Newsletter

Winter 2023

Announcing the Northeast Wolf Recovery Alliance - January 2023

The Maine Wolf Coalition (MWC) was established in 1994 after a young female wolf was killed by a bear hunter in northern Maine. Our mission is wolf recovery in Maine through research, education and protection. We do not, nor have we ever advocated for wolf reintroduction.

Over the years, there have been several false starts regarding the creation of a regional wolf advocacy organization. Finally, a regional, bi-national effort called the Northeast Wolf Recovery Alliance has been established. Presently we have representatives from Maine, Vermont, New Hampshire, Massachusetts, New York and Quebec. We anticipate adding representatives from Ontario and New Brunswick in the future.

As an alliance, we have thus far sent letters to the fish and wildlife agencies in New York and Vermont. Wolves have been killed in both states, most recently an 85 pound great lakes gray wolf was killed in south central New York in December 2021. The creation of a bi-national organization is essential because wolves do not recognize national boundaries and because this region contains a single wolf population.

Wolf advocates in the northeast U.S. have historically been opposed by the state and federal governments. Likewise, Canadian governments have historically done little to protect wolves and the continued killing of wolves is negatively impacting their ability to recolonize the abundant habitat that exists south of the St. Lawrence River.

As the saying goes, “There is strength in numbers.” By joining forces, wolf advocates in the northeast states and Canadian provinces will speak with a louder voice. We intend for that voice to finally be heard.

John Glowa

President/Founder

Maine Wolf Coalition

From the Biologist

Our unique *Canis*: the eastern wolf and eastern coyote/coywolf

By Jonathan G Way, Ph.D.

Many people are unaware of the unique genetic background of our wild *Canis* here in the Northeast. Before eastern coyotes appeared in the area, there historically was a small species of wolf, called the eastern wolf, that lived in much of the Northeast and it probably interbred with the larger gray wolf (the wolf that most people are more familiar with) in the northern part of the region.

The 'eastern or Algonquin wolf' (*Canis lycaon*), refers to the wolf found in the Algonquin region of southeastern Canada. It is noticeably smaller than a gray wolf and weighs about 60-65 pounds. It is thought to be the same or a very closely related species to the red wolf (*Canis rufus*), found in the southeastern part of the U.S. Most people officially separate the two species, although they are very closely related and could be part of an historic population living on opposite ends of their geography range. These canids are thought to be more closely related to the coyote than to the gray wolf because western coyotes, red wolves, and eastern wolves are theorized to have evolved in the New World (North America), whereas the larger gray wolf originated in the Old World (Europe and Asia).

Scientists have theorized that the genetic similarity of the coyote and *Canis lycaon* might facilitate hybridization, especially when populations are low in an area, which was the case for wolves in the Northeast about a century ago. Interestingly, one of the biggest threats currently facing the reintroduced population of red wolves in North Carolina is hybridization with coyotes colonizing the western periphery of the Alligator River National Wildlife Refuge 'red wolf recovery' area.

As a collaborator with Trent University in Ontario, I sent ~75 DNA samples of eastern coyotes from eastern Massachusetts to their lab between 2006-2008. Perhaps unsurprisingly based on the eastern coyote being larger than western coyotes but smaller than eastern wolves, the lab results provided conclusive evidence for hybridization in my samples, as well as in tissue samples taken from wild canids in New York, Maine, New Brunswick, and southern Ontario. The northeastern canids contained genetic material from both western coyotes and eastern wolves, which, of course, is consistent with the hypothesis of the hybrid origin of the animals that are most often called 'eastern coyotes'. The geneticists discovered that the samples grouped together in the Northeast, and were separate from western coyotes and eastern/red wolves even though their genes come from them. This means that they are currently breeding true with other eastern coyotes and now have relatively little influence from their parent species in the core of their range. A result of this collaboration was the publishing of our paper in 2010, *Genetic characterization of the eastern "coyote" in eastern Massachusetts*.

At the time of our discovery, Dr. Brad White, the lead researcher at Trent University, believed the eastern coyote (*Canis latrans x lycaon*) should actually be classified as its own species because all of the samples from the Northeast grouped more closely to each other than to either western coyotes or wolves. Biologists call these same canids "Tweed wolves" in southern Ontario, and White noted that the animals there are also a product of hybridization between coyotes and eastern wolves.

