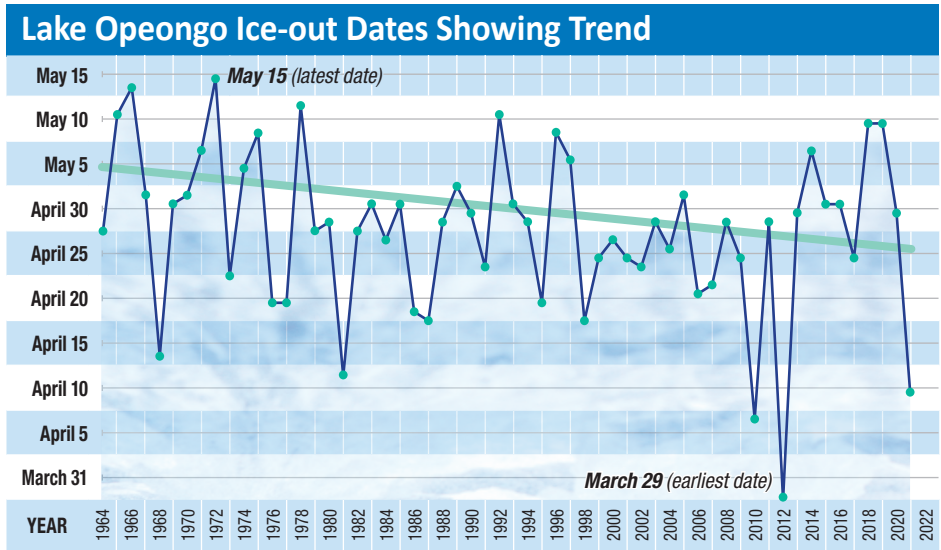




Compiled by Ontario Ministry of Natural Resources and Forestry: Algonquin Fisheries Assessment Unit

Fishing Reminders

- No live baitfish are permitted.
- No fishing is permitted within 100 m of a water control dam.
- No fishing within 300 metres downstream of Lake Opeongo's Annie Bay dam.
- Daily catch and possession limit for Lake Trout is 2 per person (1 per person with a Conservation Licence).
- Daily catch and possession limit for trout is 5 per person, no more than two of which can be Lake Trout (2 per person with not more than one Lake Trout, with a Conservation Licence).
- Be aware some lakes have slot limits. Check the Algonquin Information Guide for a list.
- Worms are not native to Algonquin and remaining worms should be taken home or thrown in the trash – not on the ground!

Refer to the Ontario Recreational Fishing Regulations Summary for complete details.



FISHING
in Algonquin Provincial Park

REVISED Publication

Fishing in Algonquin Provincial Park

This significantly revised edition provides interesting facts about Algonquin's clear, cold lakes; threats to lake ecology; and fisheries research and management. It has lists of all fish species in Algonquin, plus gamefish present in 233 lakes. Park visitors often have limited knowledge of how or where to fish, or the kinds of fish to expect. This book is intended to provide you with the information needed to plan your next angling adventure in Algonquin Park.

ONLY \$6.95

Available at the Algonquin Visitor Centre Bookstore & Nature Shop, East Gate and West Gate, or online at algonquinpark.on.ca

CONTRIBUTE TO CITIZEN SCIENCE!

As of early 2021, the Algonquin Provincial Park iNaturalist project had over 51,000 observations of 3600 species!

By submitting your observations and photos to Citizen Science platforms like iNaturalist.ca, you can help park staff document biodiversity in the Park and even protect habitat. For more information join iNaturalist.ca, and check out Algonquin Provincial Park under projects.

1. Upload a picture of any wild plant, animal or fungus.

2. iNaturalist's community and image recognition software will help you identify it.

3. Help out other naturalists by identifying their observations.

4. Every observation becomes part of a growing record of Earth's biodiversity.

Available on iOS, Android and at inaturalist.org!

iNaturalist iNaturalist Canada is run by the Canadian Wildlife Federation, the Royal Ontario Museum, and iNaturalist.org at the California Academy of Sciences.



