



THIS ISSUE

Raise Luna Moths Now

Visits to ND by Appointment

Video-Meet Michigan Turtles

Thank you, Donors & Volunteers

Nature Discovery Lessons this School Year

Gone (Trash) Fishing!

Beauty in the Beast

Natural life demonstrates plenty of pliability when presented with change to its environment. These processes are certainly interesting, if not exciting to observe in spite of the dire impacts of man-made climate change. Those immersed in the observation of wild macro-organisms either for pleasure (i.e., birders) or professionally (i.e., wildlife biologists) are beginning to tick off quite a list of species which are shifting their behavior in response to how these changes are affecting the resources they require to exist.

For instance, the shift in the geographic range of an array of familiar animal life - previously deemed as 'stable' from the perspective of human lifespans - is now occurring before our eyes within mere decades or less. To wit, talk to any lifelong Michigan birder and they'll tell you they remember when migrating ospreys didn't return to the state in the spring until late April. Now the first migrants are spotted here well before the end of March. The historically-southern Carolina Wren has transformed from novelty to ubiquity in Lower Michigan in just the past two decades. (See the opening column in the May 2017 issue: <http://naturediscovery.net/pdf/WILD%20TIMES%20May17.pdf>)

While field guides refer to the Luna Moth as "double-brooded" only in southern states, the past few summers, including this one, have shown that two life cycles per year has quickly become the standard in Lower Michigan (See <http://naturediscovery.net/pdf/WILD%20TIMES%20Aug19.pdf>). Currently, and for the following week or so, delicately green-hued Lunas are emerging from cocoons here almost daily – the onset of this summer's second go-around. You can contact us to pay a visit and see them before they're gone or to pick up Luna larvae to raise now through summer's end.

The sulphur-yellow Imperial Moth is a huge member of the giant silk moth family, Saturniidae, and shares it with other large and beautiful species like Cecropia, Polyphemus and Luna. Field guide maps depict its range throughout the eastern U.S. all the way south to the Gulf Coast. While the northern boundary is shown to cover most of Michigan my past personal experience had indicated that incidents of its occurrence within these northern reaches of its range were scant at best. Yup, that's changing...

I never saw Imperials as a young naturalist growing up in the Chicago area, and ditto after Carol and I moved to the Mid-Michigan area in late '84. Then, in the early 2000s, I was shown a dessicated specimen

of a “weird” moth found by an acquaintance. Unknowingly at the time, I had witnessed a first signal to the onset of the Imperial Moth’s march toward local commonality.

Second-hand observations ensued sporadically over the next several years. In the summer of 2008 our son, Robin, brought a male Imperial home in an empty disposable soft drink cup. While out with friends he spotted it flying around a light outside a bowling alley. It struck me as odd that this occurred in late July. At this latitude most individuals of other giant silk moth species flew in early and mid-June.

Other second-hand discoveries dribbled in, but with increased frequency. An acquaintance found a battered individual in broad daylight on the asphalt in the middle of the Williamston Farmers Market, again in late July. Local photos surfaced more and more – always in these mid-summer weeks - by astounded Facebook posters claiming they’d never seen one before.



The male Imperial Moth sports solid brown patches on the wings which are absent on the female.

I discovered the first Imperial Moth on our property in late July, 2017, during one of our day camps. Kids and I were walking on the trail on a sunny afternoon when I suddenly spotted a fluttering movement on the ground about twenty feet off the path amid the dimness under a dense thicket of alien honeysuckle bushes. The kids and I could see the silhouette of a medium-sized bird pecking at this large, flapping, winged thing. I charged off the trail toward it to scare the bird away so I could identify the victim. The bird flew up and out of my way onto a limb above the trail in the sunshine; a catbird.

I crawled through the sticky undergrowth and scooped a battered, weak, female Imperial Moth from the ground then backed out on hands and knees to show the campers. It was obviously near death, however, its body was intact. Its condition was not the catbird’s fault, but it would have quickly grown a lot worse if we hadn’t shown up at that moment. We returned to the nature center and compared our find to field guide images.