The genetic distance between groups is consistent with the Massachusetts canids originating in southern Ontario and progressing down the northeastern U.S. (mainly through New York and Maine) and into southern New England. Likewise, most of the New Jersey and Pennsylvania animals probably originated from New York individuals dispersing south.

Javier Monzón's research team published a paper in 2013 stating that molecular evidence has unequivocally confirmed coyote-wolf admixture in the creation of the northeastern coyote. Admixture is when the DNA from multiple populations or species, in this case, combines to create an animal. The process results in the introduction of new genetic lineages into a population. Based on what I have discussed to this point, that statement wasn't a surprise.

At Trent University, Brad White's team used mtDNA (female inherited DNA) and nuclear microsatellite loci to examine my, and hundreds of other, samples. As discussed, both studies documented only eastern wolf and western coyote influence in the genetic composition of eastern coyotes. So, just as it seemed convincing that the eastern coyote or coywolf was formed by hybridization between two closely related species, Monzón's study used Y-chromosomes, which is male inherited DNA, and single-nucleotide polymorphisms (SNPs), to discover something brand new.

The researchers found low levels of grey wolf and domestic dog admixture in eastern coyotes when using those two new genetic techniques. A parallel study in the same year by Dr. White's research team, led by Tyler Wheeldon, also found domestic dog genetic introgression into eastern coyotes using Y-chromosomes. It seemed that male dogs mated with wild female coyotes and somehow their offspring survived. This was a surprising finding, as it was originally thought that the different reproductive schedules of dogs and wild canines would preclude them from successfully producing offspring and incorporating their heritable material into the wild canid's gene-pool.

A study I co-published in 2016 with Dr. Bill Lynn, a well-known ethicist, made the case for classifying the canid in the Northeast as a new species, *Canis oriens*, meaning "east", or more specifically "eastern canid", in Latin. We wrote that given its mixed species origin and morphological and genetic uniqueness, the most appropriate name for this animal is "coywolf", which accounts for its two main genetic influences (i.e. coyotes and wolves) in portmanteau order. Altogether, using information from the 2010 studies and Monzón and Wheeldon's teams, we concluded that the northeastern coyote has roughly 60-65% genetic influence from coyote, 25-30% wolf and 10% domestic dog.

We thought that the name would still apply even with the relatively small amount of dog introgression in its genome since dogs are essentially domesticated grey wolves and dog DNA is found in many other wild *Canis* species, including grey wolf populations. In fact, it is believed that dog genes gave gray wolves their black coat color, as well as melanistic coyotes in the southeast.

It is important for managers to acknowledge that this animal was produced through cladogamy (i.e., when two or more species mate) events ~100 years ago, but there was now minimal recent admixture throughout most of its northeastern range. We believed that the coywolf was clearly morphologically and genetically different to any other described population of *Canis* and believed that should qualify the animal for species status. We concluded saying that the nomenclature gives them a distinct stand-alone name separating them from their parental *Canis* species/types and the associated relative amounts of *latrans* (coyote), *lycaon* (eastern wolf), *lupus* (gray wolf), and domestic dog genes contributing to their hybrid background.

While confident that this animal is a unique type of *Canis* in North America, which isn't debated in the scientific literature, I knew that the species level designation would be contentious until samples were taken throughout eastern North America and the animal was conclusively determined to be unique. There would have to be a cutoff point and genetic isolation where they become more "eastern coyote-like" and less "western coyote-like". We now know that canids become more "wolf-like" in south to central Ontario, where agricultural lands are replaced by boreal forest near Algonquin Provincial Park, thanks to Paul Wilson's 2009 paper, *Genetic characterization of hybrid wolves across Ontario*. Yet I regularly receive reports of very wolf-like looking 'coyotes' (i.e., coywolves) all the way down to North Carolina and west to Texas and Louisiana. This lack of conformity would likely make determining species status difficult.

There is considerable debate and disagreement among scientists over what to call and how to scientifically classify the canid inhabiting the northeastern United States. In the course of this creature's less than 100-year history it has been variously called coyote, eastern coyote, coydog, Tweed wolf, brush wolf, new wolf, northeastern coyote, and most recently, coywolf, with

eastern coyote being the most used common name associated with this animal. Following my team's claim in 2010 that genetic data indicated that this hybrid animal could be called coywolf, rather than a type of coyote, a few groups have responded arguing that they should be continue to be called eastern or northeastern coyotes (i.e., NOT coywolf) and should not be regarded as separate species.

