

The Mosquito Survival Guide

April showers bring May flowers... and May onwards brings mosquitoes!

If you have never felt the wrath of mosquito season in the Highlands, then consider yourself lucky. Active from mid-May through to the fall, mosquitoes are the most persistent pests of the backcountry. If you want to survive the summer months up north, we recommend you take some precautionary measures. There are 3 approaches to mosquito season; avoidance, personal defense and prevention.

1. Avoidance

Avoidance is the most effective and commonly practiced coping mechanism for mosquito season. Avoid mosquitoes, avoid mosquito bites. In order to avoid mosquitoes, you must understand mosquitoes, at least a little bit. To begin, there are 67 species of mosquito in Ontario. Fortunately, only some mosquito species bite humans and of those, only the females suck (we are speaking figuratively and literally here!). So I guess we don't hate ALL mosquitoes...



Our least favourite mosquito, the female mother, spends her 2-week life in search of blood hosts (you and your family) and a moist environment to lay eggs. Where male mosquitoes feed primarily on plant sugars, female mosquitoes require the proteins found in blood in order to produce eggs. That's right, mother mosquito is biting you so that she can make more mosquitoes. She then lays her eggs in still or slow moving water such as; puddles, bird baths and ponds. In 2 to 3 days those eggs will hatch into mosquito larvae and it won't be long after that they will be all grown up and flying on their own!

Lesson number one; avoid standing water. Once mosquitoes hit their teenage years, the cool place to hang out becomes shady, forested areas where they spend their days avoiding the midday sun. Mosquitoes will hang out in these areas until just before dusk

when they will swarm your property until dawn. Therefore, this brings us to **Lesson number two**: if you want to avoid these guys, enjoy the sun during peak hours and head in afterwards.

2. Personal Defense

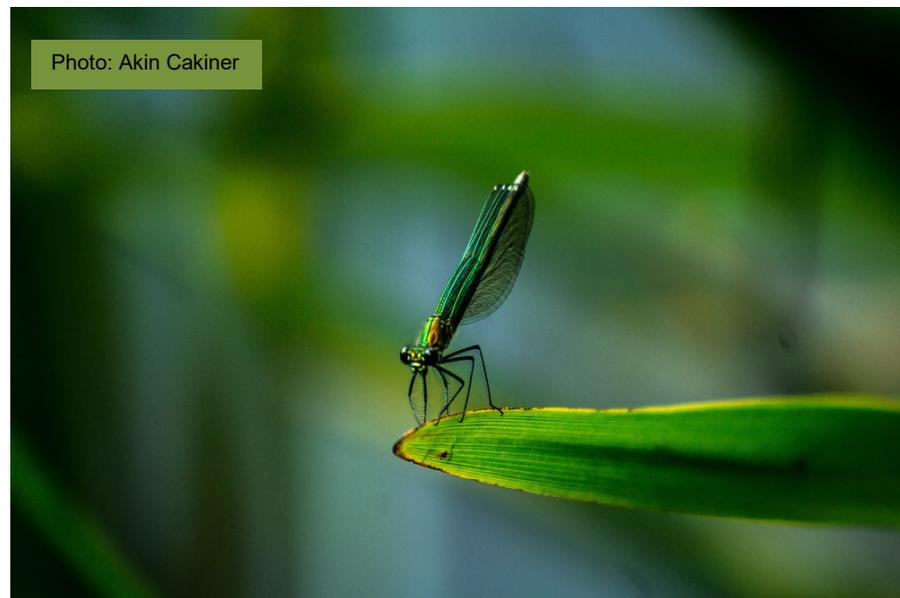
The second approach to mosquito season is personal defense. A general rule of thumb is, the less skin exposure the better. If you will be venturing into any areas where/when mosquitoes are abundant, make sure to wear long sleeves and pants. Loosely fitted clothing is best as it makes it difficult for the little monsters to bite you through the fabric. While you're at it you might as well add another layer, invest in a bug jacket and head net. Some studies suggest that mosquitoes are attracted to dark colours or areas of high-contrast. Just to be extra safe, consider keeping your summer wardrobe lighter in colour. Therefore, **lesson number three**; dress the part.

The principal way in which mosquitoes detect a blood meal is through smell. Unfortunately, the carbon dioxide we exhale is a dead giveaway to our location. Once mosquitoes get a whiff of CO₂, other factors come into play. They are drawn to body heat and from there it is the unique smells of individuals that determine who is a good meal. Scientists haven't quite figured out who smells good and why, but if you don't want to add any extra incentive, skip the scented products when you're getting ready. When all else fails, there is DEET. DEET is the main ingredient in insect repellents and is one of the most effective ways of deterring mosquitoes. If you follow package directions, it should be safe to use. If you do not wish to risk chemical insect repellents near your body or in the environment in general, consider checking out some natural alternatives that are quite effective too! Lots of farmers markets sell homemade, natural insect repellents. It has been suggested that smoke is a natural deterrent as it confuses the mosquito who may not be able to find a blood-source of CO₂ amidst the haze and perhaps because there is an evolutionary response to "duck and hide" as well. Some people swear by "smoking pots"; they put metal bins (like the maple syrup bins) around their porches and alight things that will smolder over long periods and produce a lot of smoke, such as egg cartons. **Lesson number four**; pick the right scent.