Like the other giant silk moths, the Imperial lives and functions for only a few nights in the adult stage – just enough time to mate and deposit eggs on the leaves of appropriate trees. That night I placed its frail body in a paper grocery bag and folded the top. These were definitely this female’s last hours, but did it have enough energy to deposit a few more eggs that might remain within its shrunken abdomen? The following morning I opened the bag to find it dead and already quite stiff, but was thrilled to spot eight bright, yolk-colored eggs adhered to the brown paper next to its abdomen.

The field guide, *Caterpillars of Eastern North America*, by David L. Wagner, is my caterpillar “bible.” When I discover an unknown caterpillar this go-to guide rarely fails me. It depicts this mini-beast-of-a-caterpillar occurring in a variety of color phases including green, charcoal, cinnamon red, and a paler salmon hue. About nine days later all hatched, exhibiting the salmon coloration. Larvae feed on the leaves of a variety of native trees. Based on what was conveniently accessible on our property, I raised some on pignut hickory and others on red maple. By August’s end five had survived and reached maximum size - the largest ones exceeding four inches in length with a girth all of three-fourths an inch!

Rather than spinning a cocoon to overwinter, however, this species buries itself underground prior to pupating. On one of the first days of September our larvae abruptly stopped eating and purged their guts (Caterpillars copiously drop frass which is solid and pellet-like. However, the final dropping prior to pupation is formless and runny; an indication that the leaf-eating stage of its life has ended.). I placed each into a shallow bucket of loose soil. After a short period of restless wandering one after another disappeared beneath it. Days later I placed the dark, segmented pupae into a plastic organic salad box half-buried in a

bed of damp sphagnum, then placed it in the back corner of the refrigerator for the winter. Although I removed it the following May, true to the timing of their wild cohorts the moths didn't emerge until late July.

I took photos of some of the males before releasing them, however, as we do annually with our other silk moth species I placed each of two females that had emerged on separate days into the "mating cage" the following night in hopes that at least one would attract a wild male with her pheromone (What's a mating cage? Explanation here: <http://naturediscovery.net/pdf/WILD%20TIMES%20June17.pdf>). I made it a point to step outside in the early morning darkness and shine a flashlight beam on the cage to assess the progress. In each case the ovipositor was distended beyond the tip of the abdomen confirming that each female was indeed releasing scent. Disappointingly, however, no wild suitors materialized over consecutive nights for either female. Since giant silk moths only survive and function over precious few



Carol found this female while mowing. Note the absence of dark brown patches on the wings.

nights, I opted to release each one after her second night of cage-bound failure in hopes that she may have a better chance in more natural surroundings.

I questioned why the females had been unsuccessful drawing a mate. Were nights that dipped into the 50s too cold for males of this southern moth to fly? Could it be that while the population is unquestionably multiplying over recent years there still aren't enough moths in the air to guarantee that a female will draw a mate? Perhaps the mating cage technique – so demonstrably successful over decades with the Cecropias, Polyphemuses and Lunas, for whatever reason, was less conducive to success in this species.

Fast forward to this summer, on a sunny day in... you guessed it – late July. While Carol was mowing the lawn her eye fell on a big bright yellow female Imperial sprawled open-winged in the short grass. The wings were so perfectly unblemished I surmised that she could have emerged from underground earlier that day. On the other hand, she also could have mated with a male the night before. Many females do not even take flight their first night out of the cocoon, but remain still while releasing the attractive scent.

For good measure, immediately after dark I decided to put her outside in the mating cage on the picnic table. About two hours later I checked with a flashlight to find her fluttering about the cage in an agitated fashion – very unlike a *newly*-emerged female. I moved the beam around the cage. At least two dozen yellow eggs were randomly adhered to the wire and wooden frame! So, she had mated the night before after all. I opened the cage and let her fly into the night to seek out elms and maples, cherries, hickories and others on which to naturally deposit the rest.

I gave some of the eggs and newly-hatched larvae to several acquaintances who were as thrilled as me to have the opportunity to raise these baby beasts. The ones in our possession are eating and growing in leaps and bounds. After two weeks the largest individuals - probably females – are already two inches in length. On a caterpillar scale they'll be monsters in another two weeks. Enlarge them fifty-fold, and they could star in a horror movie!



