

## What is the fencing for along Highway 60?



Anyone driving along the Park's Highway 60 corridor will notice the black drift-fencing that has been temporarily installed in various places by both Park staff and construction contractors working on the highway. It is intended to keep Snapping and Painted Turtles off of the roadway in an attempt to reduce their mortality. These turtles prefer soft ditches and banks of roads for nesting.



Painted Turtle: Note the brilliant colours!



Snapping Turtle: Be careful to avoid its jaws as it will feel threatened and may snap!



Scan for more information about Ontario Turtles at Risk in Algonquin Park



**Help Protect Us!**  
If you see a turtle on the road, slow down.  
If possible, you may want to try to assist the turtle by moving it in the direction it was heading.

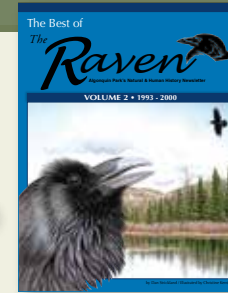
Be careful with Snapping Turtles — you should not try to pick one up! Avoid its jaws as it will feel threatened and may snap! And, always remember, watch out for other traffic!

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Available at the Algonquin Visitor Centre Bookstore, the East Gate and West Gate

## BEING BUGGED?

This can be a challenging time to be outdoors with both blackflies and mosquitoes being present. Here are some tips to help you cope:

- **Wear light-coloured clothing** (white, tan, khaki, etc.)—blackflies are attracted to dark colours.
- **Cover up.** Wear long-sleeved shirts with cuffs and collars that can be buttoned tight, as well as long pants with elastic cuffs (or tuck your pants into your socks).
- **Use insect repellent** when outdoors—something with DEET works best. The concentration of DEET should be no greater than 30% for adults and no greater than 10% for children.
- If you cannot, or prefer not to, use insect repellent, try some type of netting (**a bug hat or bug jacket**), available at most outdoor stores. When camping, you can try a bug tarp shelter to avoid biting insects.



Blackfly (top) and mosquito (bottom).

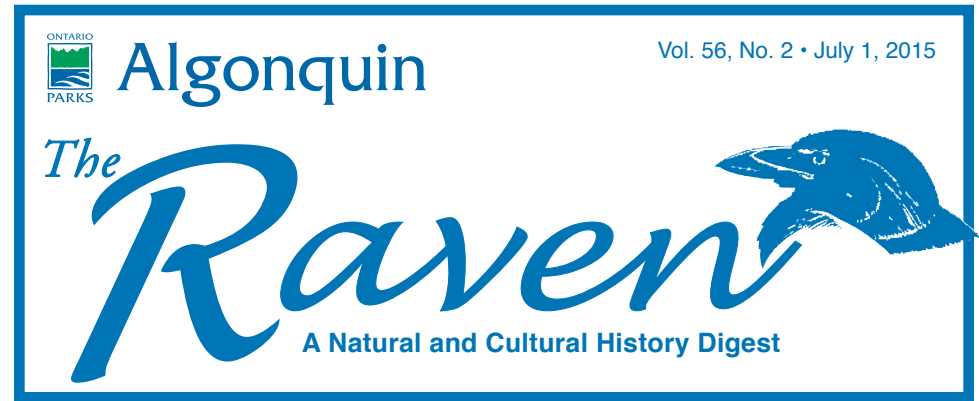


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## Secret Love Life of the Painted Turtle

by Patrick D. Moldowan

Beneath the tea-colored waters of Algonquin Provincial Park bubbled up a mystery that left turtle researchers scratching their heads (and not just from the blackfly bites). What started out as observations of "toothy turtles" became much more curious the further we investigated. Herein lies the secret love life of the Painted Turtle (*Chrysemys picta*).

The Painted Turtle is among the most conspicuous of North American turtles. Owing to its large geographic range, gregarious basking congregations, and adornment of bright colours and intricate patterns on the head, neck and limbs, the Painted Turtle has long attracted the attention of naturalists, biologists, and the public. Today the Painted Turtle is among the most well-studied turtles in the world. Reproduction is a vital part of understanding a species' biology and, in many cases, conservation.

Biologists seemed to have a solid grasp of Painted Turtle reproduction. That is, until we looked a little closer at the Algonquin turtles.

Painted Turtles have long been viewed as romantics of the animal world. Whereas bull moose have large antlers and many male birds have flashy plumage, the male Painted Turtle has his own (subtler) ornaments used to impress potential mates. At maturity the front claws of male Painted Turtles are disproportionately long (>1 cm length) compared to those of the female. Using their claws, males will actively compete for the affection of females in a courtship display known as titillation. With careful tact, a male Painted Turtle approaches a female face-to-face and waves his front claws, stroking and tickling her head and neck! If a female is receptive, a slow chase and multiple bouts of titillation will ensue before mating. You may be lucky enough to see the elaborate display if



C. LEE-COMEAU



For nearly two centuries, the function of the “teeth” or tomiodonts of the Painted Turtle has been a mystery.

visiting an Algonquin pond in late summer or early autumn, the primary breeding season of the Painted Turtle. This charming behaviour has long captured the attention of biologists. Even the famed naturalist, Charles Darwin, in 1871 wrote about the romance of the Painted Turtle in noting that a male has “claws on his front feet twice as long as those of the female; and these are used when the sexes unite”.

