

FIELD NOTES

An Instance of the Spotted Salamander (*Ambystoma maculatum*) Overwintering in the Larval Form in South-central Ontario

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The Spotted Salamander (*Ambystoma maculatum*) is a spring breeder. Following thaw these animals migrate to aquatic breeding sites, mate nocturnally over a brief period, deposit their eggs, and then return to their terrestrial woodland haunts. Eggs hatch within a matter of weeks, and the gilled larvae feed and grow in these aquatic sites until metamorphosis later that season. A more thorough review of this species' breeding biology is outlined in Petranka (2010).

On December 6th, 2015 I found five larval Spotted Salamanders in a small spring in central Parry Sound District. The pool (Figure 1) is approximately 2x2 m and is beside a low-traffic rural road in spruce and fir forest. The maximum depth is approximately 50 cm, although the substrate is extremely soft and constitutes an additional measure of depth. The pool has never been observed to freeze over 17 years of casual observation, and contains cool water in the summer. This suggests that the pool is fed by stable, low-temperature groundwater. The spring is anecdotally said to have been dug by humans earlier in the century for cattle to drink from when this parcel of land was farmed.



Figure 1. Spring containing overwintering *A. maculatum* larvae.

The larvae were in the late-stages of development (Mills 2016). They lacked balancers and had all limbs fully formed with toe differentiation (Figure 2). Interestingly, at least some of these larvae were still

present in the pool on May 26th, 2016. These larvae could not have been from a breeding event a month earlier (the typical breeding time for *A. maculatum* at this site). No breeding adults oviposited in this pool in spring 2016 and the larvae were too large and well-developed to have been only ~4 weeks old. Small numbers of adult Green Frogs (*Lithobates clamitans*) regularly overwinter in this pool, and an adult American Bullfrog (*Lithobates catesbeianus*) has been observed to also use this as a hibernation site.



Figure 2. Two of the larvae that spent the winter of 2015-2016 in this pool, photographed on May 26th, 2016.

It is unusual to see *A. maculatum* still in a larval form during the winter, but this phenomenon has been documented by others. Whitford and Vinegar (1966) documented overwintering larvae in Rhode Island, as did Ireland (1973) in Arkansas. Stangel (1988) noted this phenomenon in Massachusetts, Phillips (1992) in Missouri, and Bleakney (1952) in Nova Scotia. It appears that low water temperatures [and/or low access to food] is what slows larval development and can illicit certain individuals to remain in the larval stage while they overwinter. I suggest this is likely the mechanism in the cool, small, and barren pool discussed here. If these larvae were laid as eggs at a typical time for this site (late April), overwintered, and were still in the larval form in late May of 2016 it suggests the pre-metamorphic interval for these individuals was at least 13 months.

References

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Of Curbs and Hatchling Turtles: a Lesson in Working with the System

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It is often said that you can't fight city hall. Whether that is true or not, sometimes you can motivate the powers that be.

For some time now it has been known that many hatchling Snapping Turtles (listed as Special Concern under both the Species at Risk Act and the Ontario Endangered Species Act, 2007) are killed on a road to a water filtration plant in the city of Ottawa. Female Snapping Turtles emerge from the small lake at the site every June to find nesting locations. Although the females may head in any direction, many of them head north from the lake and lay their eggs in the gardens and open areas around the filtration plant. Every fall the eggs hatch and the hatchlings disperse. Hatchlings may only have to trek a few metres to find water when nests are laid close to the lake, but other hatchlings must cross the road to make it to the lake. Being hit by a car, even on a low traffic road, is always a risk, but a larger problem was the road's curb. Hatchlings could easily get onto the road by tumbling down from the curb on the north side of the road but those hatchlings that safely made it across the road faced a big problem: how to get up the curb and off the road on the opposite side. The standard, suburban curb is only about 10 cm tall, but from the viewpoint of a 3 cm long hatchling, it is an

insurmountable cliff. Hatchlings could follow the curb, hoping to find a gap, but this might be 10 m or more away. As a result, many hatchlings died on the road under the hot sun.

The Conservation Committee of the Ottawa Field-Naturalists' Club worked with the city on this issue and a solution has now been put into place. The city removed the existing vertical curbs along the south side of the road and installed sloped curbs (Figure 1). The gradual slope to these curbs means that hatchling Snapping Turtles will be able to cross the road, climb up the curb, and continue their trek to Mud Lake. How did we achieve this success? Simple: we wrote a letter to the mayor. The letter was polite, but very detailed in explaining the issue and the fact that it involved a federally listed species at risk. As a result, city staff were willing to work with us. Possible solutions were discussed at one meeting on site, and then a few months later, new curbs were installed (Figure 1).

The Ottawa Field-Naturalists' Club has a long history in the city and is not considered a fringe group. Our letter seems to have caused the mayor to tell his staff to solve this problem. The message seems very clear: a polite but assertive letter from a well-respected local group to the person at the top can make things happen. Too often we feel that problems are insurmountable. In our case, focusing on the right person, the mayor, who could make decisions, meant that staff were authorized to solve a problem. If we had started with the city environmental staff they would likely have told us there was nothing they could do. When dealing with your next conservation issue, don't be afraid to go to the top. Also, consider that a letter from a recognized group may carry more weight than a letter from an individual. If a local group is not available to assist with submitting a letter, the CHS conservation committee is willing to help with relevant issues.



Figure 1. Sloped curb installed at a site in Ottawa. Toy turtle (8 cm carapace length) for scale.