It is easy to imagine someone who has never even heard of an Imperial Moth stumbling upon one of these humongous, hairy, spiky caterpillars in late summer. Perhaps it had just descended from its native host

tree, then was discovered while crawling across the ground in search of soft soil in which to pupate. The surprise encounter may often elicit a knee-jerk reaction. The caterpillar is assumed to be dangerous or harmful in some way, and so, unceremoniously dispatched. By contrast, education, knowledge and familiarity of any living component of the natural world – including the Imperial Moth - generates fascination, respect, and a desire to ensure its existence.



Complete metamorphosis is the complete change in body structure from the immature to the reproductive stage in all members of the Lepidoptera, among other insect orders.

You'd be hard-pressed to find another lepidopteran in a rural yard that demonstrates metamorphosis so outrageously and wonderfully *complete* as this. Despite the unsettling metamorphic progression man has induced in our climate, we welcome the Imperial Moth's expansion into our neck of the continent.

-Jim McGrath



Raise Luna Moths This August

5 Eggs or young larvae with complete printed care instructions, only \$15.

Available for a limited time through mid-August or while supply lasts.

Contact us to make arrangements for pickup.



Individual, Family & Small Group Visits BY APPOINTMENT

Geared specifically for the times... Individuals, individual couples, families or other small groups are invited to spend an hour or more immersed in any of an array of guided experiences outside - virtually any day by appointment at Nature Discovery. The sky's the limit as to the range of activities. Here are some ideas...

- Identify Michigan turtles up close as they swim and bask in pools at your feet. Kids *love* feeding them!
- Our big red-footed tortoise, Milberta, grazes often on the lawn. Kids love hand-feeding leaves to her!
- Snakes! Meet, handle and even feed our gentle rat snakes, garter snakes, water snakes and others. Observe the garter snakes as they wind in exploratory fashion through the grass. Watch a big rat snake scale a tree trunk. Meet our newly-hatched baby rat snakes, too.
- Identify and feed up to twenty species of Michigan frogs and salamanders.
- August is a great month to see and identify butterflies. We'll help you identify a fluttering array that are nectaring on our butterfly bush, bull thistle and Joe-Pye weed now. Hummingbird moths (right) visit many times a day. We can also arrange to meet at a natural area of your or our choice for this or other naturally-immersive activities.
- August is also an excellent month to find a variety of native butterfly and moth caterpillars. Arrange a guided search around our property or neighborhood or yours, identifying specific food plants then searching for larvae on them. On the right an orange giant swallowtail egg adheres to the top of the leaf of one of several hop-trees growing in our yard. Take an egg or newly-hatched larva home to raise.
- **VISIT US** once or regularly throughout the month. We've got a wealth of natural learning experiences for kids and adults that are limited only by the level and scope of the visitor's interest!

Through August we will not be charging a specific minimum fee so as not to exclude visitors who may be financially-stressed through these times. However,

DONATIONS ARE ACCEPTED in light of each participating party's ability and discretion. Wondering about a "suggested" donation? Our previous base fee for such visits was set at only \$5/person/hr.





Video-Meet The “Grand Slam” of Michigan Turtles

Get an in-depth look at all ten species of turtles native to our state in this Nature Discovery video presentation hosted by Farmington Community Library. Learn field marks to help identify each species in addition to information on classification, habitat requirements, our state’s rarest

species, and threats humans present to turtle survival: https://www.youtube.com/watch?v=-TcNbEQpIIM&feature=youtu.be&fbclid=IwAR375OLmNCh2453B_oRazyMpf5IHqMg3f17iMDSFrMU5VKIA2kLCg9zg40

*Our sincerest
thanks to those
who have
supported us
through
generous
donations this
past month...*



- Matt Burke*
- Jan Heminger*
- Yarisha Johnson*
- Wendy Kopitsch*
- Bettie Menchik*
- Ahnalee & Nick Meyer*
- Maria Miklojcik*
- Dorothy Perri*
- Eric Petrie*
- Brian & Meghan Sharp*
- Chantal Tetreault*



Thank you, Volunteers!