I maintain that coywolf is an appropriate term for this canid inhabiting the Northeast but have no problem using the term eastern coyote synonymously, especially given its historical usage. I also concede that the canid may not yet be a candidate for species status (i.e., *Canis oriens*) as it continues to evolve. For years I have thought that it should be scientifically referred to as *Canis latrans* × *lyacon* and not as *Canis latrans* var., which means a variation of coyote. However, after much thought I now believe that *Canis latrans* × *lyacon* × *lupus* is the most appropriate classification. *Canis latrans*, the scientific name for the western coyote, comes first in this descriptor, meaning it is the most abundant source of genetic material. We now know the coywolf's hybrid status for sure so including *lycaon* accounts for the known presence of eastern wolf alleles while the *lupus* designation at the end describes the gray wolf and domestic dog influence, since dogs are classified as a subspecies of gray wolf.

I hope that the premises explained in this chapter better explain why 'coywolf' is an appropriate term to use alongside 'eastern coyote' for the canid inhabiting Northeastern North America. I hope it also clarifies a little bit about the eastern wolf that formerly lived in the region, and may be returning.

The text is an adaptation of excerpts of Way's book Coywolf: Eastern Coyote Genetics, Ecology, Management, and Politics *which can be downloaded here: https://www.easterncoyoteresearch.com/coywolfbook/.*

Wolflike canid from Maine

MWC Current Projects:

Canid Clues

This winter has been busy in northern Maine and the western Maine mountains. Our research field technicians (all of whom are volunteers) have been scouring these areas for large canid scat samples, canid paw prints in excess of 3.5 inches, and posting trail cameras where animals of interest have been located. On the right, are two paw prints found in different areas along old logging roads. These two images are examples of canid prints larger than 3.5 inches which is the upper limit for the eastern coyote. Because these prints are larger, they could possibly have come from an eastern or Algonquin wolf. When examining canid prints the surrounding area is always surveyed for human prints - which would indicate that the animal that left the large prints was probably a dog. The prints shown here did not have any human prints with them and the walking patterns of the animals was the same as those found in wild canids.

A large canid paw print in sand

A large canid print in wet sand/mud

The Scoop on Poop!

Yes, we collect poop! More specifically, wild canid poop which we call scat. Below are two examples of canid scat recently found in Maine. The one on the left is a large, desiccated scat from a wild canid found in the western mountains. Unfortunately, this sample is old and no longer contains any of the animal's DNA material - all that is left is the fur of the animal the canid consumed. This scat is about 12 inches in length and up to 1.25 inches in diameter. That's a very big poop! This indicates to us that this wild canid could possibly be larger than a typical eastern coyote. It may even be an eastern wolf!

The second scat sample (the right photo) was found in northern Maine. It is fresher and contains bone fragments and fur. It, too, is very large and likely from a large canid. Because of its freshness, this sample was used to collect the canid's DNA which will be analyzed by scientists at either Princeton University or Michigan Technological University to determine what type of wild canid deposited this scat.

Large desiccated canid scat

Large canid scat with fur and bones

MWC Tech Corner

Heard Howls?

The Maine Wolf Coalition is utilizing the latest in research technology to locate and monitor active wolf packs in the state. One new unique tool is called the AudioMoth. Think of it like a trail camera for sound.

https://www.openacousticdevices.info/audiomoth

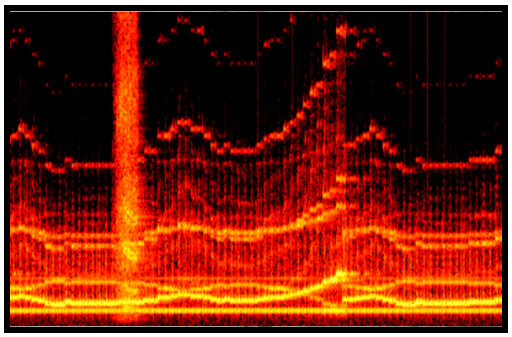
This device is being used all over the world by researchers to monitor things like biodiversity, animal behavior and identification of rare species. It has recorded everything from bats to elephants and even underwater sounds.

