the excess of water and lukewarm temperatures that are only present through the start of spring.

And if you are a mole salamander, this vernal pool is every winter's dream come true.

While we gather for Thanksgiving dinners, trim Christmas trees, light menorahs, ring in the New Year, and feast on our Valentine's plates from the Chocolate Fest, these salamanders wait. They hide, isolated in deep, muddy burrows, through the snow falls and the short days, dreaming of this very special night. When it finally comes – when the nighttime lows climb slowly back up to 40°F, when the frozen ground thaws, when the spring rains drench the forest – it's finally time for them to move. Under the cover of nightfall, they emerge by the hundreds.

Spotted Salamanders, dark backs glowing with bright yellow dots. Jefferson Salamanders, thick gray bodies sparkling with silver. Marbled Salamanders, striped white and black. They emerge from their winter burrows alongside a host of other amphibians, from the familiar Eastern Newts to the smaller, lungless salamanders and a wide variety of frogs and toads: all crawling, hopping, wiggling, and leaping towards the water.



Red-backed Salamander (*Plethodon cinereus*)

Marbled Salamander (*Ambystoma opacum*)



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But why all the rush? By their very nature, these vernal pools the amphibians seek are not around forever. Amphibians, as I hope we all remember from science class, have a partially aquatic lifestyle; while many adults walk on land, most juveniles must develop under the water. That means that successful reproduction each year depends on some very deliberate timing: as soon as waters are thawed and deep enough, these amphibians need to get in, get together, and lay their eggs. While the adults can return to their drier lifestyles afterwards, they must mate

early, because those eggs need to hatch, mature, and transition back on to land before the hot, dry summers have a chance to evaporate the vernal pools back into damp mud puddles.

It's a dangerous bet. Unfavorable conditions can quickly doom the vulnerable young: an unexpectedly late freeze might be too cold for early eggs to survive, while a warm, dry spring could evaporate the water too quickly for them to mature. But it's the best chance young amphibians have. If they were to grow up in more permanent bodies of water, like rivers or lakes, they would risk washing away or being preyed upon by aggressive young fish.

These factors make vernal pools the necessary nursery school of many of our amphibious neighbors. We have a good number around here; the Appalachian Mountains are home to more species of salamander than anywhere else in the entire world, and [at least 12 of those species are known residents of Connecticut.](#)

Big Night, as it is commonly called, is the night when conditions are just right for all those salamanders to migrate to and from the vernal pools: nighttime temperatures rising above freezing coinciding with a hard rainstorm. Conditions need to be wet enough to both sustain the pools and to keep the amphibians' fragile skin moist while they walk out in the open.

Blue-spotted Salamander (*Ambystoma laterale*)



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While many amphibians will come out to play in those conditions, it is the mole salamanders (*Ambystoma* spp.) that are most reliant on them to survive the journey from their underground burrows to their breeding grounds in the vernal pools.



Unfortunately, even if they time their emergence perfectly to maximize the warm, wet conditions and get their eggs laid in time, mole salamanders face many obstacles on the commute. Each of these salamanders has an extremely specific destination in mind: the very vernal pool in which they, themselves, were hatched. For most salamanders, this walk is about a quarter of a mile, though some have been recorded trekking as far as 6 to 9 miles to find their ponds<sup>1</sup> – quite a feat on those little legs!

Historically, most of that walk was across the forest floor, using the cover of the storm and the night to avoid predators. Nowadays, even shorter migrations are often interrupted by miles and miles of asphalt roads. Many unfortunate travelers are flattened by tires before they can reach their long-awaited destination; some studies have shown nearly a 20% mortality rate on those crossings.<sup>2</sup> On top of roadkill mortality, some salamanders return to their ancestral vernal pools, only to find those homes displaced by development. Others are threatened by litter or chemical contaminants that their absorbent skin makes them extremely susceptible to, while some never make it out of their natal pools at all due to climate change-induced shortened breeding seasons or displacement and predation by invasive species.

All in all, our salamanders are facing difficult times. Of the 12 species native to Connecticut, 6 are listed as Vulnerable or Threatened. While some reasons for their decline are beyond our abilities to fix, one very important one is deceptively easy: limiting the roadkill. Awareness about Big Night is not very high, and you can save many lives by simply staying off the road as much as possible during the warm, wet nights of early spring – and telling your friends to do the same!

Aside from limiting your driving time, you can also help by paying attention to the roads close to your home. While some areas close roads with high numbers of amphibian crossings, we do not have that resource in Kent; if you notice a lot of amphibian activity somewhere, let us know! And if you really want to get involved, take it a step further: strap on your headlamp, pull on your rainboots, and go act as their crossing guard!



Having people slow traffic or simply carry crossing salamanders across the road in whatever direction they are headed is enormously helpful. Mole salamanders can live for more than 20 years in the wild, so saving even one young life

can exponentially impact the breeding success of our local critters. The included photos are from a few such efforts: mine from crossings on Spooner Hill and Schaghticoke Road, and Cody's from down in New Haven.

As spring approaches, we have our fingers crossed to see and help a few more of these amazing amphibians during the coming weeks. So keep an eye on the weather. Watch out for tiny commuters on your streets. And when the spring peepers finally start singing again, remember that every frog, toad, and salamander you save helps make possible another year of happy amphibians!



American Toad (*Anaxyrus americanus*)

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