- Elisabeth Baumann * Ani Gerrity*
- * Simon Alstrom * Jenny Stanfield*
- * Cameron Stanfield * Isaac Stanfield*

We appreciate your help and dedication to our common cause!

The Stanfields spent an afternoon helping us cull our out-of-control pokeweed invasion.

Nature Discovery Lessons through the School Day

With in-person learning out of the question at many schools this fall, Nature Discovery will be offering weekday in-person learning opportunities for individual students and small groups in any grade, K thru high school, here at our center with appropriate COVID precautions in place. Think “tutorial-style” opportunities across the sciences that meet and even exceed curriculum requirements within the student’s grade. We’d love to discuss suggestions and ideas for your student.

Carol will be offering a series of two-hour hands-on classes once a week in September and October. September’s classes will be *Science Experiments* for 1st-3rd grade, and *Advanced Science Experiments* for 4th -6th grade. They are tentatively set to begin the week of September 7, day/time TBD. The fee will be \$100/ student/4 sessions. Enrollment will be limited to 6 students per session. Contact us for more information or to relay your interest.

Gone (Trash) Fishing!

We recently had the pleasure of a visit to Nature Discovery from Chase VanEckhoutte of Belleville, Michigan. Chase translates his concern for the health of the environment into action largely by his avid involvement in the “sport” of, yes, trash fishing.

“Trash fishing is a fun way to make a positive environmental impact. Instead of fishing for fish, when trash fishing you fish for trash. We hold trash fishing contests and award prizes for the most trash, the most unusual piece of trash and the biggest piece of trash,” says Chase.

The Facebook page may just inspire you to join – no license required: <https://www.facebook.com/trashfishing/>

Science Matters. Ignore It at Your Peril.

So says climate scientist, Benjamin D. Santer, in the “Statement to Restore Science Based Policy in Government” signed by a growing number of National Academy of Sciences members. “The scientists are calling on policymakers to restore evidence-based decision-making - especially when it comes to managing life-and-death challenges like the global pandemic and climate change.”

<https://insideclimatenews.org/news/18072020/culture-wars-coronavirus-paris-agreement-climate-change>

Four Tips for a Climate-Friendly Yard

[https://www.audubon.org/magazine/fall-2019/four-tips-climate-friendly-yard?ms=digital-eng-social-facebook-x-20200700_fb_link_-](https://www.audubon.org/magazine/fall-2019/four-tips-climate-friendly-yard?ms=digital-eng-social-facebook-x-20200700_fb_link_-handbook_climate_friendly_yard&utm_source=facebook&utm_medium=social&utm_campaign=2020_0700_fb_link_-handbook_climate_friendly_yard&fbclid=IwAR3vTN7bGsDh00SjIE_v-UwW2FwcFj4kuOtV2KKI4JsUDAJI1-IWjlli_Lg)

[handbook_climate_friendly_yard&utm_source=facebook&utm_medium=social&utm_campaign=2020_0700_fb_link_-handbook_climate_friendly_yard&fbclid=IwAR3vTN7bGsDh00SjIE_v-UwW2FwcFj4kuOtV2KKI4JsUDAJI1-IWjlli_Lg](https://www.audubon.org/magazine/fall-2019/four-tips-climate-friendly-yard?ms=digital-eng-social-facebook-x-20200700_fb_link_-handbook_climate_friendly_yard&utm_source=facebook&utm_medium=social&utm_campaign=2020_0700_fb_link_-handbook_climate_friendly_yard&fbclid=IwAR3vTN7bGsDh00SjIE_v-UwW2FwcFj4kuOtV2KKI4JsUDAJI1-IWjlli_Lg)

-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



Hannah and Gage VanEckhoutte unload a recent catch from the Detroit River.



Less Beef = Less CO₂
Cowspiracy.com

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



RSPO.org



Worldwarzero.com

Become a fan of *Nature Discovery* on Facebook!

NATURE DISCOVERY 5900 N. Williamston Road Williamston, MI 48895

(517) 655-5349 naturedisc87@gmail.com www.naturediscovery.net