

A Closer Look at Those Most Vulnerable

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During a day or two in mid-June, next to where Shanes Creek empties into Royal Lake, this year's American toad (*Anaxyrus americanus*) offspring emerged onto dry land for the first time (Figure 1). The well-camouflaged toadlets scampered from the water, across the trail, and into the woodlands. Some people took time to marvel at this annual event, being careful not to crush the amphibians. Some joggers and walkers were oblivious or disregarded warnings of the mini-migration. [Trails pose an inherent hazard](#) when next to breeding sites.

People who witness the emergence year after year noticed that this migration was larger than those in the recent past. However, it was still much smaller than from many years ago. What happened? Before dredging Royal Lake in 2016-17, this toad spawning ground was marshland. Silt deposits at the mouth of Shanes Creek created extensive areas where the water was only inches deep. This water level was too shallow for large predatory fish, deep enough for tadpoles to develop, and too extensive for herons and other hunters to eat all of the maturing amphibians. Wetland plants and submerged leaves added protective cover. The huge toad ogies and

a perfect nursery for tadpole development (Figure 2) yielded many toadlets. During a community presentation prior to the dry dredge, the Department of Public Works and Environmental Services ecologists predicted that there would be a big explosion in the frog and toad populations immediately after the lake water's draw down. The ensuing massive fish kill meant amphibians could propagate unchallenged before hungry fish repopulated the lake. At the dredge's start, the draining produced the fish kill. The dredging replaced the marshland with a steeper shoreline slope and minimal transition zone, but without the anticipated amphibian population spike. Buffer areas with wetland plants were installed along portions of the shore, but not where the toads always chose to spawn. In addition to habitat destruction, other possible reasons for the toad decline include some mid-sized fish that survived in the tributaries moved back to the lake, other predators could more easily devour the eggs and tadpoles, disease, and pollution impacts. Based on field observations, toads still spawned but those adult numbers declined, too, as did the general local toad population. Some toads reproduced elsewhere albeit in smaller gatherings.

In the six years since completing the dredge, silt continued flowing into the lake. Erosion was so bad along Shanes Creek that [stream restoration](#) was necessary to stabilize the streambank. The good news is some of the silt entering Royal Lake accumulated along the shores. Though not the nice wetlands that once were, this sediment created a better breeding ground for the toads than the steep bank. Furthermore, migratory spotted sandpipers (*Actitis macularius*), a species that needs shallow waters and mudflats to feed, returned again this year after last appearing before the dredge.



Figure 1. A toadlet crosses a popular trail on its first day on dry land (A). They blend into the stone surface (B), thereby easily overlooked and crushed underfoot.

Clearly, human activities can severely impact toads in a large area like Royal Lake, which itself is an artificial body of water. Amphibians, such as wood frogs (*Lithobates sylvaticus*) and spring peepers (*Pseudacris crucifer*), that reproduce in [vernal pools](#) and other miniature, fish-free bodies of water are even more vulnerable. For example, some of the [unauthorized social trails](#) run next to vernal pools, where people litter and toss stones (making those big splashes) into the aquatic nurseries (Figure 3). Harmful actions at Royal Lake and along its tributaries, such as netting for live bait, leaving dog and human feces to wash in, tossing cigarette butts, or dumping debris, can decimate a tiny pool's residents. The more a trail gets stomped and established, the more people it invites; a small number of people can inflict lasting damage. Therein lies a consideration when park administrators establish new trails: "self-entitled" visitors who disregard park rules will blaze social trail connections to the official pathways, though some parks are better staffed to stop unauthorized footpaths than others.

Amphibians serve important roles as both predators and prey. These sensitive critters are considered "canaries in the coal mine" to environmental change. Ways to help them and their habitat include:

- Visiting parks respectfully,
 - watch your step to avoid crushing the critters.
 - stay on the official trails
<https://www.fairfaxcounty.gov/parks/trails/trail-buddy>.
 - remove invasive seeds by cleaning footwear before entering and after leaving a park.
 - leave no trace of your presence.
- Never litter. Please clean up trash if you see it. Some of Royal Lake's frogs died from trash entanglement and others were rescued.
- Clean up pet poop. Lately, that extends to human open defecations and diapers. All this waste should be bagged and placed in trash cans. Do not toss this trash in recycling bins!
- Fix any motorized vehicle leaks, such as oil, gasoline, or antifreeze.
- Allow roof runoff to absorb into the yard instead of it emptying directly into the street, storm drain, or tributary.
- Avoid synthetic lawn and garden chemicals. More information is in the U.S. Fish & Wildlife Service's publication, [Homeowner's Guide to Protecting Frogs — Lawn & Garden Care](#).
- Replace lawns with native gardens and landscaping.
- Leave the leaves! Many toads, terrestrial frogs, and their food sources shelter or overwinter in leaf debris. Leaves dispersed throughout the yard are more beneficial than large leaf piles.