Just like a trail camera it sits out in the woods. It periodically wakes up and if it hears something, it records it. We leave it in areas that we have had interesting activity and it stays in place for a couple of months, listening and recording.

When we bring the AudioMoth back in to analyze we'll have hours and hours of nature sounds. Instead of listening to each and every sound it recorded we use a special piece of software that generates what's called a spectrogram. A spectrogram is like a sound fingerprint. Each animal makes a different picture. It allows us to quickly review the recorded sounds until we find something that looks interesting. We can then listen with our ears to determine if it's a sound we want to investigate further.

We deployed an AudioMoth at a very active site the first week of the new year. We will be analyzing it in March. Stay tuned, we will share any suspicious sounds we find. There's nothing in nature like the sound of a wolf pack howl!

The Maine Wolf Coalition is using good field work along with cutting edge technology to gather evidence of wolf activity in Maine. In future posts we'll talk about our approach to DNA analysis and how we handle and analyze trail camera pictures and video.



Sample Wolf Spectrogram

Audiomoth mounted on tree

Letters From The Field:

Living in the Woods with Wolves

Call me Sven. I have to remain anonymous for now because it's very possible that I have a thriving/breeding wolf population right in my backyard. I have a cabin on under 100 acres in the north woods of Maine. It's really cool! There's not much at all between me and Canada to the west, some hundred miles or so… millions of acres of forest - actually, 4-5 million, counting Baxter State Park.

I put out a couple of trail cameras in 2020 – boy was that exciting! Huge moose, lots of deer, fisher, snowshoe hare, red fox, partridge, a black bear family, and even a Canada lynx showed up to pose. And then I got a video of some very odd looking "coyotes", or so I thought. I lived in Montana for years, saw a lot of coyotes, and the midwest too. These animals were not coyotes. I sent the videos to John at the Maine Wolf Coalition; he and his team analyzed them and concluded that the canids sure looked wolfy and needed to be studied further. I learned that they have been collecting scat for DNA testing to definitively identify the amount of wolf in Maine's large canids.

I have 12 trail cameras out on my property now, and have collected a bunch of fresh scat samples to be tested. They've got a really strict protocol on how to collect them but I guess it has to be done right. The first two animals I got on camera were an adult male and a pup, filmed a few days apart. Since then I've captured a lot of different videos, most at night, a few during the day. I use a trapping lure at a couple of the cameras. Sometimes I don't see any canids for a week or more, then all of a sudden they're around for a spell. It's so cool seeing them.

I've seen tracks! Not a lot, I'm sure I miss many because I have a dog who goes everywhere I go so seeing a dog-like print doesn't jump out at me, but I've seen tracks larger than my doberman's. Now that there is snow I'll hopefully be able to document some.

Howls! Like I mentioned earlier, I've lived around coyotes and heard their yips, high howls and chatter. It's fascinating and I loved hearing them. But… A couple of times now I have heard distinct wolf howls in the woods here. Just like in the movies - obvious, low-pitched howling. I've tried to record it on my phone without success. I can't hear them when I'm inside through the logs, it's a bit frustrating. Low and behold, someone at MWC has a device that will record animal sounds for a couple of months at a time. So, "Operation Howl Grab" is now in play. I was given instructions on how to turn the unit on, I rode my ATV out to a hill on my property to deploy it and come March I'll

retrieve it and send it to MWC to analyze. They've got some fancy-schmaltzy software I don't understand that'll do the heavy lifting of sorting through months of sounds from the north woods.

Proving that these animals are wolves is a very slow, deliberate process I'm learning. The DNA testing will take months and months most likely, and the sound recorder will be doing its thing 'till spring. In the meantime I continue to gather videos, photos, scat and take notes. I'm told that 2022 was a year of major progress for MWC, and I'm extremely excited to see the results roll in and follow the progress of getting these wolves acknowledged and protected.

It's time to hop on my snowmobile and head out to change out some memory cards. Living with what I believe are wolves is amazing! If you enjoy wildlife as much as I do, I suggest you invest in a trail camera; you'll be amazed at what's out there right under your nose that you just don't see. And if you think you might have videos or pictures of wolves, let the MWC know!