ALGONQUIN VISITOR CENTRE

HOURS OF OPERATION

Algonquin Visitor Centre
April 24 to October 31, 2021
Open Daily 9 am - 5 pm
November 1 to December 23, 2021
Weekends 9 - 5 pm, full services
Weekdays 9 - 4 pm, limited services

Algonquin Logging Museum
June 12 to October 17, 2021
Open Daily 9 am - 5 pm
The 1.3-km trail with outdoor exhibits is available year-round.

OntarioParks.com • algonquinpark.on.ca

Algonquin

The **Raven**

A Natural and Cultural History Digest

Vol. 62, No. 1 • May 1, 2021

Robbery at the Sperm Bank!

by Peter Mills

Of all the things that have been written about in The Raven since its inception in 1960, what is the most bizarre thing it has revealed to readers about Algonquin Park? Could it be the article "One Moose's Trash is Another Fly's Treasure" from 2019, which showcased the lives of tiny flies that live on discarded antlers? Or was it the account in 2016's "A New Wolfian Identity?" that described Algonquin's Eastern Wolf—a newly discovered type of canine ("Here was a whole new species hiding right under our noses!"). Many of our readers are most fascinated with Algonquin's

human history, so perhaps what takes the cake is an account of the enduring mystery of the life and death of artist-extraordinaire, Tom Thomson (2017's "Tom Thomson came paddling past...").

Antler flies, wolves, and Mr. Thomson aside, in this issue we have a subject that is sure to join Algonquin's "most-bizarre" list because it seems to defy some of the very core principles of biology. Allow us to open and introduce you to bizarro numero uno by taking you on an imaginary hike. Try to forget where you are, drift away from your current surroundings, prepare for an adventure, and begin to feel yourself standing in complete darkness. You draw in a deep breath and fill your chest with the rich, humid air of a hardwood forest. It is late April, after midnight, and a steady rain drums the ground. Pockets of snow still linger in some of the shadier places but the damp air and dripping branches are quickly melting these last holdouts of winter.

Continued on Next Page...

Blue-spotted Salamanders have both males and females, but "Unisexual Salamanders" exist as an all-female lineage. Blue-spotted and Unisexual Salamanders look very similar.

Continued from Front Page...

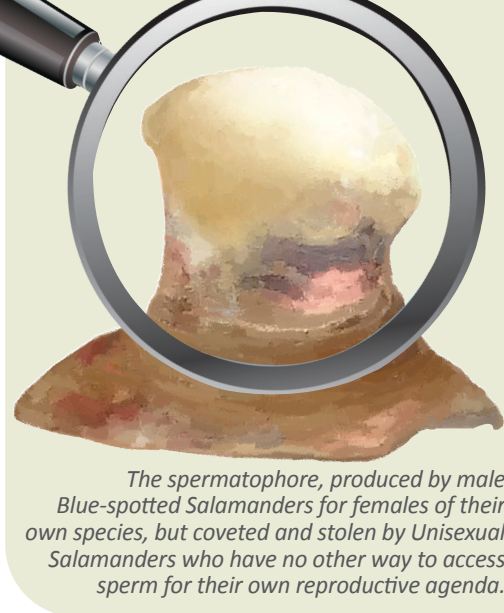
You are following a narrow woodland path and are headed to a low point in the woods where the rain and meltwater have formed a small pool. Grasping a small flashlight, you are intently focussed on the end of the beam and the tiny patch of forest floor it illuminates. Your light roves over fallen leaves and evergreen needles, roots, logs, and stones. You are expecting to see these bizarre creatures tonight—especially now that you are close to the pool and the weather seems just right. Yes—there is one. You stop in your tracks, smile at your discovery, and then slowly swing your light in an arc to see if there are others nearby. There is a second—and another—and another and another and another. It appears that you are surrounded.

