Arrival of Coyote-Wolf Hybrids in
Banshee Reeks Nature Preserve

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Introduction

During the early nineteenth century, the coyote (*Canis latrans*) of the western plains of North America began migrating eastward. The migration followed two different eastern routes, one through the southern states and one through the northern states and Canada. By the mid-twentieth century both routes had reached the eastern seaboard and coyote began dispersing up and down the coastal states. The migration routes have now met in Northern Virginia, though as early 1981 *C. latrans* had been observed in every state east of the Mississippi River (Webster, 1981).

During the migration, coyote following the northern, Canadian, route mated with wolves in the Great Lakes Region and produced viable offspring. As these offspring matured they too mated with wolves and coyote, producing an animal larger than the “true” coyote but that still retained the coyote’s ability to adapt to almost any environment. As the northern and southern routes now come together, the genetic mixing continues, giving rise to animals that are, in many cases, hybrids of hybrids. This paper will focus on the findings that the eastern coyote exhibits traits of a wolf-coyote hybrid, and is most likely a hybrid of hybrids (Bozarth, Hailer, Rockwood, Edwards, & Maldonado, 2011).

Banshee Reeks Nature Preserve (BRNP) is located in Loudoun County, Virginia, near the town of Leesburg. Loudoun County is roughly divided, east & west, by Route 15, which runs through Leesburg. The eastern part of the county has seen extensive development, while the west still has a more rural character (though it too is being developed). Over the last eighteen months there has been a noticeable increase in coyote activity within the preserve. Though there have been direct sightings, activity has been primarily observed in the form of scat & tracks.

Recent studies have found that coyote arriving in Northern Virginia display a variety of genetic traits, including traits from the coyote-wolf hybrid. What is the likelihood of coyote with hybrid genetic traits arriving in Banshee Reeks?

Methodology

To answer this question a review of current literature was conducted, primarily through the use of online sources. A search was conducted using Oregon State University’s online library resources to identify journal articles. Internet searches using terms such as coyote-wolf hybrid and eastern coyote migration used as well. The searches produced results from a variety of sources, from journals and books to local newspaper articles. Given the scope and length limitations for this assignment, sources were selected that focused on eastern migratory routes, coyote-wolf hybridization, and/or observations of coyotes and their behavior related to eastern migration and dispersal. Sources were selected from professional, peer-reviewed journals as well as educational websites and local news sites.
Discussion

The Gray Wolf was once found throughout most of North America except in the southeast and parts of California west of the Sierra Nevada (Paquet & Carbyn, 2003). As human population expanded and moved westward, wolves were eliminated through loss of habitat, prey and hunting. By the beginning of the twentieth century gray wolves had been eliminated from almost their original habitat with the exception of Alaska, most of Canada, and a few small areas in the northern United States. Wolves have been reintroduced in some western states, and populations are slowly rising, though they still only occupy a small fraction of their original range.

While not native to eastern states, coyote have expanded their range and are now present throughout North America, with the exception of furthest northeastern parts of Canada. Their dispersal has been greatly aided by manmade habitat changes. As forests are cleared for agriculture, it creates an ideal habitat for rodents and small mammals, which make up the bulk of a coyote’s diet. Eastern expansion has also been aided by the elimination of wolves. Not only do they compete for the same resources, wolves have been known to kill coyote under some circumstances. Coyote may avoid areas with large wolf populations (Gese & Beckoff, 2004). By eliminating the top canine predator and providing easy access to varied food sources (rodents, animals, trash, etc.) and habitat we have facilitated the eastern expansion of *C. latrans*.

The eastern migration has followed two primary routes; a southern route through the southeastern United States, and a northern route that took them either north, around the Great Lakes through Canada and then down the East Coast, or a route slightly to the south of the Great Lakes through northern states such as Illinois, Ohio, Pennsylvania, and New York. The northern routes merge in northern Pennsylvania, Ohio, and New York and some migrating animals turned south. The southern route heads north. Both routes have begun to meet in the mid-Atlantic region, particularly in the Northern Virginia area (Bozarth, Hailer, Rockwood, Edwards, & Maldonado, 2011). Map 1, on the following page, illustrates the migratory routes in the 1900s.

Based on genetic analysis of samples collected from coyotes that followed the northern, Canadian, route, some coyote mated with wolves, producing viable offspring. As these offspring dispersed southward through New England into New York and Ohio, they encountered other, non-hybrid, migrating coyotes. While acknowledging that there is debate on the genetic composition of the wolf species; some argue that the wolves in the Great Lakes region are themselves a hybrid of the Gray Wolf (*Canis lupus*) and coyote, while other contend they are a hybrid of the Gray Wolf and Eastern Wolf (*Canis lycaon*) (Mech, 2011).