3. Prevention

The third and final tactic to survive mosquito season is prevention. Prevent those pests from making your property home and prevent the loss of sanity that comes with constant buzzing and itching. While insecticides might seem like the obvious answer here, they're not always the healthiest option for you, your family or for the local wildlife. Most insecticides, including "natural" insecticides such as pyrethrin, are not only toxic to mosquitoes, but are toxic to all insects. There is evidence that these chemicals not only bioaccumulate (move up the food chain and into our waters too) but they can be harmful to pregnant women's fetuses and therefore young and elder humans. Meanwhile if you are ridding the area of all mosquitoes and other insects, there is an effect on all of the living animals around your property, downstream from your house and even in neighbouring areas. While insects are not everybody's favourite class of animal, they are undeniably important. There are plenty of animals that rely on insects for food and some insects, such as damselflies and dragonflies, actually eat mosquitoes. Dragonflies can consume upwards of 2000 mosquitoes in one night! And Dragonflies are attracted to natural habitats. Bats can eat over 4000 in one night and some birds upwards of 10,000. Everything has a role to play in our environment, even these little nuisances are important in keeping the whole food web intact. Insecticides threaten the natural balance of the environment and because mosquitoes have such a short life cycle, they develop a resistance to insecticides rather quickly. You may eventually find yourself with more mosquitoes than before. **Lesson number five;** insecticides = not a smart decision.

Luckily, there are many natural and effective methods for mosquito control. Begin by minimizing suitable breeding habitat on your property. Clean out rain gutters, clogged drains, bird baths, even pet water dishes. It only takes about 3 days for mosquito eggs to hatch so anywhere that water



can pool you will find momma mosquitoes. If you have any natural bodies of water or wetlands on your property try to leave them as natural as possible. In other words, the more natural plants and biodiversity in these bays and ponds, the more mosquito eaters there are! Healthy wetlands with good biodiversity host a community of aquatic species that love to eat mosquito larvae. From fish to zooplankton, these mosquito killing species

(AKA our best friends) are often so effective that these wetlands produce very few mosquitoes. **Lesson number six**; natural landscapes and plants = good.

And again, bats and many bird species are also part of this pest control team. If you can make your property more appealing to them by adding a bat or bird house, your property becomes a lot less appealing to mosquitoes. But even more are the small things you may be overlooking: When the sun has gone down and all that is left is your porch light you might be thinking that you can get some relief from Mrs. Mosquito, but don't let your guard down just yet. Mosquitoes are active into the night and are actually attracted to artificial lighting, specifically LED lighting in the blue or green spectrum. Therefore, you may think that spiffy lawn and that lovely glow are enticing...and you would be right; they are enticing mostly to mosquitoes! Meanwhile the LED lights and brighter bulbs are distracting to birds and bats who choose dusk and darker skies for safety and to hunt mosquitoes. The bright night lights also add to other problems; plants continue to grow and this means more algae if lights are pointed over water, and they make it harder for you to see into the dark beyond the lights. This makes your property an easier target instead of safer. Consider switching your light bulbs to a source that minimizes blue light emissions, cap and direct your lights downwards to areas that they are needed only such as paths, or try minimizing the amount of time your outdoor lights are on. Not only will you stop attracting as many mosquitoes, but you will also help those nocturnal species that hunt them. There are many ways that switching out blue light can benefit you. Blue light, similar to daylight, suppresses melatonin significantly more than light of other colours and wavelengths. That means that not only is this light attracting mosquitoes, but it's also making it harder for us to sleep. And if it's affecting our sleep and how we behave, think about how it affects wildlife that rely on the night sky for cover, hunting or migrating. Look for the International Dark Sky Association's (IDA) Fixture Seal of Approval when purchasing lighting! It certifies that a product is dark sky friendly and has minimal effect on the environment! **Lesson number seven**; lights, in so many ways, keep us all awake.

The takeaway lesson here is that you can't fight nature, and in trying to fight nature we are upsetting the balance in favour of things that simply make it worse and harder to fight. So if we take a minute to observe the patterns and find the allies in our environment we may see just how we can live better with nature! We hope that you have learned something from this Mosquito Survival Guide and hopefully you feel more confident going into mosquito season. See you out there!

Written by Jaime Kearnan, Senior Conservation Technician

Sources

- <https://www.darksky.org/our-work/lighting/lighting-for-industry/fsa/>
- [http://www.algonquinpark.on.ca/visit/park_management/mosquitoes-and-blackflies-\(biting-insects\).php](http://www.algonquinpark.on.ca/visit/park_management/mosquitoes-and-blackflies-(biting-insects).php)
- <https://www.health.harvard.edu/staying-healthy/blue-light-has-a-dark-side>
- Benelli, G., Jeffries, C., and Walker, T. 2016. Biological control of mosquito vectors: past, present and future. *Insects*. **7**(4). DOI: 10.3390/insects7040052
- Bentley, M. T. et al. 2009. Response of adult mosquitoes to light-emitting diodes placed in resting boxes and in the field. *Publications from USDA-ARS/UNL Faculty*. **997**.
- Mazzacano, C., and Black, S. H. 2013. Ecologically sound mosquito management in wetlands. The Xerces Society for Invertebrate Conservation.
- Takken, W., and Verhulst, N. O. 2013. Host preferences of blood-feeding mosquitoes. *Annu. Rev. Entomol.* **58**:433-453
- Van Breugel, F. et al. 2015. Mosquitoes use vision to associate odor plumes with thermal targets. *Current Biology*. **25**:2123-2129