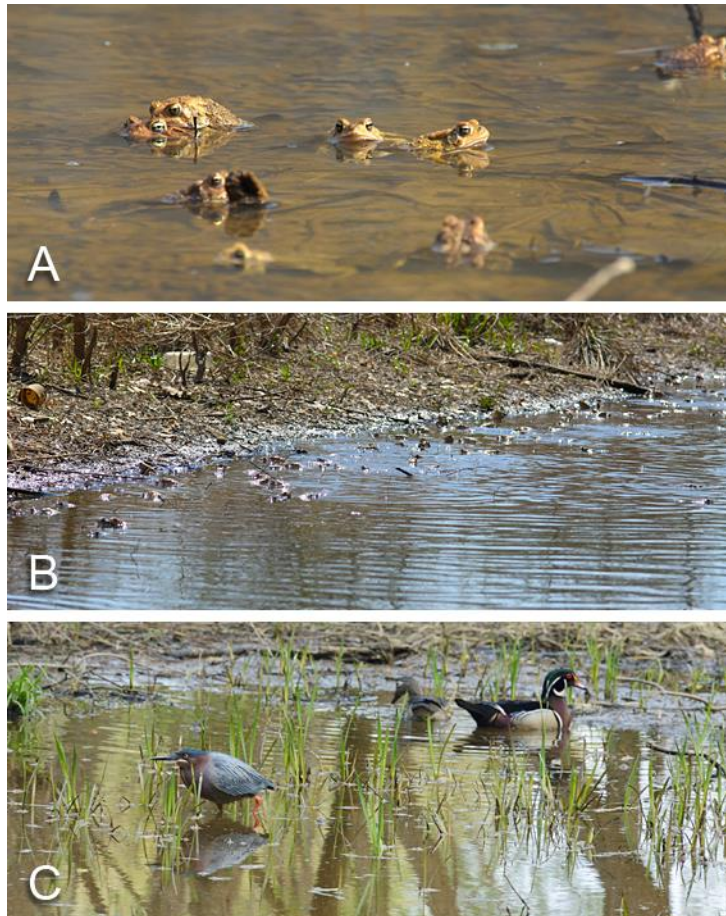
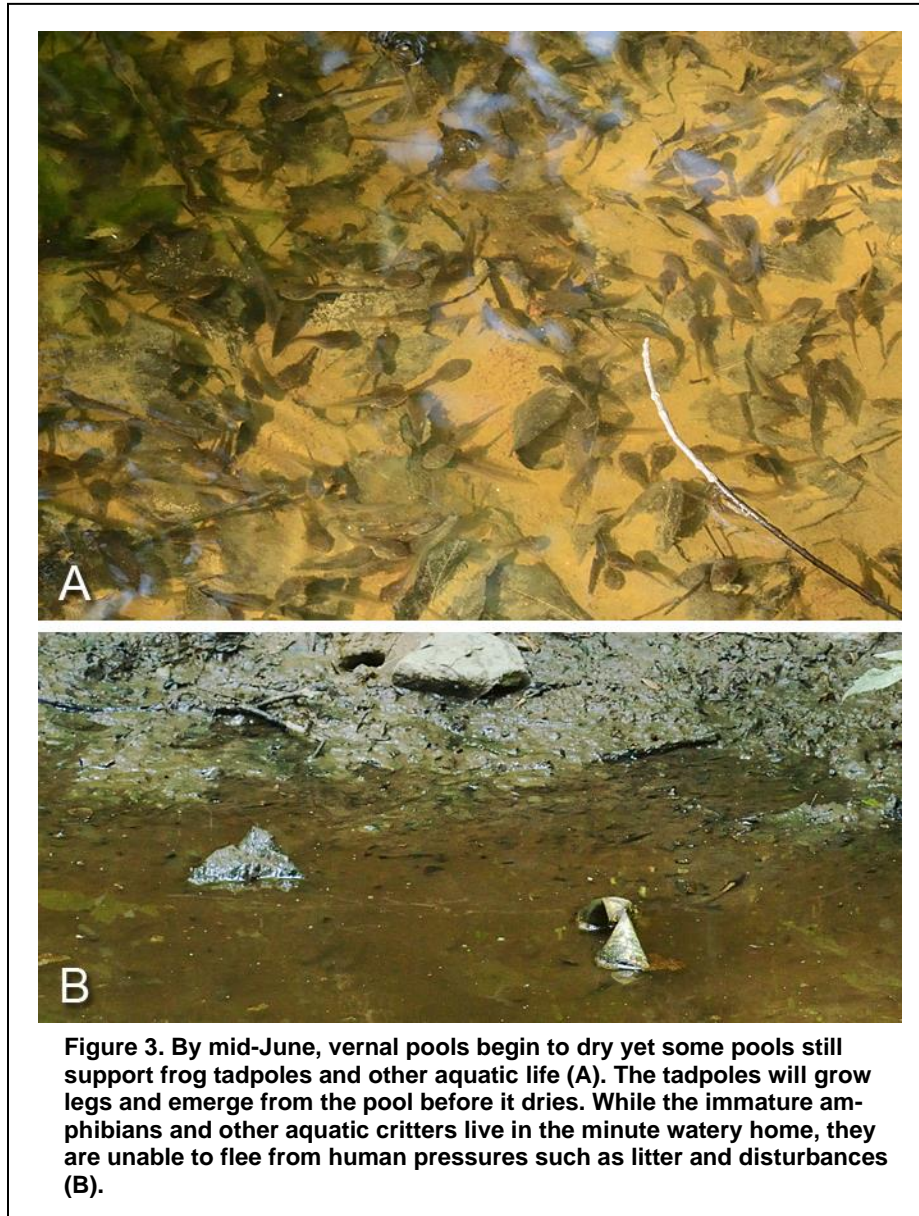


Figure 2. At Royal Lake, toads spawn over several days in early spring (A). The shallow waters of silted marshland provided broad breeding grounds for hundreds of toads (B) and a place for tadpoles to develop. Throughout the year, other wildlife, such as green herons and wood ducks, benefited from this wetland habitat (C). All images were photographed prior to the dredge.



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