The coyote is a habitat generalist, and is in fact extremely adaptable. While preferring disturbed habitat over forest, coyote have also established stable populations in urban centers such as Los Angeles, Philadelphia, Pittsburgh, New York, Washington DC, and other larger urban areas (Blanchard, 2004). The pattern of development on the East Coast allows provides ideal, broken habitat for small mammals that make up the bulk of the coyote diet, but also provides numerous wooded patches for shelter. Being secretive,
and primarily nocturnal, they often go unnoticed and have so far remained more a curiosity than a problem that must be eradicated.

Map 1

Eastward Expansion of Coyote in the 1900s. (Parker, 1995)

Eastern coyote behavior, particularly animals from the northern routes, is similar to the behavior of the western coyote, with some differences. Eastern coyote tend to have larger home ranges than their western counterparts, but smaller than wolves (Way, Rutledge, Wheeldon, & White, 2010). Eastern coyote form loose family groups, with some offspring remaining with their parents for a year or more, helping raise newborn pups before dispersing. The groups are smaller than what would be considered typical of wolves, but larger than would normally be seen with western coyotes. The larger size of the eastern coyote also allows them to hunt larger game, including deer. Coyote have been observed hunting, and eating, white-tailed deer fawns in Shenandoah National Park in Virginia. They have also displayed similar behavior in New England. Michigan,
while not an eastern state, has large, stable coyote population. For the last three years coyote have been the number one killer of deer in the Upper Peninsula, ahead of bobcats and wolves (Meyerson, 2012). While they don’t seem to target healthy adults, coyote have the potential to significantly impact deer herds through fawn predation.

Physically, eastern coyote are larger than their western cousins, with a stockier body; males are 10-15 lbs heavier on average. The head is slightly larger, with a shorter snout, stronger jaws, and smaller ears. Coats colors vary, but are typically grey with some rust or brown coloration. The following photos best illustrate the physical differences between the eastern and western coyote.

Photo 1

Eastern coyote, Shenandoah National Park (Larry Brown)
Recent studies have confirmed that coyote-wolf hybrids have migrated south and are now present in Virginia. A study lead by Christine Bozarth has found genetic evidence of coyote-wolf hybrids in Prince William National Forest and nearby Quantico Marine Corps Base, both in Northern Virginia. The study also found that coyote in Northern Virginia were closest genetically to coyote found in western Pennsylvania and western New York. These coyote share genes from the coyote-wolf hybrids that came down from Canada and bred coyote expanding east through Ohio (Bozarth, Hailer, Rockwood, Edwards, & Maldonado, 2011).

Northern Virginia is easily accessible from the Appalachian Mountains, and in fact the Appalachian Trail (AT) runs through Virginia along the spine of the Appalachian Mountains, and passes through western Loudoun County. The AT corridor may serve as route for northern and southern expansion, providing shelter as well as access to suitable habitat. The AT runs the length of Shenandoah National Park as well, which has also seen an increase in coyote activity. It has also been stated that coyote use railways as travel routes (Blanchard, 2004). The main north-south East Coast railway travels through Northern Virginia, in fact passing through Prince William County very near Prince William National Forest and Quantico Marine Corps Base.
Conclusion

The coyote is a highly intelligent and adaptable animal. It has proven over the last hundred years that, as man has altered the landscape and eliminated top predators, it can not only live alongside humans, but can thrive in the environment we create. Development in Northern Virginia has created a habitat in which the coyote can excel.

Genetic evidence of coyote-wolf hybrids has been found in Prince William National Forest and Quantico Marine Corps Base, both are south and east of BRNP. Photographs of coyote from Shenandoah National Park show animals with a physical appearance similar to the coyote-wolf hybrid found in New England. SNP is south and west of BRNP. The Appalachian Trail is a few miles to the west of BRNP, providing and wild corridor that stretches from Maine down to Georgia.

When considering the information available, it is highly likely that at least some of the coyote now in Loudoun County, and specifically in BRNP, are genetic hybrids that contain both coyote and wolf DNA. What does this mean for BRNP? The preserve has ideal habitat for coyote, with ample food and water. It has a large herd of white tailed deer, and a very healthy small mammal population. If the larger hybrid coyote were in fact to establish residence within BRNP it could have a significant impact on the deer herd, which would in turn impact the rest of the community. BRNP currently has a problem with invasive species, particularly plants. One of the many problems with the invasive plants is that the deer prefer to eat the natural vegetation and are feeding on it predominantly. This allows the invasive species to thrive and spread, out competing the native species. What impact would a stable coyote population have other predators within BRNP? How would a coyote population influence management policy? How will all this be evaluated? The arrival of coyote, particularly hybrids, presents many opportunities for further study. Coyote have the potential to assume the role of an apex predator, significantly altering the ecological landscape.
Works Cited

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