The traditional view of reproduction is one of harmony between the sexes, but I’m afraid that not all is as it seems. A study of Painted Turtles has been ongoing at the Algonquin Wildlife Research Station since 1978. This long-term project has allowed researchers to collect valuable data and unique observations on turtle biology. After handling hundreds of turtles every summer, researchers began to notice something peculiar, particularly among males. Some male Painted Turtles had very large “fangs” at the front of their upper beak. As in birds, turtles lack true teeth and instead have a beak used for cutting and crushing food. However, the beak of Painted Turtles is particularly unique in having bicuspid tooth-like structure. In effect, the Painted Turtle is a turtle with “teeth”, of sorts, or more appropriately with tomiodonts (from

Greek, *tomy*—meaning “sharp/cutting” and —*dont* meaning “tooth”). After meticulous measurement it became apparent that the tomiodonts of males were, on average, much larger than females and that the largest (oldest) males typically had the largest tomiodonts.

While researchers were paying much attention to the tomiodonts of male Painted Turtles, unbeknownst to them it was the female turtles that were harboring an important clue. What soon followed were equally curious observations: fresh wounds and scarring on the head and neck of females. Given the diligent notes of past turtle researchers we were able to look back 24 years to document the prevalence of wounding in Algonquin turtle populations. Although males display some injuries, wounding had a strong, consistent female bias. In some years, females were six times more likely than males to be wounded! The largest females experience the greatest wounding and elevated rates of wounding occurred during the late spring, coinciding with the secondary breeding season. Getting out to look at



Not all Painted Turtles are gentle suitors! Some males adopt a more aggressive strategy, like biting, later in life.



The round, white scar on this female Painted Turtle's neck provided an important clue in the toothy turtle mystery.

turtles in the field we found another hint: fresh wounds resembled two parallel gash marks that, when measured, aligned closely with the distance between male tomiodonts! Was this our clue? Were males biting and injuring females? If so, then why? Rather than developing answers, we found ourselves formulating new questions! Could there be a connection between the wounding observed in females and the large tomiodonts of males? We began to speculate that there was much



The use of this field enclosure and video camera allowed researchers to discover and document the different mating strategies of Painted Turtles.

more to these Painted Turtles than long claws, tickling, and romance as we knew it.

Now we had two indirect lines of evidence: 1) male Painted Turtles had large tomiodonts and 2) females had extensive wounding coinciding with the breeding season. Were these strands connected and, if so, how and why? Answering this question would require some careful experimentation. Systematically observing turtle behaviour in the wild is difficult – dark waters and thick aquatic vegetation obscures their underwater world from human onlookers. We set up enclosures in the wetlands and housed turtles short-term, remotely recorded the interactions of the turtles with an overhead camera. What we saw came as a surprise! Some males were behaving as perfect “suitors”, approaching females and engaging in the foreclaw display, although many males (“the jocks”) were demonstrating behaviours scarcely seen before: aggressive pursuit, nipping, biting, and a shell clattering or ramming. What distinguished the two groups, the suitors and the aggressors, was body size (and/or perhaps age). The Painted Turtles were demonstrating male size-dependent mating tactics whereby small (young) males displayed courtship and large (older) males engaged in coercion. Theory suggests that these alternative mating tactics confer different reproductive

success such that the “suitors” and “jocks” fiercely compete for the chance to mate with discerning females. Each tactic has its advantages and drawbacks, of course. Titillation can be energetically costly, time consuming, and is not often successful with the females. Aggressive tactics may serve as an indicator of male strength, affirm social dominance, or cue receptivity in females. What is clear is that the relative importance of titillation later in life decreases as investment in foreclaw growth also decreases. We have yet to determine the cue(s) responsible for the behavioural shift later in life, but it is suspected that hormones play a role.

When the name of the game is mating, nature has evolved no shortage of tactics to try and ensure success. These novel findings in a well-studied model organism such as the Painted Turtle show us that we

still have much to learn. Such fundamental life history research provides us a window into the biology of these animals and has applications as broad as conservation and evolution. The tomiodonts of the Painted Turtle, which were originally described in the mid 1800s, were not known to have any formal purpose until 2014, let alone to be a sexually dimorphic feature. It is incredible to think that this structure, which has literally been staring scientists in the face for two centuries, is only now being understood, and the answer has been on display in many of Algonquin’s ponds, lakes and rivers, just waiting to be discovered. Indeed, as Dr. Ron Brooks has said in the *Reptiles and Amphibians of Algonquin Provincial Park* “the contrast between what we expect and what we find after careful study is often remarkable”.

#### Patrick D. Moldowan

Patrick Moldowan has just completed his Masters of Science at Laurentian University. His thesis was titled *Sexual dimorphism and alternative reproductive tactics in the Midland Painted Turtle (Chrysemys picta marginata)*. He is also lead researcher

for the Bat Lake Inventory of Spotted Salamanders in Algonquin Park. Patrick has been awarded the New Noah Scholar from Wildlife Preservation Canada, and is currently studying tropical island biology and conservation on Mauritius.

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