These creatures are all headed directly for the pool which is just a few paces farther ahead. You bend at the waist and reach down to pick one up. It is a salamander—cool and moist to the touch, dark, and about the length of your palm. Spurred to breed by the first warm and wet spring weather, these salamanders have left their burrows in the forest and marched to wetlands like this pool. It is here that in the coming nights they will mate and lay eggs. Within a week or so the adults will have left the water and returned to their lives on land. But left behind will be thousands and thousands of eggs that will hatch and, for a time, the young salamanders will live as aquatic larvae that feed and grow in the water. Eventually, these young will undergo metamorphosis and also leave the pool for a life on land. To ensure the aquatic larvae aren't killed

when the pool dries out by summer, the adult salamanders aim to arrive and breed as soon as the first warm spring rains permit.

Algonquin has several species of salamander, and hearing their names isn't likely to make you raise an eyebrow. For example, we have Northern Two-lined Salamanders, Spotted Salamanders, Red-backed Salamanders, and even Eastern Newts—and these names seem quite typical of the ways biologists describe species. The creature in your hand, however, goes by a much more odd title—it is known, simply and strangely, as a *Unisexual Salamander*. Indeed, each and every one of the salamanders you have encountered on your adventure in the April forest tonight is female. There are no male Unisexual Salamanders—hence the name. But didn't we say these females are headed to the pool to breed? And how could they accomplish that without sperm from males?

In the mid-1900s this was a burning question that begged for an answer. How could an all-female population of salamanders possibly reproduce? Some of the earliest attempts to solve this riddle involved simple experiments using wild-caught Unisexual Salamanders. These researchers would capture salamanders as they migrated to their breeding pools, take them to laboratory aquariums, and then study their subjects with hopes of discovering how these females could breed without males. Frustratingly, none of these captured salamanders produced viable eggs. Yet, the females left in the wild that made it to the breeding pools clearly produced young—and lots of them. So, it seemed



The spermatophore, produced by male Blue-spotted Salamanders for females of their own species, but coveted and stolen by Unisexual Salamanders who have no other way to access sperm for their own reproductive agenda.

reasonable to think there was something present in the wild pool that was critical for these female salamanders to have so they could successfully produce larvae. But what was that thing? Could it be a particular food source? Or perhaps a certain nutrient they must absorb from the water?

Though food or nutrients could be called fair guesses, it was discovered that neither is true. Instead, the truth is that the Unisexual Salamanders left to the wild pools were able to successfully produce young because they found males to breed with.

Wait...what...? Thoroughly confused?

If so, we don't blame you—especially since we have been firmly establishing so far that bizarre numero uno is an all-female type of salamander

The eggs produced by a unisexual mother will all be daughters and are usually clones of herself.

IMAGE AND PHOTO: PETER MILLS



without any males. What is critical for us to add at this point is that these males the unisexuals are aiming to mate with are of the Blue-spotted Salamander—a different type of salamander than the Unisexual Salamanders we have been discussing so far. If it sounds like we are suggesting that the all-female Unisexual Salamanders need to mate with males from a different type of salamander in order to successfully produce young, you have followed this peculiar biological puzzle perfectly.

However, this answer clearly poses several new questions. For one, why would a male Blue-spotted Salamander be willing to mate with one of these “unisexual” females—a different type of salamander that must smell and behave

differently from the Blue-spotted females he prefers? The fact of the matter is that he may not need to be “willing” since male Blue-spotted Salamanders deposit gelatinous packets of their sperm (called spermatophores) on the bottom of the breeding pool. Female Blue-spotted Salamanders swim about and find these spermatophores, take them up into their cloaca (reproductive tract), and will lay fertilized eggs soon thereafter. The important detail here is that the male Blue-spotted Salamander's spermatophore is stealable for a brief period of time between when he has left it on the bottom of the pool and when a female discovers and picks it up. So, if a Unisexual Salamander can find one of these spermatophores before a female Blue-spotted Salamander can, the unisexual can pick it up for herself instead. If the Unisexual Salamander can accomplish this, her reproductive process is instigated and she will lay a clutch of viable eggs. Some of the genetic material from the male Blue-spotted Salamander's sperm may end up in her offspring, but the unisexual's eggs will all be daughters and are often merely clones of herself.

