



This inch-long firefly larva wandered out of the grass and onto our patio.

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Due to a dearth of details in public school natural science curricula most kids grow into adults who recognize not the entire life cycle of a particular wild organism, but only a piece of the total process, at best. Often times, this snapshot of a mere segment of the full circle results in a blind disregard for the wild creature's well-being in *all* stages of its life when landscape decisions are implemented in backyards and on rural properties.

Examples abound, particularly throughout the insect world, and, perhaps most notably among the lepidoptera. For instance, most of us familiar with the wandering "woolly bear" in early fall would be hard pressed to recognize its adult stage, the Isabella Tiger Moth, if it landed under a porch light in front of us on an early summer evening. Gardeners desire butterflies in their yards, yet, often simultaneously make decisions completely hostile to the well-being of the larvae of the same species. Indeed, few are capable of identifying the caterpillars of the tiger swallowtail, great spangled fritillary, viceroy or red admiral butterfly, much less know what specific plant life they need for any chance to grow into tomorrow's butterflies.

Who doesn't take delight in the sight of fireflies, a.k.a., lightning bugs, floating and flashing over the lawn on a warm, early July night? (Actually, they are neither flies nor bugs, but bioluminescent beetles, nearly 2000 species of which inhabit the planet.) However, in step with above-mentioned incomplete perceptions of lepidopteran lives, the rest of the lifecycle of backyard fireflies - to their detriment - never registers in the minds of most summer night beholders.

The mini-pyrotechnics show over the first half of summer is performed within the short, reproductive, adult stage of a four-stage, year-spanning metamorphosis. In fact, *three* of the four stages are relatively short. A couple weeks after egg deposition in the soil miniscule larvae hatch, then live and grow amid a predatory existence through the rest of the summer and early autumn. The larvae overwinter then continue to hunt, eat and grow in the spring. At our latitude they pupate in the soil around the end of May then begin emerging as adults later in June. Thus, for nearly ten months of the year a firefly exists in the larval form! If you like the backyard fireflies of June and July, best be aware of the existence and well-being of the larvae from August through May.

A firefly larva is characterized by brown, flat, armor-like segments. The common, local backyard species may reach an inch in length prior to pupation. When in motion a diminutive head stretches out from the protective cover of the prothorax and sways side to side as it crawls forward, giving the impression of an elephant's trunk or an anteater's snout. When disturbed the head is pulled in and the body may curl into a defensive posture.

The larva forages under the cover of darkness for invertebrates found in moist soil conditions, especially worms, slugs and snails. It pierces the skin of the prey with miniscule jaws, injects stomach acid and presumably feeds on the liquefied innards. It hides in and under the same natural materials where its prey is found - among leaf litter, fallen logs and grass roots.



So, what is the best backyard habitat for firefly larva survival? One where this natural ground cover is allowed to exist. The worst? Backyards that are what we would call “overtended” or “overgroomed” to the point that they are as neat as a well-kept living room. These are typically yards that are also treated with chemical applications meant to kill plants and insect life.

May is the best month of the year to go into the dark to find firefly larvae in the above-described suitable habitats. On a seasonably warm night take a flashlight with you but *do not* turn it on! Firefly larvae are sometimes fittingly nicknamed “glowworms” since they have bioluminescent qualities, too. However, the light emitted near the tip of the abdomen is far dimmer than the airborne flash of the adult. This is why it is necessary to turn off a flashlight when searching for them on the ground. Eyes that are not adjusted to the darkness will surely miss the dim glow.

The familiar flash of an adult may last no more than one second. By contrast the larva's luminescence seems to be controlled by a slow-motion dimmer switch. The abdomen brightens over several seconds then slowly fades over several more such that the entire process may last as long as ten or twenty seconds before the pinpoint of light is extinguished. Yet, at peak brightness the emanation is only a tiny fraction of the intensity of the adult's flash. Minutes may pass before the process is repeated.

In addition to the beam of a flashlight not allowing your eye to adjust to the darkness enough to effectively search for them, light from any other outside source may also illuminate the ground enough to make a lighted larva difficult or impossible to notice. However, walking slowly and vigilantly through good, moist, dark habitat while letting your adjusted eyes sweep from side to side should eventually lead to success. If you'd like to see and inspect the larva approach the lighted point until you are positioned directly over it then turn on the flashlight to get a good look at it, or even pick it up to examine in your hand under the flashlight.

We've seen glowworms on our property many times over the years, most often when walking to or from vernal ponds after a nighttime wade to photograph breeding frogs or to collect a sample of the myriad aquatic invertebrate life they support. We've also introduced firefly larvae to participants of springtime after-dark vernal pond wades here.

Speaking of which... If you'd like to see this subtlest of light shows at Nature Discovery consider scheduling an evening appointment with us now. You can even arrange to wade into our vernal ponds amid a cacophony of tree frog breeding activity - a memory of a lifetime that should not be taken for granted given the deteriorating state of habitats, wild populations and climate systems.

