

Artificial Wetlands from a Tadpole's Perspective

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Following the [Shanes Creek stream restoration](#), many people appreciate how the project improves the water quality along this Royal Lake tributary. The different habitats, such as wetlands and meadows, increase localized biodiversity. Still, critics of the project, especially of the overflow wetland areas, say, "It's ugly," "It's a bunch of rocks, dead wood, and mud," "It's a breeding ground for mosquitos," and "I want big trees [from before the restoration], not this stagnant swamp!" OK, let's go there!

Pictured above (Figure 1) is one of the overflow wetlands. Normally, Shanes Creek bypasses these features. During strong storms, these receptacles accept the floodwaters and dissipate the water's energy across a wide expanse. After storms subside, the soil and marsh plants slowly absorb the captured water. When these pools exist, they are home to scores of aquatic critters with the green frog (*Lithobates clamitans*) being a more conspicuous species. This frog's thumping-like mating calls echo throughout the wetlands. We've heard the humans' perspective of these zones, so let's combine empathy and science to imagine how a green frog's tadpole might perceive its home compared to a human's abode if it could make its case and talk:

Ah, yes! Here I am in this nice pool filled with rocky and woody hiding places. At least there are no fish to devour me since any brought by floods don't live long here. I can't believe human babies are raised in dry, artificial contraptions called houses. Being cold-blooded, my activity conveniently changes with the seasons, staying more energetic in the summer when I can make the most out of a productive environment. How do humans survive with warm blood? In their houses, they need to regulate temperatures that suit their narrow comfort level. What's more, humans need to bundle in clothing layers throughout winter when we amphibians chill out and sleep *au naturel* in pond mud or hibernate on land under leaf litter.

I hatched in the spring and will grow into a frog this year. My half-siblings from late-season spawns will shelter amongst the rotting vegetation and muck where they overwinter. Next spring, they will resume developing. They may eat some of the eggs laid by wood frogs, spring peepers, and toads, who also breed here early in the year.

Speaking of food, my mom and dad left me as an egg in this pool filled with yummy nourishment. As a young tadpole, I eat decaying organic matter and algae. When I get older, tiny animals, including mosquito larvae, will supplement my diet and help ready my tummy for a carnivorous adult menu. In contrast, human parents tend to their offspring for many years. They feed their babies either a secretion called milk (as all mammals do) or a synthetic milk-like formula. Some



Figure 2. A close look at Figure 1's artificial wetland finds a *Lithobates* tadpole with developing legs (top left). Two young adult green frogs sit by the water's edge (bottom right).



Figure 3. A slaty skimmer (*Libellula incesta*), resting in a nearby marshy meadow, is one of the dragonfly species present that prey upon mosquitoes throughout their lives.

humans drink milk throughout their lives, even when it is manufactured by other animals. They might mix milk with microbes, wait a while, call the result cheese or yogurt, and eat it. I wonder if their moldy milk tastes as good as my rotting organic debris.

All these different native plants grow around my pool, which help filter the water and keep me healthy. Humans surround their houses with limited plants and fields of grassy monocultures called lawns. Humans often choose exotic plants that are as ecologically worthless as plastic, then say, "The garden looks nice." The chemicals that are applied to their yard kill my adult insect-based food, wipe out the diverse plants that my insect food sources and I need, and overdose nutrients that runoff into my home! With my delicate skin, too much of those toxins can kill me! The dog poop that is not picked up has more waste and harmful bacteria washing into my home than getting soaked into the soil. It turns my home into an unflushed toilet until the next flood, whenever that will be! I'm not adapted to handle such contamination, especially when dealing with daily bombardments.

As a bug-eater, I help maintain a balanced environment that helps humans. Whereas I am grateful to the people who built this wetland and those who now [remove invasive plants](#), many more folks damage my home. Some humans think the great outdoors should be tamed like ecologically-simplistic manicured golf courses. Don't ask how many fish and bird kills occurred on golf courses due to lawn chemical misapplications! And those critters are counted because large, dead birds (especially geese) are obvious; the schools of floating and decomposing fish stink. Few people consider counting frog populations despite that we are indicator species like canaries in a coal mine. Some of my kin got stuck in manmade rubbish and were rescued by good people. Other froggy relatives could not escape their trash entanglements and slowly died. I don't leave messes in people's houses, so why do humans mistreat my home?

Other aquatic creatures, such as salamanders, snarf more mosquito larvae than me. Adult mosquitoes will be difficult for me to catch when I become a frog. I share a home with dragonflies and damselflies, who eat mosquitoes throughout their lives: as nymphs, they catch mosquito larvae; when they grow up and don wings, they catch mature mosquitoes on the fly. Robber flies and spiders are some of the additional invertebrates that include adult mosquitoes in their dinners. No

wonder there aren't too many mosquitoes around my wetland. Meanwhile, humans claim to hate mosquitoes, yet they create perfect mosquito breeding grounds, such as clogged gutters, water-collecting litter, and neglected bird baths. Get this: some humans spray their yards against mosquitoes with chemicals, such as permethrin, even though those insecticides can kill natural mosquito predators and other beneficial organisms!

Humans can have their strange world without encroaching into my habitat. I love my wetland home enough to stay in the area and, when I become a frog, spawn here, too.

Learn more about:

- controlling mosquitoes at [How to Battle Mosquitoes and Win](#) (April 2014).
- reducing your footprint by following these [Simple Steps to Help the Environment](#) (October 2023).
- [Vernal Pools](#) (January 2023), which share similarities with the overflow zones.



Figure 4. Another artificial pool is thriving with biodiversity. The benthic animal life stirs the silty bottom, making the waters turbid. The surface constantly ripples from tadpoles coming up for air. This feature is home to numerous dragonfly and damselfly species. Regardless of how much time the author spent studying this pool, he never had a mosquito bite here due to the heavy mosquito predation. While much of the vegetation is native and beneficial, invasive [Japanese stiltgrass \(*Microstegium vimineum*\)](#) is a problem at this site.

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