Now that you know the basics, it is interesting to pull back and look on this bizarre reproductive system from a greater distance. Because these Unisexual Salamanders are all female and their reproduction fundamentally depends on stealing sperm from male Blue-spotted Salamanders, unisexuals are commonly referred to as parasites. The term “parasite” may seem odd to use here since classic examples of parasites usually invoke thoughts of a creature

living inside our guts to steal food energy, or that may be otherwise out to suck our blood (e.g., think of the mosquitoes that bother you on a trail, or the ticks that gorge on moose blood in the winter). But, the formal definition of a parasite (“a species that lives at the expense of a host”) is more broad than mere blood-sucking. Since Unisexual Salamanders fundamentally depend on male Blue-spotted Salamanders for sperm, it takes time and energy for those male Blue-spotted Salamanders to produce spermatophores, and those Blue-spotted males don't even get to sire Blue-spotted Salamander offspring with their own spermatophores, it is certainly reasonable to perceive unisexuals as parasites that live at the expense of male Blue-spotted Salamander “hosts”.

As we close off this issue, we owe it to ourselves to share with you that this article was a fun challenge to write. It was no easy task to wrap our own heads around how these bizarre salamanders work, and then put it into plain language for The Raven. In the final stages of editing we always look to make sure all our loose ends are tied up. It seems we've got our bases covered here, except that we never resolved that imaginary adventure and, according to the text, you are still standing in the dark, in the rain, holding that first Unisexual Salamander. However, rather than write a conclusion for you, we've decided to let the readers finish that section for themselves. Use your imaginations if you must, but let us remind you that nothing quite compares to seeing things for yourself. See you in the spring.

Delving deeper into the lives of these Unisexual Salamanders has shown us that sperm-parasitism is not the only bizarre thing about them. Allow us to elaborate.

If you were to go look for Unisexual Salamanders near, say, Toronto, there is a chance you will find them, but in pools without Blue-spotted Salamanders. Instead, those Unisexual Salamanders would be associated with a different species that is absent from Algonquin—the Jefferson Salamander—a larger, southerly species found in hardwood ravines and escarpments. And, in the same way unisexuals pilfer sperm from male Blue-spotted Salamanders in Algonquin Park, in these southerly breeding pools the unisexuals parasitize sperm from male Jefferson Salamanders for their own reproductive agenda. This has shown us Unisexual Salamanders can exploit the males of different species of salamander for sperm, not just Blue-spotted Salamanders.

Genetic tests run on Algonquin's Unisexual Salamanders add to the story. Before the results were in, researchers presumed our Unisexual Salamanders should register positive for



The Jefferson Salamander is not found in Algonquin, but the Park's Unisexual Salamanders still carry elements of Jefferson DNA which were parasitized by their ancestors long ago.

Blue-spotted Salamander DNA since this is the species of salamander our local unisexuals pilfer sperm from. But, it was also expected Algonquin's unisexuals should test positive for Jefferson Salamander DNA, despite the fact there are no Jefferson Salamanders found in, or anywhere near, the Park. This is because the ancestors of Algonquin's Unisexual Salamanders may have once lived farther south where they parasitized Jefferson Salamanders for several generations, not Blue-spotted Salamanders. Over centuries or millennia, the offspring of those salamanders have dispersed across the landscape and have carried some Jefferson Salamander DNA with them.

Were these hunches supported by the results of the genetic tests? Yes, Algonquin's unisexuals possess locally-parasitized Blue-spotted Salamander DNA. And yes, despite the fact that there are no Jefferson Salamanders in Algonquin Park, our unisexuals still possess some Jefferson Salamander DNA their ancestors acquired long ago.