-Jim McGrath

Catch Us on LCC Radio's Coffee Break, Friday, May 3

Jim is scheduled to appear on Friday, May 3 at 9:45am, discussing our upcoming Biodiversity Day. The show airs weekdays from 9 to 10am on 89.7 FM. Listen live online at lcc.edu/radio/onair/ or watch it live (or later in the day at 6pm) online at lcc.edu/tv/watch. We'll post a reminder on our Facebook fan page.



Six-spotted Fishing Spiders.

Take the challenge to identify over 100 species of Michigan-native animal and plant life in a single afternoon! We would like to help you recognize, appreciate and work toward preserving biological or natural diversity.

Throughout the day participate in a list of other activities offered to help you become more aware of the tremendous but underappreciated natural diversity that surrounds us. Knowledgeable staff will be on hand all day to assist in a range of highly-interactive, indoor and outdoor encounters for all ages. Take the challenge to encounter 100 species of Michigan life in a single afternoon here! Checklists will be provided to help you keep a tally of species encountered.

Activities include:

- ✓ Meeting "The Grand Slam of Michigan Turtles", featuring all 10 species found in the state.
- ✓ Meeting 9 of our state's 17 species of snakes. Lots of handling and feeding opportunities, too.
- ✓ Tallying over 20 species of birds by sight and by sound.
- ✓ Checking off a long list of wildflowers, shrubs, vines and trees on the grounds.
- ✓ Identifying insects encountered around the yard and trails.
- ✓ Inspecting pans teeming with diverse invertebrate life from the vernal pond.
- ✓ Noting invasive species that are eroding natural diversity in our natural areas.
- ✓ More!



Orioles return to Michigan in early May.

Seventh Annual Biodiversity Day Sunday, May 5 Doors open from 1 to 5pm Admission: \$5/person

Around the State in May

- ❖ Friday, May 17: 9am-2:30pm. MI Reptiles & Amphibians Exhibit; Isabella Conservation District Environmental Ed Day, Chipp-a-Waters Park, Mt. Pleasant.
- ❖ Saturday, May 18: 10am. MI Frogs Exhibit, Guided Birding; E. Ingham Farmers Market, Williamston.
- ❖ Saturday, June 1: 10am-4pm. MI Reptiles & Amphibians Exhibit, Birds of the Jack Pines Presentation; Kirtland's Warbler Festival, Roscommon.
- ❖ Sunday, June 2: 1pm. Finding & Rearing Giant Silk Moths Presentation; DNR Outdoor Adventure Center, Detroit.

This little girl made friends with one of our large rat snakes after a presentation at Seven Ponds Nature Center in Dryden on April 21.



Volunteers Needed

If you have some time to spare AND you like working outside AND you like working in the soil AND you would like to do something that's good for the environment AND you'd like to do something to help our overworked and understaffed business, please contact us! During the growing season it is difficult for us to keep up all our appointments, plus all the animal care, in addition to rampant plant growth. Can you help us clear invasives out of our woods, help with our organic vegetable gardens or help to beautify our flower beds? Choose any days or hours that are convenient for you. Contact us!

2019 Summer Camp Notes

Openings still remain in most of our summer day camp weeks.

Michigan Field Birding for students 10 yrs & up, June 10-13.
Budding Naturalists for students 5-6 yrs, June 17-20.
Nature Discovery for students 7-9 yrs, June 24-27.
MI Reptiles & Amphibians for students 10 yrs & up, August 5-8.
Nature Discovery for students 7-9 yrs, August 12-15.
For details...

<http://www.naturediscovery.net/pdf/summercamps.pdf>

Young birders will check off the secretive Yellow-billed Cuckoo and over 80 other species during our field birding camp.

Photo by Steve Sage



Teaching Climate Change: Push and Pull

On April 23 NPR's program, *1A*, featured an episode on whether, and how effectively, the topic of climate change is being taught in public schools. Here are the introductory paragraphs:

There's an international consensus that man-made climate change exists. But are we preparing the next generation to combat it?

A new poll from NPR shows that 84% of parents and 86% of teachers think climate change should be taught in schools. And while learning standards in most states at least mention man-made climate change, only 42% of teachers actually cover the subject in their classrooms.

From the study: [A]s millions of students around the globe participate in Earth Day events on Monday, our poll also found a disconnect. Although most states have classroom standards that at least mention human-caused climate change, most teachers aren't actually talking about climate change in their classrooms. And fewer than half of parents have discussed the issue with their children.

When it comes to one of the biggest global problems, the default message from older generations to younger ones is silence.

The program is essential reading/listening for educators and students alike to help better understand what we are up against in light of misinformation campaigns by fossil fuel companies and their political supporters. It also recommends usable resources to help teachers guide students through the issue most effectively. The executive director of National Center for Science Education and the deputy director of Alliance for Climate Education contribute to the discussion. Links to these organizations are included below, as well.

<https://the1a.org/shows/2019-04-23/how-are-we-preparing-the-next-generation-to-fight-climate-change>

<https://ncse.com/>

<https://acespace.org/>

-JM

The next generation would be justified in looking back at us and asking, "What were you thinking? Couldn't you hear what the scientists were saying? Couldn't you hear what Mother Nature was screaming at you?" -Al Gore



Less Beef = Less CO₂
Cowspiracy.com

[Union of
Concerned Scientists
Science for a healthy planet and safer world

←350.org

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