Sven January 22, 2023

Canid of interest on Sven's property

Samples From Sven's Cams

Our Northern Maine Visitors in 2022

Funding the Maine Wolf Coalition

The Maine Wolf Coalition (MWC) is a 501c3 nonprofit organization. We are dependent on donations from our supporters to complete our current projects and research. Every dollar donated to the MWC is used to purchase equipment such as specimen tubes for scat or trail cameras we use for animals of interest and most recently to identify the DNA of the canids using the most advanced scientific techniques at Princeton University and Michigan Technological University. If you are interested in donating to our research and to support our mission to document the presence of eastern wolves in the state of Maine, please make your check out to the Maine Wolf Coalition send it to the following address:

The Maine Wolf Coalition

30 Meadow Wood Drive

China, ME 04358

USA

Remember - your donation is TAX DEDUCTIBLE!! Thank you for your support!

Other Resources for our Supporters:

Eastern Coyote Research

Maine Wolf Coalition

MWC Facebook Page

Questions or comments, contact the MWC at:

jglowa@roadrunner.com

Eastern Coyote/Coywolf

Kids Corner


How Many Wolves Can You Find
Hiding In Maine's Woods?
MAINE WOLF COALITION
mainewolfcoalition.org
Research Education & Protection

Wolves in Maine Crossword Puzzle

Across

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[6] Tool to see wolves
[8] Another name for the Eastern Wolf
[11] MWC Field Researchers love to step in this
[12] NFL team our wolves root for
[15] Wolves need this
[17] Wolf communication
[19] Baby wolves

Down

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[2] Can be tested for DNA
[3] Maine Wolf _____
[5] Neighbor with lots of wolves
[7] The boss
[9] Yet another State with wolves
[10] Small canid in our woods
[13] DNA Has documented wolves are in this State
[14] Deer herd is this in wolf country
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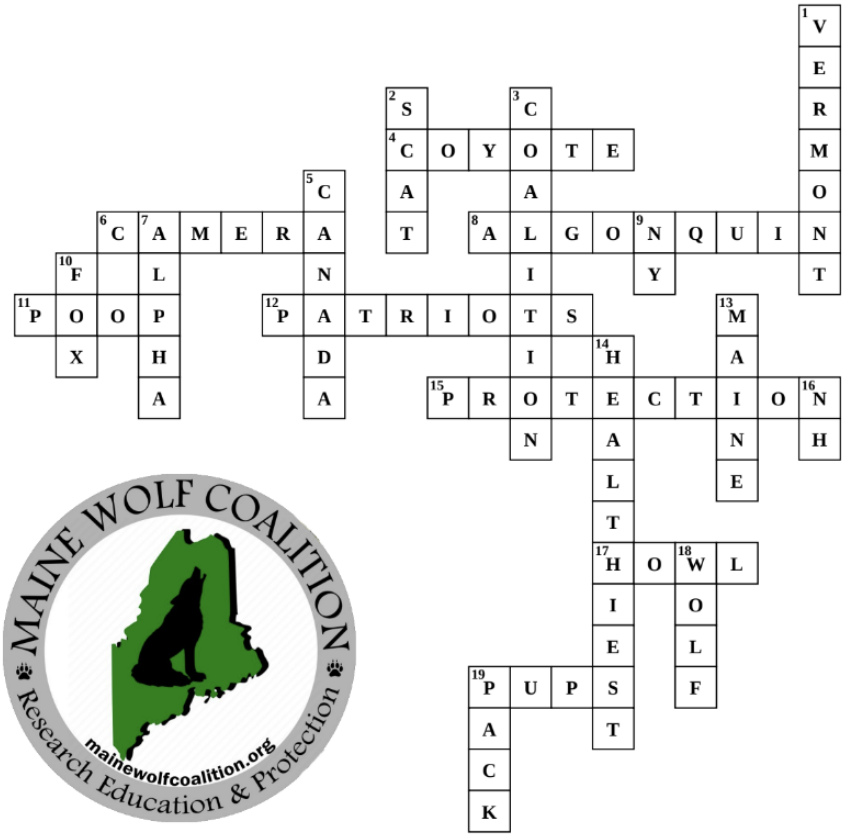
Solution



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